# Executive Summary
# Ecuador NCD Mobile Phone Survey 2020

## 1. Overview

This report summarizes results from the Ecuador Noncommunicable Diseases (NCD) Mobile Phone Survey implemented in 2020. NCDs are the leading cause of death worldwide and according to the World Health Organization country profiles in 2016, NCDs contribute to 72% of all deaths in Ecuador [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 Ecuador'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, 3,101 individuals subscribed to CNT, Claro, and Movistar mobile phone networks anonymously participated using mobile telephony interactive voice response (IVR).

The survey was the culmination of significant work by Ecuador's Ministry of Health, including but not limited to telecommunications approval from the Telecommunications Regulatory and Control Agency of Ecuador, agreements with mobile network operators, 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 Ecuador NCD 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 Ecuador. 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 24 questions on the following topics:

- Demographics
- Tobacco Use

- Alcohol Use
- Diet (Salt, Fruit, and Vegetable Consumption)
- Diabetes
- Hypertension
- Mental Health
- Physical Activity

## 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 |
| Sample | The sample employed a two-phase sample design. In the first phase a sample of mobile phone numbers from an implicit frame of all possible mobile phone numbers for CNT, Claro, and Movistar subscribers was generated via random digit dialing. In the second phase, respondents were stratified to the general population distribution. |
| Number of Interviews | 3,101 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 24 questions and administered in Spanish. |
| Contact times | All 7 days of the week, between 8am and 8pm each day |
| Contact attempts | • Contact #1: IVR<br>• Contact #2: IVR, 26 hours after Contact #1<br>• Contact #3: IVR, 26 hours after Contact #2 |
| Cost to Respondents | None. |
| Incentives | $1 USD. |
| Tool and Hosting | Surveda, with data hosted at the Ecuador Ministry of Health |

### *3.2 Implementation*

The Ecuador 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 January 31st, 2020 and ended on February 21st, 2020. A total of 3,101 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 three 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 Ecuador NCD Mobile Phone Survey included 3,101 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.

| **Table 2. Mobile Phone Survey Demographics** | | |
|---|---|---|
| | ***Mobile Phone Sample*** | ***National*** |
| **Sex** | 3,101 | 11,274,187 |
| Male | 49.6% | 48.6% |
| Female | 50.4% | 51.4% |
| | | |
| **Age** | | |
| 18-29 | 33.5% | 31.1% |
| 30-44 | 33.8% | 31.0% |
| 45+ | 32.7% | 38.0% |

By the end of data collection, all strata sample sizes were achieved, except for males and females aged 45+ years.

To achieve the 3,101 interviews, we sent invitations to 50,740 mobile phone numbers over the course of the full-scale survey. Out of these, 10,001 provided some sort of response but only 5,393 consented and provided the age and sex information necessary to be eligible to participate. Of these, 466 were ineligible due to age, and 1,593 respondents of eligible age were rejected due to stratum sample size being full. The result was 3,334 eligible respondents, of which 3,101 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 93.0% and the overall response rate was 9.9%, 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** | | | |
|---|---|---|---|
| ***Disposition*** | ***Definition*** | ***N*** | ***Percent*** |

| | | | |
|---|---|---|---|
| 1. Complete | Answered all survey questions | 2,254 | 4.44% |
| 2. Partial | Answered at least once NCD question but did not finish the survey | 847 | 1.67% |
| 3. Breakoff: Eligible | Answered age and sex questions but did not answer any NCD questions | 233 | 0.46% |
| 4. Ineligible: Age | Under age 18 | 466 | 0.92% |
| 5. Ineligible: Quotas | Answered age and sex questions but quotas were full | 1,593 | 3.14% |
| 6. Refused | Refused consent | 3,578 | 7.05% |
| 7. Breakoff: unknown eligibility | Answered some questions but stopped before completing eligibility | 1,030 | 2.53% |
| 8. No answer | No answer, possibly nonworking number | 40,739 | 80.29% |
| *Total* | | *50,740* | |

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 pre-test and full-scale surveys, we used a filtered sample of MPNs provided by the Dutch company Sample Solutions.

For Phase I, the response rate was the proportion of MPNs screened out of those dialed.

