

# Prevalence of Hypertension and Diabetes Sweet in Dubréka, in Guinea: A Cross-Sectional Study Exploring Modern and Traditional Healthcare Approaches

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## Abstract

Hypertension high blood pressure (HTN) and diabetes Type 2 diabetes mellitus (T2DM) are noncommunicable diseases (NCDs) growing in sub-Saharan Africa, under the effect of urbanization, changes in socio-economic and life-style-related factors. This study aimed to assess the prevalence of these conditions in the urban commune of Dubréka, in Guinea, and to assess the role of demographic and cultural factors in their incidence and management. A cross-sectional study was conducted with 287 participants (174 women and 113 men) in Dubréka. Data were summer collected on the characteristics of sociodemographics, BMI, blood pressure and fasting blood glucose. The prevalence of hypertension and diabetes was determined, and participants' knowledge and treatment practices were assessed in the summer. The prevalence of hypertension in the study population was 73.52%, affecting both sexes, with women presenting a higher prevalence. The prevalence of diabetes is slightly higher (75.29%) than that of men (70.79%) was 36.59%, with men (38.05%) being slightly more affected than women (35.63%). Obesity and overweight were contributory important factors, affecting respectively 25.78% and 37.28% of the population. Among the hypertensive people, 84.83% were aware of their condition, but only 7.26% received treatment, with no case-controlled hypertension having no summer observed. Socio-economic factors, including the urban setting and proximity to the capital, have probably contributed to these results. The high prevalence of hypertension and diabetes in Dubréka reflects the broader epidemiological transition in sub-Saharan Africa, with women

being disproportionately affected by hypertension linked to obesity. Access limited to health care, especially in terms of treatment and care, further aggravates the burden of these diseases. Public health interventions are urgently needed to improve awareness, treatment accessibility and culturally appropriate management strategies adapted to fight against the growing burden of NCDs in Guinea peri-urban.

### **Keywords**

Hypertension, Type 2 Diabetes, Prevalence, Traditional Medicine, Dubréka, Guinea, Public Health

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## **1. Introduction**

Hypertension High blood pressure (HTN) and type 2 diabetes (T2D) are two of the most pressing noncommunicable diseases (NCDs) worldwide, particularly in low-income countries low and intermediate (LMIC). In sub-Saharan Africa, the landscape epidemiological has moved from infectious diseases to a prevalence-increasing NCDs, in large part due to urbanization, lifestyle changes and socio-economic development. Among these diseases, hypertension and diabetes are the main causes of morbidity and cardiovascular mortality, contributing to health and economic burdens. In Guinea, the prevalence of these diseases gives rise to an increasing worry, especially in peri-urban areas where health resources are limited and where cultural practices still influence decisions in health care. Dubréka, a peri-urban commune located 50 km from the capital, Conakry, is an example illustrative of these challenges. The municipality currently has 427,915 inhabitants, including 211,735 men and 216,180 women, with a population density of 48 inhabitants per km<sup>2</sup>. The demography of Dubréka reflects the complex interaction between urbanization and rural exodus. Ethnically, the population is diversified and composed of groups such as soussou, malinké, baga, kissi, diakanké Guergé, and Peul, with Soussou being the predominant language. This diverse culture plays an important role in defining health behaviors and access to care. The commune of Dubréka operates under a decentralized administrative structure, with local governance managed by a mayor, two deputy mayors and a municipal council of nine members. Due to its proximity to Conakry, a large part of the administrative staff resides in the capital, which has an impact on the delivery of local services, including health care. This administrative configuration, combined with the disparities in socio-economic differences between urban and rural areas of Dubréka, contributes to gaps in the management and treatment of chronic diseases such as hypertension and diabetes. Previous studies in sub-Saharan Africa, including in Guinea, have shown that hypertension and obesity are more common in women than in men, largely partly due to urbanization and lifestyle changes. In Ghana, for example, the prevalence of obesity is 38.2% in women and 21.6% in men, a trend observed similarly in our study, where 38.50% of women were

overweight compared to 35.40% of men. In addition, a higher prevalence of obesity (34.48%) was observed among women, while 12.39% of men fell into this category. These results are consistent with broader epidemiological trends in the region, where women are disproportionately affected by hypertension and obesity due to factors socio-cultural and economic. This study aims to assess the prevalence of hypertension and diabetes in Dubréka and to explore the factors contributing to their increase. It will assess modern and traditional healthcare approaches, revealing how local practices, such as treatments and traditional symptom-based interventions, coexist with medical interventions. By identifying gaps in healthcare access and management, particularly in peri-urban settings, this research aims to inform public health strategies adapted to the context of the cultural and socio-economic of Dubréka.

## 2. Methods

### 2.1. Overview of the Study Area

The urban commune of Dubréka whose capital is Dubréka center east located approximately 50 km from the capital, is limited to the north by the rural commune of Khorira, to the south by the river separating Kénendé and Nèguèyah, to the East by the rural commune of Kouriah in the prefecture of Coyah, to the West by the Atlantic Ocean. The commune currently has 427,915 inhabitants, including 211,735 men and 216,180 women, with a population density of 48 inhabitants per km<sup>2</sup>. The population is ethnically diversified, including ethnic groups Sousou, Malinke, Baga, Kissi, Diakanké Guerge and Peul, the Soussou being the predominant language spoken in the region [1].

### 2.2. Study Design and Population

This study was a transverse investigation conducted from February 15 to April 15, 2015 with volunteers aged 20 and over (see the survey form in **Appendix**). A total of 287 volunteers were selected at random for the study. An initial contact was established with community elders to raise awareness and encourage participation in the study.

The proximity of seniors to the population and their knowledge of socio-cultural habits have facilitated initial contact. In order to reduce the workload, their involvement was limited to the recruitment phase. Data collection focused on information socio-demographic (age, gender), lifestyle habits such as smoking, consumption of alcohol, kola nut, Maggi Cube, Soumbara, salt, background medical family (hypertension or diabetes), the parameters anthropometric (weight, height), blood pressure and blood sugar. Blood sugar (g/l) was measured using a One Touch Ultra Mini glucometer. Blood pressure was measured on the left arm three times, at 5-minute intervals, using a blood pressure monitor electronics, the Tensioval Comfort Classic IP20, at every subject to rest for at least ten minutes after having withdrawn his shoes and all clothing heavy. Standards for physical measurements (blood pressure and anthropometric parameters) are expressed in units

international: blood pressure in mm Hg; weight in kg; height in m; hypertension East defined as blood pressure  $\geq 140/90$  mm Hg. Weight measurement was performed using an electronic scale (accuracy to within 0.1 kg). The subject stood standing, slightly dressed and without shoes. The size was measured using a stadiometer (accuracy to 1 centimeter) near) in a standing position without shoes. Body mass index (BMI) was calculated by dividing weight (kg) by height ( $m^2$ ). Overweight was defined as  $25 \leq \text{BMI} < 30$ , obesity such as  $\text{BMI} \geq 30$  and insufficiency weight as a BMI less than 18.5. Thus, 63 subjects who were diabetics without hypertension, after two weeks of monitoring and a week of hygienic-dietetic measurements, have summer included in the study. Subjects suspected of hypertension and diabetes have summer invited for confirmation of their statuses during the week that followed the investigation.

### 2.3. Traditional Considerations

Ethnomedical surveys conducted in Dubéka show that the notion of hypertension and diabetes is recent in the language of Guinean traditional healers and herbalists and for good reason the diagnosis of these pathologies is limited to a therapeutic objective of relieving signs such as migraines and headaches. The correlation of these signs to hypertension is independent of traditional medical knowledge. The healer most often adapts the diagnosis resulting from a medical intervention and borrows from classical medicine as to the name and description of the disease. This state of affairs is explained by the cohabitation between the two forms of medicine. The Malinké Healer calls hypertension “Djelisiaya” and diabetes “soukaro diankoro” which means respectively an “increase in the quantity of blood” and a “sugar disease”. The Fulani Healer defines them as the disease of salt and sugar “Naounaret landan, and Naounaret soukar”. Nevertheless, some plants were cited by (10) traditional healers and (5) herbalists found on site.

