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Urban-Rural Differences in the Management of Arterial Hypertension in Primary Health Care: An Observational Study in the Health Centers of Vlora

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Abstract

Hypertension is the main preventable risk factor for cardiovascular disease and all-cause mortality worldwide. Factors such as access to health services, medical follow-up and health education directly affect the long-term management of HTA. The aim of the study is to assess the situation and management of HTA in the population of the Vlora district.

The study is observational and is based on the analysis of data on patients with chronic diseases reported in 17 health centers of the Vlora district, including the control of blood pressure values from the population. The Chi-square test was used to assess statistical differences between groups.

The data resulted in 32,334 chronic patients, of whom 15,003 were diagnosed with HTA. From

the data analysis, it is seen that the prevalence of HTA is similar in both urban and rural areas, but its management is significantly better in urban areas (58%) compared to rural areas (41.1%), with statistically significant differences where the probability of the Chi-square distribution is $p=0.0000$, ($p<0.05$).

Arterial hypertension accounts for almost half of all chronic diseases, affecting both urban and rural populations equally, but its management varies significantly. Inequalities in access, service quality and human resources create major differences in disease control. Management of HTA is significantly better in urban areas than in rural areas. Improving HTA monitoring requires systemic interventions focused on rural areas, increasing staff, strengthening nursing, addressing the health personnel crisis and improving the

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functioning of low-performing centers, to reduce health inequalities.

Keywords: *arterial hypertension, primary care, urban area, rural area, health management.*

Introduction

Hypertension (HTN) is one of the most prevalent chronic diseases globally and contributes significantly to the burden of cardiovascular disease. Although diagnosis is relatively simple and effective treatment exists, a large proportion of patients remain with uncontrolled blood pressure (BP). Factors such as access to health services, medical follow-up, and health education directly affect the long-term management of HTN.

According to the National Program for the Prevention and Control of Chronic Diseases in Albania, in the WHO report, cardiovascular diseases are the leading cause of mortality, accounting for 59% of all deaths in Albania. (WHO, 2016-2020) Hypertension ranks as the leading preventable risk factor for cardiovascular disease (CVD) and all-cause mortality worldwide^{1,2}. (Stanaëay JD 2018, GBD 2017)

We are referring to WHO data on the prevalence of hypertension (defined as systolic blood pressure ≥ 140 mmHg, diastolic blood pressure ≥ 90 mmHg, or taking medication for hypertension) in adults aged 30-79 years, which results in an estimated 1.4 billion individuals aged 30-79 years worldwide having hypertension in 2024; which represents 33% of the population in this age range. Of these, two-thirds of adults aged 30-79 years with hypertension live in low- and middle-income countries³.

About 600 million adults with hypertension (44%) are unaware that they have HTN and are undiagnosed. Approximately 630 million adults with hypertension (44%) are diagnosed and treated, and approximately 320 million adults with hypertension (23%) have it under control.

Therefore, hypertension is and remains the leading cause of premature death worldwide and constitutes one of the global targets for non-communicable diseases to reduce the prevalence of uncontrolled hypertension by 25% during 2010-2025.³ (WHO, 2025). It is therefore seen that hypertension constitutes the most important risk factor in the global burden of chronic diseases.

In the study by Mills KT (2020) on the Global Epidemiology of HTA, it is cited that high blood pressure is the largest risk factor in the global burden of disease. While evidence shows that lowering blood pressure can significantly reduce morbidity and mortality from cardiovascular problems, To reduce the burden of diseases related to HTA, health systems must ensure that levels of treatment and control of high blood pressure are achieved. Blood pressure control is promoted as a measure of universal health coverage, especially in the context of non-communicable diseases. Therefore, achieving universal health coverage is a target of the UN Sustainable Development Goals^{4,5,6}.

Hypertension care is seen as a measure of health systems performance, with studies reporting very low hypertension control and highlighting that low- and middle-income countries achieved blood pressure control in less than 5% of patients with hypertension.⁷ (Chow, Clara K et al)

In particular, rural areas often face structural and social barriers that limit quality healthcare. In Albania, data on urban and rural differences in HTA control are still limited. This study aims to contribute to this gap, by assessing the management of HTA in the population and analyzing the situation in health centers in Vlora.

