

# Bypassing proximal health care facilities for acute care: a survey of patients in a Ghanaian Accident and Emergency Centre

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## Abstract

**OBJECTIVE** To characterise the population that presents to the Accident and Emergency Centre (AEC) at Komfo Anokye Teaching Hospital (KATH) and to identify risk factors associated with bypassing proximal care facilities.

**METHODS** A structured questionnaire was verbally administered to patients presenting to the AEC over 2 weeks. The questionnaire focused on the use of health care resources and characteristics of current illness or injury. Measures recorded include demographics, socioeconomic status, chief complaint, transportation and mobility, reasons for choosing KATH and health care service utilisation and cost.

**RESULTS** The total rate of bypassing proximal care was 33.9%. On multivariate analysis, factors positively associated with bypassing included age older than 38 years (OR: 2.18, *P* 0.04) and prior visits to facility (OR 2.88, *P* 0.01). Bypassers were less likely to be insured (OR 0.31, *P* 0.01), to be seeking care due to injury (OR 0.42, *P* 0.03) and to have previously sought care for the problem (OR 0.10, *P* < 0.001).

**CONCLUSIONS** Patients who bypass facilities near them to seek care at an urban AEC in Ghana do so for a combination of reasons including familiarity with the facility, chief complaint and insurance status. Understanding bypassing behaviour is important for guiding health care utilisation policy decisions and streamlining cost-effective, appropriate access to care for all patients.

**keywords** Accident and Emergency Centre, health insurance status, bypassing proximal care, Ghana, urban

## Background

Emergency medical care is increasingly a focus of health care service and policy in developing countries. To reduce overall morbidity and mortality in low and middle income countries (LMICs), many physician scientists have called for more research around emergency medical services (EMS) (Kobusingye *et al.* 2005; Hsia *et al.* 2010). Injury is one of the leading causes of morbidity and mortality in LMICs in sub-Saharan Africa, causing more deaths than HIV, malaria and tuberculosis combined in 2004 (WHO 2010). According to WHO (2004), the African region has the highest rate of mortality owing to road traffic injuries at 27.8 per 100 000. In Ghana, although unintentional injuries cause 25% more mortality than in the United States, injuries account for a 203% increase in disability-adjusted life years (WHO 2004).

Implementing pre-hospital EMS systems in Iraq and Cambodia demonstrated a 63% reduction in mortality related to trauma (Husum *et al.* 2003). In Ghana, London *et al.* (2001) found that decreasing time to definitive therapy and more aggressive initial resuscitation were both strategies that improved trauma outcomes. While goal-directed initial resuscitation is a health professional education issue, several factors influence the time to definitive treatment. These factors include availability of transport from place of need to closest health facility, the physical and human infrastructure of that facility and recognition of a need to transfer the patient to a higher level facility. The time to definitive treatment can be further impacted by the patient's or family's decision of where to access the health care system.

Given the association between increased morbidity and mortality from injuries and acute illness and delays in treatment, there is a need to examine how acutely injured

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patients are accessing the health care system. 'Health care bypassing' is the phenomenon of non-use of proximate facilities or providers in favour of more distant ones. This often occurs because of the perceived lower quality of care at proximate facilities (Bonu *et al.* 2003; Limwattananon *et al.* 2007; Hotchkiss *et al.* 2007). To guide policy decisions and health care resource allocation in the future, it is important to understand at what rate and for what reasons patients bypass proximate care facilities.

Ghana is a country that is located in West Africa with a total population of 23 million, classified as low income by the World Bank (2011). Ghana spends 6.8% of annual governmental expenditure (US\$10 per capita) on the health care sector (WHOSIS 2006). Ghana implemented a national health insurance scheme beginning in 2001 that provides health coverage to its citizens (Agyepong & Adjei 2008; WorldBank 2007) and Ghanaian physicians have since advocated for improvements in acute injury care (Quansah 2006). The government of Ghana has indicated a commitment to improving acute care by constructing the National Accident and Emergency Centre (AEC) at Komfo Anokye Teaching Hospital (KATH) in Kumasi. Previously, KATH had a smaller emergency centre that was composed of 'polyclinics', several separate clinics to which patients would present for the evaluation and stabilisation of acute complaints prior to definitive care or transfer to inpatient units. With the construction of the AEC, KATH now has a central area to which nearly all patients with acute complaints will present.

