Victims of location: Access to health care in the Lake Bosomtwe Basin of Ghana

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Abstract
The paper examines the spatial distribution of health care facilities, and factors that determine access to health care facilities in the lake Bosomtwe basin of Ghana. The study employed a descriptive design to examine the effect of the location of health care facilities on access to the facilities.120 respondents were selected using a simple random sampling technique. Primary data ware generated using interview, questionnaire and observation. Health care facilities were found to be inadequate distributed with low capacity to meet the needs of health seekers. The study also reveals that distance to health care facilities, poor quality of roads, lack of transport to convey sick people, are influential factors in the geographical context of access to health care. The paper recommends improvement in the road network and health care facilities in the area as well as ensuring the use of the lake as a means of transport.

Key words: Accessibility, Amansie West, Bosomtwe, Ghana, Health care, Lake Bosomtwe basin

Introduction

Access to health care is a crucial element of any health care delivery system because the opportunity to obtain health care exists if there is availability and adequate supply of services (Gulliford, 2002). Measuring and facilitating access to health care therefore contributes to a greater understanding of the performance of health systems within, and between countries. After the launching of the Bamako Initiative in 1988, many African countries have adapted "comprehensive primary health care programmes" to solve the health problems of their citizens. Furthermore, the United Nations proclaimed Millennium Development Goals of 2000 targets improved health care for all (United Nations, 2002). Factors that hamper easy access to health care in rural areas of Africa include geographical, economic, attitude of health workers toward patients, administrative and socio-cultural (Eng et al., 1998; Blustein and Weitzman, 1995; Baker et al., 1996). Similarly, it is argued that place of residence affects the lives of many people living in developing countries and as a result negatively impact on their health conditions (Fotso, 2007).

Equal access to health care is a challenge to governments all over the world when it comes to minority groups (Stein et al., 2007), low income earners and people living in rural communities. Haile, du Guerny and Stloukal (2000) assert that health facilities in Sub-Saharan Africa are concentrated in urban areas, thus making health care accessible to less than 50 percent of the population. Smeldley et al., (2003

cited in Malat 2006) stress that in the United States of America there is a gap in the provision and use of medical care between races and ethnic groups, with whites receiving quality health services than African Americans (Palacio et al., 2002).

A similar pattern of inequality can be identified within public health care systems of Ghana and other developing countries. The gap is characterised by accessibility between the northern and the southern parts of the country on the one hand (Horton, 2001) and between urban and rural areas on the other hand. Thus, there is a higher concentration of medical facilities and personnel in the southern parts and urban areas of the country. Although 66% of Ghana's population live in rural areas, 87.2% of physicians and other professionals are located in urban centres (Smith, 2002, Dussault & Franceschini, 2006). Distance from a health care facility is another factor capable of affecting access to health care services (Hutchinson et al., 1999). This is clearly shown by Guagliardo (2004) who indicates that a population's health care level may be affected negatively by the distance to health care facility. With respect to health personnel, Tsai and Kung (2003) suggest that increase in the number of physicians leads to a corresponding increase in health care accessibility. It is against this backdrop that this study examined the spatial distribution and types of health care facility in the Lake Bosomtwe basin of Ghana and their effects on access to health care by the residents.

Materials and methods

The study was conducted in six communities within the Lake Bosomtwe Basin which is located in the Bosomtwi district and Amansie East district in Ashanti region of Ghana. Lake Bosomtwe is a crater lake located about 32 km south-east of Kumasi, Ghana. It is the largest natural lake in Ghana, approximately 8 km wide, and is popular for its recreational vicinity. There are 22 communities along the lake front, with a total population of 11,532 (Ghana Statistical Service, 2002). Inhabitants of the study area are mostly farmers, fishermen and fishmongers.

The data for this study was collected from a sampled population drawn from the lake Bosomtwe basin of Ghana. Primary data were collected from 120 household heads who are potential health care seekers, in addition 10 health care personnel and 6 chiefs were interviewed. The sample size of 120 was arrived at by arbitrarily selecting 10% of the population of the study area based on the 2000 population census; a figure of 115 was arrived at and was approximated to 120. A purposive sampling technique was used to select 6 communities where respondents were drawn from. The selection of towns was based on the availability or otherwise of health care facilities and the location of the towns with reference to the two administrative districts. Consequently, Abono, Amakom and Pipie No. 2 were selected from the Bosomtwe district while Dompa, Apewu and Banso were selected from the Amansie East district. Simple random sampling technique was employed to select respondents from the six selected communities. All the houses in the selected communities were numbered and listed and the required number of houses selected, in houses where there were more than one household, the number of households was listed and one household selected using simple random sampling.

