A COMPARATIVE ANALYSIS OF DISEASES ASSOCIATED WITH MINING AND NON-MINING COMMUNITIES: A CASE STUDY OF OBUSAI AND ASANKRANGWA, GHANA

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Disease prevalence varies with geographic location. This research pursues a medical geographic perspective and examines the spatial variations in disease patterns between Obuasi, a gold mining town and Asankrangwa, a non gold mining town in Ghana, West Africa. Political ecology/economy and the human ecology frameworks are used to explain the prevalence of diseases. Mining alters the environment and allows disease causing pathogens and vectors to survive more freely than in other similar environments. Certain diseases such as upper respiratory tract infections, ear infections, sexually transmitted diseases such as HIV/AIDS and syphilis, certain skin diseases and rheumatism and joint pains may have a higher prevalence in Obuasi when compared to Asankrangwa due to the mining in Obuasi.
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>LIST OF TABLES</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>v</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LIST OF FIGURES</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>vi</td>
</tr>
</tbody>
</table>

### Chapter

1. **INTRODUCTION** ................................................................. 1  
   - Research Problem and Justification ...................................... 2  
   - Research Objectives/Questions ........................................ 3  

2. **LITERATURE REVIEW** .......................................................... 5  
   - Defining Health ..................................................................... 5  
   - Mining as a Factor in Disease Causation/Prevalence ............... 6  
   - Comparing the Leading Causes of Morbidity in the World .......... 13  
   - Resource Exploitation and the Resource Curse ....................... 14  
   - Determinants of Health Status in Ghana ................................ 16  
   - Rural-Urban Disparities ................................................... 20  
   - Structural Adjustment Programs ....................................... 22  
   - Capitalism vs. Kinship ................................................... 24  
   - Models Used to Explain the Geography of Diseases ............... 25  
   - Conceptual Framework .................................................... 28  
   - Hypothesis .......................................................................... 31  

3. **STUDY AREA** ........................................................................ 32  
   - Description of Study Area ................................................ 32  
   - Locational Difference Based on Political Economy ............... 36  
   - Methodology ........................................................................ 36  

4. **DATA ANALYSIS AND INTERPRETATION** .............................. 38  
   - Comparing the Leading Causes of Morbidity in Ghana, Adansi West District and Wassa Amenfi District ....................... 38  
   - Some Leading Causes of Morbidity in Adansi West District ...... 42  
   - Some Leading Causes of Morbidity in Wassa Amenfi District ..... 43  
   - Mining-Related Diseases .................................................... 44
Explaining the Disease Patterns Using the Human Ecology Framework ................................................................. 52
Problems and Discussion ......................................................................................................................... 54
Health, Safety and Environment ........................................................................................................... 56
Social and Economic Impact of the AGC .......................................................... 58
Using Political Ecology/Economy to Explain Health Care ............ 64

5. CONCLUSION ................................................................................................................................. 66

APPENDIX .............................................................................................................................................. 71

BIBLIOGRAPHY ........................................................................................................................................ 73
<table>
<thead>
<tr>
<th></th>
<th>Table Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Leading Causes of Morbidity in Ghana, Africa and the World, 1999</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Population Distribution in Adansi West District</td>
<td>33</td>
</tr>
<tr>
<td>3</td>
<td>Leading Causes of Morbidity, Adansi West vs. Wassa Amenfi</td>
<td>41</td>
</tr>
<tr>
<td>4</td>
<td>Economic Indicators in Obuasi</td>
<td>62</td>
</tr>
<tr>
<td>5</td>
<td>Economic Indicators in Asankrangwa</td>
<td>64</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Political Ecology Framework</td>
<td>30</td>
</tr>
<tr>
<td>2.</td>
<td>Map of Study Area</td>
<td>35</td>
</tr>
<tr>
<td>4.</td>
<td>Other Leading Causes of Morbidity in the Adansi West District</td>
<td>42</td>
</tr>
<tr>
<td>5.</td>
<td>Other Leading Causes of Morbidity in Wassa Amenfi District</td>
<td>44</td>
</tr>
<tr>
<td>6.</td>
<td>Tuberculosis Cases, Adansi West District vs. Wassa Amenfi District</td>
<td>45</td>
</tr>
<tr>
<td>8.</td>
<td>HIV/AIDS Cases in Wassa Amenfi District, 2002</td>
<td>48</td>
</tr>
<tr>
<td>9.</td>
<td>Prevalence Rate of Skin Disease, Adansi West District vs. Wassa Amenfi District</td>
<td>49</td>
</tr>
<tr>
<td>10.</td>
<td>Prevalence Rate of Accidents, Adansi West District vs. Wassa Amenfi District</td>
<td>50</td>
</tr>
<tr>
<td>11.</td>
<td>Prevalence Rate of Rheumatism and Joint Pains, Adansi West District vs. Wassa Amenfi District</td>
<td>51</td>
</tr>
<tr>
<td>12.</td>
<td>Prevalence Rate of Acute Eye Infection, Adansi West District vs. Wassa Amenfi District</td>
<td>52</td>
</tr>
<tr>
<td>13.</td>
<td>Safety Signs in AGC, Obuasi</td>
<td>57</td>
</tr>
<tr>
<td>14.</td>
<td>Safety Signs in AGC, Obuasi</td>
<td>57</td>
</tr>
</tbody>
</table>
CHAPTER 1
INTRODUCTION

Diseases such as malaria, tuberculosis (TB), diarrheal diseases, HIV/AIDS and respiratory infections are among the leading causes of death in Sub-Saharan Africa (WHO, 2003c), but the distribution of these diseases is not uniform. Due to environmental, cultural and behavioral differences some diseases occur more frequently in some communities than others. In fact, disease prevalence varies with geographic location. Mining regions may have a higher prevalence of certain diseases because mining alters the environment and allows disease causing pathogens and vectors to survive more freely than in other environments.

Malaria is endemic in many tropical regions of the world. The warm and wet climate is ideal for mosquitoes, the vector for the disease. However, due to the physical and environmental changes that mining produces, malaria may have an increased prevalence in mining areas in tropical regions. Water pits created by mining activities serve as a reservoir for mosquito breeding. In addition to malaria, some skin diseases may also have a higher prevalence in mining areas. In tropical regions with active mining, cyanide and mercury runoff from gold processing into local water bodies often increases the prevalence of skin diseases, as people use such water for daily necessities without treatment.

Thus, the economic activities of the inhabitants of an area influence the disease patterns experienced there. Occupational exposure to mining-related diseases is more likely to be seen in mining areas than in non-mining areas. Even in mining areas, the particular activities undertaken determine what diseases occur. Uranium mining in
Tajikistan has been associated with certain types of cancer and water contamination (WHO, 2004b), while gold mining in South Africa has been associated with TB and sexually transmitted diseases (STDs) (WHO, 1997).

This study examines the disease patterns in a gold-mining region in Ghana and a non-gold-mining region. It aims to explore how mining activity in a developing country influences the dominant causes of morbidity. Generally, due to poor environmental regulation, mining in developing countries is assumed to have negative impacts on the environment and the people in the immediate community, including environmental degradation and disease. While this sounds plausible, empirical testing of this relationship is rare. A direct comparison of the morbidity patterns in a mining and non-mining area is required. This is the focus of this study. The disease patterns in Obuasi, a gold-mining town in the Ashanti Region of Ghana are compared with the patterns in Asankrangwa, a non-gold mining town in the Western region of Ghana. Obuasi was chosen since previous research on the town has been primarily from an economic perspective and not an epidemiologic perspective. Asankrangwa is the control location.

Research Problem and Justification

Most research on gold mining towns in Ghana has been from an economic perspective. Few studies have examined gold mining-related disease prevalence. Akabzaa and Darimani (2001), examine some of the health impacts due to mining in Tarkwa, while Dumett (1993) studied diseases in Obuasi and Tarkwa during the colonial era. A survey by Friends of the Earth-Ghana showed a high prevalence of upper respiratory tract infection in the Obuasi area which medical experts attributed to mining activities and mining associated pollution (Awudi, 2002). Patients in the Ashanti
Goldfields Company (AGC) hospital at Obuasi have shown symptoms linked to arsenic poisoning which has been linked to the aerial pollution from mineral processing by the AGC (Awudi, 2002).

This research pursues a medical geographic perspective and examines spatial variations in disease patterns. Since Obuasi is the hub of gold production in Ghana, it attracts hordes of people, usually job seekers and their families, hunting for jobs both in the formal and informal sector. Obuasi also attracts both local and foreign investment in gold mining. Besides the positive impacts such as economic development and employment, several negative impacts result from gold mining. Gold mining provides a steady income for miners. This steady income attracts commercial sex workers who provide miners with sexual favors and potentially spread STD’s. Thus, a higher prevalence of STDs such as HIV/AIDS may exist in an urban gold mining town such as Obuasi, compared to a rural non-mining town such as Asankrangwa. Diseases such as HIV/AIDS will have serious social and economic effects on communities that depend on human labor (Oppong and Williamson, 1996).

Research Questions/Objectives

The basic research questions for this research are as follows:

1) What are the primary/leading causes of morbidity in Obuasi and Asankrangwa and why?

2) What practices in Obuasi lead to difference in disease prevalence when compared to Asankrangwa?

3) What have been the social, environmental and economic implications of gold mining activities of Ashanti Goldfields Company (AGC) in Obuasi?
To answer the above-mentioned research questions, the human ecology framework and the political ecology frameworks are used. Disease epidemiology in both locations is studied based on the human ecology framework, which combines genetics, environment and cultural practices. The political ecology framework is used to examine the epidemiology of diseases based on such factors as health care funding, employment, affordability of health care and changing national healthcare policy.
CHAPTER 2

LITERATURE REVIEW

To fully understand the disease epidemiology in Obuasi, various aspects of health status in the region need to be examined. Health is affected by among other things, government policies, budget allocation, people’s behavior and physical environment. For this research, the past and current healthcare policies in Ghana will be studied. Economy plays a vital role in health as it often determines the health status causality of a nation. It is vital that we understand the current situation of health care in Ghana. By looking at the history of health from various perspectives, and by examining the current policies being implemented, a better understanding of the epidemiology of diseases can be gained.

Defining ‘Health’

‘Health’ is a complex notion. According to Philips (1990, p.2), “a technocratic view of health is ‘the absence of disease’ (generally organic but possibly also mental).” Does this mean that medical intervention can often restore health? Illness and disease are to a certain extent relative matters. Sociologists often view illness and disease as social constructs in which different societies view symptoms and treatments differently (Phillips, 1990). The World Health Organization (WHO) defines ‘health’ as “a state of complete physical, mental and social well-being and not merely the absence of disease and illness” (WHO, 2003a).

It is widely accepted that the definition of health as “a technical measure, the absence of a diagnosed illness is not sufficient for most purposes” (Feachem, 1989). Today, many people try to measure health from only an epidemiological viewpoint by
looking at quantitative measures such as mortality, morbidity and disability in a population (Phillips, 1990). Ultimately, a practical and simpler definition of health is “the objective of basic needs approaches to provide for a ‘full life’ in which healthy individuals live in caring, well-provided and intellectually stimulating communities” (Stewart, 1985).

