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ASSESSING THE QUALITY OF CARE IN FAMILY PLANNING, ANTENATAL, AND SICK CHILD SERVICES AT HEALTH FACILITIES IN KENYA, NAMIBIA, AND SENEGAL

DHS ANALYTICAL STUDIES 44



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**Assessing the Quality of Care in Family Planning, Antenatal,
and Sick Child Services at Health Facilities in Kenya,
Namibia, and Senegal**

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Preface

The Demographic and Health Surveys (DHS) Program is one of the principal sources of international data on fertility, family planning, maternal and child health, nutrition, mortality, environmental health, HIV/AIDS, malaria, and provision of health services.

One of the objectives of The DHS Program is to analyze DHS data and provide findings that will be useful to policymakers and program managers in low- and middle-income countries. DHS Analytical Studies serve this objective by providing in-depth research on a wide range of topics, typically including several countries and applying multivariate statistical tools and models. These reports are also intended to illustrate research methods and applications of DHS data that may build the capacity of other researchers.

The topics in the DHS Analytical Studies series are selected by The DHS Program in consultation with the U.S. Agency for International Development.

It is hoped that the DHS Analytical Studies will be useful to researchers, policymakers, and survey specialists, particularly those engaged in work in low- and middle-income countries.

Sunita Kishor
Director, The DHS Program

Abstract

This study assessed the quality of care at health facilities in providing family planning, antenatal care, and sick child care, using data from nationally representative Service Provision Assessment (SPA) surveys in Kenya, Namibia, and Senegal. Quality of care was measured in structure, process, and outcome of service provision. Associations between the outcome and structural and process attributes were analyzed using multiple regressions.

Health facilities had inadequate infrastructure and supplies that are essential for providing good-quality services. Shortage of service-specific guidelines and infection prevention precautions was common across service areas and countries. Other structural inadequacies include the limited number of contraceptive methods provided by family planning facilities, little use of the Integrated Management of Childhood Illness (IMCI) guide in assessing and treating sick children, and poor availability of diagnosis tests to verify malaria for children under age 5. Although hospitals and health centers generally possessed better structural attributes than clinics and other lower-level health facilities, their performance in adhering to standards of care during service delivery was not necessarily superior, and sometimes was poorer than lower-level facilities. Long waiting time was a common problem across countries and services, and was more serious in hospitals and health centers than in clinics and other facilities. Long waiting time stands out for its consistent association with lower levels of client satisfaction. Our analysis also found evidence of more client satisfaction in the private sector than in the public sector.

KEY WORDS: quality of care, client satisfaction, family planning, antenatal care, sick child care, Kenya, Namibia, Senegal

Executive Summary

Despite remarkable progress in increasing the coverage of reproductive, maternal, and child health interventions in the developing world, there has been only limited improvement in health outcomes. One reason could be poor quality of care provided in health facilities. Using nationally representative data from the Service Provision Assessment (SPA) surveys in Kenya, Namibia, and Senegal, we conducted a comprehensive analysis of the quality of care at formal-sector health facilities in providing family planning, antenatal, and sick child services. As countries strive to improve healthcare services, assessments of the quality of care can identify problems in service delivery and provide information to help guide policies and programs.

Methods

Data for this study come from SPA surveys conducted in Kenya (2010), Namibia (2009) and Senegal (2012-2013). In each country, the analysis included only those facilities providing services of interest—that is, family planning, antenatal care, and sick child services. Based on the Donabedian quality of care framework, we assessed three aspects of quality: structure, process, and outcome. The structural characteristics assessed include the facility’s management systems, service availability, physical infrastructure, and examination equipment. For this measure of quality, data were collected through the facility inventory. The process characteristics comprise both interpersonal and technical aspects of provider-client interaction. Data for this component came from direct observation of provider-client interactions. The outcome indicator—client satisfaction with services—was an index score based on client exit interview responses to a series of questions about service quality.

We use principal component analysis to construct several indices, including the structural composite score, process composite score, and the client satisfaction score for each service within each country. The score was computed based on the first principal component, which explained the largest proportion of the total variance. The structural attributes were analyzed at the facility level and compared between hospitals/health centers and clinics/others. Analysis of the process attributes and client satisfaction was conducted at the client level and comparisons were also made between the two groups of facilities. Multiple linear regression analysis was used to assess the relationship between the client satisfaction and structural and process aspects of quality of care for each group of facilities.

Results

In Kenya, the public and private sectors had about equal shares of facilities providing family planning, antenatal care, and sick child care. In Namibia and Senegal, the public sector was the primary provider of these services. Health workers in hospitals and health centers were more likely to have received service-specific training in the 2-3 years preceding the survey, but had fewer years of in-service experience compared with health workers in clinics and other lower-level health facilities.

Health facilities at both higher and lower levels of service delivery generally had inadequate infrastructure and supplies that are essential for providing good-quality services. Shortage of service-specific guidelines and infection prevention precautions was common across service areas and across the countries. Other

structural inadequacies include the limited number of contraceptive methods provided by family planning facilities, little use of the Integrated Management of Childhood Illness (IMCI) guide in assessing and treating sick children, and poor availability of diagnosis tests to confirm malaria infection in children under age 5. In Namibia, guidelines on antenatal care were observed in only 18 percent of the hospitals/health centers and 13 percent of the clinics/others. Across countries, of the 14 (or 13 in Senegal) infection prevention precautions examined, only one-half of the items were available at health facilities. Hospitals and health centers generally showed better structural quality than clinics and other facilities. In Kenya, for all three services, hospitals/health centers showed significantly higher measurements than clinics and other types of facilities for the most structural indicators studied. Although in Namibia and Senegal the gap was less prominent, the majority of structural indicators favored hospitals and health centers when there was a significant difference between the two groups.

Although hospitals and health centers generally possessed better structural attributes than clinics and other lower-level health facilities, their performance in adhering to standards of care during the process of service delivery was not necessarily superior, and sometimes was poorer than in lower-level facilities. For example, in Kenya, clinics/other showed higher measurements in several process attributes, including providing injectables to family planning clients, giving iron or/and folate tablets to ANC clients, providing sick child care information to the child's caregiver, using visual aids during consultation, and discussing follow-up visits. Long waiting time was a common problem across countries and services, and was more serious in hospitals and health centers than in clinics/others. Family planning clients had to wait one hour or longer to receive services, and pregnant women waited up to two and half hours for antenatal care services.

The client satisfaction score was higher at clinics and other types of facilities than hospitals/health centers for both family planning and sick child care services in Senegal and for antenatal care in Kenya. While a limited number of structure and process attributes were found to be associated with client satisfaction, process attributes seem to be more predictive of client satisfaction than structural ones. Long waiting time stands out for its consistent association with lower levels of client satisfaction. Our analysis also found evidence of more client satisfaction in the private sector than in the public sector.

Conclusion

Our study provided empirical evidence on the quality of care in providing key health services at health facilities of Kenya, Namibia, and Senegal. We highlighted major gaps in the availability of essential infrastructure and equipment and in the adherence to standards of good-quality practice. Findings from this analysis are expected to inform intervention programs in identifying areas for improving quality of care.

1. Introduction

Despite remarkable progress in increasing the coverage of reproductive, maternal, and child health interventions in the developing world, there has been only limited improvement in health outcomes. One of the important factors contributing to this gap could be the poor quality of care provided in health facilities. Studies have found a significant positive association between quality of care and the use of maternal and child health services, and the uptake and continuation of family planning methods (Acharya and Cleland 2000; Arends-Kuenning and Kessy 2007; Blanc, Curtis, and Croft 2002; Koenig, Hossain, and Whittaker 1997; Mariko 2003; Mensch, Arends-Kuenning, and Jain 1996). As many countries strive to improve service delivery, there is an increased need to assess the quality of care at health facilities, in order to identify problems and to understand the factors that could lead to better client care.

The concept of quality of health care, in view of its subjective nature, is difficult to define and consequently difficult to measure. Different researchers have defined the concept differently. Donabedian defined it as “the application of medical science and technology in a manner that maximizes its benefits to health without correspondingly increasing the risk” (Donabedian 1980). Ovretveit defined quality care as the “provision of care that exceeds patient expectations and achieves the highest possible clinical outcome with the resources available”(Ovretveit 1992). Over the years, a number of systems and indicators have been proposed and developed for measuring quality of health care. For example, taking a health system perspective, the World Health Organization (WHO) has recommended that quality of care should be measured in terms of six domains—effective, efficient, accessible, acceptable, equitable, and safe (WHO 2006). Earlier, Andaleeb had proposed five dimensions for its measurement—communication, cost, facility, competence, and demeanor (Andaleeb 2001). Donabedian’s three-dimension framework measures the quality of care in structure, process, and outcome (Donabedian 1988). This approach provides analytical advantages in assessing quality of care and has been adopted by many studies.

A review of the literature reveals inadequacies in the quality of facility-based family planning, maternal, and child health services. A quality assessment of newborn care in rural Ghana reported that two-thirds of babies were delivered in health facilities without an acceptable level of quality of care (Vesel et al. 2013). Another study in Brong Ahafo, Ghana, found that in spite of the high coverage of facility delivery (68 percent), the “effective” coverage of skilled attendance was low. Only 18 percent of women delivered in a facility rated “high” or “highest” quality on all four dimensions of care, including routine delivery care, emergency obstetric care, emergency newborn care, and the non-medical component (Nesbitt et al. 2013).

With the increased focus on client-centered health services, client satisfaction has been considered as an important aspect of measuring quality of care. Previous studies that examined client satisfaction linked it with the structural and process aspects of quality. For example, studies in Kenya, Tanzania, and Ghana found that family planning client satisfaction was higher in the private sector, which showed structural and process attributes superior to the public sector (Agha and Do 2009; Hutchinson, Do, and Agha 2011). Other studies, however, have found that the interpersonal relationship between provider and client is more likely to affect client satisfaction (Mendoza Aldana, Piechulek, and al-Sabir 2001).

Based on Donabedian’s framework, this study examines the quality of family planning, antenatal care, and sick child services in formal-sector health facilities in three African countries—Kenya, Namibia, and

Senegal. We focus on these three countries primarily because of the availability of detailed and representative data on health services of interest provided in health facilities. The results of this study will expand knowledge of the quality of facility-based health care and the relationships between different aspects of quality in healthcare delivery.

2. Data and Methods

2.1 Data Used in the Analysis

This study used data from Service Provision Assessment (SPA) surveys conducted in Kenya (2010), Namibia (2009), and Senegal (2012-2013). These facility-based surveys, developed by ICF International, provide information on the quality and availability of health services, including family planning, antenatal care (ANC), and sick child services. Specifically, the SPA surveys collected data on facility infrastructure (infection control practices, running water, electricity, privacy, etc.), the availability of resources (availability of equipment, supplies, and medicines) and supportive processes and systems (client records, supervision, staff training, etc.). The SPA surveys also gauged the extent to which service providers adhere to standards of care.

The SPA comprised four standardized data collection instruments that provided general and service-specific information on the availability and quality of health services in a given country. The Facility Inventory Questionnaire was used to collect information on the availability of specific family planning, antenatal, and sick child services, among others. Additionally it collected information on the general state of infrastructure, supplies, medicines, staffing, training, and procedures employed at the facility. The Provider Interview Questionnaire collected information on the experience, qualifications, and perceptions of the service delivery environment among those health care workers who provided the selected services. The SPA included observations of family planning, ANC, and sick child services to assess the extent to which providers applied accepted service delivery and quality standards. Finally, exit interviews were conducted among the patients whose consultations were observed. The exit interview included questions on the client's understanding of the consultation or examination, recall of instructions received about treatment or preventive measures, and perception of the service delivery environment.

2.1.1 Data from facility inventory

Data at the facility level were collected through the Facility Inventory Questionnaire with representative samples of the facilities in Kenya, Namibia, and Senegal. In each country, a facility sample was selected to represent the national and regional levels, by types of facilities and by managing authorities. In Kenya, a random selection of facilities was selected from a Master Facility List (MFL) of 6,192 health facilities functioning at the time of the survey, and a sample size of 703 facilities was selected. In Namibia, given the relatively small number of health facilities, the SPA was conducted among all 446 health facilities identified by the Ministry of Health and Social Services. In Senegal, the sample was selected from among 3,084 health facilities, from which a total of 438 facilities successfully completed the surveys. In this study, only facilities providing services of interest were analyzed¹.

¹ In Kenya and Namibia, facilities were selected for the analysis of each service based on positive responses to the following questions. Family Planning: "Does this facility offer any family planning services, including clinical methods, counselling or natural family planning or surgical sterilization?" ANC: "Does this facility offer antenatal (ANC) services, postnatal (PNC) services or both?" Sick Child: "Does this facility provide sick child consultations?" For Senegal, facilities were selected for the analysis of family planning and sick child services based on a positive response to the question: "Does this facility offer any of the following client services: any family planning services, including modern methods, fertility awareness methods (natural family planning), male or female surgical sterilization? Curative care services for children under age 5, either at the facility or as outreach?"

2.1.2 Data from observations and exit interviews

In each country the number of clients surveyed was selected systematically based on the number of clients visiting the facility that day for each service type and the number of providers providing that service on the same day. When many clients were present, observations were conducted among a maximum of five clients for each provider of the respective services, with up to 15 observations per service at any one facility. Where multiple eligible clients were waiting for family planning or ANC services, interviewers attempted to select two new clients for each follow-up client, when possible. Sick child observations were conducted for children under age 5 who presented with an illness. An exit interview was attempted with every observed family planning and ANC client, as well as with caretakers of observed sick children before they left the facility. ANC observations and client exit interviews were not conducted in Senegal.

2.1.3 Data from providers

The provider sample was selected from among health service providers who provided the assessed services and were present at the sampled facilities on the day of the SPA survey. For each facility, a target of eight providers was interviewed. In facilities with fewer than eight providers, all of the providers present were interviewed. Where there were more than eight providers, providers whose work was observed were given priority and selected for interview. If interviewers observed fewer than eight providers, an additional random selection of the remaining providers was interviewed to meet the target. Providers were selected for the analysis of each type of services if they responded positively to the question: “In your current position and as a part of your work for this facility, do you ever personally provide any family planning service (any child health service/child curative care service; any antenatal or postnatal care service)?”

The distribution of the samples of facilities, providers, and clients for each type of services under study are described in the Results section of this report.

2.2 Definitions of Variables

Based on Donabedian’s quality of care framework (Donabedian 1988), our study assessed three aspects of the quality of care: structure, process, and outcome. The structural characteristics come from the facility inventory and provider interview, while the process measurements primarily rely on client observation. The outcome indicator is client satisfaction as collected in the exit interview.

2.2.1 Structure and process variables

Our selection of the structure and process indicators was guided by the WHO Service Availability and Readiness Assessment (SARA) Reference Manual (WHO 2013) and consensus within the literature (Agha and Do 2009; Hutchinson, Do, and Agha 2011). A detailed description of these variables is provided in Appendices A-D.

The structural characteristics of quality of care assessed in this analysis include the facility’s management systems, service availability, physical infrastructure, and examination equipment, for which data were collected through the facility inventory. Several structural variables were combined into one composite score using principal component analysis for each service type (family planning, ANC, sick child) within each country.

The process characteristics of quality of care comprise both interpersonal and technical aspects of the provider-client interaction. The interpersonal aspects include maintenance of privacy and the handling of the client concerns. Technical aspects of the provider-client interaction include observation of the performance of specific services, such as physical examinations, patient histories, and procedures provided for the relevant family planning, ANC, or sick child services. Waiting time, provider years of related experience, and recent training in the service area also served as measures of the technical quality of care. Data for this component came from the direct observation of provider-client interactions, provider interviews, and client exit interviews. Using factor analysis, multiple process characteristics were aggregated into an index for each service type.

2.2.2 Client satisfaction

The outcome indicator—client satisfaction with services—was measured using client exit interview responses to questions about service quality. The satisfaction variable was rated as an index of problems encountered during the visit (none versus any). Clients were asked to report on 12 aspects of their perceptions of the quality of the visit. (See Appendix E for the list of questions included in the satisfaction index for all three countries.) The responses were aggregated into an index using principal components analysis.

2.2.3 Other covariates

In the regression analysis for client satisfaction, we controlled for covariates that could affect client satisfaction. Facility and provider characteristics adjusted for include: facility managing authority, categorized into public and private (private for-profit and private not-for-private); provider's years of in-service experience; and training experience. We also controlled for client's age and education level (primary education or less versus post-primary or greater). Additionally, for ANC services we controlled for whether the client's pregnancy was her first (binary, yes/no) and a separate variable indicating whether the visit was the client's first to the facility during the current pregnancy (binary, yes/no). For sick child services, in addition to child's age (in months) and sex, we adjusted for whether the visit to the facility was the sick child's first for the same illness (binary, yes/no), and for caregiver's education level.

2.3 Statistical Methods

The Stata Statistical Software Release 12 (StataCorp. 2012) was used to conduct this analysis. The relevant facility, provider, and client weights were used to account for selection probabilities. Principal component analysis was used to construct several indices including the structural composite score, process composite score, and the client satisfaction score for each service within each country. In doing so, we attempted to create an index with the highest Cronbach's alpha possible, while still maintaining the maximum number of common variables across countries (See Appendices F-H for a list of the variables included in the structure and process composite variables for each service area, by country). The score was computed based on the first principle component, which explained the largest proportion of the total variance. In bivariate analysis, the differences in the structure and process quality of care indicators and respective composite indices were assessed by facility types. Facility types were categorized as hospitals and health centers versus all other types of facilities. Hospitals and health facilities were combined into one category due to the small number of hospitals in the sample, especially for Namibia and Senegal. The analysis of the structure variables by facility type was conducted at the facility level, whereas the analysis of the process

and client satisfaction by facility type was conducted at the client level. Pearson Chi-squared tests of independence were conducted for categorical variables. Differences in continuous variables were assessed with a Wald Test. The multivariate analysis to assess the relationship between the outcome measure of client satisfaction and structural and process aspects of the quality of care was stratified by facility type. Multiple linear regression models were used, given the continuous outcome variable (the score of the first principal component of the “problem” index).

3. Results

3.1 Family Planning

3.1.1 *Distribution of the sample*

Table 1 shows the distribution of health facilities, providers, and clients interviewed for family planning services in each survey. In Kenya facilities were relatively equally distributed between the public and private sectors with most facilities being health clinics and others (such as dispensaries, maternity wards, and stand-alone VCT clinics). In contrast, 80 percent of the Namibian facilities were in the public sector, with the majority being clinics and others. Senegal had the most skewed distribution, where more than 90 percent of the facilities were in the public sector. As in Kenya and Namibia, clinics and other lower-level facilities also accounted for most of Senegalese facilities.

The distribution of family planning providers interviewed was similar to distribution of health facilities in Senegal and Namibia, while in Namibia the proportion of providers in public hospitals/health centers and in clinics/others was relatively equal. In Kenya, there were more providers interviewed at private sector hospitals (34 percent) and clinics in both public and private sectors (28 percent in both groups); few providers (11 percent) were from public sector hospitals.

In terms of client distribution, Namibia and Senegal were similar in that the majority of clients interviewed (63 percent in Namibia and 79 percent in Senegal) were at public sector hospitals and health centers. In Namibia few clients (5 percent) were at private sector clinics, and in Senegal very few clients (2 percent) were using private sector facilities. The opposite was seen in Kenya, where the majority of clients were using private sector services (54 percent at hospitals/health centers and 25 percent at clinics), while only about one client in every five used public sector services.

