

# Executive Summary

## Sri Lanka NCD Mobile Phone Survey

### 1. Overview

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This report summarizes results from the Sri Lanka 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 83% of all deaths in the Republic of Sri Lanka [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 Sri Lanka'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, 4,624 individuals subscribed to Dialog, Mobitel, Hutch, Etisalat, and Airtel mobile phone networks anonymously participated in the survey using mobile telephony interactive voice response (IVR).

The survey was the culmination of significant work by the Republic of Sri Lanka's Ministry of Health, Nutrition and Indigenous Medicine, including but not limited to study ethical review approval from the Ethics Review Committee at Sri Lanka Medical Association, telecommunications approval from the Telecommunications Regulatory Commission of Sri Lanka, 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

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The goal of the Sri Lanka 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 Sri Lanka. 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 21 core questions on the following topics:

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

### 3. Design and Implementation

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#### 3.1 Design

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

<b>Table 1. Mobile Phone Survey Design</b>	
<b>Component</b>	<b>Design</b>
Mode	IVR
Sample	A two-phase sample of mobile phone numbers generated via random digit dialing (RDD), using the mobile phone prefixes for Dialog, Mobitel, Etisalat, Hutch, and Airtel. Sri Lanka stratified by age and sex in the second phase.
Number of Interviews	4,624 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 questionnaire consisting of 21 core questions and administered in three languages (Tamil, Sinhala, English).
Contact times	All 7 days of the week, between 8am and 8pm each day
Contact attempts	<ul style="list-style-type: none"> <li>• Contact #1: IVR</li> <li>• Contact #2: IVR, 50 hours after Contact #1</li> <li>• Contact #3: IVR, 50 hours after Contact #2</li> </ul>
Cost to Respondents	None.
Incentives	None.
Tool and Hosting	Surveda, with data hosted at the Sri Lanka Ministry of Health

#### 3.2 Implementation

The Sri Lanka 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 August 24<sup>th</sup>, 2019, and ended on October 4<sup>th</sup>, 2019. A total of 4,624 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 five mobile network operators.

### 4. Results

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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 Sri Lanka Mobile Phone Survey included 4,624 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.

	<b>Mobile Phone Sample</b>	<b>National</b>
<b>Sex</b>	4,624	9,528,784
Male	58.2%	48.7%
Female	41.8%	51.3%
<b>Age</b>		
18-29	31.8%	45.1%
30-44	36.8%	32.4%
45+	31.4%	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 4,624 interviews, we sent invitations to 220,101 mobile phone numbers over the course of both the pre-test (n=1,258) and full-scale survey (n=3,366). Out of these, 50,819 provided some sort of response but only 15,031 consented and provided the age and sex information necessary to be eligible to participate. Of these, 1,417 were ineligible due to age, and 8,080 respondents of eligible age were rejected due to stratum sample size being full. The result was 5,534 eligible respondents, of which 4,624 provided interviews (completed or partial). 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 83.6% and the overall response rate was 7.6%, which is described in detail below.

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

<b>Disposition</b>	<b>Definition</b>	<b>N</b>	<b>Percent</b>
1. Complete	Answered all survey questions	1,989	0.90%
2. Partial	Answered at least once NCD question but did not finish the survey	2,635	1.20%

3. Breakoff: Eligible	Answered age and sex questions but did not answer any NCD questions	910	0.41%
4. Ineligible: Age	Under age 18	1,417	0.64%
5. Ineligible: Quotas	Answered age and sex questions but quotas were full	8,080	3.67%
6. Refused	Refused consent	9,018	4.10%
7. Breakoff: unknown eligibility	Answered some questions but stopped before age or sex	26,770	15.81%
8. No answer	No answer, possibly nonworking number	169,282	76.91%
<b>Total</b>		220,101	

In this project, the sampling design involved two Phases. Each phase had a response rate from a random digit dialing (RDD) generated sample. The final response rate was the product of Phase I and Phase II response rates. For the full-scale survey, we used a filtered sample of active MPNs. The pre-test survey used an unfiltered list which included inactive MPNs. Therefore, the Phase I response rate is estimated using the full-scale data.

$$RR_6 = \frac{N_{answered} \times RR_{Phase II}}{N_{total}}$$

Or,

$$RR_6 = \frac{13,364}{147,050} = 0.09088$$

$$RR_{6s} = \frac{RR_{Phase II} \times III_s}{III_s + 00_{ss}}, \text{ for stratum } s.$$

RR<sub>6</sub> 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	0.871106	0.83949
30-44	0.879485	0.790476
45+	0.852914	0.750355

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 Sri Lanka:

$$RRRR6_{0000000000000000} = \frac{IIPP_{0000000000000000}}{IIPP_{0000000000000000} + 00_{0000000000000000}} * RRRR_{IIP_{0000000000000000}} = \frac{4,624}{4,624 + 910} * 0.09088 = 0.075936$$

