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Unequal access to ART: exploratory results from rural and urban case studies of ART use

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ABSTRACT

Introduction

South Africa has the world's largest Antiretroviral Treatment (ART) programme. While services in the public sector are free at the point of use, little is known about overall access barriers. This paper explores these barriers from the perspective of ART users enrolled in services in 2 rural and 2 urban settings.

Methods

Using a comprehensive framework of access, interviews were conducted with over 1200 ART users to assess barriers along three dimensions: availability (fit between patient needs and the type, place and time of services provided), affordability (fit between full costs of service use and ability to pay) and acceptability (fit between provider and patient attitudes towards and expectations of each other). Summary statistics were computed and comparisons of access barriers between sites were explored using multivariate linear and logistic regressions.

Results

While availability access barriers in rural settings were found to be mitigated through a more decentralized model of service provision in one site, affordability barriers were considerably higher in rural versus urban settings. 50% of respondents incurred catastrophic health care expenditure and 36% borrowed money to cover these expenses in one rural site. On acceptability, rural users were less likely to report feeling respected by health workers.

Conclusion

Results suggest inequitable access to ART for rural relative to urban users. Minimizing access barriers requires an understanding of their context-specific and multi-dimensional nature. This study is one of the first to present comprehensive evidence on access barriers to assist in the design of policy solutions.

BACKGROUND

Southern Africa has more than 35 per cent of the world's HIV-infected people, half of whom live in South Africa [1]. In 2003, the South African government introduced Antiretroviral Treatment (ART) free at the point of use in selected public health facilities. Between 2003 and the end of 2009, approximately 1 million adults and children were enrolled onto ART. While this is a considerable achievement, coverage of those in need was only at 56 per cent in 2009; between 2003 and mid-2009 it is estimated that 2.4 million people died from HIV-related causes, many of whom would not have had access to ART [2-4].

In the 2007 "HIV&AIDS and STI National Strategic Plan"[5] the South African government committed to providing "an appropriate package of treatment, care and support services to 80 per cent of people living with HIV… by 2011" (p. 64). However, there are no commitments to ensuring that access to treatment reaches the poor and those in rural areas during the period of scale-up. The inverse equity hypothesis suggests that the introduction of new interventions might lead to a paradoxical worsening of health equity as those in urban areas and those of higher socioeconomic status (SES) might initially have better access to the service. Because of this, some have called for the specific inclusion of health equity targets within overall HIV-treatment targets so that progress on this front can be monitored [6].

The South African government has recently acknowledged that the availability of ART services in urban informal settlements (where poverty is pervasive and HIV-prevalence is highest) and in rural areas has been limited, and plans to address these inequities in resource allocation [3]. At the time of writing, ART has been offered from approximately 500 public health care facilities, predominantly hospitals and community health centres. To increase availability, government intends to decentralize provision to enable all of the country's 4000 public facilities to initiate patients on ART through a process of task shifting from physicians to nurses. This will in addition make the service more accessible by bringing it closer to where people live [3].

Increasing coverage and ensuring retention in care requires a context-specific understanding and response to the barriers to access and use. While improving access to health care is a frequently identified goal of health policy, there is still debate about the precise meaning of the term. In the earlier literature, access was primarily viewed in terms of two factors - money fees at the point of use, and distance travelled to use care. Others have defined access in terms of service use or coverage, perhaps because this is easier to quantify [7]. More recently, access has been defined as the empowerment of an individual to use health care, a multidimensional notion based on the degree of fit between health care systems, individuals, households and communities. Under this conceptual framework, the three dimensions of access are availability (or physical access), affordability (or financial access) and acceptability (or cultural access) [8]. These dimensions are argued to act as a starting point for empirically investigating access and for developing heath policy strategies that can address these barriers [9].

Despite the importance of enhancing access to ART, very little research has been conducted regarding the barriers faced by individuals using ART services. A recent review found only 6 studies on this topic in developing countries published in the peer reviewed literature [10]. The review concluded that lack of awareness, stigma, affordability and distance to the health facility were the key barriers and commented on the lack of studies comparing access barriers between rural and urban areas.

This study unpacks the barriers to accessing ART through 2 rural and 2 urban case studies of adults using ART in South Africa. Findings from the study may provide evidence to assist government in designing policies to improve health equity between geographic locations.