Methodology

Study design

The study is cross-sectional, conducted in the Vlora district during 2025. Basic health care for adults is provided by the family doctor and nurse, at 17 Primary Health Care centers spread throughout the territory of the Vlora district, covering all residential areas.

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Study Setting and Participants

The study was conducted in the Vlora district, where the study included adult age, the total number of patients with chronic diseases, patients with HTA, and patients with BP values within the norm.

Data Collection Instruments and Procedures

Data from periodic reports on chronic diseases from Primary Health Care Centers referred to the Public Health of the Vlora district were used. The data show that there are 32,334 chronic patients, of which 15,003 patients suffer from HTN.

Statistical Analysis

Data were analyzed according to chronic diseases, patients with HTA and patients with HTA

managed with values within the norm, differences in HTA management between gender, residence, health centers, rural and urban areas. Statistical analysis was performed using the SPSS program, version 21. Differences between groups were tested with the Chi-square test, setting the statistical significance level at $p < 0.05$.

Results

Based on data reported by 17 Health Centers in the Vlora district, there are 32,334 chronic patients, of which 15,003 patients are diagnosed with HTN.

Table 1. Data on the number of chronically ill and HTN patients by health centers

Health Center	Total number of chronically ill people	Arterial hypertension		
		Total HTA Cases	Cases with HTA ,Females	No. of patients with HTA, with BP values within the normal range
1. HC No. 1 Vlorë	4602	1272 (27.6%)	660 (51.9%)	750 (59.9%)
2. HC No. 2 Vlorë	4179	2496 (59.7%)	1253 (50.2%)	1943 (77.8%)
3. HC No. 3 Vlorë	4030	1820 (45.2%)	890 (48.9%)	1700 (93.4%)
4. HC No. 4 Vlorë	5249	2343 (44.6%)	1233 (52.6%)	382 (16.3%)
5. HC No. 5 Vlorë	2043	1201 (58.8%)	714 (59.5%)	196 (16.3%)
6. Orikum	1278	538 (42.1%)	320 (59.5%)	377 (70.1%)
7. Himarë	1197	713 (59.6%)	303 (42.5%)	713 (100.0%)
8. Selenicë	688	324 (47.1%)	182 (56.2%)	150 (46.3%)
9. Novoselë	3331	1672 (50.2%)	644 (38.5%)	195 (11.7%)
10. Shushicë	1169	387 (33.1%)	205 (53.0%)	199 (51.4%)
11. Vllahinë	673	129 (19.2%)	65 (50.4%)	10 (7.8%)
12. Armen	445	306 (68.8%)	139 (45.4%)	297 (97.1%)
13. Kotë	562	174 (31.0%)	74 (42.5%)	110 (63.2%)
14. Sevaster	145	75 (51.7%)	36 (48.0%)	75 (100.0%)
15. Brataj	492	246 (50.0%)	125 (50.8%)	231 (93.9%)
16. Vranisht	266	215 (80.8%)	114 (53.0%)	202 (94.0%)
17. Nartë	1985	1093 (55.1%)	627 (57.4%)	445 (40.7%)

