

Impact case study (REF3)

Institution: London School of Economics and Political Science		
Unit of Assessment: 22B – International Development		
Title of case study: Improving the efficiency of health services in antenatal care: the case of Mozambique		
Period when the underpinning research was undertaken: 2014-2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s): Sandra Sequeira	Role(s) (e.g. job title): Associate Professor	Period(s) employed by submitting HEI: 2010 to present
Period when the claimed impact occurred: 2014-2020		
Is this case study continued from a case study submitted in 2014? No		
1. Summary of the impact (indicative maximum 100 words)		
<p>Research which tested the effectiveness of a scheduling system to manage patients' antenatal care visits in southern Mozambique has reduced average patient waiting times by 100 minutes and contributed to a 16-percentage-point increase in the number of women receiving the World Health Organization-recommended minimum four antenatal care visits. Patients attested to the benefits of the scheduling system in reducing logistical barriers to attending antenatal care services and improving overall household wellbeing. The success of this management intervention has seen the Ministry of Health declare it a national priority for 2017-2024 and include it in its official Strategy Plan. The intervention has since been rolled out across a further 46 antenatal care units and extended to 40 HIV units in public clinics across four provinces in southern Mozambique, covering more than 217,000 patients, alongside a wider programme of capacity-building at the clinic level. The government has also initiated the nationwide scale-up of the intervention in both central and northern Mozambique.</p>		
2. Underpinning research (indicative maximum 500 words)		
<p>In 2014, Dr Sandra Sequeira began a collaboration with the Ministry of Health in Mozambique, investigating whether reducing patient waiting times can increase the demand for healthcare and improve the quality of care. The project was focused on maternal health, a critical area of primary healthcare [1] [2].</p> <p>The provision of antenatal care in Mozambique faces particular challenges of patient retention. While the majority (91%) of women visit a health centre to seek antenatal care over the course of their pregnancy, only little more than half (55%) receive the World Health Organization-recommended minimum four antenatal care visits (Demographic and Health Survey Mozambique, 2011). On the technical side, even when women do receive the recommended number of antenatal care visits, they do not always receive high-quality care as core procedures do not always take place. For example, only 43.6% of women receive the necessary three doses of intermittent preventative treatment for malaria, just 51% of HIV+ pregnant women receive antiretroviral treatment, and only 18.6% of HIV+ pregnant women receive care ensuring the prevention of mother-to-child transmission of HIV (IMASIDA, 2015).</p> <p>The experience of seeking care in public facilities often involves waiting all day in a queue. According to survey data from 2012, 74% of individuals responding to a survey about problems with health systems report that they have experienced very long wait times in public clinics (Afrobarometer, 2012). Like most developing countries, tools for managing patient flow in Mozambican public facilities, such as an appointment system for scheduling next visits, are almost non-existent. There is no universal policy from the Ministry of Health for how to prioritise the order of the queue with most clinics taking patients on a first-come, first-served basis or, in some instances, by the payment of a bribe. Patients typically arrive early in the morning at the clinic and often have to wait several hours to be seen. On busy days, patients may wait all day only to be turned away if nurses leave before seeing all patients. This coordination failure that results in long waiting times can be particularly constraining for patients who need to seek frequent care, such as pregnant women.</p> <p>In fact, mothers attending antenatal care likely have numerous other responsibilities - the average woman in Mozambique has 5.6 children. Furthermore, the hassle costs of antenatal care may be</p>		

relatively salient compared to the benefits of care, which occur largely in the future. In the case of maternal health, antenatal care is often the first interaction a pregnant woman has with the health centre. The initial experience of waiting all day for poor-quality care is likely to have significant downstream negative effects. A perception of non-responsive care may also weaken the relationship between patient and provider, leading patients to be less likely to comply with medical advice. In the case of maternal health, high-quality maternal care is associated with facility delivery. Women who have negative experiences during antenatal care may therefore be less likely to return for delivery in the facility. The role of waiting time, how it affects perceptions of healthcare quality, and how this in turn affects demand for healthcare services and compliance with healthcare advice has been fairly understudied in economics and in public health.

To address this, working with the National Institute of Health and the National Directorate of Public Health and Provincial Health Authorities, and in further collaboration with the Harvard School of Public Health, Sequeira co-designed an appointment scheduling system to increase the efficiency of public health provision in antenatal care. The scheduling system was assessed between September 2016 and July 2017. This pilot was implemented in four high-volume urban and peri-urban clinics located in different provinces in southern Mozambique, covering over 8,000 patients.

