ITC Zambia Wave 2

Technical Report

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ITC Zambia Research Team
Dr. Fastone Goma (Principal Investigator, University of Zambia [UNZA], School of Medicine)
Mr. John Mayeya (Directorate of Public Health and Research. Ministry of Health)
Mr. Richard Zulu (Co-investigator, UNZA, Institute for Economic and Social Research)
Mr. Kondwani Chirwa (Project Manager, UNZA, School of Medicine)
Mr. Masauso M. Phiri (UNZA, School of Medicine)
Mrs. Josephine Chewe (Central Statistics Office [CSO], Zambia)

ITC Zambia International Research Team (University of Waterloo, Canada)
Professor Geoffrey T. Fong (Principal Investigator, Department of Psychology)
Professor Mary E. Thompson (Principal Investigator, Department of Statistics and Actuarial Science)
Professor Matthias Schonlau (Co-investigator, Department of Statistics and Actuarial Science)
Dr. Anne C.K. Quah (Research Scientist, Department of Psychology)
Dr. Susan Kaai (Project Manager, Department of Psychology)
Mr. Pete Driezen (Senior Data Analyst, Department of Psychology)

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Preface to ITC Zambia Wave 2 Technical Report

This report documents the second wave of the International Tobacco Control Policy Evaluation (ITC) Survey that was conducted in Zambia. The ITC Zambia Wave 1 Survey was conducted from September to December 2012. The second wave was conducted from August to October 2014, i.e., about two years after the first wave.

For the most part, the format of this report is similar to the Wave 1 technical report. However, there were a number of changes to some content and methods in the second wave including:

1. Respondents from the first wave were recontacted to participate in the second wave.
2. New respondents were recruited to replace those lost to attrition, using a similar sampling strategy to the one used in Wave 1.
3. A mini-enumeration activity was conducted to estimate tobacco use prevalence in Zambia.
4. New Screeners were added at Wave 2.
5. A revised weights calculation document for Waves 1 and 2 was included in this report.
1 Introduction

1.1 Background

The International Tobacco Control Policy Evaluation Project (the ITC Project) is a multi-country prospective cohort study designed to measure the psychosocial and behavioral impact of key policies of the World Health Organization Framework Convention on Tobacco Control (WHO FCTC). The ITC Project is a large global research initiative that currently involves more than 20 countries inhabited by over 50% of the world’s population, 60% of the world’s smokers, and 70% of the world’s tobacco users. The ITC Project has about 100 leading tobacco researchers and is led by Professor Geoffrey T. Fong at the University of Waterloo. In 2012, two African countries (Zambia and Kenya) joined the ITC Project.

On May 23, 2008, Zambia ratified the WHO FCTC. Policy measures adopted included the following:

- In May 2008, the Ministry of Local Government organized a public awareness campaign about Instrument No. 39 (1992) — a law that banned smoking in health-care facilities, educational facilities, and public transport.
- In April 2008, a smoking ban was expanded to all public places, i.e., health care facilities, educational facilities, public transit, universities, and government facilities except for indoor offices.
- In May 2009, a campaign was launched to enforce smoke-free laws in Lusaka.

However, Zambia does not have bans on direct tobacco advertising, promotion and sponsorship.

To evaluate the effect of the FCTC, the ITC Project is conducting parallel prospective cohort surveys with adult smokers in 22 countries – Canada, United States, Australia, United Kingdom, Ireland, Thailand, Malaysia, South Korea, China, New Zealand, Mexico, Uruguay,
Germany, France, the Netherlands, Bangladesh, Brazil, Mauritius, Bhutan, India, Zambia, and Kenya.

The ITC Zambia Wave 1 Survey was conducted from September to December 2012. The ITC Zambia Wave 2 Survey was conducted from August to October 2014.

1.2 Main Objectives

The objectives of the ITC Zambia Survey are:

1) To examine the prevalence and patterns of tobacco use behavior in Zambia. The survey will also provide information about tobacco users’ knowledge, beliefs, attitudes and opinions about using tobacco.

The ITC Zambia Survey provides multidimensional estimates of prevalence and patterns of tobacco use among the Zambian population. It describes the population’s consumption patterns and quitting behavior, as well as its knowledge, beliefs, and attitudes about tobacco use. Specifically, the survey investigates the population’s shift from traditional tobacco products (in the form of bidis, kreteks, and smokeless) to cigarettes.

2) To examine the impact of specific tobacco control policies that have been, or will be, implemented in Zambia, on tobacco use and tobacco-related behavior among tobacco users in Zambia.

The ITC Zambia Survey evaluates the impact of tobacco control policies in the following areas of the FCTC:

- Health warning labels and package descriptors
- Smoke-free legislation
- Pricing and taxation of tobacco products as well as the prevalence of compensatory behaviors that may offset the impact of taxation (e.g., cheaper purchasing options, smuggling)
- Education and support for cessation
• Tobacco advertising and promotion
• Tobacco farming

Findings from the ITC Zambia Survey will provide a detailed picture of the current tobacco control policy landscape in Zambia, including the beliefs, attitudes and behaviors of cigarette and pipe smokers and non-smokers, following the May 2008 ratification of the WHO FCTC. Of particular importance in Zambia is the linkage between tobacco use and the poverty of the tobacco users, and how tobacco control might help to alleviate this poverty.

3) To compare the psychosocial and behavioral effects of national-level tobacco control policies and programs in Zambia with findings from the other 21 ITC countries.

The ITC Project aims to provide an evidence base to guide policies enacted under the WHO FCTC, and to systematically evaluate the effectiveness of these legislative efforts. All ITC Surveys are developed using the same conceptual framework and methods, and the survey questions are designed to be identical or functionally equivalent to permit comparisons across ITC countries. The evaluation studies conducted from the ITC Surveys take advantage of natural experiments created when an ITC country implements a policy: changes in policy-relevant variables in that country from pre- to post-policy survey waves are compared to those of other ITC countries where that policy has not changed. This research design provides high levels of internal validity, allowing more confident judgments regarding the possible causal impact of policy.

4) To suggest changes to current government tobacco policies

Recommendations to strengthen the current tobacco policies are made based on existing and derived survey information. The aim is to optimize the effects of tobacco control polices with regard to situational and individual difference moderators: (a) demographic variables; (b) personality variables (e.g., time perspective); (c) environmental context (e.g., number of peers/family members who smoke); and (d) the individual’s smoking history (e.g., past quit attempts, smoking intensity, and quitting smoking).
1.3 The Research Team
The ITC Zambia Survey was conducted by team members from the University of Zambia, School of Medicine. The research team is collaborating with an international team of researchers at the University of Waterloo, Canada.

1.4 Interview Procedures
Data were collected using ‘face-to-face’ interviewing methods. The questionnaires were adapted by the ITC Zambia and Waterloo teams to ensure that they were relevant to the Zambian context. Participants gave their informed consent before commencing an interview. The surveys took approximately 60 minutes for tobacco users and approximately 30 minutes for non-users to complete. The survey was administered in five local languages: Bemba, Nyanja, Kaonde, Tonga, and Lozi. However, the English version was also provided for respondents who wished to answer in English.

Ten supervisors and 40 interviewers were contracted by UNZA. Each province had a team that comprised of a supervisor and four interviewers. This was the same fieldwork team (except for a few who dropped out and were replaced) who conducted the ITC Zambia Wave 1 Survey. Each team remained in their province until data collection was completed. Data collection commenced in August 18, 2014 and was completed in October 30, 2014.

1.5 Pilot Testing of Questionnaires
A pilot survey was conducted during the interviewers’ training workshop on Aug 16, 2014 (See Appendix A). Interviewers practiced what they had learned in the training workshop. A de-briefing session was held after the pilot testing activity. Interviewers shared their experiences regarding the field logistic challenges and the actual interviewing exercise. The questionnaires were revised based on the de-briefing exercise.
1.6 ITC Zambia Survey Timelines

The ITC Survey is a longitudinal cohort study: respondents who participated in Wave 1 were recontacted in Wave 2 to answer the follow-up survey. In Wave 1, approximately 1,500 tobacco users and 600 non-users aged 15 and older were randomly selected for participation. For Wave 2, these respondents were recontacted, and for those that could not be recontacted, the sample was replenished to retain the same approximate numbers of tobacco users and non-users. Figure 1 shows the timeline of the ITC Zambia Project.
Figure 1: ITC Zambia Survey Timeline

ZAMBIA
Timeline of Tobacco Control Policies and ITC Surveys

1992
• Smoking banned in 9 public places
• 1 text warning in English introduced, effective Jan. 1993
• Direct & indirect commercial advertising banned, with exceptions for direct advertising to general public
• Ban on selling tobacco products to minors under 18

2008
• Taxes on the most popular brand are at 34% for a pack of 20 cigarettes
• Single text warning required (in English) on front & back of pack in bold letters against contrasting background

April 2008
Ban on smoking in all indoor public places, except offices.

May 2008
ITC ratification

2009
• Fines set for violation of smoke-free law of 400 ZMW (approx. $61.00 USD) or up to 2 years imprisonment
• No official counseling services, however there are 4 clinics in Lusaka which offer cessation services

May 2009
Campaign launched to enforce smoke-free laws in Lusaka

2012
• Taxes on the most popular brand are at 27.6% for a pack of 20 cigarettes

Wave 1
Sept.-Dec 2012
Total User N=1,470
Non-User N=594

Wave 2
Total User N=1,451
Non-User N=558

Survey Mode: Face-to-Face (F2F)
Respondent Types: Tobacco User, Non-User

Updated September 2015
2 ITC Zambia Wave 2 Sampling Design

2.1 Sampling Design for ITC Zambia Wave 2

The ITC Zambia Survey was designed to be a nationally representative sample of approximately 1,500 tobacco users and 600 non-users aged 15 years or older selected through a multi-stage clustered sampling design. Specifically, the design was stratified by province and sampled a total of 150 clusters/enumeration areas (EA)*, allocated to the 10 provinces in numbers proportional to population size. See Appendix B for details of how the original sampling of the ITC Wave 1 Survey was done.

Every effort was made to recontact Wave 1 households; dropouts were replaced by adults of the same tobacco use status in newly enumerated households, in the same EA, sampled using the same procedure as in Wave 1. It was intended that if an EA (cluster) was exhausted, an additional EA (cluster) would be drawn from the same ward.

