

Assessing the impact of a waiting time survey on reducing waiting times in urban primary care clinics in Cape Town, South Africa

Johann Daniels,^{1,2}
Virginia Zweigenthal,² Gavin Reagon³

¹City Health, Cape Town; ²School of Public Health and Family Medicine, University of Cape Town, ³School of Public Health, University of the Western Cape, South Africa

Abstract

A waiting time survey (WTS) conducted in several clinics in Cape Town, South Africa provided recommendations on how to shorten waiting times (WT). A follow-up study was conducted to assess whether WT had reduced. Using a stratified sample of 22 clinics, a before and after study design assessed changes in WT. The WT was measured and perceptions of clinic managers were elicited, about the previous survey's recommendations. The overall median WT decreased by 21 minutes (95%CI: 11.77-30.23), a 28% decrease from the previous WTS. Although no specific factor was associated with decreases in WT, implementation of recommendations to reduce WT was 2.67 times (95%CI: 1.33-5.40) more likely amongst those who received written recommendations and 2.3 times (95%CI: 1.28-4.19) more likely amongst managers with 5 or more years' experience. The decrease in WT found demonstrates the utility of a WTS in busy urban clinics in developing country contexts. Experienced facility managers who timeously receive customised reports of their clinic's performance are more likely to implement changes that positively impact on reducing WT.

Introduction

Access to health services, a key component of the primary health care (PHC) approach, is a composite concept based on three dimensions:- availability – physical access; affordability – financial access; and, acceptability – cultural access.¹ Ensuring acceptable access to quality health care services requires the measurement of factors impacting on access,² such as waiting times (WT), an important obstacle to access. This

is the time a patient waits for a service after having arrived at a clinic.² Customers who experience long waiting times often feel that they are unimportant to service providers.³

Waiting times influence patients' satisfaction,⁴ with long waits being associated with low levels of satisfaction. Waiting in long queues often leads to frustration, and is an opportunity cost for patients, as it prevents them from generating an income via formal employment or informal means and from engaging in socially constructive activities. The frustration of long waiting times is poignantly described by Maister: *Once we are being served, our transaction with the service organization may be efficient, courteous and complete: but the bitter taste of how long we wait pollutes the overall judgments we make about the quality of service.*³ Importantly, waiting times can impact on service quality as a patient's condition can deteriorate whilst waiting, affecting mortality and morbidity.

There is widespread dissatisfaction with waiting times in public sector health facilities as was shown in a population based national survey in 2003.⁵ The more recent 2012 SANHANES-1 population based study demonstrates that this persists, with 24.4% of respondents believing that public sector health service waiting times were bad or very bad.⁶ A 2008 independent patient satisfaction survey conducted in Cape Town clinics found that long waiting times were a negative factor influencing patient satisfaction.⁷

The acceptability of waiting times depends on their duration; the service sought such as preventative, curative or emergency care; the facility environment; and, communication about the estimated waiting time. A poor environment to wait in and, inadequate communication about the expected wait can result in long perceived waiting times.³ Strategies to reduce waiting times often focus on decongesting facilities through technological innovations, such as medicine dispensers; establish fast-track queues for long waits in specific service points such as pharmacy; improve work flow processes; and facilitate a shift to community based care.⁶ Other strategies to overcome bottle necks and decrease waiting times in health facilities are required. This study reports on the impact of one strategy to reduce waiting times in facilities – the measurement of waiting times and dissemination of findings – on subsequent waiting times.

The City of Cape Town Health Department (City Health) provides comprehensive primary care services to the medically uninsured section of the city popula-

Correspondence: Johann Daniels, City Health, City of Cape Town, Civic Centre, Cape Town, 8001, South Africa.
Tel.: +27.0214.002981, Fax: +27.0214.211980.
E-mail: johann.daniels@capetown.gov.za

Key words: waiting time survey, waiting time reduction, primary health care clinics, South Africa.

Acknowledgements: we thank the City of Cape Town Health Management Team for permission to conduct the survey, the Sub-district Health Information Officers for assisting with the co-ordination of the data collation, collection and capturing. We are grateful for the contribution made by the clinic managers who participated in the survey and the fieldworkers for collecting the data. We acknowledge the City of Cape Town district office health information staff for their administrative support.

