Central America Diabetes Initiaive (CAMDI)

Survey of Diabetes, Hypertension and Chronic Disease Risk Factors

Villa Nueva, Guatemala 2006

Pan American Health Organization
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Introduction

Most developing countries of Latin America are in a stage of epidemiologic transition, which is the transition from infectious to chronic diseases as major sources of morbidity and mortality. These countries are also experiencing demographic transition, a shift from a pattern of high fertility and high mortality to one of low fertility and low mortality, and a nutritional transition, a shift from traditional dietary patterns to one high in saturated fat, sugar and refined foods and low in fiber. Changes in lifestyle are associated with urbanization, or the mass migration from the rural areas to the urban areas, the phenomena of globalization, and exchanges between cultures, among others. These changes are occurring rapidly in countries like Guatemala, consequently, protein–calorie malnutrition is observed most frequently in conjunction with obesity, hypertension, diabetes mellitus, and hypercholesterolemia.

The health situation in Guatemala is evolving from one in which the epidemiologic profile is characterized by the predominance of infectious diseases and disorders due to nutritional deficiencies to one in which chronic noncommunicable diseases (NCD) are prevalent. For example, between 1986 and 1999, the mortality due to communicable and perinatal diseases declined from 40% to 27% (1), while mortality from NCD increased. In 1969, mortality from cardiovascular diseases (CVD) in men was 65.9 per 100 000 inhabitants and in 1986 it increased to 80 per 100 000 inhabitants; in women, CVD mortality also increased, from 66.2 per 100 000 inhabitants in 1969 to 73.5 per 100 000 inhabitants in 1986. More recently, in the period between 1986 and 1999, the proportion of deaths due to CVD increased from 7% to 13%.

According to data compiled by the National Institute of Statistics of Guatemala for 2000, the department of Zacapa, in the east of the country, is the department with the highest mortality attributed to NCD (2). In this department, NCD mortality was approximately 60%, including 38% of deaths due to CVD and 22% to diabetes. The department of Guatemala had a NCD mortality of 39%, with 23% of mortality due to CVD and 16% to diabetes. Jutiapa, another department in eastern Guatemala, also had a high relative mortality due to NCD (32%) and the second highest mortality due to CVD in the country (26%). In departments such as Alta Verapaz and Sololá, the mortality attributed to NCD was only 10%.

It is estimated that in coming years the burden of mortality due to NCDs will continue to increase in Guatemala. Increased life expectancy, which has already reached 64.7 years in men and 69.8 years in women, will contribute to this. Furthermore, the process of urban development and changes in lifestyle and the profile of risk factors that many communities of Guatemala are experiencing will also tend to increase the NCD load in this country.

Guatemala and neighboring countries in Central America can be considered to be in the initial stage of the epidemiologic transition that developing countries are experiencing throughout the world. Unfortunately, available information is limited. Two sources of information that preceded this study, however, support this argument. The first refers to changes in the causes of general mortality. According to unpublished data of the National Institute of Statistics and the Ministry of Health of Guatemala, the percentage of deaths due to acute myocardial infarction reported in 1964 was 0.1% of all deaths, whereas it was 1.7% in 1984 and 4.2% in 2001; in 2001 myocardial infarction had reached fourth place among the leading specific causes of general mortality. Furthermore, mortality due to infectious diseases has only recently begun to decline.

The ratio between mortality due to communicable/noncommunicable causes in Central America rose from 1.0 to 3.1 between the periods of 1980–1985 and 1990–1995 (3). However, not only do mortality figures refer to the outcome of a series of health disorders, but there are also problems of ill–defined diagnoses, underreporting, and incomplete information, all of which complicate interpretation.

Overweight in the adult population is the only NCD risk factor that has been measured at the national level in Guatemala (4, 5). The National Survey of Demography and Health of 1995 showed that 34% of women 15 to 49 years of age were overweight. In 2000, the National Survey on Living Conditions revealed a prevalence of overweight of 48% in adult women, while it was 34% in men. Other studies conducted in the last 10 years in specific population groups supported these results, showing that the incidence of overweight in young women (19 to 30 years of age) was similar among those who lived in rural areas and those who migrated to Guatemala City (28% and 30%, respectively) (6). The prevalence among rural and urban young men was 7% and 16%, respectively. Ramírez–Zea and Torún also reported that in a group of low–income salaried workers, 25% of men and 45% of women were overweight (7). Finally, another study in middle–class urban workers found that the prevalence of overweight was 26% in women and 42% in men (8).

Obesity, as well as physical inactivity and diet are considered major factors in the etiology of diabetes mellitus and hypertension. Obesity can contribute significantly to heart disease and resulting disabilities. In Guatemala, there is little information about the influence of changes in lifestyle, such as the reduction of physical activity and inadequate diet, on the prevalence of chronic noncommunicable diseases such as diabetes and hypertension. For this reason, the present study examined the effects of epidemiologic transition on the health profile of a municipality in the department of Guatemala, near the capital city.

Objectives, Variables and Indicators

Objectives

- Determine the prevalence of diabetes mellitus and hypertension in people 20 years of age and older in a sample taken from the municipality of Villa Nueva, department of Guatemala.
- Determine the prevalence of factors considered of risk for diabetes and hypertension.
- Determine the relationship between the prevalence of these diseases and certain demographic, environmental, social, cultural, and economic factors.

Variables and Indicators

This project used two types of variables:
a. primary variables, which were the object of the study, and
b. secondary variables, which, in conjunction with the primary variables, make it possible to evaluate their tendencies in different contexts and situations.

The primary variables and respective indicators are:

Classification of Blood Pressure	Systolic Blood Pressure mmHg		Diastolic Blood Pressure mmHg
Normal	<120	and	<80
Prehypertension	120–139	or	80–89
Stage 1 Hypertension	140–159	or	90–99
Stage 2 Hypertension	≥160	or	≥100

Blood pressure was classified using the criteria of the Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (9).

Classification of Glucose	Fasting Plasma Glucose	Oral Glucose Tolerance Test
Normal	<100 mg/dl and	<140 mg/dl
Impaired fasting glucose (IFG)	100–125 mg/dl	
Impaired glucose tolerance (IGT)		140–199 mg/dl
Diabetes mellitus	≥126 mg/dl	≥200 mg/dl

Diabetes mellitus was diagnosed in accordance with the criteria established by the American Diabetes Association (10).

The secondary variables and respective indicators are:

Variables	Indicators
Weight [a]	
Normal	18.50–24.99 kg/m^2
Overweight	25.00–29.99 kg/m^2
Obesity, grade I	30.00–34.99 kg/m^2
Obesity, grade II	35.00–39.99 kg/m^2
Obesity, grade III	≥40.00 kg/m^2
Waist [a]	
Risk	Men ≥ 102 cm; women ≥ 88 cm
Waist/hip ratio	
Risk	Men > 1.0; women > 0.85
Physical activity	
Sedentary	<60 min/wk
Insufficient	60–149 min/wk
Active	≥150 min/wk
Total cholesterol [b]	
Desirable	<200 mg/dl
Borderline high	200–239 mg/dl
High	≥240 mg/dl
LDL cholesterol	
Optimal/Near Optimal	<130 mg/dl
Borderline	130–159 mg/dl
High/Very High	≥160 mg/dl
HDL cholesterol	
High (Optimal)	≥60 mg/dl
Borderline high	40–59 mg/dl
Low	<40 mg/dl
Triglycerides	
Normal	<150 mg/dl
Borderline high	150–199 mg/dl
High	200–499 mg/dl
Very high	≥500 mg/dl
Smoking habit	Current smokers, smokers of 1 or more cigarettes/day
Alcohol consumption	5 or more drinks/day in the last 4 weeks
Family history	Family history of diabetes mellitus, hypertension, stroke, hypercholesterolemia, and acute myocardial infarction
Sociodemographic data	Educational level, illiteracy, current employment, time of residence in urban/periurban area, ethnic group

[a] *WHO, Obesity: Preventing and Managing the Global Epidemic; Geneva 2000; ISBNS 92 4 120894 5.*
[b] *Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) Final Report, Circulation 2002; 106:3143–3421.*

Note: Indicators referring to body weight are based on the ratio of weight in kilograms divided by the square of height in meters.

Methodology

Survey design

In this cross–sectional descriptive study, 1397 men and women of the town of Villa Nueva were surveyed out of a total of 1545 people preselected by sampling in multiple stages and stratified into two age groups (20 to 39 years and 40 years or more).

The census segments were the Primary Sampling Units (PSU). A list of the census segments of the urban area of interest was prepared, with information on the number of dwellings in each. Primary sampling units were selected systematically with a probability proportional to population size, measured by the respective number of dwellings. Out of the 246 census segments into which the town was divided, 50 were selected to form the same number of PSU. In addition, the maps of these 50 segments of the town of Villa Nueva had to be updated because the information obtained from the National Institute of Statistics on those segments dated from nine years earlier. The sample was analyzed using the new diagrams of each sector.

Once the map of the selected census segments was updated, it was divided into compact segments (CS), or groups of 11 to 12 dwellings. Two CS of each segment then were selected at random using randomized numbers (100 subunits in all, 1113 dwellings selected). A census was taken of the dwellings in all the subunits. All those who met the selection criteria were included in the sample, independent of whether or not the dwelling was inhabited by more than one family. The "family" was defined as the group of cohabitants who eat at the same table. All those who met this selection criterion were considered family members for the purposes of the study and subsequently they were visited to be informed about the survey and the importance of participating. The people who agreed to participate signed a consent form after having read it with the interviewer. No substitutions of any sector, subunit, dwelling, or interviewee were allowed.

Every person selected was visited at home, where a structured interview was carried out (lasting 45 to 60 minutes) and blood pressure and the waist and hip circumferences were measured. On the same visit, the person was scheduled for another visit (usually the next day or in the next seven days). The subject was instructed to come to a specific place (health post or center, community center, school, neighbor's house, etc.) after fasting for measurement of body weight and height, a glucose tolerance test, and lipid profile (all of which was expected to take approximately 3 hours). At the end of the second session, each participant was given a snack and the most important results, together with several recommendations. Anyone who had one of the health problems studied was referred to a health center. Work days were usually from Sunday to Thursday.

A manual of procedures describing every stage of the survey was prepared and followed strictly by each interviewer in the respective work area.

Population and sample

Of the 1545 people selected, 1397 were given complete interviews (response rate, 90%). Of the respondents, 1049 underwent biochemical analyses and measurements of body weight and height (68% of all the sample).

Methods

Census. The aim of the census was to list all family members living in the selected dwellings and decide which of them would be surveyed. In the census, information was obtained about the relation with the head of household, sex, age, and date of birth of each person. People over 20 years of age for which the exclusion criteria of sex, age, state of health, etc., were applicable were asked about their pregnancies, postpartum (one month), or other physical problems that precluded their participation in the survey and, especially, the corresponding measurements.

Questionnaire. A questionnaire was administered (see Annex) that was derived from a revision of others used by PAHO and the Institute of Nutrition of Central America and Panama (INCAP) in previous studies, and from surveys conducted by WHO (STEPS) and CDC of the United States (BRFSS, NHANES). The questions addressed demographic data, health status, risk factors such as physical inactivity (based on the extended version of the International Physical Activity Questionnaire–IPAQ) (11), eating habits, and access to health care, treatment and drugs.

Blood pressure. Blood pressure was measured three consecutive times, with the subject seated and the left arm resting on a flat surface at the height of the heart. The first measurement was taken at least 5 minutes after the person sat down and the following measurements, every 5 minutes thereafter. If a difference of more than 10 mmHg was found between the second and third measurement, a fourth measurement was taken. The average of the second and third measurements was reported. In cases in which a fourth measurement was necessary, the two closest values were averaged.

Glucose tolerance test. This test consisted of taking a blood sample, after a minimum fast of 12 hours, to measure plasma glucose concentration. After obtaining the first sample under fasting conditions, the person drank a beverage containing exactly 75 g of glucose (anhydrous glucose). At exactly two hours, a second blood sample was obtained to measure plasma glucose concentration again. Venous blood samples obtained before and after the glucose load were placed in tubes with sodium fluoride (an anticoagulant that reduces glucose metabolism by blood cells). The cold chain was maintained up to the moment when the samples were delivered to the laboratory of the School of Chemical Sciences and Pharmacy of the University of San Carlos of Guatemala (LABOCLIP). There, the plasma was separated (two to four hours after extraction) and the corresponding analysis was done (the same day or the next day). The analyses of each sample were done in duplicate and in triplicate if the difference between the first two was greater than 10%, using the glucose oxidase–peroxidase method (Autolab, Analyzer Medical System, Rome, Italy). The average of the two values obtained is reported (the two closest values when a third measurement was necessary).

Lipid profile. An additional blood sample was obtained under fasting conditions and placed in tubes without anticoagulant to measure serum total cholesterol, triglycerides, and HDL cholesterol. Samples were treated in the same way as the samples obtained for the determination of plasma glucose and analyzed at LABOCLIP in duplicate, or in triplicate if the difference between the first two measurements was greater than 10%. The average of the two values obtained is reported (the

two closest values when a third measurement was necessary). Both analyses were done using colorimetric tests (Autolab, Analyzer Medical System, Rome, Italy).

Anthropometric measurements. The following measurements were taken in duplicate: body weight, height, and waist and hip circumferences, following the guidelines described by Lohman et al. (12). A third measurement was taken in the event that the difference between the first two measures was greater than 0.5 units. The average of the two values obtained was reported (the two closest values when a third measurement was necessary). Weight was measured using a digital scale (Health–O–Meter, model 840D–01, Illinois), with the subject wearing his or her usual clothes, shoeless, and without any objects in the pockets. The measurement was taken with a precision of 100 g. Scales were calibrated weekly against a high precision digital scale (Toledo, model 2136, Division of Reliance Electronic, Ohio). From the body weight of each person, 1.5 kg was subtracted, which is the average weight of the usual clothing worn in Guatemala.

Height was measured by placing the person, barefoot and with feet together and centered, against a metric scale attached to the wall. The heels, calves, buttocks, shoulder blades, and head were in contact with the wall. A wooden drafting triangle was placed on the head of the person, pressing against the hair. The reading was made to the closest millimeter. The circumference of the waist was measured at the height of the most prominent part of the abdominal wall (usually at the level of the navel), to the closest millimeter. Hip circumference was measured at the height of the great trochanters, to the closest millimeter.

Data management and statistical analysis

All the information obtained in the survey was coded and reviewed by the same interviewer and then by the supervisor of the field work. The forms reviewed were digitized using the Epi Info program (CDC–WHO, version 6.01). All information was entered in duplicate and entries were checked for errors. Subsequently, the maximum, minimum and mean values permitted for each variable were reviewed to detect anomalous values and revise them in the originals with the respective correction.

The prevalence of the primary variables (diabetes and hypertension) and associated major risk factors (obesity, hypercholesterolemia) was calculated by age and sex groups. The answers to the prevalence of diabetes and hypertension questions were validated for consistency with the report of treatment for diabetes and hypertension and the measures of blood glucose and blood pressure, respectively. Prevalences were adjusted for the proportion of nonresponses and standardized by the age and sex stratification planned for the town of Villa Nueva for the year 2000. The analyses of the data included descriptive statistics of the variables stratified by age and sex. The frequency of all variables is presented. For continuous variables, the average and confidence intervals (CI) are also reported. With regard to prevalences or proportions, tests of the analysis of variance (ANOVA) and X^2 were made to identify possible differences between groups and associations between variables. The standard error was adjusted to take into account the design of the survey by clusters. The statistical analysis was carried out with the Stata 9 program (Stata 9.1, StataCorp LP, College Station, Texas, USA).

Results

Population characteristics

The population surveyed was 1397 people, of which 1049 agreed to undergo laboratory tests. Half of the participants were women. As can be observed in Table 1a i, most of the participants were married or had partners. Almost all were of mixed–race (in the opinion of the interviewer), with barely 2% from the indigenous population. The proportion of illiterate people was almost one–fifth of the total. One–third of the respondents were unemployed. More than half of the participants considered their health to be fair/poor. Most of the people age 20 to 39 years of age considered their health to be fair/poor.

