Where do delays occur when women receive antenatal care? A client flow multi-site study in four health facilities in Nigeria

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SUMMARY
Objectives: The objective of the study was to identify where delays occur when women present for antenatal care in four Nigerian referral hospitals, and to make recommendations on ways to reduce delays in the course of provision of antenatal care in the hospitals.
Design: Prospective observational study
Setting: Four Nigerian (1 tertiary and 3 secondary) Hospitals
Participants: Women who presented for antenatal care.
Interventions: A process mapping. The National Health Service (NHS) Institute Quality and Service Improvement Tool was used for the assessment.
Main outcome measures: The time women spent in waiting and receiving antenatal care in various departments of the hospitals.
Results: Waiting and total times spent varied significantly within and between the hospitals surveyed. Mean waiting and total times spent were longest in the outpatients' departments and shortest in the Pharmacy Departments. Total time spent was an average of 237.6 minutes. $\chi^2 = 21.074$; p= 0.0001
Conclusion: There was substantial delay in time spent to receive care by women seeking routine antenatal health services in the four secondary and tertiary care hospitals. We recommend managers in health facilities include the reduction of waiting times in the strategic plans for improving the quality of antenatal care in the hospitals. This should include the use of innovative payment systems that excludes payment at time of service delivery, adoption of a fast-track system such as pre-packing of frequently used commodities and the use of new tech informational materials for the provision of health education.

Keywords: Delays; Waiting time; antenatal; Hospitals; Women; Maternity care; Process mapping; Nigeria.

INTRODUCTION
Nigeria has one of the highest rates of maternal mortality in the world. Estimates from the World Health Organization showed that 58,000 women died in 2015 in Nigeria from preventable causes which accounted for 19% of global maternal deaths.[1] One of the reasons adduced for the high maternal mortality in Nigeria is the low utilization of health facilities for maternal health care.

In turn, low utilization of maternal health services in the country has been attributed to women's perceptions that they would be delayed in receiving care in health facilities.[2-4] Available data indicate that in 2013, slightly over one-half (51%) of women who had live births five years before the survey reported four or more antenatal care visits in a health facility, which was slightly more than the 47% of women that reported the same outcome in 2003.

By contrast, only 36% delivered in a health facility, while 58% had no postnatal check-up after delivery.[5] Umar, Oche and Umar,[6] reported a waiting time of more than one hour for women receiving maternity care at the teaching hospital in Sokoto, Nigeria. A report from a primary health care centre in Lagos, Nigeria, also showed that women waited for an average of 137 minutes before seeing a doctor.[7] The results of several reviews and assessments in Nigeria suggest that a major disincentive for women not to use available antenatal, delivery and postnatal services in Nigeria is the delay they experience when they seek services in public health institutions.[8,9] Dairo and Owoyokun[10] in a study conducted in Ibadan, Nigeria reported that 59% of pregnant and nursing mothers affirmed long waiting time as a prominent factor inhibiting the utilization of antenatal care services.

Long waiting time is also a major factor cited by women for dissatisfaction with the quality of care in health facilities in Nigeria and other countries.[11–14] Some of the factors that have been identified as being responsible for delays and long waiting times in health facilities in Nigeria include inadequate staffing with attendant excessive work load experienced by health providers,[3] and poor attitudes of providers.[4] To date, the nature and extent of this delay in various service points have not been objectively verified and quantified in Nigeria. Furthermore, many of the previous studies in the country were located in individual hospital settings, which prevented a proper examination of facility delays as an important factor in women accessing maternal health care within Nigeria's health care system. We undertook the study to document the times spent by women at various service delivery points in four referral hospitals so as to identify the actual points of delay when women access antenatal care. The objective of the study was to identify the sections of the referral hospitals where delays occur in the hospital system when patients present for antenatal care, and to make recommendations on ways to reduce delays in the provision of maternity care in the country. We believe that this approach would be relevant to designing specific interventions for rectifying existing bottlenecks in the provision of quality antenatal care that address the needs of women.

METHODS
The study used process mapping to follow women when they first entered the hospitals, as they traversed each department of the hospital to access antenatal care. The patients were identified randomly as they entered the maternity units of the hospitals. Four referral hospitals (one tertiary and three secondary facilities) were selected from three out of six geo-political zones of Nigeria.