Today, health in Africa can be conceptualized in the context of the epidemiological transition model (Mabogunje, 1995). Infectious and parasitic diseases, nutritional deficiencies and reproductive health problems cause the majority of deaths in Sub-Saharan Africa. During the epidemiological transition phase, these diseases are gradually resolved, which leads to a post-transition phase in which chronic degenerative diseases such as stroke, cancer and heart diseases become predominant. Although chronic diseases are becoming more prevalent in large cities, the vast majority of Sub-Saharan Africa has barely entered the transition phase (Mabogunje, 1995).

Mining as a Factor in Disease Causation and Spread

Although many of the diseases that will be examined in this thesis are prevalent in a non-mining setting, some of them such as arsenic poisoning may be more prevalent in mining areas. By disrupting the natural environment, gold mining may enhance and exacerbate the spread of disease. Pollution caused by quarrying and blasting in mines increases not only the dust particles in the air and the surrounding environment, but also promotes the spread of toxic chemicals. Some of the toxic chemicals that result from blasting include cyanide and sulfur dioxide, which are all very harmful to the body. In addition, arsenic, which is used in processing the crushed rock, flows into streams and rivers, the major source of drinking water for local residents. Consequently, arsenic
poisoning is a major concern in gold mining areas in developing countries. Previous research in the gold mining town of Tarkwa in Ghana, showed that diseases exacerbated due to mining such as upper respiratory tract infections and skin rashes are some of the leading causes of hospitalization in the area (Akabzaa and Darimani, 2001).

Other diseases that may be intensified due to mining include: conjunctivitis, respiratory tract diseases, vector borne diseases such as malaria, schistosomiasis and STDs such as HIV/AIDS. Let us examine these in some detail.

Acute conjunctivitis is attributed to high dust particles, smoke or chemical content in the air. With surface mining, dust and other chemicals are regularly dispersed in the air, which could lead to acute conjunctivitis. Similarly, respiratory tract diseases such as tuberculosis (TB) and silicosis may spread more quickly in mining areas. Sneezing or coughing, the most common means of producing airborne TB bacilli, is common among miners as they are exposed to dust and chemicals in the air created by mining activities. An estimated 2000 miners die each year in the U.S., from lung diseases caused by coal mining dust (National Institute for Occupational Safety and Health Facts, 1996).

Tuberculosis is a contagious infection caused by Mycobacterium tuberculosis. Although all the organs in the human body are susceptible to TB, the lungs are the primary organs that are most commonly affected. Tuberculosis usually affects the young, poor and the weak who are already suffering from diseases such as HIV/AIDS, which weakens the immune system. Since TB is spread through the air, it transmits easily in crowded environments. Miners work in close proximity to each other in an enclosed environment such as an underground mine, which allows the TB bacteria to
spread easily. In South Africa, a leading gold mining country, tuberculosis is the third leading cause of death (Bradshaw et al., 2003). The severity of South Africa’s AIDS crisis is clearly a contributory factor.

Silicosis is also a respiratory disease that is caused when silicon dioxide or crystalline silica is inhaled. Silica is a naturally occurring crystal that is found in rock beds. During mining and quarrying, it forms dust, and people such as miners, stonecutters, road and building construction workers are easily exposed to the silica. It takes 10 or 15 years of exposure to silica before symptoms develop, however, intense exposure to the chemical may result in the disease in less than a year (Medline Plus, 2003).

Vector-borne diseases are often the most common of diseases not only in mining areas, but also in many developing countries particularly in Sub-Saharan Africa. While malaria may be one of the leading vector-borne diseases in mining areas, other diseases such as schistosomiasis may also be more prevalent in mining areas.

Malaria is transmitted into the human body by the female anopheles mosquito in which the parasite survives. Sporozoites, malaria-causing parasites, drift to the liver where they grow and eventually enter the blood stream and infect the red blood cells. Once in the red blood cells, the parasites further proliferate. People can get malaria anywhere from a week after being bitten by an infected mosquito to as long as a year. Malaria may have a higher prevalence in mining areas, particularly areas with surface level mines due to the numerous pits that are dug for mining activities. When these fill up with water they act as perfect breeding grounds for mosquitoes. A survey in 1994 of
Tarkwa mineworkers in Ghana showed that 75% of them carried the malaria parasite (Akabzaa and Darimani, 2001).

In recent years, malaria parasites have developed extreme resistance to many of the drugs and insecticides as these drugs are of no use in stopping the mosquitoes from transmitting the disease. Vaccine research has been ongoing for years but has produced few hopeful solutions. It is estimated that an effective vaccine to malaria is at best several years away (Roll Back Malaria, 2005). Plasmodium falciparum is the parasite that causes the most severe form of malaria. It has developed resistance to drugs throughout the world. In West Africa, it has developed resistance to mefloquine and in East-Central Africa it has become resistant to the drug sulfadoxine/pyrimethamine (CDC, 2001).

Schistosomiasis is another disease caused by a parasite called schistosoma. Schistosoma parasites usually live in pools of water, which are plentiful in mining areas. When the human body comes in contact with the water that contains the schistosoma parasite, it burrows into the skin, and then matures and migrates into the lungs and liver. It does not develop into an adult until it reaches the organs. From the lungs and the liver the parasite migrates into the bladder, rectum, intestines, liver and spleen where it lives. Schistosomiasis can be detected in two ways. First, blood in the urine (urinary schistosomiasis), which can lead to kidney problems or bladder cancer, and second, intermittent bloody diarrhea (intestinal schistosomiasis), which leads to complications in the liver and spleen (WHO, 2004a). Many miners work in conditions, which are ideal for the schistosoma parasite to survive. Like malaria, schistosomiasis is
a disease that is found primarily in and around tropical areas. It is estimated that over 200 million people are infected with schistosomiasis worldwide (CDC, 1999).

Skin diseases are also quite prevalent in mining areas. Problems such as water and air contamination and waste disposal are associated with mining activities. Both surface mining and underground mining contaminate water bodies with the release of harmful toxins such as arsenic. The air is polluted due to the release of smoke and dust and toxins such as carbon dioxide from mining activities (Sraku-Lartey, 2004).

For example, skin rashes result from cyanide and mercury pollution, a byproduct of gold processing. In fact, mercury is believed to cause cancer. Small-scale miners use mercury to process gold. Mine run-off is also quite common in mining areas. Dangerous chemicals such as cyanide, sulfur dioxide and mercury can easily contaminate streams or water bodies if the mining companies do not take proper care of the chemicals. Streams and small rivers are common bathing grounds for villagers and unfortunately, many people also use this water for drinking and cooking. In Buyat Bay, Indonesia, a range of health problems including skin diseases, headaches, and unusual swellings on various parts of the body have been associated with heavy metal contaminations due to the gold mining activities. Studies have showed that chemicals such as arsenic, mercury and manganese had an extremely high concentration in the area (WALHI, 2004). In previous research at the mining town of Tarkwa, many communities blamed the high incidence of skin rashes on the activities of the mining companies in their area (Akabzaa and Darimani, 2001).

Sexually transmitted diseases (STDs) may also have a higher prevalence in mining areas when compared to non-mining areas. Gold mining attracts labor, and pays
well. Miners often leave their families for a prolonged duration to work. Commercial sex workers are attracted to mining areas to service the miners’ desire for sexual services when they are away from their families.

Historically, in the case of southern Africa, rural areas have sent thousands of men to work in the mines of South Africa. Often, these miners stay for 2 or 3 years at a time. In the case of mine workers from Malawi, miners are known to have spent a few days with commercial sex workers having fun before they go back to their rural homes. Nearly 50% of mine workers from Malawi are estimated to carry back and infect their wives with STDs after a mining stint in South Africa (Kalipeni, et.al, 2004). The gold mines of South Africa have a 95% migrant labor population, of who many are from neighboring countries. Most of these miners are housed in single sex housing complexes near the mines. Based on interviews, one of the few entertainments for the miners is drinking and sex that is available on a daily basis (Campbell, 2004). Much of this sex is unprotected, which exacerbates the problem of STDs. A 2001 survey in the Geita Gold mines of Tanzania showed some telling numbers on HIV. Thirty five percent of the miners surveyed were involved with multiple sex partners in the last three months. Also, more than 50% of miners admitted paying for sex in the previous year while 30% of them did not always use protection during sex (GMCHP, 2001). In 2002, AngloGold mines in South Africa estimated a 30% prevalence of HIV among its miners (WEF, 2003).

HIV/AIDS is a major problem in mining areas. Although it is not as prevalent when compared to diseases such as malaria, its higher rate of prevalence in many mining areas when compared to non-mining areas is a cause for concern. A 1998 study
in the mining community of Carletonville, South Africa, showed a 20% prevalence of HIV among men in the general population while mineworkers had a 29% HIV prevalence. Sex workers in the same area had an extremely high 69% prevalence rate (Williams et al., 2003). With HIV/AIDS being one of the most devastating diseases in the past two decades, it usually gets mass attention, even if its statistics are not as appalling as other diseases such as malaria. HIV/AIDS is one of the few diseases that can, and have had major impacts on the socio-economic issues of a community.

Compared to some of its African neighbors, HIV/AIDS is not as big of a problem in Ghana. In 2000, Ghana’s HIV prevalence rate for the urban adult (15 to 49) population was about 3% (Oppong, 2002). However, AIDS is a cause for major concern because it has the potential to destabilize a society, since it usually affects those in the reproductive ages, which is also the majority of the work force. As of 1998, Ghana had no laws requiring prospective mining employees to be tested for HIV/AIDS. In Obuasi, reported cases of AIDS has increased, implying that if immediate steps are not taken in time, sooner or later AGC will have a reduced work force (Sarpong, 1998).

Syphilis is another sexually transmitted disease that may be more prevalent in mining areas. A 1996 study in Venezuela, in the mining communities of Bolivar State showed that 16% of the sample tested positive for syphilis (WHO, 2000). Also, a 1993 study of two Tanzanian communities with artisanal gold mining showed 12% of men and 17% of women having evidence of active syphilis which was higher than in non-mining communities (GMCHP, 2001).
Comparing the Leading Causes of Morbidity in the World

In order to get an idea of where Ghana stands in regards to Africa and the world, this section briefly examines some of the leading causes of morbidity in Ghana, Africa and the world. Malaria is the leading cause of morbidity in Ghana (table 1) while it is second in Africa and eighth globally. Ghana is a tropical country with the southern half of the country receiving plenty of rainfall. Plentiful rainfall along with the temperate climate provides a good breeding ground for mosquitoes. HIV/AIDS is the leading cause of morbidity in Africa and is second globally. In Ghana, it is not even in the top ten. Ghana has a substantially lower rate of HIV/AIDS compared to many African countries.

