

## **Epidemiological Susceptibility of Slum and Non-Slum Dwellers: A Discriminant Analysis**

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Date submitted: November 15, 2011

Date revised: February 2, 2012

Word count:2,997

### **Abstract**

*This study aimed to analyze slum and non slum dwellers with respect to discriminants on the availability, adequacy and utilization of the source of water supply, type of toilet and type of housing leading to their epidemiological susceptibility to communicable and non communicable diseases. The results showed that there was a significant difference on the water sources bought by slum and non slums dwellers compared to the owned and shared deep well, NAWASA and spring. There was also a significant difference seen on the type of toilet particularly on the shared and flush types. The source of water supply and the absence of sanitary toilets among the slum dwellers were found to be significant discriminants in relation to the susceptibility of the respondents to communicable and non-communicable diseases. In particular, susceptibility to these diseases becomes more pronounced among the non-slum dwellers since wastes from the slum areas are carried through the non-slum areas via the water source and unsanitary human waste disposal practices of the slum dwellers.*

**Keywords and Phrases:** *slum and non-slum dwellers, epidemiological susceptibility*

### **Introduction**

Rapid urban population growth, the urbanization of poverty and the proliferation of slums are being driven to a great extent by this dynamic form of globalization. At the same time, globalization also drives economic and cultural growth and urban culture in megacities. The inequities of globalization play out most vividly in cities of the developing world. Such cities become fragmented, with certain areas attracting businesses and high-income earners at the expense of others which have none and suffer from high unemployment, little or no access to essential services, and infrastructure in need of maintenance or repair.

The multifaceted effects of globalization on the health of poor and low-income populations in all cities need to be better understood in this context, both at the individual level and within the city and community.

The urban setting as we know it today is a complex and dynamic environment that has a profound impact on the health of the human community. Three interrelated characteristics of urbanization make it different from what it was in the past: 1) the rapid

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rate of urban growth and its effect on municipal governments; 2) the upsurge in poverty and its effect on the urban economy; and, 3) the proliferation of slums and their impact on the urban environment and the environment's impact on slums. Combined, these conditions give rise to "new urban settings" characterized by a radical process of change with positive and negative effects, increased inequities, greater environmental impacts, expanding metropolitan areas and fast growing slums. In order to meet the health challenges that new urban settings create, it is important to grasp the nature and scale of urbanization, the various driving forces that affect it and the factors and determinants of health that are linked to this process.

These slum dwellers and informal settlers confront on a daily basis another dimension of poverty which is environmental poverty. The underserved and bad living conditions in slums impact on health, livelihood and the social fiber. The effects of urban environmental problems and threats of climate change are also most pronounced in slums due to their hazardous location, poor air pollution and solid waste management, weak disaster risk management and limited coping strategies of households. It has also been argued in several studies that possible trade-offs exist between bad housing and medical care and between bad housing and education. Bad living environment thus deepens poverty, increases the vulnerability of both the poor and non-poor living in slums and excludes the slum poor from growth.

The Philippines is among the countries in Asia with large number of urban slum dwellers. In 2006, about 7% of urban population live in slums up from 2.8% in 1990. Slum population is increasing at an annual rate of over 3.5% compared to urban population growth rate of 2.3% for the period 2000-2006. In the country's premier city or Metro Manila, an estimated 37% of population or over 4.0 million people live in slums in 2010. (mballesteros@mail.pids.gov.ph)

Slums are characterized by poor sanitation, overcrowded and crude habitation, inadequate water supply, hazardous location and insecurity of tenure. The people living in slums are highly vulnerable to different forms of risks- both natural and man-made. Their living conditions depict poverty in terms of both inadequate incomes and environmental deprivation. Studies show that slum poverty puts major stress on people's lives through pollution, congestion, noise, stagnant water and flooding. Households living in these poor environs pay more for basic services (i.e., water and electricity), have poorer health status, have poorer school performance, have lower productivity and are vulnerable to crimes and violence. While the country has made substantial progress in water and sanitation targets of the MDGs, it has done poorly in improving the lives of people in slums and in providing quality of life for most of the urban poor.

Urban health shows disparities between the urban poor and urban nonpoor for indicators such as child mortality, disease morbidity, and child nutritional status. An analysis of DHS data showed urban poor children may be less healthy than rural children in terms of weight for height (acute malnutrition/wasting). Poor urban slum dwellers tend to suffer more from environmental and infectious illnesses.

Urban poverty has many facets that need to be considered — such as housing as well as levels of income and consumption. Poverty is conventionally defined in terms of

incomes that are inadequate to permit the purchase of necessities, including food and safe water in sufficient quantity. In such populations, housing/shelter may be of poor quality, overcrowded or insecure. Inadequate provision of public infrastructure (piped water, sanitation, drainage) can increase health burdens (Montgomery et al. Eds. 2003). Another factor is the lack of a voice within political systems that keeps the concerns of the poor from being heard.