### 2.4. Variables Subject to Study

- **Sociodemographic variables:** Age, gender, ethnicity and language, occupation
- **Clinical variables:**
  - **Blood pressure (BP):** Blood pressure was measured to classify participants into categories of normotensive, prehypertensive and hypertensive. Hypertension has been classified into three grades: HTN grade I (140 - 159/90 - 99 mmHg), grade II (160 - 179/100 - 109 mmHg) and grade III ( $\geq 180/\geq 110$  mmHg). The study also distinguished between hypertension systolic-diastolic, hypertension systolic isolated and hypertension diastolic.
  - **Fasting blood sugar:** fasting blood sugar levels have summer measured to identify people with type 2 diabetes (T2D), defined as fasting blood glucose  $\geq 126$  mg/dL. Diabetes management and awareness were also assessed.
- **Anthropometric variables: Body mass index (BMI).** BMI was calculated using the formula weight (kg) divided by height ( $m^2$ ). Participants were summer

classified into four categories: insufficiency weight (BMI < 18.5 kg/m<sup>2</sup>), normal weight (BMI 18.5 - 24.9 kg/m<sup>2</sup>), overweight (BMI 25 - 29.9 kg/m<sup>2</sup>) and obesity (BMI ≥ 30 kg/m<sup>2</sup>).

➤ **Knowledge and processing variables:**

- **Knowledge about hypertension and diabetes:** Participants have summer asked about their knowledge of their condition, including medical outlook modern and traditional.
- **Approaches therapeutic:** Data was collected in the summer to find out whether people hypertensive or diabetics were receiving treatment modern or traditional and, if so, whether their condition was controlled by current treatment.

## 2.5. Data Collection

Sociodemographic data, background medical and lifestyle factors (smoking, consumption of alcohol) of participants have summer recorded. Blood pressure was measured three times using an electronic Tensioval Comfort Classic IP20 device with five-minute intervals between readings and fasting blood glucose levels, which were assessed in the summer using a OneTouch UltraMini glucometer. Participants suspected of hypertension or diabetes underwent three additional checks during the course of a week at IRDPMAG. People having values persistent blood glucose levels > 1.26 g/l and blood pressure ≥ 140/90 mm Hg have summer classified as diabetics and hypertensives for the study. Weight was measured using an electronic scale with an accuracy of 0.1 kg, with subjects standing without shoes and in lightweight clothes. The size was measured using a stadiometer with an accuracy of 1 cm, and it was also without shoes. Body mass index (BMI) was calculated by dividing weight (kg) by height (m<sup>2</sup>).

## 2.6. Data Processing

The data has summer entered into Excel. The descriptive component consisted of calculating the proportions and the means (or the median) according to the nature of the variable to be described.

The study population was described according to sex, age, stage of hypertension and diabetes, duration of diabetes, history of family hypertension and diabetes and the duration of diabetes.

## 2.7. Considerations Ethics

This study followed the ethical principles of the Declaration from Helsinki. Consent has been obtained from all participants who have been informed of the purpose of the study and their right to withdraw at any time. Confidentiality was assured with anonymized data and no disclosure of personal information. Non-invasive measures have been performed in the summer by qualified personnel under hygienic conditions. Participants diagnosed with hypertension or diabetes during the study were summer-oriented to local health services for further care, prioritizing their health and well-being.

## 2.8. Limitations and Difficulties

The main limitation and challenge of this study was the lack of cooperation of some participants.

## 3. Results

### Features sociodemographic

**Table 1** summarizes the sociodemographic and clinical data of the general population.

**Table 1.** Characteristics are sociodemographic.

Demographic characteristics	Women	Men
Age (years)	52.69 ± 16.85	56.65 ± 14.05
Weight (kg)	71.90 ± 16.10	70.81 ± 13.79
Height (m)	1.60 ± 0.08	1.68 ± 0.07
BMI (Kg/m <sup>2</sup> )	28.26 ± 6.05	24.88 ± 5.16

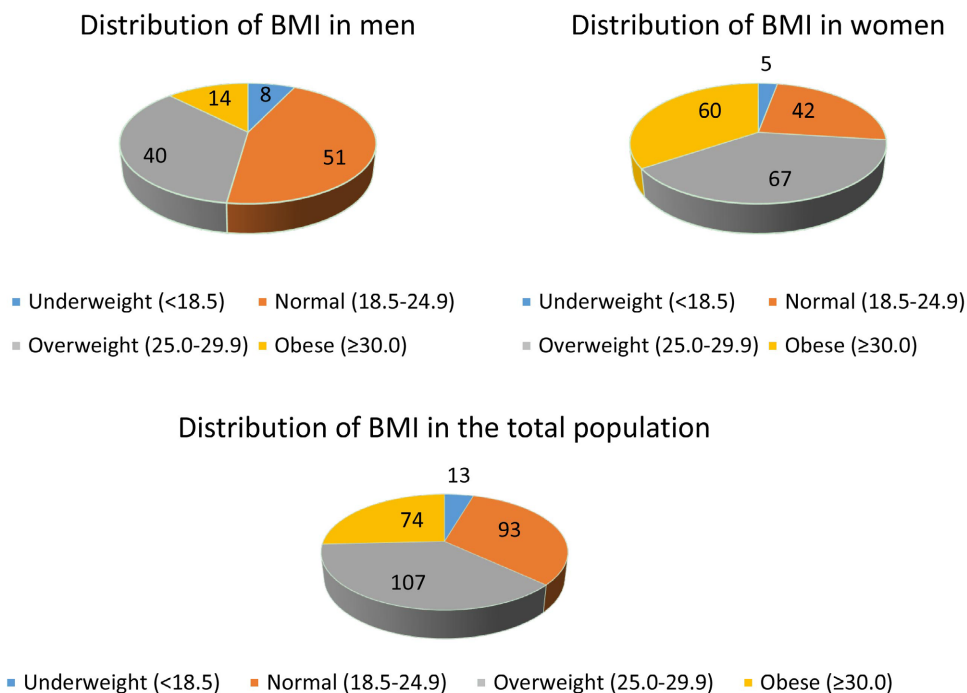
Of the 287 participants, 174 were women and 113 were men, for a female-to-male ratio of 1.54. The average age was 52.6 years for women and 56.6 years for men. The average body mass index (BMI) was higher in women (28.3 kg/m<sup>2</sup>) than in men (24.9 kg/m<sup>2</sup>), indicating a higher prevalence of overweight and obesity in women.

### Prevalence of categories body mass index by sex and age

In total, 32.40% (93/287) had a normal build including 45.13% (51/113) men and 24.14% (42/174) women. BMI indicates overweight (25 - 29.9 kg/m<sup>2</sup>) and obesity (BMI ≥ 30 kg/m<sup>2</sup>) respectively for 37.28% (107/287) and 25.78% (74/287) of the population. In women, overweight and obesity were very common for 38.50% (67/174) and 34.48% (60/174) of the population; among men, the number of people suffering from overweight was also considerable 35.40% (40/113), those suffering from obesity were less 12.39% (14/113). BMI values less than 18.5 kg/m<sup>2</sup> characterizing a state of thinness were found in 4.53% (13/287) including 7.08% (8/113) men and 2.87% (5/174) women.

The prevalence overall overweight in men by age group East respectively equal to 0.88% (1/113); 5.31% (6/113); 2.65% (3/113); 11.50% (13/113); 10.61% (12/113); 3.54% (4/113) from the smallest to the largest age group and 2.87% (5/174); 3.45% (6/174); 4.60% (8/174); 10.92% (19/174); 6.90% (12/174); 9.77% (17/174) among women respectively for the same age groups.

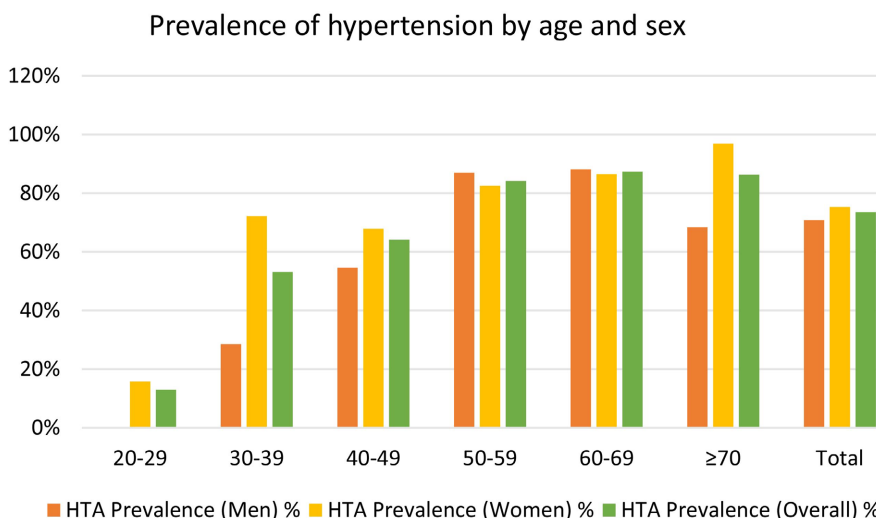
Obesity in men is absent in the first age group. It is 0.88% (1/113); 3.54% (4/113); 2.65% (3/113); 1.77% (2/113); 3.54% (4/113) for the other age groups and among women 4.02% (7/174); 5.17% (9/174); 5.75% (10/174); 6.90% (12/174); 8.05% (14/174); 4.60% (8/174) respectively by order for the same age groups (**Figure 1**).