Contributions: JD, GR, and VZ contributed to the conception and design of the study, data analysis, interpretation of results and drafting and revising of the manuscript. All the authors read and approved the final manuscript.

Conflict of interest: the authors declare no potential conflict of interest.

Received for publication: 23 December 2016.
Revision received: 1 June 2017.
Accepted for publication: 2 June 2017.

This work is licensed under a Creative Commons Attribution NonCommercial 4.0 License (CC BY-NC 4.0).

©Copyright J. Daniels et al., 2017
Licensee PAGEPress, Italy
Journal of Public Health in Africa 2017; 8:639
doi:10.4081/jphia.2017.639

tion, estimated to be 85% of 3.5 million people. Health services are delivered through small to large size clinics in a range of neighbourhoods: from informal settlements to affluent suburbs.⁸ A waiting time survey (WTS) conducted in 2007 at 94% of clinics in Cape Town, provided each clinic with a report of their median waiting time and factors associated with long waiting times. As described in Table 1, common factors⁹ found were: high workloads; large batches of patients arriving at a clinic over short time-periods during the day resulting in those in the tail waiting for long periods; and, patients arriving before the clinic opening time. Less common factors found were: logistical problems such as bottlenecks in patient flow; queuing problems and inappropriately long service times. Clinic staff and management received feedback on the WTS in the form of oral presentations and

clinic specific written reports. These detailed factors associated with long waiting times at each clinic and made recommendations to reduce these times.

Although all clinic managers were encouraged to attend an oral presentation of the WT study results for their clinic and should have received a written report, this may not have occurred due to logistical and communication difficulties. The implementation of recommended actions and timelines to reduce waiting times were left to the discretion of individual facility managers. Although facility managers and staff were encouraged to reduce patients' waiting times, senior management did not expect them to prepare a formal implementation plan, and no monitoring was conducted. It is therefore unclear if all clinic managers and staff received individual clinic reports; whether they thought the recommendations to reduce waiting times were appropriate; and, whether they implemented any interventions to reduce waiting times. Disagreement with the recommendations may have resulted in partial or no implementation, and unknown constraints may have impacted on implementation.

This study therefore aimed to assess the impact of the 2007 waiting time survey on potential reductions in subsequent waiting times in primary care clinics in Cape Town, South Africa. We wanted to remeasure the waiting times four years after the first survey; assess the perceptions of clinic managers regarding the appropriateness of the 2007 recommendations to reduce waiting times; appraise the degree of implementation of the recommended interventions to

reduce waiting times; and obtain clinic managers' views on an acceptable waiting time duration.

Materials and Methods

A *before and after* study measured the current (2011) waiting times of patients at clinics on an average day in the week and assessed the effect of interventions undertaken to reduce waiting times. We additionally compared relevant data collected in the 2007 and 2011 surveys, assessing changes in staffing, service provision and patient attendance. Through a self-administered questionnaire we assessed the perceptions of all clinic managers in City Health about the 2007 recommendations to reduce waiting times, noted any actions they took to reduce waiting times and, assessed their views on acceptable waiting times.

Based on routinely reported monthly attendance, the *before and after* study stratified the clinics, into small (<100 patients per day), medium (100-300 patients) and large (>300 patients) clinics. One facility in each category was randomly selected from each of the eight sub-districts in the city, making up 24 clinics from 65 possible clinics. All patients arriving at the clinic on one specific day were included in the sample. All clinic managers were included in the sample.

The 2011 waiting time survey was implemented in the same way and day of the week as the 2007 survey, which allowed comparability and ensured validity. As in

2007, Wednesday was selected, as it is known to have an average attendance and the full gamut of services are provided then. Attention was given to conducting the survey during a five day normal working week with no other special activities taking place during that week and no public holidays present during that week, and thus normal staffing levels were expected.

A fieldworker recorded individual patient clinic arrival and departure times. Anonymised timesheets were used to track patients as they moved between service points, and attending staff recorded the start and end time of each service rendered. This included reception, clinical consultation, and procedure times. Calculation of the duration of service and waiting times were made, by summing the service times and subtracting these from the total time at the clinic.