2.2 Mini-enumeration for Wave 2

Tobacco use prevalence in Zambia could not be estimated at Wave 1 because the implementation of the enumeration in Wave 1 was flawed. Specifically, in some EAs, the field staff erroneously missed enumerating non-users in non-user households where no interview was to be conducted. To compensate, a “mini-enumeration” was conducted in Wave 2. This mini-enumeration consisted of enumerating a minimum of 10 households in each cluster (EA), or as many as were required to complete the replenishment in the cluster, whichever was greater. The prevalence estimates from the mini-enumeration were incorporated in the cross-sectional weights as described in Chapter 6. Prevalence for various population groups can be estimated using enumerated household weights from the new enumeration and census data. The computation of standard errors must take into account the sampling design including clustering and stratification. Details of how the weights were calculated for Waves 1 and 2 are found in Chapter 6.
2.3 Recontact Sampling for the ITC Zambia Wave 2

The Wave 2 sampling plan focused on recontacting as many Wave 1 respondents as possible, even if they were smokers at Wave 1 but had quit smoking in Wave 2. There was a separate quitter survey for those Wave 1 respondents who had quit smoking. New respondents were interviewed to replace Wave 1 respondents who could not be traced at Wave 2 (i.e., lost to follow up). In order to minimize ID code errors at Wave 2, field interviewers were given Household Recontact Forms (HRFs) with pre-filled ID numbers. The Statistician from Waterloo used ID Code information from the ITC Zambia Wave 1 dataset to pre-fill the Wave 2 HRF forms.

2.4 Replenishment Sampling for the ITC Zambia Wave 2

The replenishment sample was made up of new respondents who were interviewed to replace Wave 1 respondents who could not be traced at Wave 2 (i.e., lost to follow up). They were to be taken from newly enumerated households, and thus the replenishment sampling was conducted along with the mini-enumeration. Interviewers were given maps of the EAs that were drawn in Wave 1. If there were changes in the dwellings in the EA, they first updated the Wave 1 maps. New dwellings were allocated numbers that were not used in Wave 1 in a clockwise manner. Interviewers used the Wave 1 "Random Table" (See Appendix D) to randomly select the dwellings for the new households. Specifically, they started with the dwelling in the first row below where they left off in Wave 1; then they went to the dwelling in the next row below etc., until they completed both the mini-enumeration and the replenishment sample.

The recontact/replenishment quota target for Wave 2 (per EA) was 10 tobacco users and 4 non-users. These targets were reached: altogether 1,276 Wave 1 (from Wave 1 cohort) respondents were recontacted; and 733 respondents were added to the Wave 2 sample (See Table 1).
Table 1. Number of Recontact and Replenishment Sample

<table>
<thead>
<tr>
<th></th>
<th>Tobacco Users</th>
<th>Non-Users of Tobacco</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recontact</td>
<td>911</td>
<td>365</td>
<td>1,276</td>
</tr>
<tr>
<td>Replenishment</td>
<td>540</td>
<td>193</td>
<td>733</td>
</tr>
<tr>
<td>Total</td>
<td>1,451</td>
<td>558</td>
<td>2,009</td>
</tr>
</tbody>
</table>
3 Survey Protocols

3.1 Recontact Participant Selection and Consent

Respondents who were interviewed in Wave 1 were recontacted in Wave 2. Field interviewers were asked to re-introduce themselves to respondents using a pre-determined script. Details of the field procedure are summarized in a flow chart in Appendix C.

Information and Consent

Once contact with a respondent from Wave 1 was re-established, the interviewer first allowed the respondent to read (if they were literate) the information letter about the research study before completing the consent form, i.e., the respondent signed (or thumb stamped if the respondent could not sign) two copies of the consent form.

If a respondent could not read, the interviewer orally explained the study details to the respondent using the information letter as a guide before requesting for a signature or thumb stamp. The interviewer gave the respondent the information letter and a copy of the signed (or thumb stamped if the respondent could not sign) consent form. The second copy of the consent form and the screener were attached to the completed survey questionnaire for that respondent.

3.2 Replenishment Participant Selection and Consent

Replenishment was only done in newly enumerated households at Wave 2 (within the same EAs at Wave 1), not in households that had been enumerated in Wave 1. Only Zambian citizens aged 15 years or older were eligible for replenishment.

Selection of Household Members

There were two different categories of eligible respondents in a replenishment household:

- Tobacco users – The interviewer could randomly select up to 4 tobacco users from every household (with priority to female tobacco users) as was done in Wave 1
• Non-users – The interviewer could randomly select 1 non-user at every 5th household visited as was done in Wave 1.

Information and Consent

Once a replenishment respondent was selected, the information letter was provided and consent was obtained as explained in section 3.1.

3.3 Questionnaires and Screeners

There were three individual screeners (Screeners 1, 2 and 3), one household questionnaire (H Survey), and six individual questionnaires (C, L, M, N, Q, and P).

Types of Screeners

The purpose of the screeners was to establish the tobacco status of a respondent at Wave 2.

• **Screener 1**: Replenishment Respondent: For new respondents who were randomly selected to replace each Wave 1 respondents who could not be recontacted at Wave 2. This screener was to ensure that the appropriate individual survey questionnaire (P+C, P+M, P+L or P+N) was administered at Wave 2.

• **Screener 2**: Tobacco User (Recontact): For every respondent who was a tobacco user at Wave 1. This screener was to ensure that the appropriate individual survey questionnaire (C, M, L or Q) was administered at Wave 2.

• **Screener 3**: Non-User of Tobacco (Recontact) - For every respondent who was a non-user of tobacco at Wave 1. This screener was to ensure that the appropriate individual survey questionnaire (P+C, P+M, P+L or N) was administered at Wave 2.

Recontact Surveys/questionnaires)

These questionnaires were used for Wave 1 respondents who were successfully recontacted at Wave 2. Below is a brief description of each recontact survey:

• **Household (H) questionnaire**: Only for the Head or Key Informant of the Household i.e., one H questionnaire per household.

• **Cigarette smoker (C) questionnaire**: For respondents who smoked cigarettes at least once a month.

• **Smokeless Tobacco user (L) questionnaire**: For respondents who used smokeless tobacco at least once a month.
- **Mixed Tobacco user (M) questionnaire**: For respondents who used BOTH cigarettes and smokeless tobacco at least once a month.
- **Non-user of tobacco (N) questionnaire**: For respondents who did not smoke cigarettes or use any smokeless tobacco products.
- **Quitter (Q) questionnaire**: For respondents who were tobacco users in Wave 1 but had completely quit tobacco (cigarettes or/and smokeless tobacco) at Wave 2.

**Replenishment Surveys**

These questionnaires were for new respondents at Wave 2 and for non-user respondents from Wave 1 who started smoking at Wave 2. Below is a brief description of each replenishment survey:

- **Replenishment Supplement (P)**: For new respondents at Wave 2 who had been randomly selected to replace respondents from Wave 1 who could not be recontacted at Wave 2. It was used for all replenishment respondents and administered along with one of the individual surveys described below i.e., P+C, P+M, P+L or P+N.
- **Household (H) questionnaire**: Only for the Head or Key Informant of the Household, i.e., one H survey per household.
- **Cigarette smoker (C) questionnaire**: For respondents who smoked cigarettes (P+C) at least once a month.
- **Smokeless Tobacco user (L) questionnaire**: For respondents who used smokeless tobacco (P+L) at least once a month.
- **Mixed Tobacco user (M) questionnaire**: For respondents who used BOTH cigarettes and smokeless tobacco (P+M) at least once a month.
- **Non-user of tobacco (N) questionnaire**: For respondents who did not smoke cigarettes or use any smokeless tobacco products (P+N).

### 3.4 Survey Content

The research design focuses on how individuals respond to policies and how they change over time. Below is a general description of the main constructs assessed in the ITC surveys:

- **Demographic variables**: These include questions to assess gender, age, ethnicity, education, number of smokers in the household; smoker’s state of health, religion, socioeconomic status.
- **Proximal variables**: These include measures assessing awareness of a policy (e.g., of warning labels, cessation assistance, advertising and promotion) and, where relevant,
cognitive processing as a result of exposure to the policy (e.g., thinking about health warnings).

- Distal variables: Questions assessing distal variables include those that test psychosocial theories (e.g., the theory of planned behavior: attitudes, subjective norms, perceived behavioral control/self-efficacy), risk perceptions, quit intentions, and other relevant measures. In addition, the survey included questions that measure smokers’ self-exempting beliefs, that is, those that many smokers hold that may help to sustain their smoking behavior.

- Moderator variables: Questions about moderator variables include items assessing perceived time perspective (i.e., the tendency for individuals to think about the long-term versus short-term consequences of their actions, which is a predictor of smoking behavior) and stress in addition to the demographic variables listed above. It also examines background variables such as country, region, and community size.

- Tobacco use behavior variables: Standard questions assessing tobacco use behaviors developed by the WHO will be utilized. There are questions that measure a variety of aspects of tobacco use behavior including usual brand, quit intentions, and other smoking-relevant constructs.

- Questions enquiring about household income, expenditures, wealth, and tobacco cultivation were included.

### 3.5 Survey Sections

All surveys had similar characteristics. Table 2 shows a description of these characteristics and the sections that were relevant to each survey. Each survey was divided into a number of sections that were arranged in a specific order as shown on table. In each survey section, the total number of questions across the different surveys was not necessarily the same.
<table>
<thead>
<tr>
<th>SURVEY SECTIONS</th>
<th>SURVEY TYPES</th>
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<td>WHEN AND WHY</td>
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<tr>
<td>DEPENDENCE</td>
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<tr>
<td>QUITTING ATTEMPTS</td>
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<tr>
<td>BELIEFS ABOUT QUITTING</td>
<td>√</td>
</tr>
<tr>
<td>BRAND CHOICE AND PURCHASE</td>
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<td>PERCEIVED RISK</td>
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<td>PSYCHOSOCIAL BELIEFS</td>
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<td>WARNING LABELS</td>
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<tr>
<td>DEPENDENCE</td>
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<td>QUITTING ATTEMPTS</td>
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<tr>
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<td>SURVEY CLOSING</td>
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4 Data Collection, Entry, Delivery and Cleaning

4.1 Interviewer Training Workshop

The ITC Waterloo Project Manager (PM) prepared a training manual and schedule for the ITC Zambia training workshop. The facilitators for the interviewer training workshop included the ITC Waterloo Project Manager (Dr. Susan Kaai) and the ITC Waterloo Research Scientist (Dr. Anne Quah). The in-country Principal Investigator (Dr. Fastone Goma) and a staff member from the Central Statistics office in Zambia also facilitated some of the training sessions. The training was conducted between August 11 and 21, 2014 at the Palmwood Lodge, Lusaka, Zambia (See the Training Program details in Appendix A). The training workshop consisted mainly of PowerPoint presentations; role plays and actual fieldwork practice to pilot test the questionnaires. After the pilot testing activity, a debriefing session was held and the information was used to improve the English and translated questionnaires. Interviewers also received feedback on how to improve their interviewing skills. On the last day of training, a management meeting was held with the ITC Zambia and Waterloo team to discuss the revision of certain questions, translations and fieldwork logistics.