**Figure 1.** Prevalence of categories body mass index by sex and age.

**Prevalence of hypertension according to age and gender**

Our results show a prevalence of alarming hypertension arterial blood pressure of 73.5% (211/287). The disease is widespread in all age groups, with a tendency to increase with age, reaching a peak of 93.24% in the 60 - 69 age group and 86.27% in those aged 70 and over. Women have a prevalence slightly higher (75.3%) than men (70.8%).



**Figure 2.** Prevalence of hypertension according to age and gender.

Although relatively rarely, cases of hypotension have occurred in summer and are recorded in all age groups, affecting 11.15% (32/287) of the total population.

The prevalence of hypotension was 9.73% (11/113) among men and 12.07% (21/174) among women. The distribution by age group varied, the highest frequencies being observed in the youngest age groups: 47.83% in the 20 - 29 age group, 28.13% in the 30 - 39 age group, 21.51% in the 40 - 49 age group, 2.53% in the 60 - 69 age group and 3.92% among people aged  $\geq 70$  years. The prevalence of global prehypertension was 15.33% (44/287), affecting both sexes: 12.64% (22/174) of women and 19.47% (22/113) of men. Prehypertension was more common in groups of the youngest age, with frequencies of 39.13% in the group aged 20 - 29 years, 18.75% in the group aged 30 - 39 years, 15.38% in the group aged 40 - 49 years, 15.87% in the group aged 50 - 59 years, 10.12% in the group aged 60 - 69 years and 9.80% among people aged  $\geq 70$  years (Figure 2).

**Knowledge and treatment of hypertension according to age and gender**

In our study, 84.83% (179/211) of hypertensive patients have declared to be aware of their condition, with 76.25% (61/80) of men and 90.08% (118/131) of women being aware of their hypertension. However, among those who were conscious, only 7.26% (13/179) were receiving treatment, *i.e.*, 5.08% (6/118) of women and 11.48% (7/61) of men. It should be noted that none of the patients under treatment had not adequately controlled hypertension, meaning that 100% (13/13) of patients treated were suffering from uncontrolled hypertension (Figure 3).

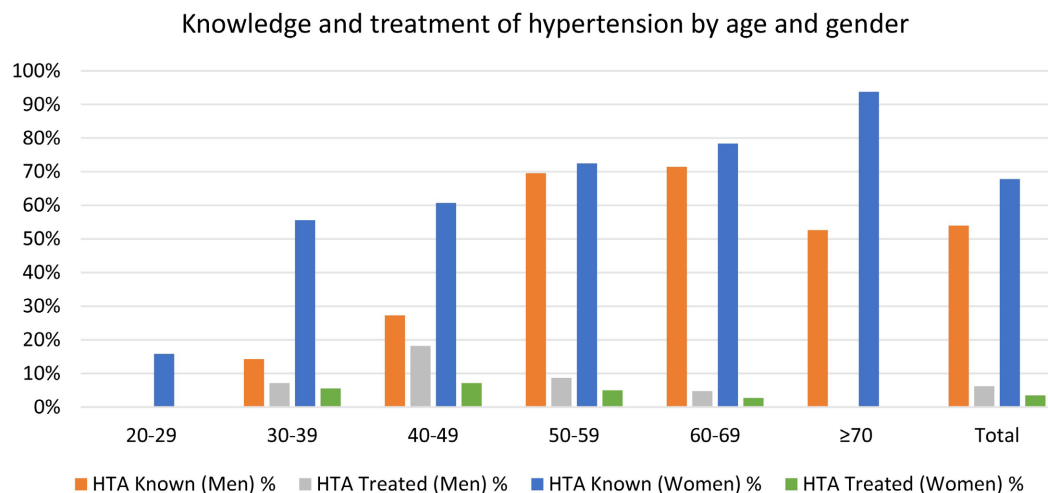


Figure 3. Knowledge and treatment of hypertension according to age and gender

**Proportions of categories BMI in the hypertensive population total**

People hypertensive underweight represented a lower proportion, representing 4.27% (9/211) of cases, with 7.5% (6/80) of men and 2.29% (3/131) of women. Normal weight individuals constituted 28.44% (60/211) of the hypertensive population, including 36.25% (29/80) of men and 23.66% (31/131) of women. Individuals overweight constituted 40.76% (86/211), with 42.5% (34/80) of men and 39.69% (52/131) of women falling into this category.

The frequency of hypertensive patients in overweight by a group of age was as

follows: 47.06% (8/17) for 30 – 39 years old, 47.37% (9/19) for 40 - 49 years old, 54.72% (29/53) for 50 - 59 years old, 30.43% (21/69) for 60 - 69 years old and 43.18% (19/44) for people aged over 70.

Obesity was present in 26.54% (56/211) of hypertensive patients, with a higher prevalence in women (34.35% [45/131]) than in men (13.75% [11/80]). The frequency of hypertensive patients obese by a group of age was: 66.66% (2/3) for 20 - 29 years old, 41.18% (7/17) for 30 - 39 years old, 47.37% (9/19) for 40 - 49 years old, 22.64% (12/53) for 50 - 59 years old, 20.29% (14/69) for 60 - 69 years old and 27.27% (12/44) for individuals over 70 years old (Figure 4).

