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ORIGINAL RESEARCH

Indicators of hospital morbidity and their association with the level of poverty in Albania

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Abstract

General and specific hospital morbidity is associated with the level of poverty thus suggesting the increase of morbidity indicators with the increasing of social and economic deprivation. In our country, studies regarding the prevalence of poverty in general have been not associated with morbidity indicators, creating this way a gap in terms of documenting the links between them. This study examined specifically this association using secondary official data regarding to crudegeneral and specific hospital morbidity and the prevalence of poverty by regions of Albania. Poverty was identified as a clear risk factorfor diseases of the circulatory system, lung cancer, stomach cancer, morbidity from trauma-accidents-poisoning, diseases of the respiratory system and digestive system, and all-cause mental morbidity. The association with the other indicators of morbidity as well as gender and regional differences suggested much more complex relationships between economic, social and cultural factors and factors related to the health system. Access to hospital care in the poorest regions of the country might explain some of the observed differences. Significant fluctuations of selected morbidity levels even between regions with similar levels of poverty suggest thatthe health information system in our country needs significant improvements. On the other hand, despite the limitations of this study, the observed differences urge for appropriate measures to address them appropriately.

INTRODUCTION

International literature suggests that poorer countries experience less favorable health status than richer countries and poorer people in general are affected by a higher number of diseases and have a poorer health status compared to people in good economic conditions (Centers for Disease Control and Prevention 2013). On the other hand, poor health is often associated with increased health spending, which in relative terms affects the most deprived groups in society. This way, morbidity and poor health are closely associated with each other and even stimulate each other in a vicious circle (Wagstaff 2002). Moreover, poverty and harmful effects that poor health status has over the households are related to social justice because these individuals have not volunteered to be poor and to have poor health status but rather social circumstances are responsible for this situation. For this reason, society as a whole has an obligation to bear a large part of these costs (Wagstaff 2002).

Poverty is often associated with a higher occurrence of infectious diseases (including HIV/ AIDS), diabetes, neoplasms, cardiovascular diseases, problems related to pregnancy and injury, lower quality of life, periodontitis, as well as higher hospitalization rates, etc. (Zhao et al. 2011; Centers for Disease Control and Prevention, 2013). A study in Australia among the indigenous population (poorer population) and non-indigenous population (more favorable economic conditions) suggested that hospital morbidity was higher among indigenous (hospital morbidity rate approximately 140 per 1000 population) than in non-indigenous population (hospital morbidity rate about 82 per 1000 population). Multivariate analysis also suggested that poverty was negatively and significantlyassociated with socioeconomic level (Zhao et al. 2011).Education, financial income, female gender and age over 50 years significantly increased the risk of hospitalization (Zhao et al. 2011).

In general, the factors that determine the socioeconomic status of individuals also have an impact on their health status (Lynch & Kaplan 2000). Also, the socioeconomic circumstances of the place where people live and work have a considerable influence on their health and economic status (Macintyre, Ellaway& Cummins 2002). Commonly, education level and personal income level are considered as basic indicators to measure the impact of socioeconomic status on health status of individuals and population groups (Centers for Disease Control and Prevention 2013).

Thus, the association between poverty and health status is relatively obvious and well documented. In Albaniascientific information linking poverty indicators to hospital morbidity is scarce. In this context, the aim of this study was to present the hospital morbidity trends during 2001-2010 in our country and to assess the association of hospital morbidity with poverty indicators, for the selected years.

Methodology

This study is based on secondary data analysis related to morbidity and poverty levels. Hospital morbidity data refer to the official figures published by the Institute of Statistics (INSTAT). Poverty indicators are taken from a study of the Institute of Statistics and the World Bank, that have published data regarding the prevalence of poverty in 2012 (INSTAT & World Bank 2013). The reason for using the 2012 poverty data was because poverty prevalence by prefecture (regions of the country) was available only for the year 2012 (INSTAT & World Bank 2013). Meanwhile for the analysis of poverty-morbidity relationship, we used morbidity data of year 2010 as the most recent year for which hospital morbidity data were more complete.

Results

Morbidity from all causes

According to the reported data, the crude all-cause morbidity rate in Albania during 2001-2010 was 831.2 cases per 10.000 population, ranging from 477.0 cases per 10.000 population in Kukes (Table 1). Crude all-cause morbidity rate was higher among females than males. During 2001-2010, the largest gender difference of crude mortality rate from all causes was observed in Kukes and Elbasan and the smallest difference in Diber. Only in Gjirokastraa reversed gender trend of crudeall-cause morbidity ratewas noticed during this period (Table 1).

Region	Male	Female	Total
Berat	740.7	1043.9	890.7
Dibër	638.5	759.8	703.1
Durrës	359.3	590.9	477.0
Elbasan	454.3	780.9	615.0
Fier	485.5	766.0	624.6
Gjirokastër	820.6	815.4	817.2
Korçë	516.2	786.2	651.0
Kukës	1265.5	1634.9	1455.7
Lezhë	504.2	761.0	637.4
Shkodër	662.5	819.4	740.2
Tirana	1100.7	1362.2	1226.9
Vlorë	895.2	1130.9	1015.0
ALBANIA	707.3	956.0	831.2

Table 1. Crude all-cause morbidity rate (per 10.000 population), by sex and region,2001-2010

Crude all-cause morbidity rate shows a steady trend in men and women during 2001-2010 (Figure 1), maintaining gender differences in favor of females although this difference tends to be slightly narrowed.





Figure 2 presents the crudeall-cause morbidity rate by region in 2010 and prevalence of poverty (in percentage).



Figure 2. Crude all-cause morbidity rate (per 10.000 population) in 2010 by prevalence of poverty in 2012 (%)

There is a positive association between the prevalence of poverty and crude all-cause morbidity rate. For example, in Kukes region, which according to INSTAT is the poorest region of the country, the crude all-cause morbidity rate in 2010 was2271.7 cases per 10.000 population, being considerably higher than morbidity rates in other regions while regions with the lowest poverty prevalence (Elbasan and Gjirokastra) also showed lower morbidity rates (Figure 2).

