Executive Summary

Sri Lanka Second NCD Mobile Phone Survey

1. Overview

This report summarizes results from the second Sri Lanka Noncommunicable Diseases (NCD) Mobile Phone Survey (T2) implemented in November 2021-January 2022. 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, 4,356 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, 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

The goal of the Sri Lanka Mobile Phone Survey (MPS) 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. In addition to providing data to inform NCD prevention and response strategies, findings from the 2021 survey were also compared to the results of the 2019 survey to help assess the feasibility and reliability of mobile phone survey data. 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 MPS included 24 core questions on the following topics:

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

3. Design and Implementation

3.1 Design

The design parameters used for the NCD MPS are shown below in Table 1.

Table 1. MPS Design

Component	***Design***
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	4,356 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 MPS questionnaire consisting of 24 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	• Contact #1: IVR • Contact #2: IVR, 26 hours after Contact #1 • Contact #3: IVR, 26 hours after Contact #2
Cost to Respondents	None.
Incentives	None.
Tool and Hosting	Surveda, with data hosted at the Sri Lanka Ministry of Health

3.2 Implementation

The second Sri Lanka NCD MPS implementation process consisted of four stages: Planning and Pre-Test, Full-scale Data Collection, Data Management and Analysis, and Data Release and Use.

Full-scale data collection commenced on November 1st, 2021 and was completed on December 6th for Dialog subscribers. Data collection for the remaining MNOs (Mobitel, Etisalat/Hutch, and Airtel) ran from December 6th to January 21st. Data collection was paused for a total of seven days during the holidays. A total of 4,365 adults aged 18 years and older completed or partially completed the survey through the four 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)
- Hypertension (section 4.5)
- Diabetes (section 4.6)
- 2019 vs. 2021 NCD MPS Survey Comparison (section 4.7)

4.1. Demographics and Response Rates

The Sri Lanka MPS included 4,356 interviews across six age by sex groups. Table 2 shows the mobile phone demographic distribution compared to the UN population national statistics for sex and age. Results presented for the sections on tobacco and alcohol use, diet, hypertension and diabetes are restricted to respondents who were 18-110 years of age.

Table 2. Mobile Phone Demographics

	Mobile Phone Sample	***National***
	4,356	9,528,78
Sex		
Male	54.3%	48.7%
Female	45.7%	51.3%
Age		
18-29	27.0%	45.1%
30-44	34.6%	32.4%
45+	38.4%	22.5%

By the end of data collection, all strata sample sizes were achieved, except for 45+ males (98.0% filled) and females (52.7% filled).

To achieve the 4,356 interviews, we sent invitations to 131,140 mobile phone numbers over the course of both the pre-test and full-scale survey. Out of these, 66,005 provided some sort of response but only 22,280 consented and provided the age and sex information necessary to be eligible to participate. Of these, 2,144 were ineligible due to age, and 11,892 respondents of eligible age were rejected due to stratum sample size being full. The result was 8,244 eligible respondents, of which 4,356 provided interviews (completed or partial). The interview rate was 52.8% (4,356/8,244) and the overall response rate was 9.0%, 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.

Disposition	Definition	N	Percent
1. Complete	Answered all survey questions	2,868	2.2%
2. Partial	Answered at least **five** questions but did not finish the survey	1,498	1.1%
3. Breakoff: Eligible	Answered age and sex questions but did not answer 5+ questions	3,878	3.0%
4. Ineligible: Age	Under age 18	2,144	1.6%
5. Ineligible: Quotas	Answered age and sex questions but quotas were full	11,892	9.1%
6. Refused	Refused consent	39,083	29.8%
7. Breakoff: unknown eligibility	Answered some questions but stopped before completing eligibility	4,642	3.5%
8. No answer	No answer, possibly nonworking number	65,135	49.7%
Total		**131,140**	100.0%

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.

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

Or,

$$Phase\ I\ Response\ Rate = \frac{22{,}280}{131{,}140} = 16.99\%$$

$Phase\ II\ Response\ Rate\ RR6_s = \frac{IP_s}{IP_s + O_s}$, 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 in Table 4.