Evidence from the pilot study showed that scheduling appointments reduced waiting times for antenatal care. Despite concerns that, even after scheduling, patients might continue to arrive early in the morning to guarantee a place in line, the study found that most patients arrived before or during their scheduled time, thus reducing an important coordination failure across patients and providers that rested on decades of social norms around queuing.

Scheduling was also found to have increased the number of patients to have received complete (WHO-recommended four visits) antenatal care during pregnancy. This study was the first to provide evidence that appointment scheduling can increase service utilisation, suggesting that poor patient experience may contribute to poor health outcomes by decreasing utilisation.

Sequeira co-led the study design, along with Dr Margaret McConnell (Harvard TH Chan School of Public Health), and Dr Maria Steenland (Brown University), Amanda de Albuquerque (Pontifical Catholic University of Rio de Janeiro), and Janeth Dula, Quinhas Fernandes, Rosa Marlene Cuco, Sergio Chicumbe, and Eduardo Samo Gudo (Ministry of Health, Mozambique). Sequeira initiated the project, established the required partnerships, has overseen the fieldwork, and been responsible for coordinating all the required research and policy activities with the Ministry given her familiarity with the Mozambican context, her experience in running experimental work in Mozambique, and the fact that she is a native speaker of Portuguese. She has conducted presentations and held meetings with the National Director of Public Health and the Director of the National Institute of Health regularly since 2014. She is also leading the analysis and writing of manuscripts that are currently in preparation to assess the medium to long-term effects of the intervention.

3. References to the research (indicative maximum of six references)

[1] Steenland, M., Dula, J., de Albuquerque, A., Fernandes, Q., Cuco, R. M., Chicumbe, S., Gudo, E. S., Sequeira, S., and McConnell, M. (2019). Effects of appointment scheduling on waiting time and utilisation of antenatal care in Mozambique. *BMJ Global Health*, 4(e001788), DOI: 10.1136/bmjgh-2019-001788.

[2] Gong, E., Dula, J., Alberto, C., de Albuquerque, A., Steenland, M., Fernandes, Q., Cuco, R. M., Sequeira, S., Chicumbe, S., Gudo, E. S., and McConnell, M. (2019) Client experiences with antenatal care waiting times in southern Mozambique. *BMC Health Services Research*, 19(538), DOI: 10.1186/s12913-019-4369-6.

4. Details of the impact (indicative maximum 750 words)

The underpinning research has had diverse impacts in Mozambique. First and most importantly, the evidence generated by the study revealed that the scheduling system significantly reduced patient waiting times and increased attendance of the recommended minimum four antenatal care visits. Testimonies of the patients involved in the scheduling intervention also revealed the attendant benefits to their lifestyle and wellbeing, reducing anxiety and enabling patients to effectively balance their other professional and domestic responsibilities. Providers reported lower

levels of stress and longer consultation times. In response to these findings, the Ministry of Health provided funding support to expand the scheduling system to other health services and to other regions of the country. The Ministry also requested the research team put in place a wider programme of capacity-building, providing technical support and training to healthcare clinic staff on how to successfully introduce management interventions at the clinic level. These impacts are described in greater detail below.

Reducing antenatal care patient waiting times

After implementation of the scheduling intervention, waiting time data for antenatal care was collected for 6,918 women [1]. Results showed that appointment scheduling shifted the distribution of arrival times for antenatal care to later in the day. Previously, 62% of women seeking antenatal care in treatment facilities arrived before the facility first opened at 8am. During follow-up rounds, this percentage declined to 22%. Forty-eight per cent of patients arrived before their hour-long appointment window. The average of mean daily waiting time across the three facilities at baseline was 182 minutes. Average waiting time after scheduling ranged from 85 to 107 minutes, a decrease of between 41% and 53% from baseline. Regression analysis, controlling for day of the week effects, showed a decline in waiting times of 100 minutes after implementation of the scheduling intervention. The scheduling intervention was particularly successful in clinics with higher volumes of patients [A].

Increased completion of WHO-recommended minimum of four antenatal care appointments

An important outcome of interest was whether implementation of the scheduling system also led to an increase in patient retention and utilisation of healthcare services, and particularly whether it would encourage more women to complete the WHO-recommended minimum of four antenatal care appointments during pregnancy. Results of the study, tracking antenatal care attendance over the course of pregnancy for 8,385 women, showed that, among the cohort of women who were exposed to the scheduling intervention during all 40 weeks of pregnancy, a 16-percentage-point increase in attendance of the recommended minimum four antenatal care appointments was observed [B]. These findings suggest that long waiting times compromise the quality of patients' experience, leading to poor health outcomes by negatively affecting attendance of antenatal care appointments and decreasing healthcare utilisation.