4.2 Period of Data Collection

The period of the data collection was from August 18, 2014 to October 30, 2014. The mode of interviewing was face-to-face, using household enumeration (HEF) and recontact forms (HRF) to obtain information from the sampled households. Respondents who were interviewed at Wave 1 and individuals who were randomly selected to replace Wave 1 participants who could not be traced at Wave 2 participated in the individual surveys based on their tobacco use status.
4.3 Survey Process

In Wave 2, the ITC Survey protocol comprised of nine main steps where an interviewer:

1. Approached a household and introduced him or herself
2. Completed the Household Recontact Form (HRF) or Household Enumeration Form (HEF).
3. Administered the household (H) survey to the head or key Informant.
4. Identified respondents for the individual interviews.
5. Obtained informed consent.
6. Administered the survey screeners in order to identify the appropriate questionnaire to use.
7. Completed the individual surveys determined by the screening result.
8. Completed the individual outcome codes in the HRF/HEF Form.
9. Ended each interview and provided the token of appreciation.

4.4 Languages, Translation and Length of Survey Questionnaire

The survey was administered in five local languages: Bemba, Nyanja, Kaonde, Tonga and Lozi. Survey questionnaires in English were also provided for respondents who preferred to answer the survey questionnaire in English. Experienced local translators were hired to translate the English questionnaires into the five Zambian local languages as per the ITC standard translation protocol used in other ITC countries. This meant that 25 translations were done (i.e., five local languages X 5 types of questionnaires). To avoid any confusion a tracking system was developed in Waterloo to monitor the translation activity. Additionally, a three-tier checking system was implemented to ensure that the translations were done to the highest possible standard. The surveys took approximately 60 minutes for tobacco users and approximately 30 minutes for non-users to complete.

4.5 Data Checking

At the end of each day, interviewers completed a self-check on the Household Surveys, Household Recontact Forms (HRFs), Household Enumeration Forms (HEFs), consent forms, screeners, and survey questionnaires they collected during the day. They reviewed all
materials to determine whether anything was missed or skipped. The field supervisor collected all completed fieldwork documents from the interviewer teams under his/her supervision. Upon completion of the fieldwork, the field supervisors gave the survey materials to the Project Manager for further quality checks and filing.

4.6 Data Entry
Following data collection activity, the ITC Zambia data were manually entered into computer files using the freely available EpiData software (http://www.epidata.dk/). Data entry templates were programmed by our ITC programmer at the University of Waterloo and reviewed by the in-country data manager. Data entry templates were programmed to ensure correct skip patterns were followed and to prevent data entry clerks from entering invalid values. Data entry was performed by two separate data entry clerks. Each clerk entered the data once. Such duplicate data entry helped minimize data entry errors since it is unlikely that two different people will make the same data entry error for a given value.

4.7 Data Delivery and Cleaning
Once duplicate data entry was completed by the in-country data clerks, the data files were transferred securely to the University of Waterloo using ITC's secure internal website, which can only be accessed by users who have an account on the website. As an extra precaution to maintain security, data files were encrypted prior to uploading them to the website. Once the data were successfully transferred, the University of Waterloo data analyst commenced data cleaning. The data analyst conducted duplicate entry comparisons of the data files, using the SAS statistical software and identified discrepancies between the two data files. A list of these discrepancies were sent to the in-country data manager for verification and correction. The in-country data manager sent the corrections to the University of Waterloo data analyst for verification.

After discrepancies had been identified and corrections sent by the in-country data manager, the University of Waterloo data analyst conducted additional checks on the data to ensure
that all skip patterns had been correctly followed and to ensure that the data did not contain invalid values. Respondent identifier codes were also checked thoroughly to ensure the data could be correctly linked within a survey wave and between waves over time. Any additional discrepancies that were identified were also sent back to the in-country data manager for verification. This back and forth communication between the University of Waterloo data analyst and the in-country data manager went on until the data were deemed clean by the University of Waterloo data analyst. Following data processing and cleaning, sampling weights were constructed for the dataset and the final, cleaned datasets were released to the country team, by posting them on the secure, internal ITC website.

4.8 Collecting Empty Tobacco Packs

During the data collection exercise, empty tobacco packs provided voluntarily by respondents who smoked cigarettes or bidis were collected by the interviewers and were subsequently handed to the Field Supervisors for storage.

4.9 Remuneration

For Wave 2, tobacco user respondents received cash to the amount of 21 ZMW Zambian Kwacha (4 USD) and non-users received cash to the amount of 11 ZMW (2 USD) as a token of appreciation for their participation.
5 Monitoring and Quality Control

5.1 Management of Fieldwork Teams

The project fieldwork team consisted of four levels of management as shown below:

Figure 2: Management of ITC Zambia Project

- **Project Manager:**
  - Overseeing all aspects of the survey fieldwork and data quality
  - Completing administrative responsibilities of the project
  - Providing necessary guidance to team members
  - Communicating with the University of Waterloo (UW) on every aspect of the project
  - Overseeing data entry process and check data entry errors
  - Checking and reporting fieldwork progress to UW

- **Data Manager:**
  - Collecting and checking all completed forms and surveys
  - Testing that the epi-data template sent from UW was correctly done
  - Overseeing the double data entry process
  - Overseeing the checking, cleaning and compilation of data
  - Transferring data from paper to computer (double entry), data cleaning and transfer of data to the Data Management Centre (DMC) at UW

\[\text{PROJECT MANAGER}\]
\[\text{DATA MANAGER}\]
\[\begin{align*}
\text{10 FIELD SUPERVISORS} \\
\text{2 DATA ENTRY CLERKS} \\
\text{40 INTERVIEWERS}
\end{align*}\]
Field supervisors:

- Informing relevant local authorities about the survey
- Identifying HHs selected from each Village/EA and ensuring all interviewers are ready with the HH list for each Village/EA
- Managing surveys and consent forms, and ensuring that interviewers had all the materials for fieldwork
- Traveling with the team and addressing any questions or concerns from the interviewers
- Checking the quality of information given by respondents and recording by the interviewers
- Communicating with the Project Manager about progress and difficulties encountered in the field
- Completing the fieldwork progress report and sending it to the Project Manager
- Handling travel arrangements and other field logistics

Interviewers:

- Obtaining consent from each survey respondent
- Interviewing each respondent using the correct survey based on the smoking status of the respondent (as per responses from the appropriate screener)
- Reporting any problems or concerns to the field supervisor

Each province was covered by one team comprising of 1 supervisor and 4 interviewers.

5.2 Interviewer Aids

Several interviewing aids were used to facilitate the administration of questionnaires. They include the following:

- **Interviewer Fieldwork Manual and Reference Sheets**: An English fieldwork manual was used to train the interviewers and supervisors on how to conduct the Wave 2 data collection activity. The manual included pre-interview preparations (e.g., identifications, consent forms, screeners, enumeration forms etc.), sampling steps, flowchart
summarizing the step-by-step procedures for conducting the recontact and replenishment interviews [see Appendix C], and interview scripts for different fieldwork scenarios.

- **Manikin Flashcards:** There were two questions in each of the surveys that required the aid of a flashcard when the response options were read out, to save time and to facilitate interviewing. The flashcards included pictures of little man-like figures (manikins) with bipolar degrees of emotion (from negative to positive emotions). Researchers studying emotional responses found the use of these manikins to be helpful to respondents in rating their own emotional responses. (See Manikin Flashcard in Appendix F).

- **Health Warning Card:** Interviewers were also provided with a laminated reference sheets showing an example of the single-text warning that interviewers were asked to read to assess readability of the health warning (see picture in Appendix G).

### 5.3 Monitoring & Quality Assurance

To ensure the accuracy and the quality of the ITC Zambia Survey, the fieldwork was monitored in several ways.

**Field Supervisor:** The Field Supervisor travelled with each interviewer team and provided regular feedback to the interviewers. Supervisors also sent regular feedback and progress reports to the Project Manager. The Field Supervisor ensured that the survey protocol and data collection standards were being closely followed. Field Supervisors monitored interviews and were available to address any questions or concerns from the interviewers.

**Identification Numbers:** Field Supervisors were instructed to ensure that households and respondents pre-filled identification numbers were properly matched.
Monitoring visit by Masauso (Photo by Kondwani Chirwa)

An interview in progress (Photo by Kondwani Chirwa)
Checking for completeness: At the end of each day, interviewers were required to perform a self-check on the survey questionnaires they had completed that day. The interviewer reviewed the whole survey to determine whether any questions had erroneously been missed or skipped. The Field Supervisor then collected all completed questionnaires from the interviewers under their supervision and conducted a thorough check to ensure that they were correctly filled. If there were gaps, the Field Supervisor asked the interviewer to re-visit the household member and complete the questionnaire. Upon the completion of each survey in each village/ward the Field Supervisor gave the completed and checked questionnaires to the in-country Project Manager (PM) for a final check before handing them over to the Data Entry Manager.

Weekly Meetings: The attendees of these in-country meetings were the Principal Investigator (PI), Project Manager (PM), Data Entry Manager (DM), Project Statistician, Project Accountant (PA), and the Regional Coordinators. The meetings were held regularly, i.e., at least once in two weeks, and were mainly attended by the whole team. However, sometimes a smaller core team comprising the PI, PM, DM, and PA held the meetings.
The objectives of the meetings were to check and monitor the fieldwork progress, deal with matters arising from the field, and monitor the budget and the expenditures of the fieldwork and the data sending process.

**Progress Reports:** The in-country PM provided regular email updates, 2-weekly progress reports on quotas completed and a narrative report regarding the progress of the data collection exercise. He also informed the UW PM about any concerns or problems that arose in the field.

### 5.4 Data Quality Control

The double entry of data proceeded in parallel with the data collection activity. In order to ensure the quality of the data collection process, the team used a multistage monitoring system:

- There were random visits by the in-country PM and the regional coordinators to monitor the interviewers in the field
- The in-country PM would randomly call the Field Supervisors to ensure that the work was being done correctly
- When a common mistake was noticed in data collection in the field (in one or more of the field teams), the PM would intervene in a timely fashion and communicate the issue to the rest of the teams to prevent them from making similar mistakes
- Enumerated households were randomly called to verify the information that the enumerators filled on the forms
- Field Supervisors cross-checked all completed enumeration and surveys daily to ensure that they were properly filled
- After data entry was completed, Data Entry Manager ran routine checks on the data sets and informed the in-country PM about any potential problems. When any issues arose the in-country PM contacted the supervisors using mobile phones. The Field Supervisors would then relay the message to the interviewers.
5.5 Handling Special Situations

5.5.1 Private Interviews

The standard was that the adult participants would be privately interviewed alone; however in some circumstances some household members insisted on being present during the interview. If such a situation arose the interviewer would only proceed with the interview if the respondent was agreeable to having the person present during the interview.