Proportions of BMI categories in the total hypertensive population

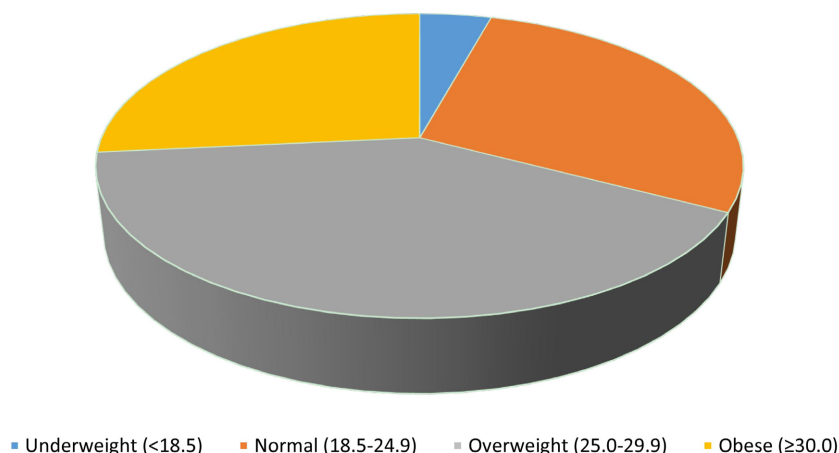


Figure 4. Proportions of categories BMI in the hypertensive population total

### Severity of hypertension

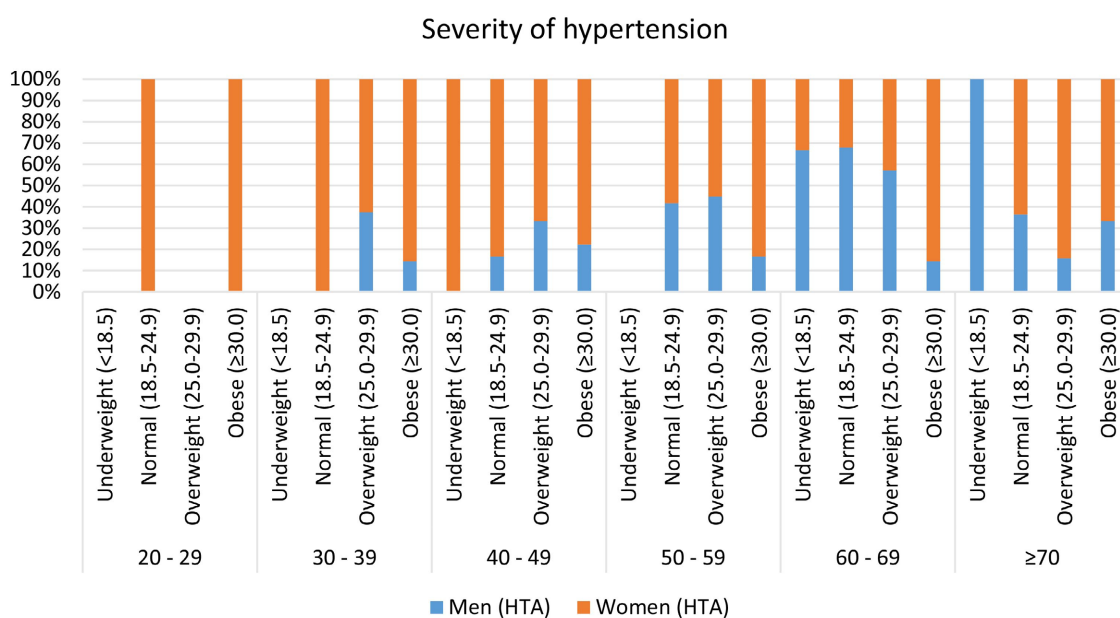
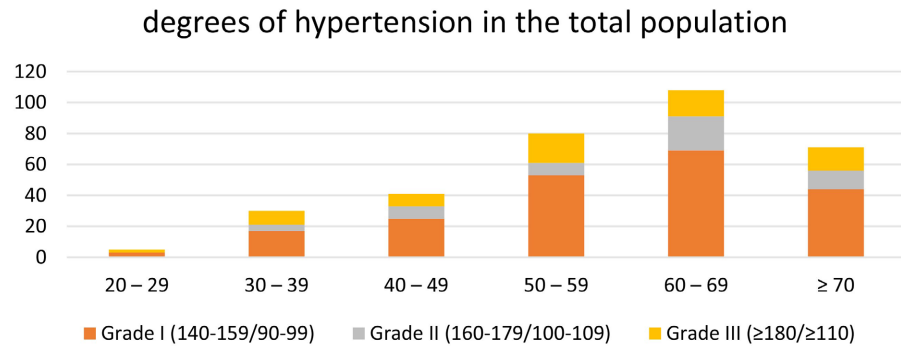


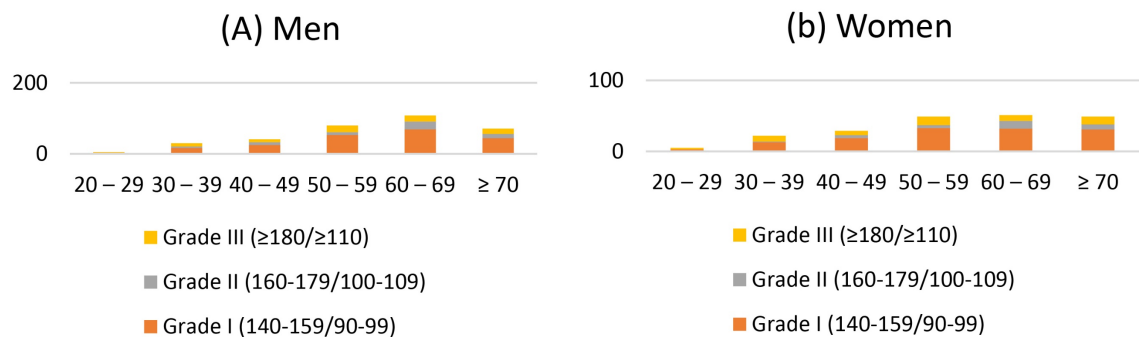
Figure 5. Severity of hypertension.

### Distribution of degrees hypertension in the total population



**Figure 6.** Distribution of degrees hypertension in the total population.

### Severity of hypertension by sex and age



**Figure 7.** Hypertension The severity of different grades shows distinct variations by gender and age.

The distribution of severity of hypertension according to different grades shows distinct variations by gender and age. Grade I hypertension, defined as blood pressure systolic between 140 and 159 mmHg or diastolic pressure between 90 and 99 mmHg, accounts for 44.55% (94/211) of all cases (Figure 5). This includes 46.25% (37/80) of men and 43.51% (57/131) of women. Grade II hypertension, characterized by systolic pressure between 160 and 179 mmHg or diastolic pressure between 100 and 109 mmHg, represents 22.27% (47/211) of the total cases, with 25% (20/80) of men and 20.61% (27/131) of women affected. Finally, grade III hypertension, the most severe form with a systolic pressure of 180 mmHg or more or a diastolic pressure of 110 mmHg or more, represents 33.18% (70/211) of all cases, affecting 28.75% (23/80) of men and 37.88% (47/131) of women (Figure 6).

Analysis of the distribution of hypertension grades by group age brings out several trends. Grade I hypertension is more common in people young and old average, but decreases with age. In men, 75% of people aged 30 to 39, 66.66% of people aged 40 to 49, 45% of people aged 50 to 59, 45.95% of people aged 60 to 69 and 33.77% of people over 70 present grade I hypertension. In women, the prevalence is 33.33% among people aged 20 to 29, 30.77% among people aged 30 to 39, 47.37% among people aged 40 to 49, 51.51% among people aged 50 to 59, 40.62%

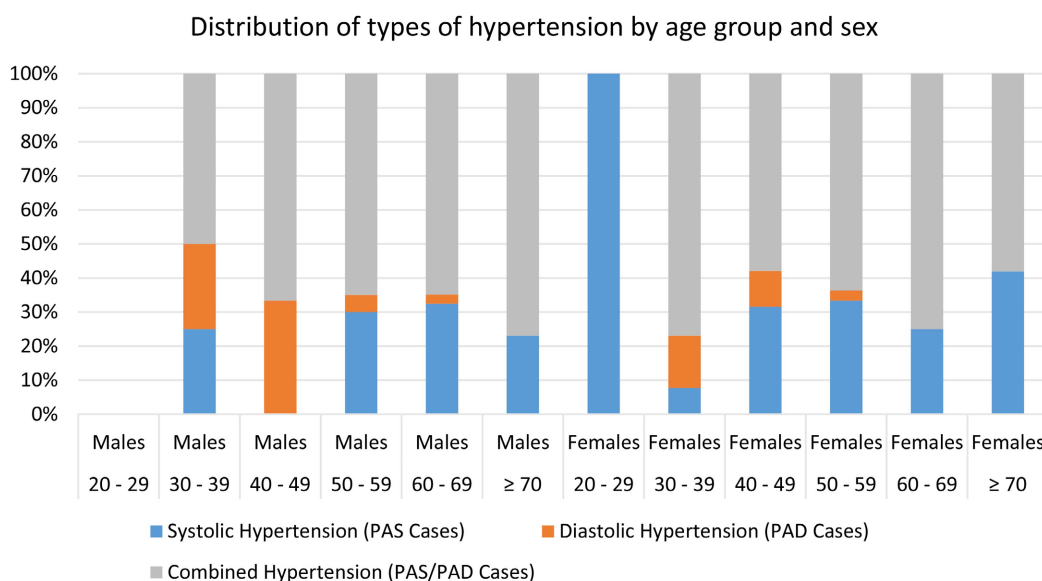
among people aged 60 to 69 and 41.94% among people over 70.

Grade II hypertension, absent in young people, begins to appear more frequently as individuals age and get older. Among men, 20% of people aged 50 to 59, 29.73% of people aged 60 to 69 and 38.46% of people over 70 present grade II hypertension. In women, the prevalence is 7.69% among people aged 30 to 39, 21.05% among those aged 40 to 49, 12.12% among those aged 50 to 59, 34.37% among those aged 60 to 69 and 22.58% among those aged over 70.

Grade III hypertension is more common in elderly people. Among men, 25% of people aged 30 to 39, 33.33% of people aged 40 to 49, 35% of people aged 50 to 59, 24.32% of people aged 60 to 69 and 30.77% of people over 70 are affected by this severe form of hypertension. Among women, 66.66% of people aged 20 to 29, 61.54% of people aged 30 to 39, 31.58% of people aged 40 to 49, 36.36% of people aged 50 to 59, 25% of people aged 60 to 69 and 35.48% of people over 70 present grade III hypertension (**Figure 7**).