Patient wellbeing

As part of the impact assessment work, 38 interviews were collected between May and June 2017 at three clinics in southern Mozambique. Questions were open-ended and invited participants to discuss their decision to attend antenatal care, their experiences at the clinic, and their experiences with the scheduling system. Previously, in their experiences without a scheduling mechanism, patients faced unpredictable and long wait times and uncertainty about whether they would be seen at all. The women interviewed felt it was important to seek antenatal care but encountered problems such as difficulty in arranging time off work, finding childcare, or having to forego other domestic responsibilities. The scheduling system improved this experience by reducing time spent at the clinic for antenatal care appointments, thereby also addressing logistical challenges and reducing uncertainty around when patients would receive care.

With a scheduled appointment, patients no longer had to anticipate "burning" or sacrificing an entire day at the clinic. They described being able to better plan their day around the clinic visit, which allowed them to resume their responsibilities before and after their appointment and rely less on the aid of others: "*In that old system you would get up early and come here and wait until 2pm while you didn't do anything at home. Now you can plan, you wake up at 5am, clean the backyard, do the dishes, clean the house, then make breakfast for the children who then leave, and you stay preparing the curry [dinner]*" [C].

One patient identified the principal benefit of the scheduling system as having made her appointment days more predictable, regarding both when she leaves for the clinic and when she returns home: "*I think it's better with the booking system...because when we know what time we'll be seen we can schedule the time we leave the house and what time we'll get back – we more or less know our schedule for the day*" [C].

Importantly, patients reported the fact that healthcare workers were less stressed and more likely to have longer consultations that would include all routine checks and procedures. This suggests

the important role that management capacity at the clinic level can play in shaping both the perceived and actual quality of care.

Benefits to healthcare workers

Healthcare workers reported improved working conditions as a result of the scheduling system. In interviews conducted as part of the impact assessment, nurses described how not having to manage a crowded waiting room has given them time to devote to other aspects of their work: "*For our health centre that used to get really full it's been beneficial. Nurses have more time to think what to do. It's going to help us all. It would be good if it were expanded to other kinds of appointments*" [D]. Similar to patients, the nurses were also able to strike a better work-life balance and reduce burnout and absenteeism: "*with the new system, things got better. [...] I leave on time and don't get home tired*" [D].

Inclusion as a priority in the Mozambique Ministry of Health official strategy

Following the success of the study, the scheduling strategy became a national priority of the Ministry of Health for 2017-2020 and became part of the Ministry's official Strategy Plan [E] [F]. In a January 2018 television appearance addressing the frequent complaints about "enchentes" (queuing) at healthcare facilities, the Minister of Health presented the scheduling system as a solution, mentioning that the new scheduling system had been trialled successfully and was now in the process of being scaled up [G] [H].

Expansion of the intervention

The Ministry requested support from the research team to expand the intervention to other areas of healthcare provision and to other parts of the country. Since the first study, the scheduling system has been rolled out across 46 antenatal care units on an experimental basis. Importantly, the government requested support for a rapid expansion of the scheduling system to help manage access to care for patients with chronic diseases such as HIV [I]. The extension of the scheduling system to chronic diseases holds potential to have an even wider impact on economic outcomes. HIV/AIDS remains one of the deadliest diseases in many sub-Saharan African countries. In fact, Mozambique has the eighth-highest HIV prevalence rate in the world (12.5% in 2016). Despite recent progress in testing and starting patients living with HIV on antiretroviral treatment, low adherence to treatment threatens to undermine these recent advances. Only 54% of patients remain active in treatment after 12 months. Loss of treatment can increase the spread of the disease and intermittent treatment can build drug resistance, reversing past gains. Long waiting times to access regular care and collect medication are considered a major driver of low demand for HIV treatment. Male patients are less likely to seek treatment because of the risk of job loss due to absence from work, while female patients face similar work trade-offs on top of childcare responsibilities. Lack of treatment for female patients can exacerbate the problem of mother-to-child transmission of HIV.

The intervention has already been expanded to 40 HIV treatment units in public clinics across three provinces in Mozambique [I]. Taken together, with an average of 1,500 antenatal care patients and 3,700 HIV patients enrolled in treatment in each facility, this represents an extension of the research initiative to cover more than 217,000 patients (50% of all patients in Mozambique's four southern provinces of Maputo City, Maputo Province, Gaza, and Inhambane).