Given experiences in other countries in the region regarding health care bypassing, it is possible that the opening of the new AEC at KATH could lead to considerable bypassing of smaller clinics and hospitals for patients in favour of receiving care at a larger tertiary centre. These patients may be treated just as well for non-emergent complaints at more proximate clinics, therefore opening up beds at the AEC for the treatment of acute medical complaints and injuries, for which it was originally intended. The aim of the current survey-based study was to characterise the population that presented to KATH over a 2-week period in July 2009 and identify risk factors associated with bypassing proximal care facilities. By taking the first key step to understanding the reasons that patients bypass care, improvement efforts can be directed towards service utilisation.

## Methods

### Study site and sample

Komfo Anokye Teaching Hospital is located in Kumasi, the second largest city in Ghana with a population of

1.17 million people (GhanaInfo 2009). The AEC opened on 4 May 2009 and is an approximately 200-bed facility staffed by physicians, house officers and nurses, with various consulting services available. The AEC serves Kumasi, the surrounding Ashanti area, and is the major referral centre for the northern two-thirds of Ghana. It is open around the clock. Patients arrive by private car, public transportation or ambulance. At the time of this study, KATH AEC was serving approximately 25 000 patients per year.

This study is a subset of a large prospective cross-sectional survey of all patients seeking emergency care at KATH. Potential participants included all patients seeking care in the AEC at KATH who were able to give informed consent or have family give informed consent if under 18 years of age. Inclusion criteria were any patient presenting to KATH AEC between 13 July 2009 and 30 July 2009 during study hours. The study was conducted in 8-h shifts that were designed to sample evenly over a 24-h period and all days of the week, including weekends. Questionnaires were administered in all of the sections of the AEC to obtain a full sample of presenting complaints. Patients were excluded whether they were under 18 without a parent or guardian available to consent (*n* approximately 22), were unable to understand English, Twi, or Fante, or if translation for Twi or Fante was not available (*n* approximately 16), had altered mental status (*n* approximately 19), were in need of acute care (*n* approximately 13), were sedated (*n* approximately 75) or were admitted or deceased before the survey was completed (*n* approximately 13). Numbers of excluded patients are estimates as Institutional Review Board regulations preclude the collection of data on patients not enrolled in the study.

Study procedures were approved by and conducted in compliance with the Committee on Human Research Publication and Ethics, School of Medical Sciences, Kwame Nkrumah University of Science and Technology and the University of Michigan Institutional Review Boards for Human Subjects.

### Survey content and administration

A pilot study was performed in June 2009 in the KATH polyclinic waiting room to ensure the quality of the questions and to ensure brevity of the questionnaire. Measures of demographics and overall health were drawn from the Ghana National Survey (Ghana Statistical Service 1998, Ghana Statistical Service 2003). The final questionnaire included information pertaining to demographics, SES (socioeconomic status) markers, health care service utilisation and chief complaint. A 'bypasser' was defined as someone who answered 'no' to both questions 'Is this

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health care facility closest to your home?’ and ‘Why did you choose this health care facility today referred here?’ Among the descriptive data collected, data were collected on job type and employment status which was dichotomised to include all those that work out of the house (farmer, trader, artisan, civil/public servant and other) verses those that did not work out of the house such as housewife, student and those that are retired.

During the study period, trained research assistants (RA) administered questionnaires to all eligible patients or to parents of eligible children who presented to the AEC. Informed consent was documented with signature or thumbprint. The questionnaire was administered verbally in English, Twi, or Fante, as preferred by the patient, and took approximately 10 min to administer. In addition to administering the survey, RAs also assessed mobility and mental status of each patient as a proxy measure of severity of illness or injury, as vital signs and disposition were not documented as part of triage care. For injured patients, RAs classified injury by ICD-9 E-code (NCHS 2000) based on patient interview at time of survey administration.

### Data analysis

Data were analysed using SPSS version 17 (PASW Company, Chicago, IL, USA). Descriptive statistics of demographics, socioeconomic markers and chief complaint were calculated. Bivariate analyses compared patients who were health care bypassers to those who were not. Logistic regression was used to identify factors that predict health care bypassing. All variables associated with bypassing care in the bivariate analysis (using a cut-off of  $P < 0.25$  according to the conservative approach suggested by Hosmer and Lemeshow (2000)) and variables that were significant in previous studies were used in the multivariate analysis. Determinants were considered significant at the multivariate level if  $P < 0.05$ . Using principal component analysis (Vyas & Kumaranayake 2006), the following six items comprised the Socioeconomic Index: ‘Does your household have electricity?’, ‘Does your household have a radio?’, ‘Does your household have a video deck/DVD/VCR?’, ‘Does your household have a phone?’ and ‘Does your household have a refrigerator?’ The Socioeconomic Index was dichotomised into ‘poor’ (lower 40% of the index) *vs.* ‘not poor’ (the upper 60% of the index).