In Ghana, the second leading cause of morbidity is upper respiratory tract infections (URTIs) such as the common cold that is usually caused by a virus. However, in Africa and globally, lower respiratory infections such as pneumonia and bronchitis are more prevalent. Tuberculosis is the eighth leading cause of morbidity in Africa, but is not among the top ten in Ghana. Diarrhoeal disease is another disease that is a leading cause of morbidity in Ghana, Africa and globally. Skin diseases are more common in Ghana than in Africa or the rest of the world. Pregnancy-related complications are also among the top ten diseases in both Ghana and Africa. Road traffic accidents are fifth in Ghana and tenth in Africa but are not in the top ten globally. One surprising statistic is that perinatal conditions (death of young babies) is a leading cause of morbidity in Africa and globally, however, it is not listed in the top ten in Ghana.
Table 1: Leading Causes of Morbidity for 1999

<table>
<thead>
<tr>
<th>Rank</th>
<th>Ghana</th>
<th>Africa</th>
<th>Global</th>
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<tbody>
<tr>
<td>1</td>
<td>Malaria</td>
<td>HIV/AIDS</td>
<td>Acute lower respiratory infections</td>
</tr>
<tr>
<td>2</td>
<td>URTIs</td>
<td>Malaria</td>
<td>HIV/AIDS</td>
</tr>
<tr>
<td>3</td>
<td>Diarrheal Diseases</td>
<td>Acute lower respiratory infections</td>
<td>Perinatal conditions</td>
</tr>
<tr>
<td>4</td>
<td>Skin Diseases</td>
<td>Diarrheal diseases</td>
<td>Diarrheal diseases</td>
</tr>
<tr>
<td>5</td>
<td>Accidents</td>
<td>Perinatal conditions</td>
<td>Ischemic heart disease</td>
</tr>
<tr>
<td>6</td>
<td>Pregnancy-related complications</td>
<td>Measles</td>
<td>Unipolar major depression</td>
</tr>
<tr>
<td>7</td>
<td>Acute eye infections</td>
<td>Pregnancy-related complications</td>
<td>Cerebrovascular disease</td>
</tr>
<tr>
<td>8</td>
<td>Hypertension</td>
<td>Tuberculosis</td>
<td>Malaria</td>
</tr>
<tr>
<td>9</td>
<td>Gynecological disorders</td>
<td>Congenital abnormalities</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Anaemia</td>
<td>Road traffic accidents</td>
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Resource Exploitation and the Resource Curse

Natural resources can make countries prosperous, however a large number of developing countries have not benefited from their natural resources. The ‘resource curse’ is a popular theory that is used to explain some of the problems in many resource rich underdeveloped countries. Countries such as Nigeria and Sudan (both rich in oil)
and Angola and Sierra Leone (rich in diamonds), have serious political and economic problems. Some countries that are highly dependent on natural resources as their major source of revenue grapple with civil wars, corruption, greater poverty, lack of democracy and severe economic problems.

In contrast, Botswana is one of the few examples in the developing world that has directly benefited from its natural resource, diamonds. Since diamonds were discovered in Botswana, it has continuously enjoyed an increase in the GDP/capita (Save the Children, 2003). The people of Botswana have directly benefited from diamonds because of the transparency of funds that are used on not just government officials, but also the people. Good governance or proper and fair implementation of government policies and management of diamonds have helped Botswana as a whole. Although Botswana has a good health care system, when compared to other African countries, it has one of the highest HIV/AIDS rates in the world. Other countries such as Canada, Australia and Norway have benefited from their natural resources and today enjoy a prosperous economy.

Gold has been a mixed blessing for Ghana. The government of Ghana owns 17% of the Ashanti Goldfields Company while private companies and shareholders own the rest. Unlike countries such as Angola or Sierra Leone where bad governance and the natural resources have contributed to war and political instability, gold has not created any major problems in Ghana. Unlike in Botswana, where the diamonds have benefited the people due to the government controlling a much larger share in the much more profitable diamond industry, gold has not fully benefited the people in Obuasi and the surrounding areas. Instead, those who benefit the most from the Obuasi gold mines
are the shareholders and private companies that own the AGC. The AGC is over 100 years old and in 1996 it became listed on the New York Stock Exchange. Recently, AngloGold Limited and Ashanti Goldfields Company merged to form the AngloGold Ashanti Limited. In 2004, the company produced over 6,000,000 ounces of gold at a value of $268/ounce compared to 533,000 ounces in 1972 (AngloGold Ashanti, 2005).

Gold mining also causes environmental degradation. Problems such as soil degradation, water and air contamination, noise and vibrations, and waste disposal are associated with mining activities. Surface mining in particular contributes to land degradation. Large strips of land are cleared for surface mining and often the land cannot be regenerated once the mining is complete.

**Determinants of Health Status in Ghana**

Health status of a country depends on several factors. Phillips (1990), identifies six areas in development that have a major impact on health.

**Changes in Human-Habitat Relationships**

Often, hosts and agents of certain diseases balance out, however, changes in the environment or habitat gives one a temporary boost over the other. For example, people moving into the forests looking for new farming land may be exposed to new diseases which were previously unknown. The physical environment in Obuasi is similar to other locations in the region, however with the introduction of gold mining the environment has been altered due to the drilling and development. Consequently, certain diseases that never existed in the area or diseases that were not common may have become more prevalent.
Population Movements and Concentration

Urbanization leads to migration of people from one place to another. Economic reasons, wars, and famines also lead to population movement, which can all have important implications on health. Many Third World cities lack adequate housing, employment and health services due to over population. The migrant labor system also has a major impact on the spread of diseases. According to Lydie and Robinson (1998), there are five migrant groups that have aided the distribution of diseases in Sub-Saharan Africa: Female itinerant traders, truckers, refugee populations, migrant laborers, and commercial sex workers, of which the latter two apply in the case of Obuasi.

In Obuasi, gold mining attracts labor from the surrounding areas. Research has shown that workers who leave their families for an extended period of time are often involved in sexual activities with multiple partners, exacerbating the problem of sexually transmitted diseases such as HIV/AIDS. Many of the gold miners who get a regular monthly income, go to commercial sex workers for their sexual needs. In contrast, the local populations who are involved in farming as their primary economic activity only earn seasonal income during the harvest season. One could argue that commercial sex workers are attracted to any kind of development and not just mining. However, research has shown that, in many cases mining in fact attracts a far greater rate of commercial workers than other economic activities.
Micro-Environmental Changes, Including Housing

Changes in various aspects such as housing conditions, sanitation and transport have impacts on the health of a community. For example, poor people living in a slum may be vulnerable to infectious diseases such as tuberculosis. On the other hand, their rich neighbors who have a different diet and lifestyle may be vulnerable to diseases of affluence such as hypertension or diabetes. Housing patterns are very important because poor planning leads to congestion, overcrowding of people and improper sanitation which is the perfect breeding ground for many diseases. Research conducted in Sri Lanka, Costa Rica and Philippines showed a positive correlation between poorer housing and an increased death rate among children (Phillips, 1990).

Although the Ashanti Goldfield Company has a well-developed housing system within its premises, there are shantytowns around the gold mines. Many people who live in these shantytowns are either directly or indirectly affected by the economy generated by the gold mines. Here, sanitation is poor and overcrowding and diseases are a problem.

Water Availability and Water Flow

Access to clean drinking water is vital to maintaining good health. Often, poor people in many developing countries do not have proper access to clean drinking water. In such circumstances, diarrhoeal disease is very common, especially among children. Water management and water flow is also very important to having good health. Stagnant agricultural water can lead to outbreaks of malaria. Broken pipelines can create pools of water, which is a good breeding ground for mosquitoes. Water extension schemes need to be planned properly as there are many positive benefits that come along with it. One of the byproducts of gold mining is arsenic, which is a
harmful chemical to the human body. Often as a method of cost cutting, many mining companies release arsenic as run-off into the local rivers and streams. According to Duker, Carranza and Hale (2004), there is a higher prevalence of Buruli ulcer in arsenic enriched environments.

Socio-Economic Changes Accompanying Development

Socio-economic problems and health problems are closely linked together. Often, it is the poor who suffer due to changes in the society. For example, income-generating schemes benefit people with skills or resources to invest or participate, but put the rest, who are not skilled at a disadvantage. In the case of a mining area, socio-economic changes brought about by mining will lead to more people leaving their traditional jobs such as farming and trying to obtain a job where income is either directly or indirectly related to mining. As more and more people move into the center of town for mining, a vacuum is created in their communities, which hurts their local economies.

War, Disturbance and Political Upheavals

Violence has a major impact on the health of a community (Kalipeni and Oppong, 1998). War and political upheavals disrupt social life and leave thousands of people hopeless, homeless and susceptible to diseases. War creates refugees, which leads to many people contracting various diseases due to the poor environment in refugee camps (Kalipeni and Oppong, 1998). In Darfur, Western Sudan, more people have died in refugee camps due to malnutrition, diseases and living conditions than the number of people killed in the genocide (BBC, 2005). In refugee camps, living conditions often become unbearable as they become crowded and unsanitary. This
provides an optimal environment for proliferation and spread of disease-causing organisms.

Rural-Urban Disparities

Defined as ‘the percent of people who take 30 minutes or less to reach a health facility based on their usual mode of travel’ (Oppong, 2002), access to healthcare in Ghana appears to be determined by location. Rural areas have poorer access than urban areas.

In 1972, only 8% of Ghana’s total population lived in the Accra-Tema metropolitan area, but nearly 50% of the government doctors worked in the area. By 1984, the situation was even worse with nearly 75% of the 818 government doctors working in the Greater Accra and Ashanti regions. Although 80% of Ghana’s population lived in rural areas, only 20% of the doctors served the area (Oppong, 2002).

People in urban areas have better and more immediate access to healthcare when compared to people in rural areas. Usually, health facilities in rural areas are under-equipped and under-staffed when compared to urban areas such as the Greater Accra region. In many areas of Ghana, especially the rural north, the availability of services and treatment is unreliable. Health facilities are often hard for people to reach, especially the old, sick, injured, women and children. Costs accumulated due to transportation, time lost from work and other economic as well as physical barriers effectively excludes the poor from using modern medical services.

Private medical facilities are often better at providing medical services when compared to government facilities. However, private facilities are beyond the monetary reach of the majority population. Imbalances between the rich and the poor, between
regions, between urban and rural areas, all characterize healthcare in Ghana (Phillips,
1990).

In many developing countries, especially in Sub-Saharan Africa, medical pluralism, combining both biomedical and traditional medicine, is practiced. Biomedical systems are made up of government and private hospitals, clinics, etc in which the medical personnel are trained in recognized medical schools. On the other hand, traditional medicine is usually not recognized by modern medicine. Local shamans and traditional medical practitioners (TMPs) are the providers in traditional medicine. In traditional medicine, knowledge is gained and passed on by family members who have learnt the art of treating various illnesses by using medicinal herbs and shrubs from the natural environment.