#### Distribution of hypertension types by group by age and gender

The most common type of hypertension observed was hypertension systolic-diastolic (**Figure 8**), touching 64.92% (137/211) of the population studied. This pathology was slightly more frequent in men (66.25%, 53/80) than in women (64.12%, 84/131). The frequency of hypertension was systolic-diastolic by a group of age was 70.59% among people aged 30 to 39, 60% among people aged 40 to 49, 64.15% among people aged 50 to 59, 69.57% among people aged 60 to 69 and 63.63% among people over 70.



**Figure 8.** Distribution of hypertension types by group by age and gender.

Hypertension systolic was present in 30.33% (64/211) of participants, affecting 27.5% (22/80) of men and 32.06% (42/131) of women. Its distribution according to groups of age was as follows: 13.33% among 20 - 29 years old, 5.88% among 30 - 39 years old, 48% among 40 - 49 years old, 43.40% among 50 - 59 years old,

15.94% among 60 - 69 years old and 29.54% among those over 70.

Hypertension diastolic was rare, occurring in 4.74% (10/211) of the population, with a prevalence slightly higher in men (6.25%, 5/80) than in women (3.82%, 5/131). By group age, frequency was 17.65% among 30 - 39 years old, 16% among 40 - 49 years old, 3.77% among 50 - 59 years old and 1.52% among 60 - 69 years old.

Blood pressure systolic average increased with age in men, ranging from  $156 \pm 00/88 \pm 00$  to  $164 \pm 10.97/86 \pm 2.52$ . In contrast, blood pressure Systolic blood pressure in women decreased with age, from  $171 \pm 19.63/74 \pm 9.24$  in the 20 - 29 age group to  $158 \pm 15.55/84 \pm 3.46$  in those over 70 years old.

**Distribution of HTN type by sex and age**

**Table 2.** Distribution according to HTN type and means according to sex and age.

Age	N	HTN	HTN (number of cases)		
			Average PASi	Average PADi	Average PAS/PAD
<b>Men</b>					
20 - 29	4	0	0	0	0
30 - 39	14	4	$156 \pm 00/88 \pm 00$ (1)	$137 \pm 00/96 \pm 00$ (1)	$157 \pm 19.80/106 \pm 19.09$ (2)
40 - 49	11	6	0	$129 \pm 2.83/94 \pm 00$ (2)	$169 \pm 16.62/106 \pm 19.40$ (4)
50 - 59	23	20	$146 \pm 3.67/84 \pm 2.71$ (6)	$135 \pm 00/106 \pm 00$ (1)	$186 \pm 41.46/103 \pm 7.21$ (13)
60 - 69	42	37	$145 \pm 7.54/82 \pm 7.72$ (12)	$137 \pm 00/93 \pm 00$ (1)	$171 \pm 16.99/102 \pm 6.22$ (24)
≥70	18	13	$164 \pm 10.97/86 \pm 2.52$ (3)	0	$165 \pm 17.20/105 \pm 13.78$ (10)
<b>Total</b>	<b>112</b>	<b>80</b>	<b><math>149 \pm 9.54/83 \pm 6.14</math></b> <b>(22)</b>	<b><math>133 \pm 4.34/97 \pm 5.37</math></b> <b>(5)</b>	<b><math>169 \pm 27.06/103 \pm 9.05</math></b> <b>(53)</b>
<b>Women</b>					
20 - 29	19	3	$171 \pm 19.63/74 \pm 9.24$ (3)	0	0
30 - 39	18	13	$197 \pm 00/76 \pm 00$ (1)	$137 \pm 00/96 \pm 00$ (2)	$176 \pm 20.25/110 \pm 8.67$ (10)
40 - 49	28	19	$151 \pm 11.50/84 \pm 1.86$ (6)	$131 \pm 4.95/94 \pm 00$ (2)	$(11)173 \pm 20.15/107 \pm 11.89$ (11)
50 - 59	40	33	$157 \pm 20.55/82 \pm 3.59$ (11)	$135 \pm 00/106 \pm 00$ (1)	$173 \pm 26.27/106 \pm 11.80$ (21)
60 - 69	37	32	$148 \pm 9.02/84 \pm 2.39$ (8)	0	$173 \pm 20.04/99 \pm 6.90$ (24)
≥70	32	31	$158 \pm 15.55/84 \pm 3.46$ (13)	0	$181 \pm 28.05/104 \pm 11.29$ (18)
<b>Total</b>	<b>174</b>	<b>131</b>	<b><math>157 \pm 17.17/83 \pm 4.44</math></b> <b>(42)</b>	<b><math>134 \pm 4.12/97 \pm 5.02</math></b> <b>(5)</b>	<b><math>173 \pm 24.57/104 \pm 10.44</math></b> <b>(84)</b>
<b>Totals</b>			<b><math>154 \pm 15.43/83 \pm 5.04</math></b> <b>(64)</b>	<b><math>134 \pm 4.00/97 \pm 4.91</math></b> <b>(10)</b>	<b><math>171 \pm 25.55/104 \pm 10.06</math></b> <b>(137)</b>

Systolic-diastolic hypertension was the most common, *i.e.* (Table 2) 64.92% (137/211) including 66.25% (53/80) of men and 64.12% (84/131) of women. Its frequency is 70.59% (12/17); 60% (15/25); 64.15% (34/53); 69.57% (48/69); 63.63% (28/44) respectively in order from the second age group. Systolic hypertension was at a frequency of 30.33% (64/211) including 27.5% (22/80) of men and 32.06% (42/131) of women. Its frequency is 13.33% (4/3); 5.88% (1/17); 48% (12/25); 43.40% (23/53); 15.94% (11/69); 29.54% (13/44) respectively in order of age groups.

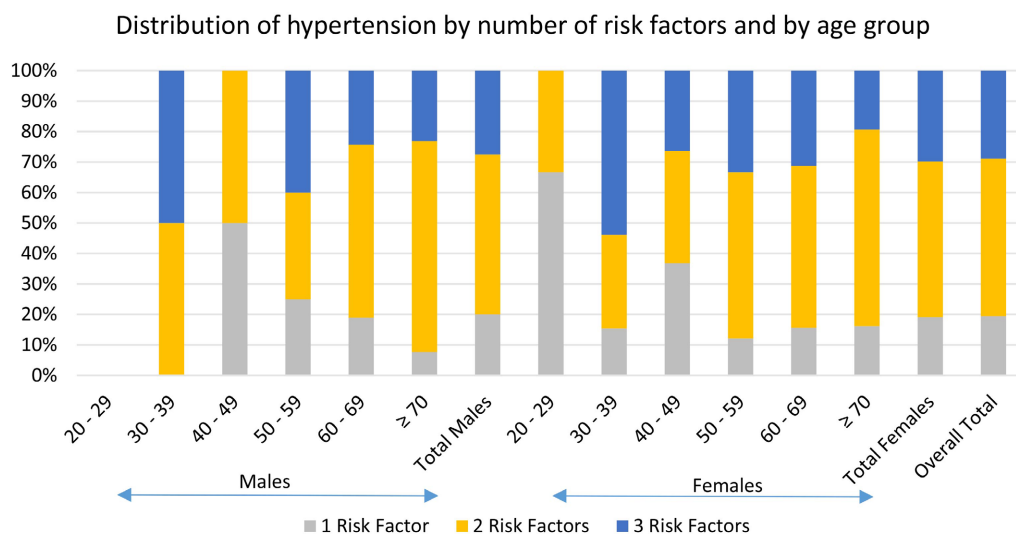
Diastolic hypertension is rare, *i.e.* 4.74% (10/211) including 6.25% (5/80) of men and 3.82% (5/131) of women. Its frequency by age group is 17.65% (3/17); 16% (4/25); 3.77% (2/53); 1.52% (1/69) respectively from the age group 30 - 39 years, 40 - 49 years, 50 - 59 years to that of 60 - 69 years.

The mean systolic hypertension increased with age in men from  $156 \pm 00/88 \pm 00$  to  $164 \pm 10.97/86 \pm 2.52$ . On the other hand, there was a decrease in systolic hypertension from  $(171 \pm 19.63/74 \pm 9.24)$  in 20 - 29 years old to  $(158 \pm 15.55/84 \pm 3.46)$  in women over 70 years of age.

#### Distribution of hypertension according to risk factors and age group

Risk factors identified are diabetes, smoking, physical inactivity, obesity and overweight (Figure 9). The presence of a risk factor East is indicated by the number 1, two risk factors by the number 2 and three risk factors by the number 3.