Questionnaires were administered to 120 randomly selected household heads. In addition, a non-participatory observation technique was applied to gather data on the nature of the roads leading to and from the various towns, the number of occasions vehicles entered the towns as well as the time intervals they arrived. Observation was also made on the use of the lake to transport sick persons to health facilities within the lake basin. The Shortest Path Matrix was employed to determine the possible choice of health care facility by residents within the basin.

Results

The importance of spatial distribution of health care facilities in any defined region cannot be over emphasised in any health care system. According to Okafor (1987:383), "*the need for medical care has a spatial component*" and any study into health care accessibility must therefore delve into the spatial distribution pattern.

The study revealed that the Lake Bosomtwe basin is serviced by different health care facilities at different locations. Within the basin itself (communities along the lake front) there is a clinic each at Amakom in the Bosomtwi district and Apewu in the Amansie East district. Outside the basin there are clinics at Brodekwano and Konkoma in the Bosomtwi district and Dunkura in the Amansie East district where residents of the Lake Bosomtwe basin seek health care. Table 1 indicates that three out of the five health care facilities accessed by residents of the study area are owned and operated by churches with one community clinic and one state facility.

The district hospitals at Bekwai and Kuntanase are the nearest district hospitals to the Lake Bosomtwe basin. These district hospitals serve the referral needs of residents of the study area and beyond. Cases referred from any of the clinics located in the study area are sent to either of these two hospitals depending upon the location of the referring clinic and how easy it is to reach a district hospital. Even though the district hospitals are mainly utilized as referral centres, some health care seekers by-pass the local health care facilities and utilize the district hospitals directly. For instance, 90.5% of respondents from Abono and 55.5% from Pipie No. 2 said they access the Kuntanase district hospital directly.

It was observed that health care facilities within the Lake Bosomtwe basin are located either on top of mountains or in valleys due to the topography of the area. For example, the clinic at Amakom is built on top of a hill while the Apewu clinic is also located in a deep valley. Seventy-six percent of respondents said the location of the health care facilities often discourages them from seeking health care, 52% also complained about the distance between their homes and the clinics.. An old woman I met in one of the houses complained to me saying;

"My grandson as I sit here I am sick but I cannot descend the hill to the clinic, I have nobody to send me to the clinic and the doctors too will not visit me here".

The shortest path matrix was run against the preferred choice of medical facility of respondents and the results are presented in Tables 2 and 3. It is realized from Table 2 that choice of health care facility of residents from four communities namely, Abono, Apewu, Banso and Amakom corresponds with the results of the Shortest Path Matrix (Table 3) while the choice of respondents from Pipie No 2 and Dompa deviates. The majority of respondents (78.8%) from Dompa said they prefer accessing the Amakom clinic to the Dunkura Health centre which is closer to them. It was found that potential health care seekers from Dompa will utilize the Amakom clinic rather than the Dunkura health care centre due the topography of the area.

Table 3 indicates that residents from Abono are likely to utilize the Kuntanase district hospital, those from Pipie No 2 are likely to choose the Konkoma clinic while people from Amakom will utilize the Amakom clinic. Similarly, potential health care seekers from Dompa are more likely to access the Dunkura health care centre while residents from Apewu and Banso are more likely to utilize the Apewu clinic.

Roads play significant role in health care access and utilization in rural communities in Africa. Roads linking towns in the study area to nearby health care facilities are mostly in deplorable conditions, motorable only during certain periods of the year. Abono is linked to the district hospital at Kuntanase with a first class road which is in good condition all year round. Pipie No.2 is linked to the nearest health care facilities at Brodekwano and Konkoma with footpaths. Banso is cut off from the rest of the towns within the basin due to lack of access roads to and from the town; it is linked only to Apewu with a footpath. The road from Dompa to Dunkura is motorable only during the dry season and vehicles are unable to use the road anytime

it rains. Roads linking Amakom and Apewu (towns with health care facilities) to the district hospital at Bekwai are in deplorable condition.

It was observed that the lake is not used as a means of transport to convey sick people to the health care facilities and was confirmed by respondents as all the respondents (100%) indicated that the lake is not used as a means of transport. Through the interviews it was found that the customs and traditions of the people do not allow the use of metal boats on the lake since according to them, the use of metal boats on the lake deprives them of fish catch from the lake.