Table 1. Sample distribution of facilities, provider interviews, and observations/client exit interviews in the family planning analysis

	Kenya			Namibia			Senegal			
	% (weighted)	N (weighted)	N (unweighted)	% (weighted)	N (weighted)	N (unweighted)	% (weighted)	N (weighted)	N (unweighted)	% (unweighted)
Family Planning Facilities										
Public										
Hospital/Health Centers	4.84	28	94	15.19	55	55	8.34	63	63	63
Clinics / Others	40.65	234	152	65.75	238	238	83.62	248	248	248
Private										
Hospital/Health Centers	13.79	79	223	3.59	13	13	1.90	12	12	12
Clinics / Others	40.72	234	106	15.47	56	56	6.14	15	15	15
Total	100%	575	575	100%	362	362	100%	338	338	338
Provider Interviews										
Public										
Hospital/Health Centers	10.80	171	301	38.16	369	287	18.46	136	136	230
Clinics / Others	27.60	437	263	40.22	388	503	76.26	560	560	465
Private										
Hospital/Health Centers	33.97	438	873	13.30	129	76	2.28	22	22	23
Clinics / Others	27.63	437	146	8.32	80	100	2.99	17	17	17
Total	100%	1,583	1,583	100%	966	966	100%	735	735	735
Exit Interviews										
Public										
Hospital/Health Centers	5.87	58	100	22.46	221	185	19.06	184	184	322
Clinics / Others	14.79	150	92	63.37	623	705	79.23	767	767	624
Private										
Hospital/Health Centers	53.99	542	707	9.14	90	45	0.56	6	6	12
Clinics / Others	25.34	254	105	5.03	49	48	1.15	11	11	10
Total	100%	1004	1004	100%	983	983	100%	968	968	968

3.1.2 Description of family planning service quality attributes

This section describes attributes of family planning service quality by type of facility—hospitals/health centers and clinics/others. Percentages are presented for categorical measures while means and standard errors are presented for continuous measures. In Kenya, three-quarters of hospitals and health centers were in the public sector, while clinics and other facilities were equally distributed between the public and private sectors. In both Namibia and Senegal, the majority (at least 80 percent) of both types of facilities were in the public sector; few facilities were in the private sector.

Kenyan providers in clinics/others had significantly more years of experience than their colleagues in hospitals/health centers (9.3 versus 7.5 years, $p < .01$). There were no differences in the number of years of experience between providers in the two types of facilities in Namibia (8.7 versus 9.3). This information was not available in Senegal. In both Kenya and Namibia, the proportion of providers who received family planning training in the last three years was higher among those at hospitals/health centers than at clinics and smaller facilities ($p < .001$ in Kenya and $p < .01$ in Namibia). No differences in provider training were observed in Senegal.

Among 12 measures of structural quality, with the exception of two measures, structural quality in Kenya was significantly better at hospitals and health centers than at clinics and other types of facilities. The number of days that family planning services were provided, on average, was five days at all Kenya facilities; the contraceptive storage measure averaged 3.3, across both types of facilities. In Namibia, most of the structural quality measures were also higher at hospitals/health centers than at clinics/others, such as basic amenities, routine quality assurance activities, and infection prevention ($p < .001$ in all cases). Several quality attributes did not vary by type of facility, including supervision, the availability of family planning guidelines, the number of days that family planning services were offered, the number of methods offered, the number of visual aids, and the contraceptive storage measure. In Senegal, the results were mixed, as some structural quality measures were higher among clinics/other facilities than hospitals and health centers. These measures include supervision in the last six months (79 versus 90 percent, $p < .05$) and the number of days family planning services were offered (5.8 versus 6.5, $p < .01$).

Compared with structural quality measures, process attributes did not vary as much by type of facility in the three study countries. Out of eight process attributes, only two were significantly different between hospitals/health centers and clinics/others in Kenya. On average, two family planning methods were discussed with each client at hospitals/health centers, while only 1.6 methods, on average, were discussed at clinics/others ($p < .05$). In contrast, nearly half of clients (48 percent) at clinics and other facilities were offered or prescribed injectables, compared with one-third of clients at hospitals/health centers ($p < .01$). Similarly, few process measures varied by type of facility in Namibia. Both privacy and confidentiality measures were higher among clinics/others than hospitals/health centers in Namibia ($p < .01$ for privacy and $p < .05$ for confidentiality). The number of family planning methods discussed with clients was the only process measure that was higher at Namibian hospitals/health centers than at clinics/others (1.34 versus 0.90, $p < .05$). This process attribute also varied significantly between the types of facilities in Senegal, but in the opposite direction. An average of 3.2 family planning methods were discussed with each client at clinics and other facilities, compared with 2.88 at hospitals/health centers ($p < .05$). Waiting time significantly varied by type of facility only in Senegal, where waiting time at hospitals and health centers was about 1.5 times longer than at clinics and other facilities ($p < .001$).

Table 2. Attributes of quality of care in family planning services among all facilities and providers of family planning services and family planning clients

	Kenya			Namibia			Senegal		
	Hospitals/ Health Centers	Clinics/ Others	P	Hospitals/ Health Centers	Clinics/ Others	P	Hospitals/ Health Centers	Clinics/ Others	P
FACILITY / PROVIDER CHARACTERISTICS									
Facility Managing Authority									
Public	74.02	50.04	0.000	80.88	80.95	0.990	81.45	93.16	0.005
Private/NGO	25.98	49.96		19.12	19.05		9.07	6.84	
Provider's years of FP experience	7.53 (.28)	9.29 (.55)	0.005	8.69(.55)	9.27(.37)	0.382	N/A	N/A	N/A
Provider received FP training in past 3 years ^a	49.68	33.83	0.000	32.82	22.12	0.003	39.47	45.82	0.132
STRUCTURE									
Monthly meetings for managerial matters	70.95	38.23	0.000	73.53	46.94	0.000	91.87	88.78	0.305
Any system to obtain client opinions about facility	78.19	56.80	0.000	64.71	48.30	0.015	25.33	17.61	0.146
Trained health worker available	79.27	22.58	0.000	70.59	25.51	0.000	97.53	87.36	0.009
Routine quality assurance activities	48.21	21.17	0.000	54.41	25.51	0.000	51.67	22.93	0.000
Supervision visit to facility with in the past 6 months	95.47	84.88	0.000	80.88	72.79	0.170	78.94	89.76	0.044
Guidelines for FP Services at facility	62.31	42.23	0.000	54.41	55.78	0.838	71.44	68.36	0.628
Number of basic amenities at facility	2.50 (.11)	1.36 (.07)	0.000	3.93(.16)	2.50 (.06)	0.000	6.38(.11)	3.78(.10)	0.000
Number of infection prevention precautions	8.39 (.13)	7.47 (.13)	0.000	8.15(.21)	7.35(.09)	0.000	8.52(.27)	8.10(.12)	0.144
Number of days FP services offered at	4.95 (.10)	5.06 (.13)	0.507	4.51(.22)	4.39(.09)	0.601	5.76(.21)	6.46(.07)	0.002
Number of FP methods offered, available and with valid expiry date	5.18 (.18)	3.52 (.16)	0.000	5.68(.22)	5.51(.08)	0.478	3.70(.42)	3.99(.20)	0.530
Number of FP visual aids at facility	3.80 (.15)	2.13 (.14)	0.000	2.09(.16)	1.91(.07)	0.317	1.29(.12)	0.87(.06)	0.002
Number of contraceptive storage measures	3.37 (.07)	3.29 (.09)	0.455	3.63(.12)	3.70(.03)	0.595	2.89(.18)	3.20(.08)	0.120
PROCESS									
Physical examination	2.92 (.06)	2.85 (.09)	0.492	2.92(.12)	2.86(.04)	0.659	2.41(.07)	2.50(.06)	0.307
Provider ensured visual and auditory privacy	82.78	79.44	0.407	83.25	92.01	0.002	91.86	92.74	0.203
Provider assured client about confidentiality	45.21	49.05	0.420	36.06	48.04	0.016	50.85	54.49	0.312
Number of FP-related issues discussed	0.83 (.07)	0.73 (.11)	0.428	0.90(.15)	1.11(.06)	0.198	0.26(.04)	0.33(.04)	0.243
Number of methods discussed with client	1.95 (.08)	1.60 (.12)	0.016	1.34(.21)	0.90(.04)	0.044	2.88(.13)	3.20(.10)	0.046
Information about method provided to client	3.00 (.05)	2.78 (.11)	0.075	2.67(.14)	2.59(.05)	0.608	3.10(.07)	3.12(.06)	0.866
Injectable contraceptive provided/prescribed	33.25	48.39	0.001	78.33	85.03	0.054	49.59	55.61	0.097
Waiting time (minutes)	65.39 (3.51)	59.17 (7.31)	0.433	67.58(5.92)	76.88(3.31)	0.171	67.61(3.53)	45.99(2.39)	0.000
OUTCOME									
Satisfaction composite score	0.04 (.03)	0.10 (.06)	0.375	0.17(.06)	-0.042(.04)	0.002	-0.24(.07)	0.08(.04)	0.000

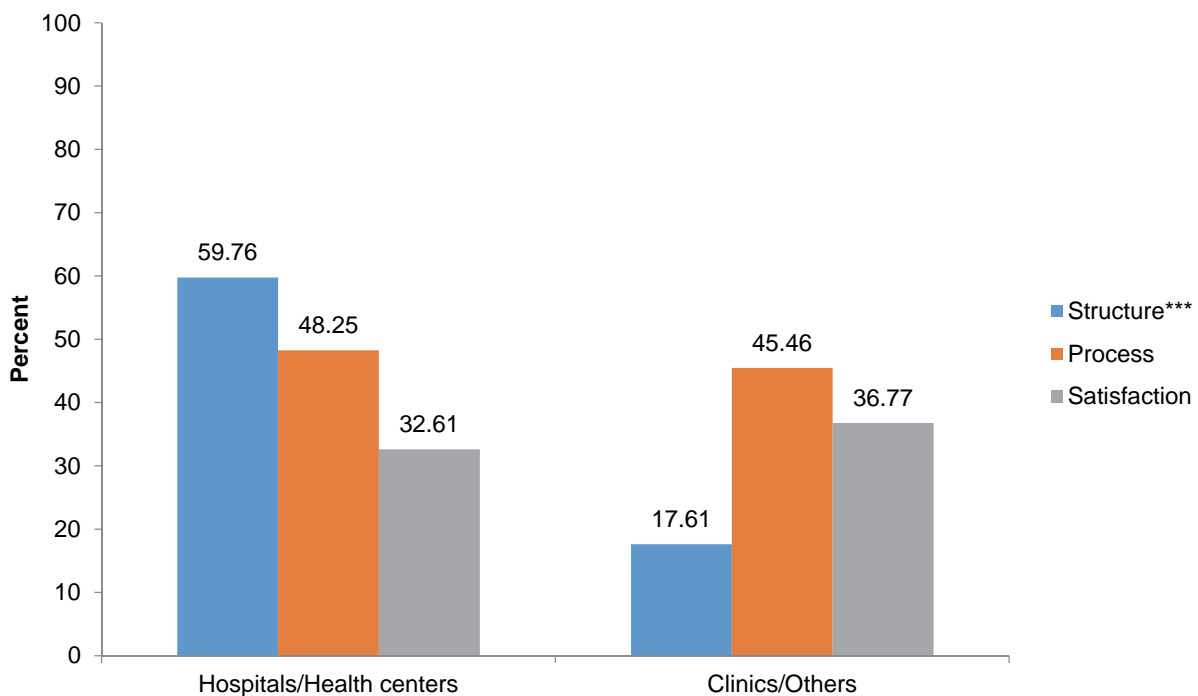
Note: N/A indicates that variable is not available in dataset; numbers in parentheses are standard errors;

^a In Senegal, the variable is provider received FP training in past 2 years. This applies to the same variable in Table 3.

Outcome, measured by client’s satisfaction score, did not vary by type of facility in Kenya, but in Namibia ($p < .01$) it was significantly higher among clients at hospitals and health centers than clients at clinics/others, while the opposite was observed in Senegal ($p < .001$). Client’s age and education were also reported because they were hypothesized to influence client’s expectations of services, and therefore, influence their satisfaction. Client’s age did not vary across facilities in any of the three countries; in Kenya and Senegal the proportion of clients at hospitals and health centers who had secondary school or more was significantly higher than at clinics and other facilities ($p < .01$ in Kenya and $p < .05$ in Senegal).

Figures 1 through 9 present the distribution of facilities in the three study countries with high scores of structure, process, and client’s satisfaction by type of facility, managing authority, and region. The composite scores were dichotomized at median values to high and low score groups. Figure 1 shows a significant difference in the proportion of facilities with a high structure composite score in Kenya, where 60 percent of hospitals and health centers had a high score ($p < .001$), compared with 18 percent of clinics and other facilities. When stratified by managing facility, the only significant difference in Kenya was in the proportion of public versus private sector facilities with high client’s satisfaction score, at 21 percent in the public sector compared with 29 percent in the private sector ($p < .01$). Client’s satisfaction score was also the only score that varied by region in Kenya, with Northeastern and Nyanza regions having the highest proportions of facilities with high client’s satisfaction score ($p < .01$).

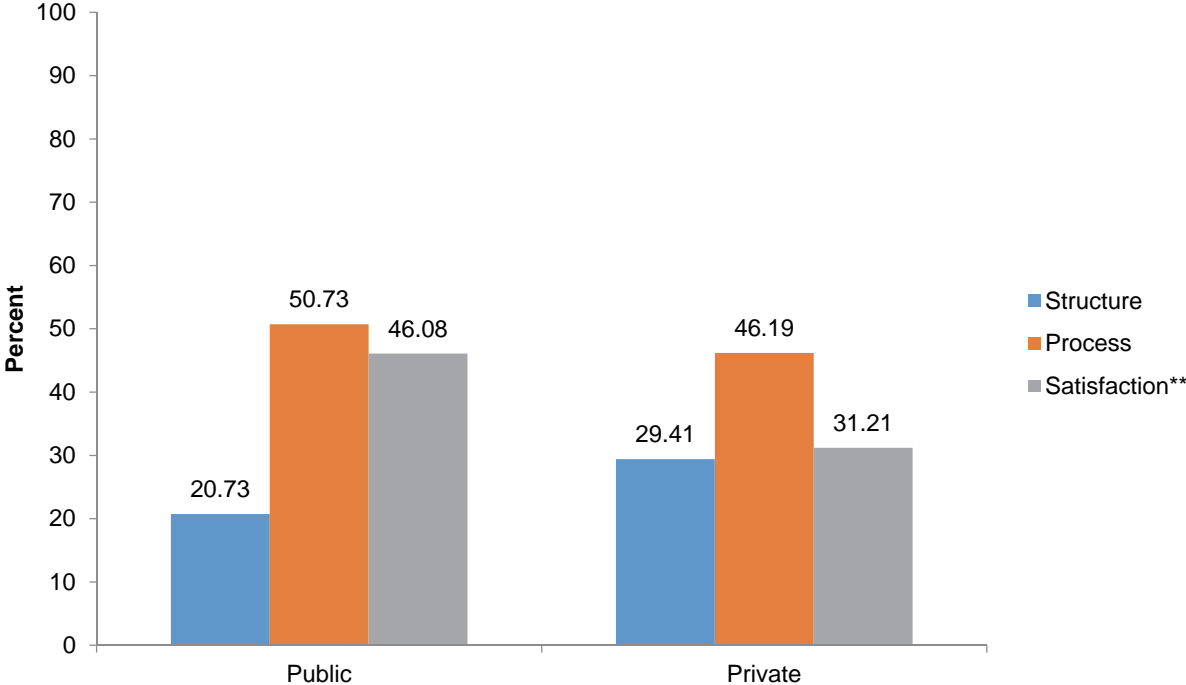
Figure 1. Kenya: Percentage of family planning facilities with high structure, process and satisfaction score by type of facility



* $p < .05$; ** $p < .01$; *** $p < .001$

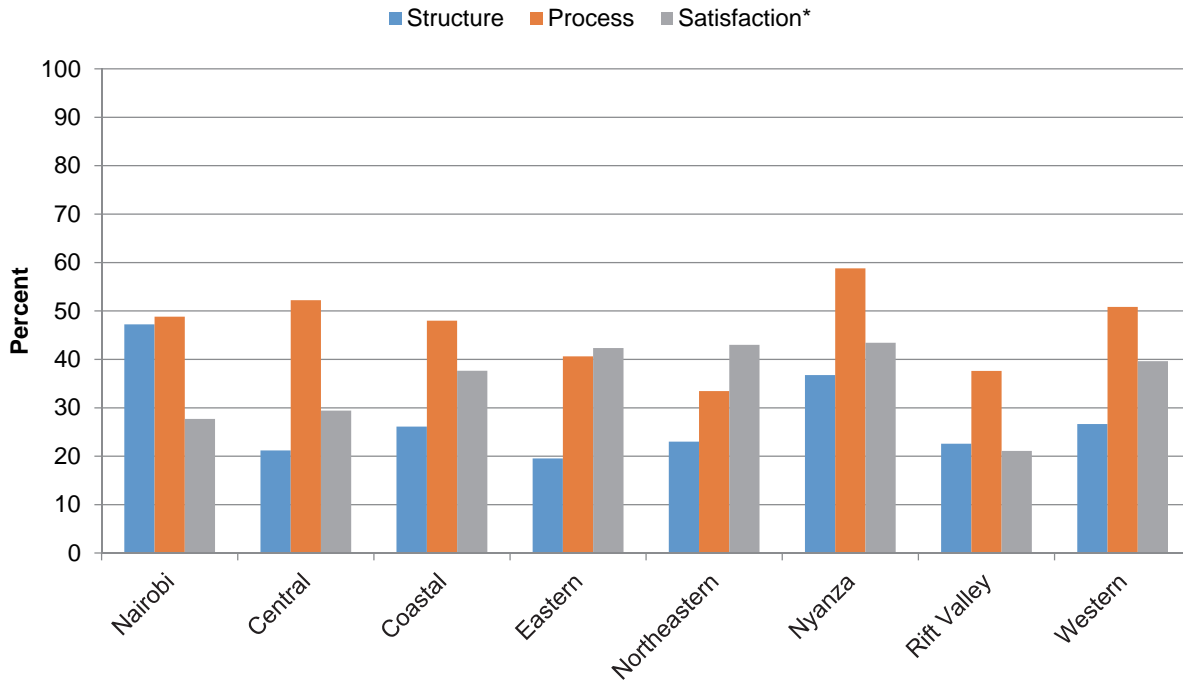
Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

Figure 2. Kenya: Percentage of family planning facilities with high structure, process and satisfaction score by managing authority



*p<.05; ** p<.01; *** p<.001
Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

Figure 3. Kenya: Percentage of family planning facilities with high structure, process and satisfaction score by region