### Results

Questionnaires were administered to 311 eligible patients presenting to the AEC, of whom 279 (90% of total sample) had data on bypassing care. Of these subjects, 242 had

complete data, and therefore, further analysis was restricted to this subset. Those that were excluded were not significantly different from those included with respect to dependent variables such as age, gender, reason to visit and insurance status. The mean age of the patients was 40 years, ranging from 1 month to 102 years, with 81.4% ( $n = 197$ ) over 18 years (see Table 1). Nearly two-thirds of the patients (62.8%) were men and 67.8% belonged to the Ashanti tribe. Of this sample, 29.8% had completed secondary education or more and most (79.3%) were currently employed out of the house; 75.6% of the subjects had health care insurance and 69% reported their health status to be good or very good. When asked about household assets, most participants indicated that they had electricity (84.6%), radio (86.3%), television (78.3%), video deck (71.1%), telephone (77.9%), refrigerator (67.1%) and ate at least two meals per day (76.3%). Fewer

**Table 1** Sociodemographic and healthcare characteristics of a sample of patients presenting to an emergency department in Ghana ( $n = 242$ )

Characteristics	<i>n</i> (%)
<b>Demographics</b>	
Age – mean (SD)	40 (22.7)
Male	152 (62.8)
Ashanti	164 (67.8)
Currently married	132 (54.5)
Currently employed out of house	190 (79.3)
Secondary education or more	72 (29.8)
Self-reported health status good/very good	158 (69.0)
<b>Household assets</b>	
Flush toilet	107 (45.0)
Electricity	203 (84.6)
Radio	207 (86.3)
Television	188 (78.3)
Video deck	170 (71.1)
Telephone	187 (77.9)
Refrigerator	161 (67.1)
Bike	15 (6.3)
Scooter	22 (9.2)
Car	54 (22.5)
At least two meals per day	180 (76.3)
<b>Health care</b>	
Insured	183 (75.6)
<b>Socioeconomic status (SES)*</b>	
Quintile 1	45 (18.6)
Quintile 2	48 (19.8)
Quintile 3	54 (22.3)
Quintile 4	44 (18.2)
Quintile 5	51 (21.1)

\*SES: Quintile 1 is poorest quintile; Quintile 5 is least poor quintile.

A. Q. Yaffee *et al.* **Bypassing proximal health care facilities for acute care****Table 2** Characteristics of current healthcare visit for a sample of patients presenting to an emergency department in Ghana (*n* = 242)

Characteristic	<i>n</i> (%)
Reason for current visit: injury	105 (43.4)
Sought care for problem prior to today	172 (71.1)
Visited facility before	117 (48.4)
Reason current facility was chosen	
Referred	135 (55.8)
Used before and had a good experience	9 (3.7)
Friend/relative used before and recommended	8 (3.3)
Facility has the best staff	67 (27.7)
Closest to home	26 (10.7)
Travel time to hospital >30 min	211 (87.2)
Public transportation to clinic	136 (56.2)

patients owned a bike (6.3%), scooter (9.2%), car (22.5%) or had a flush toilet in their home (45.0%).

Table 2 describes the characteristics surrounding the current health care visit for the sample. Almost half of the participants (43.4%) presented with injury. The majority (71.1%) had sought care for a problem prior to the visit,

and many (48.4%) had visited the facility (KATH) before. Most participants (87.2%) had to travel more than 30 min to obtain the facility, and 56.2% used public transportation.

The total rate of bypassing a local facility was 33.9% in the total study population. Table 3 demonstrates potential determinants of bypassing care. There was no difference noted between bypassers and non-bypassers in terms of gender, ethnicity, employment status, level of education, health status, SES reason for visit, travel time and method and having health insurance. Variables representing 'Reason current facility was chosen' were excluded from further analysis because of high proportion of missing values. In the unadjusted analysis, patients who bypassed were more likely to have age >38 years (OR 2.17, *P* 0.01), or to have visited the facility before (OR 2.97, *P* < 0.001). Bypassers were less likely to have sought prior care for the problem (OR 0.14, *P* < 0.001).