"*The lake is not used to transport sick persons to the clinics because it is a taboo to use a metal boat on the lake since we do not get much fish catch when metal boats are used and travelling in wooden boats on the lake is dangerous"* (a chief from one of the communities)

Residents also find it unsafe to travel on the lake in wooden canoes. When a respondent was asked why the lake is not used as a means of transport despite its cost effectiveness he had this to say,

"My grandson, about twenty-five years ago over 30 people were drowned in the lake when their boat capsized as they were travelling to another town to play a football match. We do not want this calamity to happen again" (A chief of one of the towns).

The fear of accidents on the lake and belief systems hve denied potential health care seekers the opportunity to use the lake as a means of transport to access health care faster.

Staffing of health care professionals in Ghana is determined by the location of the facilities; urban centres are well resourced while rural communities are deprived (Smith, 2000; Donkor, 2006). The Lake Bosomtwe basin was found to be affected by poor staffing of health care personnel. For instance, the Apewu Clinic is manned by a retired medical assistant supported by a traditional birth attendant. The Brodekwano clinic is also operated by one Nursing Officer and two ward assistants. The Amakom Methodist clinic has a resident expatriate physician, a trained midwife, two trained nurses, a laboratory technician and a drug dispenser.

In terms of logistics, all the facilities studied lacked the requisite medical supplies. There were no hospital beds for admission of patients. Of the five health care facilities, only the Amakom Methodist clinic and Konkoma SDA clinic have laboratories where medical tests are conducted. All the clinics lack oral health facilities and equipment. None of the clinics has x-ray equipment. There was no ambulance at any of the clinics to transport sick persons and referred patients to near-by hospitals. Stand-by power generators to mitigate the impact of frequent power outages and absent of electricity were also lacking. For example, the Apewu clinic has no electricity. The clinics at Apewu, Brodekwano and Konkoma have no refrigerators for the storage of drugs and vaccines. Simple implements for dressing of wounds were lacking in some of the clinics, compelling some of the health personnel to list wound dressing materials as medical supplies urgently needed. A health worker expressed the situation in this way:

"Sir, we do not even have cotton wool and gauze to dress wounds at the clinic at the moment; all our supplies have finished".

Medical services rendered in the health care facilities within the basin comprise consultation, prescription and dispensing of drugs. Since many of the clinics do not have dispensary technicians/assistants, drugs are dispensed by ward assistants. Birth deliveries are performed only at the Amakom Methodist clinic and Dunkura health centre. Accommodation for the health staff was found to be inadequate; apart from the Amakom Methodist clinic, none of the other clinics has accommodation for its health staff. At Dunkura, it was found that the medical assistant and most of the staff members live at Bekwai and commute to work at Dunkura.

Health care facilities within the basin are mostly of low capacity to contain the number of patients seeking health care. Five clinics with one physician cater for 11,530 inhabitants within the study area.

Respondents complained of over-crowding at the clinics and stated that patients out-number the available facilities. Table 4 reveals residents level of satisfaction with the number of health care facilities within the basin as well as their capacities in terms of staff and equipment. Sixty percent of respondents said health care facilities within the basin do not meet their health needs at all while 13.4% said they are very much satisfied with the facilities to meet their health needs.

The majority of respondents from Pipie No. 2 and Abono expressed their dissatisfaction with the capacities of the health care facilities within the basin with respect to buildings, equipment and staff; these are communities without health care facilities and potential health care seekers have to travel to other communities to access health care.

Discussion

The study established that the topography of the basin affects health care accessibility; a sick person accessing health care will have to climb mountains and or descend valleys on foot before reaching a health care facility. This situation is a challenge to people accessing health care especially the aged and is likely to prevent them from utilizing the facility. Micro location is therefore an important factor that affects location and utilization of health care facilities in the Lake Bosomtwe basin.

The nature of the roads affects transportation of sick people to the health care facilities within the area as well as referred patients to the nearby hospitals. This confirms the importance of absolute space and place in health care accessibility. At the time of the study, the roads in the study area could not be used by vehicles, this situation, according to residents affect their health and health care delivery forcing them to patronize the services of quack drug peddlers and also resorting to self medication.