Table 4. Phase II response rates for stratum *s*

Age	Males	Females
18-29	$RR6_1$ = 45.8%	$RR6_2$ = 47.1%
30-44	$RR6_3$ = 52.6%	$RR6_4$ = 51.7%
45+	$RR6_5$ = 62.6%	$RR6_6$ = 55.7%

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 MPS in Sri Lanka:

$$RR6_{overall} = \frac{IP_{overall}}{IP_{overall} + O_{overall}} * RR_{Phase\ I} = \frac{4{,}356}{4{,}356 + 3{,}878} * 0.1699 = 8.99\%$$

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 five Sri Lankan adults aged 18 years and older (19.4%) used some form of tobacco (36.2% among men and 3.6% among women). Overall, 15.2% of Sri Lankans reported being current tobacco smokers. Men reported higher rates of current tobacco smoking than women, 29.2% and 1.9%, respectively. Men also reported higher rates of daily tobacco smoking compared to women (12.1% vs. 1.0%, respectively). Overall, 8.7% reported current smokeless tobacco use (15.5% among men and 2.2% among women); approximately half of those who reported current smokeless tobacco use reported daily smokeless tobacco use (4.1%). When asked about smoking during the COVID-19 pandemic, the majority of Sri Lankans (57.6%) reported that they smoked less. However, twice the number of women (28.7%) reported smoking more during the pandemic than men (14.5%). Table 5 shows key outcomes from the NCD MPS on tobacco use.

Table 5. Tobacco use overall and by sex

Tobacco Use	**Overall**			**Males**			**Females**		
Tobacco Users (any use)	% (95% CI)			% (95% CI)			% (95% CI)		
Tobacco Smokers									
Current tobacco smokers	15.2	(14.2	, 16.1)	29.2	(27.4	, 31.1)	1.9	(1.3	, 2.5)
Daily tobacco smokers	6.4	(5.7	, 7.1)	12.1	(10.8	, 13.5)	1.0	(0.5	, 1.5)
COVID-19 Pandemic Smoking									
Smoked more than usual	15.4	(12.6	, 18.2)	14.5	(11.8	, 17.3)	28.7	(12.6	, 44.7)
Smoke less than usual	57.6	(53.8	, 61.4)	58.8	(55.0	, 62.7)	38.4	(21.5	, 55.2)
Smokeless Tobacco Users									
Current smokeless tobacco users	8.7	(7.9	, 9.6)	15.5	(14.0	, 17.1)	2.2	(1.5	, 2.9)
Daily smokeless tobacco users	4.1	(3.5	, 4.7)	7.1	(6.1	, 8.3)	1.2	(0.6	, 1.7)
Tobacco Users (any use)									
Current tobacco users	19.4	(18.3	, 20.4)	36.2	(34.2	, 38.2)	3.6	(2.7	, 4.5)

4.3. Alcohol Use

Approximately one in five adult Sri Lankans consumed alcohol in the past 30 days (21.9%), with men reporting current alcohol consumption eight times more frequently than women (40.1% vs. 5.2%, respectively). Overall, 18.1% of adult Sri Lankans reported drinking six or more drinks in a single drinking occasion in the past 30 days. Men had approximately eleven times the rate of women of heavy drinking occasions (34.5% vs. 3.1%, respectively). When asked about alcohol consumption during the COVID-19 pandemic, most Sri Lankans reported that their alcohol consumption decreased (20.2%). Table 6 shows reported alcohol use overall and by sex from the NCD MPS.

Table 6. Alcohol use overall and by sex

Alcohol Use	Overall			Males			Females		
	% (95% CI)			% (95% CI)			% (95% CI)		
Current alcohol users (past 30 days)	21.9	(20.8	, 23.1)	40.1	(38.1	, 42.2)	5.2	(4.2	, 6.2)
Heavy episodic drinkers (percentage of drinkers had 6+ drinks)	18.1	(17.0	, 19.1)	34.5	(32.5	, 36.5)	3.1	(2.3	, 3.9)
Alcohol consumption increased during the COVID-19 pandemic	3.5	(2.9	, 4.0)	6.3	(5.2	, 7.3)	0.9	(0.5	, 1.4)
Alcohol consumption decreased during the COVID-19 pandemic	20.2	(19.0	, 21.3)	36.0	(33.8	, 37.9)	5.7	(4.6	, 6.8)

4.4. Diet

Regarding salt consumption, six in ten (62.1%) adult Sri Lankans always or often added salt in some form to food when cooking or preparing foods. Overall, 16.3% of adult Sri Lankans reported always or often adding salt or salty seasoning before eating. About one in ten, (11.1%) reported always or often eating processed foods high in salt.