Univariate analysis of the clinic managers' self-administered questionnaires was conducted. We calculated proportions, and 95% confidence intervals for categorical data and, medians with inter-quartile ranges for right-skewed, numerical data such as waiting times. Bivariate analysis was conducted by comparing independent variables with the two outcomes of *actions to reduce waiting times were implemented at a clinic*; and *waiting time decrease of either 15 minutes or 25% of previous (2007) waiting time*. Prevalence ratios and 95% confidence intervals were calculated.

Differences between the 2007 and 2011 median waiting times for clinics overall, for individual clinics and 95% confidence intervals were calculated. Differences in

Table 1. Factors associated with long waiting times (WT) and recommendations to reduce WT in the 2007 survey.

Factors associated with long waiting times	Suggested actions to reduce waiting times due to these associated factors were:
High workload (staff are over worked)	By providing more staff; by shifting staff from clinics with a low workload
Batching (patients arrive in large batches especially early in the morning)	By giving appointments for quieter times and quieter days in the week; by encouraging patients to come at less busy times in the day
A lack of efficiency (staff members are at the service points but are busy with something else other than attending to patients while they are waiting)	Make attending to patients the number one priority; do other activities when there are no patients waiting
A mismatch (when patients are available to be attended to but staff members have not arrived at the service point yet)	Encouraging patients to arrive later in the day; by staggering staff shifts; meetings could be held at quiet times; breaks should be taken at quiet times whenever possible
A logistical problem (when staff are available to attend to patients and patients are waiting to be seen but due to the lack of equipment or available rooms they are unable to attend to patients)	Ensure that appropriate equipment and rooms are available.
Flow problems (staff are available to see patients while patients are delayed at some other service point).	Reallocate staff to temporarily help at the prior service point to allow a few patients to rapidly flow through to the staff who are waiting for them.
Queuing problems (when patients do not queue in the correct order and staff are not attending to patients in the order that they arrive at the service point (excluding fast-tracking)).	Provide a system for patients to queue in order; encourage staff to ensure that patients are attended to in the order that they arrive at the service point (excluding fast-tracked patients)
High service time (inappropriately high service time)	The appropriate service time should be provided

Adapted with permission from Reagon and Igumbor (2010).⁹

waiting times for clinics were classified in two ways. Firstly, clinics were stratified into two categories: those with a minimum decrease of 15 minutes in median WT from their 2007 levels; or, clinics with unchanged, increased or less than 15 minutes median WT. Secondly, they were again stratified into two categories: clinics who decreased their median WT by 25%; or clinics who had not decreased their median WT by 25% or more. These thresholds – less than 15 minutes or less than 25% of baseline WT, were viewed as being clinically significant from a patient and service perspective. The validity of the waiting time assessment was assured through piloting, and accurately measuring actual waiting and service times.

Senior managers not included in the study completed the facility manager questionnaire and their queries, suggestions and recommendations were used to clarify and improve it. A pilot study was then conducted at a clinic not included in the sample, to test and improve the quality of the questionnaire and timesheets. In addition, the validity of the facility manager questionnaire was strengthened by written explanations about what was expected overall as well as for individual questions to avoid misunderstanding. The anonymity of the self-admin-

istered questionnaire enabled the provision of honest responses.

As the research was requested by senior health management as part of a quality improvement strategy, facility managers' autonomy was affected as they may have felt coerced to participate. This was mitigated by informing them of their right to refuse participation and those that then refused were excluded from the survey. Patients were informed that participation was voluntary and that their confidentiality was assured as data was collected anonymously. Those declining participation were assured that there would be no negative consequences resulting from this decision. No individuals benefited from the study, but it was anticipated that study findings would inform senior management about service performance levels and potential improvements that could be effected. The study was approved by the Human Research Ethics committee of the University of Cape Town (HREC: 123/2011).

Results

The response rate for the clinic managers was 92% (60/65). Although in the

study 24 clinics had their WT measured, the findings could only be compared with 22 clinics, because one of the clinics assessed in 2011 was not included in the 2007 WT study and one clinic had changed dramatically since 2007 with its staff tripling in number.