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

Or,

$$Phase\ I\ Response\ Rate = \frac{5{,}393}{50{,}740} = 0.10629$$

For Phase II, we used RR6 from AAPOR.

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

$RR_6$ was derived from the 2018 Standard Definitions of the American Association for Public Opinion Research (AAPOR). Phase II stratum-specific response rates (RR #6) are presented Table 4:

| **Table 4. Phase II response rates for stratum *s*** | | |
|---|---|---|
| ***Age*** | ***Males*** | ***Females*** |
| 18-29 | 0.915344 | 0.933453 |
| 30-44 | 0.897260 | 0.951087 |
| 45+ | 0.944762 | 0.941818 |

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 Ecuador:

$$RR_{overall} = \frac{IP_{overall}}{IP_{overall} + O_{overall}} * RR_{Phase\ I} = \frac{3{,}101}{3{,}101 + 233} * 0.10628 = 0.098859$$

## *4.2 Tobacco Use*

Tobacco use is one of the most important risk factors for NCDs. Overall, 17.1% of Ecuadorian adults aged 18 years and older used some form of tobacco (25.4% among men and9.3% among women). Approximately 16% of Ecuadorians reported being current tobacco smokers. Men reported higher rates of current tobacco smoking than women, 24.0% and 7.7%, respectively. Men also reported higher rates of daily tobacco smoking compared to women (11.3% vs. 4.0%, respectively).

Overall, 5.1% reported currently using smokeless tobacco (7.3% among men and 3.0% among women); 2.0% of Ecuadorian adults reported daily smokeless tobacco use.

Overall, 4.1% reported currently using electronic cigarettes (5.6% among men and 2.7% among women); likewise, men reported higher rates of daily electronic cigarette smoking compared to women (3.2% vs. 1.1%, respectively).

Table 5 shows key outcomes from the NCD Mobile Phone Survey 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)** |
| Current tobacco users | 17.1 (15.9 , 18.5) | 25.4 (23.3 , 27.6) | 9.3 (8.0 , 10.9) |
| ***Tobacco Smokers*** | | | |
| Current tobacco smokers | 15.6 (14.4 , 16.9) | 24.0 (21.9 , 26.2) | 7.7 (6.5 , 9.2) |
| Daily tobacco smokers | 7.6 (6.7 , 8.6) | 11.3 (9.8 , 13.0) | 4.0 (3.1 , 5.2) |
| ***Smokeless Tobacco Users*** | | | |
| Current smokeless tobacco users | 5.1 (4.4 , 6.0) | 7.3 (6.1 , 8.8) | 3.0 (2.3 , 4.1) |

| | | | |
|---|---|---|---|
| Daily smokeless tobacco users | 2.0 (1.5 , 2.5) | 2.8 (2.1 , 3.9) | 1.1 (0.7 , 1.8) |
| ***Electronic Cigarette Users*** | | | |
| Current electronic cigarette users | 4.1 (3.5 , 4.9) | 5.6 (4.5 , 6.9) | 2.7 (2.0 , 3.7) |
| Daily smokeless tobacco users | 2.1 (1.7 , 2.7) | 3.2 (2.4 , 4.2) | 1.1 (0.7 , 1.8) |

### *4.3 Alcohol Use*

More than one third of adult Ecuadorians consumed alcohol in the past 30 days (36.4%), with males reporting higher rates of alcohol consumption than females (47.5% vs. 26.1%, respectively). One in three Ecuadorian adults (33.6%) reported drinking six or more drinks in a single drinking occasion. Males reported higher rates of heavy drinking occasions than females (44.6% vs. 23.5%, respectively).

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

| **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) | 36.4 (34.6 , 38.3) | 47.5 (44.7 , 50.4) | 26.1 (23.8 , 28.6) |
| Heavy episodic drinkers (percentage of drinkers had 6+ drinks) | 33.6 (31.8 , 35.5) | 44.6 (41.8 , 47.5) | 23.5 (21.3 , 26.0) |

### *4.4 Diet*

Regarding salt consumption, two out of five (41.9%) of adult Ecuadorians always or often added salt in some form to food when cooking or preparing foods. About one third of adult Ecuadorians (30.8%) reported always or often adding salt or salty seasoning before eating. Overall, 20.4% reported always or often eating processed foods high in salt. Similar rates for men and women were observed for all of the salt consumption indicators.