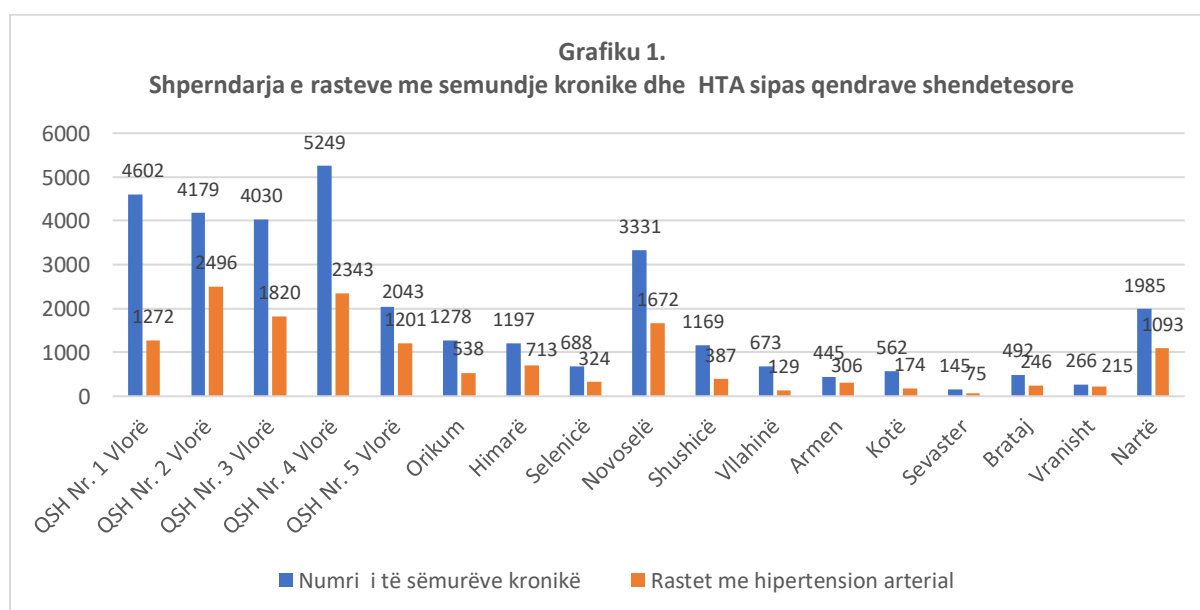
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From **Table 1** it is noted that: according to health centers (HCs), the highest number of cases with chronic diseases is observed in HCs no.4, HCs no.1, HCs no.2, HCs no.3, Novoselë and Nartë. These health centers also have the highest number of cases with HTA and cases of women with HTA.

It is also seen that the health centers with the highest % of HTA management are: HC no. 3 Vlora with

93.4%, Himara with 100%, Sevasteri with 100%, Armen 97%, Vranishti with 94% and Brataj with 93.9%.

The lowest management is observed in the Vllahina HC with 7.8%, Novoselë HC with 11.7%, HC no. 4 with 16.3% and HC no. 5 with 16.3%



The distribution by residence shows that 72% of chronically ill people live in the city and 28% in

the countryside, which is also based on the concentration of the population in urban areas Tab 2.

Table 2. Distribution of chronic diseases by place of residence

Residence	Cases with HTA	%	Other diseases	%
City	10707	71.4%	12559	72.5%
Countryside	4296	28.6%	4772	27.5%
In total	15003	100.0%	17331	100.0%

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As can be seen from the data in Table 2, the majority of cases of hypertension, around 72%, belong to urban areas and 28% to rural areas, while 73% of other chronic diseases belong to urban areas and 27% to rural areas, which also goes parallel to the concentration of the population in urban areas.

Prevalence of Hypertension by Place of Residence

From the data in Table 3, it can be seen that arterial hypertension constitutes the same problem for both the urban and rural population, which means that the place of residence has no influence and is not part of the factors that affect HTA.

Table 3. Distribution of Hypertension and Other Chronic Diseases by Place of Residence

Residence	Cases with HTA	%	P (Chi-square)	Other chronic diseases	%	P (Chi-square)
City	10707	46.0%	0.959	12559	54.0%	0.643
Village	4296	47.4%		4772	52.6%	

In Table 3 it is observed that in the city 46% of chronic diseases are HTA and 54% other chronic diseases while in the village 47.4% are HTA and 52.6% other chronic diseases. There are no statistically significant differences in

the distribution of cases with HTA and other chronic diseases according to the place of residence. In this case the probability of the Chi-square distribution is $p > 0.959$, ($p > 0.05$) for HTA and $p = 0.643$, i.e. $p > 0.05$, which indicates that the changes in values are random.