METHODS

Conceptual framework of access

This study draws on a comprehensive conceptual framework of access where access is viewed as the degree of fit between population needs and health system responses in terms of affordability (fit between costs of utilising the service and household ability to pay), availability (fit between patient needs and the type, place and time of services provided) and acceptability (fit between provider and patient attitudes towards and expectations of each other) [8, 9]. Following Braveman [11], inequitable access arises if barriers are systematically different for individuals with different levels of social advantage, including with reference to their geographical location. In other words, if the fit between health care costs and household ability to pay is less favourable in rural areas, then this is evidence of inequitable access to ART.

Each access dimension is captured by a number of variables, examples of which are outlined in Table 1. Availability variables include the travel time to reach the ART facility, the mode of travel and the time spent at the clinic during the previous clinical consultation.

Affordability variables include whether or not the respondent was receiving a government chronic care (disability) grant (R1,000 per month). At the time of this study, patients starting ART qualified to receive this grant for a six month period if their annual income was lower than a particular threshold (R29,112 for single people or R58,224 for married people). In addition, information on health care expenditure was collected including the costs incurred during the current ART clinic visit (transport, someone to take over tasks including child care, accommodation if necessary, food during the visit and telephone costs). These costs were converted to monthly expenditure estimates using information on the reported frequencies of ART clinic visits. Respondents were also asked about "self-care" expenditure that they had incurred during the previous month (e.g. costs of special food and over the counter medicines or vitamins, costs of buying traditional medicines) as well as any expenditure that they had incurred through seeking additional care from other providers (including general practitioners in the private sector, traditional healers, etc). By contrasting these costs with overall household expenditure, catastrophic expenditure – defined as expenditure on health care exceeding 10% of household expenditure [12] – was assessed. We also asked respondents whether they had needed to borrow money to cover these costs.

In terms of acceptability, we asked respondents to report their perceptions of staff attitudes ("Some staff do not treat patients with sufficient respect"), cleanliness ("The facilities (including waiting areas and toilets) are dirty"), the length of queues ("The queues to see a doctor or nurse are too long at this facility") and perceptions of stigma ("Do you feel that people in the community judge you negatively for attending this facility for your ARV treatment?").

Table 1: Dimensions of access

Availability	Affordability	Acceptability
Mode and cost of transport Travel time to facility Waiting time at facility	Overall expenditure on health care (including expenditure to reach ART facility, expenditure on self care, and expenditure on other providers) Health care costs as a proportion of household expenditure Needing to borrow money to pay for health care expenses Receipt of government "disability" grants	Perceptions of staff attitudes, facility cleanliness, length of queues, and community judgment (as a proxy for stigma)

Adapted from Thiede, Akweongo *et al.* [9]

Setting and participants

Four sub-districts were purposively selected from four provinces representing two metropolitan urban (Soweto in the City of Johannesburg, Gauteng Province and Mitchells Plain in the Cape Metropole, Western Cape Province) and two deep rural settings (Hlabisa in Northern Kwa-Zulu Natal and Bushbuckridge in Mpumalanga Province). These sites also present a mixed picture with respect to models of ART care – from decentralized, nurse-based provision in one rural site (Hlabisa) to a prominent tertiary hospital based service in one urban sub-district (Soweto). Table 2 documents contextual differences between sub-districts. HIV-prevalence at the district level has also been documented, although it should be borne in mind that there may be a great deal of heterogeneity in each district and these results may not be applicable to the sub-district population. However, based on these estimates together with population size and numbers on ART, Bushbuckridge can be classified as low, Hlabisa as high, Soweto as medium and Mitchells Plain as high in terms of the coverage of those in need of ART.

Table 2: Profile of each sub-district: population, type of service provision (centralized, decentralized), number of people on ART at time of research.