For fruit and vegetable consumption, approximately three in four (78.7%) adult Sri Lankans consumed less than five servings of fruit or vegetables per day with an average of 1.5 servings of fruit and 2.2 servings of vegetables eaten per day. Less than 1% reported consuming no fruits or vegetables per day (0.5%). On average, Sri Lankan adults consume 1.2 different types or fruits and 2.9 different types of vegetables per day. Table 7 presents salt, fruit, and vegetable consumption overall and by sex.

Table 7. Diet overall and by sex

Diet	Overall			Females			Males		
	% (95% CI)			% (95% CI)			% (95% CI)		
Salt Consumption									
Always or often add salt or salty seasoning when cooking or preparing foods	62.1	(60.5	, 63.6)	66.2	(64.2	, 68.2)	58.4	(56.0	, 60.7)
Always or often add salt or salty sauce to food before eating or as they're eating	16.3	(15.1	, 17.4)	16.5	(14.9	, 18.0)	16.1	(14.4	, 17.8)
Always or often eat processed foods high in salt	11.1	(10.1	, 12.0)	12.9	(11.4	, 14.3)	9.4	(8.1	, 10.8)
Fruit Consumption									
Average number of days per week fruits are consumed	3.3	(3.3	, 3.4)	3.2	(3.1	, 3.2)	3.5	(3.4	, 3.6)
Average number of servings of fruit consumed per day	1.5	(1.5	, 1.6)	1.5	(1.4	, 1.6)	1.6	(1.5	, 1.7)
Average number of different types of fruit consumed per day	1.2	(1.1	, 1.2)	1.1	(1.1	, 1.2)	1.2	(1.2	, 1.3)

Vegetable Consumption									
Average number of days per week vegetables are consumed	4.5	(4.4	, 4.5)	4.3	(4.2	, 4.3)	4.7	(4.6	, 4.8)
Average number of servings of vegetables consumed per day	2.2	(2.1	, 2.2)	2.1	(2.0	, 2.2)	2.2	(2.1	, 2.3)
Average number of different types of vegetables consumed per day	2.9	(2.9	, 3.0)	2.8	(2.6	, 2.9)	3.1	(3.0	, 3.3)
Fruit and Vegetable Consumption									
Consume less than five servings of fruits OR vegetables per day	78.7	(77.4	, 80.0)	80.0	(78.3	, 81.7)	77.5	(75.5	, 79.6)
Consume no fruits and vegetables	0.5	(0.3	, 0.7)	0.6	(0.2	, 0.9)	0.4	(0.1	, 0.7)

4.5. Raised Blood Pressure or Hypertension

Approximately one in five adult Sri Lankans, 19.6%, reported that they had ever been diagnosed by a doctor or health professional with raised blood pressure or hypertension. Among those who reported a diagnosis, more than half (62.7%) were currently on medication. Table 8 shows the rates of self-reported raised blood pressure or hypertension.

Table 8. Raised blood pressure/hypertension overall and by sex

Raised Blood Pressure/Hypertension	**Overall**			**Males**			**Females**		
Raised Blood Pressure/Hypertension	% (95% CI)			% (95% CI)			% (95% CI)		
Diagnosed by doctor or health care professional with raised blood pressure/ hypertension	19.6	(18.4	, 20.9)	20.0	(18.4	, 21.7)	19.2	(17.3	, 21.2)
Currently taking medication for raised blood pressure/ hypertension	62.7	(59.2	, 66.2)	61.8	(57.3	, 66.4)	63.5	(58.1	, 66.4)

4.6. Raised Blood Glucose or Diabetes

Overall, 17.2% of adult Sri Lankans indicated they were ever told by a doctor or health professional that they had raised blood glucose or diabetes (19.2% among men and 15.3% among women). Of those who reported a diagnosis, 67.7% reported that they were currently on medication for raised blood glucose or diabetes. Table 9 shows the rates of self-reported raised blood sugar or diabetes.

