



# Prevalence and Profile of Arterial Hypertension among Workers of the National Electricity Company from 2015 to 2017, City of Kinshasa

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## Abstract

**Introduction:** Our study focused on the prevalence and profile of arterial hypertension among SNEL workers in Kinshasa. Arterial hypertension is a major public health problem in developing countries. For our study, the aim was to assess the prevalence and profile of hypertension among SNEL workers. Specifically, we would like to estimate the prevalence of arterial hypertension among SNEL workers, determine the profile of SNEL workers, and establish the relationship between the profile and the occurrence of arterial hypertension. **Method:** It is a quantitative, descriptive and correlational study, bearing on a sample of 9285 workers treated during 3 years. The polyclinic of the SNEL includes 2082 hypertensives. We had done the retrospective documentary analysis and the data were recorded in a collection sheet. **Results:** After analyzing and processing the data, the results show that the annual prevalence is 671 hypertensives out of 2,722 patients, *i.e.* 24.7% in 2015; 497 hypertensives out of 1,777 patients, *i.e.* 27.9% in 2016; and 914 out of 4,786 patients, *i.e.* 19% in 2017. And the prevalence of hypertension for the three years is 22.4%. The bivariate results demonstrate that individuals whose age  $\leq 60$  years are more exposed ( $\chi^2 = 4.93$ ; dof = 1;  $p = 0.05$ ); female is more exposed ( $\chi^2 = 4.91$ ;  $p = 0.05$ ); subjects weighing more than 70 kg suffer more than those  $\leq 70$  kg ( $\chi^2 = 119.37$ ;  $p = 0.001$ ); for marital status, the unmarried are more exposed ( $\chi^2 = 318.44$ ;  $p = 0.001$ ); managers are more exposed than agents ( $\chi^2 = 81.90$ ;  $p = 0.001$ ). **Conclusion:** Arterial hypertension is a serious public health problem at the SNEL because its prevalence is 22%. Individuals

who are under 60 years old, female, weigh more than 70 kg, unmarried, and executives of SNEL are more prone to arterial hypertension.

## Subject Areas

Public Health

## Keywords

Prevalence, Profile, Arterial Hypertension

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## 1. Introduction

Arterial hypertension is a very widespread disease in the world in both developed and developing countries. Hypertension is rapidly becoming a major public health problem in all communities in low- and middle-income countries [1].

Worldwide, an estimated 972 million people were hypertensive in 2005, of which 33 million, or 34.3%, came from “developing” countries. The number of hypertensive adults by 2025 could increase by 60% and reach 1.56 billion.

High blood pressure is responsible for more than 7 million deaths a year worldwide and nearly 100 million days of disability. It is the cause of nearly half of strokes and heart attacks [2].

In 2006, 22.7% of Canadian adults aged 20 and over had been diagnosed with hypertension. Since about 17% of people with hypertension are unaware of their condition, the true prevalence of hypertension is probably higher. And it is the most frequent reason for consultation in this country [3].

The lifetime risk of developing hypertension in subjects aged 55 to 65 who have normal blood pressure is 90% [4].

It is estimated that hypertension can be attributed to excessive dietary sodium intake in nearly 30% of cases. Only the results of the Canadian Community Health Survey (CCHS) conducted in 2004 showed that in people over the age of 19, 90% of men and 60% of women had a sodium intake that exceeded the upper limit beyond which the risk of harmful effects increased [5].

In 2008, worldwide, the overall prevalence of hypertension in adults aged 25 or over including people treated for this problem was around 40%. Also in 2008 across all WHO regions, the prevalence of arterial hypertension was highest in the African region at 46% and lowest in the American region (35%).

For the Haute Autorité de Santé (2006), arterial hypertension concerned 10% - 15% of the French population, including 8 million people treated at a cost of 3 billion Euros, probably 14 million patients [6]. The figures are tending to increase, going from 8.6 to 10.5 million people treated between 2000 and 2006 [7].

In Morocco, hypertension is one of the main reasons for consultation in outpatient health services. The prevalence of hypertension is 25% to 40% depending on the country and the population considered [8].

Previously seen as a problem affecting mainly wealthy populations, on the contrary, hypertension has increased in low-income countries such as the DRC.

