

# Barriers to Timely Presentation of Patients with Surgical Conditions at Tamale Teaching Hospital in Northern Ghana

Stephen Tabiri<sup>1</sup> · Ali Jalali<sup>2</sup> · Richard E. Nelson<sup>3</sup> · Michael C. Damah<sup>1</sup> · Francis A. Abantanga<sup>1</sup> · Raymond R. Price<sup>4</sup> · Micah G. Katz<sup>4</sup>

Published online: 21 September 2018  
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## Abstract

**Background** Improving access to surgical services and understanding the barriers to receiving timely care are necessary to save lives. The aim of this study was to assess barriers to timely presentation to an appropriate medical facility using the *Three-Delay* model, for patients presenting to Tamale Teaching Hospital, in northern Ghana.

**Methods** In 2013, patients with delays in seeking surgical care were prospectively identified. Pairwise correlation coefficients between delay in presentation and factors associated with delay were conducted and served as a foundation for a multivariate log-linear regression model.

**Results** A total of 718 patients presented with an average delay of 22.1 months. Delays in receiving care were most common (56.4%), while delays in seeking care were seen in 52.3% of patients. “Initially seeking treatment at the nearest facility, but appropriate care was unavailable” was reported by 56.4% and predicted longer delays ( $p < 0.001$ ). 42.9% of patients had delays secondary to treatment from a traditional or religious healer, which also predicted longer delays ( $p < 0.001$ ). On multivariate regression, emergent presentation was the strongest predictor of shorter delays (OR 0.058,  $p = 0.002$ ), while treatment from a traditional or religious healer and initially seeking treatment at another hospital predicted longer delays (OR 7.6,  $p = 0.008$ , and OR 4.3,  $p = 0.006$ , respectively).

**Conclusions** Barriers to care leading to long delays in presentation are common in northern Ghana. Interventions should focus on educating traditional and religious healers in addition to building surgical capacity at district hospitals.

## Introduction

Five billion people do not have access to safe surgical and anesthesia care when needed [1]. Access is worst in low- and middle-income countries (LMICs) where conditions

that benefit from safe, timely surgery make up as much as 16% of the disease burden [2]. Investing in surgical services in LMICs is necessary to save lives, but understanding barriers to early presentation is also necessary. As early as 1943, physicians began to document delays in treatment and then thought to be secondary to “a

✉ Micah G. Katz  
micah.katz@hsc.utah.edu

<sup>1</sup> Department of Surgery, School of Medicine and Health Sciences and Tamale Teaching Hospital, University for Development Studies, P.O. Box TL 1350, Tamale, Ghana

<sup>2</sup> Department of Economics, Health Economics Core, CCTS Population Health Research Foundation, University of Utah, 30 N 1900 E, Rm 3B110 SOM, Salt Lake City, UT 84103, USA

<sup>3</sup> Department of Internal Medicine, IDEAS Center, Veterans Affairs Salt Lake City Health Care System, University of Utah, 30 N 1900 E, Rm 3B110, Salt Lake City, UT 84103, USA

<sup>4</sup> Department of Surgery, Center for Global Surgery, University of Utah, 30 N 1900 E, Rm 3B110 SOM, Salt Lake City, UT 84103, USA

multiplicity of conscious and unconscious psychological factors” [3]. For medical conditions that require surgical intervention, delays in presentation and treatment have a profound impact on surgical and disease complications, as well as outcomes [4]. Understanding barriers to timely, essential surgery are paramount in LMICs, where a considerable proportion of global health burden lies and challenges to healthcare access are myriad [5–10].

Resources, both physical and human, are necessary to provide timely care, but economic and geographic restrictions, cultural and religious beliefs, and poor education may serve to delay presentation by patients with surgical conditions. Barriers that lead to delays in seeking care have long been recognized problems throughout the medical community [11, 12]. More recently, a *Three-Delay* framework has been suggested in the context of surgical care in LMICs [1]. *The First Delay*, in seeking appropriate care, occurs when patients wait to seek healthcare or, for example, turning to traditional healers or prayer camps. *The Second Delay*, in reaching care, occurs due to poor access or lack of transportation to the nearest facility. *The Third Delay*, in receiving care, occurs when treatment is delayed, denied, or unavailable at the nearest health facility.