Traditional medicine is very popular in many African countries because in many rural areas, modern medicine is not easily accessible. Many people feel more comfortable with these TMPs than biomedicine doctors who may look at diseases from a more clinical view. Biomedicine strictly treats the disease and not the person. However, TMPs treat the disease from a social and cultural context (Oppong, 2003). TMPs serve the rural areas and also the poor in urban areas who seek a cheaper means to treatment.

In Africa, the biomedical health care system primarily serves the urban areas, while traditional medicine serves the rural areas. Between the two systems are the itinerant drug vendors (IDVs) who travel in rural areas supplying medical necessities to people. IDVs are not recognized as legal, however they are often the only possible source of medicine in rural areas (Oppong and Williamson, 1996). IDVs supply people
with a combination of modern medicine and traditional medicine. Medical pluralism is widespread in much of Sub-Saharan Africa including Ghana.

Structural Adjustment Programs

Since the late 1970s, the economic crisis in Sub-Saharan Africa led to the adoption of structural adjustment programs (SAPs), which were introduced by the World Bank and the International Monetary Fund (Mabogunje, 1995). During this time, the economies of many African countries including Ghana’s became stagnant due to “unprecedented government intervention in the domestic economy,” which led to market distortions. As diagnosed by the World Bank, “unwarranted state interference in the market, over-bloated public service, state ownership of manufacturing enterprises and investment in social welfare were essential symptoms of the debilitating and crippling disease that clogs the wheels of market efficiency” (Oppong, 2001). Structural adjustment then, was the prescription to cure this disease. In effect, eliminating these market distortions and limiting government intervention was the only possible solution. According to Logan and Mengisteab (1993), Structural Adjustment Programs prescribed three groups of reform.

1) Deflationary measures such as removal of subsidies and reduction of public expenditures

2) Institutional changes in the form of trade liberalization and privatization and

3) Expenditure switching measures including promoting exports and devaluating currency.

Structural adjustment programs have led to cutbacks in health sector spending, which has led to major personnel layoffs and salary cuts (Stock, 1995). Due to the
cutbacks, clinics lacked many kinds of basic drugs, thus becoming merely consulting clinics where patients would get diagnosed without any available medication. A shortage of staff followed, as physicians left for better economic situations. For example, there were more Malian physicians practicing in Paris than in Mali (Stock, 1995). Many Ghanaian nurses are leaving for the U.K., South Africa and other countries due to better pay and economic conditions. A nurse in the U.K. earns around $3000 a month while a nurse in Ghana earns $100/month (Oppong, 2002).

Privatization of healthcare facilities has not helped the majority of people. Before the introduction of structural adjustment programs, healthcare in Ghana was mostly public. After independence, medical services were free because the government financed them. In 1984, approximately 63% of health care facilities in Ghana were government or quasi-government institutions. The majority of the remaining 37% was represented by mission hospitals, while private hospitals made up less than 2% of the health care facilities (Allrefer, 1994). However, with SAPs, the government emphasized privatization of the public sector including healthcare. As SAPs required privatization of health care, private healthcare became more prevalent while public healthcare took a hit. Privatization of the healthcare system in Ghana also exacerbated the differences between rural and urban areas. Rural areas depended on public and mission health facilities more than private facilities. In contrast, private healthcare, seeking to maximize profits, targeted the urban areas, which already had superior services. With privatization, only the affluent could afford healthcare. Since 1985, pressure from the World Bank and IMF led Ghana to adopt a cost recovery program know as the ‘cash and carry’ system where patients are expected to pay before treatment (IRIN, 2004).
However, user fees and cost recovery programs have had a negative impact. When patients cannot afford the fees, they delay treatment, which leads to a higher rate of deaths.

Although there is excellent health care in Ghana, only the minority affluent can afford it (Oppong, 2002). The majority of people who cannot afford healthcare avoid hospitals, a situation which leads to their deaths and ultimately delays awareness and response to new epidemics (Turshen, 1999). For example, in Ghana, 60% of the people needing cataract surgery cannot afford the surgery cost which could ultimately lead to their blinding (Oppong, 2002). Structural adjustment programs have had adverse and often negative effects on Ghana in the healthcare sector.

Capitalism vs. Kinship

Colonialism had a major impact on the geography of diseases in Ghana. In Ghana, the main mode of production was pre-capitalist. However, with the advent of colonialism, the socio-economic situation and the epidemiology of diseases changed. Before colonialism, the primary social structure of production was based on family kinship. An individual’s access to production, land and labor was determined based on kinship or whose son or daughter one was (Mabogunje, 1995).

Often, the nutritional status of a person depended on his or her family status such as size of the family, labor and the family’s access to land (Mabogunje, 1995). Prior to colonialism, mobility was not part of the general lifestyle other than for particular groups of people such as traders. Anytime there was a disease that emerged, the burden of dealing with it was distributed among the kinship and society. As a family or society, people were better equipped to deal with diseases than individuals were.
Although diseases took their toll due to a lack of modern medicine, people had natural remedies along with proper nutrition because of societal help and thus were better equipped to face diseases in times of crisis. Pre-colonial people had learned to live with and depended on the environment for their health needs (Mabogunje, 1995).

With colonialism, the colonists brought in capitalism as the mode of survival. Money and individualism were the criteria of a capitalistic society, which would replace kinship and community work. As more people became independent from a kinship society, capitalism affected the family structure by separating groups of people, thus making it harder for individuals to cope with diseases.

As in other places, gold mining in Ghana called for labor migration and as more people moved into a particular area for employment, urban centers were created. Soon, there was an excess of population and unemployment became widespread which led to shanty housing with a lack of infrastructure and poor sanitation. Poor sanitation gave rise to new diseases. Not only did labor migration create problems in urban areas, it also created a vacuum in rural areas. Where once kinship was the mode of socio-economic life, the loss of a significant section of the economically active population created negative results for the family structure (Mabogunje, 1995). As a result, the geography of diseases changed with the introduction of capitalism.

Models Used to Explain the Geography of Diseases

This research uses the human ecology and political ecology frameworks to explain the geography of diseases.
Human Ecology Framework

The human ecology framework views disease as resulting from the interaction of three major variables: genetics, environment, and human behavior (Meade and Earickson, 2000). For example, the group of diseases known collectively as cancer may be caused by inherited genetic factors, environmental exposure (chemicals, radiation and viruses) and human behavior (e.g. smoking and use of tobacco products). Skin pigmentation is an important factor in skin cancer. Light skinned people are more prone to skin cancer than dark skinned people. Similarly, recent research on breast cancer suggests that some people may be genetically susceptible.

A good example of a genetic disease is hypertension. If a family member has hypertension, the offspring has a greater probability of developing hypertension than a person with no family history of the disease. At the same time, a person can also have hypertension based on the social environment he lives in. A stressful job, unstable family and economic problems can all lead to hypertension. Hypertension is a major reason for mortality in the United States, Canada and other countries in the developed world. However, the so-called ‘diseases of affluence’ are also becoming more prevalent in many large third world cities such as Mumbai, Accra, etc, due to modernization and the changing lifestyle of people. As revealed by the Egyptian National Hypertension Project, compared to the 1970s and 1980s, today, hypertension has become very common among Egyptians and is believed to also be common in many developing countries (Ibrahim, 1996).

Physical environment also plays a role in diseases. People are more susceptible to certain diseases because of the physical environment they live in. For example, lung
cancer may be more prevalent in certain environments such as large cities, industrial areas, mines, etc. Mining produces harmful chemicals that are released into the air and miners who work in this environment on a constant basis are more likely to develop respiratory diseases.

Many diseases are often the result of the combination of two or more of these factors: genetics, environment and cultural/social practices. In order to understand diseases, all three factors need to be thoroughly examined.

Political Ecology Framework

“Political Ecology is an emerging social theory that emphasizes issues of scale, power relations, biophysical processes and influences in a human-environment context” (Kalipeni and Oppong, 1998). Context and scale, structural relationship and historical depth are the three major elements of the political ecology model.

To understand the human-environment relations at the local, regional and global scales, the relationships of patterns of resource use to political economic forces need to be analyzed (Mayer, 1996). For example, under SAPs, Ghana is under pressure to exploit natural resources such as gold, often with little consideration for the environmental and social consequences of such resource exploitation. Thus, global economic trends, including SAPs, have major regional and local implications. The pressure to open new mines in order to improve exports, can affect large tracts of land and water resources (Asa, 2001).

A deep historical analysis is required in order to understand the complex interactions between the environment and society, which are put in the context of local history and locally specific ecologies. Focus is placed on social and biophysical factors
pertaining to the local history and ecology (Atkinson, 1991). A historical understanding of healthcare delivery from the colonial and post-colonial era, recent developments such as the cash and carry system and local economies, and agriculture are critical for explaining health care access.

Finally, centrality of human agency and structure is the third major element. “Human agency is very important in the transformation of the complex, interacting web that characterizes the environment” (Turshen, 1984). The human agency is made up of farmers, industrial managers, pastoralists, etc, who are the actors that change the environment (Giddens, 1984; Atkinson, 1991). For example, to cut costs, toxic chemicals that are produced by gold mining industries are often released into local streams as run-off. Villagers and pastoralists use these local streams for their daily survival, including drinking water. Contaminated water is a primary cause for certain diseases.

Conceptual Framework

Research on disease epidemiology will be based on the political ecology framework (figure 1). It uses three levels of study and all three levels are interconnected. To gain a clear understanding of the diseases, the historical depth is vital. Looking at history will explain many things such as how much funding has gone into the community or research, the history of the disease, etc.

Level one is based on the international influence. External forces such as the International Monetary Fund (IMF), World Health Organization (WHO), World Bank, colonization have and still play a vital role due to the influence they have on the national level. Funding from international organizations come with conditionalities that influence
the outcome of the problem. Level two is based on the national influence. Internal forces such as political institutions and governments have an important role in deciding the regional allocation of resources. Although funding is often provided by international organizations, the national government has the final decision in allocating the proper funding to various sectors of the country. Finally level three describes the regional/local/sub-national influence. Level three can be explained by using the human ecology model. Three factors influence the human ecology model: genetics, cultural practices/human behavior and the environment. When each of these factors are studied at the local level, an explanation of the disease epidemiology in a location can be better understood.
Figure 1: Political Ecology Framework Explaining the Disease Epidemiology

Level 1

International
External forces, e.g.
WHO, IMF, World
Bank, Colonization.

Historical
Depth

Level 2

National
Internal forces.
Government,
political institutions

Level 3

Regional/Local/Sub-national

Human behavior

Cultural practices

Environment

Genetics

Disease
Patterns in
Obuasi and
Asankrangwa
Hypothesis

Certain diseases such as respiratory tract infections, ear infections, sexually transmitted diseases such as HIV/AIDS, certain skin diseases and rheumatism and joint pains are expected to have a higher prevalence in Obuasi when compared to Asankrangwa due to the mining in Obuasi.
CHAPTER 3

STUDY AREA

Description of Study Area

Ghana has ten administrative regions. Each region is made up of several districts. The Adansi West district, with Obuasi as its capital, and Wassa Amenfi district with Asankrangwa as its capital, are the study areas (figure 2).