Administratively, Nigeria has 36 states and a Federal Capital Territory (Abuja). These states are further categorized into six zones: North-central, Northeast, Northwest, Southeast, South-south, and Southwest. Each of the zones is predominantly made of people of similar culture. In the Northwest, a tertiary health facility, Aminu Kano Teaching Hospital (AKTH) in Kano, Kano State was selected. The secondary care facilities were General Hospital GHA), Ijaye, Abeokuta in the Southwest; General Hospital (GHM), Minna, Niger State and Karshi General Hospital (KGHA), Abuja in the North-central.

Each hospital offers antenatal and delivery care as part of comprehensive provision of maternal health services. The antenatal clinics are held in designated parts of the hospitals and are administered by the Departments of Obstetrics and Gynaecology of the hospitals. Each Department has full complements of residents in training, consultant staff and midwives that offer full time services. However, the antenatal clinics are mainly run by residents under the supervision of clinical Consultants. The Consultants attend to complicated clinical cases, who are oftentimes then admitted for more intensive care in the antenatal wards of the hospitals.

As part of the provision of antenatal care, women presenting for the first time in the antenatal clinics report at registration desks that are situated in the antenatal clinics. Thereafter, they are assigned to specific consultant teams (Consultant and residents) and given dates to consult the teams. However, the specific times of the dates given for visit are often not identified in the appointments and so patients attending clinical appointments have to take turns to wait until they see doctors in the consulting teams. After the consultations, women are then requested to visit the laboratory departments (for laboratory investigations), radiology departments (for ultrasound or X-rays) or pharmacy departments (for prescribed drugs) to receive recommended services in other parts of the hospitals. Oftentimes, the costs of such services are paid at the individual service delivery points, rather than at a central location. Furthermore, none of the facilities had computerized records, dedicated pharmacy for antenatal clinics or and pack system for antenatal drugs.

A major concern in the four hospitals is poor staffing of the antenatal clinics with few doctors allocated to attend to patients in the hospitals. Our formative research estimated patients to doctor ratios in the hospitals to range from 330 per doctor per year in Abuja, to 924 in Kano, 2740 in Abeokuta to 1,976 in Minna.

The NHS Institute Quality and Service Improvement Tool was used by the research teams, working with a midwife and a doctor from each of the hospitals.

Each patient was identified at the point of entry by a project staff in each of the hospitals. The purpose, objectives and methods of the study were explained to them in detail. Only those who agreed to participate and who could read their wrist watches and record the findings accurately were included in the study. Also excluded were women who were coming to the hospitals to register for antenatal care for the first time. These women were often seen by record officers on their first visits and were then given appointments on days to see their consultant teams. Since they were not expected to complete all clinical processes on their first visits, they were not included in the study.

The patients were given a form (Form A3, also called client flow form) to record the times they entered and left each service delivery unit (Records, Out-patient, Pharmacy and Laboratory departments), to enable the calculation of the total time they spent in receiving care in various departments of the hospital. The women were taught to record the waiting times (i.e. times they spent waiting to see the service provider), and the contact time (i.e. times they spent with the service provider). Upon completion and exit from the hospitals, the patients were requested to deposit the completed forms at the same desk they obtained them. The forms were then examined and the clients interviewed by the project staff to ensure accuracy in the documentation of waiting times and contact times. The number of women included in the sample in each hospital was determined by the number of consenting women in the hospital, who successfully and correctly completed the timing at the service delivery points,

Data Analysis
The data analysis was done centrally. The analysis was conducted semi-quantitatively. Data were entered into the computer using the SPSS Pc+ software. The mean duration of time reportedly spent by the patients from arrival at each department in the facility to exit was calculated. Waiting time was measured as time of arrival in the Department to time when service started. Women who did not complete the forms correctly were excluded from the analysis. Due to the asymmetric nature of the data, non-parametric statistics, Kruskal-Wallis H test was used to compare the means across the facilities and departments. An independent t-test was also conducted to determine if there is a statistically significant difference in the mean duration of time spent between patients who were visiting for initial treatment and those

who came for follow-up. The significance level was set at 0.05.

Ethical Approval
Ethical approval for the study was obtained from the World Health Organization and the National Health Research Ethics Committee (NHREC) of Nigeria – number NHREC/01/01/2007 – 16/07/2014, renewed with NHREC 01/01/20017-12/12/2015b.