Table 1a i. Sociodemographic characteristics and cardiovascular risk factors (both sexes)

	Total	20 to 39 years	40 or more years	p
N	1397	767	630	
Sex (% women)	51	51	51	0.9271
Marital status (%)				
Single	17.8	24.8	4.3	0.0361
Married or cohabitating	71.4	69.9	74.2	
Separated or divorced	6.8	4.4	11.6	
Widowed	3.9	0.8	9.9	
Ethnic group (%)				
Indigenous	2.0	1.9	2.1	0.4074
Mixed–race (or mestizo)	97.9	98.1	97.6	
Other	0.1	0.0	0.2	
Schooling (%)				
None	8.2	3.5	17.3	0.1207
Incomplete elementary	22.2	16.8	32.7	
Complete elementary	20.3	20.7	19.6	
Incomplete secondary	8.1	8.9	6.5	
Complete secondary	8.7	10.3	5.7	
Incomplete tertiary (miscellaneous)	2.2	3.0	0.8	
Complete tertiary (miscellaneous)	20.3	25.0	11.3	
1 to 3 years university	7.8	9.8	4.0	
>3 years university	2.1	2.0	2.3	
Illiteracy (%)	15.3	8.5	28.5	0.0104
No paid occupation (%)	28.4	29.1	27.2	0.2851
Self–evaluation of health status (%)				
Excellent/very good	8.1	10.2	4.0	0.1590
Good	31.9	35.2	25.5	
Fair/poor	59.9	54.5	70.5	

Table 1a i. (continued)

	Total	20 to 39 years	40 or more years	p
Family history (%)				
Diabetes mellitus	24.5	21.5	30.4	0.1184
Hypertension	40.7	40.7	40.7	0.5603
Stroke	12.7	9.3	19.2	0.1567
Hypercholesterolemia	13.3	15.0	9.9	0.3506
Myocardial infarction	7.3	5.21	11.23	0.1579

Table 1a ii. Anthropometric measures and biochemical blood tests (both sexes)

	Total	20 to 39 years	40 or more years
Waist circumference (cm) n	1389	764	625
	91.7 (89.9–93.5)	89.1 (85.1–93.1)	96.7 (94.0–99.3)
Hip circumference (cm) n	1388	764	624
	97.3 (97.2–97.4)	96.1 (93.0–99.1)	99.8 (96.7–102.9)
Waist/hip ratio n	1388	764	624
	0.9 (0.9–1.0)	0.9 (0.92–0.93)	0.97 (0.9–1.0)
Body composition n	1040	524	516
Body weight (kg)	65.8 (63.2–68.3)	64.9 (61.3–68.5)	67.1 (64.3–69.9)
Height (cm)	157.5 (153.2–161.8)	158.4 (156.8–160.0)	156.2 (149.7–162.6)
BMI (kg/m^2)	26.5 (25.7–27.2)	25.8 (25.0–26.7)	27.5 (25.7–29.3)
Blood pressure n	1397	767	630
Systolic blood pressure (mmHg)	113.8 (99.6–128.1)	108.6 (91.0–126.2)	123.9 (104.9–142.9)
Diastolic blood pressure (mmHg)	70.8 (61.8–79.8)	68.8 (58.7–78.9)	74.7 (63.6–85.8)
Fasting Plasma Glucose (mg/dl) n	1034	520	514
	98.0 (91.2–104.7)	92.6 (85.4–99.7)	106.6 (90.7–122.5)
Oral Glucose Tolerance (mg/dl) n	851	444	407
	112.7 (110.6–114.9)	104.1 (75.4–132.8)	127.4 (108.6–146.2)

One–fourth of the subjects surveyed had a family history of diabetes mellitus and almost half had hypertension (Table 1a i). Average systolic blood pressure was 113.8 mmHg and average diastolic blood pressure, 70.8 mmHg (Table 1a ii). The average body mass index (BMI) was 26.5 kg/m^2, which indicates that the majority were overweight.

Most of the men (Table 1b i) stated that they were married or lived with a partner. Almost all of the respondents were of mixed race (mestizos); only one–tenth stated that they were indigenous. Illiteracy was five times more frequent among men over 40 years of age. The percentage of men without a paid occupation was very similar in both age groups.

Almost two–thirds of the men over 40 years of age considered their health fair or poor. More than one–third of the men had a family history of hypertension. The average waist/hip ratio was 0.94 (0.92 in the 20 to 39 years of age group and 0.97 in the 40 years of age or older group). The average body mass index in the 40 years of age or older group was 26.4 kg/m^2.

Table 1b i. Sociodemographic characteristics and cardiovascular risk factors (men)

Men	Total	20 to 39 years	40 or more years	p
N	455	254	201	
Marital status (%)				
Single	19.8	27.9	4.1	0.0245
Married/cohabitating	74.2	69.6	83.0	
Separated/divorced	4.6	2.4	8.7	
Widowed	1.4	0.0	4.2	
Ethnic group (%)				
Indigenous	1.7	2.1	1.1	0.4905
Mixed–race	98.2	97.9	98.6	
Other	0.1	0.0	0.3	
Schooling (%)				
None	5.9	2.1	13.2	0.1838
Incomplete elementary	18.3	12.3	30.0	
Complete elementary	20.1	21.6	17.3	
Incomplete secondary	7.9	8.0	7.7	
Complete secondary	10.6	12.9	6.3	
Incomplete tertiary	2.5	3.3	1.0	
Complete tertiary	21.4	24.9	14.5	
1 to 3 years university	10.2	12.0	6.8	
>3 years university	3.0	2.9	3.3	
Illiteracy (%)	10.2	5.2	19.8	0.0295
No paid occupation (%)	10.7	10.3	11.7	0.3744
Self–evaluation of health status (%)				
Excellent/very good	10.2	12.9	5.1	0.1842
Good	38.0	41.3	31.7	
Fair/poor	55.0	45.9	63.2	
Family history (%)				
Diabetes mellitus	24.2	21.4	29.5	0.4515
Hypertension	38.7	38.7	38.7	0.5690
Stroke	13.3	10.4	18.9	0.1832
Hypercholesterolemia	10.9	12.1	8.4	0.3765
Myocardial infarction	6.5	5.4	8.7	0.4009

Table 1b ii. Anthropometric measures and biochemical blood tests (men).

Men	Total	20 to 39 years	40 or more years
Waist circumference (cm) n	451	253	198
	89.7 (87.6–91.9)	87.7 (87.0–88.4)	93.7 (84.7–102.9)
Hip circumference (cm) n	451	253	198
	95.3 (93.2–97.4)	94.7 (90.8–98.6)	96.5 (96.4–96.6)
Waist/hip ratio n	451	253	198
	0.9 (0.937–0.943)	0.9 (0.9–1.0)	1.0 (0.9–1.1)
Body composition n	323	158	165
Body weight (kg)	69.4 (67.8–71.1)	69.3 (63.3–75.3)	69.6 (56.2–83.0)
Height (cm)	163.8 (159.4–168.2)	164.9 (164.2–165.6)	162.1 (153.4–170.8)
BMI (kg/m^2)	25.8 (24.6–27.1)	25.4 (23.2–27.7)	26.4 (25.0–27.8)
Blood pressure n	455	254	201
Systolic blood pressure (mmHg)	118.5 (94.9–142.2)	115.0 (96.4–113.6)	125.3 (83.7–167.0)
Diastolic blood pressure (mmHg)	73.0 (60.0–86.0)	71.5 (61.3–81.7)	75.8 (54.1–97.5)
Fasting Plasma Glucose (mg/dl) n	350	173	177
	99.0 (88.8–109.1)	94.5 (71.3–117.7)	105.7 (58.5–152.9)
Oral Glucose Tolerance (mg/dl) n	286	148	138
	111.1 (107.1–115.2)	105.0 (41.4–168.6)	121.0 (51.0–191.1)

Most of the women—who were almost all of mixed race—stated that they were married. Illiteracy was recorded in a larger proportion of the group of subjects 40 years of age or older than in the group of subjects 20 to 39 years of age. Almost half of the respondents stated that they did not have a paid occupation (Table 1c i).

Table 1c i. Sociodemographic characteristics and cardiovascular risk factors (women)

Women	Total	20 to 39 years	40 or more years	p
N	1397	513	429	
Sex (%)	100	37	31	
Marital status (%)				
Single	15.9	21.9	4.5	0.0610
Married/cohabitating	68.7	70.2	65.7	
Separated/divorced	9.0	6.2	14.4	
Widowed	6.4	1.7	15.5	

Table 1c i. (continued)

Women	Total	20 to 39 years	40 or more years	p
Ethnic group (%)				
Indigenous	2.2	1.8	3.1	0.2846
Mixed–race	97.7	98.2	96.7	
Other	0.1	0.0	0.2	
Schooling (%)				
None	10.5	4.9	21.2	0.0980
Incomplete elementary	26.0	21.2	35.2	
Complete elementary	20.5	19.9	21.8	
Incomplete secondary	8.2	9.7	5.4	
Complete secondary	6.9	7.9	5.0	
Incomplete tertiary	1.9	2.6	0.6	
Complete tertiary	19.3	25.0	8.2	
1 to 3 years university	5.5	7.7	1.3	
>3 years university	1.3	1.2	1.4	
Illiteracy (%)	20.2	11.6	36.8	0.0216
No paid occupation (%)	45.4	47.1	42.0	0.3435
Self–evaluation of health status (%)				
Excellent/very good	6.0	7.7	2.8	0.2078
Good	26.1	29.4	19.6	
Fair/poor	67.8	62.7	77.6	
Family history (%)				
Diabetes mellitus	24.8	21.5	31.2	0.2405
Hypertension	42.7	42.6	42.8	0.6845
Stroke	12.1	8.2	19.5	0.2381
Hypercholesterolemia	15.6	17.8	11.3	0.3362
Myocardial infarction	8.0	5.0	13.7	0.0633

Table 1c ii. Anthropometric measures and biochemical blood tests (women).

Women	Total	20 to 39 years	40 or more years
Waist circumference (cm) n	938	511	427
	93.5 (90.6–96.5)	90.5 (82.2–98.8)	99.5 (98.3–100.6)
Hip circumference (cm) n	937	511	426
	99.3 (99.0–99.5)	97.4 (94.1–100.7)	102.9 (99.4–106.3)
Waist/hip ratio n	937	511	426
	0.94 (0.9–1.0)	0.93 (0.88–1.0)	0.97 (0.95–0.99)
Body composition n	717	366	351
Body weight (kg)	62.5 (61.8–63.2)	61.2 (54.0–68.5)	64.7 (56.6–72.8)
Height (cm)	152.0 (151.7–152.3)	152.9 (149.9–155.9)	150.5 (147.9–153.0)

Table 1c ii. (continued)

Women	Total	20 to 39 years	40 or more years
BMI (kg/m²)	27.1 (27.0–27.2)	26.2 (22.3–30.1)	28.5 (24.0–33.1)
Blood pressure n	942	513	429
Systolic blood pressure (mmHg) n	109.3 (107.7–111.0)	102.5 (91.1–114.0)	122.5 (118.9–126.2)
Diastolic blood pressure (mmHg)	68.7 (65.2–72)	66.1 (58.4–73.9)	73.6 (73.4–73.9)
Fasting Plasma Glucose (mg/dl) n	684	347	337
	97.0 (93.0–100.9)	90.7 (80.4–101.0)	107.5 (89.8–125.1)
Oral Glucose Tolerance (mg/dl) n	565	296	269
	111.4 (113.4–115.3)	103.2 (97.2–109.2)	134.2 (100.0–168.5)

The majority of the women considered their state of health as fair or poor. Likewise, almost half of the respondents in both age groups had a family history of hypertension. The average waist/hip ratio was 0.94, with the highest values corresponding to women 40 years of age and older. Average systolic blood pressure was 109.3mmHg and average diastolic pressure, 68.7mmHg.

Prevalence

Tables 2a, 2b and 2c summarize the prevalence of diabetes, hypertension, obesity, lipid profile (total cholesterol, HDL cholesterol, LDL cholesterol, triglycerides), and pattern of physical activity. Of the respondents (Table 2a), 4.3% had known or diagnosed diabetes, while 4.1% were diagnosed as new cases of diabetes. The total prevalence of diabetes in Villa Nueva was 8.4%. Impaired glucose tolerance/impaired fasting glucose were present in 23.6%. Of the respondents, 64.6% had normal blood pressure, while 22.4% had prehypertension. A total of 7.2% controlled their blood pressure with medication. 1.2% and 4.5% of the participants corresponded to stage 1 hypertension and stage 2 hypertension, respectively. The total prevalence of hypertension was 12.9%. Only 38.2% of the respondents had a normal BMI; a similar proportion was overweight, while 17.6%, 2.8% and 0.8% had grade I, II and III obesity, respectively. The prevalence of normal total cholesterol, LDL cholesterol, and HDL cholesterol values was 65.4%, 81.0%, and 22.2% respectively. Of the population surveyed, 50.4% were classified as sedentary. Although the small number of people in some groups influenced statistical significance, an increase in the prevalence of all diseases and risk factors with age was observed. The prevalence of all the events presented was similar in both sexes (p>0.05; not presented in the tables).

Table 2a. Cardiovascular risk factors of the population by age (both sexes)

	Total		20 to 39 years		40 or more years		P
	%	95%CI	%	95%CI	%	95%CI	
Diabetes							
Known diabetes	4.30	(1.3–13.7)	1.25	(...–96.6)	10.18	(5.7–17.6)	0.1503
New diabetes	4.10	(1.9–8.3)	2.75	(0.3–19.3)	6.62	(0.6–47.6)	
Impaired glucose tolerance/ Impaired fasting glucose	23.60	(11.3–42.7)	18.79	(14.7– 23.8)	32.90	(7.1–75.9)	

Table 2a. (continued)

	Total		20 to 39 years		40 or more years		P
	%	95%CI	%	95%CI	%	95%CI	
Hypertension							
Normal blood pressure	64.64	(18.9–93.5)	75.70	(9.0–99.0)	43.31	(13.3–79.2)	0.0598
Prehypertension	22.40	(3.0–72.7)	20.04	(1.1–85.0)	26.95	(10.9–52.6)	
Known hypertension	7.24	(2.2–21.4)	1.84	(1.0–3.5)	17.67	(9.3–30.9)	
New hypertension, stage 1	1.20	(0.1–18.8)	0.09	(...–98.7)	3.35	(0.1–48.4)	
New hypertension, stage 2	4.52	(0.2–51.2)	2.35	(0.0–89.9)	8.72	(1.0–47.0)	
BMI							
Normal	38.22	(36.6–39.9)	43.15	(18.8–71.3)	29.52	(4.3–79.5)	0.2565
Overweight	38.46	(38.1–38.8)	36.38	(13.9–66.9)	42.12	(9.1–84.2)	
Obesity, grade I	17.66	(13.5–22.7)	16.09	(15.2–17.0)	20.42	(11.4–33.9)	
Obesity, grade II	2.84	(2.6–3.2)	1.66	(0.26–9.8)	4.95	(1.21–18.2)	
Obesity, grade III	0.77	(0.1–7.4)	0.36	(0.25–0.53)	1.48	(0.03–46.8)	
Waist circumference							
Risk	40.13	(22.9–60.1)	33.0	(15.9–56.2)	54.0	(49.3–58.6)	0.0650
No risk	59.87	(39.9–77.1)	67.02	(43.8–84.1)	46.0	(41.4–50.7)	
Total cholesterol							
<200 mg/dl	65.46	(46.8–80.3)	70.80	(48.8–86.1)	54.96	(6.3–95.7)	0.2533
200–239 mg/dl	24.64	(10.1–48.9)	22.75	(21.2–24.4)	28.38	(3.3–82.0)	
≥240 mg/dl	9.89	(7.6–12.8)	6.45	(0.2–68.7)	16.66	(3.9–49.3)	
LDL cholesterol							
<130 mg/dl	80.97	(36.4–96.9)	84.01	(39.7–97.7)	74.86	(40.1–93.0)	0.2724
130–159 mg/dl	12.91	(1.7–56.5)	11.38	(0.5–77.0)	15.99	(13.4–19.0)	
≥160 mg/dl	6.12	(2.1–16.9)	4.61	(1.5–13.0)	9.16	(0.5–67.8)	
HDL cholesterol							
<40 mg/dl	22.25	(5.8–56.9)	23.56	(2.6-78.2)	19.69	(15.9–24.2)	0.5058
40–59 mg/dl	66.31	(60.2–71.9)	65.94	(31.3–89.2)	67.03	(20.8–94.0)	
≥60 mg/dl	11.44	(1.7–49.6)	10.50	(3.3–29.0)	13.28	(0.4–84.5)	
Triglycerides							
<150 mg/dl	46.79	(37.7–56.1)	53.46	(46.7–60.1)	33.68	(18.1–53.8)	0.0667
≥150 mg/dl	53.21	(43.9–62.3)	46.54	(39.9–53.3)	66.3	(46.2–81.9)	
Physical activity							
Sedentary (<60 min/wk)	50.39	(43.5–57.2)	50.81	(49.2–52.4)	49.57	(34.3–65.0)	0.2834
Insufficient (60–149 min/wk)	27.06	(1.5–89.8)	26.02	(1.3–90.4)	29.06	(2.4–87.2)	
Active (>150 min/wk)	22.55	(1.2–87.6)	23.17	(0.9–90.6)	21.37	(2.2–76.9)	

Table 2b. Cardiovascular risk factors of the population by age (men)

	Total		20 to 39 years		40 or more years		P
	%	95%CI	%	95%CI	%	95%CI	
Diabetes							
Known diabetes	4.10	(0.0–80.1)	1.41	(...–99.9)	9.29	(0.2–84.7)	0.0863
New diabetes	5.26	(0.1–69.2)	4.21	(4.0–4.4)	7.30	(0.0–99.2)	
Impaired glucose tolerance/ Impaired fasting glucose	24.73	(12.8–42.3)	21.17	(11.0–36.92)	31.63	(3.5–85.6)	

Table 2b. (continued)