Hypertension is a disease that affects nearly one and a half billion people in the world, and a third of the African population over the age of 25 has high blood pressure (BP) which does not spare the DRC. The frequency of hypertension was estimated in 2012 at 38.5% and 33.3% respectively in men and women over the age of 25 (Patrick, 2018).

According to Leon Kabamba Ngombe *et al.* (2015), in the Democratic Congo, hypertension alone accounts for around 50% of cardiovascular consultations. It strikes both men and women whose age varies between 14 and 70 years. Because of hypertensive cardiomyopathy and stroke, it is the leading cause of death from cardiovascular disease [9].

From the perspective of the impact of stress, high blood pressure has seen a sustained increase in its prevalence and is expected to affect more than 1.5 billion people by 2025. Many causes have contributed to the increase in prevalence, with particular attention given to mental stress, including stress related to financial problems, anxiety and depression. In addition, an individual's early life stress resilience is strongly linked to the risk of high blood pressure. Stress related to working conditions has been shown to be associated with elevated blood pressure at night during sleep and work [10].

Like other companies, the National Electricity Company (SNEL of the Democratic Republic of Congo (DRC) is also confronted with the problems of cardiovascular diseases among its staff. During our academic services through the health structures of SNEL, several executives and agents of this large company no longer consulted for hypertension and on a daily basis these employees jostled for care related to this disease.

The objective of this study is to assess the prevalence and profile of hypertension among SNEL workers.

## **2. Material and Method**

### **2.1. Study Environment**

The framework chosen to carry out this study is the national electricity company (SNEL) of Kinshasa. More precisely in the health services of the said company, namely, the SNEL polyclinics of the commune of Gombe, NDJILI and the LIMINGA Health Center of Kinshasa. It is a retrospective, descriptive and relational study.

### **2.2. Target Population and Sampling**

The target population in this study is made up of SNEL workers. Those working in the city province of Kinshasa, in particular in the structures listed above.

For this study, we used the exhaustive non-probability sampling method. That is to say, any case of hypertensive patients registered, diagnosed and treated in the above-mentioned structures during the period from January 1, 2015 to De-

cember 31, 2017, *i.e.*, 3 years, was part of our study.

We arrived at a sample of 20, 82 patients working at SNEL and suffering from arterial hypertension for three years (2015, 2016 and 2017).

### 2.3. Collection Method, Technique and Instrument

Conducting a study requires the application of a data collection method.

For our study, we used the survey method.

The survey method allows us to obtain data from monthly activity reports and patient records received, and to approach some agents and executives living with hypertension.

The techniques used are those of retrospective documentary analysis and structured face-to-face interviews. And we used the data collection sheet and the interview guide.

### 2.4. Data Processing

The data collected during our investigation were codified on the tools after the creation of new variables by the analysis. Data processing was done directly by Excel, SPSS Version 22 (Statistical Package for the Social Sciences). The results of the descriptive analysis are presented as a percentage.

We also did the PEARSON chi-square test ( $\chi^2$ ) to test the link between certain characteristics of hypertensives and their grades. The results of this study are estimated at a confidence interval (CI) of 95% with the risk of alpha error set at 5% ( $p = 0.05$ ).

## 3. Results

### 3.1. Univariate Analysis Results

The annual prevalence shows us that 671 hypertensives out of 2722 patients, or 24.7%, were consulted in 2015; 497 hypertensives out of 1777 patients, *i.e.* 27.9%, were consulted in 2016; and 914 out of 4786 patients or 19% were consulted in 2017. And the prevalence of hypertension for the three years is 22% (**Table 1**). In **Table 2**, 58% of hypertensive subjects weigh more than 70 kg. **Table 3** shows that 73% of hypertensives are aged  $\leq 60$  years. In reading **Table 4**, male hypertensives are in the majority with 67%. At the end of **Table 5**, 59% of hypertensive subjects are married. But **Table 6** shows that among hypertensives, agents represent 65% while 35% are executives.

### 3.2. Results of Bivariate Analyzes

In reading **Table 7**, arterial hypertension reaches older than age  $\leq 60$  years ( $\chi^2 = 4.93$ ; dof = 1;  $p = 0.05$ ); concerning sex, the table shows that the female sex is more susceptible ( $\chi^2 = 4.91$ ;  $p = 0.05$ ); subjects weighing more than 70 kg suffer more than those  $\leq 70$  kg ( $\chi^2 = 119.37$ ;  $p = 0.001$ ); for marital status, the unmarried are more exposed ( $\chi^2 = 318.44$ ;  $p = 0.001$ ); managers are more exposed than agents ( $\chi^2 = 81.90$ ;  $p = 0.001$ ).