5.5.2 A Proxy Interview

A proxy interview is an interview conducted with another knowledgeable member of the household on behalf of the selected respondent. An example would be a woman answering the survey for her husband. Proxy interviews were not allowed in the ITC Zambia Survey.

5.5.3 Respondent was Unavailable

If a respondent was unavailable, an appointment time was rescheduled to a time that was convenient to the respondent. Only four such attempts were allowed.

5.5.4 Substitution

A substitution from the same household was allowed ONLY if a selected individual from the Non-User category (N status) had Individual Outcome Code 2 (Language barrier) or Code 3 (Health/mentally incapable) or Code 8 (Away from the household for the entire survey period).
6 Weight Construction (Wave 1 and 2)

6.1 Weight Construction for Wave 1

We have provided various weights: Enumerated household weights are based on the initial enumeration during which just some preliminary questions are asked.

Interviewed household weights are household weights for households in which interviews were conducted. Individual weights represent the number of people in the country. Finally, rescaled individual represent the number of people in the sample. This is useful for use in pooled analyses involving non-users of tobacco.

Computation of Enumerated Household weights

Denote the estimated number of household in the household’s cluster by

\[ \hat{N}_{HHclus} = N_{popclus} \bar{m}_{HHclus} \]

where \( N_{popclus} \) is the number of people in the cluster (in the population) and \( \bar{m}_{HHclus} \) is the sample average household size in the cluster. The enumerated household weight is denoted by \( EHWT \). Each term in the product represents a sampling stage.

\[
EHWT = \frac{N_{popprov}}{m_{disprov}} \times \frac{N_{popdis}}{m_{warddis}} \times \frac{N_{popward}}{m_{chward}} \times \frac{\hat{N}_{HHclus}}{n_{HHclus}}
\]

\[
= \frac{N_{popprov}}{m_{disprov}} \times \frac{1}{m_{warddis}} \times \frac{1}{m_{chward}} \times \frac{\hat{N}_{HHclus}}{n_{HHclus}}
\]

\[
= \frac{N_{popprov}}{m_{disprov} m_{warddis} m_{chward} \bar{m}_{HHclus} n_{HHclus}}
\]

where

- \( m_{disprov} \) = number of districts chosen in the province

- \( m_{warddis} \) = number of wards chosen in the district

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\( m_{clusward} \) = number of clusters chosen in the ward

\( N_{popdis} \) = number of people in the district

\( N_{popward} \) = number of people in the ward

\( N_{popclus} \) = number of people in the cluster

\( \hat{N}_{HHclus} \) = estimated (or counted) number of households in the cluster

\( n_{HHclus} \) = number of households enumerated in the cluster

Exception: There were three clusters, one in Mufulira in Copperbelt province and two in Mungwi in Northern province, where just one or two households were enumerated in the cluster. In these cases, each single-household or two-household cluster was merged with another cluster in the ward and \( m_{clusward} \) was reduced accordingly. In Copperbelt, one cluster (code = 020209028202034) had a single household enumerated. This was merged with cluster code = 020209028202032, and \( m_{clusward} \) was reduced by 1. In the Northern province, two clusters were merged with one other i.e. (070708092061022 [2 households enumerated] & 070708092061061 [1 household enumerated] were merged into 070708092061051), and \( m_{clusward} \) for their common ward was reduced by 2. Hereafter in this document “cluster” in these cases refers to the merged cluster.

**Computation of interview household weights IHWT**

For each household in which there is an interview, an interview weight \( IHWT \) was computed. The calculation is different for tobacco use households and others. It is interpreted as the number of households represented by that household.

For tobacco use households we can think of this as being 0 for any enumerated household without an interview; the \( EHWT \) values for tobacco use households without an interview
(perhaps because of refusal) are effectively redistributed to households with an interview. For a tobacco use household with an interview,

\[ IHWT = EHWT \times \frac{h_{clus}}{h_{incl}} \]

where \( h_{incl} \) is the number of tobacco use households in the EA or cluster with an interview, and \( h_{clus} \) is the number of enumerated tobacco use households in the EA or cluster. (The ratio should be close to 1.) For a household with an interview but no tobacco use,

\[ IHWT = EHWT \times \frac{h_{enclus}}{h_{incl}} \]

where \( h_{incl} \) is the number of non-use-of-tobacco households in the EA or cluster with an interview, and \( h_{enclus} \) is the number of enumerated non-use-of-tobacco households in the EA or cluster. (The ratio may be much larger since only every 8\textsuperscript{th} household was interviewed.)

**Computation of individual weights**

**Step II:** Each interviewed individual was given a household level weight \( W1 \). This is interpreted as the number of people in the same household in the category represented by the respondent.

- For an adult male tobacco user, \( W1 \) is the number of adult male tobacco users in the same household, divided by the number of interviewed adult male tobacco users in the household.
- For an adult female tobacco user, \( W1 \) is the number of adult female tobacco users in the same household, divided by the number of interviewed adult female tobacco users in the household.
- For an adult non-user of tobacco, $W_1$ is the number of adult non-users of tobacco in the same household, divided by the number of interviewed adult non-users of tobacco in the household.

The value of $W_1$ was trimmed at 4, i.e., values larger than 4 were set to 4.

**Step 11a:** Each interviewed individual has been given an adjusted household level weight $W_{1a}$. This adjustment ensures that the prevalence estimates based on the $EHWT$s, the $IHWT$s, and the final individual weights will be close to the same.

Consider an EA or cluster stratum $h$ to be defined by user and non-user households within the EA.

Let $AMS_{h_{clus}}$, $AFS_{h_{clus}}$, $AMNS_{h_{clus}}$, $AFNS_{h_{clus}}$ be respectively the numbers enumerated in the EA or cluster stratum $h$ of adult male users, adult female users, adult male non-users, adult female non-users.

Let $W1AMS_{h_{clus}}$, $W1AFS_{h_{clus}}$, $W1AMNS_{h_{clus}}$, $W1AFNS_{h_{clus}}$ be respectively the sums of $W_1$ in all interviewed households for adult male users, adult female users, adult male non-users, adult female non-users, in the EA or cluster stratum $h$.

- for an adult male user in stratum $h$ of the EA or cluster, $W_{1a}$ will be given by
  \[ W_{1a} = (AMS_{h_{clus}} / W1AMS_{h_{clus}}) \times (EHWT / IHWT) \]

- Similarly for the other refined categories.

- In case there is representation of only one gender of users or of non-users in the EA or cluster stratum, the relevant categories can be collapsed by gender for that EA or cluster stratum. For example, for a tobacco user, $W_{1a}$ will then be given by
\[ W1a = (AS_{hclus} \times W1/W1AS_{hclus})(EHWT/IHWT) \]

where \( AS_{hclus} \) is the number of enumerated adult users in the EA or cluster stratum \( h \), and 
\( W1AS_{hclus} \) the sum of \( W1 \) in all interviewed households for adult users in the EA or cluster stratum \( h \). A similar equation can be applied to the adult non-users.

- In case there is representation of only users or non-users in the EA or cluster stratum, the relevant categories can be calculated at the ward level, instead of the EA or cluster stratum. For example, for an adult male user, \( W1a \) will then be given by

\[ W1a = (AMS_{hWARD} \times W1/W1AMS_{hWARD})(EHWT/IHWT) \]

where \( AMS_{hWARD} \) is the number of enumerated adult male users in stratum \( h \) in the Ward, and \( W1AMS_{hWARD} \) the sum of \( W1 \) in all interviewed households for adult male users in stratum \( h \) in the Ward. Similar equations can be applied to the other refined categories.

**Step 12:** Each interviewed individual was given a preliminary weight \( W4 \) which is thought of as the number of people represented by that individual.

The weight \( W4 \) is given by

\[ W4 = IHWT \times W1a. \]

If we sum \( W4 \) over all individuals interviewed, we should get an estimate of the adult population of the city or area.

Population information was available by sex and age group (15-24, 25-39 and 40+) within province from the 2010 census. Thus we calculated final inflation weights \( W6 \) by calibrating to these census totals.
Let \( N_{prov, dem} \) be the number of persons from the census in province \( prov \) and demographic group (sex crossed with age group) \( dem \). For a respondent in province \( prov \) and demographic group \( dem \),

\[
W_6 = W_4 \times \frac{N_{prov, dem}}{\sum_{prov, dem} W_4}
\]

where \( \sum_{prov, dem} \) represents summation over all individuals interviewed in province \( prov \) and demographic group \( dem \).

\( W_6 \) is variable \( aDE74915v \) in the data set.

**Rescaling**

Finally, the individual weights have been rescaled within each sampling category to sum to sample sizes within tobacco use status (non-users, male tobacco users, female tobacco users), for use in pooled regression or logistic regression analyses where gender and tobacco use status are covariates. Without rescaling non-users would “dominate” through their much larger weights in analyses that combines non-users and users. The rescaled weight is \( aDE74919v \) in the data set.

The formula used for each category is as follows:

Rescaled weight: \( RWT = n_c \times W_6 / \sum_c W_6 \),

where \( n_c \) is the actual (i.e. unweighted) size of the sample in the category, and \( \sum_c W_6 \) denotes a sum over that subsample of the inflation weights.
6.2 Weight Construction for Wave 2

Prevalence for various population groups can be estimated using enumerated household weights from the new enumeration and census data. The computation of standard errors must take into account the sampling design including clustering and stratification.

Consider the country to be divided into areas $a$, where an area is the rural or urban part of a province. Let $dem$ denote an age-sex group (male/female crossed with 15-24, 25-39, 40+). Then the estimated prevalence of tobacco use (say) in a union $A$ of areas $a$ and a union $D$ of age-sex groups $d$ would be given by

\[
P_{A,D} = \frac{\sum_{a,A,D} Na, dem \sum_{a} EHWT \cdot n_{h,T,dem}}{K}
\]

where $K = \sum_{a,A,D} Na, dem \sum_{a} EHWT \cdot n_{h,dem}$

and $Na, dem$ is the census number of people in area $a$ and age-sex group $dem$, $n_{h,dem}$ is the number in age-sex group $dem$ in household $h$, and $n_{h,T,dem}$ is the number of tobacco users in the age-sex group $dem$ in household $h$. This can be expressed as a ratio estimator for sampled households:

\[
P_{A,D} = \frac{\sum_{h \in A} EHWT \cdot y_h}{\sum_{h \in A} EHWT \cdot x_h}
\]

where $x_h = \sum_{dem \in D} N_{a(h), dem} n_{h,dem}$, $y_h = \sum_{dem \in D} N_{a(h), dem} n_{h,T,dem}$ and $a(h)$ is the area in which $h$ is found; and thus its standard error could be calculated using complex survey software. It would be necessary first to derive the $x_h$ and $y_h$ variable for each household. They could each be divided by a constant to make them more manipulable.
The computation of the enumeration household weights used the same formula as in the Wave 1 enumeration. For consistency with Wave 1, cluster 070708092061061 was merged with 070708092061051.