RESULTS
A total of 73 women were followed through and analyzed. Their ages ranged from 18 to 37 years (median=24 years). The distribution of the respondents for each facility showed that 20 women successfully completed the study at the AKTH, Kano; 20 at the GHM, Minna; 14 at the KGHA, Abuja; while 19 completed the study at the GH, Abeokuta. However, in the OPD, 2 respondents were excluded in the waiting time analysis and 3 in the total time spent analysis; in the Pharmacy and Laboratory departments, 8 and 7 respondents respectively were excluded in both the waiting and total time spent analyses; see Tables 1 and 2.

A 2-tailed independent t-test conducted to examine if there is any difference in the duration of waiting and total time spent by type of visit (initial or follow-up) showed no statistically significant difference in all the departments. The time spent by the patients in the various departments (Records, Out-patient, Pharmacy and Laboratory departments) of the hospitals to obtain service were analyzed and results are presented in Tables 1 and 2.

Waiting Time in Various Departments
Table 1 show the mean waiting time and standard deviation i.e. service start time minus patient's time of arrival at the various departments of the hospitals. The results revealed that waiting time varied by the departments. In general, the pharmacy department recorded the shortest mean waiting time (8.5 minutes) with the least waiting time in pharmacy of 1.8 minutes at the AKTH, Kano, and the longest waiting time of 18.2 minutes at the KGH, Abuja.

By contrast, the outpatient department of the antenatal clinics recorded the longest mean waiting time (24.7 minutes) with the longest waiting time of 36.4 minutes in AKTH, Kano and the shortest (15.8 minutes) in KGH, Abuja. The results of waiting time within each department revealed further differences across the four health facilities. In the Medical Records Departments, waiting time ranged from the longest of 23.8 minutes in GH, Abeokuta to the shortest of 12.1 minutes in GH, Minna.

On average, women waited for 17.5 minutes to access service in the Medical Records Departments across the four facilities. In the laboratory, the longest waiting time was in GH, Abeokuta (23.2 minutes) whereas the shortest time was 7.9 minutes in AKTH, Kano. Except in the Outpatients' Department at the AKTH, Kano, waiting time was less than 30 minutes in all the departments across the health facilities. Within each facility, patients waited longest in the Outpatients Departments in all the hospitals, except in KGH, Minna where the longest waiting time was in the Pharmacy. A comparison of the differences in the reported waiting time with a Kruskal-Wallis H test revealed that the differences observed in the departments across the four facilities was statistically significant in the Pharmacy (*p*=0.000), and Laboratory (p=0.001) departments.

Table 1 Mean Waiting time (Minutes) in various departments of the health facilities (Service start time minus Arrival time)

Health Facility	Medical Records Mean (SD)	Outpatient Department Mean (SD)	Pharmacy Department Mean (SD)	Laboratory Department Mean (SD)
Aminu Kano Teaching Hospital (Kano)	(n=20) 18.3 (23.5)	(n=20) 36.4 (36.7)	(n=18) 1.8 (4.2)	(n=15) 7.9 (12.2)
General Hospital, (Minna)	(n=20) 12.1 (9.1)	(n=19) 16.5 (17.8)	(n=18) 11.7 (9.6)	(n=20) 12.1 (15.8)
Karshi General Hospital, (Abuja)	(n=14) 15.6 (15.7)	(n=14) 15.8 (19.3)	(n=11) 18.2 (26.3)	(n=13) 8.4 (5.2)
State Hospital, Ijaye (Abeokuta)	(n=19) 23.8 (24.2)	(n=18) 27.4 (21.3)	(n=18) 6.1 (7.3)	(n=18) 23.2 (20.9)
Total	(n=73) 17.5 (19.4)	(n=71) 24.7 (26.5)	(n=65) 8.5 (13.6)	(n=66) 13.4 (16.3)
Kruskal-Wallis test	χ^2= 1.851 df = 3 p=0.6040	χ^2= 6.016 df = 3 p= 0.1108	χ^2= 25.418 df = 3 p= 0.0001	χ^2= 17.744 df = 3 p< 0.0005

p-value significant at 0.05; SD = Standard deviation

Total Time Spent in the Departments
Table 2 shows the total time spent in the various departments in the hospitals. The mean total time spent at the Outpatient Departments was the longest (97.8 minutes) with women spending an average of 217.1 minutes in KGH, Abuja, 100.2 minutes in GH, Abeokuta and 64.6 minutes in AKTH, Kano. Only GH, Minna recorded 40.9 minutes (less than one hour) mean duration in the Out-patients Department. The total time spent in the Pharmacy departments was least when compared to the total mean time spent in the other departments at the health facilities. The longest mean time spent in the Pharmacy department was 36.1 minutes at

the GH, Abeokuta, while AKTH, Kano recorded the shortest mean duration of 6.1 minutes.