Table 2 shows the findings of factors used to measure the clinic managers' training and management experience; their awareness of the 2007 WT study; interventions they implemented to attempt to reduce waiting times; and, perceptions about the length of their clinics' current waiting times.

Table 3 details clinic profiles, their numbers of staff members; patients seen; patients seen per staff member; clinic managers' perceptions of a reasonable waiting time; the median WT for 2011 and 2007, together with differences between the 2007 and 2011 survey. Patient numbers seen at the clinics per day increased in 2011, as did staff numbers, which resulted in a decrease of 0.8 patients seen per staff member per day in 2011. Within this minimally changed environment the WT decreased by a statistically significant 21 minutes in 2011 (95%CI: 12-30 min), a 28% decrease on the 2007 WT.

Although an overall decrease in waiting

Table 2. Managers' profiles, their awareness of the findings of the 2007 waiting times (WT) survey, and actions they subsequently undertook to reduce WT.

Factor	Strata	Sample, No.	No. (%)	95%CI
Training in management	Received management training	60	46 (76.7)	71.2-82.2
Years of clinic management experience	5 years and more	59	35 (59.3)	52.9-65.7
Responses by clinic managers to questions posed on various aspects of the 2007 Waiting Time survey and their consequent actions	Were aware of previous WTS	60	60 (100)	100-100
	Were involved in previous WTS	58	50 (86.2)	81.7-90.7
	Received the previous WTS results verbally	59	42 (71.2)	65.3-77.1
	Received written results of the previous WTS	55	34 (61.8)	55.2-68.4
	Implemented any actions to reduce patient waiting time*	60	35 (58.3)	51.9-64.7
Clinic managers' views on whether WT at their clinics are too long or not	Implemented actions to reduce waiting times that were still in place	34	29 (85.3)	79.2-91.4
	Waiting time at their clinics' are too long	54	32 (59.3)	52.6-66.0

*This was a key outcome measure of the study

Table 3. Comparing Waiting Time and clinics profiles between 2007 and 2011.

Factor	Year	Median	Interquartile range	Median difference (%)	95%CI for median difference
Waiting Times (minutes)	2011	55	28-114	-21 (-28)	(-30.23-11.77)
	2007	76	37-125		
Number of full-time equivalent staff per clinic*	2011	19	10.8-24.6	2.4 (15)	(0.47-4.35)
	2007	16.6	9.6-26.0		
Number of patients attending per day per clinic	2011	255	184-386	22.5 (10)	(8.84-36.16)
	2007	233	146-327		
Number of patients attending per day per full-time equivalent staff member	2011	13.1	13-15	-0.8 (-6)	(-2.39-0.67)
	2007	13.9	11-17		
Facility managers' perception of acceptable clinic WT (minutes)	2011	70	45-120		

*A full-time equivalent staff member is a staff member working 8 hours per day.

times was observed in Cape Town between 2007 and 2011, there was variation between individual clinics. Most clinics (55% or 12/22) decreased their median waiting times by 15 minutes or more and half (11/22) decreased their waiting time by 25% or more, with 55% decreasing their waiting time by either ≥ 15 minutes or $\geq 25\%$ of their previous waiting time.

Table 4 shows the bivariate analysis results comparing several variables to the two main outcomes of: *managers' implementation of recommended suggestions from the 2007 survey to reduce waiting times; and decreases in WT by 25% or 15 minutes or more in 2011 compared to 2007*. No specific factor was associated with a decrease in WT, but two factors were statistically significantly associated with managers' implementation of interventions suggested from the 2007 survey. These were, receipt of written reports of the previous (2007) survey (PR=2.67; 95%CI: 1.33-5.40) and managers having more than five-years management experience (PR=2.3; 95%CI: 1.28-4.19).