Obuasi and Asankrangwa are the two data collection sites for this research. The town of Obuasi is the primary study area, although disease statistics will also include Obuasi and surrounding areas. Located in the south-central region of Ghana, the Ashanti region is one of 10 regions in the country and Obuasi is located in the Adansi West district, which is one of 18 districts in the Ashanti region. Obuasi is approximately 60 km south of Kumasi, which is the capital of the Ashanti region. Obuasi is not only the biggest and most important town; it is also the capital of the Adansi West district.

The Adansi West district has a population of 228,040 and an area of 950 square kilometers. Two-thirds of the population (150,500) lives in Obuasi sub-district, and Obuasi is the largest town in the Adansi West district (table 2). The Obuasi area has one of the highest growth rates in Ghana. Ghana’s approximate population of 20 million grows at about 2% per year compared to the Adansi West district’s growth rate of 3.1%. In Obuasi and its immediate surroundings the population grows at a rate of 4% (Adansi West district Health Services Annual Report, 2001). Gold mining may be the main reason for this high population growth rate. More and more people migrate to work in the mining industry since Obuasi is primarily a mining town. Approximately 8000 people work for the AGC in Obuasi. Outside Obuasi, nearly 70% of the population engages in
agriculture as the primary economic activity. Cocoa, citrus, cassava, plantain and oil palm are the major crops. A large section of the economy of Obuasi is based on the revenue generated from gold mining.

Table 2. Population Distribution

<table>
<thead>
<tr>
<th>Sub-District</th>
<th>Population</th>
<th>Percent %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obuasi</td>
<td>150,500</td>
<td>65.7%</td>
</tr>
<tr>
<td>Akrokerri</td>
<td>17,608</td>
<td>7.9%</td>
</tr>
<tr>
<td>Fomena</td>
<td>17,427</td>
<td>9.6%</td>
</tr>
<tr>
<td>Akrofoum</td>
<td>18,153</td>
<td>10%</td>
</tr>
<tr>
<td>Ampunyasi</td>
<td>11,177</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>228,040</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: Adansi West District Health Services 2001 Annual Report

Asankrangwa, located in the Wassa Amenfi district in the Western region of Ghana, is the second study area. While Asankrangwa is the primary focus, data will include Asankrangwa and its surroundings. Wassa Amenfi district, with an area of 4,747 square kilometers, is the largest district in the Western region. It has a population of 236,304 people, with a growth rate of about 3%. The primary economic activity is agriculture, which employs 85% of the people. Cocoa, plantain, cocoyam, coffee, oil palm and rice are the food and cash crops that are cultivated in the district. Twenty percent of Ghana’s cocoa is produced in the district.

Asankrangwa is the district capital of the Wassa Amenfi district. Asankrangwa is much smaller when compared to Obuasi. The Western region receives the most rainfall in Ghana. Although the Western region contributes some of the highest revenue to
Ghana due to many mines in the region, it has some of the worst roads in the country. With plentiful rainfall, many of the roads are inaccessible at times. Less than one-third of the districts 176 km trunk roads are tarred. Only 30% of the 516 km of smaller roads are paved and there are many areas that are not even connected by roads (Annual Performance Review of the Health Sector: Wassa Amenfi District, 2001). Delivery of services in the district is badly hindered due to the poor infrastructure. Although Wassa Amenfi district is slightly larger by area and population, when compared to the Adansi West district, it is economically more backward compared to the Adansi West district which has the Ashanti Goldfields Company (AGC).
Figure 2: Map of Study Area

Map of Ghana showing study areas
(map drawn to approximate scale)

Legend
- Regional Capitals
- Wassa Amenfi District
- data collection site
- Adansi West District
- data collection site
Locational Difference Based on Political Economy

The political and economic environment in a location influences health status and health care. In Obuasi, the AGC hospital provides subsidized health care for its employees and also those who can pay. AGC has modern medical equipment that is not found anywhere in the surrounding areas. This means that people who can go to the AGC hospital will get good health care, a stark contrast to the people in Wassa Amenfi district where the Asankrangwa Catholic hospital does not have comparable medical equipment. Most of the people in Asankrangwa have to depend on government health care, which is not as up-to-date as private health care.

Also, due to the AGC, Obuasi has benefited from the revenue generated by the gold mines. The economy of the town depends on the AGC rather than just agriculture. This extra source of income in the district is not available in the Wassa Amenfi district as there is no gold mining there. Part of chapter four will examine the economic impact the AGC has had on Obuasi and how that affects healthcare services compared to the Wassa Amenfi district.

Methodology

This research combines primary and secondary research. Primary research consists of formal and informal interviews with various people such as watchmakers, pharmacy storeowners and street vendors. Informal interviews will provide good insight relevant to this research. Thirty people were interviewed in Asankrangwa and thirty-one people were interviewed in Obuasi to gain an understanding of the local economy and answer questions regarding their livelihood and health status. The interview questions (pp. 62) will also give us an idea on how much people in the market earn and local
opinions on how the AGC has affected the economy of the town. Based on time constraints, fifteen people from each location were interviewed per day for a total of four days. The method used was purposive sampling where various people were interviewed that were thought to represent the entire population of the market place (Galloway, 2001). This is not an accurate representation of the per capita earning in Obuasi as it only includes people who have businesses in the market area. People who were unemployed or people working outside the market were not interviewed.

Secondary data for this study were collected from the hospitals in each of the study areas. Every year in Ghana, the ministry of health requires each district to produce an annual morbidity and mortality report. It contains data such as the different diseases that exist in the district, the number of cases, the top ten diseases in the district. Data was collected from the Obuasi Government hospital, which has compiled medical data for the entire Adansi West district between 1999 and 2001. The Obuasi Government hospital is the district hospital for the Adansi West district. Data was also collected from the Asankrangwa Catholic hospital, which is the district hospital for the Wassa Amenfi district and has compiled data for the entire Wassa Amenfi district between 1999 and 2002. I expect that data from the Adansi West district will be more accurate and reliable compared to Wassa Amenfi district since more people may report illnesses in Adansi West district because of the better health care facilities in the district.

Medical data were analyzed using simple statistical models and charts to compare and understand the prevalence of diseases in the two locations. Chi-square analysis was used to examine some of the diseases to see if location had an impact on disease prevalence.
Comparing the Leading Causes of Morbidity in Ghana,  
Adansi West District and Wassa Amenfi District

This chapter compares morbidity patterns in the Adansi West district and the  
Wassa Amenfi district to the national rate.

Malaria is the leading cause of morbidity in Ghana. Because the humid tropical  
environment is an ideal habitat for mosquitoes, malaria is endemic throughout Ghana.  
Upper respiratory tract infections (URTIs) such as the common cold are the second-  
leading cause of morbidity in Ghana followed by diarrheal disease. Some of the other  
leading causes of morbidity in Ghana are skin diseases, pregnancy-related  
complications and road-traffic accidents. Just as in Africa and many developing  
countries, poor roads and old vehicles that are often overfull contribute to road-traffic  
accidents in Ghana. Figure 3 shows the prevalence rate for the top twelve causes of  
morbidity in Ghana. The prevalence rate is defined as the percentage of people that  
have a particular disease at a particular time. For example, in 1999, malaria had a 42%  
prevalence rate, which means that 42 out of 100 people will have malaria at any given  
time during that year.
Disease statistics for the top ten diseases in terms of morbidity were calculated from the district annual reports. Table 3 shows the disease prevalence rate for each of the districts and the nation. Besides HIV/AIDS and TB, the four highlighted diseases in the Adansi West district are to be examined in the next section since they may be mining-related diseases.

Prevalence for every disease in the top ten in the Adansi West district is much higher than the prevalence in the Wassa Amenfi district. Some diseases are as much as ten times higher in some cases. Although some of these may be related to gold
mining, the difference between the two districts may also be due to the distribution of healthcare services. Wassa Amenfi district being more rural than the Adansi West district might have a huge under-reporting of diseases. Many people try self-treatment or alternative sources of treatment such as traditional medical practitioners because they cannot afford formal healthcare. So the difference in prevalence may be due to a combination of reasons and not just due to gold mining.

A simple chi square test was done on selected diseases to test if disease prevalence varied with location between the two districts. The diseases that were tested were HIV/AIDS, TB, skin disease, acute eye infection, rheumatism and joint pains, and accidents. The chi square value was extremely high. Testing at the .05 level of significance, we can conclude that the prevalence of diseases varies between Adansi West district and Wassa Amenfi district.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Ghana</th>
<th>Prevalence rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Malaria</td>
<td>42.9%</td>
</tr>
<tr>
<td>2</td>
<td>URTIs</td>
<td>8%</td>
</tr>
<tr>
<td>3</td>
<td>Diarrheal disease</td>
<td>5.1%</td>
</tr>
<tr>
<td>4</td>
<td>Skin disease</td>
<td>4.5%</td>
</tr>
<tr>
<td>5</td>
<td>Accidents</td>
<td>3.6%</td>
</tr>
<tr>
<td>6</td>
<td>Pregnancy complications</td>
<td>3.2%</td>
</tr>
<tr>
<td>7</td>
<td>Acute eye infection</td>
<td>2.6%</td>
</tr>
<tr>
<td>9</td>
<td>Hypertension</td>
<td>2.1%</td>
</tr>
<tr>
<td>10</td>
<td>Gynecological disorders</td>
<td>1.9%</td>
</tr>
<tr>
<td>12</td>
<td>Rheumatism and joint pains</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rank</th>
<th>Adansi West District (pop. 228,040)</th>
<th>Prevalence rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Malaria</td>
<td>40.9%</td>
</tr>
<tr>
<td>2</td>
<td>URTIs</td>
<td>11.8%</td>
</tr>
<tr>
<td>3</td>
<td>Rheumatism and joint pains</td>
<td>9.4%</td>
</tr>
<tr>
<td>4</td>
<td>Accidents</td>
<td>4.4%</td>
</tr>
<tr>
<td>5</td>
<td>Skin disease</td>
<td>3.9%</td>
</tr>
<tr>
<td>6</td>
<td>Pregnancy complications</td>
<td>3.7%</td>
</tr>
<tr>
<td>7</td>
<td>Gynecological disorders</td>
<td>3.3%</td>
</tr>
<tr>
<td>8</td>
<td>Diarrheal disease</td>
<td>2.6%</td>
</tr>
<tr>
<td>9</td>
<td>Anemia</td>
<td>1.8%</td>
</tr>
<tr>
<td>10</td>
<td>Acute eye Infection</td>
<td>1.8%</td>
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</table>

<table>
<thead>
<tr>
<th>Rank</th>
<th>Wassa Amenfi District (pop. 236, 304)</th>
<th>Prevalence rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Malaria</td>
<td>10.3%</td>
</tr>
<tr>
<td>2</td>
<td>URTIs</td>
<td>1.4%</td>
</tr>
<tr>
<td>3</td>
<td>Accidents</td>
<td>0.99%</td>
</tr>
<tr>
<td>4</td>
<td>Skin disease</td>
<td>0.81%</td>
</tr>
<tr>
<td>5</td>
<td>Diarrheal disease</td>
<td>0.66%</td>
</tr>
<tr>
<td>6</td>
<td>Rheumatism and joint pains</td>
<td>0.63%</td>
</tr>
<tr>
<td>7</td>
<td>Intestinal worm infection</td>
<td>0.45%</td>
</tr>
<tr>
<td>8</td>
<td>Gynecological disorders</td>
<td>0.39%</td>
</tr>
<tr>
<td>9</td>
<td>Amoebiasis</td>
<td>0.36%</td>
</tr>
<tr>
<td>10</td>
<td>Pregnancy complications</td>
<td>0.19%</td>
</tr>
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</table>

Some Leading Causes of Morbidity in Adansi West District

Malaria was the number one cause of morbidity in the Adansi West district. In 1999, 73,219 cases of malaria were recorded in the district with a prevalence rate of 32% (figure 4). In 2000, malaria was again the number one cause of morbidity in the Adansi West district. A total of 99,056 cases were recorded with a prevalence rate of 44% (figure 4). Similarly, malaria was the leading cause of morbidity in 2001, with a prevalence of 47% or 107,742 cases in the district (figure 4).