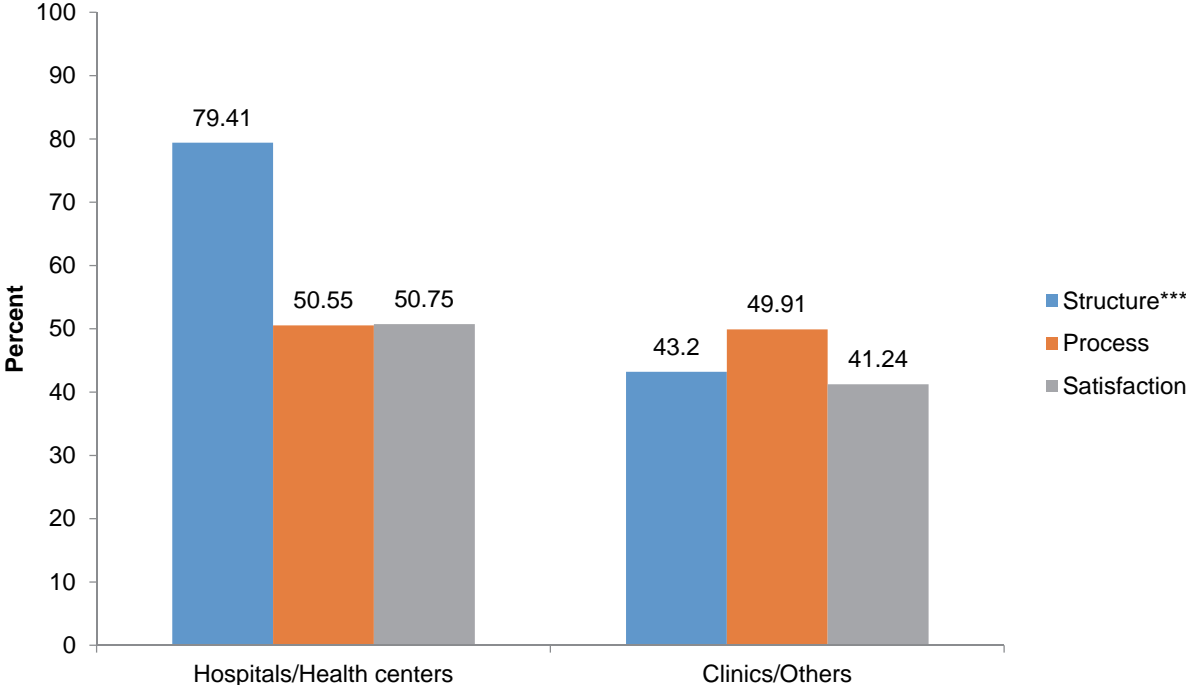


*p<.05; ** p<.01; *** p<.001

Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

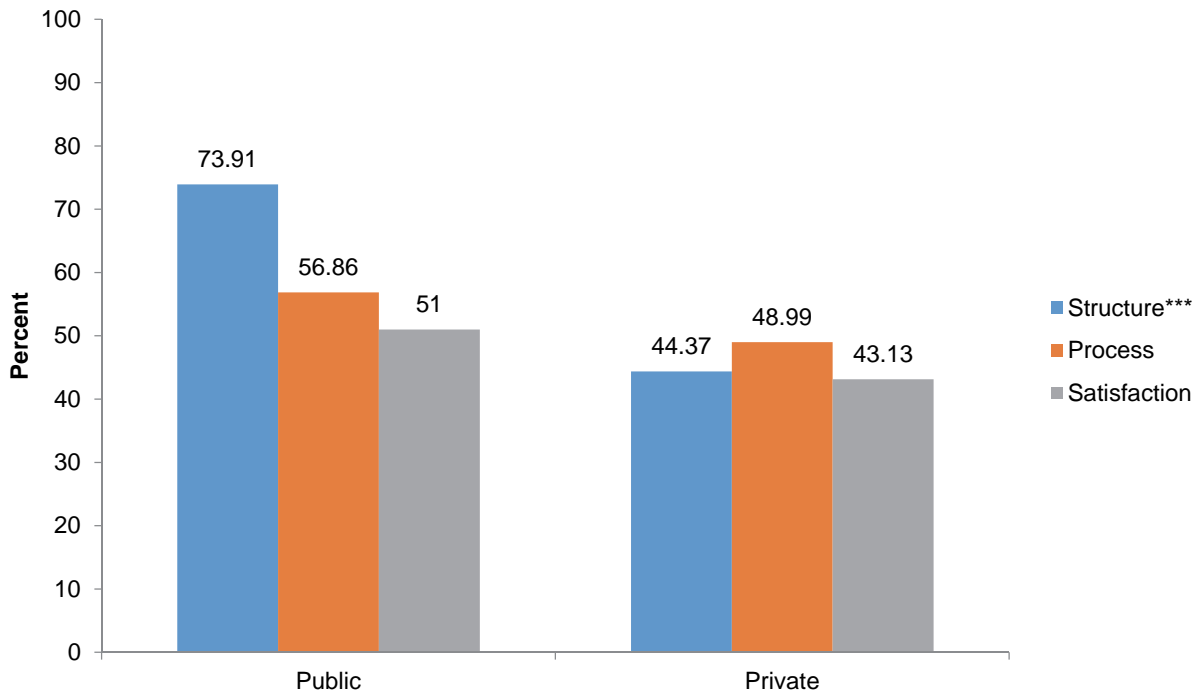
In Namibia, as shown in Figures 4 through 6, the structure composite score varied significantly by both type of facility and managing authority. Figure 4 shows that 79 percent of hospitals and health centers versus 43 percent of clinics and other facilities had a high structure score ($p < .001$), while Figure 5 indicates a similar difference by managing authority: 74 percent of public sector facilities had a high structure score compared with 44 percent of private sector facilities ($p < .001$). Figure 6 shows that all three composite scores of structure, process, and client's satisfaction varied significantly between regions in Namibia. Hardap and Omakeke had the highest proportions of facilities with a high structure score ($p < .001$), and Omakeke and Ohangewe had the highest proportions of facilities with a high process score ($p < .05$). But the highest proportion of facilities with a high satisfaction score was found in Oshana, where the proportions of facilities with high structure and process scores were very low ($p < .05$).

Figure 4. Namibia: Percentage of family planning facilities with high structure, process and satisfaction score by type of facility



*p<.05; ** p<.01; *** p<.001
Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

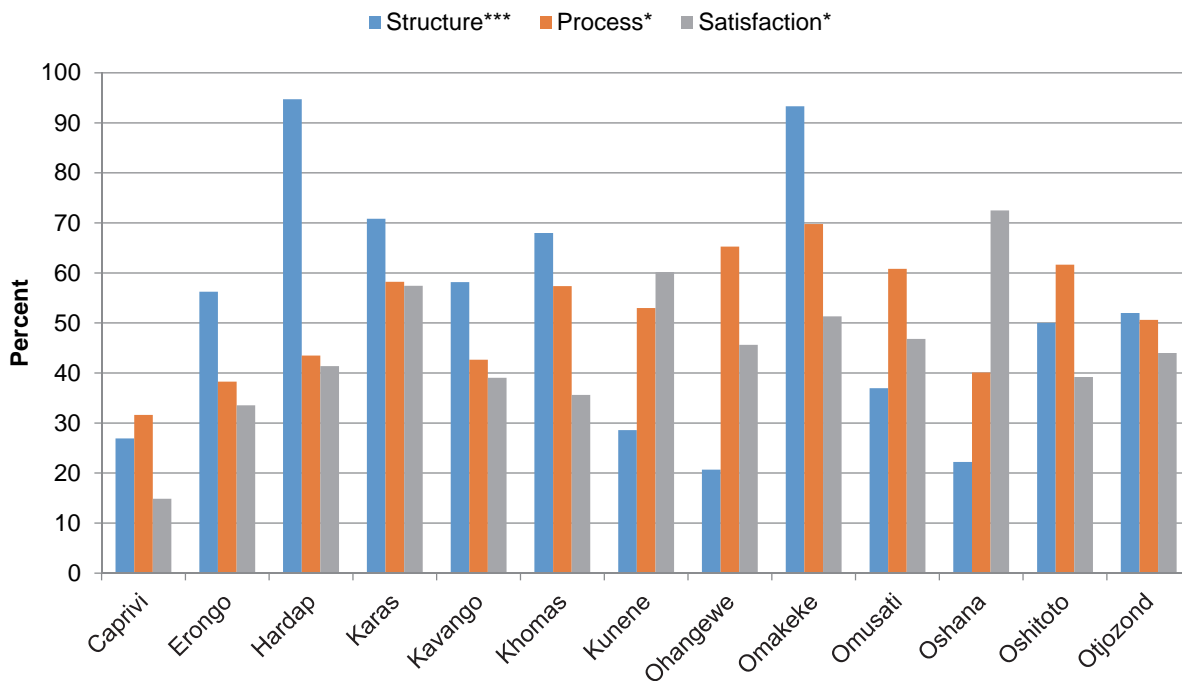
Figure 5. Namibia: Percentage of family planning facilities with high structure, process and satisfaction score by managing authority



*p<.05; ** p<.01; *** p<.001

Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

Figure 6. Namibia: Percentage of family planning facilities with high structure, process and satisfaction score by region

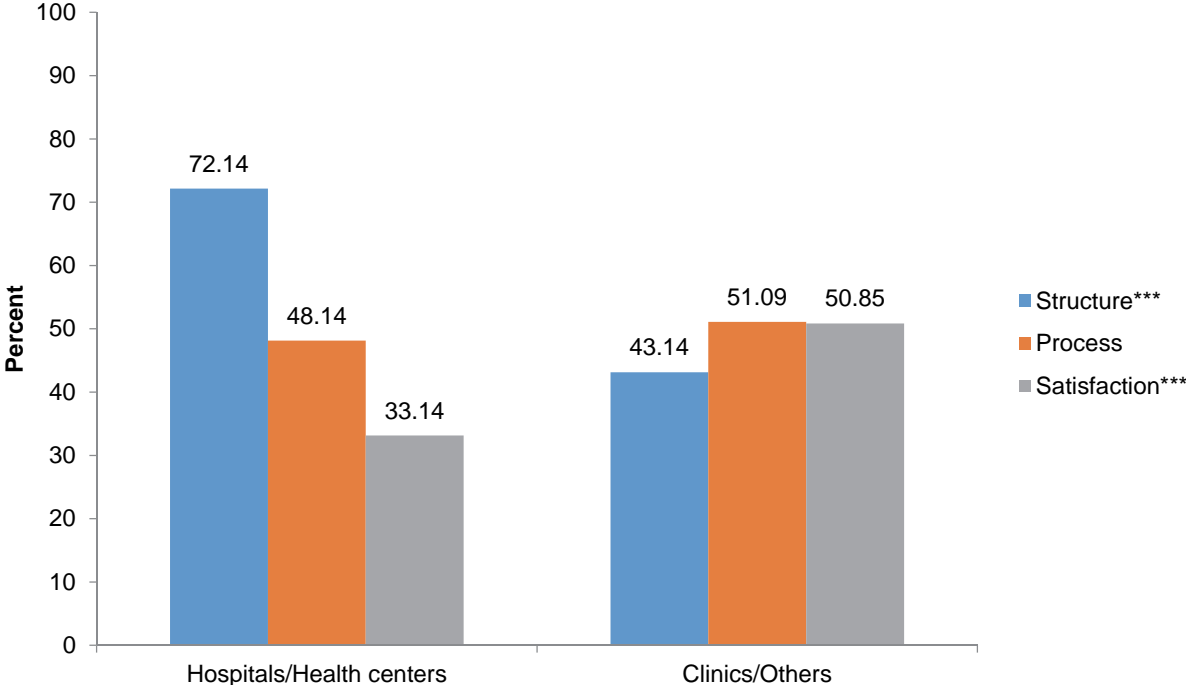


*p<.05; ** p<.01; *** p<.001

Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

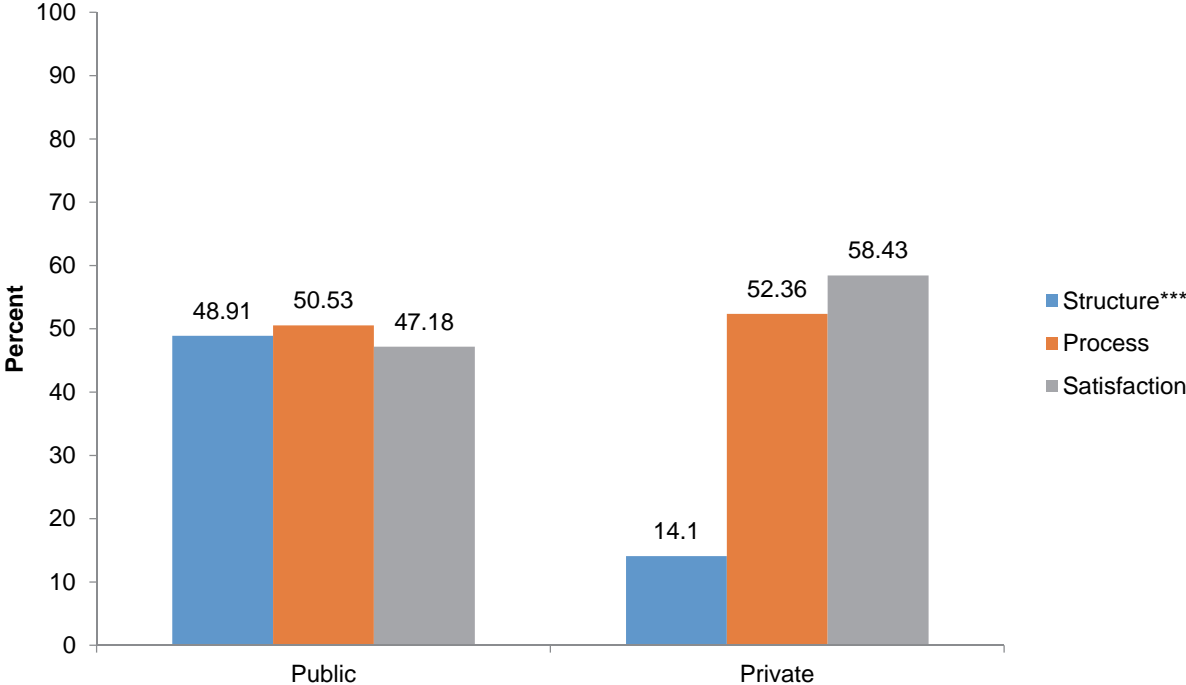
Finally Figures 7 through 9 show structure, process, and satisfaction scores in Senegal. Similar to Namibia, the structure score in Senegal varied significantly by both type of facility and managing authority. Nearly three-quarters (72 percent) of Senegalese hospitals and health centers, compared with 43 percent of clinics and other facilities, had a high structure score ($p<.001$). The public sector facilities also had a much higher proportion with a high structure score (49 percent) than the private sector facilities (14 percent) ($p<.001$). In contrast, clients at clinics and other facilities seemed more satisfied than those at hospitals and health centers: about half of clinics and other facilities versus one-third of hospitals and health centers had a high client's satisfaction score ($p<.001$). In Senegal, significant differences in structure, process, and satisfaction scores were also observed by region. Kaffrine had the highest proportion of facilities with a high structure score ($p<.01$); it also had the highest proportion of facilities with a high process score, along with Ziguinchor ($p<.001$); yet the highest proportions of facilities with high client satisfaction were found in Matam (81 percent) and Sediou (76 percent) ($p<.001$).

Figure 7. Senegal: Percentage of family planning facilities with high structure, process and satisfaction score by type of facility



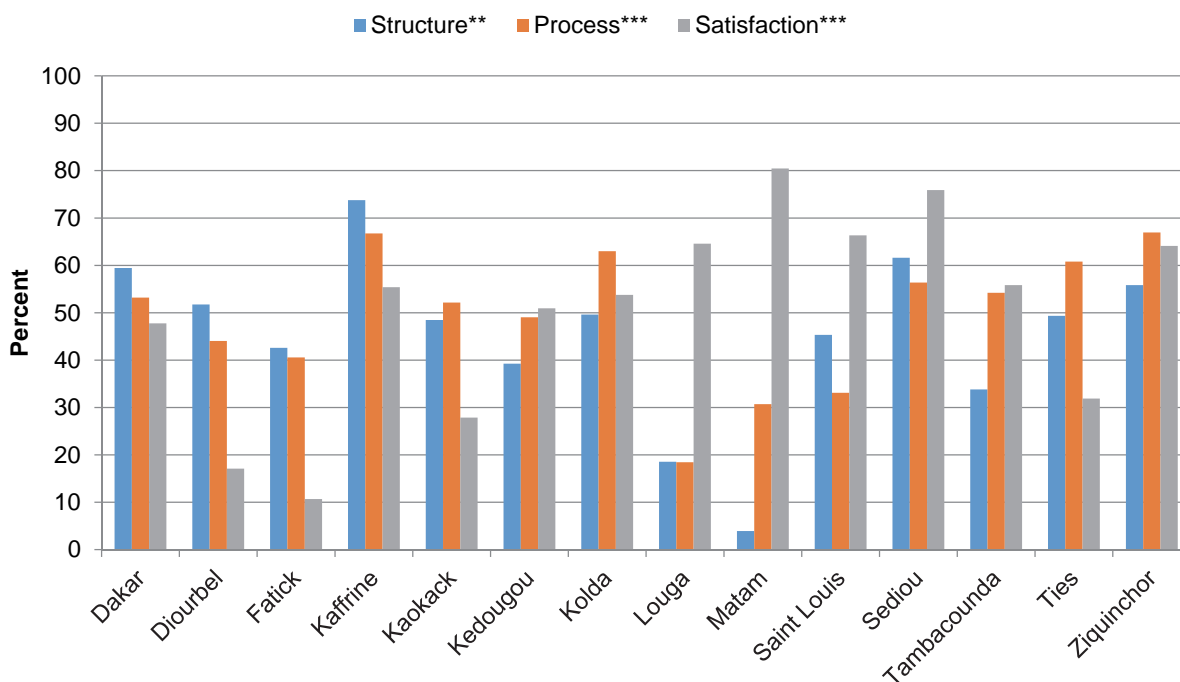
*p<.05; ** p<.01; *** p<.001
Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

Figure 8. Senegal: Percentage of family planning facilities with high structure, process and satisfaction score by managing authority



*p<.05; ** p<.01; *** p<.001
Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level
Results in the private sector is based on n<50.

Figure 9. Senegal: Percentage of family planning facilities with high structure, process and satisfaction score by region



*p<.05; ** p<.01; *** p<.001

Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level. Structure score distribution is based on n<50 in most regions.

3.1.3 Factors associated with family planning client's satisfaction

Table 3 presents results from multivariate regression models, by type of facility, where several attributes were combined into a structure composite score and a process composite score. The outcome is the client's satisfaction composite score. While results were not consistent across countries, a few should be highlighted. First, it was noteworthy that in two of the three countries, Kenya and Namibia, waiting time was negatively associated with client's satisfaction, both at hospitals/health centers and at clinics/others. The longer the waiting time, the lower the satisfaction score. Second, there was no strong evidence that the structure and process composite scores were associated with client satisfaction. The only significant association was between an increased process composite score and increased satisfaction score among clients in Kenyan hospitals and health centers (p<.05).

Table 3. Factors associated with client satisfaction score related to family planning services

	Kenya			Namibia			Senegal		
	Hospitals/ Health Centers	Clinics/ Other Facilities	Hospitals/ Health Centers	Hospitals/ Health Centers	Clinics/ Other Facilities	Hospitals/ Health Centers	Hospitals/ Health Centers	Clinics/ Other Facilities	Clinics/ Other Facilities
	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)
FACILITY / PROVIDER CHARACTERISTICS									
Government managing authority (ref=private/NGO)	-0.08 (.08)	-0.28 (.11)*	-0.27 (.15)	-0.05 (.18)	-0.68(.20)**	0.18(.19)			
Provider's years of FP experience	0.01 (.00)	-0.01 (.01)	0.01 (.01)	0.002 (.01)	N/A	N/A			
Provider received FP training in past 3 years (ref=no)	-0.09 (.07)	-0.14 (.12)	-0.10 (.13)	-0.10 (.11)	-0.02(.13)	0.05(.08)			
STRUCTURE									
Structure composite score	0.10 (.05)	-0.06 (.06)	-0.12 (.10)	-0.01 (.08)	-0.09(.11)	-0.01(.06)			
Supervision visit to facility with in the past 6 months (ref=no)	-0.08 (.13)	-0.03 (.11)	-0.09 (.11)	0.27 (.12)*	0.83(.32)**	-0.12(.10)			
Number of FP commodity storage measures ^b	-0.07 (.06)	-0.04 (.09)	-0.33 (.19)	0.16 (.10)	--	--			
Number of days FP services provided	-0.04 (.03)	-0.02 (.04)	-0.06 (.05)	-0.041 (.019)*	-0.13(.07)	-0.14(.04)***			
Number of FP methods offered, available and with valid expiry date ^a	--	--	-0.05 (.05)	-0.01 (.03)	-0.03(.02)	-0.01(.01)			
Number of FP visual aids at facility ^{a,b}	--	--	0.04 (.04)	-0.06 (.03)*	--	--			
PROCESS									
Process composite score	0.09 (.04)*	0.11 (.09)	0.09 (.06)	0.08 (.04)	0.12(.13)	0.01(.05)			
Provider ensured visual and auditory privacy ^c (ref=no)	--	--	--	--	0.06(.31)	0.11(.16)			
Injectable provided/prescribed (ref=no)	0.12 (.06)	0.47 (.12)***	0.01 (.14)	-0.05 (.11)	0.10(.13)	0.01(.8)			
Waiting time (minutes)	-0.01 (.00)***	-0.00 (.00)*	-0.01 (.01)**	-0.01 (.01)**	0.01(.00)	-0.01(.00)			
R-squared	.09	.17	.21	.05	.09	.03			

Note: All models controlled for client's characteristics, including age and education.

^a These variables are included in the structure composite score in Kenya;

^b These variables are included in the structure composite score in Senegal.

^c These variables are included in the process composite score in Kenya and Namibia;

*p<0.05; **p<0.01; ***p<0.001

In Kenya, no individual structure and process measure was found associated with client's satisfaction, while in Namibia and Senegal, very few were. For example, among clients of clinics and other facilities in Namibia, client's satisfaction score was higher in facilities receiving a supervision visit in the last six months, compared with those that did not receive a supervision visit in the last six months ($p < .05$). However, Namibian clinics and other facilities with more days when family planning services were provided and with more family planning visual aids had a lower client's satisfaction score ($p < .05$ in both cases). In Senegal, results were also inconsistent between the two types of facilities. At hospitals and health centers, receiving supervision within the last six months was associated with increased client's satisfaction ($p < .01$), but at clinics and other facilities client's satisfaction score was negatively associated with the number of days when family planning services were offered ($p < .001$).

Among process attributes, as mentioned earlier, waiting time and process composite score were associated with client's satisfaction at hospitals and health centers in Kenya. At clinics and other types of facilities, providing or prescribing injectables was strongly associated with an increased satisfaction score ($p < .001$). No process attributes were found to be associated with client satisfaction in Senegal, and waiting time was the only factor associated with it in Namibia.