Discussion

It was gratifying that the overall waiting times for the sample of clinics in Cape Town had decreased by a median of 21 minutes between 2007 and 2011, a 28% reduction from the 2007 waiting times. Although the Hawthorne effect might be operating with staff improving their efficiency, there-

by reducing patient waiting times during the survey,² this would have been the case for both surveys. Therefore, the decrease in WT between the 2007 and 2011 surveys is likely to be unbiased. Given that similar conditions pertained in 2007 and 2011, this was a real reduction, rather than just an artefact of changed staffing and clinic attendance. The results are notable as there was doubt that any actions to reduce WT had been implemented and if implemented, whether they had been successful. Although clinic managers may not have implemented all the interventions, interventions they had implemented were effective. Interventions, such as encouraging some patients (for example those attending for immunisation services) to make and attend clinics via appointments, have been found to have a snowball effect on the reduction of waiting times of other patients.^{10,11} However, implementation of further interventions to reduce waiting times beyond that already achieved may not be realised, as current overall median waiting times (55 minutes) are lower than the 70 minutes acceptable limit given by managers. Managers may believe that they have *done enough* and that further actions to reduce WT are not a priority. However, responses to questions regarding acceptable waiting times may be artificially inflated, as managers may have believed that actual waiting times were longer than were found.

The results show that clinics that implemented actions to reduce waiting times were not more likely to decrease median waiting times than those clinics who reported that they had not implemented any inter-

ventions. It is unclear why some clinics who reported no actions to reduce waiting times, had reduced median waiting times. This may be due to misclassification as interventions could have been implemented but not reported. Additionally, the culture of the organisation may have changed to become more *patient centred* with staff becoming more aware of the implication of long waits. Such a changed milieu may have promoted decreases in WT. Alternatively, some individual staff members may have on their own initiative effected changes at their service points, resulting in reductions in WT which were not formally reported. The captured metric of *any* intervention implemented may also be too coarse to measure an effect thus rendering any difference present to the null result and future studies should measure *specific* interventions and how they were implemented, rather than simply measuring the implementation of *any* intervention.

All managers were aware of the survey and most (86%) had been involved in the 2007 WTS and had received either written (62%) or verbal (71%) reports. Even though they were not given instructions, some managers acted on relevant available information to improve health service provision. Fifty-eight percent of clinic managers undertook actions to reduce waiting times, which confirms that they found the recommendations appropriate. This finding echoes a 1992 Zimbabwean study that described the clinic managers' use of a client flow analysis to assess patient waiting times, which was then used to reduce

Table 4. Bivariate analysis comparing managers' responses to the 2007 waiting times (WT) survey recommendations with whether they implemented any recommendations to reduce waiting times and with actual reductions in WT in 2011.

Variable description	Variable group	Clinic managers who implemented any actions to reduce WT				2011 Median WT decrease by 15 min and more OR by 25% or more of the 2007 median WT			
		Yes	No	Prevalence ratio	95%CI	Yes	No	Prevalence ratio	95%CI
Clinic managers who were involved in the previous WTS	Yes	29	21	1.16	0.56-2.41	7	8	0.7	0.27-1.83
	No	4	4			2	1		
Clinic managers who received verbal results of the previous WTS	Yes	28	14	1.88	0.96-3.72	6	6	1	0.37-2.661
	No	6	11			3	3		
Clinic managers who received written results of the previous WTS	Yes	26	8	2.67	1.33-5.40	4	5	0.5	0.24-1.30
	No	6	15			4	1		
Clinic managers who have 5 years and more management experience	Yes	27	8	2.3	1.28-4.19	5	3	1.4	0.57-3.50
	No	8	16			4	5		
Clinic managers who implemented any planned actions to reduce WT	Yes					5	3	1.4	0.57-3.50
	No					4	5		
Clinic implemented actions to reduce WT that were still in place	Yes					5	3	1.4	0.57-3.50
	No					4	5		
Clinic managers who thought WT at the clinic was too long	Yes	17	15	0.73	0.48-1.10	5	4	1.1	0.41-2.99
	No	16	6			3	3		

patient waiting times.¹³

The large proportion (42%) who did not implement any actions to reduce waiting times, may suggest that a large proportion of managers find that implementation of changes are difficult to initiate and sustain. This factor was also reported by an American WT improvement project which concluded that implementing actions to reduce WT requires motivated staff and the co-operation of most (clinical and non-clinical) staff members, which may be a difficult environment to create in a healthcare setting.¹² Also it is likely that knowledge of problems and awareness of recommendations are necessary factors, but they by themselves are not sufficient to catalyse improvements. Additional self-motivation, staff motivation and leadership skills are probably also required to initiate implementation and monitoring of changes. Knowledge of the presence of long waits at clinics and causes of these long waits are a necessary spur to action, and in some cases this was sufficient to reduce WT. Only two factors were associated with implementing actions to reduce WT: *clinic managers who received a written report* and those who had *5 or more years* experience as a clinic manager. These additional factors – informed and experienced managers – may suggest that other motivators are required to initiate and sustain action to reduce WT. Conducting ad-hoc WTS may not be a sufficient incentive, and staff *buy-in* through appropriate training and consultation are critical.