Tamale Teaching Hospital (TTH) is the only large referral center in the northern part of Ghana, the poorest and most sparsely populated area in the country with the worst access to surgical services [13]. Our experience has been that patients face significant barriers to receiving timely care, often presenting to TTH months or years after the onset of disease or injury [14].

The purpose of this study is to characterize the reasons for delay in seeking surgical care among patients presenting to TTH. Identifying the source of greatest delays may lead to targeted interventions and can provide a benchmark against which interventions to reduce delays can be measured.

## Materials and methods

### Setting

Ghana is a LMIC in West Africa, with a population of 26 million (Fig. 1). As a tertiary healthcare facility, TTH serves the three regions of the north, namely the Upper East, Upper West, and Northern regions.

### Participants

From January 2013 to December 2013, all patients reporting with surgical conditions were prospectively identified and assessed for delays in presentation. All

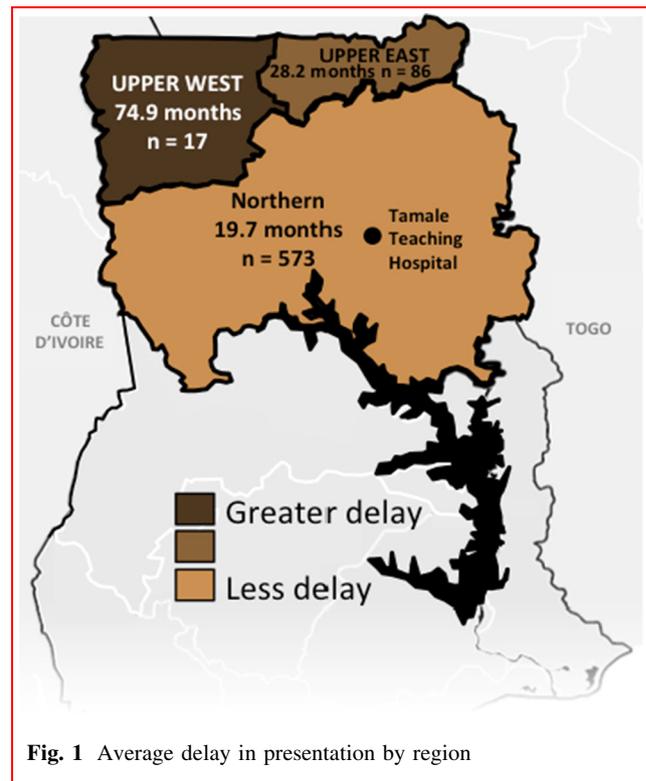


Fig. 1 Average delay in presentation by region

patients seeking elective or emergency care on the surgical ward, endoscopy unit, accident and emergency department, and outpatient surgery clinic at TTH were considered. Exclusion criteria included patients unwilling to give consent, and residence outside of the Northern, Upper East, or Upper West Regions.

### Definitions

Delays were defined as any passage of time having a potential impact on the morbidity, treatment, or outcome of the presenting illness, as determined by the assessing physician. We could not find consensus on definitions for delays and used greater than 7 h for emergent presentation, or greater than 7 days for non-emergent presentation, based on author experience. Length of delay was defined as the earliest onset of symptoms or trauma, to time of presentation at TTH. Emergent presentation was defined as any illness that threatened life, limb, or eyesight, as determined by the admitting physician.

Nurses, physicians, and research assistants collected data, first from the patient’s chart and, secondly, from the patient or close relative able to speak for the patient. Patients were asked for their age, religion, and educational level. In addition, patients were asked what led to a delay in presentation, with the following predetermined categories:

- *First delay*—in seeking care
  - Patient did not believe symptoms represented a problem
  - Sought treatment from a traditional/religious figure
  - Fear of coming to the hospital
- *Second delay*—in reaching care
  - Difficulty obtaining transport/hospital too far away
- *Third delay*—in receiving appropriate care
  - Sought treatment at the nearest facility, but care was unavailable

Patients were allowed to select multiple reasons for delay. Patients who, right from the beginning of the surgical condition, presented to TTH were categorized as “*first*” or “*second*” delays, while cases who received care at another hospital were considered “*third delay*.” For patients that sought treatment at another hospital, delay was measured from the time of presentation at the referring hospital to reaching TTH.