The health care facilities within the study area were found to be inadequately resourced with both staff and equipment. This confirms the assertion by Donkor (2006) that a greater percentage of health personnel in Ghana are located in big cities which according to Warren and Tregoning (1979) is because Ghanaian trained physicians do not accept posting to rural communities; which in the view of Dussault and Franceschini (2006) is because they are trained to work with equipment that are not available in health care facilities in rural areas and the high investments made on them. This is also in line with the view of Oppong (2003) that health care facilities in rural communities in sub-Saharan Africa lack adequate medical supplies. The inadequate supply of health care personnel affects quality of services rendered and is likely to influence accessibility to health care within the basin as the health care needs of residents may not be met by the available health staff.

The study also revealed that most of the health staff do not reside in the community but commute to and from the district capital to work. This situation implies that they come to work late and close early due to inadequate flow of vehicles to and from the study area, this leads to a situation where individuals who need health care services would have to wait for long hours or by-pass the local clinic to others elsewhere. Secondly, sick people are likely not to have access to health care in certain times of the day or week because the health staff may not be available during the night, early morning and weekends (Saturdays and Sundays). "Opening time" of the clinics therefore becomes a barrier to accessibility to health care by residents.

It was observed that the lake is not used as a means of transport to convey sick people to the health care facilities despites the poor road network in the area, and the various advantages of water transport in terms of cost, proximity and time. This situation impacts negatively on transportation of sick persons to nearby clinics People who fall sick especially in the night are therefore carried at the backs and shoulders of family and community members to seek medical attention at the nearby clinics.

Conclusion

The discussions in this work have centred on the distribution of health care facilities and personnel in the Lake Bosomtwe basin. It was found that five health care facilities serve the twenty-two towns within the basin and beyond; two of which are located in the study area. The study has also revealed that roads linking the towns to the health care facilities are in deplorable state in most parts of the year and in some towns there are no motorable roads linking the towns and health care facilities. This situation affects accessibility and use of health care in the Lake Bosomtwe basin. Natural elements such as the topography of the area and the presence of the lake have been found to affect the location of health care facilities.

The study recommends that existing roads in the area should be improved and new ones constructed to health care facilities. The staff strength and equipment in the health care facilities within the basin also need to be improved by the Ghana Health Service. Finally, it is recommended that efforts should be made by the ministries of transport, health and local government at ensuring that the lake is used as a means of transport to convey sick people to the nearby health care facilities

References:

Baker, D. W., Stevens, C. D. & Brook, R. H. (1996). Determinants of Emergency Department Use: Are race and ethnicity important*? Annals of Emergency Medicine*, 28, 677-82.

Blustein, J. & Weitzman, B. C. (1995). Access to hospital with High Technology Cardiac Services: How is race important? *American Journal of Public Health*, 85, 345-51.

Donkor, P. (2006). Oral Health Manpower - What are Ghana's requirements*? Ghana Medical Journal.* 40(4): 116–117.

Cartography Unit (2012). Department of Geography and Tourism, University of Cape Coast, Cape Coast

Dussault, G. & Franceschini, M. C. (2006). Not enough there, too many here: understanding geographical imbalances in the distribution of the health workforce. *Human Resources for Health*, 4:12

Eng, T. R., Maxfield, A., Patrick, K., Deering, M. J., Ratzan, S. C. &, Gustafson, D.H., (1998). Access to Health Information and Support A Public Highway or a Private Road? *Journal of American Medical Association (JAMA)* Vol. 280 No. 15.

Fotso, J. C. (2007) Urban-rural differentials in child malnutrition: trends and socioeconomic correlates in sub-Saharan Africa. Health Place. 2007 Mar;13(1):205-23.

Ghana Statistical Service (2002). 2000 *Population and housing Census*. Summary Report of Final Results. Ghana Statistical Service, Accra

Gulliford, M.; Figueroa-Munoz J.; Morgan, M.; Hughes, D.; Gibson, B: Beech R, Hudson, M. (2002). What does 'access to health care' mean? J Health Serv Res Policy. 2002 Jul;7(3):186-8.

Guagliardo, M. F. (2004) 'Spatial accessibility of primary care: concepts, methods and challenges', *International Journal of Health Geographies*, 3:3.

Haile, S.; du Guerny, J. & Stloukal, L. (2000). Provision of reproductive health services in Sub-Saharan Africa: Lessons, issues, challenges and the overlooked rural majority. Sustainable Development Department, FAO *SD Dimensions*

Horton, R. (2001). Ghana: defining the African challenge. *Lancet*; 358: 2141–2149.