Table 4 shows the results of the multivariate regression. Variables were included in the regression if they were *P* < 0.25 in the bivariate analysis (Hosmer & Lemeshow 2000), or if they were significantly associated with bypassing care in previous research (age and education). On

**Table 3** Bivariate associations between patient characteristics and bypasser status for a sample of patients presenting to an emergency department in Ghana (*n* = 242)

Characteristic	Bypassers	Non-bypassers	Unadjusted OR (95% CI)	<i>P</i> -value
	( <i>n</i> = 82, 33.9%)	( <i>n</i> = 160, 66.1%)		
	<i>n</i> (%)	<i>n</i> (%)		
<b>Demographics</b>				
Age ≥ 38	50 (61.0)	67 (41.9)	2.17 (1.26, 3.74)	0.01
Male	46 (56.1)	106 (66.2)	0.65 (0.38, 1.12)	0.12
Ashanti	60 (73.2)	104 (65.0)	1.47 (0.82, 2.64)	0.20
Currently married	38 (46.3)	94 (58.7)	0.61 (0.36, 1.04)	0.07
Currently employed out of the house	62 (75.6)	128 (81.0)	0.73 (0.38, 1.38)	0.33
Secondary education or more	27 (32.9)	45 (28.1)	1.26 (0.71, 2.23)	0.44
Self-reported health status good/very good	53 (67.1)	105 (70.0)	0.87 (0.49, 1.57)	0.65
<b>Household assets</b>				
Socioeconomic status (SES)*				
Quintile 5	22 (26.8)	29 (18.1)	1.68 (0.73, 3.89)	0.22
Quintile 1	14 (17.1)	31 (19.4)	1.0	
<b>Health care</b>				
Insured	58 (70.7)	125 (78.1)	0.68 (0.37, 1.24)	0.21
<b>Current visit</b>				
Reason for visit: injury	30 (36.6)	75 (46.9)	0.65 (0.38, 1.13)	0.13
Sought care for problem prior to today	36 (43.9)	75 (46.9)	0.14 (0.07, 0.26)	<0.001
Visited facility before	54 (65.8)	63 (39.4)	2.97 (1.70, 5.18)	<0.001
Travel time to facility >30 min	60 (73.2)	104 (65.0)	1.47 (0.82, 2.64)	0.20
Public transportation to clinic	38 (46.3)	94 (58.7)	0.61 (0.36, 1.04)	0.07

\*SES: Quintile 1 is poorest quintile; Quintile 5 is least poor quintile.

A. Q. Yaffee *et al.* **Bypassing proximal health care facilities for acute care****Table 4** Multivariable associations between patient and bypasser status for a sample of patients presenting to an emergency department in Ghana ( $n = 242$ )

Characteristic	Adjusted OR (95% CI)	P-value
<b>Demographics</b>		
Age $\geq 38$	2.18 (1.02, 4.67)	0.04
Male	0.86 (0.41, 1.84)	0.70
Ashanti	1.15 (0.55, 2.42)	0.71
Education: secondary or more	1.31 (0.52, 3.29)	0.56
Currently married	0.51 (0.25, 1.05)	0.07
Socioeconomic status: Quintile 5	1.80 (0.52, 6.16)	0.22
Insured	0.31 (0.13, 0.76)	0.01
<b>Current visit</b>		
Reason for visit: injury	0.42 (0.18, 0.94)	0.03
Previously sought care for problem	0.10 (0.04, 0.22)	<0.001
Visited facility before	2.88 (1.38, 6.00)	0.01
Public transportation to clinic	1.25 (0.63, 2.48)	0.52

multivariate analysis, bypassers were more likely to be older than 38 years (OR: 2.18,  $P$  0.04) and to have visited the facility before (OR 2.88,  $P$  0.01). Bypassers were less likely to be insured (OR 0.31,  $P$  0.01), to be seeking care due to injury (OR 0.42,  $P$  0.03) and to have previously sought care for the problem (OR 0.10,  $P$  < 0.001).

## Discussion

Overall, 33.9% of patients who presented to an urban, academic hospital in Ghana for emergency care bypassed a closer facility to receive health care. Bypassing care has important implications for the patient as well as the health care system as a whole. In this study, patients who bypassed proximate facilities were found to be older and the vast majority (65.8%) had visited the facility previously. In contrast, only 39.4% of non-bypassers had visited KATH previously. This may indicate that patients are taking an active role in their health care and that they are choosing to spend more resources at facilities of their choosing which they perceive provide better care, regardless of location. This has important implications for interventions; it may be useful to improve the care, or perception of care, provided in local facilities. It would also help to encourage patients to seek care closer to home and thus result in a more even distribution of resource utilisation. Our results are consistent with previous work in other countries (Kruk *et al.* 2009), including work by Akin (1999) in Sri Lanka, where it was found that facilities with more doctors and drugs or facilities that were in better condition were less likely to be bypassed. In our case, the new AEC at KATH is well-stocked with pharmaceuticals and was opened only months before this study took place.