In the Medical Records departments, total duration of total time spent was 54.9 minutes, but this was greater than one hour at the AKTH, Kano (74.2 minutes) and GH, Abeokuta (72.1 minutes). On average 70.7 minutes was spent in the laboratory but a mean duration of 148.1 minutes was recorded at the GH, Abeokuta.

Table 2 Mean Time spent in receiving care in various departments of the health facilities (departure time – Arrival Time)

Health Facility	Medical Records Mean (SD)	Outpatient Department Mean (SD)	Pharmacy Department Mean (SD)	Laboratory Department Mean (SD)	Total time spent
Aminu Kano Teaching Hospital (Kano)	(n=20) 74.2 (38.9)	(n=19) 64.6 (42.6)	(n=18) 6.1 (5.4)	(n=15) 38.7 (20.1)	(n=20) 175.6 (64.8)
General Hospital, (Minna)	(n=20) 40.3 (31.3)	(n=19) 40.9 (26.4)	(n=18) 29.3 (14.9)	(n=20) 49.1 (50.7)	(n=20) 154.7 (56.2)
Karshi General Hospital, (Abuja)	(n=14) 25.1 (17.7)	(n=14) 217.1 (82.8)	(n=11) 26.8 (25.3)	(n=13) 33.7 (32.6)	(n=14) 303.7 (89.1)
State Hospital, Ijaye (Abeokuta)	(n=19) 72.1 (54.0)	(n=18) 100.2 (72.6)	(n=18) 36.1 (49.8)	(n=18) 148.1 (172.2)	(n=19) 341.4 (302.3)
Total	(n=73) 54.9 (43.1)	(n=70) 97.8 (85.6)	(n=65) 24.4 (31.1)	(n=66) 70.7 (105.4)	(n=73) 237.6 (181.4)
Kruskal-Wallis test	χ^2= 15.332 df = 3 p=0.0016	χ^2= 28.761 df = 3 p= 0.0001	χ^2= 30.018 df = 3 p= 0.0001	χ^2= 13.136 df = 3 p=0.0044	χ^2= 21.074 df = 3 p= 0.0001

Within facility results revealed that the longest time spent was in the Medical Records Department in AKTH, Kano (74.2 minutes), the Outpatients' Department at the GH, Abuja (217.1 minutes), and in the laboratories at the GH, Minna (49.1 minutes) and the GH, Abeokuta (148.1minutes). Total time spent averaged 237.6 minutes with the longest of 341.4 minutes in GH, Abeokuta and the shortest of 175.6 minutes in AKTH, Kano. Kruskal-Wallis H test conducted to compare the total time spent in each department across the hospitals showed that there was a statistically significant difference in the total mean time spent in all the departments: Medical Records (*p*=0.001), Outpatient (*p*=0.000), Pharmacy (*p*=0.000), and Laboratory (*p*=0.004).

DISCUSSION
To the best of our knowledge, this is first study in Nigeria to use a standardized quality improvement assurance method to estimate the actual times spent by women in obtaining services at various service delivery points in maternal health facilities. The results varied considerably but there was evidence of long waiting and total time spent in many of the service delivery points of the hospitals.

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Waiting time from arrival at the service delivery point to start of service was longest at the outpatient departments and shortest at the pharmacy departments. Waiting time is a function of both the number of health care providers that attend to patients, as well as the proper coordination and organization of service provision.[3,12] Although, estimates from the WHO and studies in Nigeria reveal the low density of nurses/midwives and doctors in the country,[15,16] it is not clear whether this is solely responsible for long waiting and service delivery times experienced by women. However, in view of the large number of obstetric patients that visit these hospitals, a mechanism needs to be established to manage the situation while maintaining the quality of service provision.