Table 9. Raised blood glucose/diabetes overall and by sex

Raised Blood Glucose/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	17.2	(16.0	, 18.3)	19.2	(17.6	, 20.8)	15.3	(13.5	, 17.0)
Currently taking medication for raised blood glucose/ diabetes	67.7	(64.0	, 71.3)	70.7	(66.4	, 75.1)	64.1	(58.0	, 70.1)

4.7. 2019 vs. 2021 NCD MPS Comparison

The 2021 NCD MPS used the same process and implementation protocol that was used in the first Sri Lanka NCD MPS conducted in 2019. The 2021 NCD MPS was conducted during the COVID-19 pandemic, while the 2019 NCD MPS was conducted pre-pandemic. The same questionnaire was used to collect NCD risk factor data for adults aged 18 years and older. To determine differences between the first and second survey, p-values based on the t-statistic were calculated using R Statistical Software (v4.1.3; R Core Team 2022) [2].

Tobacco use significantly decreased among adults from 26.9% in 2019 to 19.4% in 2021, (from 45.3% to 36.2% among men). This represents a 7.5% relative decline in current tobacco use in the form of smoked and smokeless tobacco (9.1% decline for men). Current tobacco smoking among adults significantly decreased from 22.3% in 2019 to 15.2% in 2021, (from 38.0% to 29.2% among men). The majority of respondents, 57.6%, who reported current tobacco smoking also reported that they smoked less during the COVID-19 pandemic at the time of the survey. Likewise, current smokeless tobacco use among adults also significantly declined from 14.1% in 2019 to 8.7% in 2021.

Current alcohol use among adult Sri Lankans significantly decreased from 26.5% in 2019 to 21.9% in 2021. The prevalence of heavy episodic drinking declined from 38.1% in 2019 to 34.5% in 2021 among men and from 6.7% in 2019 to 3,1% in 2021. One in five adult Sri Lankans (20.2%) reported that their alcohol consumption decreased during the COVID-19 pandemic.

When comparing dietary salt consumption, there was a significant decrease among adult Sri Lankans who always or often add salt or salty seasoning before eating (19.4% in 2019 to 16.3% in 2021). In addition, there was a significant decrease among adult Sri Lankans who always or often ate processed foods high in salt (13.8% in 2019 to 11.1% in 2021). There was a significant increase in the average number of days per week fruit are consumed (3.1 in 2019 to 3.3 in 2021) and a significant increase in the average number of servings of fruit consumed per day from 1.4 in 2019 to 1.5 in 2021.

Self-reported diagnosis of raised blood pressure or hypertension by a doctor or health care professional remained approximately the same with 1 in 5 adult Sri Lankans reporting diagnosis (18.8% vs. 19.6% 2019 and 2021 respectively). -. Among those who reported a diagnosis, significantly more reported currently being on medication from 56.2% in 2019 to 62.7% in 2021. Self-reported diagnosis of diabetes by a doctor or healthcare professional also remained approximately the same (16.4% in 2019 to 17.2% in 2021). Tables 10 and 11 present the estimates for the 2019 and 2021 NCD mobile phones survey along with corresponding p-values.