Hutchinson, P.; Habte, D. & Mulusa, M. (1999). *Health care in Uganda: selected issues*. World Bank publication.

Malat, J. (2006). Expanding research on racial disparity in medical treatment with ideas from sociology. *health: An Interdisciplinary Journal for the Social Study of Health, Illness and Medicine* SAGE Publications London, 1363-4593; Vol. 10(3): 303–321.

Okafor, S. I. (1987). Inequalities in the distribution of health care facilities in Nigeria**.** In Akhtar, R. (1987) *Health and Disease in Tropical Africa: Geographical and Medical Viewpoints*. Taylor & Francis

Oppong, J. R. (2003). Medical Geography of Sub-Saharan Africa in Aryeetey-Atto, S. (2003) (Ed) *Geography of Sub-Saharan Africa*. Pearson Educational Inc.

Palacio, H., Kahn, J. G., Richards, T.A. & Morin, S. F. (2002). Effect of race and/or ethnicity in use of antiretroviral and prophylaxis for opportunistic infections: A review of the literature. *Public Health Reports*, 117, 233-51.

Smith, F. (2002). Reflections on health care in Ghana. *The Pharmaceutical Journal*, Vol. 268. No 7200

Stein, J. A.; Andersen, R. & Gelberg, L. (2007). Applying the Gelberg-Andersen Behavioral Model for Vulnerable Populations to Health Services Utilization in Homeless Women. *Journal of Health Psychology*, Vol. 12(5) 791–804.

Tsai, W. & Kung, P. (2003). Is Accessibility Effect or Supplier-induced Demand Effect to Raise Ambulatory Care Utilization? - The Taiwan Experience. *AcademyHealth Meet*. 2003; 2

United Nations (2002). *UN Millennium Development Goals* (MDG). New York: United Nations.

Warren, D. M. & Tregoning, M. A. (1979). Indigenous Healers and Primary Health Care in Ghana. *Medical Anthropology Newsletter*, Vol. 11, No. 1 :11-13.

Table 1: Ownership of health care facilities in the study area

Facility	Type of ownership	Operator
Amakom Health Centre	Mission	Methodist church
Apewu Clinic	Community clinic	Community/Baptist church
Konkoma Clinic	Mission	SDA Church
Brodekwano Clinic	Mission	Methodist church
Dunkura Health Centre	State	Ghana Health Service

Source: Fieldwork

Table 2: Residents preferred choice of medical facility by place of residence

Town	Health care facilities						Total
	Amakom health centre	Apewu clinic	Brode-kwano clinic	Dunkura health centre	Konkoma clinic	Kuntanase hospital	
Abono	-	9.5%	-	-	-	90.5%	(21)
Pipie No.2	22.2%	-	11.1%	-	11.1%	55.6%	(18)
Amakom	100%	-	-	-	-	-	(21)
Dompa	78.3%	4.3%	-	17.4%	-	-	(23)
Apewu	-	100%	-	-	-	-	(19)
Banso	-	100%	-	-	-	-	(18)
Total	35.8% (43)	33.2% (40)	1.7% (2)	3.3% (4)	1.7% (2)	24.4% (29)	(120)

Source: Fieldwork

Table 3: Shortest Path Matrix for possible choice of health care facilities by residents based on distance and the number of communities one travels through

Towns	Health care facilities					
	Amakom Health Centre	Apewu clinic	Bro'kwano clinic	Dunkura health centre	Konkoma clinic	Kuntanase Dist. Hosp.
Abono						❖
Pipie No2					❖	
Amakom	❖					
Dompa				❖		
Apewu		❖				
Banso		❖				

Source: Fieldwork

Table 4: Staff strength of the health care facilities in the lake Bosomtwe Basin

Health care Facility	Type of health personnel						
	Physician	Medical Assistant	Midwife	Nurse	Drug dispenser	Laboratory Assistant	Ward Assistants
Apewu Clinic	-	1[1]	-	-	-	-	
Amakom Health Centre	1[2]		2	1	1	1	2
Konkoma Clinic						1	
Dunkura Health Centre	-	1	1		1		4
Brodekwano Clinic				1			2
Total	**1**	**2**	**3**	**2**	**2**	**2**	**8**

Source: Fieldwork

Table 5: Views of respondents about capacity of healthcare facilities to meet their needs