Table 4. Distribution of Hypertension Cases by Place of Residence and Gender

Residence	Cases with HTA	Female	%	P (Chi-square)
City	10707	5555	51.9%	0.720
Village	4296	2029	48.1%	

In Table 4 we note that the distribution of female cases with HTA is similar in both urban (51.9%) and rural areas (48.1%), without a statistically significant difference $p = 0.720$ ($p > 0.05$), which indicates that the differences in values are random, and that gender and residence are not factors influencing HTA. Biological and lifestyle factors influence more than

residence. Women in rural areas are not less at risk, but less followed by the system.

This is also reported by similar studies, where the NCD Risk Factor Collaboration, 2021 refers to the fact that, The prevalence of hypertension by gender is similar in urban and rural settings, but the level of treatment varies. (Lancet 2021.)

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Table 5. Distribution of HTA cases and managed cases by residence

Residence	No. of patients with HTA, with BP values within the normal range	%
City	6211	77.88%
Village	1764	22.12%
In total	7975	100.00%

In Table 5, it is noted that by analyzing the total number of patients with HTA (N-7975), with BP values within the norms, it is clearly seen that in the majority of them, about 78% of managed HTA

are residents of the city and in rural areas, it results that BP values within the norm in patients with HTA are only in 22% of patients.

Table 6. Distribution of managed HTA cases by location

Residence	Cases with HTA	No. of patients with HTA, with BP values within the normal range	%	P (Chi-square)
City	10707	6211	58.0%	<0.001
Village	4296	1764	41.1%	

In Table 6 we note that: Cases managed with HTA under control in the city are higher than in the countryside, with a comparable value of 58% in the city and 41% in the countryside.

Statistically significant differences are observed in the distribution of cases with HTA values within the norm in rural and urban areas. In this case, the probability of the Chi-square distribution is $p=0.0000$, $p<0.05$. So the main difference is Observed in blood pressure control according to residence where:

- City: 58% of patients with HTA have values within the norm
- Village: only 41.1% of patients are well managed

These values are far from the norms for managing HTA, as one of the risk factors for death in our

country, indicating the need for interventions studied based on concrete needs in the population, follow-up and monitoring according to WHO protocols and guidelines.

Discussion

From the analysis of the study data, it is observed that arterial hypertension affects almost the same number of urban and rural populations (46% vs 47.4%, $p=0.959$), but it turns out that its management varies significantly. This was also observed in the study by Mansouri, who emphasized that Hypertension is one of the most widespread diseases in both urban and rural areas, without major differences in prevalence. (Mansouri, Asieh et al 2023).

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The problem is not “how often HTA occurs”, but “how well is it controlled”

The management of hypertension differs significantly between urban and rural areas. This element is clearly evidenced by the data of this study, where patients with arterial hypertension living in urban areas present higher levels of blood pressure control compared to those in rural areas (58% versus 41.1%, $p < 0.05$), where its management is significantly poorer in rural areas.

This result is related to better access to health services, more regular medical follow-up and more frequent health education in urban areas. The study findings are also consistent with international studies, which report that rural populations have poorer control of hypertension due to structural and social barriers to health care (Mills et al., 2020; WHO, 2021; Chow et al., 2013). This means that people in rural areas are not less sick, but they are less treated and less monitored. This finding is directly related to: faster access to health services in the city, with more regular medical follow-up, with continuous blood pressure monitoring and better health education. While in rural areas, difficulties in accessing health are often observed: with delays in seeing a doctor, lack of periodic check-ups, economic difficulties and transportation. But as a result of uncontrolled hypertension, the risk of: myocardial infarction, cerebral stroke, renal failure and premature death increases.

The role of health access is also emphasized in WHO reports (2021) where: urban systems have better health coverage and rural areas are more exposed to uncontrolled hypertension.

The study by Mills et al., 2020, a global study on hypertension, highlights that populations in rural areas have lower blood pressure control rates due to limited access to healthcare and poor therapeutic adherence, as also seen in this study. *For these reasons, it is necessary to organize a health service to serve residents living in rural areas, with low accessibility, as an essential right to life, mainly for categories in economic difficulty*

and impotence, for the lonely elderly and without family support.

