

Executive Summary

Malawi NCD Mobile Phone Survey 2019

1. Overview

This report summarizes results from the Malawi Noncommunicable Diseases (NCD) Mobile Phone Survey implemented in 2019. NCDs are the leading cause of death worldwide and according to the World Health Organization country profiles in 2016, NCDs contribute to 80% of all deaths in the Malawi [1]. Efficient monitoring and surveillance are cornerstones to track the progress of NCD burden, related risk factors, and policy interventions. The systematic monitoring of risk factors to generate accurate and timely data is essential for Malawi's ability to prioritize crucial resources and make sound policy decisions to address the growing NCD burden. With increasing access and use of mobile phones globally, opportunities exist to explore the feasibility of using mobile phone technology as an interim method to collect data and supplement household surveys.

In the survey, 5,814 individuals subscribed to Airtel and TNM mobile phone networks anonymously participated in the survey using mobile telephony interactive voice response (IVR) and short message service (SMS) modes.

The survey was the culmination of significant work by the Republic of Malawi's Ministry of Health, including but not limited to study ethical review approval from the National Health Sciences Research Committee, telecommunications approval from the Malawi Communications Regulatory Authority, agreements with mobile network aggregators, and data hosting. The Ministry of Health led questionnaire development, sampling, the mass media campaign, and data collection. Technical assistance was provided by the US Centers for Disease Control and Prevention, RTI International, and InSTEDD. Bloomberg Philanthropies Data for Health Initiative provided financial support through the CDC Foundation.

This report is structured as follows:

- Goals (Section 2)
- Design and Implementation (Section 3)
- Results (Section 4)
- Conclusions (Section 5)

2. Goals

The goal of the Malawi Mobile Phone Survey was to provide nationally representative estimates of indicators that can provide information on NCDs to help make programmatic recommendations to improve and enhance NCD prevention and response in Malawi. The results may be used to supplement results of key behavior risk factors assessed in the WHO Stepwise survey or other national surveillance systems.

The NCD Mobile Phone Survey included 18 core questions on the following topics:

- Demographics
- Tobacco Use
- Alcohol Use
- Diet (Fruit, Vegetable, and Salt Consumption)
- Diabetes
- Hypertension

3. Design and Implementation

3.1 Design

The design parameters used for the NCD Mobile Phone Survey are shown below in Table 1.

Table 1. Mobile Phone Survey Design	
Component	Design
Mode	IVR and SMS
Mode Strategy	The primary mode of contact was IVR with SMS as the fallback. The “fallback” mode initiated if the respondent did not complete the survey in the primary mode.
Sample	A two-phase sample of mobile phone numbers generated via random digit dialing (RDD), using the mobile phone prefixes for Airtel and TNM. Malawi stratified by age and sex in the second phase.
Number of Interviews	5,814 interviews, allocated proportionally across strata to the general population distribution.
Strata	6 strata, created by crossing sex (male, female) with age categories (18-29, 30-44, 45+)
Questionnaire	The NCD Mobile Phone Survey core questionnaire consisting of 18 questions and administered in three languages (English, Nyanja, Tambuka).
Contact times	All 7 days of the week, between 8am and 8pm each day
Contact attempts	<ul style="list-style-type: none"> • Contact #1: IVR • Contact #2: IVR, 50 hours after Contact #1 • Contact #3: SMS, 50 hours after Contact #2 • Contact #4: SMS, 50 hours after Contact #3
Cost to Respondents	None. Incoming SMS messages were free, and channels were configured so that no data charges were incurred by respondents.
Incentives	Respondents who completed the survey were sent 720 Kwacha credit.
Tool and Hosting	Surveda, with data hosted at the Malawi Ministry of Health

3.2 Implementation

The Malawi NCD Mobile Phone Survey implementation process consisted of five stages: Engagement, Planning and Pre-Test, Full-scale Data Collection, Data Management and Analysis, and Data Release and Use.

Full-scale data collection commenced on April 24th 2019, and ended on July 1st 2019, with a pause from May 20 to 26. A total of 5,814 adults aged 18 years and older completed or partially completed (defined

as answering at least one NCD behavior or risk factor question) the survey through the two mobile network operators.