Figure 4: Some Leading causes of Morbidity in the Adansi West District, 1999-2001

Source: Adansi West District Health Services Annual Report, 2001
Upper respiratory tract infections were the second leading cause of morbidity in the district in two of the three years. In 1999, 30,959 cases of URTIs were recorded which made up a 14% prevalence rate (figure 4). However, in 2000, URTI’s dropped to seventh, constituting 4861 cases or a 2% prevalence rate (figure 4). In 2001, URTI’s were the second leading cause of morbidity with 45,311 cases or 20% prevalence rate (figure 4). Some of the reasons for the drastic fluctuation of prevalence rates may be improper data reporting and missing data. Other diseases that are in the top ten causes of morbidity in the Adansi West district are diarrhea and pregnancy-related complications.

Some Leading Causes of Morbidity in Wassa Amenfi District

Top ten causes of morbidity for Wassa Amenfi district was available only for the years 2001 and 2002. As expected, malaria was the leading cause of morbidity in the Wassa Amenfi district. In 2001, it accounted for only a 11% prevalence rate and 10% in 2002 (figure 5).

Upper respiratory tract infection is the third leading cause of morbidity in the Wassa Amenfi district compared to second in the Adansi West district. In 2001, a total of 4,256 cases are URTIs or a prevalence rate of 2% (figure 5). There is ten times more number of cases in the Adansi West district (45,311) compared to Wassa Amenfi district. Diarrheal disease and pregnancy-related complications are also among the leading causes of morbidity in Wassa Amenfi district.
Source: Annual Performance Review of the Health Sector: Wassa Amenfi District, 2001

Mining-Related Diseases

Tuberculosis

Tuberculosis prevalence has been steady in the Adansi West district. Between the years 1998 to 2001, the number of TB cases for the district was 120, 168, 167 and 162. In Wassa Amenfi district there were 109 cases in 1999 and 129 cases in 2000. Between 1998 and 2001, TB prevalence was 53/100,000, 74/100,000, 73/100,000 and 71/100,000 in the Adansi West district. For 1999 and 2000 in the Wassa Amenfi district, TB prevalence was 46/100,000 and 55/100,000 (figure 6). A simple chi square test proved that at the .05 confidence level, there is significant evidence to suggest that TB prevalence varies between the two districts.

Although the populations for the districts are similar, the number of TB cases in Adansi West district is much higher. This may be partly attributed to gold mining in
Obuasi and its surrounding areas. Although TB is more prevalent in large cities where there is overcrowding and poor sanitation, gold mining in the district may have created optimal conditions for a high TB prevalence in Obuasi. Mining has created slums where over-crowding and poor sanitation has become the norm. Also, gold miners who work deep underground are more easily exposed to TB as they are in close proximity with their co-workers in a closed environment. Although TB may be considered an urban disease not related to mining, in the case of Obuasi, gold mining has created an urban setting, which may allow TB to be more prevalent.

Figure 6: Tuberculosis Cases, Adansi West District vs. Wassa Amenfi District

HIV/AIDS

HIV/AIDS in Ghana is much less prevalent compared to many other Sub-Saharan African countries. According to data gathered from the district hospital, in Adansi West district (figure 7), 262 people tested positive in 1999. It increased to 358 people in 2000 and 356 people in 2001.

In contrast, Wassa Amenfi district recorded only 202 cases in 2002 (figure 8). The raw figures are presented in two separate charts since there is no data available for any same year to be compared side by side. However, when the prevalence per 100,000 is calculated for the average of the three years for the Adansi West district versus the one-year for the Wassa Amenfi district, there was a significant difference. Adansi West district had 143 /100,000 prevalence compared to only 86/100,00 for Wassa Amenfi district. A simple chi square test at the .05 level of significance suggests that there is enough evidence to conclude that HIV/AIDS varies between the two districts.

The latest national data for HIV/AIDS is from the 2003 HIV Sentinel Survey Report. Obuasi had a 6% prevalence rate in 2002, but that number decreased to 3.7% in 2003. It is still higher than the national average of 3.6%. One reason for the drastic decrease in HIV/AIDS rates in Obuasi may be due to the recent closures of some of the mine sites leading to the reduction of work force and possibly the emigration of both clients and commercial sex workers. Also, a decline in rates could mean that many of the people that were infected may have died off over time. Although the HIV/AIDS rate for Obuasi is higher than the national rate, it is still lower than what we may expect from a mining town based on our literature review. The government of Ghana and the AGC
have targeted high-risk populations with HIV/AIDS educational programs to build awareness of the problem (AGC, 2002). Educating the general public regarding HIV/AIDS may have helped in reducing the prevalence, since the AGC benefits from having a healthy workforce. When compared to Wassa Amenfi district, where only the government plays a role in educating the public regarding diseases, the Adansi West district has the benefit of the AGC helping them in educating its people about HIV/AIDS.

Figure 7: HIV/AIDS Cases in Adansi West District in 1999, 2000, 2001

![Figure 7: HIV/AIDS Cases in Adansi West District in 1999, 2000, 2001](source)

Source: Adansi West District Health Services Annual Report, 2001
In 1999, skin diseases were the fourth leading cause of morbidity in the Adansi West district. Skin diseases comprised 12,474 cases or 5.4% of total morbidity (figure 9). In 2000, skin diseases were the third leading cause of morbidity with 9,683 recorded cases or a prevalence rate of 4.1% (figure 9). However, in 2001, the number of skin disease cases drastically dropped to 4467 cases or a prevalence rate of 2% (figure 9). In Wassa Amenfi district, there were 2080 and 1745 cases each in 2001 and 2002 (figure 9), which is less than a 1% prevalence rate.

Chemicals such as cyanide, sulfur dioxide and arsenic are all used or released in processing gold. These chemicals are often let out as run off which contaminates the local water systems. The contaminated water is used by the locals who may develop skin diseases and rash due to the chemicals in the water. Skin diseases may be more prevalent in the Adansi West district due to gold mining and a simple chi square test at the .05 level of significance proves that there is enough evidence to suggest that skin disease varies between the two districts.

Source: Annual Performance Review of the Health Sector: Wassa Amenfi District, 2001

Skin Disease
Accidents

In the Adansi West district, accidents were the fifth leading cause of morbidity in 1999 with 11,060 cases at a prevalence rate of 4.9% (figure 9). In 2000, there were 11,584 cases at a prevalence rate of 5.1% (figure 9). In 2001, the district had significantly less cases of skin diseases. Only 7,656 cases were recorded at a 4.2% prevalence rate (figure 9). This may be attributed to the diligent safety measures being taken by the Ashanti Goldfield Company (AGC, 2002).

In the Wassa Amenfi district, accidents had a 1% prevalence rate in 2001 with 2,391 cases. In 2002, 2,304 cases were reported with a prevalence rate of .9% (figure 10). Most of these accidents are automobile related accidents.

Comparing the two districts, accidents have a much higher prevalence rate in the Adansi West district. This may be partly attributed to the gold mines. Accidents are common in an industrial setting such as a gold mining area. Gold miners work deep
underground and are often in unsafe situations, which lead to accidents. Injuries caused by burns, falls, etc. are all considered accidents. A simple chi square test proved that at the .05 level of significance, there is significant evidence to suggest that accident prevalence varies between the two districts.

Figure 10: Prevalence Rate of Accidents, Adansi West District vs. Wassa Amenfi District

![Graph showing prevalence rate of accidents over years.](image)


Rheumatism and Joint Pains

Rheumatism and joint pains were the third leading cause of morbidity in the Adansi West district in two of the three years. In 1999, rheumatism and joint pains accounted for 13,055 cases or 5.8% prevalence rate (figure 11). In the year 2000, there were no recorded cases of rheumatism and joint pains. This may most likely be due to data not being reported for 2000. In 2001, rheumatism and joint pains was the third leading cause of morbidity with a total of 30,162 cases or 13.2% prevalence rate in the Adansi West district (figure 11).
Rheumatism and joint pains were expected to be high in a gold mining area due to the type of work that most of the miners do. Gold mining is a physically demanding job that requires miners to work long hours in tough environments. Gold miners operate heavy machinery, which includes a lot of lifting and pulling. As the body joints are involved in such physical work, rheumatism and joint pains are common among miners. Most of the cases recorded may be miners who go to the AGC hospital.

In the Wassa Amenfi district, the prevalence rate was less than 1% in both 2001 and 2002. A simple chi square test proved that at the .05 level of significance, there is enough evidence to suggest that rheumatism and joint pain prevalence varies between the two districts.

Figure 11: Prevalence Rate of Rheumatism and Joint Pains, Adansi West District vs. Wassa Amenfi District

Acute Eye Infection

Acute eye infection in the Adansi West district has a prevalence rate of 1.3%, 2.2% and 1.9% for the three years of data (figure 12). Acute eye infection in Wassa Amenfi district was not in the top ten causes of morbidity. It is possible that it may have been included in the ‘other disease’, or it may not have been reported for the year. Acute eye infection may have a higher prevalence in Obuasi due to the gold mining. Chemicals and a high content of dust particles in the air due to the gold mining may be the main reasons.

Figure 12: Prevalence Rate of Acute Eye Infection, Adansi West District vs. Wassa Amenfi District

![Prevalence Rate Graph]


Explaining the Disease Patterns Using the Human Ecology Framework

To properly explain the diseases in the districts, the human ecology framework which stresses that, diseases result from the interaction of three major variables: genetics, environment and human behavior is used. In this research, the prevalence of
most of the diseases can be explained as a combination of both the environment and human behavior. There are no diseases that are strictly influenced by genetics.