**Wave 1-Wave 2 longitudinal household weights**

Households present in waves 1 and 2, and respondents who answered both in waves 1 and 2, are assigned longitudinal household weights. The longitudinal interview household weight consists of the wave 1 interview household weight inflated or rescaled (for the user households and the non-user households of each ward) to account for wave 1 households who were not responding in wave 2. Specifically, we rescaled $IHWT$ to sum to the total of the $IHWT$s at Wave 1 for user households within each cluster. This produced the household Wave1-Wave 2 weight $IHWT12$.

**Wave 1-Wave 2 longitudinal Individual weights**

For each individual Wave 1 respondent still present in Wave 2, we multiplied $IHWT12$ by the within household weight $W1a$ from Wave 1, producing a preliminary longitudinal weight $W12WTT$. The within household weight $W1a$ adjusts for sub-sampling within household (specifically for sampling 1 of several nonusers of a specific gender in every 5th household).

The individual longitudinal inflation weights are adjusted at the province level to match Wave 1 province totals for gender crossed with age group, to compensate for differential attrition rates by gender and age group: We rescaled $W12WTT$ weights to sum to the Wave 1 cross sectional weight ($W1XWT$, this is $W6$ in Wave 1 weights above) totals for age group (15-34, 35+) crossed with gender within province. This produced the longitudinal weights $W12WT$ for individuals. $W12WT$ is variable $bDE74921v$ on the dataset.
As for wave 1, inflation weights are then rescaled in each sampling category to sum to sample sizes within tobacco use status (non-users, male tobacco users, female tobacco users). This is variable \( bDE74951v \) in the data set.

**Wave 2 cross-sectional weights**

To compute cross sectional weights three adjustments needed to be made:

- nonresponse adjustments for the recontact part of the sample together with replenishment within clusters used at Wave 1
- adjustments for some new clusters (replenishment)
- calibration of weights to correspond with the prevalence estimates from the mini-enumeration at a high level

Household non-response and household additions were mainly adjusted at the cluster level. Then the weights were re-calibrated to correspond to prevalence estimates from the mini-enumeration. Finally, for each tobacco use status crossed with gender (male non-users, female non-users, male tobacco users, female tobacco users) within a cluster, individual inflation weights were constructed and multiplied with a constant so as to calibrate to census totals for age-sex groups within provinces.

The details follow.

We first constructed Wave 2 cross-sectional interview household weights \( IHWT2 \). In each interview household in cluster, whether a Wave 1 household or a household newly recruited at Wave 2, we let \( IHWT2 \) be the total value of \( IHWT \) from Wave 1 for households of the same cluster and household tobacco use status (TUS), divided by the number of interview households in that cluster-TUS in Wave 2.

Exception: There were two clusters where there were interviews in non-user households in Wave 2 but none in Wave 1. In one case, there had been non-user households enumerated in
Wave 1. In that case, we computed \( IHWT2 \) for the non-user interview households by summing the Wave 1 \( EHWT \) for the enumerated non-user households and dividing by the number of interview non-user households in the cluster in Wave 2. In the other case, no non-user households had been enumerated in the cluster in Wave 1. In that case, we computed \( IHWT2 \) for the non-user interview households by averaging \( IHWT2 \) for such households in the ward, as follows. First, for the non-user interview households in the other clusters in the ward, we let \( IHWT2\text{pre} \) be the total value of \( IHWT \) from Wave 1 for households of the same cluster and TUS (non-user), divided by the number of interview households in that cluster-TUS in Wave 2. Then, for wave interview non-user households in the cluster with no Wave 1 enumerated non-user households, we let \( IHWT2\text{pre} \) be the average value of \( IHWT2\text{pre} \) over non-user households in the other clusters in the ward. Then for all interview non-user households in the ward, let

\[
IHWT2 = \left( \frac{IHWT2\text{pre}}{\sum IHWT2\text{pre}} \right) \times \sum IHWT
\]

where \( IHWT \) is the interview household weight from Wave 1, and the first sum is over all non-user interview households in the ward in Wave 2, while the second sum is over all non-user interview households in the ward and in Wave 1. Thus the \( IHWT2 \) should have the same total in the ward as \( IHWT \) for non-user households.

**Step 211:** Each interviewed individual, in an old household or a new household, has been given a household level weight \( W1X2 \). This is interpreted as the number of people in the same household with the same refined category.

- for an adult male tobacco user or quitter, \( W1X2 \) is the number of adult male tobacco users or quitters in the same household, divided by the number of adult male tobacco users or quitters interviewed in that household.
- for an adult female tobacco user or quitter, $W_1X_2$ is the number of adult female tobacco users or quitters in the same household, divided by the number of adult female tobacco users or quitters interviewed in that household
- for an adult male non-user of tobacco, $W_1X_2$ is $2 \times$ (number of adult male non-users in the same household, divided by the number of adult male non-users interviewed in that household) (denominator should be 1); we multiply by 2 because a non-user in a household which is eligible to have a non-user sampled has probability $\frac{1}{2}$ of being of the correct gender.
- for an adult female non-user of tobacco, $W_1X_2$ is $2 \times$ (the number of adult female non-users in the same household, divided by the number of adult female non-users interviewed in that household)

For a majority of recontact tobacco users or quitters, $W_1X_2$ should be the same as $W_1$ from Wave 1. Where a Wave 1 household has some Wave 2 interviews, but also at least one dropout, or at least one person who has changed from being a non-smoker to being a smoker, $W_1X_2$ may be different from $W_1$ for some tobacco user members of the household. Recontact respondents quitting smoking would not cause a change from $W_1$ to $W_1X_2$. Since $W_1X_2$ is gender specific for non-users, it will typically be different from $W_1$ from Wave 1 for non-users.

We have capped the value of $W_1X_2$ at 4 to reduce the potential variability of the weights. Step 2I1a below ensures that each individual still represents an approximately correct number at the cluster level.

**Step 2I1a:** Each interviewed individual has been given an adjusted household level weight $W_1aX_2$. This adjustment is meant to account for the fact that non-users have different inclusion probabilities depending on whether they are from user or non-user households.
Let \(A_{MS_{clus}}\), \(A_{FS_{clus}}\), \(A_{MNS_{clus}}\), \(A_{FN_{clus}}\) be respectively the numbers enumerated in Wave 1 in the EA or cluster stratum \(h\) of adult male users, adult female users, adult male non-users, adult female non-users.

Let \(W_{1AMS_{clus}}\), \(W_{1AFS_{clus}}\), \(W_{1AMNS_{clus}}\), \(W_{1AFNS_{clus}}\) be respectively the sums of \(W_{1X2}\) in Wave 2 in all interviewed households (new or old) for adult male users, adult female users, adult male non-users, adult female non-users, in the EA or cluster stratum \(h\).

For an adult male user in stratum \(h\) of the EA or cluster, \(W_{1aX2}\) is given by

\[
W_{1aX2} = \left(\frac{A_{MS_{clus}} \times W_{1X2} / W_{1AMS_{clus}}}{W_{1AMNS_{clus}} / W_{1AFNS_{clus}}}\right) \left(\frac{E_{HWT}}{I_{HWT}^2}\right)
\]

where \(E_{HWT}\) is the common value of \(E_{HWT}\) for the cluster in Wave 1. Similarly for the other refined categories.

Exceptions:

1. In case there was representation of only one gender of users or of non-users in the EA or cluster stratum, the relevant categories were collapsed by gender for that EA or cluster stratum. For example, for a tobacco user, \(W_{1aX2}\) is given by

\[
W_{1aX2} = \left(\frac{A_{S_{clus}} \times W_{1X2} / W_{1AMS_{clus}}}{W_{1AS_{clus}} / W_{1AFNS_{clus}}}\right) \left(\frac{E_{HWT}}{I_{HWT}^2}\right)
\]

where \(A_{S_{clus}}\) is the number of enumerated adult users in the EA or cluster stratum \(h\), and \(W_{1AS_{clus}}\) the sum of \(W_{1X2}\) in all interviewed households for adult users in the EA or cluster stratum \(h\). A similar equation can be applied to the adult non-users.

2. In cases where there was representation only of users in the EA or cluster tobacco user interview households, so that the enumerated non-users in that cluster stratum were not represented, the relevant categories were calculated at the ward level. For example, for an adult male non-user in any cluster in the ward, \(W_{1aX2}\) is then given by
where $AMNS_{\text{WARD}}$ is the number of enumerated adult male non-users in tobacco use households in the ward, and $W1AMNS_{\text{WARD}}$ the sum of $W1X2$ in all interview households for interviewed adult male non-users in tobacco use in the ward.

3. For three clusters $AFS_{\text{htus}}$ (computed from Wave 1 enumeration) was 0, but there were female tobacco users interviewed at Wave 2, 2 in one cluster and 1 in each of the two other clusters. In these cases the relevant categories were calculated at the ward level. That is, for any female tobacco user in any cluster in the ward, $W1aX2$ is then given by

$$W1aX2 = (AFS_{\text{WARD}} \times W1X2 / W1AFS_{\text{WARD}})(EHWT / IHWT2)$$

where $AFS_{\text{WARD}}$ is the number of enumerated adult female tobacco users in the ward, and $W1AFS_{\text{WARD}}$ is the sum of $W1X2$ in all interview households for interviewed adult female tobacco users in the ward.

4. In one case where there were no interviewed non-users in user households in the ward, the genders and strata were collapsed for this category. For an interviewed adult non-user in a non-user household:

$$W1aX2 = W1X2 \times (\sum EHWT \times nANS) / (\sum IHWT2 \times W1X2)$$

where the first sum is over all enumerated households in the ward, and $nANS$ is the number of adult non-users enumerated in the household; the second sum is over all interviewed non-users in the ward.

5. In another case where there was only one interviewed non-user in a user household in the ward (in Lusaka), the genders and strata were collapsed for this category, in the same way.
Step 212: Each interviewed individual has been given a preliminary cross-sectional inflation weight $W_{4X2}$.

$W_{4X2}$ will be thought of as the number of people in the same gender and tobacco-use category represented by that individual.

The weight $W_{4X2}$ is given by

$$W_{4X2} = IHWT_2 \times W_{1aX2}.$$

Step 213: The cross-sectional inflation weights $W_{4X2}$ were re-calibrated to match the prevalence estimates of smoking of the Wave 2 mini-enumeration, producing adjusted weights $W_{5X2}$. Specifically, prevalence was matched for the following 30 cells: females, urban males, and rural males within the 10 provinces.