Finally, there was no strong evidence of differential client's satisfaction between managing authorities. Client's satisfaction score was lower only among public sector clinics/others in Kenya ($p < .05$) and public sector hospitals/health centers in Senegal ($p < .01$), compared with their private sector counterparts. Family planning provider's experience and training also did not seem to affect client's satisfaction.

3.2 Antenatal Care

As mentioned in the Methods section, information on ANC service process and outcome was not available in the SPA survey of Senegal. Consequently, we present results from Kenya and Namibia in this section.

3.2.1 *Distribution of the sample*

Table 4 shows that the majority of facilities in both Kenya and Namibia were in the public sector (60 percent in Kenya and 86 percent in Namibia); most of facilities were also clinics and other types of facilities in both countries (75 percent in Kenya and 84 percent in Namibia). With regard to ANC providers interviewed in Kenya, 36 percent were from public sector hospitals and health centers, 24 percent from private sector clinics and other facilities, another 22 percent from public sector clinics and other facilities. Only 18 percent were from private sector hospitals/health facilities. The distribution of Namibian providers interviewed was more skewed toward the public sector—38 percent of providers were from public hospitals/health centers and 40 percent from clinics/others. Just 13 percent were from private sector hospitals/health centers, and even fewer (8 percent) were from private sector clinics and other facilities.

In terms of the distribution of ANC clients, the majority of ANC clients interviewed in both countries were using services in the public sector. In Kenya, however, half of all clients (50 percent) were at public sector hospitals and health centers, whereas in Namibia, nearly two-thirds (63 percent) were at services at public sector clinics and other types of facilities. Few clients in Kenya were interviewed at private sector clinics and other facilities (11 percent), and even fewer in Namibia (4 percent).

Table 4. Sample distribution of facilities, provider interviews, and observations/client exit interviews in the ANC analysis

	Kenya			Namibia		
	% (weighted)	N (weighted)	N (unweighted)	% (weighted)	N (weighted)	N (unweighted)
ANC						
Facilities						
Public						
Hospital/Health Centers	17.02	44	225	13.20	40	40
Clinics / Others	42.89	181	97	73.27	222	222
Private						
Hospital/Health Centers	7.88	96	115	3.63	11	11
Clinics / Others	32.21	242	127	9.90	30	30
Total	100.00	564	564	100.00	303	303
Provider Interviews						
Public						
Hospital/Health Centers	35.95	323	930	38.16	369	287
Clinics / Others	21.77	422	128	40.22	388	503
Private						
Hospital/Health Centers	18.32	633	451	13.30	129	76
Clinics / Others	23.95	383	252	8.32	80	100
Total	100.00	1,761	1,761	100.00	966	966
Exit Interviews						
Public						
Hospital/Health Centers	49.56	193	874	23.46	201	174
Clinics / Others	26.00	152	154	63.05	542	576
Private						
Hospital/Health Centers	13.47	701	257	9.37	81	49
Clinics / Others	10.98	357	118	4.12	35	60
Total	100.00	1,403	1,403	100.00	859	859

3.2.2 *Description of ANC service quality attributes*

Table 5 compares structural and process attributes of ANC service quality between types of facilities, in Kenya and Namibia. As mentioned earlier, most facilities in both countries were in the public sector. ANC providers at clinics and other types of facilities in Kenya had significantly more years of experience compared with their colleagues in hospitals and health centers ($p < .01$), while there were no differences in provider's experience in Namibia. The proportion of Namibian providers who received ANC training in the last three years was higher at hospitals and health centers than at clinics and other facilities.

In Kenya, most of the 14 structural quality attributes varied significantly between the types of facilities. In most cases, hospitals and health centers scored higher on these measures than did clinics and other facilities. For example, significantly larger proportions of hospitals and health centers maintained a system to collect client opinions on service quality, had routine quality assurance activities, had health workers available at all times, and had ANC service guidelines, compared with clinics and other facilities. In contrast, only 69 percent of hospitals and health centers had iron or folic acid on hand, compared with 82 percent of clinics and other facilities ($p < .05$). A few structural quality attributes did not vary by type of facility, including supervision, infection prevention measures, the number of days per week when ANC services were offered, the number of ANC services offered, and whether ITNs were routinely distributed to ANC clients at the facility.

Most of the structural quality measures also differed between the two types of facilities in Namibia. Like Kenya, in most cases structural quality seemed better at Namibian hospitals and health centers than at clinics and other facilities. For example, hospitals and health centers in Namibia had more basic amenities, ANC specific equipment, and better infection prevention measures compared with clinics and other facilities. There were no differences between the two types of facilities in a number of structural quality attributes, including facility supervision, the number of days per week that ANC services were offered, the numbers of ANC services and tests offered, iron and folic acid availability, the availability of ANC guidelines, and ITN distribution to ANC clients. None of the attributes were higher among clinics and other facilities than among hospitals and health centers.

In terms of process attributes of quality, few measures varied by type of facility in both countries. In addition, unlike structural quality measures, these measures were generally higher at clinics and other facilities than at hospitals and health centers. In fact, in Kenya, there was only one measure that differed between the two types of facilities: 19 percent of ANC clients at clinics and other facilities had received iron or folic acid compared with 14 percent of ANC clients at hospitals and health centers ($p < .05$). In Namibia, ANC providers at clinics and other facilities scored higher than their colleagues at hospitals and health centers with regard to asking clients about signs and problems with the index pregnancy ($p < .05$) and discussing delivery preparation ($p < .01$). Waiting time, although quite long across facilities, was significantly shorter at clinics and other facilities (128 minutes on average) than at hospitals and health centers (162 minutes, $p < .01$). Despite these differences, client's satisfaction score was significantly higher at Namibian hospitals and health centers than at clinics and other facilities ($p < .01$), while it did not vary by type of facility in Kenya.

Table 5. Attributes of quality of care in ANC services among all facilities and providers of ANC services, and ANC clients

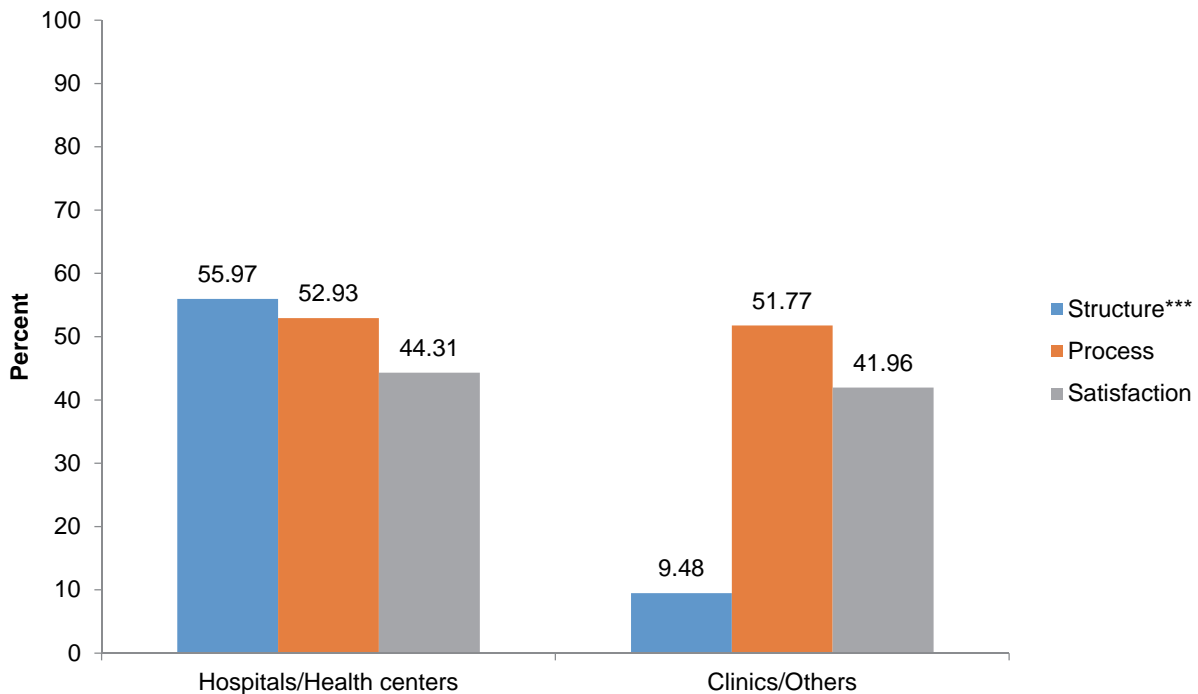
	Kenya			Namibia		
	Hospitals/ Health Centers	Clinics/ Others	P	Hospitals/ Health Centers	Clinics/ Others	P
FACILITY / PROVIDER CHARACTERISTICS						
Facility Managing Authority						
Public	68.36	57.12	0.039	78.43	88.1	0.067
Private/NGO	31.65	42.88		21.57	11.9	
Provider's years of ANC experience	7.53 (0.28)	9.18 (.52)	0.005	8.68(.55)	9.26(.37)	0.382
Provider received ANC training in past 3 years	69.69	64.24	0.156	37.15	28.08	0.016
STRUCTURE						
Monthly meetings for managerial/ administrative issues	67.78	39.56	0.000	68.63	48.63	0.005
Any system to obtain client opinions	75.39	56.10	0.001	62.75	47.62	0.050
Routine quality assurance activities	48.98	23.13	0.000	47.06	24.60	0.001
Supervision visit to facility with in the past 6 months	94.18	88.01	0.054	92.35	76.59	0.370
Number of basic amenities at facility	2.62 (.11)	1.43 (.08)	0.000	3.57(.18)	2.35(.06)	0.000
Number of infection prevention precautions	7.83 (.18)	7.39 (.17)	0.083	7.96(.25)	7.40(.09)	0.038
Health workers always available	79.64	26.61	0.000	64.71	26.98	0.000
Number of days per week that ANC services are offered	4.45 (.14)	4.26 (.19)	0.448	2.94(.22)	2.52(.10)	0.085
Number of services provided to ANC clients	5.49 (.06)	5.47 (.09)	0.845	4.98(.14)	5.00(.06)	0.896
Number of equipment for ANC services, excluding iron and folate	6.95 (.22)	6.21 (.21)	0.016	7.98(.24)	7.16(.10)	0.002
Facility has iron or folic acid	68.85	81.46	0.013	100.00	94.05	0.070
Facility routinely distributes ITN to ANC clients	64.20	57.41	0.226	68.63	64.68	0.590
Number of test for ANC clients	4.84 (.15)	2.42 (.24)	0.000	4.92(.16)	4.63(.10)	0.122
Guidelines for ANC services at facility	79.27	57.77	0.000	17.65	13.10	0.392
PROCESS						
Number of ANC procedures	10.72 (.12)	10.65 (.24)	0.798	6.76(.17)	6.58(.09)	0.331
Number of ANC client's history discussed	3.49 (.13)	3.09 (.23)	0.120	3.68(.28)	3.55(.17)	0.686
Provider asked about signs and problems with pregnancy	2.77 (.10)	2.78 (.19)	0.956	2.04(.16)	2.41(.09)	0.041
Issues with delivery preparation discussed	2.41 (.09)	2.31 (.15)	0.589	1.22(.15)	1.73(.09)	0.003
Client received iron/folate tablets or both at this or previous visit	13.57	19.24	0.037	92.13	96.08	0.077
Client received tetanus toxoid vaccine at this or previous visit	43.64	46.35	0.510	81.25	84.80	0.355
Waiting time (minutes)	71.88 (2.86)	75.79 (7.11)	0.610	162.44(10.39)	127.93(5.34)	0.003
OUTCOME						
Satisfaction score	0.06 (.03)	0.03 (.06)	0.570	0.18(.05)	-0.01(.05)	0.005

Note: Numbers in parentheses are standard errors.

Finally, Table 5 also shows no differences in ANC client’s characteristics between the two types of facilities in Namibia. In Kenya, ANC clients at hospitals and health centers were more likely to have secondary school education or more, and to have a first pregnancy ($p<.01$ and $p<.05$, respectively).

Figures 10 to 15 show the distribution of ANC structure, process, and client’s satisfaction scores in Kenya and Namibia by type of facility, managing authority, and region. In each country, these ANC-related composite scores were dichotomized at median values to high and low scores. Figures 10 and 11 indicate that in Kenya the structure score varied by both facility type and managing authority. A higher proportion of hospitals and health centers had a high structure score, compared with clinics and other facilities (56 versus 10 percent, $p<.001$), and the same proportion was also higher among public sector facilities than private sector facilities (29 versus 16 percent, $p<.01$). The satisfaction score also appeared higher among public sector ANC clients (53 percent of facilities had a high score) than clients of the private sector (41 percent of facilities) ($p<.01$). When stratified by region, the structure score did not vary between regions but the highest proportion of facilities with a high process score was found in Nyanza (62 percent) and Central (61 percent) regions, while Coastal region had the highest proportion of facilities with a high satisfaction score (67 percent) ($p<.001$ in both cases).

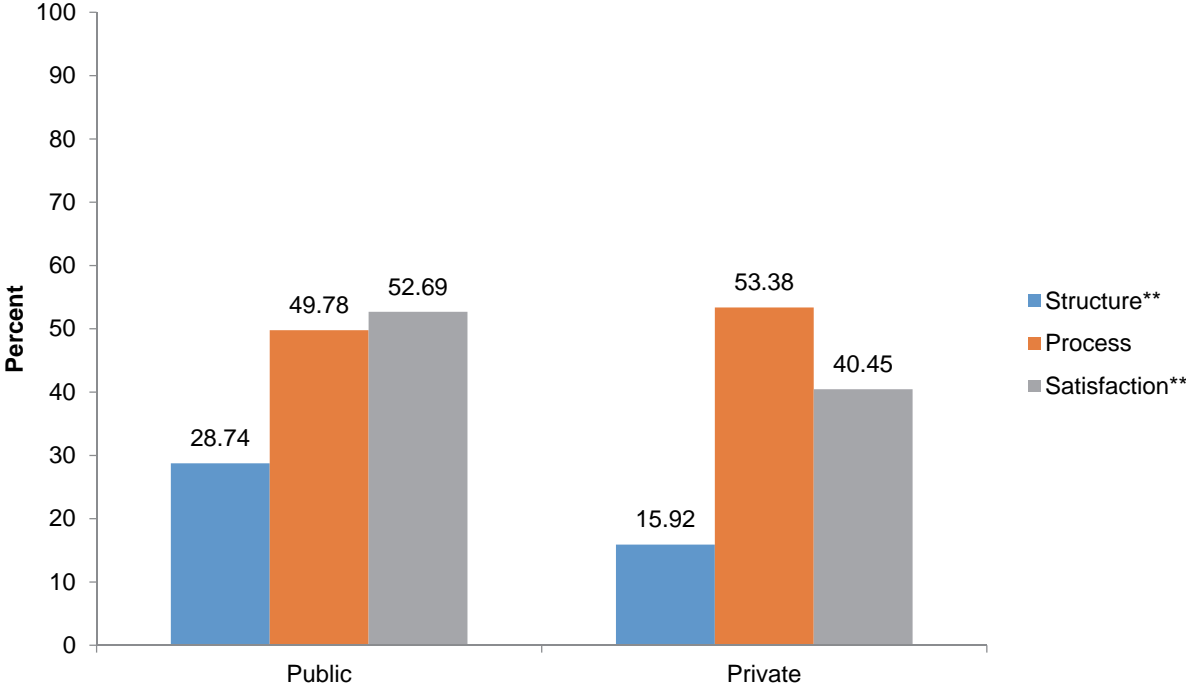
Figure 10. Kenya: Percentage of ANC facilities with high structure, process and satisfaction score by type of facility



* $p<.05$; ** $p<.01$; *** $p<.001$

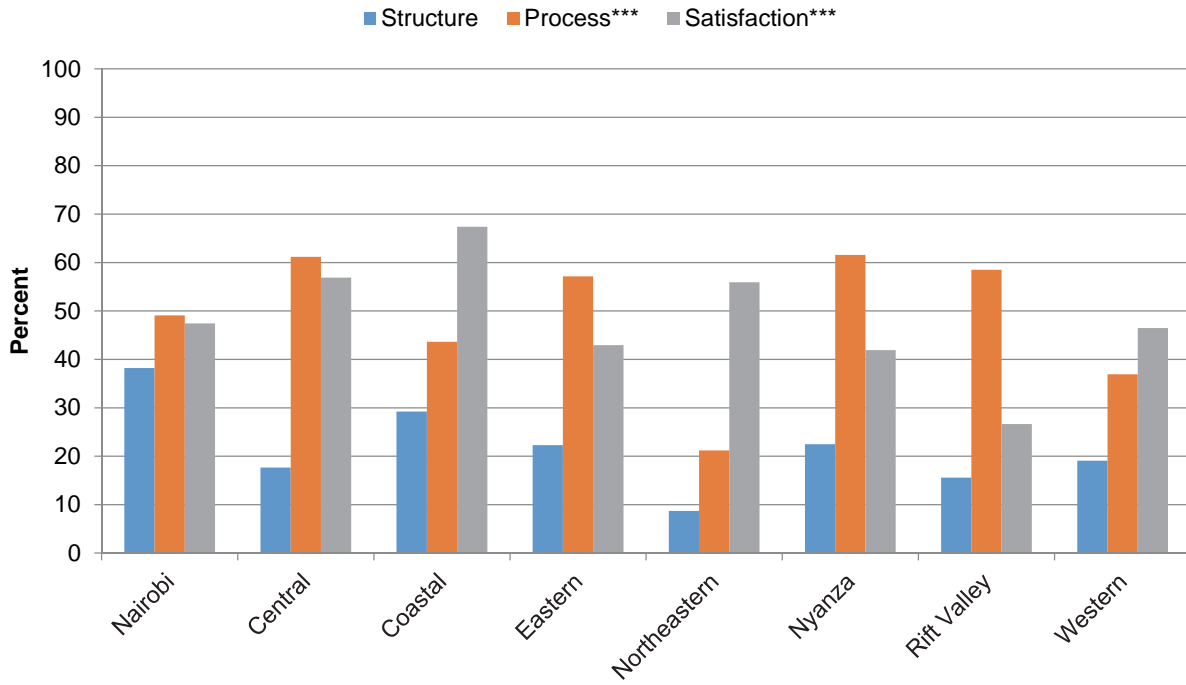
Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

Figure 11. Kenya: Percentage of ANC facilities with high structure, process and satisfaction score by managing authority



*p<.05; ** p<.01; *** p<.001
Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

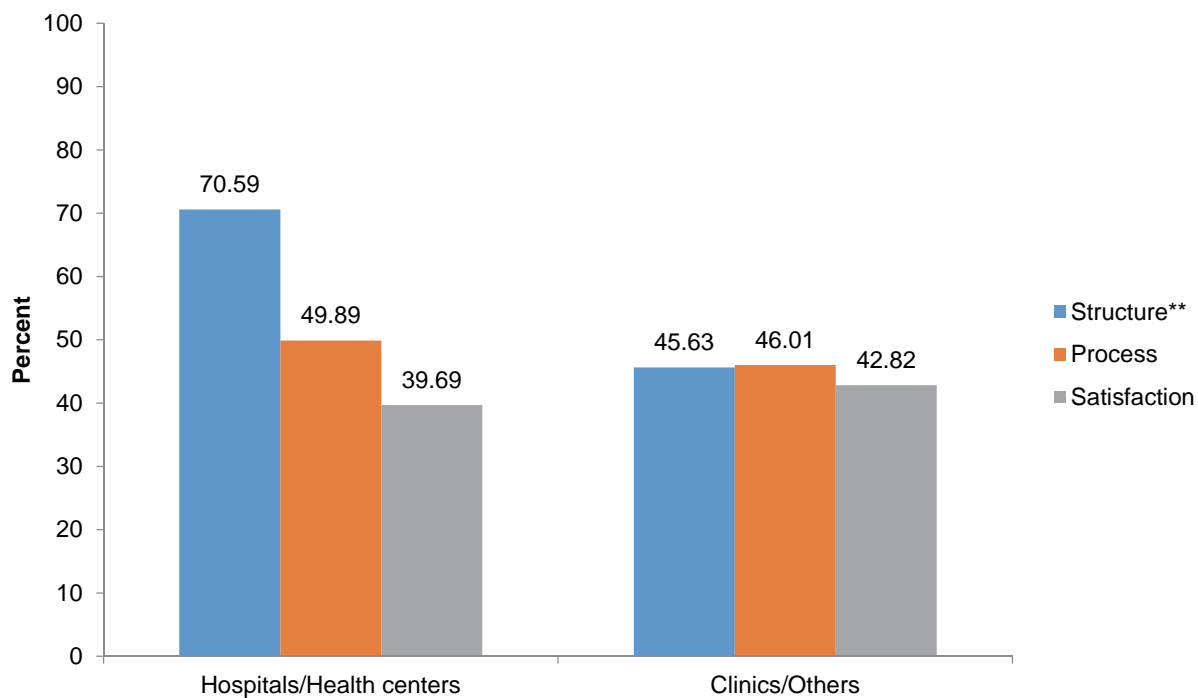
Figure 12. Kenya: Percentage of ANC facilities with high structure, process and satisfaction score by region