The environment plays a significant role in explaining the prevalence of many of the diseases. Malaria is the leading cause of morbidity in both districts and may be attributed to the physical environment. Wassa Amenfi district receives more rainfall than any other area in Ghana and it also has the worst roads among any district. The warm and temperate climate, along with plentiful rain, creates an ideal physical environment for mosquito breeding. Yet, the prevalence rate of malaria in the Wassa Amenfi district is much lower than expected and this can be partly explained due to the human behavior in terms of the under-reporting of medical data.

Diseases such as TB and silicosis may also result from the interaction between the environment and human behavior. In Obuasi, gold mining creates a physical environment, which may lead to a higher prevalence of RTIs. The AGC has attracted an influx of people into the town, but unfortunately many people do not find employment. Where unemployment is high in larger towns and cities, shantytowns become prevalent where sanitation and over-crowding becomes a health problem. This is a perfect physical environment for diseases such as TB to survive. Under reporting of data also contributes to the prevalence rates in a location.

Skin diseases may also be attributed to the physical environment and the human behavior of under-reporting of data. In both districts, skin diseases are one of the leading causes of morbidity. In Adansi West district where gold mining is prevalent, chemicals such as arsenic contaminate local water supply. In Wassa Amenfi district where it rains tremendously, pesticides used for local farming contaminate the streams
and rivers that people use. Skin diseases have a strong relationship with the physical environment.

Most of the diseases analyzed in this paper have a stronger environmental factor in explaining the prevalence. However, sexually transmitted diseases such as HIV/AIDS may have a stronger link to human behavior than the environment. The sexual behavior of gold miners and commercial sex workers makes them a high-risk population for STDs.

Problems and Discussion

In the field of data collection, there are many problems that arise. Data collection for this research was extremely hard and sometimes the data was inaccurate, as records were not properly kept. Much of their medical data for the districts has been casually recorded with many numbers often missing. This is a common problem that is faced in the developing world when collecting medical data.

Just as in many other fields, medical geography data collection can often be tiresome. In this case, medical data was recorded for each of the two districts. Several healthcare facilities exist in each district. The majority of people from each district go to the medical facilities in their district, however geography often plays a role in who goes where. For example, the AGC hospital is one of the best hospitals in the Ashanti region. As long as a patient pays, he or she will be provided medical care. If you work for the AGC, healthcare is subsidized, but for the vast majority of people who do not work in the AGC, payment is necessary. So people who can afford healthcare will often travel long distances from other districts to receive medical care at the AGC hospital. This is usually because there might not be a hospital close to them in their respective
district, or that the nearest medical facility to them might not be adequate to treat their illness. As a result, they end up coming to the AGC, and they are recorded as a case in the Adansi West district although they may reside in a neighboring district. When looking at medical data, one cannot be absolutely sure that a person is from a district where they receive treatment as people travel to neighboring districts for treatment.

Social stigma also plays a role in the lack of or improper reporting of medical data. A person may go to two different medical facilities because they might not feel comfortable with one facility. When this happens, the same person is recorded as two different cases in two different locations. This is a problem that exists with certain diseases that carry a stigma such as HIV/AIDS. A person might go to one hospital where he or she is diagnosed with HIV. Due to the public stigma, the person might go to another hospital for confirmation, thus getting recorded as two different cases. Often, people who may be at risk of having HIV/AIDS may not even seek medical care due to the society’s perception of people with the disease. The biggest problem that was faced during the data collection was the lack of reliable data.

Under reporting of diseases is also a major problem in developing countries. Often people cannot afford healthcare or have to travel long distances to get to a medical facility. Many people often ignore their illness, as they cannot afford to travel long distances for medical treatment. Disease statistics were maintained only for particular years and it was hard to compare the diseases between the two districts, since at times, data for the districts were for different years. Due to poor infrastructure and a lack of proper funding, data cannot be properly obtained, especially in rural areas.
Privatization has also affected the healthcare system negatively. Privatization of healthcare has led to a ‘cash and carry’ system where healthcare is provided only if a person can pay cash. So, major healthcare costs are accessible only to the affluent few (Oppong, 2002). The government needs to invest much more money into the healthcare system so that it can be more affordable to the majority of people.

Health, Safety and Environment

Safety has become one of the priorities of the AGC. In order to work in the mines, everyone entering the mines must wear the proper uniform and a helmet for protection. Although miners work long hard hours, they are given proper breaks to reenergize themselves.

The AGC built a 175-bed hospital within its premises, which is the best-equipped hospital in the surrounding area. Anybody can seek medical attention here for a nominal fee. Sexually transmitted diseases such as HIV/AIDS have been particularly targeted recently to improve the health of the miners (AGC, 2002). The AGC offers health classes for its miners where they are taught various aspects of the disease and safety. Free condoms were also included with paychecks to encourage miners to use proper protection when involved in sexual activities. Different safety and health signs are posted at every corner in the AGC premises. Some of the most frequent signs are that of malaria, HIV/AIDS and physical safety (Figures 13, 14).
Figure 13: Safety Signs in AGC, Obuasi

Source: Field survey, 2003

Figure 14: Safety Signs in AGC, Obuasi

Source: Field survey, 2003
Most of the mining done by the AGC is underground, as surface level mining has come to an end. AGC reclaims and revegetates land that had been destroyed due to mining. The AGC is actively involved in funding farming projects within the community (AGC, 2002).

Social and Economic Impact of the AGC

The economic and social impact that the AGC has had on the Adansi West district is immense. The political economy of the AGC has affected the district in many ways. For some, wages go up due to gold mining, quality of life improves and there is an influx of migration into the district. Gold mining also brings about economic and infrastructure development.

Based on an interview with a community development officer of the AGC, the following insights were obtained on how the AGC has played an active role in developing the surrounding community. The Minerals and Mining Law of 1986, section 71, says that all individuals have to be compensated for their land. Between 1993 and 2003, $2.9 million in compensation was paid to individuals in the surrounding community. Act 462 also known as the Local Government Act helps the Adansi West district by having the AGC pay $98,000/year for using its land for gold mining. This is an important form of revenue that is used by the district for its development. The AGC also pays taxes to the government of Ghana in the form of royalties. Between 1993 and 2002, the AGC paid $82 million to the Ghanaian government. A portion of this is to be invested back into the communities surrounding the mines for development.

Paying taxes to the government by the AGC is a legal responsibility, however, the AGC goes beyond its legal responsibilities. The AGC is active in the betterment of
community it benefits from, by going beyond legal obligations and helping the community by investing into it. One of the goals of the AGC is to be a good corporate citizen by sharing its profits with the community. It has given assistance to the entire district by maintaining and funding urban projects, building schools, and electrification projects (AGC, 2002). Roads have also been constructed using AGC funds, bridges have been built, community water supply and health and sanitation has been maintained and various other developments in the community have taken root using AGC funding (AGC, 2002). Corporate donations are also made to various organizations in the community.

A new soccer stadium was built in Obuasi and a team was sponsored to promote entertainment in the community (AGC, 2002). According to the community development officer, between 1992 and 1995, over $30,000 were donated by the AGC to build roads for the Adansi West district. In one of the areas, due to noise levels affecting the community due to mining, the AGC compensated farmers in the community with $58,000. An extra $1 million was spent to build a new community of 101 houses for the people. Forty new schools were also built by the AGC and many existing schools were rehabilitated by being provided much needed school supplies.

The community development officer also mentioned that the AGC has also actively participated in the “self-help electrification project” in Ghana so that people will not leave rural areas for urban life. Although this is a national project, the AGC has provided transformers, poles, and wires so that the government can supply electricity to certain communities.
AGC has built a 175-bed hospital on its premises to provide quality health care for the community (AGC, 2002). Although a district hospital exists in Obuasi, the AGC hospital is better funded and equipped to provide health care. Recently, fifteen thousand dollars were provided by the AGC to the town of Obuasi to maintain street sweepers/cleaners to keep the town clean. Other community-based projects that the AGC has provided and funded include waste disposal plants. The AGC also set up schools/workshops for the development of locals with advanced skills such as mechanics and carpentry, so that they can serve the AGC and the local government (AGC, 2002).

Most of the information mentioned above regarding community development comes from an AGC official who expectedly will have only good things to say regarding the company he works for. However, based on conversations in the community, some locals complained that the AGC wasn’t doing much to help the community. One local mentioned that the roads were still bad and overcrowding was becoming a problem. Reality can be seen only when you go into the community. When you are within the AGC compound, everything is developed and things look wonderful, but once you go outside the AGC premises, one can see that poverty and underdevelopment is prevalent.

Obuasi and Asankrangwa Interviews

Interviews were conducted in Obuasi to see how the AGC has impacted the local economy. Thirty-one people were interviewed in the Obuasi market and were asked various questions, primarily about their family earnings to see if and how the AGC has helped their businesses. Listed below are the questions that were asked:
1. What kind of business do you own/operate?
2. How many family members live in your household including yourself?
3. On average, how much do you earn in a day?
4. On average, how much do you earn in a month?
5. Do you earn any supplemental income?
6. Are you the only person earning in your family? If not, who else earns?
7. Do you own or rent your shop? If renting, how much do you pay per month?
8. On average, how much do you pay for electricity/month?
9. How much does it cost to feed your family per month?
10. How much do you save in a month?
11. What is your education level?
12. Are your children in school? Do you plan on sending all of them to school?
13. Has AGC helped the city in terms of the economy or business for you?
14. Has AGC been a good thing or bad thing for Obuasi? Please explain?
15. Are you happy with life in general? Why?
16. Do you like President Kufour?

Fifteen male and sixteen female owned businesses were sampled in the market covering a wide range of businesses. This was a purposive sample that was subjectively chosen to cover a broad range of the population. Some of the businesses include a watch seller, provisions seller, electronic store, restaurant owner, clothing store, fruit/vegetable seller, stamp maker, bookstore owner, hair saloon, etc. Sixteen people have at least a middle school level education known as junior secondary school (JSS) in Ghana, while five people have a high school level education also known as senior secondary school (SSS). None of the interviewees had any form of higher education such as technical school or college.

Table 4 shows the various statistics of the interviewees in Obuasi. Median family size in Obuasi is 4 people per household while the median number of children is 3. The monthly income per household in Obuasi is 1,800,000 cedis which is equivalent to $225/month or $1.87/person/day compared to the average Ghanaian’s salary of $1/day. The reason for the higher income may be due to the AGC influence on the local economy and also, the sample did not include the unemployed. Everyone interviewed
were people with jobs, so it is expected that the income will be higher than the average for the district. When asked whether AGC has helped their personal business and the town’s economy, 21 of the 31 people interviewed said that the AGC has helped their businesses and the economy. When asked whether AGC has been a good or bad influence on Obuasi, 24 of the 31 people said that it has been a good thing for the community. Twenty out of the 31 people also said that they had personal satisfaction because of their faith in God, and their good businesses.

Overall, based on the interviews, the AGC has had a positive impact on the town and its surroundings. Mining is a very profitable business and the miners who work at the AGC are very well paid. Some of the money that is generated by the AGC helps the local economy as miners spend their paychecks in the town markets. These statistics cannot be used for the entire district as they represent the town of Obuasi only. Average earning will be much higher in Obuasi when compared to other communities in the district due to the direct economic impact of the AGC.