Thus for example if $A$ is the urban part of a province and $D$ represents adult males of all age groups, for an adult male tobacco user in area $A$ we set

$$W_{5X2} = W_{4X2} \times P_{A,D} \times \frac{\sum W_{4X2} \times I_{A,D}}{\sum W_{4X2} \times I_{A,D,T}}$$

where $I_{A,D}$ is the indicator for being an adult male in area $A$, and $I_{A,D,T}$ is the indicator for being an adult male tobacco user in area $A$.

For an adult male non-user of tobacco in area $A$ we set

$$W_{5X2} = W_{4X2} \times (1 - P_{A,D}) \times \frac{\sum W_{4X2} \times I_{A,D}}{\sum W_{4X2} \times I_{A,D,T}}.$$
Then we can show that

\[
\frac{\sum W_5 X_2 * I_{A,D,T}}{\sum W_5 X_2 * I_{A,D}} = P_{A,D}.
\]

**Step 215:** The cross-sectional inflation weights were then calibrated to sum to census totals for age group (15-34, 35+) crossed with gender within province, producing final cross-sectional inflation weights \(W_6 X_2\). This is variable \(bDE74915v\) in the data set.

**Weight rescaling**

As for Wave 1, the inflation weights \(W_6 X_2\) were then rescaled in each sampling category to sum to sample sizes within tobacco use status (non-users, male tobacco users, female tobacco users). This is variable \(bDE74919v\) in the data set.
7 Disposition Codes

7.1 Disposition Codes for Household Outcome Codes (Enumeration)

1. Could not find
2. Vacant
3. Not a household (e.g., business premise)
4. Threat to safety
5. No contact- weather condition
6. No answer- 2 attempts
7. No answer- survey period ends
8. Household refusal
9. Language barrier
10. No one capable of answering
11. Enumeration prevented for other reasons
12. Enumerated

7.2 Disposition Codes for Individual Outcome Codes

1. Missed (after 4 attempts)
2. Language barrier
3. Health/Mentally incapable
4. Proxy refusal
5. Refusal
6. Incomplete (start, break-off)
7. Completed
8. Away for the entire survey period
7.3 Response Outcomes for the ITC Zambia Wave 2 Survey

Number of households planned = 1,538
Number of households enumerated = 1,995
Number of households enumerated with replenishment respondents = 733
Number of tobacco users interviewed (including quitters) = 1,451
Number of non-users interviewed = 558
Total number of interviews = 2,009

7.4 Sample Size and Representation Tables

A total of 2,009 respondents were left in the data file after cleaning (i.e., removal of duplicates and out of frame households). These respondents were from 1,995 households. Table 3 shows a breakdown of the sample by smoking status and gender. Table 4 shows the total respondents participating in ITC Zambia Wave 2. Table 5 shows the Wave 1 to Wave 2 retention rates and initial tobacco use at the time of recruitment by Province.

Table 3: Total Sample of Respondents by Smoking Status and Gender

<table>
<thead>
<tr>
<th>Sample Area (provinces)</th>
<th>Cigarette only</th>
<th>Mixed</th>
<th>Smokeless only</th>
<th>Quitter</th>
<th>Non-user</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Central</td>
<td>103</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Copperbelt</td>
<td>98</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Eastern</td>
<td>122</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Luapula</td>
<td>58</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Lusaka</td>
<td>233</td>
<td>10</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Muchinga</td>
<td>62</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Northern</td>
<td>87</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Northwestern</td>
<td>72</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Southern</td>
<td>149</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Western</td>
<td>29</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>14</td>
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<tr>
<td>Subtotal A</td>
<td>1,013</td>
<td>42</td>
<td>3</td>
<td>1</td>
<td>45</td>
</tr>
<tr>
<td>Subtotal B</td>
<td>1,055</td>
<td>4</td>
<td>256</td>
<td>136</td>
<td>558</td>
</tr>
<tr>
<td>Grand Total</td>
<td>2,009</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>
Table 4: Total Respondents Participating in ITC Zambia Wave 2

<table>
<thead>
<tr>
<th>Sample</th>
<th>Tobacco Status</th>
<th>Cohort</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>National sample</td>
<td>Cigarette only</td>
<td>611</td>
<td>444</td>
<td>1,055</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Mixed</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Smokeless only</td>
<td>162</td>
<td>94</td>
<td>256</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quitter</td>
<td>136</td>
<td>0</td>
<td>136</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-user</td>
<td>365</td>
<td>193</td>
<td>558</td>
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</table>

Table 5: Wave 1 to Wave 2 Retention Rates by Initial Tobacco Use at the Time of Recruitment and Province.

<table>
<thead>
<tr>
<th>Tobacco User</th>
<th>Lost Freq</th>
<th>Lost %</th>
<th>Retained Freq</th>
<th>Retained %</th>
<th>All Respondents Freq</th>
<th>Retained %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>42</td>
<td>28.8</td>
<td>104</td>
<td>71.2</td>
<td>57</td>
<td>26.7</td>
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<tr>
<td>Copperbelt</td>
<td>69</td>
<td>30.0</td>
<td>161</td>
<td>70.0</td>
<td>101</td>
<td>31.5</td>
</tr>
<tr>
<td>Eastern</td>
<td>40</td>
<td>22.6</td>
<td>137</td>
<td>77.4</td>
<td>54</td>
<td>21.7</td>
</tr>
<tr>
<td>Luapula</td>
<td>34</td>
<td>31.5</td>
<td>74</td>
<td>68.5</td>
<td>49</td>
<td>33.3</td>
</tr>
<tr>
<td>Lusaka</td>
<td>209</td>
<td>82.0</td>
<td>46</td>
<td>18.0</td>
<td>289</td>
<td>80.5</td>
</tr>
<tr>
<td>Muchinga</td>
<td>8</td>
<td>9.9</td>
<td>73</td>
<td>90.1</td>
<td>9</td>
<td>8.0</td>
</tr>
<tr>
<td>Northern</td>
<td>55</td>
<td>42.3</td>
<td>75</td>
<td>57.7</td>
<td>77</td>
<td>42.1</td>
</tr>
<tr>
<td>Northwestern</td>
<td>20</td>
<td>25.3</td>
<td>59</td>
<td>74.7</td>
<td>32</td>
<td>29.1</td>
</tr>
<tr>
<td>Southern</td>
<td>52</td>
<td>31.0</td>
<td>116</td>
<td>69.0</td>
<td>67</td>
<td>27.9</td>
</tr>
<tr>
<td>Western</td>
<td>42</td>
<td>41.2</td>
<td>60</td>
<td>58.8</td>
<td>60</td>
<td>42.0</td>
</tr>
<tr>
<td>Overall</td>
<td>571</td>
<td>38.7</td>
<td>905</td>
<td>61.3</td>
<td>795</td>
<td>38.4</td>
</tr>
</tbody>
</table>
## Appendix A: ITC Zambia Wave 2 Interviewer Training Workshop

University of Zambia, School of Medicine (UNZA), Lusaka, Zambia  
August 11-21, 2014  
Venue: Palmwood Lodge, Jesmondine, Lusaka

### Day 1 – August 11, 2014 (Monday)

<table>
<thead>
<tr>
<th>Time</th>
<th>Description</th>
<th>Presenter / Facilitator</th>
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</thead>
<tbody>
<tr>
<td>0800 – 0830</td>
<td>Registration</td>
<td>Kondwani Chirwa</td>
</tr>
</tbody>
</table>
| 0830 – 0900 | Welcome  
Overview of Workshop Agenda and Goals  
Introduction of Team Members  
Ice Breaking Activity | Fastone Goma               |
| 0900 – 1030 | Overview of Tobacco Control in Zambia since Wave 1  
Importance of Survey  
Key Findings from the W1 National Report | Fastone Goma, John Mayeya |
| 1030 – 1100 | Refreshments                                                                |                         |
| 1100 – 1110 | Introduction to the ITC Project                                              | Anne Quah               |
| 1110 – 1230 | Lessons Learnt from Wave 1  
Missing data, Progress report, Checks etc.  
Roles and expectations  
Entering EAs  
Data Collection  
Household Enumeration  
Individual Survey  
Completion of all Relevant Forms | Fastone Goma, Masauso Phiri, Josephine Chewe, Richard Zulu |
| 1230 – 1400 | Lunch                                                                       |                         |
| 1400 – 1500 | What is new to Wave 2?  
Screening process to individual surveys  
Recontact vs. Replenishment surveys  
Recontact vs. Replenishment respondents  
Recontact households vs. new households in EAs | Susan Kaai, Anne Quah |
<p>| 1500 – 1530 | Overview of Survey Types and Survey Features                               | Anne Quah               |
| 1530 – 1545 | Refreshments                                                                |                         |
| 1545 – 1645 | Description of Household (H) Survey                                         | Susan Kaai              |
|           | Role Play                                                                   | All                     |
|           | Household Survey (includes Q&amp;A)                                             |                         |</p>
<table>
<thead>
<tr>
<th>Time</th>
<th>Description</th>
<th>Presenter / Facilitator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1645 – 1700</td>
<td>Debriefing</td>
<td>Fastone Goma / Kondwani Chirwa</td>
</tr>
<tr>
<td>1700 – 1800</td>
<td>Supervisors meeting</td>
<td>Fastone Goma / Kondwani Chirwa</td>
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### Day 2 – August 12, 2014 (Tuesday)

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<th>Presenter / Facilitator</th>
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<tbody>
<tr>
<td>0800 – 1230</td>
<td>sampling plan</td>
<td>Anne Quah / Masauso Phiri / Fastone Goma</td>
</tr>
<tr>
<td></td>
<td>- Recontact Sampling Plan</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Recontacting Wave 1 Respondents</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Q &amp; A</td>
<td></td>
</tr>
<tr>
<td>1230 – 1400</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>1400 - 1730</td>
<td>Sampling plan</td>
<td>Anne Quah / Susan Kaai</td>
</tr>
<tr>
<td></td>
<td>- Replenishment Sampling Plan</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Household Enumeration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Q &amp; A</td>
<td></td>
</tr>
<tr>
<td>1730 – 1745</td>
<td>Debriefing</td>
<td>Fastone Goma / Kondwani Chirwa</td>
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### Day 3 – August 13, 2014 (Wednesday)