Morbidity from diseases of the circulatory system

According to the reported data, the crude morbidity rate from circulatory diseases in Albania during 2001-2010 was 70.7 cases per 10.000 populationand ranging from 38.1 cases in Fier to 113.4 cases per 10.000 population in Tirana (Table 2). This indicator in Tirana is about 2-3 times higher than in most of other regions of the country. This finding probably is attributed to imported cases from other cities, since in Tirana is located the University Hospital Centre "Mother Teresa", a unique tertiary health care facility, which offers its services even for Tirana non-resident individuals.

Crude morbidity rate from diseases of the circulatory system is generally higher among males than females, with higher gender gap in Tirana region while in Kukesthis indicator is higher among females (Table 2).

Region	Male	Female	Total
Berat	71.8	61.1	67.2
Dibër	66.4	61.3	65.1
Durrës	59.2	45.6	53.8
Elbasan	51.4	47.8	50.5
Fier	38.4	36.0	38.1
Gjirokastër	81.4	75.6	79.9
Korçë	64.0	63.1	64.6
Kukës	82.1	87.9	88.0
Lezhë	40.1	35.1	38.3
Shkodër	71.9	57.3	65.8
Tirana	129.1	92.5	113.4
Vlorë	80.2	65.5	74.2
ALBANIA	76.0	62.2	70.7

Table 2. Crude morbidity rate from circulatory diseases (per 10.000 population), by sex and region, 2001-2010

Crude morbidity rate from circulatory diseases shows monotonous increasing trends in both men and women during 2001-2010 (Figure 3), but gender differences are slightly increasing during this period. This trend is probably due to the increasing ofcardiovascular risk factorssuch as tobacco and alcohol use and obesity (DHS Albania). However, the increasing gender gap suggests that morbidity among men is increasing faster in time than women. This finding is in contrast with the increasing prevalence of smoking and alcohol abuse by women in Albania, but perhaps the reflection of these risky behaviors, in term of cardiovascular morbidity rate among women, is going to occur later in time.

Figure 3. Crude morbidity rate from circulatory diseases (per 10.000 population),by sex and years



Figure 4 presents the crude morbidity rate from diseases of the circulatory system by region in 2010 and prevalence of poverty (in percentage). Overall, there is a positive correlation between poverty level and morbidity rate from circulatory diseases. However, Kukesregion (outlier) is responsible for this trend, while this combination is not common to most other regions. Thus, regions with high levels of poverty (Lezha and Fieri) show lower morbidity rates from diseases of the circulatory system

compared with regions where the poverty level is lower (as in Tirana, Vlora and Gjirokastra), suggesting a negative correlation between poverty and morbidity from circulatory diseases. This trend couldalso be an indicator of regional differences in access to hospital care. Therefore, we can assume that inpoorest prefectures the access to hospital care is limited thus leading to an artificial reduction of the morbidity rate from circulatory diseases in these areas.





Ischemic heart disease morbidity

According to the reported data, during 2001-2010, the crude morbidity rate from ischemic heart disease in Albania was 19.9 cases per 10.000 population, ranging from 6.2 cases in Fier to 33.8 cases per 10.000 population in Tirana (Table 3). The higher figures in Tirana probably

are attributed to imported cases from other cities of the country that are treated at the University Hospital Center "Mother Teresa".

Crude morbidity rate from ischemic heart disease is higher among men than women, with the largest gender differences in regions of Tirana, Berat and Vlora and lowest in Lezharegion (Table 3).

Region	Male	Female	Total
Berat	32.2	20.2	26.2
Dibër	16.2	7.4	12.3
Durrës	20.0	11.5	15.7
Elbasan	12.3	6.3	9.3
Fier	18.7	13.5	16.1
Gjirokastër	17.0	8.9	13.0
Korçë	22.9	13.7	17.0
Kukës	7.7	4.6	6.2
Lezhë	10.0	7.3	8.6
Shkodër	20.3	13.8	17.0
Tirana	49.1	18.3	33.8
Vlorë	34.3	23.1	28.6
ALBANIA	26.5	13.6	19.9

Table 3. Crude morbidity rate from ischemic heart disease (per 10.000 population),by sex and region, 2001-2010

During 2001-2010, crude morbidity rate from ischemic heart disease shows a monotonous increasing trend in both men and women (Figure 5), but gender differences are increasing. This trend is probably due to the increasing of risk factors such as smoking and alcohol use, and obesity (DHS Albania), which are more prevalent among males. However, the increasing gender gap suggests that morbidity among men is increasing faster in time than among women. This finding is in contrast with the increasing prevalence of smoking and alcohol abuse by women in Albania, but perhaps the reflection of these risky behaviors, in term of cardiovascular morbidity rate among women, is going to occur later in time.

Figure 5. Crude morbidity rate from ischemic heart disease (per 10.000 population), by sex and years



Figure 6 shows the crude morbidity rate from ischemic heart disease by region in 2010 and prevalence of poverty (in percentage). Overall, there is a slight negative correlation between ischemic heart disease morbidity and poverty, but

the results vary considerably by region, with no clear trend. This can be largely attributed to the differences in accuracy of reporting from the respective reporting sites and therefore it is impossible to achieve any definite conclusion.

Figure 6. Crude morbidity rate from ischemic heart disease (per 10.000 population) in 2010 by prevalence of poverty in 2012 (%)



Cerebrovascularmorbidity

According to the reported data, the crude cerebrovascular morbidity rate in Albania during 2001-2010 was 11.2 cases per 10.000 population, ranging from 4.4 cases in Lezhë to 5.5 cases per 10.000 population in Tirana (Table 4). The higher figures in Tirana probably are attributed to imported cases from other cities of the country that are treated at the University Hospital Center "Mother Teresa".

Crude cerebrovascular morbidity rate is higher among men than women, with higher gender differences in the regions of Tirana, Durres and Vlora and the lowest in Kukes (Table 4). In Fier, the cerebrovascular morbidity rate is equal in both sexes.