Among the people hypertensive, 19.43% (41/211) had at least one risk factor, 51.66% (109/211) two and 28.91% (61/211) had three risk factors.



**Figure 9.** Distribution of hypertension according to the number of risk factors and age group.

#### Prevalence of diabetes by group by age and gender

The prevalence of global diabetes was 36.59% (105/287), with a prevalence of 38.05% (43/113) in men and 35.63% (62/174) in women (Figure 10). By group age, prevalence was 40.63% (13/32), 25.64% (10/39), 47.62% (30/63), 45.95% (34/74) and 41.46% (17/41) from the group aged 30 - 39 years.

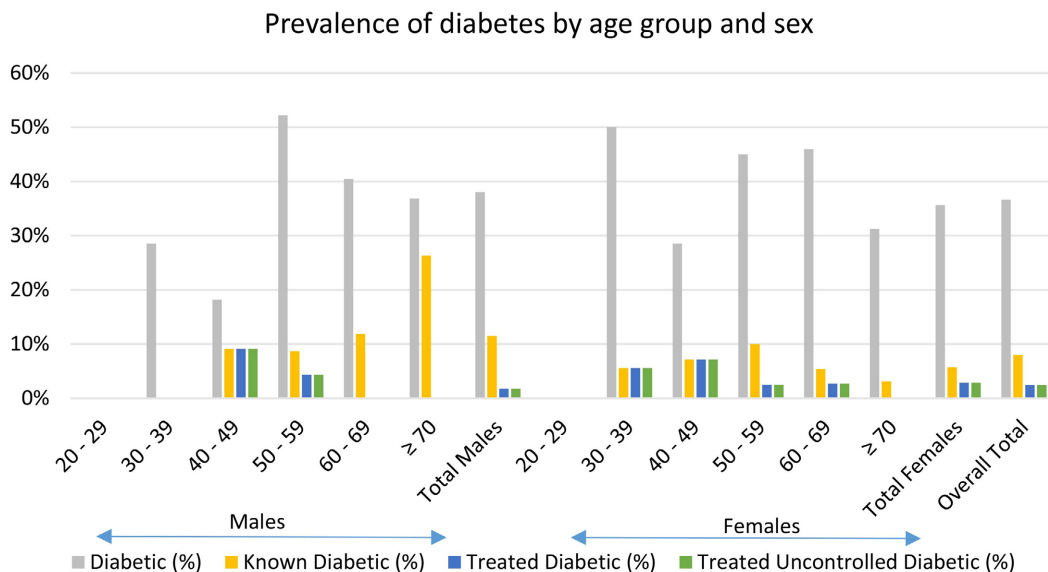


Figure 10. Prevalence of diabetes by group by age and gender.

In total, 21.90% (23/105) of people diabetics were aware of their condition, including 30.23% (13/43) of men and 16.13% (10/62) of women. The majority of diabetics were unaware of their condition, representing 78.09% (82/105) of the diabetic population, including 69.77% (30/43) of men and 83.87% (52/62) of women.

Among the people who knew their diabetes, 30.43% (7/23) were receiving treatment, including 15.38% (2/13) men and 50% (5/10) women. However, none of the individuals under treatment did not have diabetes controlled, 100% (7/7) being uncontrolled.

**Distribution of people diabetics by BMI, group age and gender**

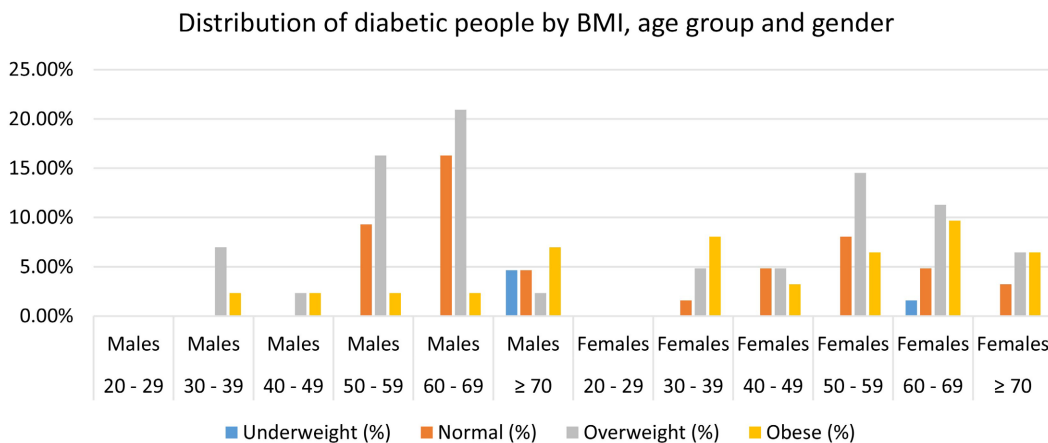


Figure 11. Distribution of people diabetics by BMI, group age and gender.

In total, 44.76% (47/105) and 26.66% (28/105) of the diabetic population are respectively overweight or obese. The prevalence of diabetics in overweight is 48.84% (21/43) in men and 41.93% (26/62) in women. The prevalence of obesity

East also significant, affecting 16.28% (7/43) of men and 33.87% (21/62) of women. Very few diabetic patients present an insufficient weight, with a BMI less than 18.5, *i.e.*, only 2.86% (3/105) of the population. On the other hand, 25.71% (27/105) of diabetics have a normal BMI, with 30.23% (13/43) of men and 22.58% (14/62) of women falling into this category.

By group age, the percentage of diabetics overweight is 46.15% (6/13) for 30 - 39 years old, 50% (5/10) for 40 - 49 years old, 53.33% (16/30) for 50 - 59 years old, 53.33% (16/34) for 60 - 69 years old and 27.77% (5/18) for those over 70.

Regarding obesity, prevalence is 46.15% (6/13) in the 30 - 39 age group, 30% (3/10) in the 40 - 49 age group, 16.66% (5/30) in the 50 - 59 age group, 17.64% (6/34) in the 60 - 69 age group and 38.88% (7/18) among those over 70 (Figure 11).

#### Distribution of diabetics according to the number of risk factors

Risk factors identified are: hypertension, consumption of cola drinks or tobacco, sedentary lifestyle, obesity and overweight (Figure 12). More than half of diabetic patients have three risk factors, *i.e.* 58.10% (61/105), with 51.16% (22/43) of men and 62.90% (39/62) of women. Next come those presenting two risk factors, *i.e.* 38.10% (40/105), with 48.84% (21/43) of men and 30.65% (19/62) of women. Finally, 6.45% (4/62) of women have not only one risk factor, none case not being observed in men.

Distribution of diabetics according to the number of risk factors

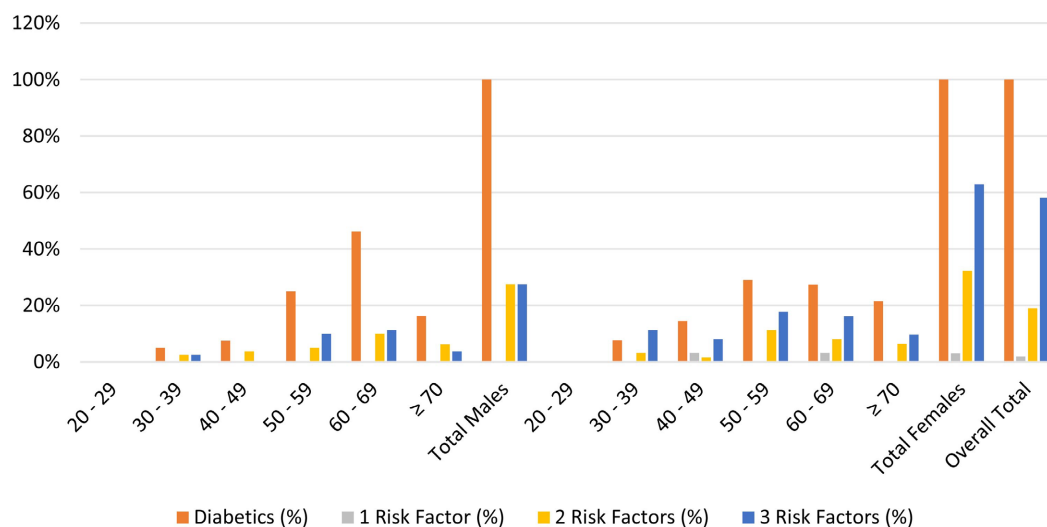


Figure 12. Distribution of diabetics according to the number of risk factors.