Table 4: Economic Indicators in Obuasi, Earning is Shown in Cedis. $1 = 8000 Cedis

<table>
<thead>
<tr>
<th></th>
<th>Family Size</th>
<th>No of children</th>
<th>Daily Earnings</th>
<th>Monthly Earnings</th>
<th>Food cost / month</th>
<th>Cost of electricity / month</th>
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<th>Savings / month</th>
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Interviews were also conducted in Asankrangwa in order to compare its non-mining economic activity to Obuasi’s mining based economy. Thirty people were interviewed in the Asankrangwa market and were asked the same questions that were asked in Obuasi. Questions were primarily about their family earnings to get a gauge
on the economy of the area. However, two questions regarding the AGC and Obuasi were omitted from the Asankrangwa interview, as there is no AGC influence in Asankrangwa.

Six male and twenty-four female owned businesses were selected in the market covering a wide range of businesses. There were more women working in the market area in Asankrangwa when compared to Obuasi, hence, the variation in male to female ratio. Some of the businesses include stores that sold cooking utensils, general stores, clothing store, seamstress, electrical store, cosmetics, vegetables, food products, fish stalls, and household products. Twenty-two of the thirty people had a middle school level education known as junior secondary school (JSS). Eight people had an elementary school or lower education and there was no one with a high school level education. Comparing this to Obuasi, there were several interviewees who had a high school level education. This difference is primarily the urban-rural difference. Obuasi is a larger town with much better schools compared to Asankrangwa, which is a rural town where schools are not as well developed.

Table 5 shows some of the statistics from the interviews in Asankrangwa. The median family size is 6 per household compared to 4 in Obuasi. However, one surprising number was the median number of children per household. There were only 3 children per household in Asankrangwa, the same as in Obuasi. It was expected that Asankrangwa would have a higher child per household due to its rural setting and farming being its primary economic activity. Usually, farmers in developing countries tend to have more children as they provide a free source of labor for the family farm.
Asankrangwa’s monthly household income is 1,550,000 cedis, which is equivalent to $193.75 or $1.16/person/day which is significantly less than Obuasi’s $1.87/person/day. The primary reason for the difference may be the urban mining setting in Obuasi and rural non-mining setting in Asankrangwa. Although the earning capacity of the people in Asankrangwa is much lower than in Obuasi, 20 out of the 30 people said that they were happy with their lives.

Table 5: Economic Indicators in Asankrangwa, Earning is Shown in Cedis. $1 = 8000 Cedis

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Using Political Ecology/Economy to Explain Health Care

The political ecology framework and the political economy outline various factors that influence health care in a location. Everything has to be looked at from a historical perspective. Just as in the case of many African countries, structural adjustment programs have had a negative impact on the health care system.

Health care was free prior to SAPs as it was primarily a state controlled sector. However, with SAPs, international external forces such as the World Bank and IMF influenced the health care in Ghana. To provide loans to Ghana, World Bank and IMF pushed the country to privatize health care. On a national level, Ghana adopted privatization of health care, which lead to a cut in government funding. Furthermore, policies such as the ‘cash and carry’ system negatively influenced health care for the
poor. Health care became something that only people who could pay were provided with.

Recently, the government of Ghana launched a National Insurance Health Scheme. It is designed to provide affordable medical care mainly to the poor and vulnerable people in Ghana. According to this plan, the adult Ghanaian will pay 6000 cedis or $.66 per month. The money will go towards the health treatment of the aged, poor, and children of parents who both subscribe to the scheme (IRINEWS.ORG, 2004). So the political economy of health care in Ghana is influenced by the differences in the system such as public vs. private, funding for health care, urban-rural disparities and finally the disparities between the poor and rich.
CHAPTER 5
CONCLUSION

Disease prevalence varies with geographic location. This research has attempted to examine how diseases vary between a mining area and a non-mining area. Previous research has suggested that the prevalence of certain diseases such as HIV/AIDS, malaria and skin diseases may be higher in mining areas than in non-mining areas. This is due to the change in environment that mining related activities have on a location.

This research has compared the morbidity data for the Adansi West district, which has the AGC gold mines to the Wassa Amenfi district, which has no major gold mines. Using the political ecology/economy framework and the human ecology model, this research tries to explain how and why disease prevalence is different between the two districts.

Data gathered from the district hospitals shows that diseases such as HIV/AIDS, skin diseases, rheumatism and joint pains, tuberculosis (TB), acute eye infection and accidents all have a much higher prevalence in the Adansi West district than in Wassa Amenfi district. However, in this case, they cannot be particularly considered mining-related diseases because, the higher prevalence is not restricted to only these diseases. The prevalence rate for most of the other diseases in the Adansi West district is also much higher compared to Wassa Amenfi district.

The Adansi West district has the AGC hospital, which is a well-developed private hospital. AGC workers get free or subsidized healthcare and many people can come here to treat their illnesses. However, in the Wassa Amenfi district, which is more rural,
the major hospitals are poorly funded and ill-equipped government hospitals. People who can afford healthcare will go to a better facility if the healthcare service is better and more cases get reported. If the healthcare service is poor, people lack the trust and confidence in the facility and often seek alternative forms of treatment such as TMPs and IDVs, which will lead to fewer people reporting a disease. This may lead to a greater variation in the collecting and reporting of data in a location such as the Wassa Amenfi district.

Much research has been done on diseases in mining areas especially in countries such as South Africa (Bradshaw et al., 2003 and Campbell, 2004). Understandably, most of this research has been on diseases such as HIV/AIDS because of the extensive social and economic impact the disease has on the people of a community and the high rates of the disease in Southern Africa. Research in the Careltonville mines of South Africa showed that HIV prevalence rates for men, women, mine workers and sex workers were 20%, 37%, 29% and 69% (Williams et al., 2003). HIV/AIDS prevalence rate in Ghana is comparatively lower than some of its neighbors. In 2003, the sentinel survey reported a 3.6% national rate while Obuasi had a 3.7% prevalence rate. Therefore, in Obuasi, focus needs to be emphasized not only on HIV/AIDS, but also on other diseases such as TB, skin diseases and RTIs as these diseases have a much higher prevalence rate than HIV/AIDS.

Diseases such as URTIs are also very high in Obuasi similar to previous research conducted by Friends of the Earth-Ghana survey, which suggested that URTIs were attributed to mining related activities and pollution (Awudi, 2002). Although previous research has shown that symptoms linked to arsenic poisoning were present
among people in Obuasi (Awudi, 2002), data from this research found no data on arsenic poisoning. However, skin diseases were higher in the district and arsenic is a byproduct of gold mining.

The affordability of health care and access to health care services needs to be improved in rural areas. Although the majority of Ghana’s population lives in the rural areas, healthcare is very limited. Often, the disparity between the urban and rural areas is immense. The government has to invest more into healthcare in rural areas so that it can be easily accessed and afforded by the poor. In Ghana, many people in rural areas use traditional healers and IDVs as they are the only form of healthcare access in rural areas. There is a certain professional bias towards these IDVs and traditional healers who have been helping the poor for a long time. Modern medicine needs to work hand in hand with traditional healers and IDVs since these are the people that have access to the majority of rural areas. The government of Ghana can lessen the burden of healthcare access to rural areas by recognizing and training IDVs who provide valuable and often the only source of medical treatment in rural areas.

When it comes to funding, corruption can be an underlying problem to many of the issues relating to healthcare. Corruption is rampant in many developing countries where public and government funds intended for the development and well being of the public is used by corrupt officials. The U.N. and WHO provide funding to many developing countries for infrastructure development and healthcare. However, a large sum of this money goes directly into the pockets of corrupt politicians and people in power at all different levels. Proper monitoring techniques need to be improvised when in comes to the allocation of government funds into not just healthcare, but also
infrastructure and economic development. Once the government takes more responsibility in the proper allocation of funds and awareness and education improves, governments will be better prepared to fight many of the existing problems in healthcare.

Research on gold mining in Ghana has focused more on the social, environmental and economic impact gold mining has on a community (Akabzaa and Daramani, 2001, and Awudi, 2002). Furthermore, research on the AGC gold mines in Obuasi has been more from an economic perspective than an epidemiological one. Future research on gold mining in Ghana and specifically in Obuasi needs to focus on the impact of gold mining on the healthcare system. People often use alternative sources of treatment rather than modern medical facilities. Disease data should also include these alternative sources of treatment such as IDV, TMPs and traditional healers where valuable data is gathered.

Looking at diseases strictly from an epidemiological perspective or any one source is too narrow in understanding the complexities of health care. Formal sources such as government and private health care facilities limit the extent to which data can be gathered as they primarily serve specific populations such as people in urban areas or affluent people. The health care infrastructure in rural areas is often inadequate. Therefore, in many developing countries, people use alternative sources of medicine and treatments. Examining the impact on the health care system by informal sources such as IDVs, TMPs and rural medicine will provide much valuable information in understanding the epidemiology of diseases. Furthermore, collecting data from local
pharmacies and obtaining information regarding self-treatment will broaden the spectrum through which diseases can be examined.

In conclusion, based on the medical data from the district hospitals, most of the diseases in the Adansi West district have a much higher prevalence than in Wassa Amenfi district. This higher prevalence cannot strictly be explained as a difference between a mining area and a non-mining area. Instead, the difference in prevalence is due to the political economy of healthcare services such as the geographic distribution and availability of health services, allocation of funds, affordability of healthcare, missing and inaccurate data reporting and rural-urban differences.
APPENDIX

INTERVIEW QUESTIONNAIRE
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Read to respondent:

“Thank you for agreeing to answer these questions. We promise to keep this information confidential (private). Your answers will be put together with those of many others in order to understand the quality of life in your town and also to make suggestions to improve healthcare and the quality of life in your town.”

1. What kind of business do you own/operate?
2. How many family members live in your household including yourself?
3. On average, how much do you earn in a day?
4. On average, how much do you earn in a month?
5. Do you earn any supplemental income?
6. Are you the only person earning in your family? If not, who else earns?
7. Do you own or rent your shop? If renting, how much do you pay per month?
8. On average, how much do you pay for electricity/month?
9. How much does it cost to feed your family per month?
10. How much do you save in a month?
11. What is your education level?
12. Are your children in school? Do you plan on sending all of them to school?
13. Has AGC helped the city in terms of the economy or business for you?
14. Has AGC been a good thing or bad thing for Obuasi? Please explain?
15. Are you happy with life in general? Why?
16. Do you like President Kufour?
READ TO RESPONDENT:

Thank you for answering these questions. We wish you the best with your business and family life. Are there any questions you would like to ask about this survey before we finish? (Questions 13 and 14 apply to interviews in Obuasi only).


Dumett, R. 1993. “Disease and mortality among gold miners of Ghana: Colonial government and mining company attitudes and policies, 1900-1938.” Social Science and Medicine, 37, 2, 213-232,