Table 10. 2019 vs. 2021 NCD MPS Indicators and p-values overall

2019	2021

Tobacco Use	n	%	(95% CI)		n	%	(95% CI)		p-value	Difference
Tobacco Smokers										
Current tobacco smokers	1174	22.3	21.2	23.4	677	15.2	14.2	16.1	0.0000	-7.1
Daily tobacco smokers	540	10.5	9.7	11.4	285	6.4	5.7	7.1	0.0000	-4.1
Smokeless Tobacco Users										
Current smokeless tobacco users	621	14.1	13.1	15.2	366	8.7	7.9	9.6	0.0000	-5.4
Daily smokeless tobacco users	291	6.7	5.9	7.5	172	4.1	3.5	4.7	0.0000	-2.6
Tobacco Users (any use)										
Current tobacco users	1408	26.9	25.7	28.0	861	19.4	18.3	20.4	0.0000	-7.5
Alcohol Use										
Current alcohol users (past 30 days)	857	26.5	25.0	28.1	971	21.9	20.8	23.1	0.0000	-4.6
Heavy episodic drinkers (percentage of drinkers had 6+ drinks)	701	22.0	20.5	23.5	797	18.0	17.0	19.1	0.0000	-4.0
Diet										
Salt Consumption										
Always or often add salt or salty seasoning when cooking or preparing foods	1698	61.9	60.0	63.9	2397	59.0	57.5	60.0	0.9281	-2.9
Always or often add salt or salty sauce to food before eating or as they're eating	563	19.4	17.9	20.9	656	16.3	15.1	17.4	0.0014	-3.1
Always or often eat processed foods high in salt	389	13.8	12.4	15.1	436	11.1	10.1	12.0	0.0015	-2.7
Fruit Consumption	n	Mean	(95% CI)		n	Mean	(95% CI)			
Average number of days per week fruits are consumed	3053	3.1	3.0	3.1	3996	3.3	3.3	3.4	0.0000	0.3
Average number of servings of fruit consumed per day	2582	1.4	1.3	1.4	3592	1.5	1.5	1.6	0.0003	0.2
Average number of different types of fruit consumed per day	2504	1.2	1.1	1.2	3548	1.2	1.1	1.2	0.7735	0.0
Vegetable Consumption	n	Mean	(95% CI)		n	Mean	(95% CI)			
Average number of days per week vegetables are consumed	2573	4.4	4.3	4.5	3722	4.5	4.4	4.5	0.2220	0.1
Average number of servings of vegetables consumed per day	2299	2.1	2.0	2.2	3406	2.2	2.1	2.2	0.4832	0.1
Average number of different types of vegetables consumed per day	2285	3.0	2.9	3.1	3433	2.9	2.9	3.0	0.4922	-0.1
Fruit and Vegetable Consumption	n	%	(95% CI)		n	%	(95% CI)			
Consume less than five servings of fruits OR vegetables per day	2278	82.2	80.6	83.7	3025	78.7	77.4	80.0	0.0009	-3.5

Consume no fruits and vegetables	7	0.2	0.0	0.4	19	0.5	0.3	0.7	0.0888	0.3
Raised Blood Pressure/Hypertension										
Diagnosed by doctor or health care professional with raised blood pressure/ hypertension	467	18.8	17.2	20.4	757	19.6	18.4	20.9	0.4086	0.8
Currently taking medication for raised blood pressure/ hypertension	231	56.2	51.3	61.0	453	62.7	59.2	66.2	0.0349	6.5
Raised Blood Glucose/Diabetes										
Diagnosed by doctor or health care professional with raised blood glucose/diabetes	396	16.4	14.9	18.0	677	17.2	16.0	18.3	0.4751	0.8
Currently taking medication for raised blood glucose/ diabetes	257	68.3	63.4	73.2	451	67.7	64.0	71.3	0.8379	-0.6

Table 11. 2019 vs. 2021 NCD MPS indicators and p-values by sex

	2019 Men				2021 Men					
Tobacco Use	n	%	(95% CI)		n	%			p-value	Difference
Tobacco Smokers										
Current tobacco smokers	1034	38.0	36.2	39.9	641	29.2	27.4	31.1	0.0000	-8.8
Daily tobacco smokers	457	16.9	15.5	18.3	267	12.1	10.8	13.5	0.0000	-4.8
Smokeless Tobacco Users										
Current smokeless tobacco users	536	22.3	20.6	24.0	330	15.5	14.0	17.1	0.0000	-6.8
Daily smokeless tobacco users	248	10.3	9.1	11.6	153	7.1	6.1	8.3	0.0002	-3.2
Tobacco Users (any use)										
Current tobacco users	1230	45.3	43.4	47.2	796	36.2	34.2	38.2	0.0000	-9.1
Alcohol Use										
Current alcohol users (past 30 days)	755	44.6	42.2	47.0	874	40.1	38.1	42.2	0.0051	-4.5
Heavy episodic drinkers (percentage of drinkers had 6+ drinks)	626	38.1	35.7	40.5	739	34.5	32.5	36.5	0.0229	-3.6
Diet										
Salt Consumption										
Always or often add salt or salty seasoning when cooking or preparing foods	1009	64.2	61.8	66.6	1363	62.3	60.2	64.3	0.2162	-1.9
Always or often add salt or salty sauce to food before eating or as they're eating	327	19.7	17.8	21.7	354	16.5	14.9	18.0	0.0107	-3.2
Always or often eat processed foods high in salt	251	16.2	14.4	18.1	264	12.9	11.4	14.3	0.0051	-3.3
Fruit Consumption	n	Mean	(95% CI)		n	Mean				