#### Distribution of HTN/Diabetics by group by age and gender

In total, 96 out of 105 diabetic patients suffered also hypertension, which represents 91.43%. This includes 90.48% (39 out of 43) of men and 91.93% (57 out of 62) of women. None case n/A summer recorded in the 20 - 29 age group. The frequency of hypertension in diabetics by age group is as follows: 84.62% (11 out of 13) for 30 - 39 years old, 80% (8 out of 10) for 40 - 49 years old, 90% (27 out of

30) for 50 - 59 years old, 97.06% (33 out of 34) for 60 - 69 years old and 94.44% (17 out of 18) for those over 70 (Figure 13).

### Distribution of HTN /Diabetics by age group and gender

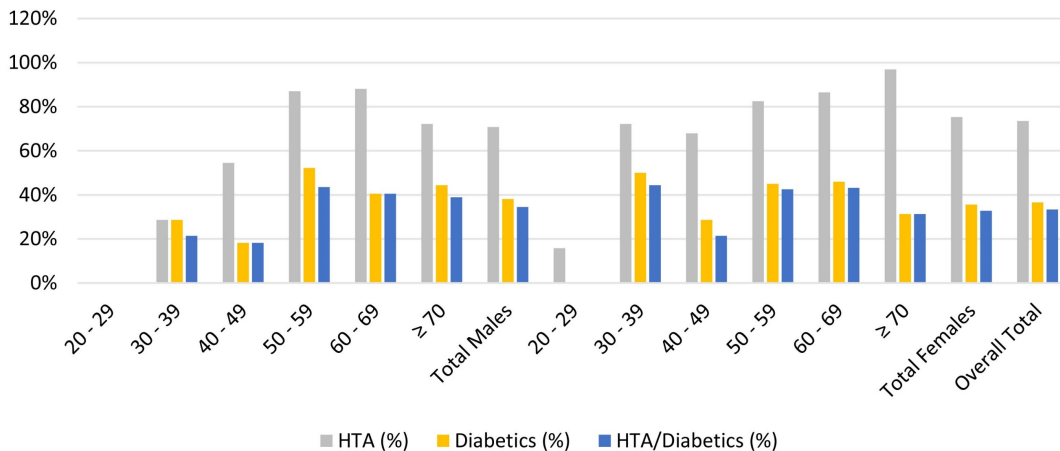


Figure 13. Distribution of HTN/Diabetics by group by age and gender.

### Distribution of HTN/Diabetics by category of BMI

Significant proportion of diabetics hypertensive are either in overweight, 44.79% (43 out of 96), of which 51.22% (20 out of 39) are men and 40.35% (23 out of 57) are women, *i.e.* obese, 27.08% (26 out of 96), of which 15.38% (6 out of 39) are men and 35.09% (20 out of 57) are women. Those who have a normal BMI represent 26.04% (25 out of 96), of which 30.77% (12 out of 39) are men and 22.81% (13 out of 57) are women. Diabetics hypertensive having a low BMI are rare, representing only 2.08% (2 out of 96).

### Distribution of HTN / Diabetics by BMI categories

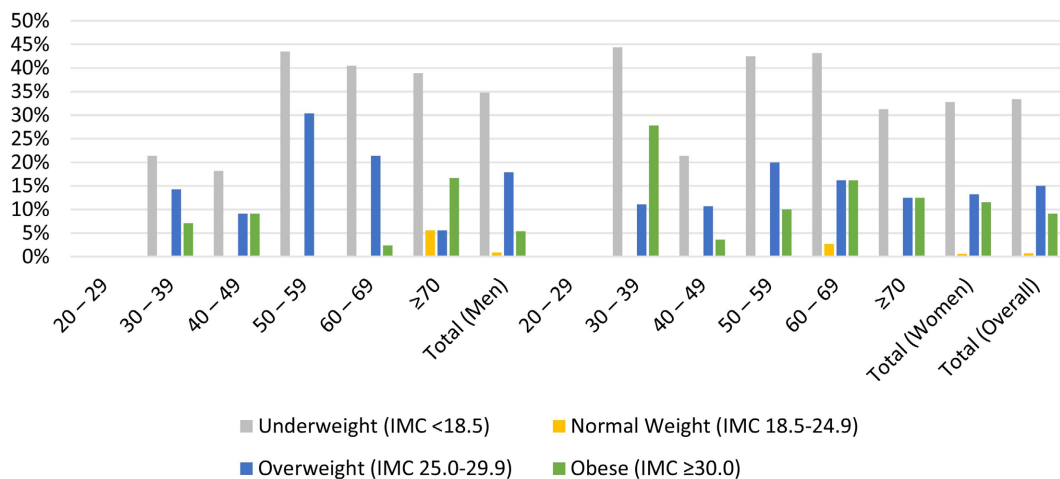


Figure 14. Distribution of HTN/ Diabetics by category of BMI.

The proportion of people overweight by group of age is 36.36% (4 out of 11),

50% (4 out of 8), 55.55% (15 out of 27), 45.46% (15 out of 33) and 29.41% (5 out of 17) of the second group age at the last, respectively. The rate of obesity is 54.54% (6 out of 11), 25% (2 out of 8), 14.81% (4 out of 27), 18.18% (6 out of 33) and 41.18% (7 out of 17), also classified by group age from the second (Figure 14).

## 4. Discussion

### Study population and characteristics of sociodemographic

The study involved 287 participants, including 174 women, for a female-to-male ratio of 1.54. This higher representation of women could be explained by their greater sensitivity to health care management, including in a family environment. Among the professionals in the sector, the tertiary sector was the most represented, with 62.37% (179/287) of participants. This prevalence can be attributed to the urban environment or the study conducted.

Body mass index (BMI) analysis showed that 37.28% (107/287) of the population was overweight (BMI 25 - 29.9 kg/m<sup>2</sup>), while 25.78% (74/287) were classified as obese (BMI ≥ 30 kg/m<sup>2</sup>). In several African countries, obesity has reached epidemic proportions, particularly among women. Urbanization and socioeconomic development remain critical factors contributing to this trend [1] [2]. In Ghana, for example, obesity has been reported at 38.2% among women versus 21.6% among men, with 65% of women being affected in 2009 [3] [4]. Similarly, in Douala, Cameroon, the prevalence was 23.4%, with rates of 36.1% for women and 17.8% for men. In our study, 38.50% (67/174) of the female population were overweight and 34.48% (60/174) were obese, compared to 35.40% (40/113) and 12.39% (14/113) in men, respectively.

The prevalence of obesity found in our study is lower than the 36% reported in Canada in 2006 [5] but exceeds rates in countries like China and France, where the prevalence is 10.8% and 14.3% [6] [7].

French Cases of hypertension have been recorded in all age groups, with a frequency overall of 11.15% (32/287). Among men, 9.73% (11/113) were concerned, compared to 12.07% (21/174) in women. The frequency of prehypertension was 15.33% (44/287), with distributions similar between the sexes: 12.64% (22/174) in women and 19.47% (22/113) in men. This prevalence is significantly lower than that observed in China, where prehypertension affected 35.15% of men and 23.56% of women [8], and in Algeria, where 49.68% of men and 31.47% of women were concerned [9]. According to the Framingham cohort study, the rate of progression of prehypertension toward hypertension over four years was 17.6% in people under 65 years of age and 49.5% in those over 65 years of age. In the American NHANES III survey (1999 - 2000), the prevalence of prehypertension was almost the same in the age groups of 18 to 39 years (32%) and 40 to 59 years (34%), but was significantly lower in people over 60 years old (24%) [10] [11].

Hypertension arterial is very widespread in Dubréka, affecting 73.52% (211/287) of the population in all age groups, from 20 years old. The highest prevalence was observed in the older age groups. The prevalence of hypertension has

increased alarmingly over the years, from 45% in 2009 to almost 80% in 2018. This rate East significantly higher than the national prevalence reported in urine (20 - 40%) [12]-[14], and to scale global (16% - 40%) in Canada, the United States, France and sub-Saharan Africa [15]-[18]. The sub-regional prevalence East also lower in Abidjan (29.7%) [19] and Ghana (13.0%) [20].