	Total		20 to 39 years		40 or more years		P
	%	95%CI	%	95%CI	%	95%CI	
Hypertension							
Normal blood pressure	56.18	(8.9–94.4)	63.28	(9.0–96.8)	42.47	(3.5–93.8)	0.1105
Prehypertension	31.86	(7.1–74.1)	32.41	(3.4–86.6)	30.80	(27.1–34.8)	
Known hypertension	4.40	(3.5–5.5)	0.86	(0.1–5.0)	11.20	(3.0–34.2)	
New hypertension, stage 1	1.57	(0.0–47.2)	0.00	–	4.59	(0.0–87.6)	
New hypertension, stage 2	6.01	(0.3–55.6)	3.46	(0.1–49.2)	10.94	(0.4–80.0)	
BMI							
Normal	43.27	(22.3–66.9)	45.89	(6.0–91.8)	38.86	(12.1–74.6)	0.2258
Overweight	38.79	(32.1–46.0)	37.80	(1.8–95.3)	40.45	(0.5–98.9)	
Obesity, grade I	14.03	(11.9–16.5)	13.65	(1.7–59.7)	14.66	(0.7–79.6)	
Obesity, grade II	1.54	(1.3–1.8)	0.85	(...–100.0)	2.69	(...–99.4)	
Obesity, grade III	0.42	(...–99.8)	0.00	–	1.12	(...–100.0)	
Waist circumference							
Risk	10.7	(2.4–36.2)	7.03	(0.0–95.3)	17.82	(1.3–78.0)	0.3473
No risk	89.3	(63.8–97.5)	92.97	(4.7–100.0)	82.18	(22.0–98.7)	
Total cholesterol							
<200 mg/dl	61.92	(53.2–69.9)	64.28	(10.2–96.6)	57.42	(0.5–99.7)	0.5646
200–239 mg/dl	27.53	(25.0–30.3)	28.04	(7.1–66.4)	26.56	(0.9–93.7)	
≥240 mg/dl	10.55	(6.0–17.8)	7.68	(0.0–86.1)	16.02	(0.2–95.4)	
LDL cholesterol							
<130 mg/dl	80.12	(20.7–98.4)	81.18	(35.7–97.1)	78.05	(7.9–99.3)	0.6065
130–159 mg/dl	12.98	(0.9–70.7)	12.97	(0.4–84.8)	13.00	(4.5–31.9)	
≥160 mg/dl	6.90	(1.1–33.0)	5.85	(1.1–26.2)	8.95	(0.0–98.1)	
HDL cholesterol							
<40 mg/dl	26.80	(2.2–85.6)	28.62	(0.4–97.3)	23.32	(15.8–33.0)	0.4142
40–59 mg/dl	67.40	(48.2–82.1)	67.40	(11.2–97.1)	67.41	(9.2–97.7)	
≥60 mg/dl	5.80	(0.0–98.2)	3.98	(0.0–99.1)	9.28	(0.0–99.0)	
Triglycerides							
<150 mg/dl	40.12	(16.9–68.9)	44.13	(22.0–68.9)	32.47	(17.2–52.6)	0.0195
≥150 mg/dl	59.88	(31.1–83.1)	55.87	931.1–78.0)	67.53	(47.4–82.8)	
Physical activity							
Sedentary (<60 min/wk)	55.96	(11.4–92.6)	56.16	(17.8–88.4)	55.57	(4.7–97.0)	0.1441
Insufficient (60–149 min/wk)	26.13	(0.1–99.4)	24.56	(0.1–99.3)	29.17	(0.1–99.5)	
Active (>150 min/wk)	17.90	(0.3–94.2)	19.27	(0.3–95.1)	15.26	(0.4–88.4)	

Table 2c. Cardiovascular risk factors of the population by age (women)

	Total		20 to 39 years		40 or more years		P
	%	95%CI	%	95%CI	%	95%CI	
Diabetes							
Known diabetes	4.49	(0.9–18.8)	1.10	(...–31.2)	11.05	(1.5–50.6)	0.0863
New diabetes	2.93	(0.1–59.2)	1.36	(...–95.6)	5.97	(0.3–54.9)	
Impaired glucose tolerance/ Impaired fasting glucose	22.51	(9.6–44.4)	16.50	(11.2–23.6)	34.13	(13.3–63.6)	

Table 2c. (continued)

	Total		20 to 39 years		40 or more years		P
	%	95%CI	%	95%CI	%	95%CI	
Hypertension							
Normal blood pressure	72.77	(43.0–90.4)	87.59	(6.5–99.9)	44.13	(38.4–50.1)	0.1105
Prehypertension	13.31	(1.1–68.7)	8.18	(0.1–88.0)	23.24	(3.8–69.8)	
Known hypertension	9.98	(2.0–37.6)	2.78	(2.77–2.8)	23.88	(5.6–62.4)	
New hypertension, stage 1	0.85	(0.4–1.7)	0.18	(...–99.6)	2.16	(1.4–3.2)	
New hypertension, stage 2	3.09	(0.2–38.7)	1.28	(...–99.6)	6.59	(5.9–7.4)	
BMI							
Normal	33.93	(16.7–56.9)	40.89	(38.6–43.2)	21.11	(0.9–88.5)	0.2258
Overweight	38.17	(31.7–45.1)	35.22	(21.5–51.9)	43.62	(31.1–57.0)	
Obesity, grade I	20.74	(16.3–26.0)	18.09	(3.89–54.7)	25.61	(1.7–87.2)	
Obesity, grade II	3.96	(3.80–4.13)	2.32	(0.3–18.3)	6.99	(2.2–20.01)	
Obesity, grade III	1.06	(0.5–2.1)	0.66	(0.64–0.67)	1.81	(0.7–4.3)	
Waist circumference							
Risk	68.33	(65.5–71.1)	57.89	(38.6–75.0)	88.53	(45.8–98.6)	0.0806
No risk	31.67	(28.9–34.5)	42.11	(25.0–61.4)	11.47	(1.4–54.2)	
Total cholesterol							
<200 mg/dl	69.06	(36.5–89.6)	77.27	(36.4–95.3)	52.35	(48.6–56.1)	0.0712
200–239 mg/dl	21.72	(2.6–73.9)	17.49	(1.2–78.8)	30.31	(11.6–59.2)	
≥240 mg/dl	9.22	(2.8–26.4)	5.23	(0.7–29.4)	17.34	(4.4–48.7)	
LDL cholesterol							
<130 mg/dl	81.81	(55.4–94.2)	86.7	(39.0–98.5)	71.60	(61.1–80.2)	0.1544
130–159 mg/dl	12.84	(3.0–41.6)	9.87	(0.6–68.2)	19.03	(11.8–29.1)	
≥160 mg/dl	5.36	(4.0–7.1)	3.43	(3.1–3.8)	9.37	(8.4–10.4)	
HDL cholesterol							
<40 mg/dl	17.64	(16.5–18.9)	18.53	(16.3–21.0)	15.85	(14.9–16.8)	0.3973
40–59 mg/dl	65.20	(58.2–71.6)	64.49	(62.3–66.6)	66.63	(41.5–84.9)	
≥60 mg/dl	17.16	(10.6–26.5)	16.98	(16.8–17.2)	17.52	(3.9–52.8)	
Triglycerides							
<150 mg/dl	53.36	(48.0–59.0)	62.71	(33.0–85.2)	34.95	(18.9–55.3)	0.0884
≥150 mg/dl	46.44	(41.0–52.0)	37.29	(14.8–67.0)	65.05	(44.7–81.0)	
Physical activity							
Sedentary (<60 min/wk)	45.04	(11.8–83.4)	45.66	(12.2–83.6)	43.83	(10.6–83.7)	0.5763
Insufficient (60–149 min/wk)	27.94	(21.5–35.4)	27.42	(15.1–44.5)	28.95	(20.4–39.4)	
Active (>150 min/wk)	27.02	(2.6–83.7)	26.92	(1.7–88.4)	27.22	(5.5–70.5)	

Comparison of the prevalence of risk factors in participants who responded to the questionnaire and had biochemical tests and those who only responded to the questionnaire

The percentage of men who underwent biochemical testing was greater than the percentage of women. The differences between the group with biochemical tests and those who only responded to the questionnaire were not statistically significant for the condition of employment. There were statistically significant differences between the two groups in educational level, physical activity, and the prevalence of hypertension ($p<0.05$).

Table 3. Comparison of factors between subjects with and without biochemical tests

Factors	People			P
	Questionnaire alone	Questionnaire + biochemical tests	Total	
Sex				
Men	24.9	75.1	100.0	0.2299
Women	28.1	71.9	100.0	
Employment				
Unpaid	30.2	27.8	28.4	0.4080
Paid	69.8	72.2	71.6	
Literacy status				
Illiterate	11.7	16.6	15.3	0.0246
Literate	88.3	83.4	84.7	
Smoking habit				
Current smoker	15.2	16.3	16.0	0.5381
Former smoker	10.6	13.1	12.5	
Never smoked	74.0	70.6	71.5	
Physical activity				
Sedentary (<60 min/wk)	44.5	50.3	48.8	0.0115
Insufficient (60–149 min/wk)	24.0	27.3	26.4	
Active (>150 min/wk)	31.5	22.4	24.8	
BMI				
Normal	58.5	43.7	45.3	0.0677
Overweight	28.7	38.3	37.2	
Obesity	12.8	18.0	17.5	
Ethnic group				
Indigenous	4.8	3.4	3.4	0.3936
Mixed–race	95.1	96.5	96.1	
Other	0.1	0.1	0.5	
Waist circumference				
Risk	36.5	40.7	39.6	0.1322
No risk	63.5	59.3	60.5	
Blood pressure				
Known hypertension	3.7	8.5	7.3	0.0253
New hypertension	4.6	6.1	5.7	
Prehypertension	6.3	6.8	6.6	
Normal pressure	15.0	16.0	15.8	
Optimal pressure	70.4	62.6	64.6	

Characteristics of people with diabetes, hypertension, and overweight

Among the respondents with diabetes, the proportion of smokers and former smokers, overweight and obese subjects, those with high blood pressure, and those who are illiterate was significantly greater ($p<0.05$) than among respondents that did not have diabetes (Table 4).

The proportion of individuals with optimal blood pressure, LDL cholesterol levels within normal limits, total cholesterol less than 200 mg/dl, HDL cholesterol within the range of protection, and triglycerides lower than 150 mg/dl was lower among subjects with diabetes than without diabetes (Table 4). With the exception of HDL cholesterol concentration, there were statistically significant differences in these variables in the subjects with and without diabetes.

Table 4. Characteristics of the population with diabetes

Characteristics	Diabetes				Total		P
	Yes		No				
	%	95%CI	%	95%CI	Prevalence	95%CI	
Employment							
Unpaid	29.2	(21.1–38.8)	28.1	(25.2–31.2)	28.2	(25.4–31.2)	0.8242
Paid	70.8	(61.2–78.9)	71.9	(68.8–74.8)	71.8	(68.8–74.6)	
Literacy status							
Illiterate	31.7	(23.5–41.2)	13.8	(11.8–16.0)	15.3	(13.3–17.5)	<0.0001
Literate	68.3	(58.8–76.5)	86.2	(83.9–88.2)	84.7	(82.5–86.7)	
Smoking habit							
Current smoker	21.1	(12.9–32.7)	16.0	(13.3–19.2)	16.5	(13.8–19.5)	0.0037
Former smoker	22.7	(15.0–32.9)	11.0	(8.9–13.5)	11.9	(9.9–14.4)	
Never smoked	56.2	(45.3–66.5)	73.0	(69.5–76.2)	71.6	(68.2–74.7)	
Physical activity							
Sedentary (<60 min/wk)	55.0	(44.5–65.1)	49.9	(46.4–53.5)	50.4	(46.9–53.7)	0.4895
Insufficient (60–149 min/wk)	27.1	(18.9–37.2)	27.0	(23.9–30.4)	27.1	(24.1–30.2)	
Active (>150 min/wk)	17.9	(11.6–26.4)	23.1	(20.2–26.1)	22.5	(19.9–25.5)	
BMI							
Normal	22.4	(14.3–33.1)	46.3	(42.5–50.1)	44.6	(41–48.3)	0.0001
Overweight	46.8	(35.5–58.6)	37.3	(33.7–41.1)	37.9	(34.5–41.6)	
Obesity	30.8	(21.9–41.4)	16.4	(13.9–19.2)	17.5	(14.9–20.1)	
Ethnic group							
Indigenous	0.7	(0.1–4.8)	3.6	(2.5–5.2)	3.4	(2.3–4.8)	0.1509
Mixed–race	99.3	(95.2–99.9)	96.3	(94.7–97.4)	96.5	(95.1–97.6)	
Other	0.0	(0)	0.1	(0.0–0.4)	0.1	(0.2–0.4)	

Table 4. (continued)

Characteristics	Diabetes				Total		P
	Yes		No				
	%	95%CI	%	95%CI	Prevalence	95%CI	
Waist circumference							
Risk	49.7	(39.3–60.2)	39.2	(35.9–42.6)	40.1	(36.9–43.4)	0.0585
No risk	50.3	(39.8–60.7)	60.8	(57.4–64.1)	59.9	(56.6–63.1)	
Blood Pressure							
Known hypertension	26.5	(19.2–35.4)	5.6	(4.4–7.0)	7.3	(6.1–8.8)	<0.0001
New hypertension	12.3	(7.1–20.4)	4.8	(3.6–6.4)	5.5	(4.2–7.0)	
Prehypertension	5.9	(2.3–14.5)	6.8	(4.9–9.2)	6.7	(5.0–8.9)	
Normal blood pressure	15.7	(9.2–25.6)	15.6	(13–18.5)	15.6	(13.1–18.4)	
Optimal blood pressure	39.5	(29.5–50.3)	67.2	(63.7–70.5)	64.9	(61.6–68.2)	
LDL cholesterol							
<130 mg/dl	69.6	(57.4–79.5)	81.9	(78.8–84.6)	80.9	(78–83.6)	0.0161
130–159 mg/dl	16.8	(9.5–27.8)	12.6	(10.3–15.3)	12.9	(10.7–15.5)	
≥160 mg/dl	13.6	(7.2–24.4)	5.5	(4.0–7.5)	6.2	(4.6–8.1)	
Total cholesterol							
<200 mg/dl	48.7	(37.4–60.1)	66.8	(63.2–70.3)	65.5	(62.1–68.7)	0.0011
200–239 mg/dl	27.2	(18.5–40.5)	24.4	(21.0–28.0)	24.6	(21.3–28.3)	
≥240 mg/dl	23.1	(3.4–14.8)	8.8	(6.8–11.3)	9.9	(7.9–12.2)	
HDL cholesterol							
<40 mg/dl	26.8	(16–41.2)	21.9	(18.4–25.8)	22.2	(18.7–26.2)	0.4099
40–59 mg/dl	65.9	(51.9–77.7)	66.3	(62.6–69.9)	66.3	(62.7–69.7)	
>60 mg/dl	7.2	(3.5–14.8)	11.8	(9.5–14.6)	11.5	(9.2–14.1)	
Triglycerides							
<150 mg/dl	23.8	(15.9–33.9)	48.7	(45.1–52.3)	46.8	(43.6–50.4)	0.0001
≥150 mg/dl	76.2	(66.0–84.1)	51.3	(47.7–54.9)	53.2	(49.9–56.4)	

The percentage of men with hypertension was greater among those who had diabetes than among those who did not ($p<0.05$). The percentage of men with paid employment was very similar in those with and without diabetes. The proportion of participants who smoked, were sedentary, pre–obese, had a waist circumference of risk, and high cholesterol levels was greater in men with diabetes than in those without diabetes (Table 5a).

Table 5a. Characteristics of the surveyed population (men) by presence of diabetes

Characteristics	Diabetes		P
	Yes	No	
Employment			
Unpaid	13.0	10.0	0.574
Paid	87.0	90.0	
Illiterate			
Yes	17.6	9.0	0.1264
No	82.4	91.0	

Table 5a. (continued)

Characteristics	Diabetes		P
	Yes	No	
Smoking habit			
Current smoker	32.5	28.0	
Former smoker	33.5	19.0	0.0862
Never smoked	34.0	53.0	
Physical activity			
Sedentary (<60 min/wk)	63.4	55.2	
Insufficient (60–149 min/wk)	26.1	26.1	0.4299
Active (>150 min/wk)	10.5	18.7	
BMI			
Normal	28.0	50.8	
Overweight	60.0	37.2	0.105
Obesity	12.0	12.0	
Ethnic group			
Indigenous	0.0	4.3	
Mixed–race	100.0	95.6	0.3838
Other	0.0	0.1	
Waist circumference			
Risk	18.6	10.0	0.1209
No risk	81.4	90.0	
Blood pressure			
Known hypertension	19.3	3.2	
New hypertension	13.4	6.4	
Prehypertension	5.7	11.1	0.0015
Normal blood pressure	16.8	22.5	
Optimal blood pressure	44.7	56.8	
LDL cholesterol			
<130 mg/dl	69.3	81.1	
130–159 mg/dl	17.6	12.6	0.3061
≥160 mg/dl	13.1	6.3	
Total cholesterol			
<200 mg/dl	49.8	63.1	
200–239 mg/dl	26.4	27.6	0.0522
≥240 mg/dl	23.8	9.3	
HDL cholesterol			
<40 mg/dl	37.3	25.8	
40–59 mg/dl	59.0	68.2	0.3137
≥60 mg/dl	3.7	6.0	
Triglycerides			
<150 mg/dl	24.9	41.6	0.0667
≥150 mg/dl	75.1	58.4	

In the populations of women with diabetes and without diabetes, there were statistically significant differences in the distribution of certain risk factors, such as illiteracy, smoking habit, obesity, waist circumference, blood pressure, LDL cholesterol, total cholesterol, and triglycerides (Table 5b).