In Albania, the health system continues to face a shortage of family doctors and specialists, creating gaps in the system in rural areas and increasing health inequalities. Albania ranks among the countries with the lowest density of doctors in Europe, with about 1.2 doctors per 1000 inhabitants, a figure much lower than the European average (3.5-4.0/1000 inhabitants). This shortage is particularly felt: in rural areas, in remote villages, in peripheral health centers where the service is often limited or intermittent. The Basic Package of Services in Primary Health Care states that "On average, each HC serves a population of 8,000–10,000 people (this figure varies significantly in urban and rural areas), having a doctor/patient ratio of about 1 to 2,500 and a nurse/patient ratio of about 1 to 400 inhabitants."

But in urban areas, the ratio is usually 1 nurse for 3000-4000 inhabitants, which makes it impossible to provide health care to so many inhabitants. Meanwhile, based on the definition made in the Basic Package of Services in Primary Health Care, this ratio is determined to be 1 nurse and 400 inhabitants. The time set for a medical visit is 30 minutes per patient. Based on the monthly working time for an employee is 160 hours, so a nurse can check about 80 inhabitants per month. This makes it totally impossible to care for all inhabitants according to the legislation. Increasing the nursing staff based on the number of population would reduce health inequalities, complications and preventable mortality, by providing regular follow-up for chronic diseases.

Difference between health centers

Very large differences were observed between Health Centers (HCs) in the level of HTA management (e.g. centers with >90% control vs. centers with <20%), from which we can also hypothesize that “the capacity exists”, but “the implementation is not the same”. This is

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consistent with the concept of “quality of care”: where the real quality of service often explains the results better than the mere presence of the service. So the data suggest that the main problem is not the occurrence of the disease, but the quality and continuity of healthcare.

Patients in urban areas benefit by having better opportunities for:

- faster access to services
- more regular medical follow-up
- continuous monitoring
- more frequent health education

While patients in rural areas face:

- transportation difficulties
- lack of periodic check-ups
- limited health information

The large differences between health centers suggest that the organization of the service and the active role of health personnel, especially nurses, are decisive factors for the control of HTA, so it is possible to have better management of HTA as in centers with >90% control (HC no. 3)

The analysis of the results clearly shows the need for:

- systematic monitoring programs in rural areas
- active nursing follow-up
- standardization of care protocols
- reduction of health inequalities
- ongoing health education for patients

Conclusion

Arterial hypertension is a major health problem in the studied population, accounting for almost half of all chronic diseases in both urban and rural areas. This indicates that HTA is a widespread and ongoing burden on the health system.

The prevalence of HTN does not vary by location, which means that risk factors affect urban and rural populations equally. However, differences are clearly evident in the management and control phase of the disease.

Management of hypertension is better in urban than rural areas, with 58% of urban patients achieving blood pressure values within the normal range compared to only 41.1% of rural patients. This difference is statistically significant and reflects real inequalities in health care.

Urban-rural differences are not related to gender, as the distribution of female cases with HTA is similar in both settings. This suggests that the main barriers are structural and organizational, rather than biological.

It was found that there are large variations in the level of HTA control between health centres, with some centres achieving very high management rates (HC 3) and others with very poor performance. This shows that service quality and local organisation have a decisive impact on clinical outcomes, confirming that the main barriers are structural and organisational, not biological.

The lack of health personnel, especially in rural areas, represents a key factor explaining the poor management of hypertension, influenced by the massive emigration of doctors and nurses from Albania. This human resource crisis limits continuous monitoring and health education of patients.

Strengthening the role of nursing and primary care is essential for improving the control of HTA, especially in rural areas, through active follow-up, health education, standard protocols, and the use of evidence-based care models.

At the end of the study, we conclude that in the population of the Vlora district arterial hypertension is equally prevalent in urban and rural areas, but disparities in access, service quality, and human resources create major disparities in disease control. Improving the management of HTA requires systemic interventions focused on rural areas, increasing staffing, strengthening nursing, and addressing the health workforce crisis. Targeted interventions in rural areas and improving the functioning of low-performing centers are essential for

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improving public health and reducing health inequalities.

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