*p<.05; ** p<.01; *** p<.001

Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

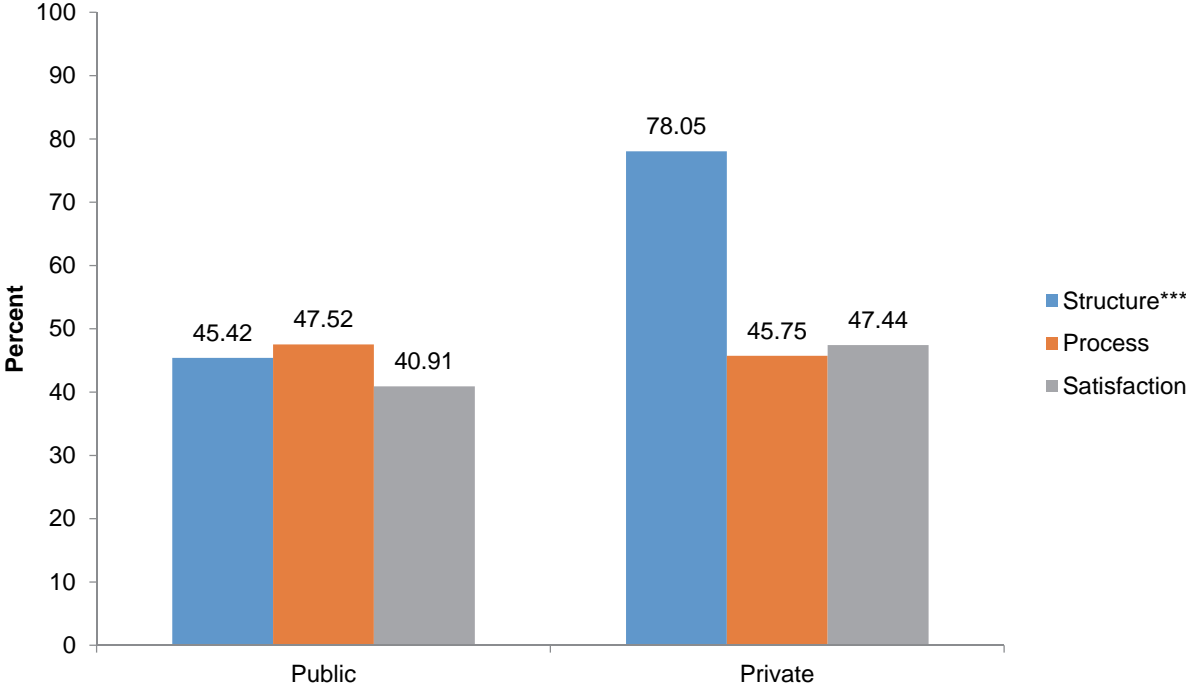
Figure 13. Namibia: Percentage of ANC facilities with high structure, process and satisfaction score by type of facility



*p<.05; ** p<.01; *** p<.001

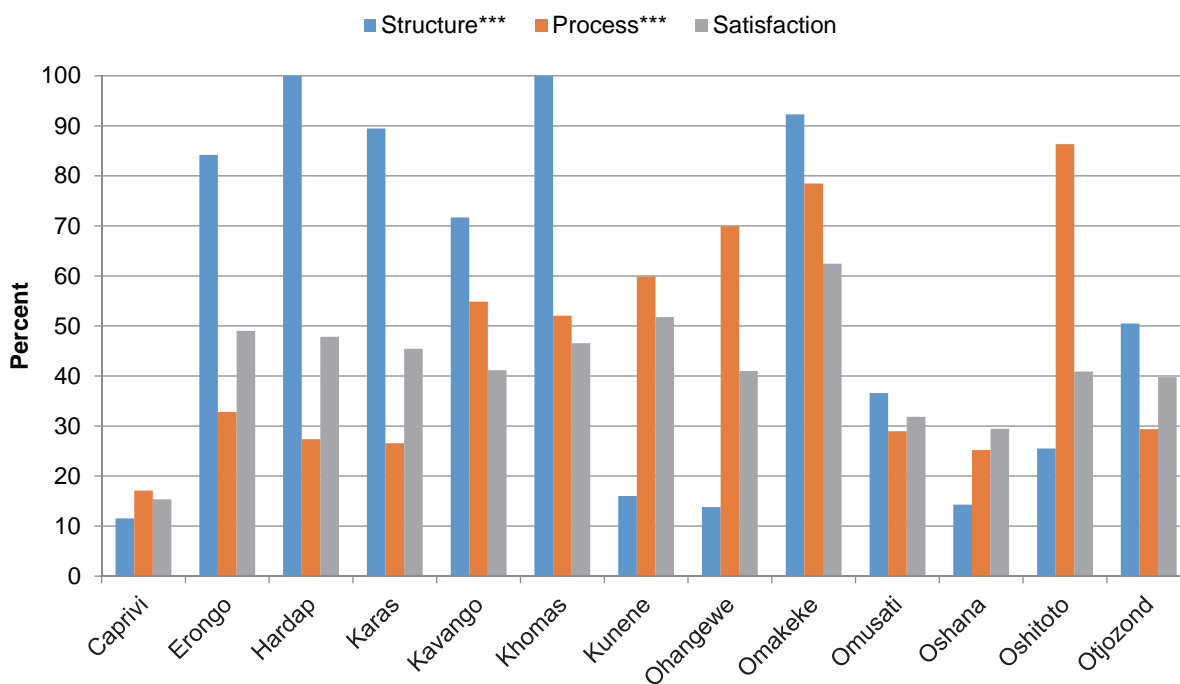
Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

Figure 14. Namibia: Percentage of ANC facilities with high structure, process and satisfaction score by managing authority



*p<.05; ** p<.01; *** p<.001
Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

Figure 15. Namibia: Percentage of ANC facilities with high structure, process and satisfaction score by region



As in Kenya, the ANC structure score in Namibia also varied by facility type and managing authority. In Figure 13, 71 percent of hospitals/health centers versus 46 percent of clinics/others in Namibia had a high ANC structure score ($p < .001$), while Figure 14 shows that 78 percent of private sector facilities had a high structure score compared with 45 percent of public sector facilities ($p < .001$). Both structure and process scores varied significantly by region in Namibia, while client's satisfaction did not. Figure 15 shows that a few regions, such as Hardap and Khomas, had 100 percent of facilities with a high structure score, while others including Caprivi and Ohangewe had just 12 percent and 14 percent of facilities, respectively, with a high structure score ($p < .001$). Similarly, Oshitoto and Omakeke had the highest proportions of facilities with a high process score, while the proportion was lowest in Caprivi ($p < .001$).

3.2.3 Factors associated with ANC client's satisfaction

Table 6 shows several facility, process, and client characteristics that were associated with ANC client's satisfaction score in Kenya and Namibia. Results varied by type of facilities within each country, with the exception of managing authority, which indicates that the satisfaction score was significantly lower among public sector facilities than among private sector facilities in three of the four models.

At Kenyan hospitals and health centers, increased client's satisfaction was found at facilities with a higher structure composite score ($p < .05$). In terms of service delivery process, receiving iron/folic acid and tetanus toxoid vaccine was important to client's satisfaction ($p < .05$ and $p < .01$, respectively). Shorter waiting time was strongly associated with increased client's satisfaction ($p < .001$). Clients also reported being more satisfied with providers who had more experience providing ANC services ($p < .05$). Clients with more

education reported being less satisfied compared with clients with no more than primary schooling ($p < .001$).

Among ANC clients at clinics and other facilities in Kenya, few factors in addition to managing authority were found to be associated with client's satisfaction. The only facility-level factor associated with client's satisfaction was supervision. ANC clients had higher levels of satisfaction at facilities that received supervision within the last six months compared with clients at other facilities ($p < .05$). Clients with a first pregnancy reported being more satisfied with ANC services than those with one or more previous pregnancies ($p < .01$).

Table 6. Factors associated with client satisfaction score related to ANC services

	Kenya		Namibia	
	Hospitals/ Health Centers	Clinics/ Other Facilities	Hospitals/ Health Centers	Clinics/ Other Facilities
	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)
FACILITY / PROVIDER CHARACTERISTICS				
Government managing authority (ref=private/NGO)	-0.15 (.06)*	-0.39 (.13)**	-0.34 (.12)**	0.09 (.11)
Provider's years of ANC experience	0.01 (.00)*	0.01 (.01)	-0.01 (.01)	0.01 (.00)***
Provider received ANC training in past 3 years (ref=no)	0.00 (.06)	0.23 (.13)	-0.16(.08)*	0.07 (.09)
STRUCTURE				
Structure composite score	0.13 (.06)*	0.01 (.10)	-0.10 (.06)	-0.13 (.05)*
Supervision visit to facility with in the past 6 months (ref=no)	0.20 (.25)	0.36 (.15)*	-0.10(.14)	0.42 (.17)*
Number of days per week that ANC services are offered	0.01 (.02)	-0.04 (.02)	0.01 (.04)	-0.03 (.03)
Number of equipment for ANC services, excluding iron and folate ^a	--	--	0.03 (.03)	0.02 (.24)
Number of test for ANC clients ^a	--	--	0.04 (.03)	0.01 (.04)
Facility has iron or folic acid (ref=no)	-0.03 (.06)	-0.17 (.12)	Omitted	0.15 (.12)
Facility routinely distributes ITN to ANC clients ^b (ref=no)	0.08 (.05)	-0.02 (.13)	--	--
PROCESS				
Process composite score	0.01 (.04)	0.01 (.13)	0.07 (.11)	-0.04 (.08)
Client received iron/folate tablets or both at this or previous visit (ref=no)	0.15 (.06)*	0.07 (.12)	-0.19 (.18)	0.21 (.02)
Client received tetanus toxoid vaccine at this or previous visit (ref=no)	0.30 (.10)**	0.14 (.14)	0.08 (.12)	0.03 (.13)
Waiting time (minutes)	-0.01 (.00)***	-0.01 (.00)	-0.00 (.00)	-0.01 (.00)***
R-squared	.12	.14	.10	.09

Note: All models controlled for client's characteristics, including age, education, and whether it was her first pregnancy, and whether it was her first visit to the facility for the index pregnancy.

^a Variable included in Kenya structure composite score

^b Variable included in the Namibia structure composite score

*p<0.05; **p<0.01; ***p<0.001

Note: All hospitals/health centers in Namibia have iron or folic acid. This variable was omitted from the analysis.

In Namibia, few factors were found to be associated with ANC client's satisfaction score. Among clients at hospitals and health centers, in addition to managing authority, provider's ANC training was the only factor associated with client's satisfaction. Surprisingly, the association was negative: ANC clients reported being less satisfied with providers who had received training in the last three years compared with clients of other providers ($p < .05$). Among ANC clients at clinics and other facilities, the satisfaction score did not depend on the managing authority, but was lower at facilities with a higher structure composite score ($p < .05$). Increased client's satisfaction was found at clinics and facilities with supervision in the last six months ($p < .05$), shorter waiting time ($p < .001$), and providers who had more experience providing ANC services ($p < .001$).

3.3 Sick Child Care

In this section, we present results of the analysis of sick child service quality and factors associated with client's satisfaction in the three study countries.

3.3.1 *Distribution of the sample*

Table 7 shows the distribution of the sample of facilities, providers, and clients of sick child services. In Kenya, more than two facilities in every five (43 percent) included in the survey were private sector clinics or other facilities; clinics and other facilities in the public sector accounted for 37 percent of the sample, while less than 20 percent of facilities were hospitals and health centers in either the public or private sector. The distributions of facilities in Namibia and Senegal were similar: the majority of facilities (68 percent in Namibia and 80 percent in Senegal) were public sector clinics and other facilities. In both countries private sector hospitals and health centers accounted for the smallest proportion of the sample (4 percent in Namibia and 2 percent in Senegal).

Among providers interviewed in Kenya, those from public sector hospitals and health centers accounted for the largest proportion (32 percent), followed by providers from clinics and other facilities in the private sector (28 percent) and the public sector (24 percent), while the proportion of providers in private sector hospitals/health centers was 16 percent. The distributions of providers in Namibia and Senegal were more skewed. In Namibia, nearly 80 percent of the providers were in the public sector; about one provider in every seven was at a private sector hospital or health center, while only 6 percent of the providers interviewed were at private sector clinics or other facilities. In Senegal, 70 percent of providers interviewed were from clinics and other facilities in the public sector and another 18 percent were from hospitals/health centers in the public sector. Few were from the private sector: 9 percent from clinics/other facilities and 3 percent from hospitals/health centers.

Finally, Table 7 shows that in all three countries the majority of sick child clients interviewed were using services in the public sector. In Kenya, public sector sick child clients were relatively equally distributed between the two types of facilities, while in the other two countries most of them were at clinics and other facilities. Approximately 18 percent of clients were using sick child services from private sector clinics and other facilities in Kenya and Senegal, while only 8 percent were using services from these sources in Namibia. Few clients were using services at private sector hospitals and health centers, especially in Namibia (5 percent) and Senegal (3 percent).

Table 7. Sample distribution of facilities, provider interviews, and observations/client exit interviews in the sick child analysis

	Kenya			Namibia			Senegal		
	% (weighted)	N (unweighted)	N (weighted)	% (weighted)	N (unweighted)	N (weighted)	% (weighted)	N (unweighted)	N (weighted)
Sick Child Facilities									
Public									
Hospital/Health Centers	13.22	40	228	17.58	61	61	8.00	73	73
Clinics / Others	37.12	278	106	68.30	237	237	79.56	291	291
Private									
Hospital/Health Centers	6.30	85	124	3.75	13	13	2.14	16	16
Clinics / Others	43.37	238	183	10.37	36	36	10.29	33	33
Total	100%	641	641	100%	347	347	100%	413	413
Provider Interviews									
Public									
Hospital/Health Centers	31.82	341	1,082	42.44	448	448	17.66	201	342
Clinics / Others	23.85	595	159	35.96	380	380	70.12	799	671
Private									
Hospital/Health Centers	16.16	672	523	15.68	166	166	3.07	35	53
Clinics / Others	28.17	504	349	5.93	63	79	9.15	104	73
Total	100%	2,113	2,113	100%	1,057	1,057	100%	1,139	1,139
Exit Interviews									
Public									
Hospital/Health Centers	35.26	180	1,055	21.17	327	327	14.30	187	365
Clinics / Others	37.64	348	355	66.40	1,025	1,083	65.21	850	753
Private									
Hospital/Health Centers	9.20	701	291	4.51	70	48	2.48	32	59
Clinics / Others	17.91	728	256	7.92	122	120	18.01	235	127
Total	100%	1,957	1,957	100%	1,544	1,544	100%	1,304	1,304

3.3.2 Description of sick child service quality attributes

Table 8 presents the description and comparisons of sick child service quality attributes across types of facilities in each of the study countries. In Kenya, hospitals and health centers scored higher than clinics and other facilities in all of the 13 structural quality attributes. Marked differences were seen, for example, in the proportion of facilities that had routine quality assurance activities (49 versus 21 percent, $p < .001$), the availability of health workers (80 versus 22 percent, $p < .001$), and the availability of the Integrated Management of Childhood Illness (IMCI) mother's card (36 versus 18 percent, $p < .001$). Results in Namibia and Senegal in terms of structural quality were mixed. Several attributes varied significantly by type of facility, while others did not. In Namibia, for example, hospitals and health centers scored higher than clinics and other facilities in having monthly meetings ($p < .001$), a system to collect client's opinions ($p < .01$), the availability of health workers ($p < .001$), and the number of days per month when sick child services were offered ($p < .001$). In Senegal, hospitals and health centers scored higher than clinics and other facilities in terms of basic amenities ($p < .001$), health workers' availability ($p < .001$), and infection prevention measures ($p < .05$). Differences between types of facilities were also observed with other structural quality attributes in Senegal, such as routine quality assurance activities ($p < .001$) and supervision ($p < .01$).

Comparisons of measures of service delivery process were mixed across the three study countries. In Kenya, four of the seven process measures were found to be significantly better at clinics and other facilities than at hospitals and health centers. These include information provided to caregivers ($p < .001$), whether the provider discussed return visits ($p < .01$), waiting time ($p < .001$), and whether the provider used visual aids during the consultation ($p < .05$, although caution should be exercised because of the small number of clinics and other facilities). In Namibia, only two of the seven process measures varied by type of facility, including information provided to caregivers and whether the provider discussed return visits. Both measures were higher at clinics and other facilities than at hospitals and health centers ($p < .001$ and $p < .01$, respectively). In Senegal, the pattern was not consistent across process measures. Some were better at clinics and other facilities, while others were better at hospitals and health centers. Clinics and other facilities scored higher than hospitals and health centers in measures of symptoms discussed by providers and caregivers ($p < .001$) and information provided to caregivers ($p < .001$). Hospitals and health centers were better than clinics and other facilities in measures of physical exam of the sick child ($p < .05$), whether the provider used visual aids during the consultation ($p < .001$), whether the provider discussed returned visits ($p < .01$), and waiting time ($p < .01$).

Client's satisfaction score varied significantly by type of facility in Kenya and Senegal. Sick child clients at clinics and other facilities reported being more satisfied than those at hospitals and health centers ($p < .001$ in both cases). The difference in client's satisfaction across facility types in Namibia did not reach the statistical significance level of .05.