Table 5b. Characteristics of the surveyed population (women) by presence of diabetes

Characteristics	Diabetes		P
	Yes	No	
Employment			
Unpaid	48.8	45.1	0.4842
Paid	51.2	54.9	
Illiterate			
Yes	48.8	18.2	0.0001
No	51.2	81.8	
Smoking habit			
Current smoker	7.3	4.7	0.0431
Former smoker	9.7	3.4	
Never smoked	83.0	91.9	
Physical activity			
Sedentary (<60 min/wk)	45.0	45.0	0.9941
Insufficient (60–149 min/wk)	28.4	27.9	
Active (>150 min/wk)	26.6	27.1	
BMI			
Normal	17.7	42.5	<0.0001
Overweight	35.9	37.4	
Obesity	46.4	20.1	
Ethnic group			
Indigenous	1.6	3.0	0.7567
Mixed–race	98.4	96.9	
Other	0.0	0.1	
Waist circumference			
Risk	87.4	66.8	0.0002
No risk	12.6	33.2	
Blood pressure			
Known hypertension	35.2	7.8	<0.0001
New hypertension	11.0	3.4	
Prehypertension	6.3	2.7	
Normal blood pressure	14.4	9.1	
Optimal blood pressure	33.1	77.0	
LDL cholesterol			
<130 mg/dl	69.9	82.6	0.0065
130–159 mg/dl	15.7	12.6	
≥160 mg/dl	14.4	4.8	

Table 5b. (continued)

Characteristics	Diabetes		P
	Yes	No	
Total cholesterol			
<200 mg/dl	47.1	70.6	0.0002
200–239 mg/dl	30.7	21.1	
≥240 mg/dl	22.2	8.3	
HDL cholesterol			
<40 mg/dl	12.2	18.0	0.3238
40–59 mg/dl	75.6	64.5	
≥60 mg/dl	12.2	17.5	
Triglycerides			
<150 mg/dl	22.2	55.7	<0.0001
≥150 mg/dl	77.8	44.3	

Table 6. Prevalence (%) of diabetes, hypertension, overweight (BMI≥25) and high cholesterol (≥200 mg/dl) by age and sex.

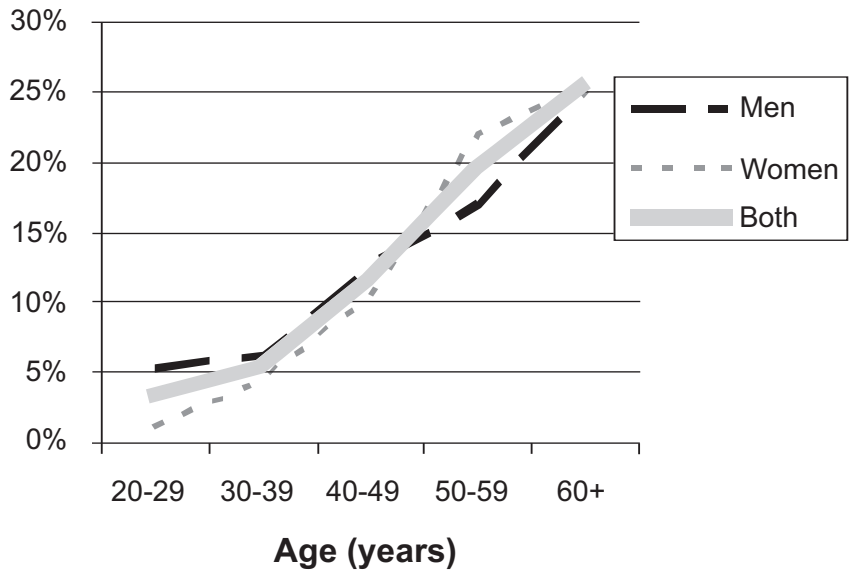
Age Group	Sex		
	Men	Women	Both
Diabetes			
20–29	4.4	0.6	2.2
30–39	5.6	4.6	5.1
40–49	7.4	11.2	9.4
50–59	20.9	22.4	21.7
60+	23.7	25.4	24.6
Total	8.8	7.7	8.2
Hypertension			
20–29	4.3	1.7	2.9
30–39	6.7	9.0	7.9
40–49	14.3	19.3	16.8
50–59	32.8	39.0	36.0
60+	47.8	56.0	51.9
Total	12.7	14.4	13.6
Overweight			
20–29	42.4	47.9	45.7
30–39	63.0	69.2	66.3
40–49	61.4	79.6	70.9
50–59	69.1	85.3	78.0
60+	44.6	63.3	54.3
Total	55.1	64.2	60.1
High cholesterol			
20–29	3.2	4.4	3.9
30–39	15.0	4.9	9.8
40–49	15.7	13.3	14.5

Table 6. (continued)

Age Group	Sex		
	Men	Women	Both
High cholesterol (continued)			
50–59	17.3	17.3	17.3
60+	16.0	27.0	21.4
Total	11.9	9.1	10.4

The prevalence of diabetes increased with age in both men and women. The prevalence of diabetes was higher in men than in women under the age of 40 years, higher in women from 40 to 59 years of age, and similar in both sexes after 60 years of age. The total prevalence was higher in men than in women (Figure 1, Table 6).

Figure 1. Prevalence of diabetes, by age and sex.



Among the participants with hypertension, a greater proportion did not have paid work, were illiterate, and were either overweight or obese (Table 7).

The proportion of nonsmokers was smaller in the group of subjects who had hypertension, which was due to a greater proportion of former smokers in this group compared to the group without hypertension (Table 7).

A larger proportion of participants with hypertension had LDL cholesterol, total cholesterol, and HDL cholesterol values considered of risk than the group without hypertension (Table 7).

Table 7. Characteristics of the population with hypertension

Characteristics	Hypertension				Total		P
	Yes		No				
	%	95%CI	%	95%CI	Prevalence %	95%CI	
Employment							
Unpaid	29.1	(23.3–35.7)	28.0	(24.6–31.8)	28.2	(25.1–31.5)	0.7652
Paid	70.9	(64.3–76.7)	72.0	(68.2–75.4)	71.8	(68.5–74.9)	
Literacy status							
Illiterate	33.4	(26.1–41.6)	12.5	(9.3–16.3)	15.3	(12.2–18.9)	<0.0001
Literate	66.6	(59.4–73.9)	87.5	(83.6–90.6)	84.7	(81.0–87.5)	
Smoking habit							
Current smoker	9.0	(4.7–16.7)	17.6	(14.4–21.3)	16.5	(13.5–19.8)	0.003
Former smoker	23.4	(16.1–32.5)	10.2	(7.8–13.0)	11.9	(9.5–14.8)	
Never smoked	67.6	(58.7–75.1)	72.2	(68.0–76.1)	71.6	(67.7–75.1)	
Physical activity							
Sedentary (<60 min/wk)	47.6	(40.5–54.7)	50.8	(45.5–55.8)	50.4	(45.5–55.2)	0.5780
Insufficient (60–149 min/wk)	27.3	(21.8–34.0)	27.0	(23.7–30.5)	27.0	(23.9–30.3)	
Active (>150 min/wk)	25.1	(18.6–32.9)	22.2	(18.7–26.0)	22.6	(19.1–26.3)	
BMI							
Normal	29.2	(23.3–35.8)	47.2	(41.0–48.2)	44.6	(41.0–48.2)	0.0001
Overweight	42.8	(35.5–50.2)	37.2	(34.6–41.3)	37.9	(34.6–41.3)	
Obesity	28.0	(21.9–35.0)	15.6	(14.5–20.7)	17.5	(14.5–20.7)	
Ethnic group							
Indigenous	5.3	(1.9–13.8)	3.0	(1.7–5.2)	3.4	(2.0–5.4)	0.0517
Mixed–race	94.0	(86.0–97.5)	97.0	(94.7–98.2)	96.5	(94.4–97.8)	
Other	0.7	(0.1–2.8)	0.0	(0)	0.1	(0.2–0.3)	
Waist circumference							
Risk	59.8	(52.0–67.0)	37.0	(33.4–40.7)	40.1	(36.7–43.5)	<0.0001
No risk	40.2	(32.9–48.0)	63.0	(59.2–66.6)	59.9	(56.4–63.2)	
LDL cholesterol							
<130 mg/dl	73.8	(61.2–83.3)	82.0	(78.3–85.1)	80.9	(77.0–84.3)	0.0395
130–159 mg/dl	14.3	(8.5–23.0)	12.7	(9.9–16.1)	12.9	(10.1–16.2)	
≥160 mg/dl	11.9	(6.7–20.0)	5.3	(3.6–7.7)	6.2	(4.4–8.3)	
Total cholesterol							
<200 mg/dl	47.9	(38.2–57.5)	68.2	(64.6–71.4)	65.5	(62.0–68.7)	<0.0001
200–239 mg/dl	31.0	(23.9–39.2)	23.7	(20.2–27.4)	24.6	(21.3–28.3)	
≥240 mg/dl	21.1	(14.5–29.5)	8.1	(6.3–10.5)	9.9	(7.9–12.2)	
HDL cholesterol							
<40 mg/dl	20.3	(14.1–28.4)	22.6	(18.8–26.7)	22.3	(18.7–26.2)	0.5921
40–59 mg/dl	66.2	(58.8–72.7)	66.3	(62.3–70.0)	66.3	(62.7–69.7)	
≥60 mg/dl	13.5	(9.4–18.9)	11.1	(8.7–14.0)	11.4	(9.2–14.1)	
Triglycerides							
<150 mg/dl	26.8	(21.0–33.3)	49.9	(46.2–53.5)	46.8	(43.5–50.0)	<0.0001
≥150 mg/dl	73.2	(66.7–78.9)	50.1	(46.5–53.7)	53.2	(49.9–56.4)	

Men with hypertension had a statistically significant higher prevalence of illiteracy, smoking, obesity or overweight, waist circumference of risk, diabetes mellitus, and total cholesterol and triglyceride levels classified as of risk than men without hypertension (Table 8a).

Table 8a. Characteristics of the surveyed population (men) by presence of hypertension

Characteristics	Hypertension		P
	Yes	No	
Employment			
Unpaid	8.2	10.6	0.5953
Paid	91.8	89.4	
Illiterate			
Yes	20.7	8.3	0.0128
No	79.3	91.7	
Smoking habit			
Current smoker	14.3	30.6	0.0015
Former smoker	42.6	17.1	
Never smoked	43.1	52.3	
Physical activity			
Sedentary (<60 min/wk)	50.2	56.8	0.5893
Insufficient (60–149 min/wk)	30.1	25.6	
Active (>150 min/wk)	19.7	17.6	
BMI			
Normal	33.2	51.7	0.0159
Overweight	44.2	37.9	
Obesity	22.6	10.4	
Ethnic group			
Indigenous	8.8	3.1	0.0781
Mixed–race	90.4	96.9	
Other	0.8	0.0	
Waist circumference			
Risk	29.9	7.9	0.0001
No risk	70.1	92.1	
Diabetes mellitus			
No	75.0	92.9	0.0001
Yes	25.0	7.1	
LDL cholesterol			
<130 mg/dl	70.0	81.4	0.1741
130–159 mg/dl	15.8	12.6	
≥160 mg/dl	14.2	6.0	
Total cholesterol			
<200 mg/dl	46.3	64.2	0.0007
200–239 mg/dl	26.4	27.7	
≥240 mg/dl	27.3	8.1	
HDL cholesterol			
<40 mg/dl	27.7	26.7	0.2273
40–59 mg/dl	61.7	68.3	
≥60 mg/dl	10.6	5.0	

Table 8a. (continued)

Characteristics	Hypertension		P
	Yes	No	
Triglycerides			
<150 mg/dl	20.6	43.0	0.003
≥150 mg/dl	79.4	57.0	

Women with hypertension had a significantly higher prevalence of illiteracy, overweight or obesity, waist circumference classified as a risk, diabetes mellitus, and elevated total cholesterol and triglyceride levels than women without hypertension (Table 8b).

Table 8b. Characteristics of the surveyed population (women) by presence of hypertension

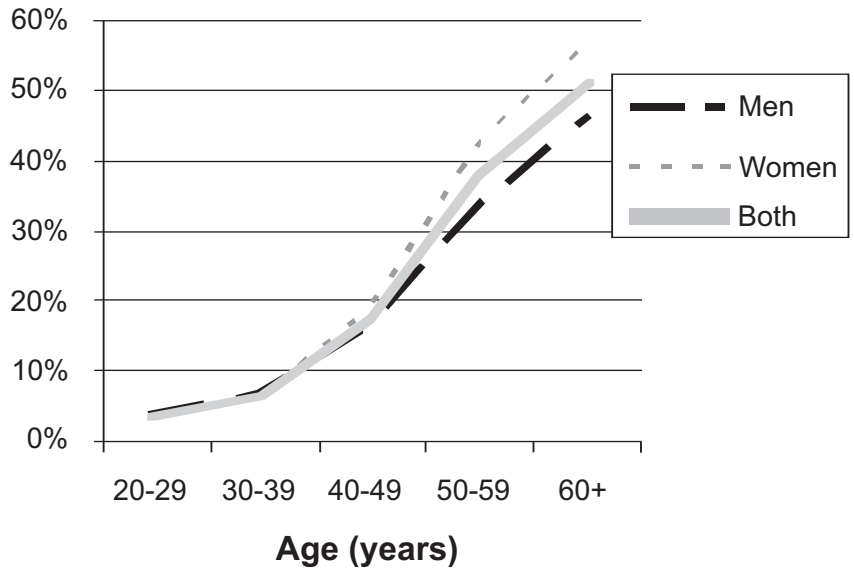
Characteristics	Hypertension		P
	Yes	No	
Employment			
Unpaid	46.6	45.1	0.7523
Paid	53.4	54.9	
Illiterate			
Yes	44.1	16.6	<0.0001
No	55.9	83.4	
Smoking habit			
Current smoker	4.9	4.8	0.1247
Former smoker	7.3	3.4	
Never smoked	87.8	91.8	
Physical activity			
Sedentary (<60 min/wk)	45.4	44.9	0.6562
Insufficient (60–149 min/wk)	25.0	28.4	
Active (>150 min/wk)	29.6	26.7	
BMI			
Normal	26.1	43.3	0.0019
Overweight	41.6	36.5	
Obesity	32.3	20.2	
Ethnic group			
Indigenous	2.5	3.0	0.0806
Mixed–race	97.0	97.0	
Other	0.5	0.0	
Waist circumference			
Risk	84.8	65.5	0.0003
No risk	15.2	34.5	
Diabetes mellitus			
No	76.4	95.3	<0.0001
Yes	23.6	4.7	
LDL cholesterol			
<130 mg/dl	77.0	82.5	0.0620
130–159 mg/dl	13.0	12.8	
≥160 mg/dl	10.0	4.7	

Table 8b. (continued)

Characteristics	Hypertension		P
	Yes	No	
Total cholesterol			
<200 mg/dl	49.3	72.2	<0.0001
200–239 mg/dl	35.4	19.5	
≥240 mg/dl	15.3	8.3	
HDL cholesterol			
<40 mg/dl	13.4	18.3	0.4006
40–59 mg/dl	70.4	64.4	
≥60 mg/dl	16.2	17.3	
Triglycerides			
<150 mg/dl	32.6	56.9	0.0001
≥150 mg/dl	67.4	43.1	

The prevalence of hypertension increased with age. After 40 years of age, the prevalence of hypertension was higher in women than in men (Figure 2, table 6).

Figure 2. Prevalence of Hypertension, by age and sex.



Overweight people had a significantly higher prevalence of waist circumferences of risk and elevated total cholesterol and triglyceride levels than people with normal weight (Table 9).