#### 4.2 Tobacco Use

Tobacco use is one of the most important risk factors for NCDs, shared across the world’s four leading NCDs: cardiovascular disease, diabetes, cancer, and chronic respiratory diseases. Overall, approximately one in four Sri Lankan adults aged 18 years and older (27.0%) used some form of tobacco (45.3% among men and 10.1% among women). Approximately one in five Sri Lankans reported being current tobacco smokers (22.4%). Men reported higher rates of current tobacco smoking than women, 38.1% and 8.0%, respectively. Men also reported higher rates of daily tobacco smoking compared to women (16.9% vs. 4.7%, respectively). Overall, 14.2% reported current smokeless tobacco use (22.3% among men and 6.0% among women); 6.8% of Sri Lankan adults reported daily smokeless tobacco use.

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

<b>Tobacco Use</b>	<b>Overall</b>		<b>Males</b>		<b>Females</b>	
<b>Tobacco Users (any use)</b>	<b>% (95% CI)</b>		<b>% (95% CI)</b>		<b>% (95% CI)</b>	
<b>Current tobacco users</b>	27.0	(25.8 , 28.2)	45.3	(43.4 , 47.3)	10.1	(8.7 , 11.6)
<b>Tobacco Smokers</b>						
<b>Current tobacco smokers</b>	22.4	(21.3 , 23.6)	38.1	(36.2 , 39.9)	8.0	(6.7 , 9.4)
<b>Daily tobacco smokers</b>	10.6	(9.7 , 11.5)	16.9	(15.5 , 18.3)	4.7	(3.8 , 5.9)
<b>Smokeless Tobacco Users</b>						
<b>Current smokeless tobacco users</b>	14.2	(13.2 , 15.3)	22.3	(20.7 , 24.0)	6.0	(4.8 , 7.5)
<b>Daily smokeless tobacco users</b>	6.8	(6.0 , 7.6)	10.4	(9.2 , 11.7)	3.1	(2.3 , 4.2)

#### 4.3 Alcohol Use

Approximately one in four adult Sri Lankans consumed alcohol in the past 30 days (26.6%), with males reporting current alcohol consumption five times more frequently than females (44.6% vs. 9.1%, respectively). More than one in five adult Sri Lankans (22.0%) reported drinking six or more drinks in a single drinking occasion. Males had approximately six times the rate of females of heavy drinking occasions (38.1% vs. 6.8%, respectively).

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

<b>Alcohol Use</b>	<b>Overall</b>		<b>Males</b>		<b>Females</b>	
	<b>% (95% CI)</b>		<b>% (95% CI)</b>		<b>% (95% CI)</b>	
<b>Current alcohol users (past 30 days)</b>	26.6	(25.1 , 28.2)	44.6	(42.3 , 47.1)	9.1	(7.5 , 11.1)

<b>Heavy episodic drinkers (percentage of drinkers had 6+ drinks)</b>	22.0 (20.6 , 23.5)	38.1 (35.7 , 40.5)	6.8 (5.4 , 8.6)
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#### 4.4Diet

Regarding salt consumption, more than half (61.9%) of adult Sri Lankans always or often added salt in some form to food when cooking or preparing foods. About one in five of adult Sri Lankans (19.5%) reported always or often adding salt or salty seasoning before eating. Overall, 13.8% reported always or often eating processed foods high in salt.

For fruit and vegetable consumption, more than three in four (82.2%) adult Sri Lankans consumed less than five servings of fruit or vegetables per day with an average of 2.1 servings of vegetables and 1.4 servings of fruits eaten per day. Less than 1% reported consuming no fruits or vegetables per day (0.2%). On average, Sri Lankan adults consume 1.2 different types of fruits and 3.0 different types of vegetables per day.