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Region	Male	Female	Total
Berat	13.8	10.5	12.2
Dibër	7.1	5.2	6.1
Durrës	15.6	12.1	13.8
Elbasan	9.2	8.2	8.7
Fier	4.8	4.8	4.8
Gjirokastër	13.9	12.5	13.2
Korçë	12.6	10.5	11.5
Kukës	9.4	8.3	8.8
Lezhë	5.6	3.1	4.4
Shkodër	15.6	12.5	14.0
Tirana	18.7	12.4	15.5
Vlorë	14.5	10.7	12.6
ALBANIA	12.7	9.7	11.2

Table 4. Crude morbidity rate from cerebrovascular diseases(per 10.000 population),by sex and region, 2001-2010

Crude cerebrovascular morbidity shows a monotonous increasing trend in both men and women (Figure 7) during 2001-2010 time period,

but gender differences are increasing suggesting that morbidity among men is increasing faster in time compared to females.

Figure 7. Crude morbidity rate from cerebrovascular diseases (per 10.000 population), by sex and years



Figure 8 presents the crude cerebrovascular morbidity rate by region in 2010 by the prevalence of poverty (in percentage). Overall,

there is a negative association between cerebrovascular morbidity and poverty with poorerregions exhibiting lower morbidity rates. Besides inaccuracies in reporting, a possible explanation for this finding could be the prevalence of physical activity which in general, is higher in poorer regions.

Figure 8. Crude morbidity rate from cerebrovascular diseases (per 10.000 population) in 2010 by prevalence of poverty in 2012 (%)



Neoplasms

According to the reported data, the crude neoplasmmorbidity rate in Albania during 2001-2010 was 49.0 cases per 10.000 population, ranging from 3.1 cases in Dibër to 186.9 cases per 10.000 population in Tirana (Table 5). The higher figures in Tirana probably are attributed to imported cases from other cities of the country that are treated at the University Hospital Center "Mother Teresa".

Crude neoplasm morbidity rate is higher among men than women in Berat, Dibra, Korca, Kukes and Durres. In other prefectures a reversed trendis noticed, especially in Tirana, where for every 10.000 populationthere are recorded, on average, 69.8 more cases with neoplasms among women than among men (Table 5). Gender trends of neoplasms are attributed to their specific type. However, hospital records do not correlate with the distribution of disease in populations because affected subjects can be treated in secondary hospitals in regions or tertiary hospital in University Hospital Center "Mother Teresa", depending on the defined criteria.

Region	Male	Female	Total
Berat	7.2	1.7	4.5
Dibër	4.5	2.0	3.1
Durrës	4.8	4.3	4.4
Elbasan	5.5	13.1	9.2
Fier	2.6	10.3	6.4
Gjirokastër	8.8	9.5	9.1
Korçë	12.3	11.4	11.9
Kukës	8.3	7.0	8.0
Lezhë	6.3	11.8	9.1
Shkodër	4.9	15.4	10.1
Tirana	153.7	223.5	186.9
Vlorë	7.8	12.6	10.2
ALBANIA	40.2	58.2	49.0

Table 5. Crude neoplasm morbidity rate (per 10.000 population), by sex and region,2001-2010

Crude neoplasm rates show an increasing trend in both men and women (Figure 9), but gender differences are increasing during 2001-2010 in favor of women thus suggesting that neoplasm morbidity is increasing faster in time among women than men. The increasing of neoplasm morbidity rate in time points to the modernization of the lifestyle and ageing of the population in Albania, whilst the quick increase of this indicator among women requires special attention in order for putative factors to be carefully investigated and enabling appropriate preventive measures.

Figure 9. Crude neoplasm morbidity rate (per 10.000 population), by sex and years



Figure 10 displays the crude neoplasm morbidity ratein 2010 and the prevalence of poverty (in

percentage)by regions.

Figure 10. Crude neoplasm morbidity rate (per 10.000 population) in 2010 by prevalence of poverty in 2012 (%)



It can be noted that the association between poverty and neoplasm morbidity rate is slightly negative (Figure 10). Except for Tirana region (that has totally different specifics compared to other regions), higher neoplasm morbidity rates are usually present in better-off regions (e.g. in Gjirokastra, Vlora and Elbasan).

Morbidity from lung, stomach and hematopoietic cancer

Table 6 displays the crude morbidity rate from lung, stomach and hematopoietic system cancer in Albania during 2001-2010. In all cases, hospital morbidity from these types of cancers is higher in Tirana compared to other regions, because of the substantial portion of patients being treated here. Crude hospital morbidity rate of lung and stomach cancer is higher among men than women in all regions of the country during 2001-2010 whereas morbidity from cancer of the hematopoietic system is higher among females onlyin Durres and Kukes region.

Gender trends of lung and stomach cancer are closely linked with the consumption of tobacco and alcohol, which are more often present among men. Except Tirana region, higher levels of morbidity from lung cancer among men are observed in Kukes, Shkodra and Lezha and from stomach cancer in Kukes, Berat and Elbasan region.

	Lung cancer		S	Stomach cancer			Hematopoietic system			
Region	morbidity				morbidity			cancer morbidity		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Berat	0.70	0.01	0.37	1.14	0.22	0.69	0.50	0.24	0.39	
Dibër	0.24	0.02	0.12	0.73	0.15	0.42	0.73	0.18	0.45	
Durrës	0.33	0.12	0.24	0.76	0.43	0.60	0.47	0.64	0.57	
Elbasan	0.72	0.04	0.38	1.07	0.38	0.75	0.66	0.64	0.65	
Fier	0.23	0.02	0.13	0.22	0.20	0.20	0.38	0.38	0.37	
Gjirokastër	1.35	0.18	0.78	0.73	0.36	0.56	0.25	0.06	0.16	
Korçë	1.28	0.20	0.76	0.66	0.30	0.49	1.12	0.79	0.97	
Kukës	2.43	1.03	1.74	1.81	0.90	1.37	0.39	0.59	0.49	
Lezhë	2.07	0.23	1.13	0.56	0.35	0.46	0.45	0.31	0.38	
Shkodër	1.73	0.30	1.01	0.36	0.17	0.25	0.05	0.03	0.03	
Tirana	18.19	3.57	10.91	8.49	4.62	6.57	35.12	23.20	29.15	
Vlorë	0.56	0.13	0.34	0.40	0.18	0.29	0.69	0.67	0.70	
ALBANIA	4.89	1.04	2.96	2.52	1.28	1.89	8.35	5.55	6.95	

Table 6. Crude morbidity rate from different types of cancers (10.000 population), by sex
and region, 2001-2010.