In addition to determining which patients had delays and emergent presentation, the patients’ chief complaint was classified from a preselected list by the admitting physician. Treatment was categorized into surgical (any operation that occurred in the operating theater), procedural (endoscopy or interventions done at the bedside), and conservative (medical management only). Complications were defined as any unfavorable outcome, secondary to the presenting disease or subsequent treatment, as determined by the treating physician.

## Analysis

Pairwise correlation coefficients between delay in presentation and factors possibly associated with delay were conducted to determine the strength and the statistical significance of the association. We then specified variables to be included in a multivariate log-linear regression model based on whether  $p$  values of the correlation coefficients were  $< 0.05$ . Standard errors in our regression were clustered by region to allow for dependence within regions, while assuming independence across regions. Our outcome variable is the exponentiated natural log of delay in presentation measured in months. We transformed our outcome variable in log form after initial diagnostics of the linear model indicated non-normal distribution of our error terms. All statistical analysis was implemented in Stata 15.1 (StataCorp., College Station, TX).

## Ethical approval

The study received ethical approval from the Ghana Health Service (approval ID NHRCIRB162).

## Results

Our study population was composed of 718 patients that presented to TTH in 2013 with delays in presentation. During this period, there were 2876 surgical consults, yielding a 25% rate (718/2876) of consults with associated delays in presentation. The average delay from onset of illness to presentation to TTH was 22.1 months (Table 1). The mean delay was least for a chief complaint of trauma (2.1 months), followed by respiratory complaints (7.5 months). The longest delays were seen for neurological reasons (43.2 months), bleeding (38.9 months), and other (56.1 months).

Table 2 shows basic patient demographics and ultimate treatment. 58.4% of patients were male, and the average age was 35 years. Forty-four percent presented with emergent problems. The majority (70.2%) had enrolled into the National Health Insurance Scheme (NHIS), 64.8% identified as Muslims, and 45.8% had no formal education. Ultimately, 53.3% of patients had complications associated with the disease, and 24.9% of patients receiving surgical treatment experienced complications related to surgery. The perioperative mortality rate was 12 per 1000 surgeries.

The majority of patients came from the Northern Region (85%) (Fig. 1). Patients from the Upper West district had the longest average delay (74.9 months, 17 delays recorded), while patients from the Northern Region had the shortest delay (19.7 months, 573 recorded delays).

Eighty-two percent of patients reported a reason for delay that fit within the pre-defined categories of this study, and 28% of those patients reported more than one reason for delay. The most common reasons for delay were

**Table 1** Mean delay in presentation by chief complaint

Chief complaint	Mean delay (in months)	$n$	%
Neurological	43.2	54	7.4
Bleeding	38.9	18	2.5
Other	56.1	57	7.9
Infection	29.9	53	7.4
Mass	23.4	54	7.5
Pain	21.8	346	48.2
Respiratory	7.5	15	2.1
Trauma	2.1	122	17
All	22.1	718	100

**Table 2** Patients demographics

Variable	Percent
Male	58.4
Age (mean)	35.0
Emergency	43.5
Referred	44.2
National Health Insurance Scheme	70.2
<i>Mode of transport</i>	
Private	69.9
Ambulance	8.6
Bus	1.4
Taxi	5.8
Not reported	14.1
<i>Religion</i>	
Christian	29.4
Islam	64.8
Traditional	2.2
<i>Education</i>	
No formal education	45.8
Primary	12.8
Middle	9.6
Secondary	12.5
Tertiary	11.4
Not reported	7.8
<i>Treatment</i>	
Surgery	46.4
Procedure	8.2
Conservative	39.6
Unknown	5.8

**Table 3** Reasons for delay in presentation

Reason for delay	n	%
<i>First delay—in seeking care</i>		
Patient did not believe symptoms represented a problem	42	5.8
Sought treatment from traditional/religious figure	308	42.9
Fear of coming to the hospital	26	3.6
<i>Second delay—in reaching care</i>		
Difficulty obtaining transport/hospital too far away	33	4.6
<i>Third delay—in receiving care</i>		
Sought treatment at the nearest facility, but care unavailable	405	56.4

seeking care at another hospital where appropriate care was not available (56.4%), followed by seeking care from traditional or religious healers (42.9%) (Table 3).