Hypertension arterial touch in both women (75.29%) and men (70.79%) in Dubréka. This trend is consistent with that observed in Saudi Arabia, where the prevalence of hypertension East similar between the sexes (4.55% for men and 4.2% - 4.9% for women) [21]. It differs. However, results were previous in Guinea, where the prevalence was higher among women (31%) than among men (27%) [22]. In Kopèrè (Dubréka prefecture), 98% of men were hypertensive [23], while in Gadeloupe, hypertension affected 21% of women and 26% of men in the original population African [24]. In France, hypertension was more common among men than among women (36.5% versus 25.2%).

The relationship between hypertension and aging is well established in prevalence studies conducted in African and European countries. Among young people adults (18 - 29 years), prevalence East by about 10%, then increased up to about 40% in older adults (70 years and older) [25]. The prevalence of hypertension increases with age, regardless of country [26]-[28]. This trend has also been described in summer in Morocco [29], France [30] and Ghana [31]. However, in people over 70 to 79 years old, two studies show a decrease in prevalence after having reached its peak. In the second group age of our study, more than half (53.12% or 17/32) were hypertensive. Being hypertensive at the age of an adult also has summer highlighted in the 2018 US guidelines [32] [33].

In our study, 84.83% (179/211) of hypertensive patients have declared they have knowledge about hypertension, including 76.25% (61/80) of men and 90.08% (118/131) of women. Among those who knew their Status as hypertensive, only 7.26% (13/179) were under treatment, of which 5.08% (6/118) were women and 11.48% (7/61) were men. Hypertension is supported in medical services in general, with an orientation towards units in Conakry specialized in cases of complications. However, the high cost of medications, which are not subsidized, remains a barrier for many patients. In addition, due to the permanent nature of hypertension and the cost of treatment in modern medicine, many patients turn to the traditional healers. Our ethnomedical surveys have identified Several plants used in the management of hypertension, including *Pilostigma thonningii* (*Caesalpinaceae*).

None of the patients under treatment had not controlled hypertension, which reflects a rate of uncontrolled hypertension of 100% (13/13). In Burkina Faso, a study by Somnoma JB *et al.* revealed that 68.18% of elderly people (n = 60) reported having knowledge of hypertension, while 45.45% (n = 40) knew their measures of usual blood pressure levels [34]. A study conducted in Dakar reported that 61% of people informed were undergoing treatment antihypertensive, but only 32% of them had controlled blood pressure, which represents less than 6% of

the hypertensive population globally [35].

In Canada, approximately 25% of the population is hypertensive and, unfortunately, up to 50% of people ignore their condition. Moreover, only a small fraction of hypertensive patients receive treatment effectively. In African countries, hypertension treatment rates rarely exceed 30%. This means that more than 60% of people hypertensive in Africa receive no drugs [36]. In our study, this rate was as low as 7.26% (13/179).

An American study has identified the wrong treatment adherence prescribed as a major factor contributing to bad Blood pressure control in black and white hypertensive patients. Non-adherence to treatment was quoted as the main reason for treatment failure. About 40% of hypertensive patients do not adhere to their therapeutic plan [5] [37]. In France, between 2013 and 2014, the prevalence of hypertensive patients receiving medicinal treatment was 47.3% [45.1% of men and 49.6% of women]. In 2019, a study conducted in Dakar, Senegal, found that only 6% of the hypertensive population had controlled blood pressure. Similarly, a study conducted in Mauritania in 2014 reported that 63% of hypertensive patients had uncontrolled blood pressure despite treatment.

In Dubréka, only 15.17% (32/211) of hypertensive patients were unaware of their condition. This figure is lower than the 30.3% observed in Algeria and clearly lower than the figures reported in European countries (36.7% - 53.4%). Among the hypertensive population in our study, men had a slightly higher rate of sensitization than that of women (23.75% versus 9.92%).

Until 2018, diabetes care in Dubréka was limited, with patients being referred to the national hospital in Conakry for specialized treatment. In 2019, a diabetes unit was created in the prefecture as part of the fight program against non-communicable diseases. However, the management is always faced with challenges, such as the lack of routine HbA1C testing. Continuing education is provided to improve care. In traditional medicine, the diagnosis of diabetes implied often unconventional methods like the urine ant attraction test, which is supposed to indicate a high sugar level. Commonly found plants used understand *Afzelia africana* Smith ex Pers. (Fabaceae), *Allium sativum* L. (Alliaceae), *Anacardiumouest* L. (Anacardiaceae), *Carica papaya* L. (Caricaceae), *Cassia sieberiana* DC (Fabaceae), *Jatropha curcas* L. (Euphorbiaceae), *Lannea acida* A. Rich. (Anacardiaceae), *Moringa oleifera* Lam. (Moringaceae), *Nauclea pobeguunii* (Pobéguin ex Pellegr.) Small (Rubiaceae), *Persea americana* Mill. (Moraceae), *Tamarindus indica* L. (Fabaceae) and *Tamarindus indica* L., (Loranthaceae).

Regarding the factors, clinical and metabolic outcomes of hypertension, hyperglycemia, hypertriglyceridemia, and total cholesterol levels were slightly raised in people hypertensive. These results are consistent with the association known between hypertension and metabolic disorders. Hypertensive patients present a risk of increased cardiovascular disease, which requires effective management of these risk factors in parallel with blood pressure control. Regular monitoring of blood sugar, blood profile lipids, and global cardiovascular risk is essential for this

population.

## 5. Conclusions

The results of this study highlight the prevalence alarming rate of hypertension (HTN) and type 2 diabetes (T2D) in the urban commune of Dubréka, Guinea. With 73.52% of the population studied affected by hypertension and 36.59% by diabetes, these non-communicable diseases (NCDs) pose a serious threat to public health in the region. The higher prevalence of these diseases among women, especially in the context of the rates of obesity and overweight, highlights gender disparities in health, which mirror trends seen across sub-Saharan Africa.

Urbanization and socioeconomic development seem to be the main factors behind the rise in rates of hypertension and diabetes in Dubréka. The lack of effective health infrastructure and the availability of limited treatments further aggravate the burden of these diseases. Although 84.83% of people hypertensive are aware of their condition, only 7.26% of them were receiving treatment, and none had controlled blood pressure. This highlights a critical gap in access to health care and in the effectiveness of current management strategies.

The results of the Dubréka study agree with those other studies conducted in sub-Saharan Africa, particularly in Ghana and the Ivory Coast, where women are particularly affected by obesity and hypertension. The urban-rural divide, limited access to health care and cultural factors contribute to these trends, suggesting the need for targeted interventions. These interventions must not only focus on awareness raising, but also on the guarantee of affordable, accessible and effective treatments.

The fight against the incidence increasing non-communicable diseases in Dubréka needs a multidimensional approach that integrates education in public health, improving access to health care and integrating cultural practices into modern medicine. By adapting interventions to needs premises, this study lays the foundations for a reducing the burden of hypertension and diabetes in peri-urban areas such as Dubreka.

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## Authors' Contributions

All authors have contributed to this research and have read and approved the final version of the manuscript.

## Statement of Approval Ethics

Confidentiality has been respected throughout the data collection process, and all results have been used strictly by scientists.

## Declaration of Consent Enlightened

Before our study is performed, patients have given their consent to participate in the study.

## Conflicts of Interest

The authors do not declare any conflict of interest regarding the publication of this article.

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## Appendix

MEDICINAL PLANT RESEARCH AND DEVELOPMENT CENTER - DUBRÉKA

Sheet NO.: ..... Date: ...../...../..... Surveys: .....

### Epidemiological Investigation Form

Patient:

Region:		Village		Number of healers				
Prefecture:		Sector:						
Sub-Prefecture:		Population:						
Demographic data				Clinical data				
Sex	Age (years)	Size (m)	Weight (Kg)	CMI (kg/m <sup>2</sup> )	Blood pressure (mm Hg)		Blood sugar (g/l)	
					Systolic blood pressure (SBP) (mm Hg)	PAD (mm Hg)	Chickens (number of beats/min)	Pulse pressure
					1st measure			
					2nd measure			
					3rd measure			
					Average			

#### How to assess the life of the population:

Food:	Professional activities	Level of education	Previous antidiabetic treatment	Previous antihypertensive treatment	Risk factors:
Salt	Cultivators	literate	Hypoglycemics	Conventional treatment	Man 55 years old Woman 65 years old
Fat diet	Fishermen	Not literate	Insulin	Plants	Sedentary lifestyle Fatoumata BAH PhD
Alcohol	Housewives	Intellectual	Plants		Tobacco
Maggi Cube	Officials				Family history of HTN
Cola	Others				Family history of diabetes