Figures 11-13 present crude morbidity rates from lung, stomach and hematopoietic system cancer by sex and years. It is noted that the hospital morbidity rate from lung cancer is increasingduring the 2001-2010 period, especially among men (despite the variation in 2006), suggesting an increase of the gender gap regarding this indicator (Figure 11). Obviously, a part of all gender differences might be explained by the higher prevalence of past smoking among men.



Figure 11. Crude morbidity rate from lung cancer (10.000 population), by sex and years

Meanwhile, the stomach cancer morbidity rate is clearly rising in both men and women during this period of time, but gender differences areincreasing faster in favor of males compared with time trends of lung cancer. Probablythe exaggerated consumption of alcohol (and

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tobacco) among men compared to women is responsible for this situation (Figure 12).



Figure 12. Crude morbidity rate from stomach cancer (per 10.000 population), by sex and years

Meanwhile, gender differences in hematopoietic system cancer morbidity rate seem to be

decreasing in time, despite some slight fluctuations observed (Figure 13).

Figure 13. Crude morbidity rate from hematopoietic system cancer (per 10.000 population), by sex and years



Figure 14 displays the association between poverty and morbidity from lung cancer by region of the country. There is a positive correlation between these two indicators since the lung cancer morbidity rate is consistently higher in poorer regions (e.g.in Kukes, Lezha, Shkodra), but on the other hand, even in some other poor regions such as Fieri and Durres, the morbidity rate from lung cancer is quite low, complicating this way its relationship with poverty. Tirana is an exception because here is treated a considerable number of lung cancer cases coming from all over the country.

Figure 14. Crude lung cancer morbidity rate (per 10.000 population) in 2010by prevalence of poverty in 2012 (%)



Figure 15displays the association between poverty and morbidity from stomach cancer by regions of the country. There is a positive correlation between these two indicators as stomach cancer morbidity rate is higher in poorer regions (e.g. in Kukes and Lezhe), but on the other hand, even in poorer regions such as Fier, Durres and Shkodra, the morbidity rate from stomach cancer is quite low, complicating this way its relation with poverty further more. Most likely these fluctuations could be attributed to the displacement of relevant cases for treatment at the University Hospital Center in Tirana.



Figure 15. Crude stomach cancer morbidity rate (per 10.000 population) in 2010 by prevalence of poverty in 2012 (%)

Figure 16 shows the association between poverty and morbidity from cancer of hematopoietic

system by regions of the country.





A slight negative association between these two indicators is noted since hematopoietic cancer morbidity rate is lower in the poorer regions (e.g.in Kukes and Fier), but on the other side, even in some other poor regions such as Lezha, the morbidity rate from hematopoietic system cancer is about 3-4 times higher(Figure 16), complicating further its relationship with poverty. Similarly to previous examples, these fluctuations may be due to the displacement of relevant cases for treatment at the University Hospital Center in Tirana.

	Year 2001	Year 2002	Year 2003	Year 2004	Year 2005	Year 2006	Year 2007	Year 2008	Year 2009	Year 2010
All other regions	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.4	0.4
Tirana	71.5	35.2	78.5	67	34.9	78.2	100.3	56.8	110.4	119
ALBANIA	14.2	7	15.5	13.5	7.2	15.9	20.7	12.2	23.4	25.5

Table 7. Crude breast cancer morbidity rate (per 10.000 women), by years

Despite fluctuations in time, it can be observed that hospital morbidity rate from breast cancer is steadily increasing (in Tirana and nationwide) (Figure 17), being consistent with other indicators suggesting the increasing incidence and prevalence of this disease in Albania.

Figures 17. Crude breast cancer morbidity rate (per 10.000 women) in Tirana and other regions, by years



Figure 18 shows the association between poverty and breast cancer morbidity by region. Despite the slight negative correlation with poverty, the distribution of breast cancer morbidity rate by regions and poverty level is misleading because the majority of these cases are treated in Tirana. It is therefore impossible to reach appropriate conclusions regarding this association.



Figure 18. Crude breast cancer morbidity rate (10.000 women) in 2010 by prevalence of poverty in 2012 (%)

Prostate cancer morbidity

Table 8 presents the hospital morbidity rate from prostate cancer (per 10.000 men). Because morbidity rates in other regions except Tirana were very low, they were grouped together in order to facilitate reading the data. Hospital morbidity from prostate cancer is only several times higher in Tirana compared with all other regions as this disease is treated surgically in hospitals across the country and not just in Tirana.

	Year 2001	Year 2002	Year 2003	Year 2004	Year 2005	Year 2006	Year 2007	Year 2008	Year 2009	Year 2010
All other regions	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.4	0.4
Tirana	71.5	35.2	78.5	67	34.9	78.2	100.3	56.8	110.4	119
ALBANIA	14.2	7	15.5	13.5	7.2	15.9	20.7	12.2	23.4	25.5

Table 8. Crude prostate cancer morbidity rate (per 10.000 men), by years

Despite fluctuations in time, it can be observed that hospital morbidity rate from prostate cancer is steadily increasing (in Tirana, in other regions and nationwide) (Figure 19), probably an indication of the ageing of the population (in addition to other reasons).



Figure 19. Crude prostate cancer morbidity rate(per 10.000 men) in Tirana and other regions, by years

Figure 20 shows the association between poverty and prostate cancer morbidity by region. In this case the relationship is clearly negative suggesting lower levels of prostate cancer morbidity rate in poorer regions (e.g. in Kukes, Fier, Lezha and Durres). These data suggest that the access of prostate cancer patients to hospital care in the poorest regions of the country could be more problematic. Also, the negative link between poverty and prostate cancer hospital morbidity could be an indicator of the low culture of men population about this disease and the delayed contact with health services, a phenomenon that may be more prevalent in the poorest areas of Albania. However, other studies need to be undertaken in order to verify this negative correlation and the reasons for it.