Poverty, crowded living conditions, outdoor and indoor pollution, and food insecurity are among the factors causing ill health. However, there are numerous advantages to working in urban areas. These include defined geographic zones, people grouped in workplaces, availability of urban services such as water, electricity, trained people and health centers (although they may be unavailable to the urban poor), and urban openness to new ideas. Given the rapid spread of urbanization and urban poverty, there are potential political, social, economic and epidemiological costs to not addressing the needs of the urban poor. This challenge is stated directly in the Millennium Development Goals: “achieve significant improvement in the lives of at least 100 million slum dwellers by 2020.” It’s a start.

This premise motivates and interests the researchers to investigate slum and non slum dwellers in relation to their epidemiological susceptibility through analysis of the availability, adequacy and utilization of the source of water supply, type of toilet as well as their type of housing.

### **Objectives of the Study**

1. to determine the availability, adequacy and utilization of the source of water supply, type of toilet and type of housing among slum and non slum dwellers
2. to determine the difference on the availability, adequacy and utilization of the source of water supply, type of toilet and type of housing between slum and non-slum dwellers.
3. to determine the diseases acquired among the slum and non-slum dwellers.
4. to determine the significant difference on the diseases acquired (communicable and non-communicable) between slum and non-slum dwellers.

### **Materials and Methods**

The researcher used a descriptive - correlational method of research through the data gathered using a self made questionnaire consisting of two parts the profile and the epidemiological susceptibility of slum and non slum dwellers when analyze as to availability, adequacy and utilization of source of water supply, type of toilet and type of housing followed by the test of difference between the communicable and non-communicable diseases acquired in slum and non slum dwellers.



## Results and Discussion

**Table 1 Profile of the Respondents in Terms of Dwelling Location**

Dwelling Location	Frequency	Percent
Slum	158	39.70%
Non-Slum	240	62.60%
<b>Total</b>	<b>398</b>	<b>100%</b>

The profile of the respondents in terms dwelling location revealed in table 1. The table presented that 158 or 39.70% of the respondents lives in a slum area and 240 or 60.30% of the respondents are living in a non slum area. The finding confirmed that majority of the respondents live in a non slum area considering Dapitan and Dipolog as not a congested area of residence.

**Table 2 Availability of the Source of Water Supply, Type of Toilet and Type of Housing of Slum and Non- Slum Dwellers**

Indicators/ Discriminants	Slum		Non- Slum		Computed	Interpretation
	Average Weighted Value	Description	Average Weighted Value	Description		
<b>I. Source of Water Supply</b>						
1. owned	1.78	ANE	1.67	ANE	1.263	NS
2. Shared	2.27	ANE	2.32	ANE	-0.634	NS
3. Bought	2.19	ANE	2.00	ANE	2.352	S
4. Deep well	2.40	AE	2.43	AE	-0.307	NS
5. NAWASA	1.85	ANE	1.84	ANE	0.152	NS
6. Spring	2.69	AE	2.55	AE	1.827	NS
<b>Mean</b>	<b>2.20</b>	<b>ANE</b>	<b>2.14</b>	<b>ANE</b>	<b>2.175</b>	<b>S</b>
<b>II. Type of Toilet</b>						
1. owned	1.49	NA	1.42	NA	0.792	NS
2. shared	2.34	AE	2.55	AE	-2.837	S
3. flush	1.87	ANE	1.64	NA	2.904	S
4. wrap and throw	2.87	AE	2.87	AE	0.059	NS
5. water sealed	1.47	NA	1.57	AE	-1.313	NS
6. pit privy	2.87	AE	2.78	AE	1.845	NS
<b>Mean</b>	<b>2.15</b>	<b>ANE</b>	<b>2.14</b>	<b>ANE</b>	<b>0.587</b>	<b>NS</b>
<b>III. Type of housing</b>						
1. owned	1.42	NA	1.46	NA	-0.405	NS
2. rented	2.66	AE	2.65	AE	0.063	NS
3. wood	1.79	ANE	1.99	ANE	-2.531	S
4. concrete	2.30	ANE	2.24	ANE	0.744	NS
5. mixed	2.19	ANE	2.09	ANE	1.127	NS
6. makeshift	2.87	AE	2.81	AE	1.078	NS
<b>Mean</b>	<b>2.21</b>	<b>ANE</b>	<b>2.21</b>	<b>ANE</b>	<b>-0.073</b>	<b>NS</b>

**AE** – Available Enough      **S-** Significant  
**ANE** – Available Not Enough    **NS-** Non-Significant  
**NA** – Not Available

Of the various discriminants identified, only the source of water supply appeared to have a strong differentiating power between the slum and non-slum dwellers. Of the various types of toilets, significant differential characterizations for the slum and non-slum dwellers are observed for shared and flush types. Finally, of the type of housing, only the use of wood materials registered significant differentiation between slum and non-slum dwellers.