This study found that only 36.6% of patients who bypassed care were seeking care for an injury-related complaint. In fact, patients who bypassed were less likely to be injured than those who did not bypass. This is intuitive in that often patients who are injured are in need of prompt treatment that only more proximate facilities can provide. However, the closest facilities may not always be equipped with the necessary life-saving measures needed for trauma resuscitation (Quansah 2001; Quansah *et al.* 2004). Trauma systems are a vital component of improved outcomes (Mock *et al.* 1998). The AEC at KATH is an important step to improving care for trauma patients in Kumasi, but other public health measures such as implementing a feasible EMS system could also be considered to improve overall trauma-related morbidity and mortality.

Mock *et al.* (2001) demonstrated that one of the main barriers to utilisation of health services was ability to pay for services. Our study did not demonstrate any significant association between health care bypassing and SES. This could be explained by the fact that the majority (75.6%) of patients in this study have health insurance as a result of the national health insurance scheme implemented in 2001, after the time of Mock's study. The overall effect of SES may be diluted by the use of this insurance to cover health care costs. SES is positively correlated with insurance status in Ghana, with those belonging to the least poor quintile having higher rates of enrollment in the national health insurance scheme (Sarpong *et al.* 2010). Our study did demonstrate that bypassers were less likely to be insured than non-bypassers; therefore, bypassers may in fact have slightly lower SES than non-bypassers. Lack of health insurance may also be a contributing factor in the finding that bypassers were less likely to have previously sought care for their presenting complaint.

Our study did not show an association between education and bypassing. In contrast, previous studies in LMICs have demonstrated that educated individuals are more likely to bypass facilities (Akin & Hutchinson 1999). Only 29.8% of our sample population achieved secondary education or higher, and therefore, it is possible that the effect of education was diluted in our study. Alternatively, given that Ghana's public health information resources are fairly well distributed, both bypassers and non-bypassers may have increased public health awareness, which could dampen the effect of increased education.

## Limitations

This study has a few limitations. First, the study had a relatively small sample size. Secondly, the verbally administered questionnaire introduces the possibility of interviewer biases. Although interviewers were trained, if

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questions were not asked the same with each interview, variation in the types of responses gained might be introduced. Most questionnaires were administered in a language other than English (Twi or Fante), possibly introducing bias due to translation and interpretation. The data were collected over a short-time period and therefore could be subject to seasonal variations in chief complaints, employment and travel time to hospital. The exclusion of seriously ill patients may introduce bias as these patients may have been more likely to have travelled farther and thus been bypassed. In this case, our figures for bypassing would be an underestimate. Further, the definition of time travelled to reach the hospital may have been influenced by road conditions and traffic and may not accurately reflect physical distance travelled.

Twenty-two per cent of completed surveys were excluded from further analysis because of missing dependent or predictor variable data. These cases were similar to those included in the final model with respect to age, gender, reason to visit and insurance status. This analysis is then based on the assumption that the data were missing at random, and therefore, the results may be generalised to the entire sample. Finally, the administration of questionnaires in a health care setting introduces the possibility that patients modified answers in an attempt to affect the quality of the health care that they would receive. As well, subjects in the health care setting may be a self-selecting group that might not be fully generalisable to the metropolitan population as a whole. However, we do not believe that these limitations have systematically biased the findings.

### Conclusions

Bypassing care, as defined in this study, has the potential to affect the health care system countrywide. Our study has demonstrated that patients who bypass are less likely to have health insurance and therefore may be of lower SES and less able to afford health care. For these individuals, bypassing proximal facilities not only is inefficient from a health care utilisation perspective, but also may be economically burdensome on the patient and the system as a whole. Many bypassers had not previously sought care for their presenting complaint, which may lead to inequality in health care facility use, with tertiary care centres receiving an overabundance of patients who could be adequately treated at local clinics. In contrast, lack of bypassing for more serious conditions such as injuries may lead to an improper use of specialty facilities targeting these conditions.

The AEC at KATH is a health care setting offering acute treatment for those in need. This new centre serves as a

major health care access point for many people in the surrounding region. The AEC sees a large number and variety of patients, some of whom may be able to be adequately cared for at surrounding health care facilities. However, the facility is as of yet unable to capture a subset of injured patients, for which its construction was partially intended. Currently, Ghana is allocating more money to health care and attempting to improve national health metrics. Understanding the phenomenon of health care utilisation and bypassing within the current Ghanaian health system will help guide policy decisions and streamline cost-effective, appropriate access to care for all patients, which ultimately may decrease morbidity and mortality in Ghana.

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