Town	Patients and capacity of the health care facilities					**Total (N)**
	Not at all	Very little	Little	Much	Very much	
Abono	66.7	23.8	9.5	0	0	100% (21)
Pipie No.2	88.8	5.6	5.6	0	0	100% (18)
Amakom	52.4	0	9.6	19.0	19.0	100% (21)
Dompa	56.5	17.4	4.3	4.3	17.5	100% (23)
Apewu	52.6	15.8	5.3	5.3	21.0	100% (19)
Banso	44.4	33.3	0	0	22.3	100% (18)
Total	60.0%	15.8%	5.8%	5.0%	13.4%	100% (120)

Source: Fieldwork data

Pearson's chi-square: Value = 33.898, df = 20, Asymp. p= 0.027

[1] This personnel said he is a retired medical assistant but there was no record of on him at the District directorate of health services at Bekwai-the district capital.

[2] The physician was an expatriate volunteer.

Table 6: Satisfaction of respondents on the number of health care facilities, services, staff strength and equipment

Satisfaction level	Frequency	Per cent
I am satisfied with the number of health staff	45	37.5
I am satisfied with the health services provided	43	33.3
I am satisfied with the available equipment	40	38.3
I am satisfied with the buildings of the clinic	93	77.5
I am satisfied with the number of health facilities	39	32.5
I am satisfied with the time spent at the clinics	50	41.6

Source: Fieldwork

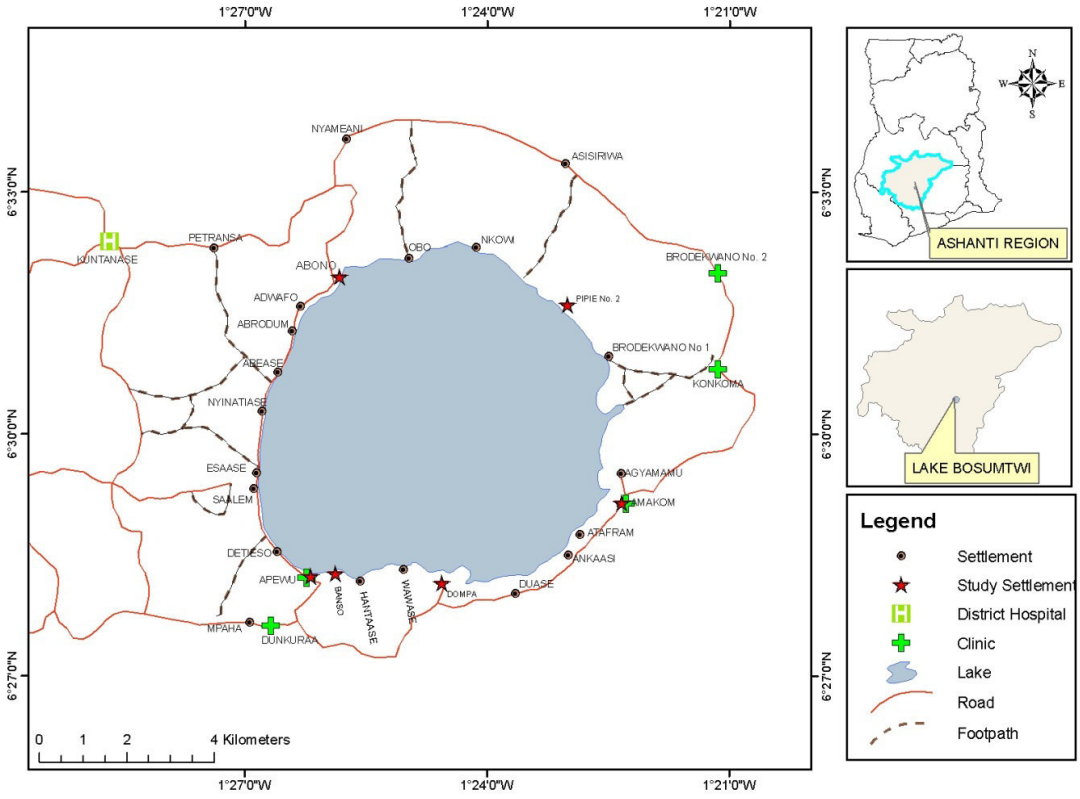

Figure 1: Map showing health care facilities utilized by residence of Lake Bosomtwe Basin
Source: Cartography Unit, UCC (2012)