Table 8. Attributes of quality of care in sick child services among all facilities and providers of sick child services and sick child clients

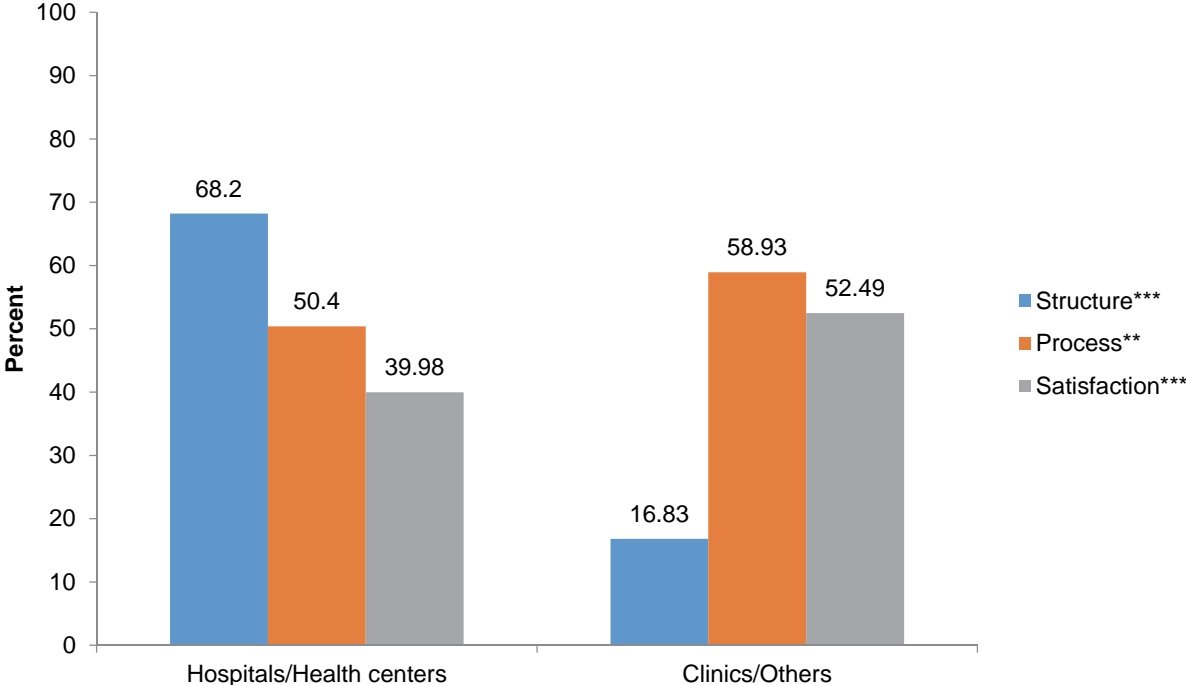
	Kenya			Namibia			Senegal		
	Hospitals/ Health Centers	Clinics/ Others	P	Hospitals/ Health Centers	Clinics/ Others	P	Hospitals/ Health Centers	Clinics/ Others	P
	67.73	46.12	0.000	82.43	86.81	0.339	21.11	11.46	0.031
32.27	53.88		17.57	13.19		78.89	88.54		
7.79 (.26)	10.12 (.53)	0.000	9.28(.52)	9.85(.42)	0.397	N/A	N/A		
29.85	23.18	0.034	40.45	41.23	0.829	33.2	40.88	0.021	
STRUCTURE									
Monthly meetings for managerial/ administrative issues	68.03	39.56	0.000	74.32	47.25	0.000	83.82	85.12	0.776
Any system to obtain client opinions	75.51	56.80	0.001	67.57	47.62	0.003	26.09	17.20	0.071
Routine quality assurance activities	48.98	20.94	0.000	56.76	24.18	0.000	47.98	21.60	0.000
Supervision visit to facility with in the past 6 months	94.04	81.37	0.000	82.43	75.46	0.208	70.06	85.74	0.001
Number of basic amenities at facility	2.64 (.11)	1.45 (.07)	0.000	4.01(.16)	2.37(.06)	0.000	5.22 (.11)	2.64(.09)	0.000
Health workers always available	79.66	22.10	0.000	70.27	26.01	0.000	98.87	83.76	0.000
Number of infection prevention precautions	7.71 (.18)	6.92 (.16)	0.000	7.28(.29)	7.39(.08)	0.717	8.31(.25)	7.74(.13)	0.045
Number of SC services provided at facility	2.35 (.17)	1.73 (.17)	0.011	3.34(.26)	3.42(.13)	0.783	3.39 (.25)	3.43(.15)	0.877
Number of equipment available for SC services	3.66 (.10)	2.86 (.10)	0.000	2.95(.11)	2.84(.06)	0.395	3.10(.10)	3.09(.05)	0.939
IMCI guide always used in assessing/treating sick child	80.36	62.39	0.000	55.41	51.65	0.567	36.28	44.26	0.189
Number of days per month that SC services are provided	25.64 (.34)	22.99 (.23)	0.000	22.97(.51)	20.72(.20)	0.000	25.80(.62)	26.32(.39)	0.457
Blood test to verify malaria always available for children under age 5	29.94	19.43	0.017	55.41	59.34	0.543	58.77	54.96	0.537
IMCI mother's card available	36.42	18.34	0.000	12.16	6.59	0.114	45.25	41.24	0.514
PROCESS									
Number of symptoms that provider asked about or caregiver mentioned	3.54 (.05)	3.51 (.07)	0.713	3.92(.12)	3.83(.05)	0.534	2.81(.06)	3.14(.04)	0.000
Physical exam of sick child	8.11 (.15)	8.17 (.21)	0.819	8.78(.25)	9.28(.12)	0.073	5.08(.13)	4.72(.10)	0.027
Information provided to caregiver	1.69 (.06)	2.04 (.08)	0.000	1.31(.11)	1.82(.05)	0.000	0.45(.04)	0.65(.04)	0.000
Provider used visual aids	4.37	7.26	0.036	5.81	7.81	0.374	15.32	10.22	0.000
Provider recorded on child's health card/booklet	93.35	94.66	0.378	98.01	87.43	0.552	51.54	47.45	0.189
Provider discussed follow-up visit	56.39	65.11	0.002	45.99	56.92	0.003	69.46	60.39	0.002
Waiting time (minutes)	69.34 (2.56)	51.57 (3.02)	0.000	111.56(6.34)	107.91(2.97)	0.603	51.08(2.69)	64.08(3.00)	0.001
OUTCOME									
Satisfaction score	0.12 (.02)	0.26 (.03)	0.000	-0.01(.05)	0.10(.03)	0.081	-0.24(.06)	0.02(.04)	0.000

^a In Senegal, the variable is provider received sick child care training in past 2 years. This applies to the same variable in Table 9.

Finally, Table 8 shows that the characteristics of providers and clients differ somewhat between the two types of facilities in all three countries. In Kenya, hospitals and health centers were more likely to be in the public sector, while clinics and other facilities were more likely to be in the private sector ($p < .001$). Providers at Kenyan hospitals and health centers had less experience providing sick child services than those at clinics and other facilities ($p < .001$), but were more likely to have received training in the last three years ($p < .05$). Clients of sick child services at hospitals and health facilities were more highly educated than those at clinics and other facilities ($p < .01$). In Namibia, there were no differences in facility and provider characteristics, but children brought to hospitals and health centers tended to be younger than those brought to clinics and other facilities ($p < .05$). In Senegal, there were differences in the distribution of facilities across managing authorities ($p < .05$) but they were based on small numbers of hospitals and health centers. The proportion of providers who received training in the last two years was higher at clinics and other facilities than at hospitals and health centers ($p < .05$). In terms of client's characteristics, caregivers who brought children to clinics and other facilities appeared to be less educated ($p < .001$) and were more likely to have repeat visits to the same facility for the same sickness episode ($p < .01$) compared with caregivers who brought children to hospitals and health centers.

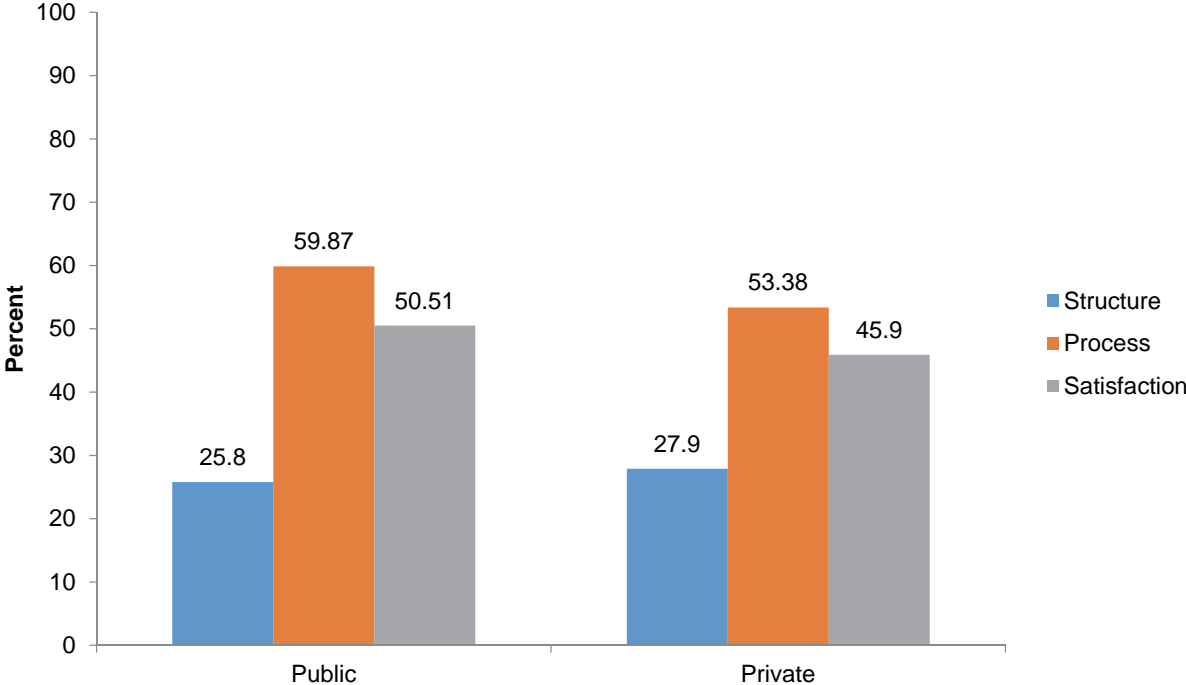
Figures 16 through 24 show the distribution of sick child structure, process, and satisfaction scores, dichotomized at median values, in the three study countries, by facility type, managing authority, and region. Kenya presents an interesting scenario, in which all three scores varied significantly by type of facility but not by managing authority. In Figure 16, although the sick child structure score was much higher in Kenya among hospitals and health centers (68 percent) than clinics and other facilities (17 percent) ($p < .001$), the opposite pattern was observed with service delivery and client's satisfaction. Higher proportions of clinics and other facilities had high process and satisfaction scores (59 and 53 percent, respectively) than hospitals and health centers (50 and 39 percent, respectively) ($p < .01$ and $p < .001$). These two scores also varied significantly by region, but while Nyanza showed the highest proportion of facilities with a high process score (77 percent), Northeastern showed the highest client's satisfaction, with 75 percent of facilities having a high score in this regard ($p < .001$ in both cases).

Figure 16. Kenya: Percentage of facilities providing sick child care with high structure, process and satisfaction score by type of facility



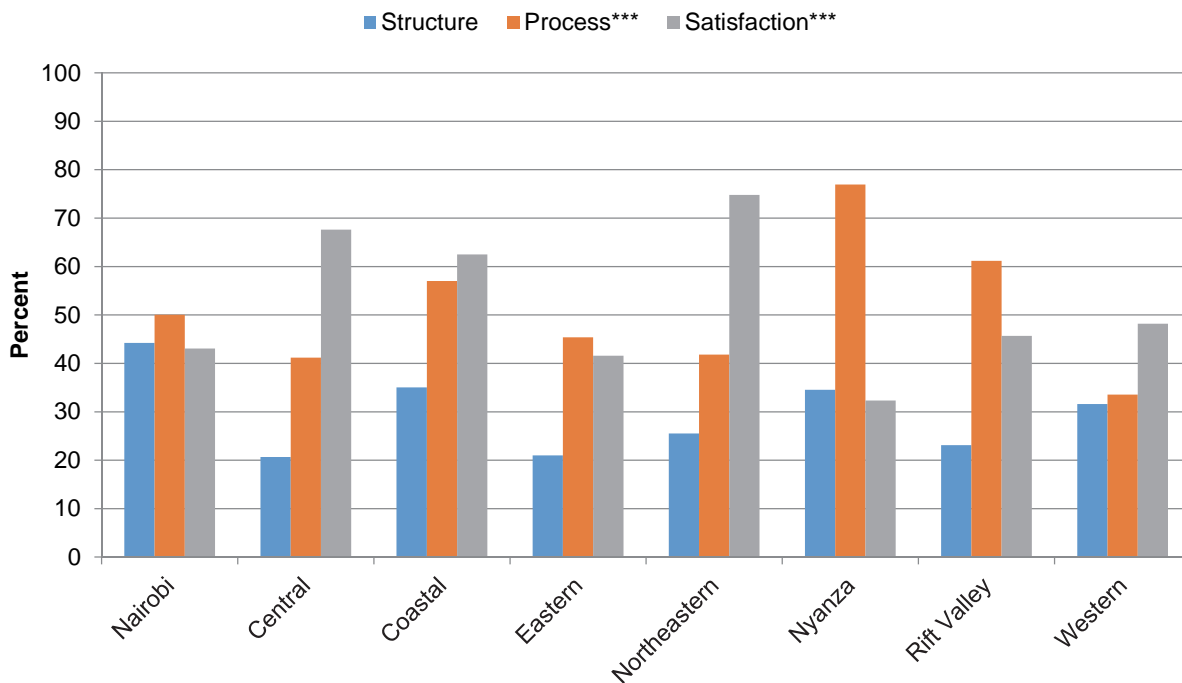
*p<.05; ** p<.01; *** p<.001
 Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

Figure 17. Kenya: Percentage of facilities offering sick child care with high structure, process and satisfaction score by managing authority



*p<.05; ** p<.01; *** p<.001
Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

Figure 18. Kenya: Percentage of facilities offering sick child care with high structure, process and satisfaction score by region

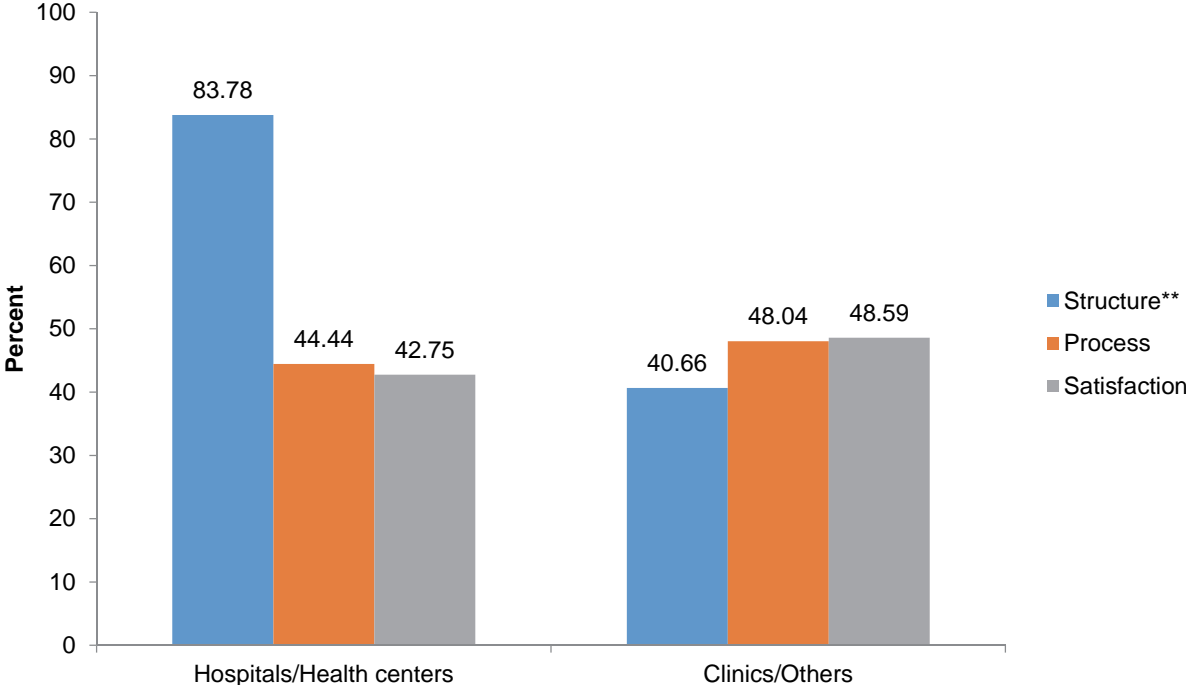


*p<.05; ** p<.01; *** p<.001

Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

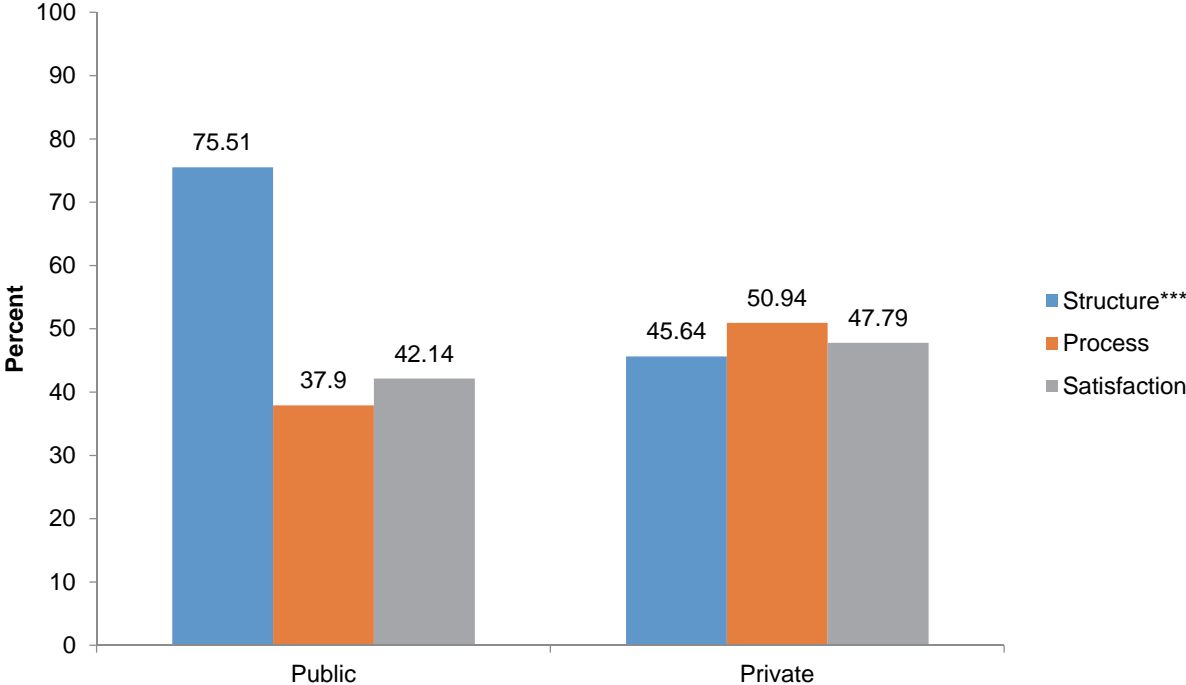
In Namibia (Figures 19-21), the sick child structure score was different between both types of facilities and managing authorities. A much higher proportion of facilities with a high score was seen among hospitals/health centers compared with clinics/others (84 versus 41 percent, $p<.01$) and among public sector compared with private sector facilities (76 versus 46 percent, $p<.001$). When stratified by region (Figure 21), all three scores were significantly different between regions, where Omakeke had the highest proportion of facilities with high scores in all three aspects of service delivery ($p<.001$ in all cases).