Average number of days per week fruits are consumed	1767	2.9	2.8	3.0	2171	3.2	3.1	3.2	0.0000	0.2
Average number of servings of fruit consumed per day	1508	1.4	1.3	1.4	1955	1.5	1.4	1.6	0.0746	0.1
Average number of different types of fruit consumed per day	1460	1.2	1.1	1.3	1915	1.1	1.1	1.2	0.2161	-0.1
Vegetable Consumption	n	Mean	(95% CI)		n	Mean				
Average number of days per week vegetables are consumed	1491	4.2	4.1	4.3	2020	4.3	4.2	4.3	0.8495	0.1
Average number of servings of vegetables consumed per day	1335	2.1	2.0	2.2	1862	2.1	2.0	2.2	0.9840	0.0
Average number of different types of vegetables consumed per day	1317	2.8	2.7	2.9	1876	2.8	2.6	2.9	0.6518	0.0
Fruit and Vegetable Consumption	n	%	(95% CI)		n	%				
Consume less than five servings of fruits OR vegetables per day	1340	83.1	81.2	84.9	1664	80.0	78.3	81.7	0.0180	-3.1
Consume no fruits and vegetables	5	0.3	0.0	0.5	12	0.6	0.2	0.9	0.1545	0.3
Raised Blood Pressure/Hypertension										
Diagnosed by doctor or health care professional with raised blood pressure/ hypertension	280	18.1	16.2	20.0	448	20.0	18.4	21.7	0.1400	1.9
Currently taking medication for raised blood pressure/ hypertension	137	54.7	48.8	60.7	274	61.8	57.3	66.4	0.0663	7.1
Raised Blood Glucose/Diabetes										
Diagnosed by doctor or health care professional with raised blood glucose/diabetes	248	16.8	14.9	18.7	430	19.2	17.6	20.8	0.0600	2.4
Currently taking medication for raised blood glucose/ diabetes	165	69.2	63.4	75.0	302	70.7	66.4	75.1	0.6788	1.5
	2019 Women				**2021 Women**					
Tobacco Use	n	%	(95% CI)		n	%				Difference
Tobacco Smokers										
Current tobacco smokers	140	7.7	6.4	9.1	36	1.9	1.3	2.5	0.0000	-5.8
Daily tobacco smokers	83	4.7	3.6	5.7	18	1.0	0.5	1.5	0.0000	-3.7
Smokeless Tobacco Users										
Current smokeless tobacco users	85	5.9	4.6	7.2	36	2.2	1.5	2.9	0.0000	-3.7
Daily smokeless tobacco users	43	3.0	2.1	3.9	19	1.2	0.6	1.7	0.0008	-1.8
Tobacco Users (any use)										
Current tobacco users	178	9.9	8.4	11.3	65	3.6	2.7	4.5	0.0000	-6.3
Alcohol Use										