Figure 20. Crudeprostate cancer morbidity rate(per 10.000 men) in 2010 by prevalence of poverty in 2012 (%)



Hospital morbidity caused by traumaaccidents and poisoning

Table 9 presents the hospital morbidity rate from trauma-accidents-poisoning (per 10.000 population) in Albania. Morbidity caused by trauma-accidents-poisoning in Albania during 2001-2010 was 44.3 cases per 10.000 population, ranging from 18.2 cases in Lezha to 77.4 cases in Tirana. Regarding regional differences,

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Tirana, Vlora and Kukesshow the highest trauma-accidents-poisoning morbidity rates while Lezha, Durres, Dibraand Korca show the lowest rates. This distribution of hospital cases affected by these types of injuries could be related withthe poor road infrastructure in these regionsthat increases the chances of road traffic accidents, which comprise the main burden in this group.

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Table 9. Crude morbidity	rate from trauma-accidents-poisoning	(per 10.000 population),
	by sex and region, 2001-2010	

Region	Male	Female	Total
Berat	34.7	22.4	28.5
Dibër	31.5	17.3	24.1
Durrës	25.7	13.1	19.4
Elbasan	43.1	25.3	34.3
Fier	47.7	23.5	35.7
Gjirokastër	71.6	44.4	58.0
Korçë	34.3	15.1	24.7
Kukës	103.2	36.0	69.6
Lezhë	25.3	11.3	18.2
Shkodër	33.5	19.3	26.4
Tirana	105.6	49.1	77.4
Vlorë	92.1	60.9	76.4
ALBANIA	58.6	30.0	44.3

The crude morbidity rate from traumaaccidents-poisoning showsan increasing trend for men but a decreasing one for womenduring 2001-2010 (Figure 21), suggesting the deepening of gender gap during this period.In fact, for every 10.000 population there are about 30 more cases of injuries from traumaaccidents-poisoning needing hospitalization among men than women. However, it is wise to wait for the data regarding the following years in order to investigate the trend of injuries from these causes also in the context of intensifying preventive actions to reduce them.



Figure 21. Crude morbidity rate from trauma-accidents-poisoning (per 10.000 population), by sex and years

Figure 22 shows the association between poverty and morbidity from trauma-accidents-poisoning by regions of the country.

There is a positive correlation between poverty and trauma-accidents-poisoningmorbidity rate (the association is positive because Kukes region is included in the analysis, playing the role of an "outlier" in this case). However, there is no clear trend in the association between poverty and this indicator as regions with similar levels of trauma-accidents-poisoningmorbidity rates have similar levels of poverty. For example, Tirana and Vlora have a trauma-accidents-poisoning morbidity rate of 77.1 and 75.5 cases per 10.000 population, respectively, but the prevalence of poverty in Tirana and Vlora isdifferent: 14.2% and 11.7%, respectively. In this way, as the road traffic accidents comprise the main burden of disease in this group, the association of morbidity from trauma-accidents-poisoning with poverty can also be affected by other elements such as road infrastructure in respective regions, ageing of vehicles and their safety, the enforcement of legislation relating to road safety, etc.

Figure 22. Crude morbidity rate from trauma-accidents-poisoning (per 10.000 population) in 2010 by prevalence of poverty in 2012 (%)



Diabetes morbidity

Hospital morbidity rate from diabetes presents a monotonous increasing trend during 20012010: on average in 2010 there were about 4 more diabetes cases treated in hospital per every 10.000 population compared to 2001 (Table 10).

Year	Male	Female	Total
2001	6.1	6.8	6.5
2002	6.2	6.9	6.5
2003	7.3	8.0	7.7
2004	7.7	8.0	7.8
2005	8.3	8.6	8.4
2006	8.6	9.0	8.8
2007	8.5	9.3	8.9
2008	9.1	9.8	9.4
2009	11.1	11.7	11.4
2010	9.8	10.9	10.4

Table 10. Crude diabetes morbidity rate (per 10.000 population), by sex and years

Meanwhile, diabetes morbidity rate is higher among women than men in each year of the study, with a slight increase of this difference in favor of women during this period (Figure 23).

Figure 23. Crude diabetes morbidity rate (per 10.000 population), by sex and years



Regarding the hospital morbidity from diabetes the data by region of the country in 2010 were not available and therefore it was impossible to analyze its relationship with poverty.

Morbidity from diseases of the respiratory system

According to the reported data, the crude

morbidity rate from diseases of the respiratory system in Albania during 2001-2010 was 77.8 cases per 10.000 populationand ranging from 45.7 cases in Fier to 120.3 cases per 10.000 population in Tirana (Table 11). Since these diseases are treated in hospitals across the country, this indicator is much more uniform among regions compared with other causes of hospital morbidity. In this way, these differences may indicate inherent differences of morbidity that in most cases are not determined by its treatment options and opportunities. Higher levels of respiratory morbidity are observed in Tirana (maybe here

the referring of patients from other regions might have an influence) but also in Gjirokastra, Kukes and Vlora regions. These trends need attention through future studies in order to shed light on the responsible factors.

Region	Male	Female	Total
Berat	82.2	69.3	76.5
Dibër	74.8	66.2	71.7
Durrës	61.5	46.8	55.5
Elbasan	58.5	53.2	56.8
Fier	47.1	42.5	45.7
Gjirokastër	97.0	87.4	93.6
Korçë	71.6	66.8	70.2
Kukës	87.2	90.2	91.7
Lezhë	52.4	43.2	48.5
Shkodër	84.6	64.2	75.6
Tirana	137.4	98.0	120.3
Vlorë	87.7	73.3	81.8
ALBANIA	84.5	68.0	77.8

Table 11. Crude morbidity rate from respiratory system diseases (per 10.000 population),by sex and region, 2001-2010.

Crude morbidity rate from respiratory diseases displays a monotonous decreasing trend (if year 2001, when reported rates are much higher compared to following years, is excluded) in both men and women during 2001-2010 (Figure 24), but gender differences seem to have been stabilized at approximately 16-17 more cases among males for every 10.000 population.

Figure 24. Crude morbidity rate from respiratory system diseases (per 10.000 population), by sex and years



Figure 25 presents the association between poverty and hospital morbidity from respiratory diseases by regions. The correlation in this case is positive but this is due to the very high level of this indicator in Kukes. In fact, Kukes is the poorest district in Albania. This finding seems to once again highlight the fact that poverty remains one of the main risk factors for hospital morbidity also in Albania.