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<th>Description</th>
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<tbody>
<tr>
<td>0800 - 1030</td>
<td>Household Forms</td>
<td>Susan Kaai</td>
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<tr>
<td></td>
<td>- Household Enumeration Form (HEF)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Prefilled Household Recontact Form (HRF)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Role Play</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>- Household Recontact Form</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Household Enumeration Form</td>
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<tr>
<td>1030 – 1100</td>
<td>Refreshments</td>
<td></td>
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<tr>
<td>1100 – 1200</td>
<td>Description of Information Letter and Consent Form</td>
<td>Anne Quah</td>
</tr>
<tr>
<td></td>
<td>Role Play</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>- Consent Form (includes Q&amp;A)</td>
<td></td>
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<tr>
<td>1200 – 1245</td>
<td>Description of Screeners (1, 2, and 3)</td>
<td>Susan Kaai</td>
</tr>
<tr>
<td></td>
<td>Role Play</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>- Screeners (includes Q&amp;A)</td>
<td></td>
</tr>
<tr>
<td>1245 – 1400</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>1400 – 1445</td>
<td>Description of Replenishment Survey (P)</td>
<td>Anne Quah</td>
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### Day 4 – August 14, 2014 (Thursday)

<table>
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<th>Time</th>
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<tr>
<td>0800 - 1030</td>
<td>Description of Smokeless Survey (L)</td>
<td>Susan Kaai</td>
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<tr>
<td>0800 - 1030</td>
<td>Role Play</td>
<td>All</td>
</tr>
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<td>1030 – 1100</td>
<td>Refreshments</td>
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<tr>
<td>1100 – 1230</td>
<td>Description of Non-User Survey (N)</td>
<td>Susan Kaai</td>
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<tr>
<td>1100 – 1230</td>
<td>Role Play</td>
<td>All</td>
</tr>
<tr>
<td>1230 – 1400</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>1400 – 1530</td>
<td>Description of Quitter Survey (Q) (includes Q &amp; A)</td>
<td>Susan Kaai</td>
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<tr>
<td>1400 – 1530</td>
<td>Role Play</td>
<td>All</td>
</tr>
<tr>
<td>1530 – 1545</td>
<td>Refreshments</td>
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<tr>
<td>1545 – 1630</td>
<td>Description of Mixed User Survey (M)</td>
<td>Anne Quah</td>
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<tr>
<td>1545 – 1630</td>
<td>Role Play</td>
<td>All</td>
</tr>
<tr>
<td>1630 - 1715</td>
<td>Review of forms and surveys</td>
<td>Susan Kaai / Anne Quah</td>
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<tr>
<td>1630 - 1715</td>
<td>Mankin Flashcards, Tobacco Products, and Health Warning Cards</td>
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<tr>
<td>1700 - 1715</td>
<td>Debriefing</td>
<td>Fastone Goma / Anne Quah</td>
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### Day 5 – August 15, 2014 (Friday)

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<tbody>
<tr>
<td>0800 – 0845</td>
<td>Description of Interviewer Scripts and Flowchart (Q &amp; A)</td>
<td>Susan Kaai</td>
</tr>
<tr>
<td>0845 – 0945</td>
<td>Principles of Conducting ITC Surveys and Interviewing Techniques</td>
<td>Susan Kaai</td>
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</tbody>
</table>
### Mock Interviews using Local Languages
- Consent Form
- Screeners
- Interview Script
- HEF and HRF
- H Survey
- Individual Surveys (C, L, M, N, and Q)

<table>
<thead>
<tr>
<th>Time</th>
<th>Description</th>
<th>Presenter / Facilitator</th>
</tr>
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<tbody>
<tr>
<td>0945 - 1530</td>
<td>Mock Interviews using Local Languages</td>
<td>Kondwani Chirwa</td>
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<td></td>
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<td>All</td>
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<tr>
<td></td>
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<td>(Refreshment: 1030 - 1045)</td>
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<td></td>
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<td>(Lunch: 1230 – 1400)</td>
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<tr>
<td>1530 – 1545</td>
<td>Refreshments</td>
<td>Fastone Goma / Kondwani Chirwa</td>
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<tr>
<td>1545 - 1700</td>
<td>Fieldwork Practice Logistics and Instructions</td>
<td>Fastone Goma / Kondwani Chirwa</td>
</tr>
<tr>
<td>1700 – 1715</td>
<td>Debriefing</td>
<td>Fastone Goma / Anne Quah</td>
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### Day 6—August 16, 2014 (Saturday)

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<tbody>
<tr>
<td>0800 - 1700</td>
<td>Visit to the Field to Practice Interviews</td>
<td>Fastone Goma / Kondwani Chirwa / Supervisors</td>
</tr>
<tr>
<td>1700 – 1730</td>
<td>Debriefing</td>
<td>Fastone Goma / Kondwani Chirwa</td>
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### Day 7—August 17, 2014 (Sunday)

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<th>Description</th>
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<tbody>
<tr>
<td>0800 – 1530</td>
<td>Feedback from Field Practice Interviews</td>
<td>Fastone Goma / Kondwani Chirwa</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Refreshment: 1030 - 1045)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Lunch: 1230 – 1400)</td>
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<tr>
<td>1530 – 1545</td>
<td>Refreshments</td>
<td>Fastone Goma / Kondwani Chirwa / Anne Quah/Susan Kaai</td>
</tr>
<tr>
<td>1545 – 1630</td>
<td>Debriefing &amp; Wrap Up</td>
<td>Fastone Goma / Kondwani Chirwa / Anne Quah/Susan Kaai</td>
</tr>
<tr>
<td></td>
<td>Feedback, Evaluation Forms</td>
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<tr>
<td></td>
<td>Q&amp;A</td>
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<tr>
<td>1630 - 1700</td>
<td>Last Words</td>
<td>Fastone Goma / Anne Quah</td>
</tr>
<tr>
<td>Time</td>
<td>Description</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>All Day</td>
<td>Lusaka: start of fieldwork</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Fastone, Kondwani, Masauso, Anne and Susan to join Lusaka interviewers into the field</td>
<td></td>
</tr>
<tr>
<td></td>
<td>August 19, 2014 (Tuesday)</td>
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<tr>
<td>All Day</td>
<td>Central Province: Fieldwork</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Fastone, Kondwani, Masauso, Anne and Susan to join Central Province interviewers into the field</td>
<td></td>
</tr>
<tr>
<td></td>
<td>August 20, 2014 (Wednesday)</td>
<td></td>
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<tr>
<td>morning</td>
<td>Conference calls with remaining provinces in the field</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Fastone, Kondwani, Masauso, Anne and Susan</td>
<td></td>
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<tr>
<td>afternoon</td>
<td>Stakeholders and Ministry of Health Meeting on Pictorial Health Warnings</td>
<td></td>
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<tr>
<td></td>
<td>August 21, 2014 (Thursday)</td>
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<tr>
<td>morning</td>
<td>Management team debriefing on training, fieldwork start, and MOH meeting</td>
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</table>
Appendix B: ITC Zambia Wave 1 Sampling Design

The research team was to conduct an enumeration of about 10,500 households, enough to be able to interview 1,500 adult (15 years or older) users of tobacco. It was also intended to interview 600 non-users of tobacco. We conducted a stratified sample by province sampling a total of 150 clusters allocated to the provinces proportional to population size. Calculations were based on 2010 census data. Within each cluster we intended to sample and interview 10 tobacco users and 4 non-tobacco users. To attain 10 tobacco user individuals we expected to have to enumerate 70 households in each cluster.

Sampling of households within a cluster. In any enumerated household all tobacco users up to a maximum of 4 (randomly selected if necessary) were to be interviewed. If there were more than 4 users in a household, we sampled all female users and selected male users at random until 4 users are sampled. This procedure was meant to ensure a sufficient number of female users in the sample. Smoking is much less prevalent among females as compared to males. Sampling was to continue until the cluster quota of users (10 users) was reached. In every 5th enumerated household up to one randomly selected non-user (alternating male and female) was to be interviewed until the quota of non-users (4 non-users) for the cluster was met. If a 5th household did not contain any users, we still were to sample a non-user. With 70 enumerated households, every 5th household should yield about 5 households; sufficient to fill the desired quota of 4 non-users. Among non-users, this procedure was meant to sample an equal number of males and females.

Enumeration. The interviewer teams would go to the selected clusters, also known as enumeration areas (EAs). If there was not already a list of the dwelling units of an EA, they would make a list. They would visit the dwelling units on the list in random order, and at each dwelling unit, once contact was made, enumerate the household (list all the members and their age, sex, tobacco use, relationship to head of household), and select individuals for interview, if any were eligible. They would conduct the interviews then or at a later visit. They would stop enumerating households in the EA when the target numbers of interviews for the EA were reached. We can get estimates of prevalence, even if not all 10,500 households are enumerated, as long as households were approached
in random order and the enumeration data were carefully recorded even when there was no one eligible in the households. ¹

Allocation of clusters to wards and districts. For cost reasons we constrained the number of wards and districts to be sampled. The total number of districts was constrained to be 20. Therefore, in each of the 10 provinces we sampled 2 districts with inclusion probability proportional to population size. Within each district we sampled 2 wards except in the large LUSAKA ward (capital) in which we sampled 4 wards, again with inclusion probabilities proportional to population size. Therefore, the total number of wards sampled was 42. Within the two districts of a province we sampled an equal number of wards (except for rounding). Within each ward we sampled clusters with inclusion probability proportional to population size. Depending on the size of the province the number of clusters ranged from 2 to 6 (2 was a lower bound constraint).

The sample scheme was slightly changed in Lusaka province because Lusaka district, the capital, made up more than half of the population of Lusaka province. Out of the 4 districts in this province we sampled Lusaka district with certainty (purposively) and one district of the remaining three. An overview over the stratified 5-stage sampling plan is given in Table B1. The final sample design in terms of the allocation of wards and clusters to districts is shown in Table B2.

Table B1: Overview of the Stratified 5–Stage Sampling Plan

<table>
<thead>
<tr>
<th>Hierarchy</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strata</td>
<td>10 Provinces</td>
</tr>
<tr>
<td>Stage 1</td>
<td>sample 2 districts within province (include Lusaka district purposefully)</td>
</tr>
<tr>
<td>Stage 2</td>
<td>sample 2 wards within district (except 4 wards in Lusaka district)</td>
</tr>
<tr>
<td>Stage 3</td>
<td>sample 2-6 clusters within ward (number of clusters is proportional to ward's population)</td>
</tr>
<tr>
<td>Stage 4</td>
<td>enumerate 70 households; sample 10 of these</td>
</tr>
<tr>
<td>Stage 5</td>
<td>sample up to 4 smokers per household and up to 1 non-smoker in every 5th enumerated household</td>
</tr>
</tbody>
</table>

¹ In India, we targeted the number of households, not the number of individuals. In India, we could not get estimates of prevalence without enumerating the full cluster.
In Table B2 the number of clusters refers to the total number of clusters selected in a province. Figure B1 contains a bar chart of the number of clusters by district. The largest number of clusters was selected in the capital district, Lusaka. The minimum number of clusters by district is 4 (by design).