4. Results

This section presents the following results:

- Demographics and Response Rates (section 4.1)
- Tobacco Use (section 4.2)
- Alcohol Use (section 4.3)
- Diet (section 4.4)
- Diabetes (section 4.5)
- Hypertension (section 4.6)

4.1 Demographics and Response Rates

The Malawi Mobile Phone Survey included 5,814 interviews across 6 age by sex groups. Table 2 shows the Mobile Phone Demographic distribution compared to the UN population national statistics for sex and age.

	<i>Mobile Phone Sample</i>	<i>National</i>
Sex	5,814	9,528,784
Male	64.4%	48.7%
Female	35.6%	51.3%
Age		
18-29	53.7%	45.1%
30-44	34.5%	32.4%
45+	11.8%	22.5%

By the end of data collection, all strata sample sizes were achieved, with the exception of 45+ males and females.

To achieve the 5,814 interviews, we sent invitations to 238,570 mobile phone numbers. Due to the nature of the RDD (random digit dialing) sampling, it was expected that many of these mobile phone numbers were invalid or unregistered. Out of these, 29,608 provided some sort of response but only 13,886 consented and provided the age and sex information necessary to be eligible to participate. Of these, 2,504 were ineligible due to age, and 5,083 respondents of eligible age were rejected due to stratum sample size being full. The result was 6,299 eligible respondents, of which 5,814 provided interviews (completed or partial) with known sex. Completed interviews were defined as answering all survey questions. Partial interviews were defined as answering at least one NCD question and not finishing the survey. The interview rate was 92.2% and the overall response rate was 6.9%, which is described in detail below.

The final disposition codes for this sample are shown in Table 3.

Table 3. Final disposition codes for all dialed mobile phone numbers			
<i>Disposition</i>	<i>Definition</i>	<i>N</i>	<i>Percent</i>
1. Complete	Answered all survey questions	3,693	1.55%
2. Partial	Answered at least once NCD question but did not finish the survey	2,121	0.89%
3. Breakoff: Eligible	Answered age and sex questions but did not answer any NCD questions	494	0.21%
4. Ineligible: Age	Under age 18	2,504	1.05%
5. Ineligible: Quotas	Answered age and sex questions but quotas were full	5,074	2.13%
6. Refused	Refused consent	2,786	1.17%
7. Breakoff: unknown eligibility	Answered some questions but stopped before age or sex	12,936	6.19%
8. No answer	No answer, possibly nonworking number	208,962	87.59%
<i>Total</i>		238,569	

In this project, the sampling design involved two Phases. Each phase had a response rate. The final response rate was the product of Phase I and Phase II response rates. For the full-scale survey, we used a sample of MPNs filtered by Airtel and TNM. The pre-test survey used an unfiltered list. Therefore, the Phase I response rate is estimated using the full-scale data.

$$\text{Phase I Response Rate} = \frac{\text{Number MPNs screened}}{\text{Number MPNs dialed}}$$

Or,

$$\text{Phase I Response Rate} = \frac{13,233}{177,833} = 0.07441$$

Phase II Response Rate $RR6_s = \frac{IP_s}{IP_s + O_s}$, for stratum s .

RR_6 was derived from the 2016 Standard Definitions of the [American Association for Public Opinion Research \(AAPOR\)](#). Phase II stratum-specific response rates (RR #6) are presented Table 4:

Age	Males	Females
18-29	0.944981	0.934295
30-44	0.908571	0.912718
45+	0.875639	0.864322

The overall response rate is the product of Phase I and Phase II response rates, resulting in an overall response rate for the entire NCD Mobile Phone Survey in Malawi:

$$RR6_{overall} = \frac{IP_{overall}}{IP_{overall} + O_{overall}} * RR_{Phase I} = \frac{5,814}{5,814 + 494} * 0.07441 = 0.06964$$

4.2 Tobacco Use

Tobacco use is one of the most important risk factors for NCDs. Overall, 27.6% of Malawian adults (aged 18 years and older) used some form of tobacco (32.2% among men and 23.4% among women). Men reported higher rates of current tobacco smoking, 27.5%, than women, 18.7%. Men also reported higher rates of daily tobacco smoking compared to women (6.9% vs. 2.3% respectively). Overall, 18.3% reported current smokeless tobacco use (21.1% among men and 15.7% among women); 4.0% of Malawian adults reported daily smokeless tobacco use.