Current alcohol users (past 30 days)	102	9.0	7.2	10.8	97	5.2	4.2	6.2	0.0003	-3.8
Heavy episodic drinkers (percentage of drinkers had 6+ drinks)	75	6.7	5.2	8.3	58	3.1	2.3	3.9	0.0000	-3.6
Diet										
Salt Consumption										
Always or often add salt or salty seasoning when cooking or preparing foods	689	59.9	56.9	63.0	1034	56.1	53.7	58.4	0.4228	-3.8
Always or often add salt or salty sauce to food before eating or as they're eating	236	19.1	16.8	21.5	302	16.1	14.4	17.8	0.0400	-3.0
Always or often eat processed foods high in salt	138	11.6	9.7	13.5	172	9.4	8.1	10.8	0.0748	-2.2
Fruit Consumption	n	Mean	(95% CI)		n	Mean				
Average number of days per week fruits are consumed	1286	3.2	3.1	3.3	1825	3.5	3.4	3.6	0.0000	0.3
Average number of servings of fruit consumed per day	1074	1.4	1.3	1.5	1637	1.6	1.5	1.7	0.0014	0.2
Average number of different types of fruit consumed per day	1044	1.2	1.1	1.3	1633	1.2	1.2	1.3	0.5104	0.0
Vegetable Consumption	n	Mean	(95% CI)		n	Mean				
Average number of days per week vegetables are consumed	1082	4.6	4.5	4.7	1702	4.7	4.6	4.8	0.1613	0.1
Average number of servings of vegetables consumed per day	964	2.1	2.0	2.3	1544	2.2	2.1	2.3	0.3515	0.1
Average number of different types of vegetables consumed per day	968	3.2	3.0	3.3	1557	3.1	3.0	3.3	0.6322	-0.1
Fruit and Vegetable Consumption	n	%	(95% CI)		n	%				
Consume less than five servings of fruits OR vegetables per day	938	81.4	79.0	83.8	1361	77.5	75.5	79.6	0.0167	-3.9
Consume no fruits and vegetables	2	0.2	0.0	0.5	7	0.4	0.1	0.7	0.3131	0.2
Raised Blood Pressure/Hypertension										
Diagnosed by doctor or health care professional with raised blood pressure/ hypertension	187	19.3	16.8	21.9	309	19.2	17.3	21.2	0.9595	-0.1
Currently taking medication for raised blood pressure/ hypertension	94	57.3	49.9	64.8	179	63.5	58.1	66.4	0.1911	6.2
Raised Blood Glucose/Diabetes										
Diagnosed by doctor or health care professional with raised blood glucose/diabetes	148	16.1	13.6	18.5	247	15.3	13.5	17.0	0.5947	-0.8

Currently taking medication for raised blood glucose/ diabetes	92	67.4	59.6	75.2	149	64.1	58.0	70.1	0.5100	-3.3

5. Conclusions

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 MPS provide a strong foundation for the development of prevention and response strategies in Sri Lanka. Some key outcomes included:

- One in five adult Sri Lankans reported being current tobacco users, 19.4%; 6.4% reported being daily tobacco smokers. Overall, 8.7% reported current smokeless tobacco use; approximately half of those who reported current smokeless tobacco use reported daily smokeless tobacco use (4.1%). Men were more likely to report any type of tobacco use than women.
- Overall, one in four (21.9%) reported current alcohol consumption, and 18.1% 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.
- While a majority of current tobacco smokers (57.6%) and current alcohol users (20.2%) reported decreased use during the COVID-19 pandemic, women were twice as likely to report an increase in tobacco smoking than men (28.7% vs. 14.5%).
- More than three in four adult Sri Lankans, 78.7%, reported consuming less than five servings of fruits or vegetables per day.
- More than three in five adult Sri Lankans (62.1%) reported always or often adding salt or salty sauces to food as they are cooking or preparing it.
- Overall, 19.6%, indicated ever being told that they have raised blood pressure or were hypertensive by a doctor or health professional, of which more than half (62.7%) reported taking medication for their raised blood pressure or hypertension.
- Overall, 17.2% reported ever receiving a clinical diagnosis of raised blood glucose or diabetes, 67.7% of whom were currently taking medication.

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 MPS results such as these will also facilitate comparisons over time and across countries.

Limitations:

The main limitation of any MPS 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 MPS 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 Sri Lanka 2018. Geneva: WHO; 2018. https://www.who.int/nmh/countries/2018/lka_en.pdf?ua=1
2. Team, R.C. A language and environment for statistical computing. 2022; Available from: https://www.R-project.org/.