In our view, it is ideal that each patient do not spend more than 10 minutes waiting to receive any of the components of antenatal care. In Western countries, patients are normally given appointments on specific days and times they should visit the hospital to receive antenatal care.[17,18] This appointment method ensures that women are attended to, on time and prevent them from having to wait for long periods before they receive routine services. In contrast, emergency services should be attended to very promptly and certainly within minutes of arrival in the Emergency Departments of the hospitals.

This study sought to identify the points of delay in women receiving maternity care in the hospitals. The results showed that in general, the outpatient departments accounted for the longest times spent, while the Pharmacy Departments accounted for the shortest periods with variations within and between facilities. While the time spent in each Department may be due to the nature of the services provided in the Departments, it is also possible to eliminate the bottlenecks that lead to delays and to devise innovative and creative ways to improve service efficiency and effectiveness. For example, it was evident that the pharmacy departments in the hospitals have evolved a form of service delivery where similar groups of drugs (especially those frequently used by women attending antenatal clinics) are placed together in packs to promote easy dispensation to clients.[3,19] This "pack system" can considerably reduce the time spent in offering services to women. This type of creativity can improve efficiency and service satisfaction for women, and also save costs.

Furthermore, the recent worldwide increase in computerization of hospital systems and online archiving of medical records has improved the ability of health institutions to plan the treatment of patients in order to remove delays.[20,21]

Unfortunately, there was no evidence that computerization of patients' admission and treatment management was in place in any of the hospitals studied. It would appear that many patients in these hospitals did not seek appointments before arrival in the hospital for routine care. For secondary and tertiary hospitals that provide services on a referral basis, this ought not to be the case. Although some women may have been given appointments, hospitals seem to rely on the old method whereby patients are told the days to visit the clinics, without identification of the specific times of those days that they should visit. We believe that this is where the required change for improved quality of services ought to begin. Hospitals need to re-orientate their clinical care through computerization of their admission and patients' recruitment processes such that patients know the days and times they should visit. Such appointments should be made inviolable and it should be made mandatory that clinical care providers should promptly attend the service delivery points to honour the appointments given to patients. Indeed, as part of their commitment to offering quality care, the hospitals need to prescribe ideal waiting times and contact times to be adopted at various service delivery points, as quality assurance methods of service delivery. This should come with incentives and sanctions to ensure that heads of units abide by these prescriptions.

Limitation
A limitation of this study is our focus only on contact and waiting times at the various service delivery points in the hospitals, without looking at the intermediary times the patients spent from their homes to the hospital and back, and the time they spend moving between the different service delivery points in the hospitals. These are equally valuable times which must be assessed if the true efficiency of time management for treatment seeking in hospitals is to be known. Indeed, if a cost-analysis study on maternal health care utilization is to be undertaken, the total time spent by the patient from the time she took the decision to seek care up till the time she returns home must be taken into account. Also, due to the asymmetrical nature of the data, comparison of differences in waiting and total time spent was conducted with a non-parametric method which is less sensitive than the parametric techniques in detecting statistically significant difference. Furthermore, the study failed to investigate the actual reasons for delays in the service delivery points of the hospitals. We believe this would be a subject for future research based on qualitative research and detailed analysis.

Despite these shortcomings, the results of this study enable policymakers and health care providers to identify points of contacts for reducing waiting and total time spent as part of the overall elements of quality of care delay in the provision of antenatal care. When the time lost in treatment seeking is put in economic and financial perspectives, it would amount to huge personal and national economic losses. These issues are often considered by patients as part of their decision-making on whether or not to seek care and their choice of specific methods and source of care. Reducing delays in service provision would improve the efficiency, cost-effectiveness and quality of clinical services, and enhance service utilization for the overall improvement of clinical outputs and outcomes.

CONCLUSION
In conclusion, the results of this study demonstrate that long waiting and service delivery intervals are significant features of antenatal care service provision in four referral hospitals in Nigeria. There was a substantial delay in time spent to receive care by women seeking routine antenatal health services.

We recommend managers in health facilities include the reduction of waiting times in the strategic plans for improving the quality of antenatal care in the hospitals. This should include the use of innovative payment systems that excludes payment at time of service delivery, adoption of a fast-track system such as pre-packing of frequently used commodities and the use of new tech informational materials for the provision of health education. Policies and action plans should be put in place by hospital managers and care providers to reduce delays as a way to improve health care utilization and improve the quality of maternity services in the hospitals.

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