Table 5 shows key outcomes from the NCD Mobile Phone Survey on tobacco use.

Tobacco Use	Overall	Males	Females
Tobacco Smokers	% (95% CI)	% (95% CI)	% (95% CI)
Current tobacco smokers	22.9 (21.6 , 24.2)	27.5 (26.0 , 29.1)	18.7 (16.7 , 20.9)
Daily tobacco smokers	4.5 (3.9 , 5.1)	6.9 (6.1 , 7.8)	2.3 (1.6 , 3.2)
Smokeless Tobacco Users			
Current smokeless tobacco users	18.3 (17.1 , 19.6)	21.1 (19.7 , 22.6)	15.7 (13.8 , 17.8)
Daily smokeless tobacco users	4.0 (3.5 , 4.7)	5.0 (4.3 , 5.8)	3.1 (2.3 , 4.2)
Tobacco Users (any use)			
Current tobacco users	27.6 (26.2 , 29.0)	32.2 (30.6 , 33.8)	23.4 (21.2 , 25.6)

4.3 Alcohol Use

Approximately one in six adult Malawians consumed alcohol in the past 30 days (16.9%), with males reporting current alcohol consumption more frequently than females (25.0% vs. 9.5% respectively). Among adult Malawians who reported drinking in the past 30 days prior to the survey, 14.6% reported drinking six or more drinks in a single drinking occasion. Males had approximately three times the rate of females of heavy drinking occasions.

Table 6 shows reported alcohol use overall and by sex from the NCD Mobile Phone Survey.

Alcohol Use	Overall		Males		Females	
	% (95% CI)		% (95% CI)		% (95% CI)	
Current alcohol users (past 30 days)	16.9	(15.8 , 18.1)	25.0	(23.4 , 26.7)	9.5	(8.0 , 11.2)
Heavy episodic drinkers (percentage of drinkers had 6+ drinks)	14.6	(13.5 , 15.7)	22.2	(20.6 , 23.8)	7.7	(6.4 , 9.2)

4.4 Diet

Regarding salt consumption, more than half (59.5%) of adult Malawians always or often added salt in some form when cooking. About one third, 32.9%, of adult Malawians reported always or often eating processed foods high in salt. Overall, 41.0% reported always or often adding salt or salty sauce to their food before or as they are eating.

For fruit and vegetable consumption, more than half (54.5%) of all adult Malawians consumed less than five servings of fruit or vegetables per day with an average of 1.7 servings of vegetables and 3.6 servings of fruits eaten per day. Less than 1% reported consuming no fruits or vegetables per day (0.2%).

Table 7 presents salt, fruit, and vegetable consumption overall and by sex.

Diet	Overall		Males		Females	
Salt Consumption	%	(95% CI)	%	(95% CI)	%	(95% CI)
Always or often add salt or salty sauce to food before eating or as they're eating	41.0	(39.3 , 42.7)	43.7	(41.9 , 45.6)	38.5	(35.9 , 41.3)
Always or often add salt or salty seasoning when cooking or preparing foods	59.5	(57.7 , 61.2)	57.6	(55.7 , 59.5)	61.1	(58.3 , 63.9)
Always or often eat processed foods high in salt	32.9	(31.3 , 34.5)	33.7	(32.0 , 35.6)	32.1	(29.5 , 34.8)

Fruit Consumption	Mean (95% CI)	Mean 95% CI	Mean 95% CI
Average number of days per week fruits are consumed	3.6 (3.6 , 3.7)	3.5 (3.4 , 3.6)	3.7 (3.6 , 3.8)
Average number of servings of fruit consumed per day	1.7 (1.7 , 1.8)	1.7 (1.6 , 1.7)	1.8 (1.7 , 1.9)
Vegetable Consumption	Mean (95% CI)	Mean 95% CI	Mean 95% CI
Average number of days per week vegetables are consumed	5.1 (5.1 , 5.2)	4.8 (4.7 , 4.8)	5.4 (5.3 , 5.6)
Average number of servings of vegetables consumed per day	3.7 (3.6 , 3.8)	3.3 (3.2 , 3.4)	4.1 (3.9 , 4.2)
Fruit and Vegetable Consumption	% (95% CI)	% (95% CI)	% (95% CI)
Consume less than five servings of fruits OR vegetables per day	54.5 (52.7 , 56.2)	61.0 (59.1 , 62.8)	48.4 (45.5 , 51.3)
Consume no fruits and vegetables per day	0.2 (0.1 , 0.5)	0.1 (0.0 , 0.3)	0.2 (0.0 , 1.1)

4.5 Raised Blood Glucose or Diabetes

Overall, 4.8% of adult Malawians indicated they were ever told by a doctor or health professional that they had raised blood glucose or diabetes (4.6% among men and 5.0% among women). Of those who reported a diagnosis, 36.5% reported that they were currently on medication for raised blood glucose or diabetes.