**Table 4** Factors associated with delay in presentation

Factor	Pearson’s CC	Spearman’s rho	p value
<i>Treatment related</i>			
Surgery***		−0.106	0.006
Procedure		0.044	0.249
Emergency***		−0.508	<0.001
Conservative***		0.076	0.047
Complication		0.063	0.094
<i>Mode of transport</i>			
Private***		0.221	<0.001
Ambulance***		−0.221	<0.001
Bus		0.033	0.387
Taxi***		−0.112	0.035
<i>Self-reported</i>			
Misunderstood severity of symptoms		0.021	0.587
Sought treatment: other hospital***		0.237	<0.001
Sought treatment: religious/traditional healer***		0.383	<0.001
Fear of hospital***		0.112	0.003
Transportation issues***		−0.079	0.040
<i>Other factors</i>			
No formal education		−0.035	0.371
Christian***		0.105	0.006
Muslim		−0.043	0.269
Age***	0.127		0.001
Male***		−0.081	0.035
National Health Insurance Scheme***		0.101	0.009
Distance to hospital	0.053		0.168
Time to hospital	0.057		0.140

\*\*\*Statistically significant ( $p < 0.05$ )

Table 4 shows the strength of association between delay in presentation and all our variables. Factors associated with significantly greater and lesser delays were all included in our multivariate regression of log months of delay in presentation (Table 5).

On multivariate log-linear regression, patients presenting emergently, with NHIS coverage, seeking religious/traditional healer, or at another hospital were the most significant predictors of delay in presentation. Our model explained 43.9% of the variation in log delay in presentation. There were no qualitative changes to our model when removing patient’s age as a covariates and using 684 observations in our regression.

**Table 5** Multivariate regression of log delay in presentation (in months)

	Odds ratio	<i>p</i> value	95% CI
Surgery	0.941	0.661	(0.562, 1.575)
Conservative	0.650	0.229	(0.220, 1.920)
Emergent**	0.0575	0.002	(0.0349, 0.0947)
Private transportation	0.845	0.649	(0.215, 3.319)
Ambulance	0.206	0.069	(0.0311, 1.358)
Taxi	0.321	0.058	(0.0936, 1.100)
Sought treatment: other hospital**	4.253	0.006	(2.581, 7.008)
Sought treatment: religious/traditional healer**	7.557	0.008	(3.389, 16.85)
Fear	2.853	0.145	(0.413, 19.73)
Reported transportation issue	0.779	0.335	(0.331, 1.831)
Christian	1.906	0.06	(0.934, 3.889)
Age	1.009	0.109	(0.995, 1.023)
Male	0.887	0.77	(0.189, 4.153)
National Health Insurance Scheme*	1.508	0.019	(1.182, 1.924)
N			644
R2			0.439

Exponentiated coefficients; 95% confidence intervals in brackets

Statistical significance: \* $p < 0.05$ , \*\* $p < 0.01$

## Discussion

Barriers to care leading to long delays in presentation are commonly seen at TTH and patients averaged 22.1 months from symptoms to presenting to the hospital. While the numbers paint a grim story, they only reflect the unacceptability of the situation at TTH and cannot fully capture the distressing reality.

The most common type of delay occurred after patients sought care at another hospital, but appropriate care was unavailable. Referral is appropriate for complicated surgical conditions. Some patients, however, were referred for common problems, such as incision and drainage, that district hospitals should have the capacity to perform [1]. Therefore, one strategy to decrease delays would be expanding surgical capacity in district hospitals to ensure that short-term treatment of life-threatening conditions is

available [15, 16]. However, with current, limited capacity at district hospitals in Ghana [9, 13], it is common that a patients' problem may exceed their hospitals' capacity. Our study design does not elaborate what specific barriers lead to a delay in reaching TTH, which warrants further investigation. Although only 4.6% of patients report difficulty obtaining transport to TTH, our personal experience is that the inconvenience and fear of traveling to the city, along with financial limitations, are major barriers. This discrepancy might be explained because "unavailable care" was chosen as the primary reason for delay and a second reason was not used. Regardless, to reduce delays after referral, we recommend ensuring that the referral process for patients is clear and that access to transportation is secured.