Table B2: Sample Design for ITC Zambia.

<table>
<thead>
<tr>
<th>PROVINCE</th>
<th>DISTRICT</th>
<th>n_districts</th>
<th>n_wards</th>
<th>n_cluster_prov</th>
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<td>2</td>
<td>15</td>
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<tr>
<td>CENTRAL</td>
<td>Kabwe</td>
<td>2</td>
<td>2</td>
<td>15</td>
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<tr>
<td>COPPERBELT</td>
<td>Kitwe</td>
<td>2</td>
<td>2</td>
<td>23</td>
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<tr>
<td>COPPERBELT</td>
<td>Mufulira</td>
<td>2</td>
<td>2</td>
<td>23</td>
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<tr>
<td>EASTERN</td>
<td>Chipata</td>
<td>2</td>
<td>2</td>
<td>18</td>
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<tr>
<td>EASTERN</td>
<td>Petauke</td>
<td>2</td>
<td>2</td>
<td>18</td>
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<tr>
<td>LUAPULA</td>
<td>Kawambwa</td>
<td>2</td>
<td>2</td>
<td>11</td>
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<tr>
<td>LUAPULA</td>
<td>Samfya</td>
<td>2</td>
<td>2</td>
<td>11</td>
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<tr>
<td>LUSAKA</td>
<td>Chongwe</td>
<td>2</td>
<td>2</td>
<td>26</td>
</tr>
<tr>
<td>LUSAKA</td>
<td>Lusaka</td>
<td>2</td>
<td>4</td>
<td>26</td>
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<tr>
<td>MUCHINGA</td>
<td>Chinsali</td>
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<td>MUCHINGA</td>
<td>Mafinga</td>
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<td>NORTHERN</td>
<td>Kasama</td>
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<td>NORTHERN</td>
<td>Mungwi</td>
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<td>NORTHWESTERN</td>
<td>Mufumbwe</td>
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<td>NORTHWESTERN</td>
<td>Solwezi</td>
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<td>8</td>
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<td>SOUTHERN</td>
<td>Kalomo</td>
<td>2</td>
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<td>18</td>
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<tr>
<td>SOUTHERN</td>
<td>Namwala</td>
<td>2</td>
<td>2</td>
<td>18</td>
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<tr>
<td>WESTERN</td>
<td>Kalabo</td>
<td>2</td>
<td>2</td>
<td>10</td>
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<tr>
<td>WESTERN</td>
<td>Shang'ombo</td>
<td>2</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>20</strong></td>
<td><strong>42</strong></td>
<td><strong>150</strong></td>
</tr>
</tbody>
</table>
Each row represents a district. The number of clusters in a district is given in the last column. The total number of clusters equals 150.

Several clusters needed to be replaced during fieldwork:

1. In Kabwe, ward 16, two of the four EAs sampled represented barracks. Two replacement EAs were sampled PPS among the remaining 4 EAs (there were a total of 8 EA’s including the barracks in this ward).

2. In Mungwi District, ward 6 in Northern Province a malicious rumour and ensuing hostility made it impossible for the survey to progress. This affected 2 of 3 EAs (inside the same SEA) in Ward 6. Two replacement EAs were sampled PPS in the same ward.

3. Another incidence occurred in ward 18 of Kalabo, Western Province in an EA close to the border with Angola. This EA contained many illegal refugees who do not like answering questions. One replacement EA was sampled PPS in the same ward.

Figure B1: Number of Clusters by District.

Each bar is labeled as “province, district”.

<table>
<thead>
<tr>
<th>Province, District</th>
<th>Number of Clusters</th>
</tr>
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<tbody>
<tr>
<td>LUSAKA, LUSAKA</td>
<td>20</td>
</tr>
<tr>
<td>COPPERBELT, KITWE</td>
<td>15</td>
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<tr>
<td>COPPERBELT, MUFULIRA</td>
<td>10</td>
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<tr>
<td>SOUTHERN, NAMWALA</td>
<td>5</td>
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<tr>
<td>SOUTHERN, KALOMO</td>
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<tr>
<td>EASTERN, PETAUKE</td>
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<tr>
<td>EASTERN, CHIPATA</td>
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<tr>
<td>CENTRAL, KABWE</td>
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<tr>
<td>NORTHERN, MUNGWI</td>
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<tr>
<td>CENTRAL, CHIBOMBO</td>
<td>5</td>
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<tr>
<td>NORTHERN, KASAMA</td>
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<tr>
<td>LUAPULA, KAWAMBWA</td>
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<tr>
<td>WESTERN, SHANG’OMBO</td>
<td>5</td>
</tr>
<tr>
<td>WESTERN, KALABO</td>
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</tr>
<tr>
<td>LUAPULA, SAMFYA</td>
<td>5</td>
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<tr>
<td>NWESTERN, SOLWEZI</td>
<td>5</td>
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<tr>
<td>NWESTERN, MUFUMBWE</td>
<td>5</td>
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<tr>
<td>MUCHINGA, MAFINGA</td>
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<tr>
<td>MUCHINGA, CHINSALI</td>
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<tr>
<td>LUSAKA, CHONGWE</td>
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</tbody>
</table>
Appendix C: Flowchart for ITC Zambia Wave 2 Survey

1. Approach Household: Ask for Head or Key Informant
   - Available
   - Unavailable

2. Complete HRF/HEF Form A

3. Administer H Survey with the head or key informant

4. Ask if any of respondents in prefilled recontact form (HRF)/selected in HEF is available for the interview
   - Available
   - Unavailable

5. Read information letter and obtain consent
   - Consented
   - No consent

6. Administer appropriate screener

7. Complete appropriate individual survey

8. Complete the individual outcome code in the HRF/HEF Form

Repeat Step 5-8 to interview next available respondent

9. Thank and provide of token of appreciation to the household

Move to next household/ Quality check

Note:
HRF: Household Recontact Form
HEF: Household Enumeration Form
Appendix D: Random Table (A sample of the table)

Random Order Sequence Table for selecting dwelling units to enumerate

<table>
<thead>
<tr>
<th>Between 26 and 50 units</th>
<th>Between 51 and 75 units</th>
<th>Between 76 and 100 units</th>
<th>Between 101 and 125 units</th>
<th>Between 126 and 150 units</th>
<th>Between 151 and 175 units</th>
<th>Between 176 and 200 units</th>
<th>Between 201 and 225 units</th>
<th>Between 226 and 250 units</th>
<th>Between 251 and 275 units</th>
<th>Between 276 and 300 units</th>
<th>Between 301 and 325 units</th>
<th>Between 326 and 350 units</th>
<th>Between 351 and 375 units</th>
<th>Between 376 and 400 units</th>
<th>Between 401 and 425 units</th>
<th>Male / Female / No-User (W/PU/NNU)</th>
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</table>
Appendix E: ITC Zambia Screeners

ITC ZAMBIA WAVE 2 SURVEY
(SCREENER 1: REPLENISHMENT)

Date of Survey: ________/_______/_______
Start Time: _______ am/pm
End Time: _______ am/pm

Please tick the correct box for each question below:
1. Do you currently smoke cigarettes at least once a month (FR321)?
   Yes □ No □
2. Do you currently use any smokeless tobacco products at least once a month (TF714)?
   Yes □ No □
3. Do you currently smoke bidis at least once a month (TF011)?
   Yes □ No □
4. Do you currently smoke pipe at least once a month (ST376)?
   Yes □ No □

Use flowchart to select survey and then record here (P+C, P+M, P+L or P+N):

Checked by: ___________________________ (Name of Supervisor)
Date Checked: _________________________

Screen 1—REPLENISHMENT
Circle the appropriate responses
ITC ZAMBIA WAVE 2 SURVEY
(SCREENER 2: W1 Tobacco User)

Interviwer ID: 

Individual ID: 

Date of Survey: _____(dd)/_______(mm)/_______(yy)
Start Time: ______am/pm
End Time: _______am/pm

Please tick the correct box for each question below
1. Have you quit all tobacco products completely [AQ860]? Yes ☐ No ☐
   If response=Yes, use the Quitter Survey (Q). If response=No, ask the next questions.
2. Do you currently smoke cigarettes at least once a month [FR321]? Yes ☐ No ☐
3. Do you currently use any smokeless tobacco products at least once a month [TF714]? Yes ☐ No ☐
4. Do you currently smoke bidis at least once a month [TF011]? Yes ☐ No ☐
5. Do you currently smoke pipe at least once a month [ST376]? Yes ☐ No ☐

Use flowchart to select survey and record here (M, C, L or Q): __________
Checked by: __________ (Name of Supervisor)
Date Checked: ____________

Screen 2 - W1 Tobacco Users
Circle the appropriate responses

QUITTER

Survey Q
FR321

Do you currently smoke cigarettes?

TF714
Do you currently use any smokeless tobacco products?

TF011
Do you currently smoke bidis at least once a month?

ST376
Do you currently smoke pipe at least once a month?
ITC ZAMBIA WAVE 2 SURVEY
(SCREENER 3: W1 Non-User of Tobacco)

Interviewer ID: 

ID: Province District Constituency Ward Region CSA No. SEA No. Dwelling No. Household No.

Individual ID: 

Date of Survey: ______ (dd)/_______(mm)/_______(yy)
Start Time: ________am/pm
End Time: ________am/pm

Please tick the correct box for each question below
1. Do you currently smoke cigarettes at least once a month (FR321)? Yes No
2. Do you currently use any smokeless tobacco products at least once a month (TF714)? Yes No
3. Do you currently smoke bidis at least once a month (TF011)? Yes No
4. Do you currently smoke pipe at least once a month (ST376)? Yes No

Use flowchart to select survey and then record here (P+C, P+M, P+L or N): 

Checked by: ______________________________ (Name of Supervisor)
Date Checked: ____________________________

Screening 3 – Tobacco Non-Users
Circle the appropriate responses

FR321 Do you currently smoke cigarettes?

TF714 Do you currently use any smokeless tobacco products?

TF011 Do you currently use any smokeless tobacco products?

ST376 Do you currently smoke pipe at least once a month?
Appendix F: Manikin Flashcards

MANIKIN FLASHCARD 1

AROUSAL SCALE

Very Alarmed  Somewhat Alarmed  Neither Alarmed nor Calm  Somewhat Calm  Very Calm
MANIKIN FLASHCARD 2

VALENCE SCALE

Very Unpleasant  Somewhat unpleasant  Neither unpleasant nor pleasant  Somewhat pleasant  Very Pleasant
Appendix G: Health Warning in Zambian Cigarette Packages