The response rates for both the clinic managers and for the before and after assessment of waiting times were both high at 92% and 99% respectively, which indicates a robust study with plausible findings and inspires confidence about the generalizability of the study findings, at least for Cape Town City Health services.

A study limitation was the study design – an uncontrolled ‘before and after’ study, which is known to be inferior to controlled trials. There is a possibility that factors other than the intervention resulted in the changes found, resulting in an over-estimate of quality improvement interventions.¹⁵ In our case, other system-wide interventions

including changes in the organisational culture and specific interventions to improve the equitable spread of the workload of staff, may have contributed to these changes.

Conclusions

This study demonstrates that waiting times at primary care services, a key factor for an accessible, quality health service, can be reduced and points to the value of measuring WT as a service quality improvement strategy. We demonstrated sizeable reductions in WT in most clinics in Cape Town. Whilst the specific factors contributing to the decrease in waiting time were not elucidated, unsurprisingly, management experience and written communication with managers were the only factors found to be associated with reported actions to reduce WT. We recommend that rapid assessments, to monitor waiting times should be routinely conducted. Further research to assess the effect of specific actions taken to reduce waiting times, may elucidate the measures that have most impact on waiting times in busy public primary care service settings.

References

1. McIntyre D, Goudge J, Harris B, et al. Prerequisites for national health insurance in South Africa: results of a national household survey. *S Afr Med J* 2009;99:725-9.
2. Hart M. Improving out-patient clinic waiting times: methodological and substantive issues. *Int J Health Care Qual Assur* 1995;8:14-22.
3. Maister D. *Professional Business Profession Life*. 1985. Available from: <http://davidmaister.com/articles/the-psychology-of-waiting-lines/>.
4. Eilers GM. Improving patient satisfaction with waiting time. *J Am Coll Health* 2004;53:41-8.
5. Peltzer K. Patient experiences and

health system responsiveness in South Africa. *BMC Health Serv Res* 2009;9:1-12.

6. Shisana O. The South African National Health and Nutrition Examination Survey: SANHANES-1. HSRC press; 2013.
7. Naidoo Y. Inter Press Service. 2008. Available from: <http://www.ipsnews.net/2008/09/south-africa-nurse-short-age-cripples-health-system/>.
8. Day CG. Health and related indicators. In: Padarath ER, ed. *South African Health Review 2013-14*. Durban: Health Systems Trust; 2014. pp 201-305.
9. Reagon G, Igumbor E. Strengthening health systems through training of health care providers in the conduct of routine waiting time and system efficiency surveys. *Stud Health Technol Inform* 2009;160:590-4.
10. Welch J. Appointment systems in hospital outpatient departments. *Operat Res Q* 2013;15:224-37.
11. Harper PR, Gamlin H. Reduced outpatient waiting times with improved appointment scheduling: a simulation modelling approach. *Or Spectrum* 2003;25:207-22.
12. Cuevas JA. Improving process turnaround time in an outpatient clinic: iSixSigma. 2010. Available from: <https://www.isixsigma.com/industries/healthcare/improving-process-turnaround-time-outpatient-clinic/>
13. Management Sciences for Health. Family planning management development. Reducing client waiting time. *Family Plan Manager* 1992;1:1-8.
14. National Department of Health. National core standards for health establishments in South Africa. Pretoria. 2011. Available from: <http://www.gov.za/sites/www.gov.za/files/framework%20for%20assessment%20of%20health%20establishments%20-%20core%20standards.pdf>.
15. Eccles M, Grimshaw J, Campbell M, Ramsay C. Research designs for studies evaluating the effectiveness of change and improvement strategies. *Qual Safety Health Care* 2003;12:47-52.