Table 9. Characteristics of the overweight population

Characteristics	Normal		Overweight		Total		P
	%	95%CI	%	95%CI	Prevalence %	95%CI	
Employment							
Unpaid	30.4	(26.3-34.6)	28.2	(23.4-33.5)	29.1	25.8–32.6	0.5080
Paid	69.6	(65.42-73.47)	71.8	(66.5-76.6)	70.9	67.4–74.2	
Literacy status							
Illiterate	14.1	(9.5-20.4)	16.7	(13.1-21.2)	15.7	(12.3-19.7)	0.3220
Literate	85.9	(79.6-90.5)	83.3	(78.8-86.9)	84.3	(80.3-87.7)	
Smoking habit							
Current smoker	16.3	(11.8-22.1)	16.0	(12.7-20.0)	16.2	13.2–19.6	0.9086
Former smoker	10.3	(6.7-15.6)	11.4	(8.2-15.6)	10.9	8.2–14.5	
Never smoked	73.4	(66.4-79.3)	72.6	(67.7-76.9)	72.9	68.8–76.6	
Physical activity							
Sedentary (<60 min/wk)	50.2	(43.0-57.3)	49.8	(43.8-55.8)	49.9	45.1–54.8	0.9627
Insufficient (60–149 min/wk)	26.9	(21.7-33.0)	27.7	(23.0-32.9)	27.4	24.1–30.9	
Active (>150 min/wk)	22.9	(18.6-27.8)	22.5	(18.7-27.0)	22.7	19.3–26.6	
Ethnic group							
Indigenous	4.0	(1.8-8.5)	3.2	(1.7–5.8)	3.5	2.1–5.8	0.7441
Mixed–race	95.8	(91.3–98.1)	96.7	(94.1–98.2)	96.4	94.1–97.8	
Other	0.2	(0.02-1.1)	0.1	(0.01-0.7)	0.1	0.0–0.5	
Waist circumference							
Risk	14.3	(11.3-17.9)	62.3	(55.7-68.5)	42.9	39.3–46.6	<0.0001
No risk	85.7	(82.1-88.7)	37.7	(31.5-44.3)	57.1	53.4–60.7	
Blood pressure							
Yes	9.0	(6.6-12.1)	17.9	(14.2-22.3)	14.3	(11.8-17.2)	0.0002
No	91.0	(87.9-93.4)	82.1	(77.7-85.8)	85.7	(82.8-88.2)	
LDL cholesterol							
<130 mg/dl	85.0	(78.8-89.6)	79.2	(74.9-82.9)	81.6	77.5–85.0	0.0653
130–159 mg/dl	11.0	(7.4-16.1)	13.7	(10.4-17.7)	12.6	9.8–16.0	
≥160 mg/dl	4.0	(2.4-6.8)	7.0	(4.8-10.6)	5.8	4.0–8.3	
Total cholesterol							
<200 mg/dl	73.8	(68.2-78.7)	59.1	(54.4-63.7)	65.1	61.4–68.6	<0.0001
200–239 mg/dl	20.6	(16.1-26.0)	28.3	(23.5-33.6)	25.1	21.5–29.1	
≥240 mg/dl	5.6	(3.8-8.2)	12.6	(10.1-15.6)	9.8	7.7–12.2	
HDL cholesterol							
<40 mg/dl	15.7	(11.0-21.9)	24.8	(20.8–29.4)	21.1	17.4–25.3	0.0656
40–59 mg/dl	70.0	(64.2-75.2)	63.9	(59.3-68.3)	66.4	62.8–69.8	
≥60 mg/dl	14.3	(10.8-18.9)	11.3	(8.2-15.3)	12.5	10.1–15.5	
Triglycerides							
<150 mg/dl	63.1	(57.2-68.7)	33.5	(29.3-38.0)	45.6	(42.0-49.2)	<0.0001
≥150 mg/dl	36.9	(31.3-42.8)	66.5	(62.0-70.7)	54.4	(50.9-58.0)	

Overweight men had a significantly greater frequency of hypertension, waist circumference of risk, and high total cholesterol, HDL cholesterol and triglyceride levels than men with a normal BMI (Table 10a).

Table 10a. Characteristics of the surveyed population (men) by presence of overweight.

Characteristics	Weight		P
	Normal	Overweight	
Employment			
Unpaid	14.1	8.0	0.0862
Paid	85.9	92.0	
Illiterate			
Yes	10.3	9.1	0.7354
No	89.7	90.9	
Smoking habit			
Current smoker	26.9	32.1	0.2561
Former smoker	16.3	21.8	
Never smoked	56.8	46.1	
Physical activity			
Sedentary (<60 min/wk)	59.6	53.6	0.6622
Insufficient (60–149 min/wk)	25.3	26.9	
Active (>150 min/wk)	15.1	19.5	
Hypertension			
Yes	8.9	17.5	0.027
No	91.1	82.5	
Ethnic group			
Indigenous	6.2	2.9	0.3112
Mixed–race	93.6	97.1	
Other	0.2	0.0	
Waist circumference			
Risk	0.0	22.5	<0.0001
No risk	100.0	77.5	
Diabetes mellitus			
Yes	97.6	89.4	0.0042
No	2.4	10.6	
LDL cholesterol			
<130 mg/dl	85.7	75.3	0.0735
130–159 mg/dl	10.4	15.6	
≥160 mg/dl	3.9	9.1	
Total cholesterol			
<200 mg/dl	69.6	51.1	0.0014
200–239 mg/dl	25.5	32.4	
≥240 mg/dl	4.9	16.5	
HDL cholesterol			
<40 mg/dl	18.4	30.1	0.0481
40–59 mg/dl	72.1	65.1	
≥60 mg/dl	9.5	4.8	

Table 10a. (continued)

Characteristics	Weight		P
	Normal	Overweight	
Triglycerides			
<150 mg/dl	57.6	21.2	<0.0001
≥150 mg/dl	42.4	78.8	

Overweight women (BMI≥25) had a significantly greater frequency of hypertension, diabetes mellitus, waist circumference of risk, and high total cholesterol and triglyceride levels than women with a normal BMI (Table 10b).

Table 10b. Characteristics of the surveyed population (women) by presence of overweight.

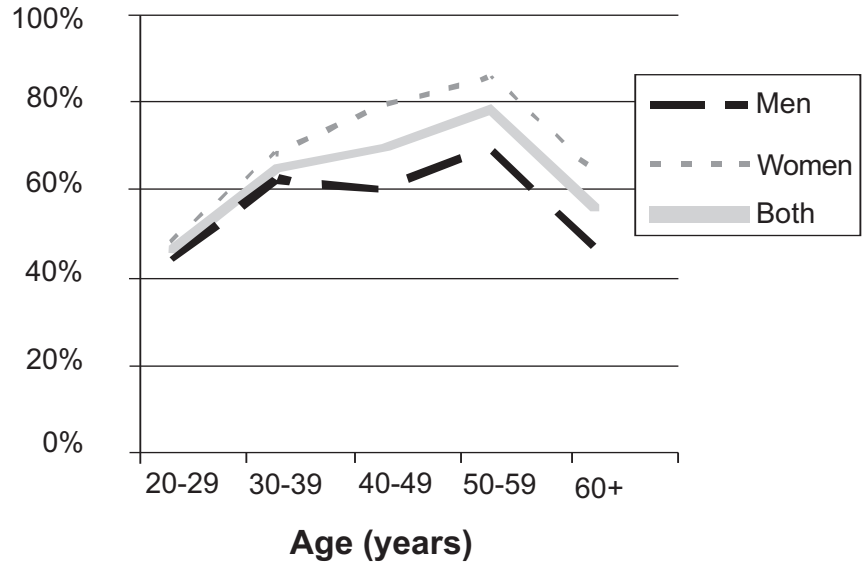
Characteristics	Weight		P
	Normal	Overweight	
Employment			
Unpaid	47.7	42.8	0.3498
Paid	52.3	57.2	
Illiterate			
Yes	18.1	22.3	0.3332
No	81.9	77.7	
Smoking habit			
Current smoker	5.2	4.4	0.937
Former smoker	3.9	3.8	
Never smoked	90.9	91.8	
Physical activity			
Sedentary (<60 min/wk)	40.2	46.9	0.2109
Insufficient (60–149 min/wk)	28.7	28.2	
Active (>150 min/wk)	31.1	24.9	
Hypertension			
Yes	9.1	18.2	0.0022
No	90.9	81.8	
Ethnic group			
Indigenous	1.7	3.5	0.366
Mixed–race	98.3	96.4	
Other	0.0	0.1	
Waist circumference			
Risk	29.4	91.3	<0.0001
No risk	70.6	8.7	
Diabetes mellitus			
Yes	97.4	90.5	0.0001
No	2.6	9.5	

Table 10b. (continued)

Characteristics	Weight		P
	Normal	Overweight	
LDL cholesterol			
<130 mg/dl	84.1	82.0	0.6473
130–159 mg/dl	11.7	12.3	
≥160 mg/dl	4.2	5.7	
Total cholesterol			
<200 mg/dl	78.5	65.4	0.0021
200–239 mg/dl	15.2	25.0	
≥240 mg/dl	6.3	9.6	
HDL cholesterol			
<40 mg/dl	12.6	20.7	0.0847
40–59 mg/dl	67.5	63.1	
≥60 mg/dl	19.9	16.2	
Triglycerides			
<150 mg/dl	69.3	43.1	<0.0001
≥150 mg/dl	30.7	56.9	

The prevalence of overweight increased with age up to 59 years, and then decreased in both sexes. Overweight was more prevalent in women in all age groups than in men (Figure 3, table 6).

Figure 3. Prevalence of over weight (BMI ≥ 25), by age and sex.



Participants with high cholesterol levels were significantly more often employed, pre–obese or obese, and had high LDL cholesterol and triglyceride levels than those with normal cholesterol levels (Table 11).

Table 11. Characteristics of the population with high cholesterol

Characteristics	High cholesterol				Total		P
	Yes		No				
	%	95%CI	%	95%CI	Prevalence %	95%CI	
Employment							
Unpaid	20.1	(13.7–28.6)	28.5	(25.1–32.1)	27.6	(24.3–31.3)	0.0363
Paid	79.9	(71.4–86.4)	71.5	(67.9–74.9)	72.4	(68.7–75.7)	
Literacy status							
Illiterate	16.6	(10.5–25.2)	15.3	(11.9–19.2)	15.4	(12.3–19.2)	0.7145
Literate	83.4	(74.8–89.5)	84.7	(80.8–88.0)	84.6	(80.8–87.8)	
Smoking habit							
Current smoker	12.6	(6.4–23.5)	17.2	(13.8–21.1)	16.8	(13.7–20.3)	0.1045
Former smoker	20.1	(13.0–29.6)	11.7	(9.2–14.7)	12.5	(9.9–15.6)	
Never smoked	67.3	(54.8–77.7)	71.1	(66.9–74.9)	70.7	(66.8–74.3)	
Physical activity							
Sedentary (<60 min/wk)	56.7	(44.5–68.0)	49.7	(44.4–55.0)	50.4	(45.3–55.5)	0.4524
Insufficient (60–149 min/wk)	22.5	(15.0–32.3)	27.0	(23.5–30.6)	26.5	(23.3–29.9)	
Active (>150 min/wk)	20.8	(13.2–30.9)	23.3	(19.7–27.3)	23.1	(19.5–27.0)	
BMI							
Normal	24.6	(17.8–32.8)	47.1	(43.3–50.7)	44.9	(41.0–48.7)	0.0005
Overweight	55.5	(44.3–66.0)	36.9	(33.4–40.4)	38.7	(35.2–42.2)	
Obesity	19.9	(12.6–30.1)	16.0	(13.1–19.4)	16.4	(13.7–19.5)	
Ethnic group							
Indigenous	6.1	(2.3–15.7)	3.1	(1.8–5.1)	3.4	(2.0–5.5)	0.2044
Mixed–race	93.9	(84.3–97.6)	96.8	(94.6–98.0)	96.5	(94.2–97.8)	
Other	0.0	(0.0)	0.1	(0.0–0.4)	0.1	(0.0–0.4)	
Waist circumference							
Risk	47.5	(37.3–57.8)	37.9	(34.6–41.3)	38.9	(35.6–42.3)	0.0677
No risk	52.5	(42.1–62.6)	62.1	(58.6–65.3)	61.1	(57.7–64.4)	
LDL cholesterol							
<130 mg/dl	3.9	(1.4–9.8)	88.2	(77.0–91.1)	80.9	(77.0–84.3)	<0.0001
130–159 mg/dl	29.9	(21.6–39.9)	11.3	(8.6–14.7)	12.9	(10.1–16.2)	
≥160 mg/dl	66.2	(56.0–75.0)	0.5	(0.1–1.4)	6.2	(4.4–8.3)	
HDL cholesterol							
<40 mg/dl	18.0	(9.8–30.6)	22.7	(19.0–26.9)	22.3	(18.7–26.2)	0.0077
40–59 mg/dl	59.1	(47.3–69.8)	67.1	(63.6–70.6)	66.3	(62.7–69.7)	
≥60 mg/dl	22.9	(15.3–32.7)	10.2	(8.0–12.8)	11.4	(9.2–14.1)	
Triglycerides							
<150 mg/dl	21.2	(12.9–32.7)	49.6	(46.1–53.0)	46.8	(43.5–50.0)	<0.0001
≥150 mg/dl	78.8	(67.3–87.0)	50.4	(46.9–53.8)	53.2	(49.9–56.4)	

Men with high total cholesterol levels had a greater frequency of overweight or obesity, diabetes mellitus, hypertension, and high LDL cholesterol and triglyceride concentrations than men with normal cholesterol levels. These differences were statistically significant (Table 12a).

Table 12a. Characteristics of the surveyed population (men) by presence of high cholesterol

Characteristics	High cholesterol		P
	Yes	No	
Employment			
Unpaid	3.4	10.6	0.087
Paid	96.6	89.4	
Literacy status			
Illiterate	5.9	10.7	0.4564
Literate	94.1	89.3	
Smoking habit			
Current smoker	19.4	29.5	0.1687
Former smoker	32.9	19.4	
Never smoked	47.7	51.1	
Physical activity			
Sedentary (<60 min/wk)	52.5	56.6	0.6951
Insufficient (60–149 min/wk)	31.4	24.8	
Active (>150 min/wk)	16.1	18.6	
BMI			
Normal	19.9	52.8	0.0008
Overweight	70.3	35.4	
Obese	9.8	11.8	
Ethnic group			
Indigenous	7.6	3.6	0.3832
Mixed–race	92.4	96.3	
Other	0.0	0.1	
Waist circumference			
Risk	18.4	9.8	0.1036
No risk	81.6	90.2	
Diabetes mellitus			
No	80.3	92.5	0.0284
Yes	19.7	7.5	
Blood pressure			
Known hypertension	13.5	3.5	0.0211
New hypertension	14.8	6.5	
Prehypertension	12.5	10.7	
Normal blood pressure	15.4	22.4	
Optimal blood pressure	43.8	56.9	
LDL Cholesterol			
<130 mg/dl	4.6	87.1	<0.0001
130–159 mg/dl	18.4	12.5	
160 mg/dl	77.0	0.4	

Table 12a. (continued)

Characteristics	High cholesterol		P
	Yes	No	
HDL cholesterol			
<40 mg/dl	24.0	27.1	0.6178
40–59 mg/dl	66.8	67.5	
≥60 mg/dl	9.2	5.4	
Triglycerides			
<150 mg/dl	17.3	42.8	0.0346
≥150 mg/dl	82.7	57.2	

Women with high total cholesterol levels had a greater frequency of sedentary lifestyle, waist circumference of risk, diabetes mellitus, hypertension, and high LDL cholesterol, HDL cholesterol, and triglyceride concentrations. These differences were statistically significant (Table 12b).

Table 12b. Characteristics of the surveyed population (women) by presence of high cholesterol

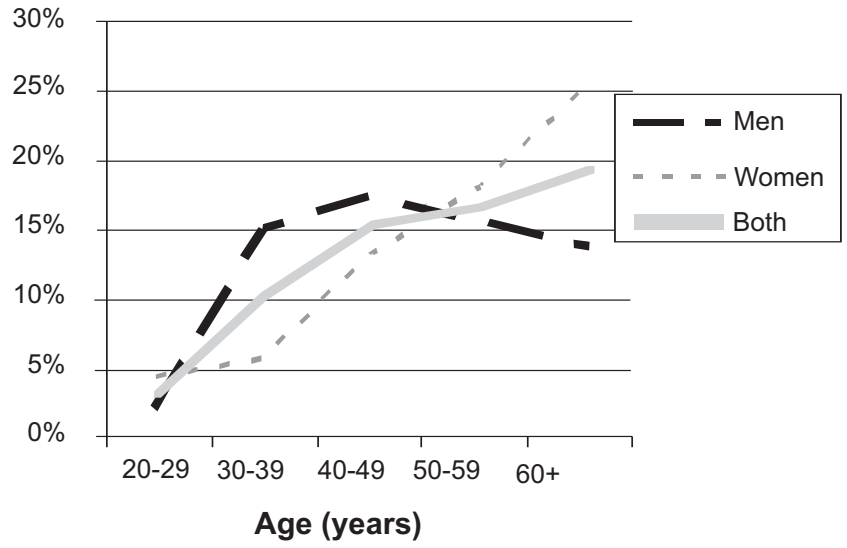
Characteristics	High cholesterol		P
	Yes	No	
Employment			
Unpaid	39.5	46.3	0.228
Paid	60.5	53.7	
Literacy status			
Illiterate	28.9	19.8	0.0728
Literate	71.1	80.2	
Smoking habit			
Current smoker	4.9	5.0	0.9279
Former smoker	5.2	3.9	
Never smoked	89.9	91.1	
Physical activity			
Sedentary (<60 min/wk)	61.6	42.8	0.0095
Insufficient (60–149 min/wk)	12.2	29.2	
Active (>150 min/wk)	26.2	28.0	
BMI			
Normal	30.1	42.1	0.0705
Overweight	37.8	38.2	
Obese	32.1	19.7	
Ethnic group			
Indigenous	4.6	2.6	0.5797
Mixed–race	95.4	97.3	
Other	0.0	0.1	
Waist circumference			
Risk	81.2	66.0	0.0008
No risk	18.8	34.0	
Diabetes mellitus			
No	84.5	94.5	0.0015
Yes	15.5	5.5	

Table12b. (continued)

Characteristics	High cholesterol		P
	Yes	No	
Blood pressure			
Known hypertension	19.0	7.8	0.0001
New hypertension	5.8	3.9	
Prehypertension	4.1	2.7	
Normal blood pressure	19.2	8.5	
Optimal blood pressure	51.9	77.1	
LDL cholesterol			
<130 mg/dl	3.2	89.2	<0.0001
130–159 mg/dl	41.0	10.2	
≥160 mg/dl	55.8	0.6	
HDL cholesterol			
<40 mg/dl	11.0	18.3	<0.0001
40–59 mg/dl	50.2	66.7	
≥60 mg/dl	38.8	15.0	
Triglycerides			
<150 mg/dl	25.7	56.4	<0.0001
≥150 mg/dl	74.3	43.6	

The prevalence of high cholesterol levels increased with age in women, but declined in men starting at 50 years of age. The prevalence of high total cholesterol levels was similar in men and women of all ages, but was higher in men than in women between 30 and 49 years of age, and higher in women than in men after 50 years of age (Figure 4, Table 6).