However, the relationship between poverty and respiratory morbidity is not a simple one as other poorer regions, such as Lezha and Fieri have lower respiratory morbidity rates compared with the corresponding levels in the richer districts such as Tirana or Gjirokastra. On the left side of the chartit can be noted that richer regions show high respiratory morbidity rates. If Kukes region is exempted from analysis, then the association between poverty and respiratory hospital morbidity turns negative. These findings, seemingly contradictory, might be explained by differences in access to hospital care in these regions where in the poorer regions such access is more difficult and this is being reflected in lower respiratory hospital morbidity rates as well. On the other hand, a considerable proportion of patients with respiratory diseases head to Tirana for receiving the appropriate treatment thus artificially reducing this indicator in different regions other than Tirana.

Figure 25. Crude morbidity rate from respiratory system diseases (per 10.000 population) in 2010 by prevalence of poverty in 2012 (%)



However, the considerably higher level of hospital respiratory morbidity rate in Kukes in 2010 (Figure 25) needs to be explained and verified in the future. We think that this is a random finding, as the level of hospital respiratory morbidity rate in Kukes during each year of the period 2001-2009 has been generally high and comparable to other regions with similar levels of poverty, but not the highest (these data are not shown in tables or figures). In general, the level of hospital respiratory morbidity during 2001-2010 was the highest in Tirana region (for 7 years in this 10-year period).

Morbidity from diseases of the digestive system

According to the reported data, the crude digestive system morbidity rate in Albania during 2001-2010 was 139.9 cases per 10.000 population and ranging from 107.4 cases in Lezha to 243.5 cases per 10.000 population in Berat (Table 12). For the first time it is noted

that this indicator is not of highest value in Tirana, a phenomenon that was not observed for other causes of hospital morbidity, because these diseases are well treated in every hospital across the country. In this context, the regional differences might suggest other factors responsible for such patterns, reflecting perhaps the associations with the consumption of alcohol, tobacco or other unhealthy or risky foods such as salted, coal grilled foods, etc. However, additional data are needed to confirm these assumptions.

Region	Male	Female	Total
Berat	244.5	242.8	243.5
Dibër	205.1	169.5	186.3
Durrës	115.9	105.3	110.6
Elbasan	92.0	134.9	113.1
Fier	112.6	111.1	111.8
Gjirokastër	162.3	140.1	151.2
Korçë	139.3	122.8	131.1
Kukës	236.9	233.7	236.3
Lezhë	120.8	93.9	107.4
Shkodër	180.0	119.2	149.4
Tirana	168.4	122.5	145.3
Vlorë	129.3	110.6	120.0
ALBANIA	148.8	131.2	139.9

Table 12. Crude morbidity rate from digestive system diseases (per 10.000 population),by sex and region, 2001-2010.

Crude morbidity rate from digestive diseases shows a decreasing trend in both sexes until 2006 whereas later on there is an upward trend in men (Figure 26) and the gender gap seems to be expanding.

This trend probably is due to the consumption offried and coal grilledfood, alcohol and tobacco,

the prevalence of which is much higher among men. Moreover, in recent years in Albania there has been a booming of businesses that offer coal grilled food, a risk factor for digestive system diseases. All these factors might explain some of the trends associated with hospital digestive morbidity in Albania.



Figure 26. Crude morbidity rate from digestive system diseases (per 10.000 population), by sex and years

Figure 27 shows the association between hospital morbidity rate from digestive diseases and level

of poverty (in percentage) by region.

Figure 27. Crude morbidity rate from digestive system diseases (per 10.000 population) in 2010 by prevalence of poverty in 2012 (%)



Given that digestive diseases are usually treated in hospitals across the country than this type of analysis is appropriate in this case. There is a positive correlation between digestive morbidity and poverty level: poorer regions exhibit higher rates of hospital morbidity, although the trend is not always clear (Figure 27). It could be possible that these trends are explained by the more risky ways of feeding in poorer regions, as stated earlier in this document.

Morbidity from mental diseases

Hospital morbidity rate form mental diseases in Albania has increased during 2001-2010 (Table 13 and Figure 28), despite fluctuations, being always higher among men than women. This gender gap in favor of men seems to be due to schizophrenic psychoses, the crude rate of which is much higher among men (Table 14). Meanwhile, as expected, neurotic disorders are more common among women (Table 15). Despite fluctuations, neurotic disorders have been decreasing more in men than women during the study period while schizophrenic psychosis have been slightly decreasing in men but slightly increasing in women (Tables 14-15).

	-				
Voor	All mental diseases				
1 ear	Male	Female	Total		
Year 2001	13.9	9.6	11.8		
Year 2002	14.4	10	12.2		
Year 2003	15	10.8	12.9		
Year 2004	15.5	13.3	14.4		
Year 2005	16.7	10.7	13.7		
Year 2006	15.6	11.3	13.4		
Year 2007	13.6	9.8	11.7		
Year 2008	15.3	10.7	13		
Year 2009	15	11.3	13.2		
Year 2010	17.8	13.7	15.8		

Table 13. Crude morbidity rate from all mental diseases (per 10.000 population),by sex and years

Figure 28. Crude morbidity rate from all mental diseases (per 10.000 population), by sex and years



The rising trend of the overall hospital mental morbidity rate (Figure 28) is an issue of concern that deserves special attention by the relevant institutions. However, hospital morbidity rates from schizophrenic psychosis and neurotic disorders seem to be decreasing over the years during 2001-2010period, despite fluctuations (Figures 29 and 30). It is absolutely necessary to verify the accuracy of data and to undertake further

studies to verify these trends and identify the factors responsible for this situation.