Sub-district	Bushbuckridge	Hlabisa	Soweto	Mitchells Plain
Setting	Rural Mpumalanga	Rural KwaZulu-Natal	Urban Gauteng	Urban Western Cape
Population size	+/-500,000	228,000	>1 million	290,000
Health service	1 District & 1 Regional Hospital 1 CHC 33 PHC clinics	1 District Hospital 15 PHC clinics	1 National Central & 1 TB Hospital 5 CHCs 26 PHC clinics	3 Community Health Centres (CHC) 10 Primary Health Care (PHC) clinics
Model of ART service provision at time of research (2008/9)	Separate (doctor based) clinics within outpatient departments of two local hospitals with plans for down referral of stable cases to two nurse-based CHCs	Decentralized, nurse based service in all 16 service delivery sites since late 2007	Long standing large clinics (adult and paediatric) in central hospital, decentralised doctor based services in 4 CHCs and 1 PHC clinic	Doctor based services in 3 CHCs
Numbers on ART (date)	3,900 (March 2008)	7,576 (December 2008)	+/-28,500 (December 2009)	4,843 (October 2008)
HIV prevalence in 2008/09 antenatal clinic survey of pregnant women (by District)	34.9% (Ehlanzeni District)	39.9% (Umkhanyakude District)	29.7% (City of Johannesburg)	17.9% (Cape Metropole)

A representative sample of 1267 ART users was interviewed within 12 ART facilities across the four settings (approximately 300 respondents per setting). An interviewer administered questionnaire was designed to collect socioeconomic and demographic data as well as information regarding key barriers to accessing ART from the perspective of ART users. Subjects were included if they had been taking ART for at least 14 days, were over the age of 18 and were judged sufficiently well by clinical staff to be interviewed. After obtaining written informed consent to participate in the study, the interview was conducted by trained fieldworkers in the language of each subject's choice. Ethical approval for the study was granted by committees at the Universities of Cape Town, Witwatersrand and KwaZulu-Natal. Further permission to conduct the research was obtained from provincial and local health authorities.

Data analysis

Completed questionnaires were checked for accuracy by a data collection coordinator and double entered into a data entry platform specifically designed for this purpose in EpiData version 3 [13].

Data were then exported to Stata/IC 11.0 for analysis. A measure of socioeconomic status (SES) was constructed using Multiple Correspondence Analysis (MCA) on a number of selected household characteristics (including type of house, walls, toilet facility, roof, water supply, electricity for cooking etc), assets (including fridge, stove, DVD player, television, cellphone, bicycle etc) and other factors associated with deprivation at the household level (including the sex, education and employment status of the household head). While the construction of SES indices is commonly achieved using Principal Components Analysis (PCA) [14], such a technique is more appropriate for use with continuous, normally distributed data as opposed to the predominantly categorical data often used in SES indices development [15].

Summary statistics were used to compute average scores for each access variable, by site, and multivariate logistic and linear regressions were used to test for differences in access after controlling for socioeconomic (asset index, employment status, education) and demographic (sex) characteristics. This allowed for us to focus specifically on the site-level (rural/urban) access barriers and to test for inequalities in these barriers between sites, after holding other measures of social disadvantage constant. We also controlled for baseline CD4 count at the commencement of ART and time since commencement of ART. These were felt to be relevant in that sicker/healthier patients and those on ART for shorter/longer might face different access barriers. For example, stigma might be a higher barrier initially, while affordability barriers might be compounded over time. Skewed quantitative variables were logged before inclusion in multivariate analysis.

RESULTS

Table 3: Socio-demographics and health status by site

	Bushbuck-ridge (rural)	Hlabisa (rural)	Soweto (urban)	Mitchells Plain (urban)	p-value
Sample size	312	300	331	323	
Sociodemographics					
Asset index (% in poorest half)	72.76	86.33	16.92	29.72	<0.001
Respondent employed (%)	17.31	12.00	28.05	30.96	<0.001
Mean (median) years of schooling	7.3 (8)	6.6 (7)	9.4 (10)	9.2 (10)	<0.001
Sex (% female)	75.64	62.00	80.66	75.54	<0.001
Mean (median) age in years	38 (38)	39 (37)	38 (37)	34 (32)	
Baseline health status and time on treatment					
Median baseline CD4 count (IQR)*	102 (49-153)	124 (73-176)	100 (44-158)	124 (70-175)	0.002
Mean (median) months on ART	15.69 (12)	18.88 (15)	17.68 (13.5)	12.32 (5)	<0.001

*IQR – Interquartile Range

Table 3 documents key socioeconomic and demographic variables by site. Rural respondents had lower socioeconomic status than urban respondents. Asset index scores indicated that 73% and 86% of respondents in rural Bushbuckridge and Hlabisa fell into the poorest 50%, in contrast with 17% and 30% in urban Soweto and Mitchells Plain. Similarly, 17% and 12% of respondents in Bushbuckridge and Hlabisa were employed, compared to 28% and 31% in Soweto and Mitchells Plain. Rural respondents also had lower mean number of years of education. While the baseline CD4 count was similar across sites, respondents in urban Mitchells Plain had spent less time on ART.