Figure 4. Prevalence of hypercholesterolemia, by age and sex.



Diabetes, hypertension, and hypercholesterolemia

More than 70% of all respondents (n=984) stated that they had never had their blood glucose level measured. Among the respondents who reported undergoing a blood glucose test (n=398), around 20% had undergone the test more than 2 years earlier. Of the respondents (n=80), 4.3% had diabetes diagnosed before the interview. Most of the diabetes diagnoses were made after 40 years of age (71%). Most of the subjects diagnosed previously (61.7%) had fasting blood sugar levels of 130 mg/dl or more. More than 90% of the people with diabetes had been prescribed medications; however, 32.3% stated that they never or almost never took them. Likewise, about 70% indicated that they had received instructions to follow a special diet, but 47.3% responded that they had never or almost never followed it. The situation was similar for instructions to lose weight, not drink alcohol, exercise, and take home remedies (Tables 13 a, b, c).

Table 13a. Diagnosis and control of diabetes

Have you ever had a blood glucose test?	%
Yes	24.6
No	74.3
I don't know	1.1
How long ago did you have a blood glucose test?	
Less than 6 months	38.1
Between 6 and 11 months	11.2
Between 1 and 2 years	30.5
More than 2 years	19.9
I don't know	0.3
Have you been told that you have diabetes?	
Yes	4.3
No	95.1
I don't know	0.6
Age at the time of diagnosis of diabetes	
<40 years	28.7
40 to 64 years	65.0
More than 65 years	6.3
Blood sugar control (fasting test)	
<130 mg/dl	38.3
≥130 mg/dl	61.7
Prescribed treatment[a]	
None	4.9
Drugs	93.2
Special diet	69.7
Lose weight	29.9
Do not drink alcohol	20.0
Exercise	28.9
Home remedies	13.8
Other	5.1

[a] Response categories are not mutually exclusive.

Table 13b. Compliance with diabetes treatment

Compliance with treatment	%
Do you take drugs?	
Never or almost never	32.3
Always or almost always	61.2
Sometimes	6.5
Do you follow a special diet?	
Never or almost never	47.3
Always or almost always	28.7
Sometimes	24.0
Are you trying to lose weight?	
Never or almost never	57.9
Always or almost always	21.4
Sometimes	20.7
Do you follow recommendations to not drink?	
Never or almost never	72.3
Always or almost always	14.2
Sometimes	13.5
Do you follow recommendations to exercise?	
Never or almost never	67.4
Always or almost always	21.2
Sometimes	11.4
Do you take home remedies?	
Never or almost never	59.2
Always or almost always	20.1
Sometimes	20.7

Table 13c. Access of people with diabetes to services and treatment

Where is your diabetes controlled?	%
Public hospital	18.5
Social Security	17.5
Private doctor	38.1
Clinical laboratory	4.1
Family member or friend	1.1
Self control	2.8
Other	4.0
None	14.6
Preventive care [a]	
HbA1c has been measured at least once (last 12 months)	7.6
Foot examination (last 12 months)	27.1
Eye examination (last 24 months)	30.0

[a] Response categories are not mutually exclusive.

Table 13c. (continued)

Number of visits (last 12 months)	%
None	38.1
1 to 2	20.8
3 or more	41.1
Can you find drugs? [b]	
Can't find them	2.1
Yes, always	80.8
Yes, but not easily	13.9
Yes, but with a great deal of difficulty	3.3
Do you usually have money to buy drugs? [a]	
No	3.1
Yes, always	48.3
Yes. but not easily	23.8
Yes, but with a great deal of difficulty	24.8
Type of diabetes treatment	
Oral hypoglycemic agents	58.3
Insulin	8.2
Oral hypoglycemic agents + insulin	2.0
Diet alone	5.4
None	26.1
Medication[a]	
Sulfonylureas	56.4
Metformin	11.0
Insulin	10.2
Other (thiazolidinedione. meglitinide)	2.3

[a] Response categories are not mutually exclusive.

[b] People who did not report drug treatment are excluded.

Of all the respondents (n=99), 9.0% stated that their blood pressure had never been taken. Of those who reported that their blood pressure had been measured (n=1291), around one–fourth had it taken more than two years earlier. Of the respondents, 10.6% had been diagnosed as having hypertension before the interview. Hypertension was diagnosed between 40 and 60 years of age in most of those respondents reporting it. More than half of the people diagnosed previously as having hypertension (51.2%) presented high blood pressure (140/90 or above). Only 6.1% of the subjects with hypertension had been instructed to take drugs; 46% stated that they never or almost never took them. About 28% said that they had received instructions to follow a low salt diet, but 37.9% responded that they never or almost never followed it. The proportion of people with hypertension who followed instructions to lose weight, not drink alcohol, exercise, avoid stress, and take home remedies was still smaller (Tables 14 a, b, c).

Table 14a. Diagnosis and control of hypertension

Has your blood pressure been taken?	%
No	9.0
Yes	90.4
I don't know	0.7
When was the last time your blood pressure was taken?	
<6 months	41.4
6 to 11 months	12.2
1 year 11 months	17.7
2 to 3 years	12.4
>3 years	15.9
I don't know	0.4
Do you have hypertension?	
Yes	7.2
No	92.8
Age at time of diagnosis of hypertension	
<40 years	27.3
40 to 64 years	60.8
More than 65 years	11.9
Control of blood pressure	
<140/90	48.2
>140/90	51.8
What treatment were you prescribed? [a]	
None	9.8
Drugs	6.1
Low–salt diet	27.5
Lose weight	19.3
Quit smoking	8.9
Do not drink alcohol	8.5
Exercise	21.2
Prevent stress	16.8
Home remedies	6.1
Other	10.3

[a] Response categories are not mutually exclusive.

Table 14b. Compliance with hypertension treatment

Compliance with treatment	%
Do you take drugs?	
Never or almost never	46.0
Always or almost always	50.5
Sometimes	3.5
Have you reduced your salt intake?	
Never or almost never	37.9
Always or almost always	44.5
Sometimes	17.6
Have you tried to lose weight?	
Never or almost never	65.0
Always or almost always	17.3
Sometimes	17.7
Have you followed recommendations to stop smoking?	
Never or almost never	89.2
Always or almost always	8.4
Sometimes	2.4
Do you follow recommendations to not drink?	
Never or almost never	85.0
Always or almost always	5.6
Sometimes	9.4
Do you follow recommendations to exercise?	
Never or almost never	68.6
Always or almost always	14.6
Sometimes	16.8
Do you follow recommendations to avoid stress?	
Never or almost never	52.3
Always or almost always	22.7
Sometimes	25.0
Do you follow recommendations to take home remedies?	
Never or almost never	72.5
Always or almost always	9.5
Sometimes	18.0

Table 14c. Access of people with hypertension to health services and treatment

Where is your hypertension controlled?	%
Public hospital, health post, or health center	5.6
Guatemalan Institute of Social Security (IGSS) or company medical officer	20.7
Private doctor/private clinic	18.7
Family member or friend	4.0
Other	2.3
None	48.8
Number of times you have visited the doctor (last 12 months)	
None	55.9
One or more	44.1
Can you find drugs? [a]	
Yes, always	47.6
Yes, but not easily	10.3
Yes, but with a great deal of difficulty	3.9
Can't find them	38.2
Do you usually have money to buy drugs? [a]	
Yes, always	31.0
Yes. but not easily	15.3
Yes, but with a great deal of difficulty	14.4
No	39.3
Medication by type [b]	
Diuretics	8.5
Beta–blockers	9.2
Angiotensin converting enzyme (ACE) inhibitors	35.5
Others	8.4
Type of treatment	
Diuretics	2.0
Beta–blockers	7.7
Angiotensin converting enzyme (ACE) inhibitors	29.9
Others	4.8
Drug combination	8.2
None	47.3

[a] People who did not report drug use are excluded.

[b] Response categories are not mutually exclusive.

Of the respondents, 84.3% (n=1148) stated that they had never undergone a cholesterol test. Among those who said that they had undergone a cholesterol test (n=237), fewer than 20% had done it more than two years earlier. Hypercholesterolemia was diagnosed in 5.2% of the respondents before the interview. Most diagnoses of hypercholesterolemia were made in patients 40 to 60 years of age. Only 3.5% of the people with hypercholesterolemia had been instructed to take drugs; 82.5% said that they never or almost never took them. Only 3% indicated that they had received instructions to follow a special diet, but 62.0% answered that they never or almost never followed it. The proportion of people with hypercholesterolemia who followed instructions to lose weight and exercise was 10% to 25%, respectively (Tables 15 a, b, c).

Table 15a. Diagnosis and control of hypercholesterolemia

Have you ever had a cholesterol test?	%
Yes	15.1
No	84.3
I don't know	0.6
The last time you had a cholesterol test	
<6 months	37.8
6 to 11 months	11.6
1 year 11 months	31.1
2 to 3 years	6.9
>3 years	10.6
I don't know	2.0
Do you have high cholesterol?	
Yes	5.2
No	94.3
I don't know	0.5
Age at time of diagnosis of high cholesterol levels	
<40 years	34.5
40 to 64 years	60.7
More than 65 years	4.8
What treatment were you prescribed? [a]	
None	0.6
Drugs	3.5
A special diet	3.0
Lose weight	0.7
Exercise	1.6
Home remedies	0.2
Other	0.2

[a] Response categories are not mutually exclusive

Table 15b. Compliance with hypercholesterolemia treatment

Compliance with treatment	%
Do you take drugs?	
Never or almost never	82.5
Always or almost always	12.6
Sometimes	4.9
Do you follow a special diet?	
Never or almost never	62.0
Always or almost always	17.6
Sometimes	20.4
Have you tried to lose weight?	
Never or almost never	74.1
Always or almost always	10.4
Sometimes	15.5
Have you followed recommendations to exercise?	
Never or almost never	62.0
Always or almost always	23.7
Sometimes	14.3
Have you followed recommendations to take home remedies?	
Never or almost never	94.4
Always or almost always	2.1
Sometimes	3.5

Table 15c. Access of people with hypercholesterolemia to health services and treatment

Where is your cholesterol controlled?	%
Public hospital, health post, or health center	5.6
Guatemalan Institute of Social Security (IGSS) or company medical officer	20.7
Private doctor/private clinic	18.7
Family member or friend	4.0
Other	2.3
None	48.8
Number of visits to the doctor (last 12 months)	
None	75.2
One or more times	24.8
Can you find drugs? [a]	
Yes, always	24.0
Yes, but not easily	2.5
Yes, but with a great deal of difficulty	–
Can't find them	73.5
Do you usually have money to buy drugs? [a]	
Yes, always	13.4
Yes, but not easily	9.5
Yes, but with a great deal of difficulty	5.0
No	72.1
Type of cholesterol treatment	
Statins	5.6
Fibrates	12.2
None	82.2

[a] People who did not report drug treatment are excluded.

Discussion

The present report is the first epidemiologic study on the prevalence of diabetes mellitus and hypertension to be carried out in Guatemala with a representative sample of a geographic area of the country. The general prevalence of diabetes mellitus (8.4%) and hypertension (13%) that we found mean that among the inhabitants over 19 years of age in the town of Villa Nueva there are about 7000 people with diabetes and 13000 people with hypertension, half of which are undiagnosed.

The prevalence of diabetes in Villa Nueva was comparable to the prevalence reported in the United States in 2000 (8.1%) (13) and Mexico City in 2000 (8.4%) (14), and higher than the prevalence reported in four Bolivian cities in 1998 (15). Most of the studies in cities of South America (16–18) have reported prevalences lower than that reported here (8.4%). The proportion of cases of diabetes diagnosed in Villa Nueva (4.3%) was lower than reported in the United States (5%) in 2000 and Bolivia (5.2%) in 1998.

Diabetes and hypertension occurred most frequently in people over 39 years of age, particularly women. These results correspond with the greater prevalence of risk factors found in these population groups, such as overweight, large waist circumference, sedentary life style, and hypercholesterolemia.

With respect to the criteria for defining diabetes mellitus, this study used the blood glucose results obtained in both fasting and two hours after a 75–g load of glucose, according to the criteria established by the ADA (19).

In the United States, a prevalence of hypertension similar to the prevalence reported in Villa Nueva (14.9%) has been reported (20). Cuba has recently reported hypertension prevalences of 22.4% and 24.2% in men and women of African origin, respectively. This figure is much higher than the prevalence reported in Villa Nueva (20).

The prevalence of overweight in Villa Nueva (59.7%) was similar to the prevalence reported in Bolivia in 1998 (15) but lower than in the United States (63.7%) (13).

The higher prevalence of diabetes mellitus and hypertension in people with a lower level of schooling, and probably lower socioeconomic level, supports the results found in studies conducted in other countries, such as Bolivia (21) and Brazil (22). This phenomenon may be related to a reduced availability and access to information, education, and health services. For this reason, these diseases should now be considered a public health problem that affects poorer sectors and requires immediate action to prevent and control the epidemic that is expected to appear in the next 10 to 15 years.

A large proportion of the people who had diabetes and hypertension showed abnormal blood glucose and blood pressure levels. It has been demonstrated that the appearance of certain chronic complications of diabetes and mortality can be prevented by better metabolic control in people with type 1 diabetes (23) and type 2 diabetes (23).

In conclusion, the prevalence of diabetes mellitus found in the town of Villa Nueva, department of Guatemala, is higher than the prevalence reported in most countries of Latin America; the prevalence of hypertension reported here is comparable to that reported in most Latin American studies. It is particularly important that, despite having a younger population, Villa Nueva had a prevalence of diabetes similar to the prevalence in the United States. This means that in the future there will be an important increase in the prevalence of diabetes as the population ages, unless preventive strategies are introduced. The data presented indicate that diabetes affects people with a lower educational level, which suggests that the poorest people bear the greatest burden.

Annex 1. Questionnaire

Central America Diabetes Initiative (CAMDI)

Multinational Survey
on Type 2 Diabetes Mellitus, Hypertension,
and Risk Factors

Guatemala

General Information on the Interview

		Response
1	Identification of interviewee	__/____
2	Date of interview	__ /__/____ Day Month Year
3	Time of beginning of the interview	__:__
4	Name of person interviewed:	
5	Sector (census segment)	___
6	Subunit segment	____
7	Dwelling	____
8	Initials of interviewer:	___

Health Status and Family History

"I would like to ask you some questions about your health and the health of your close family members."

Question		Response
9	You would say that your health is:	Excellent 1 Very Good 2 Good 3 Average 4 Bad 5 I don't know/Unsure 9
10	In general, where do you go first when you become ill?	A public hospital 1 IGSS 2 Doctor's office or private hospital 3 Company doctor 4 Pharmacy 5 Home remedies 6 A healer, chiropractor naturopath 7 Other place or advisor 8
11	Have you ever seen a doctor for a health examination or checkup? If the Response is Yes, note how many years ago.	Yes 1 ____ years ago No 2/ 00 I don't know/Unsure 9/ 99
12	Have your father, mother, brother or sister related by blood had any of the following diseases?	
12.1	Diabetes or excess sugar in blood	Yes 1 No 2 I don't know/Unsure 9
12.2	High blood pressure	Yes 1 No 2 I don't know/Unsure 9
12.3	Stroke	Yes 1 No 2 I don't know/Unsure 9
12.4	Cancer or malignant neoplasm	Yes 1 No 2 I don't know/Unsure 9
12.5	High cholesterol	Yes 1 No 2 I don't know/Unsure 9
12.6	Attach or heart attack before the age of 45 years (father, brother)	Yes 1 No 2 I don't know/Unsure 9

Health status and family history (continued)

Question		Response
12.7	Attack or heart attack before the age of 55 years (mother, sister)	Yes 1 No 2 I don't know/Unsure 9
12.8	Osteoporosis. lack of calcium in bones or hip fracture	Yes 1 No 2 I don't know/Unsure 9

Diabetes mellitus

"The following questions are related to diabetes, meaning excess sugar in blood."