Veen	Se	chizophrenic psy	choses
rear	Male	Female	Total
Year 2001	4.6	1.7	3.2
Year 2002	4.8	1.9	3.3
Year 2003	5.0	2.3	3.6
Year 2004	4.5	2.1	3.3
Year 2005	5.0	2.2	3.6
Year 2006	4.4	2.5	3.4
Year 2007	3.8	1.8	2.8
Year 2008	3.6	2.1	2.9
Year 2009	3.5	2.2	2.9
Year 2010	4.3	2.2	3.2

Table 14. Crude morbidity rate from schizophrenic psychoses (per 10.000 people),by sex and years

Figure 29. Crude morbidity rate from schizophrenic psychosis (per 10.000 population), by sex and years



Veen	Neurotic disorders			
rear	Male	Female	Total	
Year 2001	3.9	4.7	4.3	
Year 2002	4.0	4.8	4.4	
Year 2003	3.6	4.3	3.9	
Year 2004	3.1	5.0	4.1	
Year 2005	3.3	3.8	3.6	
Year 2006	2.5	3.7	3.1	
Year 2007	2.4	4.0	3.2	
Year 2008	2.8	3.3	3.1	
Year 2009	2.6	3.5	3.1	
Year 2010	2.7	4.2	3.4	

Table 15. Crude morbidity rate from neurotic disorders (per 10.000 population), by sex and years





Regarding the hospital morbidity from mental diseases the data by region of the country in 2010 were not available and therefore it was impossible to analyze its relationship with poverty.

Morbidity from urogenital system diseases According to the reported data, the crude

morbidity from urogenital system diseases in Albania during 2001-2010 was 46.5 cases per 10.000 population, ranging from 26.9 cases in Durres to 78.8 cases per 10.000 population in Kukes (Table 16). In each regionthe hospital urogenital morbidity rate is higher in women than in men with the exception of Gjirokastra.

Region	Male	Female	Total
Berat	36.9	76.5	56.8
Dibër	35.1	38.0	36.8
Durrës	14.7	38.6	26.9
Elbasan	27.8	43.7	35.6
Fier	19.2	46.3	31.6
Gjirokastër	54.6	42.9	48.8
Korçë	18.2	59.8	38.9
Kukës	61.8	95.0	78.8
Lezhë	25.9	52.0	39.4
Shkodër	36.1	62.5	49.2
Tirana	65.8	75.7	67.3
Vlorë	27.2	64.1	45.8
ALBANIA	36.4	58.5	46.5

Table 16. Crude morbidity rate from urogenital system diseases (per 10.000 population),by sex and region, 2001-2010

Crude urogenital morbidity rate shows an increasing trend in women and a stabilized trend in men (Figure 31), implying increasing gender

differences in favor of women with approximately 20-25 more cases among women for every 10.000 population compared to men.

Figure 31. Crude morbidity rate from urogenital system diseases (per 10.000 population), by sex and years



Figure 32 shows the association between poverty

and hospital urogenital morbidity rateby region.



Figure 32. Crude morbidity rate from urogenital system diseases (per 10.000 population) in 2010 by prevalence of poverty in 2012 (%)

In general there is a positive correlation between poverty and urogenital morbidityas the poorest regions exhibit, in general, higher morbidity rates (e.g.Kukes, Lezha, Shkodra, Dibra) (Figure 32). Meanwhile, even in the other poor regions, such as in Durres and Fier, this indicator is quite low, suggesting a complex relationship between poverty and hospitalurogenital morbidity in Albania. Future studies are needed in order to highlight the factors responsible for such trends and differences.

Abortions

Since 2007, abortions in Albania are reported to the Public Health Institute from all the country's public maternity hospitals and abortion licensed private institutions.

In 2013 there have been reported a total of 6442 abortions. Abortions performed in the public sector constitute about 95.4% of the total number of reported abortions. Approximately half (46.2%) of all abortions in Albania were carried out in the capital, Tirana, followed by Fier(10.4%), Vlora (8.7%), Durres (7.3%), and Berat (6.5%) districts. Abortions in Gjirokastra and Kukes regions comprise 1.0% and 1.3% of all abortions nationwide, respectively.

A large increase of spontaneous abortion rate against voluntary abortion is noticed. Spontaneous abortion in 1996 accounted for 18.2% of all reported abortions, in 2009 it accounted for 48.1% of total abortions whereas in 2013 it accounted for 67.2% of the total number of reported abortions. Such explosive increase of spontaneous abortion rate is very likely to be artificial and therefore there is need to thoroughly investigate this phenomenon in the future.

Over 60% of abortions occurred in women aged 25-34 years old whereas abortions performed by adolescent girls (14-19 years old) account for 4.9% of the total number of reported abortions. Approximately 80% of all abortions are performed by women with 8-years of formal education or secondary education. Urban women undergoing abortion account for 61.2% of the total numbers of reported abortions. The overwhelming majority (92.8%) of reported abortions are performed among married women. The rate of abortions per 1.000 live births has decreased during 2009-2013 (Table 17), reflecting perhaps an increased awareness of women and the use of contraceptive methods. This is supported by the increased number of births in contrast with the number of abortions reported, from 3.7 live births per every abortion in 2009 to 5.1 live births per every abortion in 2013.

X7			Year		
Variable 2009		2010	2011	2012	2013
Number of live births	34044	33856	34297	34974	33994
Number of abortions	9200	8085	8307	7846	6638
Abortion rate (per 1.000 live births)	270.2	238.8	242.2	224.3	195.3
Live birth/abortion ratio	3.7:1	4.2:1	4.1:1	4.5:1	5.1:1

Table 17. Data on abortions in Albania for the period 200-2013

Regarding the hospital morbidity from abort)ionthe data by region of the country in 2010 were not available and therefore it was impossible to analyze its relationship with poverty.

Congenital Defects

In 2009 the National Congenital Malformation Surveillance System of (NCMSS) was established making the reporting of congenital malformation (CM) a mandatory process. During 2011-2013, the prevalence of CMs in Albania was 14.1 cases per 1.000 live births, with significant fluctuations between regions (Table 18), decreasing from 15.2 cases per 1.000 live births in 2011 to 12.9 cases per 1.000 live births in 2013. One of the reasons for these fluctuations is the lack of complete reporting of CMs from other districts except Tirana. In Tirana the reporting of CMs is almost complete, and this is why we think that the overall prevalence of CMs in Albania is closer to Tiranafigures.