Table 4 presents the site level results on each of the access variables included in this analysis. The results of multivariate regressions are shown as adjusted odds ratios (AOR) or coefficients. Using rural Bushbuckridge as the referent, these results summarize differences between Bushbuckridge and the other sites across each dependent access variable, after controlling for socioeconomic status (asset index), sex, years of education, employment status (employed or not), time on treatment and baseline health status (CD4 count).

Availability

In terms of availability (table 4, figure 1), rural users on average spent more time travelling to the facilities than urban users. These findings however may have less to do with the setting and more to do with the service delivery model. Thus while availability barriers were highest in rural Bushbuckridge across most variables, it is noteworthy that the model of decentralized service provision in the Hlabisa site suggests the potential to overcome many of these barriers in rural areas. For example, it could be argued that the ability to reach the facility by foot indicates that the

services are located close to the homes of respondents. Here, 32.4% and 32.1% of respondents from rural Hlabisa and urban Mitchells Plain reported travelling by foot to the facility. These two sites were also characterised by higher coverage of those in need and a more decentralized model of service provision (Table 2). Once at the facility, respondents spent over 3.5 hours, with similar waiting times across most settings, with the exception of Mitchells Plain where mean waiting times were higher.

Affordability

Very few respondents were in receipt of the government disability (chronic care) grant. Based on the income qualifying criteria, 98%,100%, 91% and 93% of respondents would qualify for the grant in Bushbuckridge, Hlabisa, Soweto and Mitchells Plain respectively. In contrast, only 46%, 48%, 24%, and 31% received it. While it may be tempting to suggest that this is an area where rural sites could be achieving more favourable access, it is also possible that access barriers are lower because both rural sub-districts have Demographic Health Surveillance sites which would typically increase the resources available in these areas (e.g. through donor funding for research and non governmental organisations).

Total expenditure on health care was considerably higher in the two rural sites (see table 4 and figure 2) and respondents in these sites were also more likely to report catastrophic expenditure, defined as spending more than 10% of household resources on health care, as well as needing to borrow money to cover health care expenses. While respondents in these sites spent far more on travel and other factors associated with reaching and spending time at the ART facility, particularly high levels of health care expenditure were attributable to spending on self care (over the counter medicines, traditional medicines). In Hlabisa, respondents reported mean expenditure of R87.96 on self care practices; 50% of respondents in this site incurred catastrophic expenditure. On the other hand, there were no significant differences on spending on other providers (including private general practitioners) – with respondents in all sites spending just over R20 on this category.

Acceptability

Rural/urban patterns in perceptions of the acceptability of services were less clear. Respondents in rural Bushbuckridge were considerably more likely to report that queues were too long, despite the fact that estimates of overall waiting times were similar across sites. Dirty facilities were reportedly more problematic for respondents in Bushbuckridge and Mitchells Plain, and fears of stigma ("Do you feel that people in the community judge you negatively for attending this facility for your ARV treatment?") were lower in the high coverage, decentralized services of Mitchells Plain and Hlabisa. However, a higher proportion of respondents reported respectful interpersonal relationships between staff and patients in the two urban sites relative to the rural sites.