Question		Response
13	Have you ever had a test of glucose, or sugar, in blood?	Yes 1 No 2 (*Pass to Question 15*) I don't know/Unsure 9 (*Pass to Question 15*)
14	When was the last time that you had a blood sugar test?	Less than 6 months ago 1 6 to 11 months ago 2 1 to 2 years ago 3 More than 2 years ago 4 I don't know/Unsure 9
15	Has any health professional told you that you have diabetes or excess sugar in blood?	Yes 1 No 2 (*Pass to Question 28*) I don't know/Unsure 9 (*Pass to Question 28*)
16	How old were you when they told you that you have diabetes?	Age: ___years
17	What treatment or medical recommendation have you been prescribed for diabetes or to lower the blood sugar?	Some 1 No 0 (*Pass to Question 18*) I don't know/Unsure 9 (*Pass to Question 18*)
17.1	Drugs	Yes 1 No 2
17.2	A Special Diet	Yes 1 No 2
17.3	Lose Weight	Yes 1 No 2
17.4	Do not drink alcoholic beverages in excess	Yes 1 No 2
17.5	Regular exercise or physical activity	Yes 1 No 2

Diabetes mellitus (continued)

Question		Response
17.6	Home remedies (specify):	Yes 1 No 2
17.7	Other recommendation:	Yes 1 No 2
18	If you are taking drugs for diabetes, what are you taking? (Ask the subject to show you the drug)	
18.1		
18.2		
18.3		
19	During the last month, have you used any of the following treatments or recommendations to control your diabetes?	
19.1	Drugs	Always or almost always 1 Sometimes 2 Never or almost never 3
19.2	A special diet	Always or almost always 1 Sometimes 2 Never or almost never 3
19.3	Lose weight	Always or almost always 1 Sometimes 2 Never or almost never 3
19.4	Do not drink alcoholic beverages in excess	Always or almost always 1 Sometimes 2 Never or almost never 3
19.5	Regular exercise or physical activity	Always or almost always 1 Sometimes 2 Never or almost never 3
19.6	Home remedies (specify):	Always or almost always 1 Sometimes 2 Never or almost never 3
19.7	Other: _____	Always or almost always 1 Sometimes 2 Never or almost never 3
20	Where do you usually check your blood sugar?	Public hospital, health post, or health center 1 IGSS or company medical officer 2 Private doctor/Private clinic 3 On the street 4 Family member or friend 5 By myself 6 I don't check it 7 Another way or place: 8 _____

Diabetes mellitus (continued)

Question		Response	
21	In the last 12 months, how often have you checked your blood sugar?	Number of times	_____
		Per day	1
		Per week	2
		Per month	3
		Per year	4
		Never	00/0
		I don't know/Unsure	99/9
22	Have you heard about glycosylated hemoglobin? (If the response is YES, note how many times it has been measured in the last 12 months.)	Yes	1 ___ years
		No	2/00
		I don't know/Unsure	9/99
23	Approximately, how many times have you consulted a doctor or health care professional about your diabetes?	Number of times	_____
		Never	00
		I don't know/Unsure	99
24	In the last 12 months, has any doctor or health care professional checked your bare feet?	Yes	1
		No	2
		I don't know/Unsure	9
25	When was the last time that your vision was checked with dilation of the pupil?	Less than 1 month ago	1
		1 to 11 months ago	2
		1 to 2 years ago	3
		More than 2 years ago	4
		Never	5
		I don't know/Unsure	9
26	Do you usually find the drugs that the doctor prescribes for diabetes?	Yes, always	1
		Yes, but not easily	2
		Yes, but it is difficult	3
		Can't find them	4
27	Do you usually have money or the means for obtaining the drugs that your doctor prescribes for diabetes?	Yes, always	1
		Yes, but not easily	2
		Yes, but it is difficult	3
		Cannot buy or obtain them	4
28	(ONLY FOR WOMEN) Has any doctor told you that you had diabetes only during some of your pregnancies?	Yes	1
		No	2
		I haven't had children	3
		I don't know/Unsure	9

Hypertension

"The following questions are related to blood pressure."

Question		Response
29	Has your blood pressure ever been taken?	Yes 1 No 2 (*Pass to Question 31*) I don't know/Unsure 9 (*Pass to Question 31*)
30	When was the last time that your blood pressure was taken?	Less than 6 months ago 1 6 to 11 months ago 2 1 year to 1 year and 11 months ago 3 2 to 3 years ago 4 More than 3 years ago 5 I don't know/Unsure 9
31	Has a doctor, nurse, or other health professional ever told you that you have high blood pressure?	Yes 1 No 2 (*Pass to Question 41*) I don't know/Unsure 9 (*Pass to Question 41*)
32	How old were you when they told you that you have high blood pressure?	Age: _____Years
33	What treatment have they prescribed you for high blood pressure?	Some 1 No 0 I don't know/Unsure 9 (*Pass to Question 34*)
33.1	Drugs	Yes 1 No 2
33.2	Reduce salt in food	Yes 1 No 2
33.3	Lose weight	Yes 1 No 2
3.4	Quit smoking	Yes 1 No 2
33.5	Do not drink alcoholic beverages in excess	Yes 1 No 2
33.6	Regular exercise or physical activity	Yes 1 No 2
33.7	Prevent stress	Yes 1 No 2
33.8	Home remedies (specify)	Yes 1 No 2
33.9	Other	Yes 1 No 2
34	If you are taking drugs for blood pressure, what are you taking? *(Ask the subject to show you the drug)*	
34.1		

Hypertension *(continued)*

Question		Response
34.2		
34.3		
34.4	During the last month, have you used any of the following treatments to control your high blood pressure?	
35		
35.1	Drugs	Always or almost always 1 Sometimes 2 Never or almost never 3
35.2	Low–salt diet	Always or almost always 1 Sometimes 2 Never or almost never 3
35.3	Lose weight	Always or almost always 1 Sometimes 2 Never or almost never 3
35.4	Quit smoking	Always or almost always 1 Sometimes 2 Never or almost never 3
35.5	Do not drink alcoholic beverages in excess	Always or almost always 1 Sometimes 2 Never or almost never 3
35.6	Regular exercise or physical activity	Always or almost always 1 Sometimes 2 Never or almost never 3
35.7	Prevent stress	Always or almost always 1 Sometimes 2 Never or almost never 3
35.8	Home remedies (specify): _____	Always or almost always 1 Sometimes 2 Never or almost never 3
35.9	Other: _____	Always or almost always 1 Sometimes 2 Never or almost never 3
36	Where do you usually check your blood pressure?	Public hospital, health post, or health center 1 IGSS or company medical officer 2 Private doctor/Private clinic 3 On the street 4 Family member or friend 5 By myself 6 I don't check it 7 Another way or place: 8 _____

Hypertension *(continued)*

Question		Response
37	In the last 12 months, how often have you checked your blood pressure?	Number of times _____ Per day 1 Per week 2 Per month 3 Per year 4 Never 00/0 I don't know/Unsure 99/9
38	Approximately, how many times in the last 12 months have you consulted a doctor or health care professional about your high blood pressure?	Number of times: _____ Never 00 I don't know/Unsure 99
39	Do you usually find the drugs that the doctor prescribes for high blood pressure?	Yes, always 1 Yes, but not easily 2 Yes, but it is difficult 3 Can't find them 4
40	Do you usually have money or the means for obtaining the drugs that your doctor prescribes for high blood pressure?	Yes, always 1 Yes, but not easily 2 Yes, but it is difficult 3 Cannot buy or obtain them 4

Other Chronic Diseases

41	Has any doctor ever told you that you have to have had any of the following diseases? (If the response is YES, ask the subject at what age it was diagnosed for the first time.)	
41.1	Angina pectoris	Yes. _____ years 1 No 2/00 I don't know/Unsure 9/9
41.2	Heart attack	Yes. _____ years 1 No 2/00 I don't know/Unsure 9/99
41.3	Stroke	Yes. _____ years 1 No 2/00 I don't know/Unsure 9/99
41.4	Cancer or malignant neoplasm, specify: _____	Yes. _____ years 1 No 2/00 I don't know/Unsure 9/99
41.5	Osteoporosis, lack of calcium in the bones, or hip fracture	Yes. _____ years 1 No 2/00 I don't know/Unsure 9/99

Eating habits

The following questions are about what you usually eat and how you eat it.

	Food	Portion	Never 00/00.0	Every –day (10)	Times per week (2)						Times per month			Frequency	Size of portion
					1	2	3	4	5	6	1	2	3		
42.1	Tortillas	1 unit												__ __	__ __. __
42.2	Bread of any type	1 unit												__ __	__ __. __
42.3	Pastry	1 unit												__ __	__ __. __
42.4	Milk. counting that of atoles, cereals and oat-meal, or mosh	1 glass												__ __	__ __. __
42.5	Cheese or cream	1 slice/ teaspoon												__ __	__ __. __
42.6	Eggs	1 unit												__ __	__ __. __
42.7	Vegetables. herbs	1 unit/piece												__ __	__ __. __
42.8	Fruits. not counting juices	1 unit/slice												__ __	__ __. __
42.9	Chicken	1 part												__ __	__ __. __
42.1	Beef or pork	1 ounce												__ __	__ __. __
42.11	Fish	1 ounce												__ __	__ __. __
42.12	Sausages. including ham, frankfurters, chorizo, longaniza, etc.	1 unit/slice												__ __	__ __. __
42.13	Sweet carbonated water	1 glass/ bot/can												__ __	__ __. __
42.14	Sweet or sweetened beverages	1 glass/ tetrapak												__ __	__ __. __
42.15	Natural juices	1 glass/ can/tetrapak												__ __	__ __. __
42.16	Soup, instant dehydrated, bottled, or cubes	1 cup/glass												__ __	__ __. __
42.17	Beer, wine, or sangría	1 bottle/can												__ __	__ __. __
42.18	Rum, whisky, or other strong spirits	1ounce/ drink												__ __	__ __. __
42.19	Coffee	1 cup												__ __	__ __. __

Eating habits *(continued)*

	Food	Portion	Never 00/00.0	Every –day (10)	Times per week (2)						Times per month			Frequency	Size of portion
					1	2	3	4	5	6	1	2	3		
42.20	Sugar added to any food	1 teaspoon												__ __	__ __. __
42.21	Butter, margarine, or mayonnaise added to bread or any other food	1 teaspoon												__ __	__ __. __
42.22	Fast food, including hamburgers, hot–dogs, Chinese food, fried chicken	1 unit/ plate/piece												__ __	__ __. __
42.23	Typical dishes. including tacos, tostadas,tamales, chuchitos, stuffed chiles, "rellenitos"	1 unit												__ __	__ __. __
42.24	Desserts, including cakes, chocolate, cookies	1 unit/ package												__ __	__ __. __
42.25	Salted snacks like potato chips, cheese doodles, fried pork rinds, etc.	1 small bag/cup												__ __	__ __. __

Eating habits *(continued)*

Question		Response	
43	What type of fat do you use or is used usually at home to cook food?	Vegetable Oil Margarine Vegetable Shortening Animal Shortening Butter I don't know/Unsure	1 2 3/00 4/00 5/00 9/99
44	When you eat vegetables, do you eat them with margarine, fried, or dipped in egg batter?	Always or almost always Sometimes Never or almost never	1 2 3
45	When you eat beans, do you eat them prepared or fried?	Always or almost always Sometimes Never or almost never	1 2 3
46	When you eat rice, do you eat it fried?	Always or almost always Sometimes Never or almost never	1 2 3
47	When you eat potatoes, do you eat them fried?	Always or almost always Sometimes Never or almost never	1 2 3
48	When you eat meat or chicken, do you eat it fried, breaded, or sautéed?	Always or almost always Sometimes Never or almost never	1 2 3
49	When you eat chicken, do you eat the skin?	Always or almost always Sometimes Never or almost never	1 2 3
50	When you eat meat, do you eat the fat?	Always or almost always Sometimes Never or almost never	1 2 3
51	Do you add salt to your prepared food?	Always or almost always Sometimes Never or almost never	1 2 3
52	How do you usually eat your food?	With only a little salt Normal With a fair amount of salt	1 2 3
53	Are you following a special diet now for your health?	Yes, for more than 6 months Yes, for less than 6 months No	1 2 (*Pass to Question 55*) 3 (*Pass to Question 55*)

Eating habits *(continued)*

Question		Response
54	What does the diet that you are following consist of?	
54.1	In increasing vegetable consumption	Yes 1 No 2
54.2	In increasing fruit consumption	Yes 1 No 2
54.3	In increasing consumption of the food: _____	Yes 1 No 2
54.4	In reducing fats	Yes 1 No 2
54.5	In reducing the amount of sugar and sweet beverages	Yes 1 No 2
54.6	In reducing the amount of salt	Yes 1 No 2
54.7	In reducing consumption of the food: _____	Yes 1 No 2
54.8	In switching from lard, margarine, or butter to oil	Yes 1 No 2
54.9	In other recommendations (specify): _____	Yes 1 No 2
55	Do you usually have money to obtain the following foods?	
55.1	Vegetables	Yes, always 1 Yes, but not easily 2 Yes, but it is difficult 3 Cannot buy or obtain them 4
55.2	Fruits	Yes, always 1 Yes, but not easily 2 Yes, but it is difficult 3 Cannot buy or obtain them 4
55.3	Vegetable oil	Yes, always 1 Yes, but not easily 2 Yes, but it is difficult 3 Cannot buy or obtain them 4

Physical Activity

"I am now going to ask you some questions about how much time you were active in the last 7 days. You should answer each question, even if you do not consider yourself an active person. I will ask you about activities or efforts that you carry out for 10 consecutive minutes or more in different places."

Section 1: Physical Activity at Work

The first questions are about activities you do during work. It should not include work for which you do not earn money and that is done at home, such as odd jobs or work to maintain the house, garden, patio, or land around your home, or to care for your family.

Question		Response
56	Do you do work or have a trade for which you are paid, whether inside or outside your home, or do you do jobs for which you are not paid (in the fields, as a volunteer, or related with your studies, etc.) and is not done at home?	Yes 1 No 2 (*Pass to Section 2: Physical activity related to move ments/trips and transportation*)
The following questions are about all the activity or effort made in the last 7 days as part of your work that lasted at least 10 consecutive minutes or more. It should not include your trips to and from work.		
57	In the last 7 days, on how many days did you perform activities or intense physical efforts that made you breathe much harder than normal as part of the work? *(Give examples)*	Days of the week _____ No 0 (*Pass to Question 59*) I don't know/Unsure 9 (*Pass to Question 59*)
58	On each of these days, approximately how much time in total you devoted to those activities or efforts as long as you devoted 10 consecutive minutes or more each time? (or if the person cannot answer, ask: *"How much time in total did you devote to those activities or efforts in the last 7 days?"*	_____hours _____ minutes a day _____hours _____ minutes of the week
59	In the last 7 days, on how many days did you perform moderate activities or efforts, that is, less intense than the previous activities, but that still made you breathe a little harder than normal as part of the work? *(Give examples)*	Days of the week _____ No 0 (*Pass to Question 61*) I don't know/Unsure 9 (*Pass to Question 61*)
60	On each of those days, approximately how much time did you devote to those activities or efforts for 10 consecutive minutes or more? (or, if the person cannot answer, ask: *"How much time in total did you devote to those activities or efforts in the last 7 days?)"*	_____hours _____ minutes a day _____hours _____ minutes of the week

Physical Activity *(continued)*

Question		Response
61	In the last 7 days, on how many days did you walk for 10 consecutive minutes or more as part of your work? (not including how much you walked in going to and from your job)?	Days of the week 0 (*Pass to Section 2*) No 9 (*Pass to Section 2*) I don't know/Unsure
62	On each of those days, approximately how much time in total did you walk as a part of your work? (or if the person cannot answer, ask: *"How much time in total did you walk as part of your work in the last 7 days?)"*	_____hours _____ minutes a day _____hours _____ minutes of the week
Section 2: Physical Activity Related to Your Movements/Trips and Transportation *Now, think about how you traveled from one place to another, always considering the two–way trip to and from work, when you go to the store, to the market, to carry out errands, going to church, etc.*		
63	In the last 7 days, how many days did you travel in a car, pick–up truck, motorcycle, or other motor vehicle?	Days of the week _____ No 0 (*Pass to Question 65*) I don't know/Unsure 9 (*Pass to Question 65*)
64	On each of those days, approximately how much time in total did you travel in a car, pick–up truck, motorcycle, or other motor vehicle? (or, if the person cannot answer, ask: *"How much time in total did you travel in a motor vehicle in the last 7 days?)*	_____hours _____ minutes a day _____hours _____ minutes of the week
65	In the last 7 days, how many days did you ride a bike for at least 10 minutes to go from one place to another?	Days of the week _____ No 0 (*Pass to Question 67*) I don't know/Unsure 9 (*Pass to Question 67*)
66	On each of those days, approximately how much time did you ride a bike from one place to another for 10 consecutive minutes or more? (or, if the person cannot answer, ask: "*How much time in total did you ride a bike from one place to another in the last 7 days?"*)	_____hours _____ minutes a day _____hours _____ minutes of the week
67	In the last 7 days, how many days did you walk from one place to another for 10 consecutive minutes or more?	Days of the week 0 (*Pass to Section 3*) No 9 (*Pass to Section 3*) I don't know/Unsure