In northern Ghana, traditional perceptions of illness still hold, and patients often believe their illness is caused by sorcery or witchcraft [17, 18]. Forty-eight percent of patients cited treatment by traditional or religious healers, which led to the greatest lengths of delays. These results are not surprising, as a majority of the population in rural Ghana rely on traditional medicine for their health needs [19]. While traditional methods of treatment are embedded in the culture and religion of Ghana [17, 18], traditional healers are also more prevalent and affordable. In 2016, the doctor-to-population ratio was 1:13,419 in the Northern Region, 1:18,986 in the Upper West Region, and 1:25,878 in the Upper East Region [20], while the patient-to-traditional healer ratio is closer to 1:200 [21]. Traditional healers often do not charge in advance, but are instead compensated if their treatment leads to recovery [18, 22]. While integrating traditional or religious healers into the healthcare system would face challenges, an integrated approach may lead to earlier referral and a minimization of delays [23].

Delays in presentation were longest in the Upper West Region, followed by Upper East Region, and then the Northern Region, where TTH is located. Although referral patterns may play a role in longer delays, distance and time to TTH did not predict longer delays and few patients (4.6%) reported that distance to the hospital or problems with transportation were barriers to early presentation. Poverty and the cost of medical care may play a role—while the three regions studied are among the poorest in Ghana, the Upper West Region has the highest rate of poverty depth and severity [24], and the longest delays. Indeed, previous authors have noted low access to surgical care with a significant need for health improvements in the Upper West Region [13, 25, 26].

Fifty-four patients (7.5%) presented with masses, and the average delay was 23.4 months for this group. In patients with cancer, delays have been associated with a later stage at presentation leading to increased mortality

[27, 28]. Twenty-four patients over this period of review presented with breast masses with an average delay of 11 months. Unfortunately, delays in presentation for breast cancer are a common problem in Ghana where over 50% of patients present with an advanced stage [29], a rate consistent with other countries in sub-Saharan Africa [30]. Our finding of long delays for other masses only confirms the need for promoting self breast exams and education to encourage early presentation for concerning findings.

Several other factors were associated with shorter and longer delays. Trauma and respiratory symptoms resulted in the shortest delay, which is not surprising due to their urgent nature. With average delays of 2.1 and 7.5 months, however, even these patients are presenting after distressingly long delays. Other correlations are more difficult to explain: On multivariate analysis coverage by NHIS predicted longer delays. Although NHIS was designed to cover necessary medical care without shared costs [31], this rarely occurs at our institution and patients face expenses in receiving medical care. The impact of NHIS on delays in addition to the contribution of cost should be further studied. Ultimately, only emergent presentation was a strong negative predictor of delays. These results highlight the multiple factors that lead to delay, and that barriers to early presentation are nuanced, guided by culture, infrastructure, poverty, and education. Previous groups have assessed perceived barriers to access of surgical care in the Upper West Region of Ghana, finding that barriers to seeking and receiving care differ between communities [9]. This study expands on this literature and serves to tease out the most common reasons for delays at TTH.

This study has several limitations. Without data from patients with early presentation, we are unable to compare characteristics of patients with and without delays. Our protocol allowed the treating physicians to determine what constituted a delay in presentation, which may have led to the over- or under-capturing of data. In particular, our study design is unable to account for referral patterns that may lead to system delays. Although this study characterizes reasons for delay, barriers to getting to TTH after referral, in particular, need to be better investigated. Finally, our study was not designed to capture *Third Delays* that occur after patients present to TTH. Even after reaching our hospitals, patients experience delays, especially in emergency settings due to erratic power, water, and oxygen supply, which warrants further characterization.

## Conclusions and recommendations

Barriers to care leading to long delays in presentation are commonly seen at TTH. The most common and greatest predictors of longer delays are treatment from traditional or

religious healers in addition to originally seeking care at another hospital, but appropriate care was unavailable. The ability to treat surgically related life-threatening problems in district hospitals should be expanded to meet international recommendations. Further study is needed to define why essential surgical care is not available and should focus on provider knowledge and skills, in addition to ensuring that necessary resources are available. Identified deficiencies should be targeted by the Ghana College of Physicians and Surgeons along with the Ghana Ministry of Health. Patient education and improved interaction or integration of religious and traditional caregivers may lead to shorter delays. We recommend further study into the referral patterns of religious and traditional healers, along with investigating collaborative models to expedite referrals. This research may be performed and then implemented by the Public Health Unit of the Ghana Health Service.

## Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Authors' contribution** ST, MD, and FA designed the study and facilitated collection of data. MK wrote the manuscript with ST and AJ. All authors revised the drafted manuscript and provided critical revision of the manuscript for important intellectual content.

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