Table 4: Access by site

	Bushbuckridge (rural)		Hlabisa (rural)		Soweto (urban)		Mitchells Plain (urban)	
Availability	Mean / percent	AOR/ Coef	Mean / percent	AOR/ Coef (95% CI)	Mean / percent	AOR/ Coef (95% CI)	Mean / percent	AOR/ Coef (95% CI)
Mean travel time to clinic (minutes)	74.94	#	66.40	**-9.01* (-15.34 - -2.65)**	33.23	**-39.21* (-46.14 - -32.28)**	23.48	**-49.43* (-56.09 -42.76)**
Transport by foot (%)	5.45	#	32.44	**9.09* (5.05 - 16.36)**	19.64	**7.68* (4.03 - 14.62)**	32.09	**11.29* (6.10 - 20.89)**
Mean time at clinic for doctor/nurse visit (minutes)	213.52	#	231.70	15.70 (-4.84 - 36.24)	217.12	10.14 (-11.95 - 32.23)	243.88	**42.05* (20.94 - 63.17)**
Mean time at clinic to collect ARV medication (minutes)	**241.38**	#	**169.37**	**-72.64* (-91.04 - -54.25)**	**100.59**	**-136.98* (-157.04 - -116.92)**	**163.04**	**-74.47* (-93.68 - -55.26)**
Affordability		#						
Respondent receives a disability (chronic care) grant (%)	45.51	#	47.67	0.96 (0.67-1.35)	23.56	**0.36* (0.24-0.55)**	30.96	*0.72** (0.49- 1.04)*
Expenditure on other providers in past month (ZAR)	21.81	#	24.50	0.22 (-0.05 0.49)	21.75	-0.13 (-0.42 - 0.16)	23.09	-0.01 (-0.29 -0.28)
Expenditure on self care in past month (ZAR)	30.18	#	87.96	**1.50* (1.23 - 1.78)**	1.86	**-0.86* (-1.16 - -0.56)**	12.91	**-0.39* (-0.68 - -0.10)**
Expenditure to reach and during ART facility visits in part month (ZAR)	43.76	#	44.68	**-0.40* (-0.61 - -0.19)**	10.76	**-1.69* (-1.92 - -1.46)**	8.58	**-1.95* (-2.17 -1.73)**
Total expenditure on health care in past month (ZAR)	95.75	#	156.43	**0.31* (0.04 - 0.58)**	34.37	**-1.77* (-2.06 - -1.48)**	44.92	**-1.68* (-1.95 - -1.40)**
Households incurring health care costs greater than 10% of household expenditure (%)	25.60	#	50.18	**2.94* (2.03 - 4.26)**	8.18	**0.28* (0.16 - 0.50)**	8.20	**0.27* (0.16 - 0.45)**
Respondent borrowed money to pay for health care in the past month (%)	27.24	#	36.33	**1.48* (1.03 - 2.13)**	1.81	**0.06* (0.03 - 0.16)**	11.18	**0.34* (0.21 - 0.55)**
Acceptability								
Respondent agrees that queues are too long (%)	81.41	#	49.33	**0.20* (0.14 - 0.30)**	65.26	**0.47* (0.31 - 0.71)**	67.60	**0.54* (0.36- 0.82)**

Respondent agrees that some staff do not treat patients with sufficient respect (%)	28.53	#	38.46	**1.61* (1.12 - 2.30)**	14.50	**0.43* (0.27 -0.67)**	16.61	**0.53* (0.35 - 0.82)**
Respondent agrees that the health care facility is dirty (%)	22.44	#	16.39	**0.62* (0.40 - 0.95)**	11.48	**0.52* (0.32 - 0.85)**	25.86	**1.54* (1.01 - 2.34)**
Respondent feels that people in the community judge him/her negatively for attending the ART facility (%)	19.55	#	15.00	**0.68* (0.44 - 1.07)**	22.42	1.46 (0.92 - 2.31)	6.21	**0.33* (0.19 - 0.59)**

AOR/coef: Odds ratio (logistic regression) or coefficient (linear regression) on site indicator, after controlling for asset index, education, sex, employment, duration on treatment and baseline CD4 count.

CI: Confidence interval

***: significant at 5% level**

***: significant at 10% level*

#: base case / referent

DISCUSSION

This study has assessed barriers to accessing ART services from the perspective of users interviewed in 12 facilities within 2 urban and 2 rural health sub-districts. Site level differences in access barriers were assessed after controlling for differences in socioeconomic status, duration on treatment, and health status at the start of treatment. Our analysis is limited to a sample of users, and so we cannot explore which determinants of access, either individually or combined, would contribute to the failure to use ART services. Instead in this analysis we are concerned with inequities in the levels of barriers faced by users within different geographic locations.