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

<i>Diet</i>	<i>Overall</i>	<i>Males</i>	<i>Females</i>
<b><i>Salt Consumption</i></b>	<b>% (95% CI)</b>	<b>% (95% CI)</b>	<b>% (95% CI)</b>
<b>Always or often add salt or salty seasoning when cooking or preparing foods</b>	61.9 (60.0 , 63.9)	64.2 (61.8 , 66.6)	59.9 (56.8 , 62.9)
<b>Always or often add salt or salty sauce to food before eating or as they're eating</b>	19.5 (18.0 , 21.1)	19.7 (17.8 , 21.7)	19.3 (17.1 , 21.8)
<b>Always or often eat processed foods high in salt</b>	13.8 (12.5 , 15.2)	16.2 (14.4 , 18.2)	11.6 (9.7 , 13.6)
<b><i>Fruit Consumption</i></b>	<b>Mean (95% CI)</b>	<b>Mean 95% CI</b>	<b>Mean 95% CI</b>
<b>Average number of days per week fruits are consumed</b>	3.1 (3.0 , 3.1)	2.9 (2.8 , 3.0)	3.2 (3.1 , 3.3)
<b>Average number of servings of fruit consumed per day</b>	1.4 (1.3 , 1.4)	1.4 (1.3 , 1.4)	1.3 (1.2 , 1.4)
<b>Average number of different types of fruit consumed per day</b>	1.2 (1.1 , 1.2)	1.2 (1.1 , 1.3)	1.2 (1.1 , 1.3)
<b><i>Vegetable Consumption</i></b>	<b>Mean (95% CI)</b>	<b>Mean 95% CI</b>	<b>Mean 95% CI</b>
<b>Average number of days per week vegetables are consumed</b>	4.4 (4.3 , 4.5)	4.2 (4.1 , 4.3)	4.6 (4.5 , 4.7)
<b>Average number of servings of vegetables consumed per day</b>	2.1 (2.0 , 2.2)	2.1 (2.0 , 2.2)	2.1 (2.0 , 2.3)

<b>Average number of different types of vegetables consumed per day</b>	3.0 (2.9 , 3.1)	2.8 (2.7 , 2.9)	3.2 (3.0 , 3.3)
<b><i>Fruit and Vegetable Consumption</i></b>	<b>% (95% CI)</b>	<b>% (95% CI)</b>	<b>% (95% CI)</b>
<b>Consume less than five servings of fruits OR vegetables per day</b>	82.2 (80.6 , 83.7)	83.0 (81.0 , 84.8)	81.4 (78.9 , 83.7)
<b>Consume no fruits and vegetables per day</b>	0.2 (0.1 , 0.5)	0.3 (0.1 , 0.6)	0.2 (0.0 , 0.8)

#### 4.5 Raised Blood Glucose or Diabetes

Overall, 16.4% of adult Sri Lankans indicated they were ever told by a doctor or health professional that they had raised blood glucose or diabetes (16.8% among men and 16.0% among women). Of those who reported a diagnosis, 68.3% 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.

	<b>Overall</b>	<b>Males</b>	<b>Females</b>
<b>Raised Blood Glucose/Diabetes</b>	<b>% (95% CI)</b>	<b>% (95% CI)</b>	<b>% (95% CI)</b>
<b>Diagnosed by doctor or health care professional with raised blood glucose/diabetes</b>	16.4 (14.9 , 18.0)	16.8 (15.0 , 18.8)	16.0 (13.7 , 18.6)
<b>Currently taking medication for raised blood glucose/diabetes</b>	68.3 (63.2 , 73.0)	69.2 (63.1 , 74.7)	67.4 (59.1 , 74.7)

#### 4.6 Raised Blood Pressure or Hypertension

Approximately one in five adult Sri Lankans, 18.7%, 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, more than half (56.2%) were currently on medication for the said condition.

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

	<b>Overall</b>	<b>Males</b>	<b>Females</b>
<b>Raised Blood Pressure/Hypertension</b>	<b>% (95% CI)</b>	<b>% (95% CI)</b>	<b>% (95% CI)</b>

<b>Diagnosed by doctor or health care professional with raised blood pressure/hypertension</b>	18.7 (17.1 , 20.4)	18.1 (16.3 , 20.1)	19.3 (16.8 , 22.0)
<b>Currently taking medication for raised blood pressure/hypertension</b>	56.2 (51.2 , 61.0)	54.7 (48.7 , 60.7)	57.3 (49.7 , 64.6)

## 5. Conclusions

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

- More than a quarter of adult Sri Lankans reported being current tobacco users, 27.0%; 10.6% reported being daily tobacco smokers. Men were more likely to report any type of tobacco use than women.
- Overall, more than one in four (26.6%) reported current alcohol consumption, and more than one in five (22.0%) 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 three in four adult Sri Lankans, 82.2%, reported consuming less than five servings of fruits or vegetables per day.
- Almost three in five adult Sri Lankans (58.0%) reported always or often adding salt or salty sauces to food as they are cooking or preparing it.
- Overall, 16.4% reported ever receiving a clinical diagnosis of raised blood glucose or diabetes, 68.3% of whom were currently taking medication.
- Overall, 18.7% indicated ever being told that they have raised blood pressure or were hypertensive by a doctor or health professional, of which more than half (56.2%) 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 Sri Lankan adults aged 18 years and older. Results will inform the Ministry of Health in Sri Lanka as they 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*

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World Health Organization. Noncommunicable diseases country profiles Sri Lanka 2018. Geneva: WHO; 2018. [https://www.who.int/nmh/countries/2018/lka\\_en.pdf?ua=1](https://www.who.int/nmh/countries/2018/lka_en.pdf?ua=1)