Table 8 shows the rates of self-reported raised blood sugar or diabetes.

	Overall	Males	Females
Raised Blood Glucose/Diabetes	% (95% CI)	% (95% CI)	% (95% CI)
Diagnosed by doctor or health care professional with raised blood glucose/diabetes	4.8 (4.0 , 5.7)	4.6 (3.8 , 5.5)	5.0 (3.7 , 6.7)
Currently taking medication for raised	36.5 (27.4 , 46.7)	30.9 (22.5 , 40.9)	41.5 (26.7 , 58.2)

blood glucose/diabetes			
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4.6 Raised Blood Pressure or Hypertension

Approximately a quarter of adult Malawians, 24.2%, reported that they had ever been diagnosed by a doctor or health professional with raised blood pressure or hypertension. Among those who reported they were diagnosed to have raised blood pressure or hypertension 32.3% were currently on medication for the said condition.

Table 9 shows the rates of self-reported raised blood pressure or hypertension.

	<i>Overall</i>	<i>Males</i>	<i>Females</i>
Raised Blood Pressure/Hypertension	% (95% CI)	% (95% CI)	% (95% CI)
Diagnosed by doctor or health care professional with raised blood pressure/hypertension	24.2 (22.6 , 25.9)	20.6 (19.0 , 22.2)	27.4 (24.8 , 30.3)
Currently taking medication for raised blood pressure/hypertension	32.3 (28.4 , 36.6)	32.7 (28.5 , 37.2)	32.1 (26.3 , 38.6)

5. Conclusions

NCDs and their associated risk factors have profound consequences on the individual and Malawian society at large. The data presented in the Malawi NCD Mobile Phone Survey provide a strong foundation for the development of prevention and response strategies in Malawi. Some key outcomes included:

- More than a quarter of adult Malawians reported being current tobacco users, 27.6%; 4.5% reported being daily tobacco smokers. Men were more likely to report current or daily tobacco smoking than women.
- Overall, 16.9% reported current alcohol consumption, of whom 14.6% reported heavy episodic drinking. Men were more likely to drink alcohol in the past 30 days as well as report being heavy episodic drinkers than women.
- More than half of adult Malawians, 54.5%, reported consuming less than five servings of fruits or vegetables per day.
- More than half of adult Malawians, 59.2%, reported always or often adding a form of salt as they prepared a meal.
- Two in five adult Malawians (41.0%) reported always or often adding salt or salty sauces to food before or as they are eating it.

- Overall, 4.8% reported ever receiving a clinical diagnosis of raised blood glucose or diabetes. A third, 36.5%, of those who reported ever being diagnosed with raised blood glucose or diabetes were currently taking medication.
- Overall, 24.2% indicated ever being told that they have raised blood pressure or were hypertensive by a doctor or health professional. A third of whom reported ever being diagnosed were currently taking medication for their raised blood pressure or hypertension.

Conclusions:

Findings from this survey help provide a national baseline on select NCD risk factors for Malawian adults aged 18 years and older. Results will inform the Ministry of Health in the Malawi as they advance efforts to improve and enhance NCD prevention and response efforts. The timely reporting of mobile phone survey results such as these will also facilitate comparisons over time and across countries.

Limitations:

The main limitation of any mobile phone survey includes the population's access to a mobile phone. Therefore, the population who do not have access to mobile phones was not represented in this survey. The results of the mobile phone survey were based on self-reports and may be influenced by recall or social desirability bias.

6. *References*

1. World Health Organization. Noncommunicable diseases country profiles Malawi 2018. Geneva: WHO; 2018. https://www.who.int/nmh/countries/2018/mar_en.pdf?ua=1