Figure 19. Namibia: Percentage of facilities offering sick child care with high structure, process and satisfaction score by type of facility



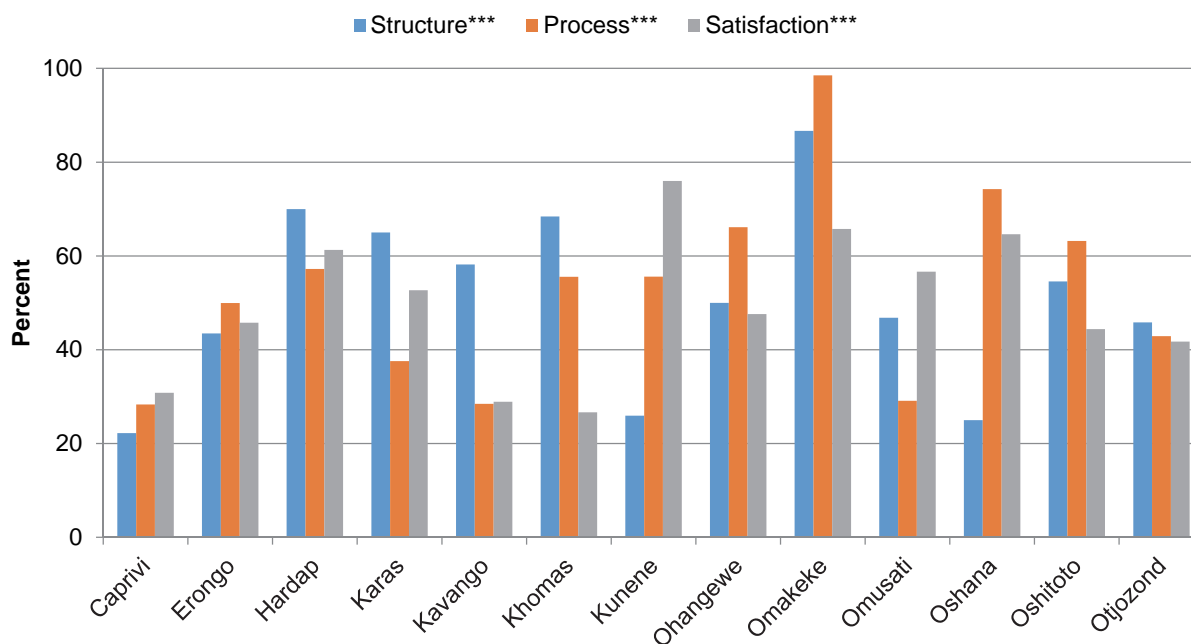
*p<.05; ** p<.01; *** p<.001
Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

Figure 20. Namibia: Percentage of facilities offering sick child care with high structure, process and satisfaction score by managing authority



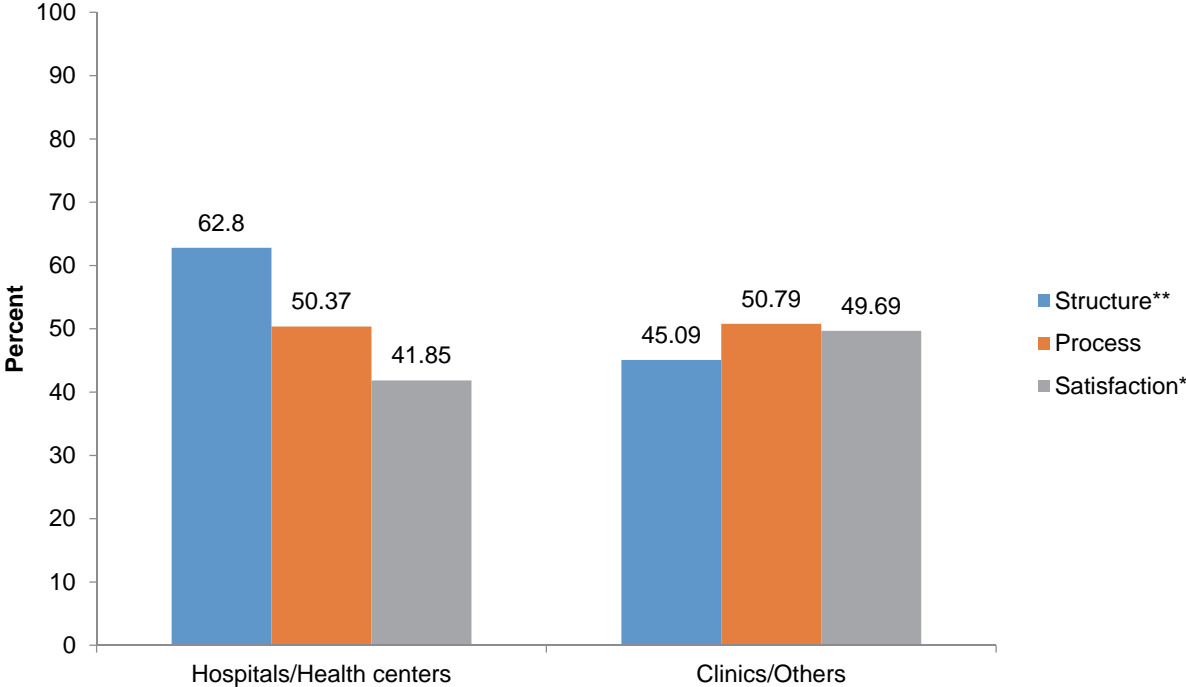
*p<.05; ** p<.01; *** p<.001
Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

Figure 21. Namibia: Percentage of facilities offering sick child care with high structure, process and satisfaction score by region



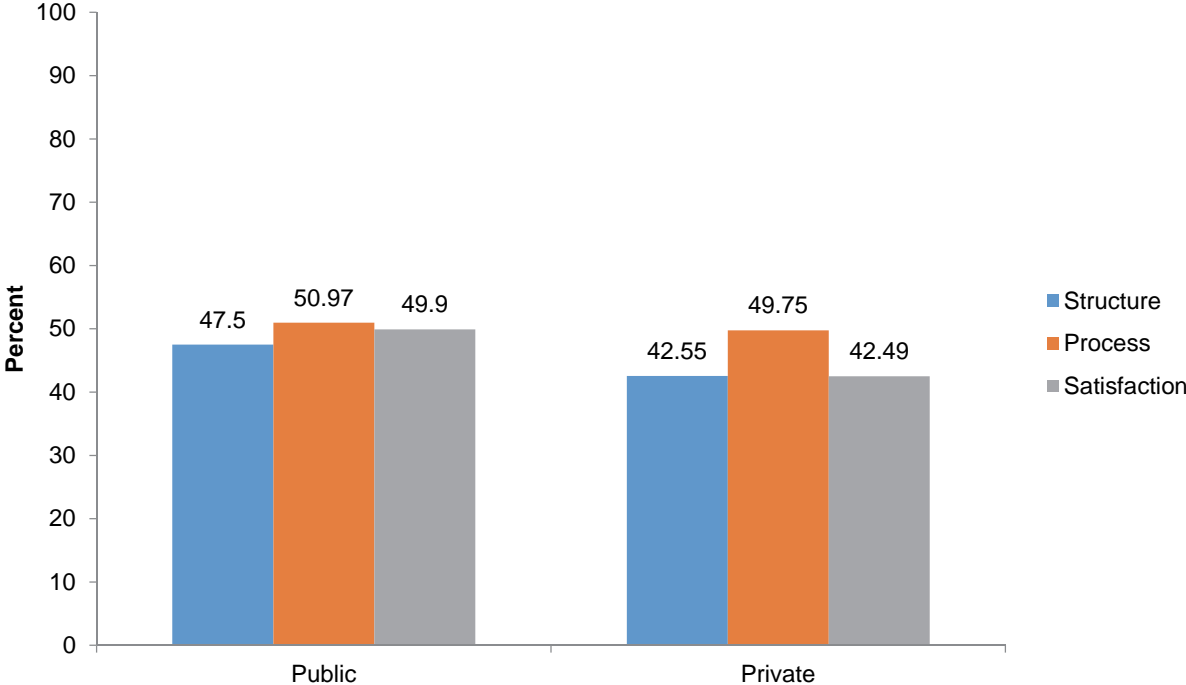
Figures 22-24 show the distribution of these scores in Senegal. Figure 22 indicates that while the sick child structure score appeared higher among hospitals and health centers (with a higher proportion of facilities with a high score) than among clinics and other facilities (63 versus 45 percent, $p < .01$), the opposite was observed with client's satisfaction: 50 percent of clients at clinics and other facilities reported being highly satisfied compared with 42 percent of clients at hospitals and health centers ($p < .05$). There were no differences between the public and private sectors with regard to these three scores, as shown in Figure 23. Figure 24, however, shows regional differences in the process and satisfaction scores. Kaffrine and Diourbel had the highest proportions of facilities with a high process score (72 and 62 percent, respectively), while clients in Louga, Saint Louis, and Matam were most likely to be satisfied (89, 86, and 85 percent, respectively) ($p < .001$ for both scores).

Figure 22. Senegal: Percentage of facilities offering sick child care with high structure, process and satisfaction score by type of facility



*p<.05; ** p<.01; *** p<.001
Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level

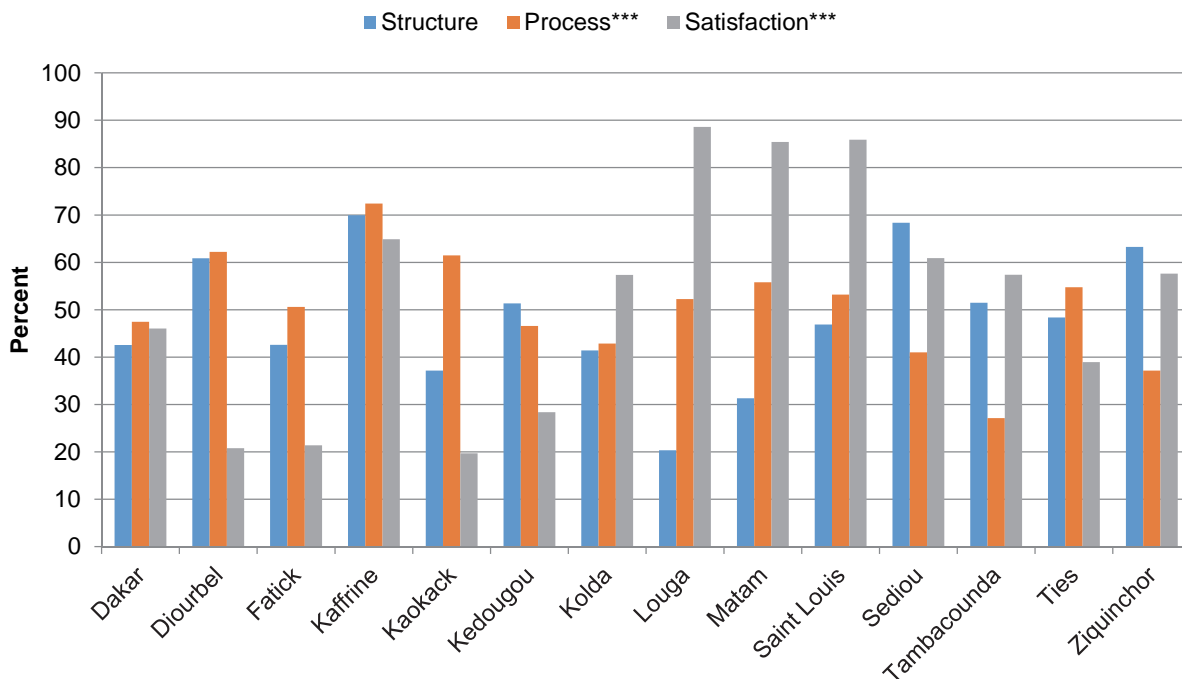
Figure 23. Senegal: Percentage of facilities offering sick child care with high structure, process and satisfaction score by managing authority



*p<.05; ** p<.01; *** p<.001

Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level
Results in the private sector is based on n<50.

Figure 24. Senegal: Percentage of facilities offering sick child care with high structure, process and satisfaction score by region



*p<.05; ** p<.01; *** p<.001

Structure score was calculated at the facility level, while process and satisfaction scores were calculated at the client level.

Structure score distribution is based on n<50 in most regions

3.2.4 Factors associated with sick child client's satisfaction

Table 9 presents results of multivariate models regressing client's satisfaction score against service delivery factors, and characteristics of the facility, provider, and client, by type of facility. A few results were consistent across models. Increased waiting time was found to be significantly associated with a lower client's satisfaction score in four of the six models. The process composite score was also consistently associated with increased client's satisfaction in all four models in Namibia and Senegal. The structure composite score was positively associated with client's satisfaction at clinics and other facilities in Kenya, but the association was negative at hospitals and health centers in both Namibia and Senegal.

Table 9. Factors associated with client satisfaction score related to sick child services

	Kenya			Namibia			Senegal		
	Hospitals/ Health Centers	Clinics/ Other Facilities	Hospitals/ Health Centers	Hospitals/ Health Centers	Clinics/ Other Facilities	Hospitals/ Health Centers	Hospitals/ Health Centers	Clinics/ Other Facilities	Clinics/ Other Facilities
	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)
FACILITY / PROVIDER CHARACTERISTICS									
Government managing authority (ref=private/NGO)	-0.26 (.06)***	-0.07 (.06)	-0.18(.14)	0.19(.13)	-0.20(.14)	.16(.12)			
Provider's years of SC experience	0.00 (.00)	0.00 (.00)	0.01(.00)	0.01(.00)*	N/A	N/A			
Provider received SC training in past 3 years (ref=no)	0.11 (.04)*	-0.02 (.06)	-0.18(.11)	-0.06(.05)	-0.31(.11)**	-0.11(.05)*			
STRUCTURE									
Structure composite score	0.03 (.04)	0.10 (.04)*	-0.27(.08)**	0.05(.04)	-0.30(.09)**	0.05(.04)			
Number of infection prevention precautions ^a	--	--	-0.03(.02)	-0.01(.01)	--	--			
Number of SC services provided at facility ^a	--	--	0.05(.03)	0.02(.01)	--	--			
Number of equipment available for SC services ^a	--	--	-0.09(.06)	-0.02(0.02)	--	--			
Supervision visit to facility with in the past 6 months ^a	--	--	0.18(.11)	0.16(.06)*	--	--			
Number of days per month that SC services are provided	0.03 (.04)	0.00 (.01)	-0.01(.01)	-0.03(.01)**	-0.01(.02)	-0.03(.01)**			
Blood test to verify malaria always available for children under age 5	-0.03 (.05)	-0.12 (.08)	-0.07(.09)	0.01(.05)	-0.08(.08)	0.03(0.05)			
IMCI mother's card available	-0.09 (.05)*	-0.06 (.05)	-0.28(.08)	-0.04(.07)	-0.32(.15)*	0.01(.07)			
IMCI guide always used in assessing/treating sick child ^a	--	--	-0.15(.09)	-0.11(.05)*	--	--			
PROCESS									
Process composite score	-0.03 (.03)	-0.02 (.03)	0.13(.06)*	0.07(.03)*	0.14(.06)*	0.06(.03)*			
Provider used visual aids	-0.01 (.09)	-0.04 (.08)	-0.28(.21)	0.14(.07)*	-0.26(.20)	0.12(.06)			
Provider recorded on child's health card/booklet	0.21 (.09)*	0.43 (.21)*	-0.34(.23)	0.01(.18)	-0.30(.20)	0.02(.18)			
Provider discussed follow-up visit	0.01 (.04)	0.15 (.07)*	0.35(.09)***	0.04(.05)	0.32(.09)***	0.04(.05)			
Waiting time	-0.01 (.00)***	-0.00 (.00)***	-0.00(.00)	-0.00(.00)***	-0.00(.00)	-0.00(.00)***			
R-squared	.13	.14	.21	.09	.20	.07			

Note: All models controlled for the sick child's characteristics (including, age, and whether it was his/her first visit to the facility for the same sickness episode) and the caregiver's education.

^a These variables are included in the structure composite score in Kenya and Senegal;

*p<0.05; **p<0.01; ***p<0.001; ^a ^b These variables are included in the structure composite score in Namibia and Senegal

Concerning other factors found to be associated with the outcome—sick child client’s satisfaction—within each country, in Kenya clients of sick child services at public sector hospitals and health centers appeared to report a lower satisfaction score than those at private sector hospitals and health centers ($p < .001$). Surprisingly, the availability of the IMCI mother’s card at hospital and health centers was negatively associated with client’s satisfaction ($p < .05$). However, clients seemed more satisfied if sick child providers recorded on the child’s health card, whether clients were receiving services at hospitals/health centers or clinics/others ($p < .05$ in both cases). Among Kenyan clinics and other facilities, sick child clients also reported being more satisfied if providers discussed return visits with them ($p < .05$). Only a few client characteristics were associated with the satisfaction score. If the sick child was a boy, clients of hospitals/health centers tended to report a lower satisfaction score than if the sick child was a girl ($p < .001$). Among sick child clients at hospitals/health centers, caregivers with higher levels of education also appeared to report being less satisfied ($p < .01$). Among sick child clients at clinics and other facilities, first-time visitors reported being more satisfied with services than return visitors ($p < .05$).

In Namibia, in addition to the factors already mentioned, a few other factors were associated with sick child client’s satisfaction. Among clients of hospitals and health centers, those who discussed return visits with the provider reported a higher satisfaction score than those who did not ($p < .05$). Discussion of follow-up visits was the only factor associated with client’s satisfaction at these facilities, besides the structure and process scores. Among clients of clinics and other facilities, a higher satisfaction score was reported at facilities that were supervised within the last six months ($p < .05$), but an increased number of days when sick child services were provided and consistent use of the IMCI guide were both associated with clients being less satisfied with services ($p < .01$ and $p < .05$, respectively). Among process attributes, in addition to process score and waiting time, mentioned previously, the use of visual aids was the only factor important to client satisfaction: clients reported being more satisfied if providers used visual aids during consultations ($p < .05$). Clients were also more satisfied if providers had more years of experience ($p < .05$). None of the client’s characteristics were found associated with the outcome in Namibia.

In Senegal, as mentioned, the process score was associated with increased satisfaction across types of facilities, while the structure score was negatively associated with client’s satisfaction at hospitals and health centers. In addition, among sick child clients at hospitals and health centers, higher satisfaction was reported if providers discussed follow-up visits with caregivers ($p < .001$), but the availability of the IMCI mother’s card was associated with a lower satisfaction score ($p < .05$). Across facilities, provider’s training in sick child services in the last two years was negatively associated with client satisfaction ($p < .01$ and $p < .05$, respectively). Clients of sick child services at clinics and other facilities also reported being less satisfied at facilities that offered these services more often during the month ($p < .01$). As in Namibia, none of the client’s characteristics appeared to be important to client satisfaction with sick child services in Senegal.

4. Discussion and Conclusion

This study assessed the quality of care at formal-sector health facilities in providing family planning, antenatal care (ANC), and sick child services, using data from the nationally representative Service Provision Assessment (SPA) surveys of health facilities in Kenya, Namibia, and Senegal. Quality of care was measured in structure, process, and outcome of the service provision. Associations between the outcome and structural and process attributes were analyzed using multiple regressions.

Higher-level facilities—hospitals and health centers—generally showed better structural quality than lower-level facilities, including clinics and other types of health facilities. In Kenya, for all three services, hospitals/health centers had significantly higher measurements for most of the structural indicators studied compared with clinics and other facilities. Although in Namibia and Senegal the gap was less prominent, the majority of structural indicators favored hospitals and health centers when there was a significant difference between the two groups. This finding is to be expected. Because there is greater demand for services provided in hospitals and health centers, more resources are allocated to them than to clinics and other facilities. The greater differences observed in Kenya compared with Namibia and Senegal could be because family planning, antenatal, and child health services in Kenya were offered by a large percentage of private clinics and others, which are commonly found to lack essential infrastructure and equipment. Among the facilities offering each of the three services, in Kenya more than 40 percent were private clinics/others compared with 6-15 percent in Namibia and Senegal.

When looking at individual structural attributes, health facilities at both higher and lower levels had inadequate infrastructure and supplies that are essential for providing good-quality services. In Namibia, for example, among facilities offering ANC services, service guidelines that detail how to manage pregnancy-related problems were observed in only 18 percent of the hospitals/health centers and 13 percent of the clinics/others. Another area of concern is the shortage of items for infection-prevention. Of the 14 (or 13 in Senegal) infection prevention items examined, only one-half were available at health facilities.

Availability of some service-specific structural attributes was also of concern, such as the limited number of contraceptive methods provided by family planning facilities, lack of regular distribution of ITNs to ANC clients, little use of the IMCI guide in assessing/treating sick children, and poor availability of diagnosis tests to verify malaria for children under age 5.

The observation of provider-client interaction in SPA surveys provides opportunities to assess whether the service provision process follows standards of acceptable content and quality. Although hospitals and health centers generally possessed better structural attributes than clinics and other lower-level health facilities, their performance in adhering to standards of care during the process of service delivery was not necessarily superior, and sometimes was poorer than at lower-level facilities. This finding suggests that enhanced structural attributes might improve the process of service delivery but not ensure its quality (Brook, McGlynn, and Shekelle 2000). Compared with structural measurements, process indicators did not vary as much by type of facility across service areas in all three countries. Moreover, lower-level facilities sometimes outperformed hospitals and health centers in providing some of the services. In Namibia, for example, family planning clinics/others were more likely than hospitals/health centers to ensure visual and auditory privacy for clients and assure client's confidentiality; clinics offering ANC services also were

more likely to discuss with clients signs and problems related to pregnancy and delivery preparation. In Kenya, clinics/other also showed higher measurements in several process attributes, including providing injectables to family planning clients, giving iron or/and folate tablets to ANC clients, providing sick child care information to the caregiver, using visual aids during consultation, and discussing follow-up visits.

The weak relationship between the structural and process attributes leads to a different question: what factors influence providers' performance during service delivery, if not the infrastructure environment of the facility? Human resource management including supervision and training may be associated with provider's performance in service delivery. Our comparisons between two groups of facilities, however, indicate that health providers in hospitals and health centers are more likely to have received service-specific training in the past three years and to have received supervision visits within the past six months. Also, in a study exploring how human resource management affects family planning providers' performance in service delivery, the authors found that having a job description was significantly associated with better quality of family planning delivery after controlling for other covariates, but not supervision and training (Thatte and Choi 2014). Another important factor is client volume. With a large number of clients, which can be the case in hospitals and health centers, quality of care is likely to be compromised.

Results on service-specific process indicators show that family planning providers rarely counselled clients on important family planning issues such as risk of STIs, or condom use for dual protection, as well as partner's attitudes towards contraceptive use. In all three countries, while family planning providers tended to discuss major issues related to the specific contraceptive method provided to clients, they did not seem to counsel about other family planning methods. For ANC, interventions like giving pregnant women iron/folate tablets and tetanus toxoid were not commonly observed in Kenya, whereas in Namibia the majority of consultations prescribed iron/tablets and tetanus toxoid vaccine to clients. For sick child care, poor practice was observed in adhering to the IMCI guidelines. Providers are expected advise caregivers about sick child care at home, such as giving information about feeding/breastfeeding, advising intake of extra fluids during sickness, advising continued feeding during sickness, naming the illness for the caregivers, and teaching them about symptoms requiring immediate return for medical care (WHO 2005). However we found that such consultation was rarely offered to caregivers of sick children in all three countries.