Availability access barriers to use were context specific. While the literature has suggested that rural ART users are likely to face higher travel times, are less likely to reach the facility by foot, and are more likely to wait longer for their clinical consultations (given shortages of health care human resources) [10], results from the Hlabisa site suggest that some of these access barriers can be mitigated in rural areas. In this sub-district, nurse based services are offered from all 16 service points. This contrasts with the highly centralized model of care that operated in Bushbuckridge at the time of this research, where availability barriers were found to be higher across most variables assessed.

Although there are no user fees associated with the public sector ART programme in South Africa, the affordability barriers to access faced by rural users appear sizeable. Despite their lower socioeconomic status, rural users spent more on health care and were more likely to report having to borrow money to cover these expenses. On the other hand, rural users had better access to the disability grant than their urban counterparts. Given the household expenditure levels reported by our respondents, the majority would qualify for this grant, receipt of which might mitigate affordability access barriers. While the model of care developed in the Hlabisa site appears to have mitigated many of the availability barriers, Hlabisa respondents fared worst in terms of affordability, and this site in addition had users with the poorest socioeconomic indicators. The biggest contributor to catastrophic expenditure in this site was spending on self care practices – which includes over the counter medicines and vitamin supplements. Informal reports from Hlabisa suggest that the use of the traditional medicine “uBhejane” was popular at the time of this study. This costly herbal mixture was claimed to strengthen the immune system and cure AIDS, although no evidence is available to support this claim [16]. Reliance on self- care practices may also be associated with cultural acceptability barriers and perceived poor quality of care – in other words, here is an example of how acceptability factors might mediate the degree of fit between patients and the health system around issues of affordability [17].

Other direct acceptability barriers were seen to differ across sites. While supply shortages and other organisational constraints might make it difficult for the service to reduce queues and waiting times, it is of concern that many users reported that the staff did not treat them with respect and that the services were dirty. If health care facilities are to function as places of healing, it is essential that good interpersonal relationships are developed between providers and patients [17] and that patients are not exposed to potential health risks in dirty facilities.

CONCLUSION

Rural users of ART services had lower socioeconomic status and on the whole faced higher access barriers than urban users. These findings are suggestive of inequitable access to ART in rural relative to urban areas. Although care is free at the point of use, affordability barriers are high. Decentralized

provision, outreach services and less frequent follow-up visits would be important policy options to mitigate access barriers to ART.

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COMPETING INTERESTS

None

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Figure 1: Time commitments associated with using ART services, by site

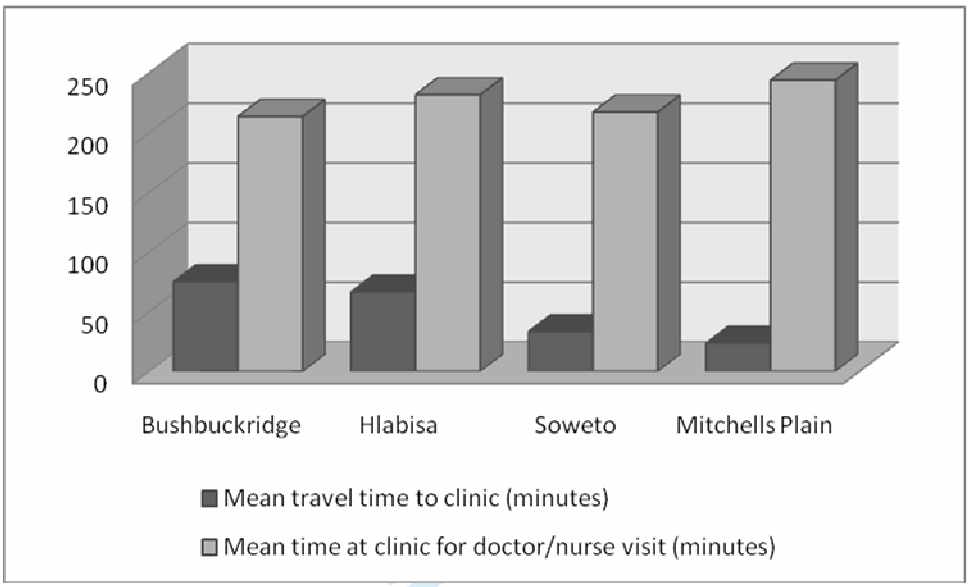

Figure 2: Expenditure on health care, by site