For fruit and vegetable consumption, approximately nine out of ten (91.3%) adult Ecuadorians consumed less than five servings of fruit or vegetables per day with an average of 1.2 servings of vegetables and 1.2 servings of fruits eaten per day. Less than 1% reported consuming no fruits or vegetables per day (0.6%).

For sugar consumption, Ecuadorian adults consumed sugar-sweetened beverages 3 days a week, and diet beverages 1.8 days a week in average. Two out of five (39.5%) of Ecuadorian adults, use the traffic light label when choosing food.

Table 7 presents salt, fruit, vegetable, and sugar consumption overall and by sex. In addition, Table 7 presents use of nutritional guidance.

| Table 7. Diet Overall and by Sex | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ***Diet*** | ***Overall*** | | | ***Males*** | | | ***Females*** | | |
| ***Salt Consumption*** | **%** | **(95% CI)** | | **%** | **(95% CI)** | | **%** | **(95% CI)** | |
| Always or often add salt or salty seasoning when cooking or preparing foods | 41.9 | (39.9 | , 43.9) | 42.6 | (39.8 | , 45.5) | 41.3 | (38.5 | , 44.1) |
| Always or often add salt or salty sauce to food before eating or as they're eating | 30.8 | (29.0 | , 32.7) | 33.3 | (30.6 | , 36.0) | 28.6 | (26.2 | , 31.2) |
| Always or often eat processed foods high in salt | 20.4 | (18.8 | , 22.0) | 23.9 | (21.5 | , 26.4) | 17.2 | (15.2 | , 19.4) |
| ***Fruit Consumption*** | **Mean (95% CI)** | | | **Mean 95% CI** | | | **Mean 95% CI** | | |
| Average number of days per week fruits are consumed | 3.6 | (3.5 | , 3.7) | 3.4 | (3.3 | , 3.5) | 3.8 | (3.7 | , 3.9) |
| Average number of servings of fruit consumed per day | 1.2 | (1.1 | , 1.2) | 1.1 | (1.1 | , 1.2) | 1.2 | (1.1 | , 1.3) |
| ***Vegetable Consumption*** | **Mean (95% CI)** | | | **Mean 95% CI** | | | **Mean 95% CI** | | |
| Average number of days per week vegetables are consumed | 3.7 | (3.7 | , 3.8) | 3.6 | (3.5 | , 3.7) | 3.8 | (3.7 | , 3.9) |
| Average number of servings of vegetables consumed per day | 1.2 | (1.1 | , 1.2) | 1.1 | (1.1 | , 1.2) | 1.2 | (1.1 | , 1.3) |
| ***Fruit and Vegetable Consumption*** | **% (95% CI)** | | | **% (95% CI)** | | | **% (95% CI)** | | |
| Consume less than five servings of fruits OR vegetables per day | 91.3 | (90.1 | , 92.4) | 91.3 | (89.6 | , 92.8) | 91.3 | (89.6 | , 92.8) |
| Consume no fruits and vegetables per day | 0.6 | (0.3 | , 1.0) | 0.6 | (0.3 | , 1.3) | 0.5 | (0.2 | , 1.1) |
| ***Sugar Consumption*** | **Mean (95% CI)** | | | **Mean (95% CI)** | | | **Mean (95% CI)** | | |
| Average number of days per week sugary drinks are consumed | 3.0 | (2.9 | , 3.0) | 3.1 | (3.0 | , 3.2) | 2.8 | (2.7 | , 2.9) |
| Average number of days per week diet drinks are consumed | 1.8 | (1.8 | , 1.9) | 2.0 | (1.9 | , 2.1) | 1.7 | (1.6 | , 1.8) |
| ***Nutritional Guidance*** | **% (95% CI)** | | | **% (95% CI)** | | | **% (95% CI)** | | |

| | | | |
|---|---|---|---|
| Always or often uses the nutritional traffic light when selecting food | 39.5 (37.6 , 41.5) | 40.4 (37.7 , 43.2) | 38.7 (36.0 , 41.4) |

### *4.5 Raised Blood Glucose or Diabetes*

Overall, 12.4% of adult Ecuadorians indicated they were ever told by a doctor or health professional that they had raised blood glucose or diabetes (11.6% among men and 13.1% among women). Of those who reported a diagnosis, approximately two-fifths 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.