**Table 1.** Prevalence of hypertensives monitored at SNEL.

Year of consultation	Number of patients treated	Number of hypertensives treated	Prevalence of hypertensives
2015	2.722	671	24.7%
2016	1.777	four hundred ninety seven	27.9%
2017	4.786	914	19%
<b>TOTAL (3 years)</b>	<b>9.285</b>	<b>2.082</b>	<b>22%</b>

**Table 2.** Distribution of subjects according to age groups.

Age of workers	Hypertension				Total (n = 9285)	
	Hypertensive (n = 2082)		Not hypertensive (n = 7203)			
	effective	%	effective	%	effective	%
≤60 years old	1527	73	5103	71	6630	71
>60 years	555	27	2100	29	2655	29

**Table 3.** Distribution of subjects according to gender.

Gender of workers	Hypertension				Total (n = 9285)	
	Hypertensive (n = 2082)		Not hypertensive (n = 7203)			
	effective	%	effective	%	effective	%
Feminine	687	33	2193	30	2880	31
Male	1395	67	5010	70	6405	69

**Table 4.** Distribution of subjects according to their weight.

Weight of workers	Hypertension				Total (n = 9285)	
	Hypertensive (n = 2082)		Not hypertensive (n = 7203)			
	effective	%	effective	%	effective	%
>70	1207	58	3198	44	4405	47
≤70	875	42	4005	56	4880	53

**Table 5.** Distribution of subjects according to their marital status.

Marital status of workers	Hypertension				Total (n = 9285)	
	Hypertensive (n = 2082)		Not hypertensive (n = 7203)			
	effective	%	effective	%	effective	%
Not married	854	4	1553	22	2407	26
Married	1228	59	5650	78	6878	74

**Table 6.** Distribution of subjects according to their professional categories.

Categories of workers	Hypertension				Total (n = 9285)	
	Hypertensive (n = 2082)		Not hypertensive (n = 7203)		effective	%
	effective	%	effective	%		
Frames	729	35	1800	25	2529	27
Officers	1353	65	5403	75	6756	73

**Table 7.** Relationship between profile and occurrence of hypertension.

Profile of workers	Hypertension		95% CI					
	Yes	No	RR	BI	BS	$\chi^2$	dl	p
<b>1. Age</b>								
≤60 years old	1527	5103	1.1	1.01	1.26	4.93	1	0.05
>60 years old	555	2100	1	Ref				
Total	2082	7203						
<b>2. Sex</b>								
Feminine	687	2193	1.1	1.01	1.26	4.91	1	0.05
Male	1395	5010	1	Ref				
Total	2082	7203						
<b>3. Weight</b>								
>70 kg	1207	3198	1.5	1.57	1.91	119.37	1	0.001
≤70 kg	875	4005	1	Ref				
Total	2082	7203						
<b>4. Marital Status</b>								
Not married	854	1553	1.99	2.28	2.80	318.44	1	0.001
Married	1228	5650	1	Ref				
Total	2082	7203						
<b>5. Occupational categories</b>								
Frames	729	1800	1.44	1.46	1.80	81.90	1	0.001
Officers	1353	5403	1	Ref				

## 4. Discussion

The annual prevalence shows us that 671 hypertensives out of 2722 patients, or 24.7%, were consulted in 2015; 497 hypertensives out of 1777 patients, *i.e.*, 27.9%, were consulted in 2016; and 914 out of 4786 patients or 19% were consulted in 2017. And the prevalence of hypertension for the three years is 22%. These results are contradictory to those found by Hélène Godet-Thobie, *et al.* (2008), in their study, the periodic prevalence was 47.3% [11].

Regarding the profile, we found that 73% of hypertensives are aged ≤ 60 years;

it is an age of professional activities, during which the subjects work daily, and this work overload generates stress explaining the occurrence of arterial hypertension. Inserm (2018) maintains that this health problem can occur at all ages, but its incidence increases with advancing age. As for Isabelle (2018), the lifetime risk of presenting with hypertension in subjects aged 55 to 65 who have normal blood pressure is 90% [4].