Providing an evidence base for increased investment in health services

The Mozambican government's commitment to extending the benefits of the research intervention is evidenced by the allocation of significant funds (approximately USD200,000) by the Ministry of Health and its research branch, the National Institute of Public Health, to support the expansion of the intervention [F]. In addition to funding the implementation across the four provinces in the south (and the pilot launch of the intervention in central and northern Mozambique), resources have also been made available for a wider programme of capacity-building, to ensure the sustainability of the intervention beyond the project timeline. The research team has been funded to provide substantial technical support and training for staff at both province and district level, who can in turn train nurses and clinicians at the selected facilities. This "training of trainers" strategy will ensure continued feasibility and quality. Community mobilisation events have also been held to raise awareness among patients, while supervisory networks have also been established and trained among health authorities at the central, provincial, and district levels.

Overall, the implementation of the scheduling intervention has been a significant success and has been acknowledged as such by senior personnel in the Ministry of Health. It has also been used to help to mitigate the strain on health facilities during the Covid-19 pandemic [J]. The Deputy Director-General of the National Institute of Health (a collaborator on the project) has attested to these benefits: *“This project represents a ground-breaking collaboration between health specialists and economists to improve the primary care system in Mozambique. The project has received strong support from the Ministry of Health and is a national priority for health. It has also become extremely relevant during the current pandemic as it aims to avoid crowded health facilities and ensure that patients with chronic diseases and those in need of regular care such as maternal and childcare continue to access health facilities effectively and safely on a regular basis”* [E]. In particular, the research team has played a critical role in ensuring that there is a rigorous assessment of the expansion of the scheduling intervention, to identify the critical factors for the success of this type of management-level intervention and how it should be customised across clinics with varying levels of managerial capacity. This evidence-based approach is more likely to enable effective and sustainable change in the health system.

The quality of healthcare gained greater prominence in the international health systems agenda with the 2018 publication of the Lancet Global Health Commission’s Report on High-Quality Health Systems, which aims to ensure that the quality of healthcare increases alongside global coverage targets set by the Sustainable Development Goals. Against the backdrop of rapid urbanisation across sub-Saharan Africa, the problem of overcrowded facilities and congestion is expected to be significantly exacerbated over the next 20 years. This intervention has been shown to improve the management of public healthcare delivery in settings in which urban congestion and poor management of patient flows is a consistently recognised constraint, even beyond the Mozambican context. At present, over 50% of respondents to the Afrobarometer survey highlight queuing for healthcare as a key concern. The scheduling system is easily scalable and transferable to other spheres of healthcare provision in the country, requiring minimal staff training and limited financial resources. In fact, the research team received a WHO competition award for this project, with the committee commending both its *“strong potential to directly impact future work to reduce wait times and improve flow of care in the high-burden HIV clinic setting and other areas”* and the involvement of high-level policymakers in the project team [K]. The project has also received funding support from the World Bank, J-PAL, and the International Growth Centre. All funders can provide a global platform for the dissemination of the intervention across countries.

5. Sources to corroborate the impact (indicative maximum of 10 references)

[A] Waiting time for antenatal care as measured by patient-reported survey data collected by the research team.

[B] Figures on number of visits, obtained from administrative data contained in facility registers.

[C] Patient testimonies: Patient B12, Boane Health Center - transcript of interview conducted 22 June 2017; and Patient B3, Boane Health Center - transcript of interview conducted 6 July 2017.

[D] Nurse B1N, Boane Health Center - transcript of interview conducted 2 June 2017.

[E] Supporting statement from Deputy Director-General, National Institute of Health, Mozambique, 2 August 2020.

[F] Supporting statement from Director-General, National Institute of Health, Mozambique, 25 January 2018.

[G] *Jornal de Noite*, STV Notícias, 15 January 2018. In Portuguese. Video available upon request.

[H] "Para reduzir enchentes nas consultas: Saúde equaciona revisão de horários", *O País*, 16 January 2018. In Portuguese.

[I] Supporting statement from the Coordinator of the Health Policies and Systems Program, National Institute of Health, Ministry of Health, Mozambique, 28 April 2021. In Portuguese (with English translation provided).

[J] Ministry of Health guidelines issued to all district authorities, 27 March 2020.

[K] Confirmation of World Health Organization's Research to Enhance the Adaptation and Implementation of Health Systems Guidelines (RAISE) competition award, 23 July 2019.