**Table 8. Raised Blood Glucose/Diabetes Overall and by Sex**

| | ***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 | 12.4 (11.1 , 13.8) | 11.6 (9.9 , 13.6) | 13.1 (11.3 , 15.1) |
| Currently taking medication for raised blood glucose/diabetes | 43.5 (37.7 , 49.4) | 43.1 (34.7 , 51.9) | 43.8 (35.9 , 51.9) |

### *4.6 Raised Blood Pressure or Hypertension*

Approximately one in five adult Ecuadorians, 21.8%, reported that they had ever been diagnosed by a doctor or health care professional with raised blood pressure or hypertension. Among those who reported they were diagnosed to have raised blood pressure or hypertension, almost half (48.3%) were currently on medication for the said condition.

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

**Table 9. Raised Blood Pressure/Hypertension Overall and by Sex**

| | ***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 | 21.8 (20.2 , 23.5) | 21.7 (19.4 , 24.2) | 21.9 (19.6 , 24.3) |

| | | | |
|---|---|---|---|
| Currently taking medication for raised blood pressure/hypertension | 48.3 (43.9 , 52.7) | 48.4 (42.1 , 54.7) | 48.2 (42.1 , 54.5) |

### *4.7 Mental Health*

Overall, Ecuadorian adults reported 3.9 days of mental stress in the last month. There were no differences in the results when analyzing the information by sex. Table 10 shows the average number of days of mental stress in the last month.

Table 10 shows the average number of mental health stress overall and by sex.

| **Table 10. Mental Health Stress Overall and by Sex** | | | |
|---|---|---|---|
| | ***Overall*** | ***Males*** | ***Females*** |
| **Mental Health** | **Mean (95% CI)** | **Mean (95% CI)** | **Mean (95% CI)** |
| Average number of days of mental health stress in the past month | 3.9 (3.6 , 4.1) | 3.9 (3.5 , 4.2) | 3.9 (3.6 , 4.3) |

### *4.8 Physical Activity*

Approximately 7 out of 10 (68.3%) Ecuadorian adults reported insufficient physical activity, which is defined as less than 150 minutes of moderate intensity physical activity in a week.

Table 11 shows physical activity overall and by sex.

| **Table 11. Physical Activity Overall and by Sex** | | | |
|---|---|---|---|
| | ***Overall*** | ***Males*** | ***Females*** |
| **Physical Activity** | **% (95% CI)** | **% (95% CI)** | **% (95% CI)** |
| Insufficient physical activity | 68.3 (66.4 , 70.1) | 61.8 (59.0 , 64.5) | 74.2 (71.7 , 76.5) |

## *5. Conclusions*

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

- Overall, 17.1% of Ecuadorians reported being current tobacco users; 7.6% reported being daily tobacco smokers. Men were more likely to report any type of tobacco use than women.

- Overall, more than one third (36.4%) reported current alcohol consumption, and 33.6% 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.
- Two out of five adult Ecuadorians (41.9%) reported always or often adding salt or salty sauces to food as they are cooking or preparing it.
- More than nine out of ten adult Ecuadorians, 91.3%, reported consuming less than five servings of fruits or vegetables per day.
- Overall, 12.4% reported ever receiving a clinical diagnosis of raised blood glucose or diabetes, two-fifths (43.5%) of whom were currently taking medication.
- Overall, one-fifth (21.8%) indicated ever being told that they have raised blood pressure or were hypertensive by a doctor or health professional, of which half, 48.3%, 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 Ecuadorian adults aged 18 years and older. Results will inform the Ministry of Health in Ecuador 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

World Health Organization. Noncommunicable diseases country profiles Ecuador 2018. Geneva: WHO; 2018. https://www.who.int/nmh/countries/2018/ecu_en.pdf