Waiting time is an important component of quality of care and of client satisfaction. Long waiting time has been found to be associated with increased client dissatisfaction and to have a negative impact on use of health services and on health outcomes (Pizer and Prentice 2011; Prentice and Pizer 2007). Our analysis indicates that prolonged waiting time was a common problem across service areas and countries. Family planning clients had to wait one hour or longer to receive services—twice as long as the recommended waiting time of 30 minutes (O'Malley et al. 1983). The average waiting time was unbearably long for antenatal care, as long as over two and half hours at hospitals/health centers in Namibia. Clients waited longer at hospital and health centers generally than at clinics and other types of facilities. Our results confirmed the findings from previous research that long waiting time is a serious problem at health facilities in developing countries (Mendoza Aldana, Piechulek, and al-Sabir 2001; Oche and Adamu 2013). The major problems causing long waiting time reported in the literature include lack of health workers, large patient load, and inefficient registration process (Oche and Adamu 2013).

The outcome aspect of the quality of care was only measured through client satisfaction due to data availability. When comparing higher- and lower-level health facilities, we found that higher-level facilities do not necessarily have greater client satisfaction. To the contrary, the satisfaction score was higher at clinics and other types of facilities than at hospitals/health centers for both family planning and sick child care services in Senegal, and for antenatal care in Kenya. Within each type of facility, we further examined how structural and process attributes are associated with client satisfaction after controlling for variables that could potentially affect client satisfaction.

A limited number of structural and process attributes were identified as associated with client satisfaction. Process attributes seem to be more predictive of client satisfaction than structural ones. In both Namibia and Senegal, the process composite score was positively associated with satisfaction of clients seeking sick child services, irrespective of facility type. A study in three African countries also found client satisfaction to be associated more with process quality than structural quality (Hutchinson, Do, and Agha 2011). Waiting time showed consistent negative effects on client satisfaction. This finding agrees with findings of previous research in both developed and developing countries that waiting time is an important factor influencing client satisfaction (Mendoza Aldana, Piechulek, and al-Sabir 2001; Pizer and Prentice 2011; Tafese, Woldie, and Megerssa 2013). A few other service-specific process attributes, especially those indicating receipt of tangible services (i.e. injectables for family planning clients, iron/folic acid and tetanus toxoid vaccine for ANC clients) also appeared to affect client satisfaction. This finding is comparable to that of several previous studies in which not being able to get prescribed drugs and supplies was a major cause of client dissatisfaction (Mitike, Mekonnen, and Osman 2002; Tafese, Woldie, and Megerssa 2013).

We did not find much evidence of a significant relationship between the structural quality and client satisfaction. Among the list of structural attributes, the composite structural score showed positive effects on client satisfaction with ANC services at hospitals and health centers and with sick child services at clinics and other types of facilities in Kenya. Having a supervision visit within the past six months stands out as positively associated with client satisfaction in several models. Some structural attributes showed negative effects on client satisfaction in several models. For example, the structure composite score was negatively associated with client satisfaction with ANC services at clinics/others in Namibia and with sick child services at hospitals and health centers in both Namibia and Senegal. The number of days when family planning services were provided was negatively associated with client satisfaction in lower-level facilities in Namibia and Senegal. Another unexpected finding is that provider's receipt of training in the past three months was negatively associated with client satisfaction.

We acknowledge that apart from quality of care client satisfaction can also be affected by many other factors, including previous experience with health services, client expectations for the provider, as well as the client's socio-demographic characteristics and cultural background. When judging the service received, due to the limited knowledge about technical aspects of the care, clients tend to give more weight to the interpersonal relationship with the provider. Several studies have confirmed that client satisfaction is more likely to be predicted by the provider's interpersonal relationship with the client rather than technical capability and the facility's infrastructural environment (Lei and Jolibert 2012; Mendoza Aldana, Piechulek, and al-Sabir 2001).

Our results provided some evidence that client satisfaction was greater in the private sector than in the public sector. After controlling for variables that could potentially affect client satisfaction, family planning

clients at private clinics/others in Kenya and private hospital/health centers in Senegal reported greater satisfaction with the service received than their counterparts at public sector facilities. Antenatal clients in the public sector were also more likely to be satisfied than in the private sector for all facilities in Kenya, and for hospitals and health centers in Namibia. Such private-public disparity was also observed in client satisfaction with sick child services at hospitals and health centers in Kenya. Our findings accord with an assessment based on the 2004 Kenya SPA data, which showed that the odds of family planning clients being satisfied at private sector facilities were three times higher than at public sector facilities (Agha and Do 2009). Hutchinson and colleagues also reported significantly higher levels of client satisfaction with family planning services provided in private facilities than in public facilities in Ghana, Kenya, and Tanzania (Hutchinson, Do, and Agha 2011). The private sector was generally reported to have greater timeliness and hospitality to patients compared with the public sector (Basu et al. 2012), which may in part explain the higher level of client satisfaction.

While the observations of actual process of service delivery in SPA surveys provide direct evidence of quality of care, it should be noted that the presence of an observer could possibly make providers adjust their behavior; what was observed may not be the daily practice. We measure client satisfaction based on client's responses to a series of questions. While this approach may be less subjective than asking a single question about whether the client was satisfied with the service received, clients may respond to the series of questions with answers deemed social acceptable, depending upon their expectations and cultural background.

In conclusion, through a comprehensive assessment of the structure, process, and outcomes of key maternal and child health services in three African countries, our study has provided empirical evidence on the quality of care and highlighted major gaps in the availability of essential infrastructure and equipment, and in adherence to standards of quality practice. Findings from this analysis are expected to inform intervention programs in identifying areas for improving quality of care.

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Appendix A

Definitions of common structural attributes for family planning, ANC, and sick child care services

Variable	Definition	Variable type
<u>Managing authority</u>	Public sector: government sector facilities Private sector: all private for profit, non-profit and faith-based facilities	Binary
<u>Structural attributes and equipment</u>		
Basic amenities	Number of amenities at facility: water, electricity, generator, telephone, email, ambulance	Out of 6
Infection prevention precautions	Number of infection prevention measures at facility: sharps containers, gloves, disinfectant, disposable needles, autodestruct syringes, disposable syringes, waste bin with plastic liners, hand disinfectant, electric dry heat stabilizer, autoclave, waste disposal of sharps, waste disposal of hazards	Kenya: Out of 14 Namibia: Out of 14 Senegal: Out of 13
<u>Management</u>		
Routine management meetings	Where there are monthly meeting to discuss management issues	Binary
Quality assurance system	Whether the facility has a routine quality assurance system	Binary
System to collect client opinion	Whether the facility has a system to obtain clients' opinions regarding services	Binary
Supervision	Whether the facility reported that the last supervision visit was in the last 6 months	Binary

Appendix B

Definitions of family-planning-specific structural and process attributes of service quality

Variable	Definition	Variable type
Structural Attributes		
Service availability		
Days FP services available	Number of days the facility provides family planning services	Out of 7
FP methods offered, in stock and valid	Number of family planning methods, in stock at time of visit and valid: combined pills, progestin only pills (2 month, 3 month), combined injectables (1 month), implants, male condoms, female condoms, IUDs, emergency contraceptive pills, diaphragm, male sterilization, female sterilization	Kenya: Out of 13 items Namibia: Out of 13 items Senegal: Out of 12 items
Contraceptive storage measures	Number of measures in place to store contraceptive methods safely: Contraceptive methods organized by expiration date, protected from water, protected from sun, protected from rodents/pests	Out of 4
Health care provider always available	Whether a trained health care provider was always available at the facility	Binary
Counseling		
FP visual aids	Number of family planning visual aids available: Samples of methods, male condom model, female condom model, posters, teaching aids	Kenya: Out of 8 Namibia: Out of 5 Senegal: Out of 3
FP guidelines/protocols	Whether the facility had family planning guidelines or protocols available on the day of the visit	Binary
Process Attributes		
Physical examinations performed	Number of family planning physical examinations performed during consultation: blood pressure, weighed, asked about smoking, asked about symptoms of sexually transmitted infections, reviewed client health card	Out of 5
Visual and auditory privacy	Whether the provider ensured both visual and auditory privacy for client during consultation	Binary
Confidentiality	Whether the provider assured the client orally of confidentiality during consultation	Binary
FP-related issues discussed	Number of issues related to family planning discussed during consultation: partner's attitude toward family planning, partner status, risk of STIs, use of condoms to prevent STIs, use of condoms with other methods to avoid STIs	Out of 5
FP methods discussed	Number of methods discussed with client: combined pill, progestin-only pill, injectable (1 month), injectable (2-3 months), implant, male condom, female condom, IUD, emergency contraception, spermicide, diaphragm, vasectomy, female sterilization	Kenya: Out of 12 Namibia: Out of 12 Senegal: Out of 13
Information about FP methods provided	Number of types of information provided about family planning explained during consultation: how to use method, possible side effects, what do if problems occurred, told to return for follow-up	Out of 4
Injectable prescribed	Whether the client was provided or prescribed an injectable method by the provider	Binary

Appendix C

Definitions of ANC-specific structural and process attributes of service quality

Variable	Definition	Variable type
Structure Attributes		
Service availability		
Days ANC services available	Number of days the facility provides ANC services	Out of 7
Routine ANC services	Number of routine ANC services: HIV counseling, HIV testing/results, STI testing/referral, preventative antimalarial treatment, delivery preparations, FP counseling	Out of 6
ANC equipment available	Number of ANC equipment available at facility: Vaginal speculum (small, medium, large), individual infant chart/record, vitamin K, vitamin A, fetal stethoscope, thermometer, infant scale, adult weighing scale	Out of 11
Availability of iron or folate tablets	Whether the facility had iron or folate tablets	Binary
Routine ANC-related tests	Number of routine ANC-related tests available at facility: Anemia (blood test), syphilis (blood test), urine protein, rh factor, urine glucose, blood group	Out of 6
Tetanus toxoid vaccine available	Whether tetanus toxoid vaccine offered on all days that ANC services are offered	Binary
Insecticide Treated Nets (ITN) available	Whether ITNs are distributed to ANC clients	Binary
Counseling		
Guidelines for ANC	Whether the facility had ANC guidelines or protocols available on the day of the visit	Binary
Process Attributes		
Number of ANC procedures performed	Number of ANC procedures performed during consult: blood pressure, palpate abdomen for fetal presentation, palpate abdomen for uterine height, listen abdomen for fetal heartbeat, anemia test, urine test, syphilis test, counseled/referred for HIV test, tested for HIV/referral, looked at client health card, weighed client, examined palms for anemia, examined feet for edema, examined client's breast, vaginal exam	Out of 15
ANC client history	Number of types of client history information requested during consult: age, current medication, date of last menstruation, number of prior pregnancies, prior stillbirth, infants who died in first week, heavy bleeding during or after delivery, previous assisted delivery, previous abortions, multiple pregnancies, prolonged labor, hypertension, convulsions	Kenya: Out of 13 Namibia: Out of 9
Signs and problems with current pregnancy	Number of signs or problems with current pregnancy discussed during consultation: Bleeding, fever, headache/blurred vision, swollen face or hands, tiredness/breathlessness, felt the baby move, other symptoms/problems in pregnancy, persistent cough, HIV status	Kenya: Out of 9 Namibia: Out of 7
Delivery preparation	Number of delivery-related issues about which the health care provider advised/counseled: place of delivery, use of skilled health worker for delivery, items to have for home delivery, importance of newborn immunization, delivery preparation, care of newborn, early initiation of breastfeeding	Kenya: Out of 7 Namibia: Out of 5
Client received iron or folic acid tablets	Whether client received iron or folic acid tablets during consultation	Binary
Client asked about tetanus toxoid	Whether client received tetanus toxoid vaccine	Binary

Appendix D

Definitions of sick-child-specific structural and process attributes of service quality

Variable	Definition	Variable type
Structure Attributes		
Service availability		
Days SC services available	Number of days the facility provides sick child services in the month	Out of 31
Routine SC services	Number of routine sick child services provided: Weigh child, plot weight on graph, take child's temperature, assess immunization status, group health education, administer paracetamol/sponge for fever	Kenya: Out of 7 Namibia: Out of 6 Senegal: Out of 7
SC equipment available	Number of pieces of sick child equipment available at facility: Infant scale, child scale, thermometer, timer/watch or clock with second hand	Kenya: Out of 6 Namibia: Out of 4 Senegal: Out of 4
Malaria blood test	Whether the facility always has malaria blood tests available for children under age 5	Binary
IMCI mother's card available	Whether IMCI mother's card are available at facility	Binary
Insecticide Treated Nets (ITN) available	Whether ITNs are distributed to ANC clients	Binary
Counseling		
IMCI guide followed	Whether the facility always follows guide for integrated management of childhood illness (IMCI) when assessing/treating sick child	Binary
Process Attributes		
Number of symptoms checked	Number of symptoms that the provider asked for or that the caregiver mentioned: Cough or difficulty breathing, diarrhea, fever or body hotness, ear problems, unable to drink/breastfeed, vomiting everything, convulsions, blood in stools	Kenya: Out of 7 Namibia: Out of 8 Senegal: Out of 7
Physical exams for sick child	Number of types of sick child exams performed: Temperature by thermometer, feel for fever or hotness, count respirations, auscultate child, check skin turgor for dehydration, check for pallor by looking at palms, check for pallor by looking at conjunctiva or mouth, look in ear, feel behind ear, undress child to examine, press feet to check for edema, assess for HIV symptoms, weigh the child, plot weight on growth chart, compare weight to standard weight, check mouth and throat, check for neck stiffness, offered breast or drink, normal feeding when not ill, normal breastfeeding when not ill, feeding or breastfeeding during this illness, discuss weight/growth/growth chart, review immunization card or asked about vaccination history, asked if child received vitamin a, looked at health card during visit	Kenya: Out of 24 Namibia: Out of 24 Senegal: Out of 16
Information provided to caregiver	Number of pieces of information given to caregiver during consultation: provide general information about feeding/breastfeeding, advise extra fluids during this sickness, advise continued feeding during sickness, name the illness for the caretaker, describe symptoms requiring immediate return for care	Out of 5
Visual aids	Whether provided used visual aids during consultation	Binary
Child's health card	Whether provider recorded on child's health card/booklet	Binary
Follow-up	Whether the provider discussed follow-up visit during consultation	Binary

Appendix E

Questions that were used to construct the client satisfaction score (the same for all services): whether each of the followings was a major problem (1=no, 0=yes)

1. Time you waited
2. Ability to discuss problems or concerns about your health with the provider
3. Amount of explanation you received about the problem or treatment
4. Quality of the examination and treatment provided
5. Privacy from having others see the examination
6. Privacy from having others hear your consultation discussion
7. Availability of medicines/methods at this facility
8. The hours of services at this facility
9. The number of days services are available to you
10. The cleanliness of the facility
11. How the staff treated you
12. Cost for services or treatments
13. Any problem you had today that I did not mention

Internal reliability coefficients of the satisfaction index by type of service and country

	Kenya	Namibia	Senegal
Family planning services	0.85	0.72	0.72
ANC services	0.86	0.75	N/A
Sick child care	0.90	0.84	0.71

Appendix F

Variables included in the structure and process composite indices in family planning, by country

	Variable type			Country	
	Categorical	Continuous	Kenya	Namibia	Senegal
STRUCTURE COMPOSITE INDEX					
Monthly meetings for managerial/ administrative issues	Yes / No	---	X	X	X
Any system to obtain client opinions	Yes / No	---	X	X	X
Routine quality assurance activities	Yes / No	---	X	X	X
Supervision visit to facility within the past 6 months	Yes / No	---	---	X	---
Number of basic amenities at facility	---	0-6	X	X	X
Number of infection prevention precautions (out of 14)	---	0-14	X	X	X
Number of FP methods offered, available and with valid expiry date	---	0-13 (Kenya and Namibia) 0-12 (Senegal)	X	---	---
Number of FP visual aids at facility	---	0-8 (Kenya) 0-5 (Namibia) 0-3 (Senegal)	X	---	X
Guidelines for FP Services at facility	Yes / No	---	X	X	X
Cronbach's Alpha			.66	.51	.51
PROCESS COMPOSITE INDEX					
Physical examinations	---	0-5	X	X	X
Provider ensured visual and auditory privacy	Yes / No	---	X	X	X
Provider assured client about confidentiality	Yes / No	---	X	X	X
Number of FP-related issues discussed	---	0-5	X	X	X
Number of methods discussed with client	---	0-12 (Kenya and Namibia) 0-13 (Senegal)	X	X	X
Information about method provided to client	---	0-4	X	X	X
Cronbach's Alpha			.51	.53	.51

Appendix G

Variables included in the structure and process composite indices in antenatal care (ANC), by country.

	Variable type		Country	
	Categorical	Continuous	Kenya	Namibia
STRUCTURE COMPOSITE INDEX				
Monthly meetings for managerial/ administrative issues	Yes / No	---	X	X
Any system to obtain client opinions	Yes / No	---	X	X
Routine quality assurance activities	Yes / No	---	X	X
Supervision visit to facility with in the past 6 months	Yes / No	---	---	---
Number of basic amenities at facility	---	0-6	X	X
Number of infection prevention precautions	---	0-14	X	X
Health workers always available	Yes/No	---	X	X
Number of days per week that ANC services are offered	---	0-7	---	---
Number of services provided to ANC clients	---	0-6	X	X
Number of equipment for ANC services, excluding iron and folate	---	0-11	X	---
Facility has iron or folic acid	Yes / No	---	---	---
Facility routinely distributes ITN to ANC clients	Yes / No	---	---	X
Number of tests for ANC clients	---	0-6	X	---
Guidelines for ANC services at facility	Yes / No	---	X	X
Cronbach's Alpha			.61	.53
PROCESS COMPOSITE INDEX				
ANC procedure	---	Kenya: 0-17 Namibia: 0-15	X	X
ANC client's history is taken	---	Kenya: 0-13 Namibia: 0-9	X	X
Provider asked about signs and problems with pregnancy	---	Kenya: 0-9 Namibia: 0-7	X	X
Issues with delivery preparation discussed	---	Kenya: 0-7 Namibia: 0-5	X	X
Client received iron/folate tablets or both at this or previous visit	Yes / No	---	---	---
Client received tetanus toxoid vaccine or both at this or previous visit	Yes / No	---	---	---
Cronbach's Alpha			.70	.75

Appendix H

Variables included in the structure and process composite indices in sick child care, by country.

	Variable type		Country		
	Categorical	Continuous	Kenya	Namibia	Senegal
STRUCTURE COMPOSITE INDEX					
Monthly meetings for managerial/ administrative issues	Yes / No	---	X	X	X
Any system to obtain client opinions	Yes / No	---	X	X	X
Routine quality assurance activities	Yes / No	---	X	X	X
Supervision visit to facility within the past 6 months	Yes / No	---	X	X	X
Number of basic amenities at facility	---	0-6	X	X	X
Health workers always available	Yes / No	---	X	X	X
Number of infection prevention precautions (out of 14)	---	0-14 (Kenya and Namibia)	X	---	X
	---	0-13 (Senegal)		---	
	---	0-7 (Kenya and Senegal)	X	---	X
	---	0-6 (Namibia)		---	
Number of SC services provided at facility	---	0-6 (Kenya)	X	---	X
	---	0-4 (Namibia and Senegal)		---	
Number of equipment available for SC services	Yes / No	---	X	---	X
IMCI guide always used in assessing/treating sick child	---	0-31	---	---	---
Number of days per month that SC services are provided	Yes / No	---	---	---	---
Blood test to verify malaria always available for children <5	Yes / No	---	---	---	---
IMCI mother's card available	Yes / No	---	---	---	---
Cronbach's Alpha			.60	.45	.55
PROCESS COMPOSITE INDEX					
Number of symptoms that provider asked about or caregiver mentioned	---	0-7 (Kenya and Senegal)	X	X	X
	---	0-8 (Namibia)			
	---	0-24 (Kenya and Namibia)	X	X	X
	---	0-16 (Senegal)			
Physical exam of sick child	---	0-5	X	X	X
Information provided to caregiver	Yes / No	---	---	---	---
Provider used visual aids	Yes / No	---	---	---	---
Provider recorded on child's health card/booklet	Yes / No	---	---	---	---
Provider discussed follow-up visit	Yes / No	---	---	---	---
Cronbach's Alpha			.61	.59	.26*

*No combination of variables resulted in an alpha of greater than .40. The variables for this process index were chosen based on the variables included in the index for Namibia and Kenya.