Reading our results, male hypertensives are in the majority with 67%. 58% of hypertensive subjects weigh more than 70 kg; 59% of hypertensive subjects are married. Agents represent 65% while 35% are executives. Men are the most affected due to the societal expectation of them being the primary providers for their families. Being overweight is often cited as a risk factor for hypertension. The workforce at SNEL is higher for agents compared to managers, which explains the higher percentage.

However, results from Girardin, F. and Pechère-Bertschi, A. (2015), show a total of 2169 adults who had at least two blood pressure measurements, including 974 men (45%) and 1197 women (55%); the prevalence of hypertension was 30.6%, this prevalence was higher in men than in women (36.5% vs 25.2%) and increased with age [12].

In reading **Table 7**, the age of more than 60 years is more exposed ( $\chi^2 = 4.93$ ; dof = 1;  $p = 0.05$ ); the age of less than 60 years is considered an active age since individuals beyond the age of 60 are often preparing for retirement.

According to Losimba, Munyapara, Abiand Batina (2014), hypertension is a disease that affects nearly one and a half billion people worldwide and a third of the African population over the age of 25 years old has high blood pressure which does not spare the DRC. Concerning sex, women are more exposed ( $\chi^2 = 4.91$ ;  $p = 0.05$ ), we understand that women most often bear stress, the frequency was estimated in 2012 at 88.5% and 33.3% respectively in men and women over the age of 25 [13].

Subjects weighing more than 70 kg suffer more than those  $\leq 70$  kg ( $\chi^2 = 119.37$ ;  $p = 0.001$ ); our results corroborate those of Aniakara *et al.* (2003), this author emphasizes that there is a strong correlation between the body mass index (overweight index, relating weight to height) and the blood pressure level; on the other hand, a hypocaloric diet in an obese hypertensive patient is accompanied by a drop in blood pressure [14].

For marital status, the unmarried are more exposed than the married ( $\chi^2 = 318.44$ ;  $p = 0.001$ ); the unmarried live in solitude, which can plunge them into nervousness explaining the increase in blood pressure; the same applies to executives who are more exposed than agents ( $\chi^2 = 81.90$ ;  $p = 0.001$ ). Managers have a heavy responsibility for the company, and the management of resources generates stress that can constitute a risk factor for high blood pressure among company managers [15].

Our results meet the ideas of the WHO (2012), which states that in the case of hypertension, sufficient rest and relaxation are particularly important. People

with hypertension should take care to have enough sleep, recreational vacations and relaxing leisure activities, they should avoid daily agitations and conflicts. The author adds that the employer must ensure the safety and protect the physical and mental health of his employees at work. To fulfill this obligation, he must give priority to collective prevention actions, which in fact make it possible to act on the causes of stress rather than on its symptoms [2].

According to Morocco's Ministry of Health (2007), stress in the workplace then consists of harmful physical and emotional responses that can occur when there is a conflict between the demands of the employee's work and the degree of control available to this employee to respond to these requests [8].

## 5. Conclusions

Our study on the prevalence and profile of high blood pressure among SNEL workers has revealed that high blood pressure is a serious public health problem at SNEL with a prevalence of 22%. Arterial hypertension reaches more among people with the age  $\leq 60$  years ( $\chi^2 = 4.93$ ; dof = 1;  $p = 0.05$ ); concerning sex, the table shows that female is more susceptible ( $\chi^2 = 4.91$ ;  $p = 0.05$ ); subjects weighing  $> 70$  kg suffer more than those  $\leq 70$  kg ( $\chi^2 = 119.37$ ;  $p = 0.001$ ); for marital status, the unmarried are more exposed ( $\chi^2 = 318.44$ ;  $p = 0.001$ ); managers are more exposed than agents ( $\chi^2 = 81.90$ ;  $p = 0.001$ ).

Individuals who are under 60 years old, female, weigh more than 70 kg, unmarried, and executives of SNEL are more prone to arterial hypertension. We suggest that workers at SNEL implement preventive measures such as drinking 2 liters of water per day, managing stress, exercising regularly, and seeking timely medical attention.

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## Conflicts of Interest

The authors declare no conflicts of interest.

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