Physical Activity *(continued)*

Question		Response
68	On each of those days, approximately how much time in total did you walk (for 10 consecutive minutes or more)? (or, if the person cannot answer, ask: *"How much time in total did you walk from one place to another in the last 7 days?"*)	_____hours _____ minutes a day _____hours _____ minutes of the week
Section 3: Housework and Family Care Now think about the activities or efforts that you have made in the last 7 days in or around your home, such as manual work for housekeeping and work in the garden, patio or land around the dwelling for the care of your family.		
69	In the last 7 days, on how many days did you perform intense activities or efforts that made you breathe harder than normal in the garden, patio or land around your house (for 10 consecutive minutes or more)? *(Give examples)*	Days of the week _____ No 0 (*Pass to Question 71*) I don't know/Unsure 9 (*Pass to Question 71*)
70	On each of those days, approximately how much time did you devote to those activities or efforts for 10 consecutive minutes or more? (or, if the person cannot answer, ask: "*How much time in total did you devote to those activities or efforts in the last 7 days?*")	_____hours _____ minutes a day _____hours _____ minutes of the week
71	In the last 7 days, how many days did you perform moderate activities or efforts, that is, less intense than the previous activities, but still strenuous enough to make you breathe a little harder than normal in your garden, patio, or land around your house? *(Give examples)*	Days of the week _____ No 0 (*Pass to Question 73*) I don't know/Unsure 9 (*Pass to Question 73*)
72	On each of those days, approximately how much time in total did you devote to those activities or efforts for 10 consecutive minutes or more? (or, if the person cannot answer, ask: "*How much time in total did you devote to those activities or efforts in the last 7 days?*")	_____hours _____ minutes a day _____hours _____ minutes of the week

Physical Activity *(continued)*

Question		Response
73	In the last 7 days, on how many days did you perform moderate activities or efforts that made you breathe a little harder than normal in your house for 10 consecutive minutes or more)? *(Give examples)*	Days of the week _____ No 0 (*Pass to Section 4*) I don't know/Unsure 9 (*Pass to Section 4*)
74	On each of those days, how much time in total did you devote to those activities or efforts for 10 consecutive minutes or more? (or, if the person cannot answer, ask: *"How much time in total did you devote to those activities or efforts in the last 7 days?"*)	_____hours _____ minutes a day _____hours _____ minutes of the week
Section 4: Physical Activity For Recreation, Sports and Free Time *Now, think about all the activities or efforts that you did in the last 7 days only for recreation, sport, or exercise in your free time. Please, do not include any activity that you have already mentioned.*		
75	Without counting any of the walks that you have already mentioned, in the last 7 days how many days did you walk for 10 consecutive minutes or more in your free time?	Days of the week _____ No 0 (*Pass to Question 77*) I don't know/Unsure 9 (*Pass to Question 77*)
76	On each of those days, approximately how much time in total did you walk in your free time for 10 consecutive minutes or more? (or, if the person cannot answer, ask: *"How much time in total did you walk from one place to another in the last 7 days?"*)	_____hours _____ minutes a day _____hours _____ minutes of the week
77	In the last 7 days, on how many days did you perform intense activities or efforts that made you breathe harder than normal in your free time? *(Give examples)*	Days of the week _____ No 0 (*Pass to Question 79*) I don't know/Unsure 9 (*Pass to Question 79*)
78	On each of those days, approximately how much time in total of your free time did you devote to those activities or efforts for 10 consecutive minutes or more? (or, if the person cannot answer, ask: *"How much time in total did you devote to those activities or efforts in the last 7 days?"*)	_____hours _____ minutes a day _____hours _____ minutes of the week

Physical Activity *(continued)*

Question		Response
79	In the last 7 days, on how many days did you perform moderate activities or efforts that were less intense than in the previous case, but still made you breathe a little harder than normal in your free time? *(Give examples)*	Days of the week _____ No 0 (*Pass to Question 81*) I don't know/Unsure 9 (*Pass to Question 81*)
80	On each of those days, how much time in total did you devote to those activities or efforts for 10 consecutive minutes or more? (or, if the person cannot answer, ask: "How much time in total did you devote to those activities or efforts in the last 7 days?)	_____hours _____ minutes a day _____hours _____ minutes of the week
81	In the last 7 days, approximately how much time did you spend sitting per day? (or, if the person cannot answer, ask: How much time in total did you spend sitting down on Wednesday?)	_____hours _____ minutes a day _____hours _____ minutes of the week
82	In the last 7 days, how much time in total did you spend sitting on a weekend day? (or, if the person cannot answer, ask: *"How much time in total did you spend sitting on Sunday?"*)	_____hours _____ minutes a day _____hours _____ minutes of the weekm
The following questions are about whether or not you practice some <u>exercise or sport, regardless of whether you already included it</u> in a previous response.		
83	Do you practice a sport or exercise at least once a week?	Yes. Which sport? 1 (*Pass to Question 85*) _____ 2 No
84	Have you tried to exercise more or to begin it in the last 6 months?	Yes. Which sport? 1 (*Pass to Question 88*) _____ No 2 (*Pass to Question 88*)
85	When did you begin?	Less than 4 weeks ago 1 1 to 6 months ago 2 More than 6 months ago 3 I don't know/Unsure 4
86	How many times a week do you exercise/practice?	Days of the week _____
87	How long do you exercise/practice every day?	_____hours _____minutes a day

Physical Activity *(continued)*

Question		Response
88	Has a doctor, nurse, or other health professional recommended that you increase your physical activity or exercise?	Yes 1 No 2 I don't know/Unsure 9
89	If you were to decide to begin exercising or already exercise, do you know some place where you can receive advice or assistance on how to proceed?	Yes 1 No 2 I don't know/Unsure 9
90	If you were to decide to begin exercising or already exercise, are there suitable places where you can exercise?	Yes 1 No 2 I don't know/Unsure 9

Body weight

"Now I am now going to ask you some questions about your weight."

Question		Response
91	Since you turned 18 years old, have you weighed yourself or been weighed?	Yes 1 No 2 (*Pass to Question 93*) I don't know/Unsure 9 (*Pass to Question 93*)
92	When was the last time that you weighed yourself?	Less than 1 year ago 1 Between 1 and 2 years 11 months 2 3 to 5 years ago 3 More than 5 years 4 I don't know/Unsure 9
93	Has a doctor, nurse, or other health professional told you that you are overweight, obese, or weigh more than you should?	Yes 1 No 2 I don't know/Unsure 9
94	Are you following a program or treatment to lose weight now?	Yes 1 No 2 (*Pass to Question 96*)
95	Are you following a program or treatment to prevent weight gain now?	Yes 1 No 2 I don't know/Unsure 9
96	How much do you think you weigh?	_____ Kilograms
97	How much do you think you should weight?	_____ Kilograms
98	How much would you like to weigh?	_____ Kilograms
99	Which of the following figures do you think looks like your body? *(Show drawings)*	_____
100	Which of these figures do you think it would be better to have? *(Show drawings)*	_____
101	If you were advised to lose weight, do you know where you could receive advice or assistance on how to do it?	Yes 1 No 2 I don't know/Unsure 9

Cholesterol

The following questions are about cholesterol.

Question		Response
102	Have you ever had your blood cholesterol measured?	Yes 1 No 2 (*Pass to Question 104*) I don't know/Unsure 9 (*Pass to Question 104*)
103	When was the last time that you had a cholesterol test?	Less than 6 months ago 1 Between 6 and 12 months 2 Between 1 and 2 years 3 Between 3 and 4 years 4 5 years or more 5 I don't know/Unsure 9
104	Has a health professional ever told you that your blood cholesterol is high?	Yes 1 No 2 (*Pass to Question 114*) I don't know/Unsure 9 (*Pass to Question 114*)
105	How old were you when they first told you that you had high cholesterol?	Age: _____years
106	What treatment or program have they prescribed you for lowering cholesterol?	Some 1 No 0 (*Pass to Question 107*) I don't know/Unsure 9 (*Pass to Question 107*)
106.1	Drugs	Yes 1 No 2
106.2	A special diet?	Yes 1 No 2
106.3	Lose weight?	Yes 1 No 2
106.4	Regular exercise or physical activity	Yes 1 No 2
106.5	Home remedies (specify):	Yes 1_____ No 2
106.6	Other:	Yes 1_____ No 2
107	If you take drugs to lower your cholesterol, what are you taking? *(Ask the subject to show you the drug)*	
107.1		
107.2		
108	During the last month, have you used any of the following treatments to control your high cholesterol?	
108.1	Drugs	Always or almost always 1 Sometimes 2 Never or almost never 3
108.2	A special diet	Always or almost always 1 Sometimes 2 Never or almost never 3

Cholesterol *(continued)*

Question		Response
108.3	Lose weight	Always or almost always 1 Sometimes 2 Never or almost never 3
108.4	Regular exercise or physical activity	Always or almost always 1 Sometimes 2 Never or almost never 3
108.5	Home remedies (specify): _____	Always or almost always 1 Sometimes 2 Never or almost never 3
108.6	Other: _____	Always or almost always 1 Sometimes 2 Never or almost never 3
109	Where do you have your cholesterol checked most of the time?	Public hospital, health post, or health center 1 IGSS or company medical officer 2 Private doctor/Private clinic 3 On the street 4 Family member or friend 5 By myself 6 I don't check it 7 Another way or place: 8 _____
110	In the last 12 months, how many times have you measured your blood cholesterol?	Number of times _____/year Never 0 I don't know/Unsure 9
111	Approximately how many times in the last 12 months have you seen a doctor or other health professional for your high cholesterol?	Number of times _____ Never 0 I don't know/Unsure 9
112	Do you usually find the drugs that the doctor prescribes you for high cholesterol?	Yes, always 1 Yes, but not easily 2 Yes, but it is difficult 3 Can't find them 4
113	Do you usually have money or the means to obtain the drugs that your doctor prescribes for high cholesterol?	Yes, always 1 Yes, but not easily 2 Yes, but it is difficult 3 Cannot buy or obtain them 4

Smoking habit

I will now ask you several questions about smoking.

Question		Response
114	In your life, have you smoked at least 100 cigarettes, cigars, or pipes of tobacco?	Yes 1 No 2 (*Pass to Question 125*) I don't know/Unsure 9 (*Pass to Question 125*)
115	How old were you when you first started smoking in your life?	_____years
116	How often do you smoke now?	Daily 1 Occasionally 2 (*Pass to Question 121*) I don't smoke 3 (*Pass to Question 121*)
117	On the average, how many cigarettes/ cigars/pipes have you smoked every day in the last 4 weeks?	_____
118	Approximately how long ago did you begin to smoke every day? (years/months)	_____years/months
119	How soon after awakening do you smoke your first cigarette?	After 60 minutes 1 From 31 to 60 minutes 2 From 6 to 30 minutes 3 In the first 5 minutes 4
120	Do you want to try to stop smoking? *(Pass to Question 124)*	Yes, in the next month 1 Yes, in 1 to 6 months 2 Yes, in 7 months or more 3 No 4 I don't know/Unsure 9
121	In the last 4 weeks, how many cigarettes/ cigars/pipes have you smoked?	_____
122	Have you ever smoked every day?	Yes 1 No, never 2 (*Pass to Question 124*) I don't know/Unsure 9 (*Pass to Question 124*)
123	How long ago did you stop smoking every day? (years/months)	____years or months
124	In the last 12 months, has any health professional advised you to quit smoking?	Yes 1 No 2 I haven't seen a doctor in that time 3 I haven't smoked in the last 12 months 4 (*Pass to Question 125*)
125	How many times have you tried to quit smoking in the last 12 months?	____times
126	In the last 12 months, has any health professional asked you if you smoke?	Yes 1 No 2 I haven't seen a health professional in that time 3

Smoking habit *(continued)*

Question		Response
127	Do you believe that smoking harms the health of the smoker?	Yes 1 No 2 I don't know/Unsure 9
128	Do you believe that smoking harms the health of the people around the person who smokes?	Yes 1 No 2 I don't know/Unsure 9

Alcohol Consumption

"I will now ask you several questions about your drinking habits.

Question		Response
129	Have you ever drunk an alcoholic beverage in your life? (Clarify: a beverage is equivalent to a can or bottle of beer. a glass of wine. a cocktail, or a drink of spirits.)	Yes 1 No 2 (*Pass to Question 141*) I don't know/Unsure 9 (*Pass to Question 141*)
130	Approximately how old were you when you had your first complete drink?	_____years
131	In the last 12 months, have you had at least one alcoholic beverage?	Yes 1 No 2 (*Pass to Question 141*) I don't know/Unsure 9 (*Pass to Question 141*)
132	When you drink, how many drinks do you usually consume?	_____
133	What do you usually drink?	Mild (beer, wine) 1 Strong (rum, whisky, etc) 2 Combination of mild and strong 3
134	In the last ones 4 weeks, have you drunk at least one alcoholic beverage?	Yes 1 No 2 (*Pass to Question 137*) I don't know/ Unsure 9 (*Pass to Question 137*)
135	Taking into account all sorts of alcoholic beverages, how many times have you had more than 5 drinks a day in the last 4 weeks?	_____
136	Taking into account all sorts of alcoholic beverages, how many times have you had more than 5 drinks a day in the last 4 weeks?	_____
137	During the last year have you ever felt the need to reduce the amount of alcohol that you drink?	Yes 1 No 2 I don't know/Unsure 9
138	During the last year, have you ever been upset because someone criticized your drinking habits?	Yes 1 No 2 I don't know/Unsure 9

Alcohol Consumption *(continued)*

Question		Response
139	During the last year, have you ever felt bad or guilty about your drinking habits?	Yes 1 No 2 I don't know/Unsure 9
140	During the last year, have you ever had a drink in the morning to calm down?	Yes 1 No 2 I don't know/Unsure 9

Personal Data

Finally, I need some information about you and your family

Question		Response
141	Sex	Male 1 Female 2
142	Date of birth	____/_____/____ Day Month Year
143	Age	_____years
144	You are:	Single 1 Married/co–habitating 2 Separated/ Divorced 3 Widowed 4
145	What was the last grade of school that you completed?	Select one: The number of years you studied in that level: Elementary _____ Middle School _____ High School _____ University _____
146	Do you know how to read and write?	Reads and writes without difficulty 1 Reads and writes with difficulty 2 Does not read or write 3
147	Do you speak a Mayan language that your parents taught you?	Yes 1 No 2 I don't know/Unsure 9
148	How long have you lived in the town of Villa Nueva?	<12 months 1 From 1 to 3 years 2 (*Pass to Question 150*) More than 4 years 3 (*Pass to Question 150*)
149	Where have you lived most in the last 12 months?	Urban area 1 Other periurban area 2 Rural area 3

Smoking habit *(continued)*

Question		Response
150	Where were you born?	Urban area 1 Other periurban area 2 Rural area 3 Other country 4
151	Race:	Indigenous 1 Mixed–race 2 Caucasian 3 Black 4 Asian 5 Other 6

Occupational and Home Situation

Question		Response
152	What is your profession or trade?	_____
153	*(Only married or cohabitating subjects)* What is the profession or trade of your partner?	_____
154	Do you have paid work?	Yes 1 No 2 (*Pass to Question 156*) I don't know/Unsure 9 (*Pass to Question 156*)
155	What work do you do?	_____
156	In the last 12 months, how many months have you been without paid work?	_____months

Occupational and Home Situation *(continued)*

Question		Response
157	How many people in your home have a paid job?	_____
158	Do you or someone in your home receive an income from rent or benefits?	Yes 1 No 2 I don't know/Unsure 9
159	The house where you live is:	Your own 1 Rented 2 Rent–free 3 Improvised (shack) 4 Other 5 _____
160	How many rooms does your residence have, without counting the bath and kitchen? *(By observation)*	_____
161	Predominant flooring material in house	Ceramic tile, carpet, varnished wood 1 Granite floor 2 Poured cement, unfinished wood 3 Packed earth/ Adobe 4 Panel, cardboard, straw, plastic 5 Other 6
162	Predominant wall material in house	Cement block or brick 1 Prefabricated 2 Wood 3 Packed earth/ Adobe 4 Panel, cardboard, straw, plastic 5 Other 6
162	Time of conclusion of interview	____:____

Annex 2: Blood Pressure and Physical Measurements

	Multinational Survey of Diabetes, Mellitus, Hypertension and Risk Factor Guatemala Annex 2. Blood Pressure and Physical Measurements

Identification

1	Identification of interviewee	__/___
2	Date of interview	__/__/____ Day Month Year
3	Name of interviewee:	
4	Sector	__
5	Subunit	___
6	Residence	___
7	Contact telephone	

Measurements

	Anthropometry	1st Measurement	2nd Measurement	3rd Measurement
8	Weight (kg)	____.__	____.__	____.__
9	Height (cm)	____.__	____.__	____.__
10	Waist circum.	____.__	____.__	____.__
11	Hip circum.	____.__	____.__	____.__
12	Measurements made by (initials):			__

	Blood Pressure	1st Measurement	2nd Measurement	3rd Measurement
13	Systolic pressure	___	___	___
14	Diastolic pressure	___	___	___
15	Pulse (beats per minute)	___	___	___
16	Time	____:__	____:__	____:__
17	Measurements made by (initials):			__

Annex 2 (continued)

	Blood Extraction	
18	Time of blood extraction, fasting conditions	____.____
19	Time of intake of glucose load	____.____
20	Extracted by (initials):	____
21	Time of blood extraction 2 hours after glucose load	____.____
22	Extracted by (initials):	____

LIST OF ABBREVIATIONS

CDC: Centers for Disease Control and Prevention
NCD: Chronic noncommunicable diseases
CVD: Cardiovascular diseases
g: grams
IGSS: Instituto Guatemalteco de Seguridad Social (Institute of Social Security of Guatemala)
BMI: Body mass index
INCAP: Institute of Nutrition of Central America and Panama
mg/dl: milligrams per deciliter
mmHg: millimeters of mercury
mmol/L: millimols per liter
MSPAS: Ministerio de Salud Pública y Asistencia Social (Ministry of Public Health and Social Welfare)
PAHO: Pan American Health Organization
PSU: Primary sampling units

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