**Table 3 Test of Difference between Non- Communicable Disease acquired in the Slum and Non-slum dwellers**

Non- Communicable disease	Dwelling location		Computed Test of Proportion	Interpretation
	slum	Non-slum		
1. hypertension	52	77	4.84	Significant
2. coronary artery disease	7	6	0.08	Not Significant
3. diabetes mellitus	13	14	0.04	Not Significant
4. chronic obstructive pulmonary disease	29	50	5.58	Significant
5. stroke	1	2	0.33	Not Significant
6. cancer	2	2	0	Not Significant
7. bronchial asthma	41	63	4.65	Significant
8. cataract	8	6	0.29	Not Significant
9. error of refraction	0	3	3.00	Not Significant
10. blindness	1	4	1.80	Not Significant
11. mental disorder	0	1	1.00	Not Significant
12. renal disease	4	4	0	Not Significant

Degree of freedom=1       $f=0.5$       critical value=3.841

Non-communicable diseases such as hypertension, chronic obstructive pulmonary disease and bronchial asthma differentiated the slum from the non-slum dwellers. In all three types of non-communicable diseases, the non-slum dwellers were found to be more prone than the slum dwellers.

**Table 4 Test of Difference between Communicable Disease acquired in the Slum and Non-slum dwellers**

Communicable Disease	Dwelling location		Computed Test of Proportions	Interpretation
	slum	Non-slum		
1. tuberculosis	4	2	0.67	Not Significant
2. leprosy	2	1	0.33	Not Significant
3. schistosomiasis	1	0	1.00	Not Significant



<i>Table 4 cont'd</i>				
4. filariasis	1	0	1.00	Not Significant
5. malaria	3	0	3.00	Not Significant
6. dengue hemorrhagic fever	16	15	0.03	Not Significant
7. measles	61	110	14.04	Significant
8. chicken pox	95	142	9.32	Significant
9. mumps	54	107	17.45	Significant
10. diphtheria	8	15	2.13	Not Significant
11. whooping cough	77	132	14.47	Significant
12. tetanus	23	29	0.69	Not Significant
13. influenza	86	106	2.08	Not Significant
14. pneumonia	51	69	2.70	Not Significant
15. cholera	5	7	0.33	Not Significant
16. typhoid fever	30	36	0.55	Not Significant
17. bacillary dysentery	0	1	1.00	Not Significant
18. soil transmitted helminthiases	1	0	1.00	Not Significant
19. paragonimiasis	0	0	0.00	Not Significant
20. hepatitis A	1	2	0.33	Not Significant
21. paralytic shellfish poisoning	1	0	1.00	Not Significant
22. leptospirosis	0	0	0.00	Not Significant
23. rabies	6	4	0.04	Not Significant
24. scabies	6	16	4.55	Significant
25. anthrax	0	1	1.00	Not Significant
26. sexually transmitted infections	1	0	1.00	Not Significant
27. hepatitis B	1	0	1.00	Not Significant
28. HIV/AIDS	1	0	1.00	Not Significant
29. meningococemia	0	0	0.00	Not Significant
30. avian influenza	0	0	0.00	Not Significant
31. severe acute respiratory syndrome	1	1	0.00	Not Significant

$$df=1 \quad f=0.5 \quad \text{critical value}=2.841$$

As shown in table 4 on communicable diseases it shows that measles, chicken pox, mumps, whooping cough and scabies are significant among slum and non slum dwellers. It indicates that communicable infections particularly scabies would result for shared toilet and where water is bought because scarcity of water would lead to poor hygiene.

## Discussions

1. Among the discriminants identified, the source of water supply emerged as the factor that differentiates slum and non-slum dwellers. Human waste disposal through sanitary toilets are predictably more prevalent among the non-slum dwellers. It is , however, surprising to find that the non-slum dwellers are found to

be significantly more susceptible to certain types of communicable and non-communicable diseases than the slum dwellers.

2. There are possible reasons for this observed phenomenon. First, it is possible that with the close proximity of the slum dwellers to the non-slum dwellers, wastes from the slum areas eventually settle in the non-slum areas where disease-causing bacteria thrive and thereafter, cause infection among the non-slum dwellers. Second, it is equally possible that the slum dwellers, having been exposed to the infections for longer periods of time, have developed immunity to them.
3. Given these information, it is logical to isolate the significant discriminants that relate to the susceptibility of slum and non-slum dwellers to communicable and non-communicable diseases, namely, source of water supply and use of sanitary toilets.

### **Conclusion**

The source of water supply and the absence of sanitary toilets among the slum dwellers were found to be significant discriminants in relation to the susceptibility of the respondents to communicable and non-communicable diseases. In particular, susceptibility to these diseases becomes more pronounced among the non-slum dwellers since wastes from the slum areas are carried through the non-slum areas via the water source and unsanitary human waste disposal practices of the slum dwellers.

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