Table 18.	Prevalence of	CMs per 1.0	00 live births	durina 2011-	2013. by region
					2010, by 1091011

Region	Number of live births during 2011-2013	Number of CM cases during 2011-2013	CM prevalence (per 1.000 liver births)
Berat	6792	50	7.4
Dibër	4728	23	4.9
Durrës	10689	112	10.5
Elbasan	10301	85	8.3
Fier	10933	128	11.7
Gjirokastër	1423	41	28.8
Korcë	6733	53	7.9
Kukës	3411	37	10.8
Lezhë	4579	31	6.8
Shkodër	4786	19	4.0
Tiranë	36216	849	23.4
Vlorë	5805	72	12.4
Total	106396	1500	14.1

The proportional prevalence and the prevalence rate per 1.000 live births for specific CMsduring 2011-2013 are presented in Table 19. The body systems most often affected by CMs in Albania are the cardiovascular system, musculoskeletal system, genital system, gastrointestinal system and the oral cavity.

 Table 19. Proportional prevalence and prevalence rate(per 1.000 live births) of specific

 CMsduring 2011-2013 in Albania

Variable	Year	Year	Year	Period
variable	2011	2012	2013	2011-2013
Body system affected by CMs				
Central Nervous System	50 (9.6) – 1.5 *	29 (5.8) – 0.8	20 (4.2) – 0.5	99 (6.6) <i>– 0.9</i>
Eyes, ears, face and neck	16 (3.1) – 0.5	19 (3.8) – 0.5	29 (6.0) – 0.8	64 (4.3) – 0.6
The cardiovascular	123 (23.6) – 3.6	133 (26.7) – 3.8	84 (17.5) – 2.3	340 (22.7) – 3.2
Respiratory system	6 (1.2) – 0.2	6 (1.2) – 0.2	2(0.4) - 0.1	14 (0.9) – <i>0.1</i>
Gastrointestinal and oral cavity	71 (13.6) – 2. <i>1</i>	84 (16.8) – 2.4	50 (10.4) – 1.3	205 (13.7) – 1.9
Genital system	65 (12.5) – 1.9	76 (15.2) – 2.2	93 (19.4) – 2.5	234 (15.6) – 2.2
Urinary system	15 (2.9) – 0.4	7 (1.4) – 0.2	11 (2.3) – 0.3	33 (2.2) – 0.3
Musculoskeletal system	98 (18.8) – 2.9	84 (16.8) – 2.4	124 (25.8) – 3.3	306 (20.4) - 2.9
Integument defects	3 (0.6) – 0.1	2(0.4) - 0.1	0(0.0) - 0.0	5 (0.3) – 0.0
Chromosomal defects	55 (10.6) – 1.6	33 (6.6) – 0.9	36 (7.5) – 1.0	124 (8.3) – 1.2
Unspecified defects	19 (3.6) – 0.6	26 (5.2) – 0.7	31 (6.5) – 0.8	76 (5.1) – 0.7
Total	521(34.7) - 15.2	499 (14.3) - 14.3	480 (32.0) - 12.9	1500 (100.0) - 14.1

* The absolute number and column percentage(in parentheses) or proportional prevalence, followed by prevalence rate per 1,000 live births based on the total number of births in the respective periods. For the total ,row percentage.

Regarding the hospital morbidity from congenital malformations data by region of the country

Discussion

This study is probably one of the few studies that highlight the association between poverty and indicators of hospital morbidity in Albania. We noted a strong positive correlation between poverty and morbidity from all causes, as well as positive correlations of poverty with morbidity from diseases of the circulatory system, lung cancer, stomach cancer, morbidity from traumaaccidents-poisoning, respiratory system diseases, morbidity from diseases of the digestive system, morbidity from all mental diseases, etc. Meanwhile, inverse associations were noted for other diseases. These findings suggest for complex relationships between morbidity, poverty and other social and cultural factors and factors relevant to health care and social welfare policies.

in 2010 were not available and therefore it was impossible to analyze its relationship with poverty.

The most noticeable phenomenon is the considerable fluctuation of morbidity rates among regions with similar prevalence of poverty. This may reflect significant changes in lifestyle and in all other factors that play a role in general and specific morbidity (which in our opinion is unlikely, as we are dealing with the same social, economic and cultural Albanian context, which, despite the differences, cannot produce such great differences) or may suggest different qualities in the process of reporting of morbidity indicators and/or classification of morbidity causes (which in our opinion could play a major role for the explanation of the observed differences).

As it was evidenced by the National Health Report in 2014 about Health Status of the Albanian Population (IPH 2014), there are significant shortcomings and problems in the reporting of many health indicators and information health system inAlbania needs urgent reformation and renovation in order to make an accurate evaluation of health indicators and health system in general. On the other hand, to better assess the relationship between mortality and poverty indicators, it is necessary to control the effect of age in analysis.

Despite these limitations, another conclusion based on our findings is that the access to hospital care in our country might explain a considerable part of the observed differences regarding morbidity indicators. In poorer regions of Albania the access to the hospital services is likely to be more difficult, thus artificially contributing to observed regional differences. On the other hand, the avoidance of referral system and the crowding of patients in Tirana make Tirana the region with the most unfavorable indicators of hospital morbidity compared to other regions. These are obviously artificial differences produced due to the system, and thusthey are not inherent. This should be always taken into consideration wheninterpretinghospital morbidity information for Tirana.

For all these reasons, the findings of this study should be interpreted with caution.

Summary Box

What is known about this issue ?

In general, poverty, social and economic deprivation are factors that increase the risk of disease, damage to health and adverse treatment outcomes. In our country, studies linking poverty with hospital morbidity indicators are very limited.

What this study adds?

This report sheds light on the associations between the prevalence of poverty with the indicators of general and specific hospital morbidity, by regions of the country, suggesting statistical relationships between poverty with all-cause and specific morbidity and highlighting significant differences by gender and regions. Various factors related to lifestyle as well as the access to hospital services are thought to be partly responsible for these differences. Also, the available evidence suggests for complex relationships between poverty and morbidity.

What are the implications for public health?

It is necessary to undertake in-depth studies to better document the association of poverty with morbidity indicators in order to take preventive measures for addressing inequalitites.

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