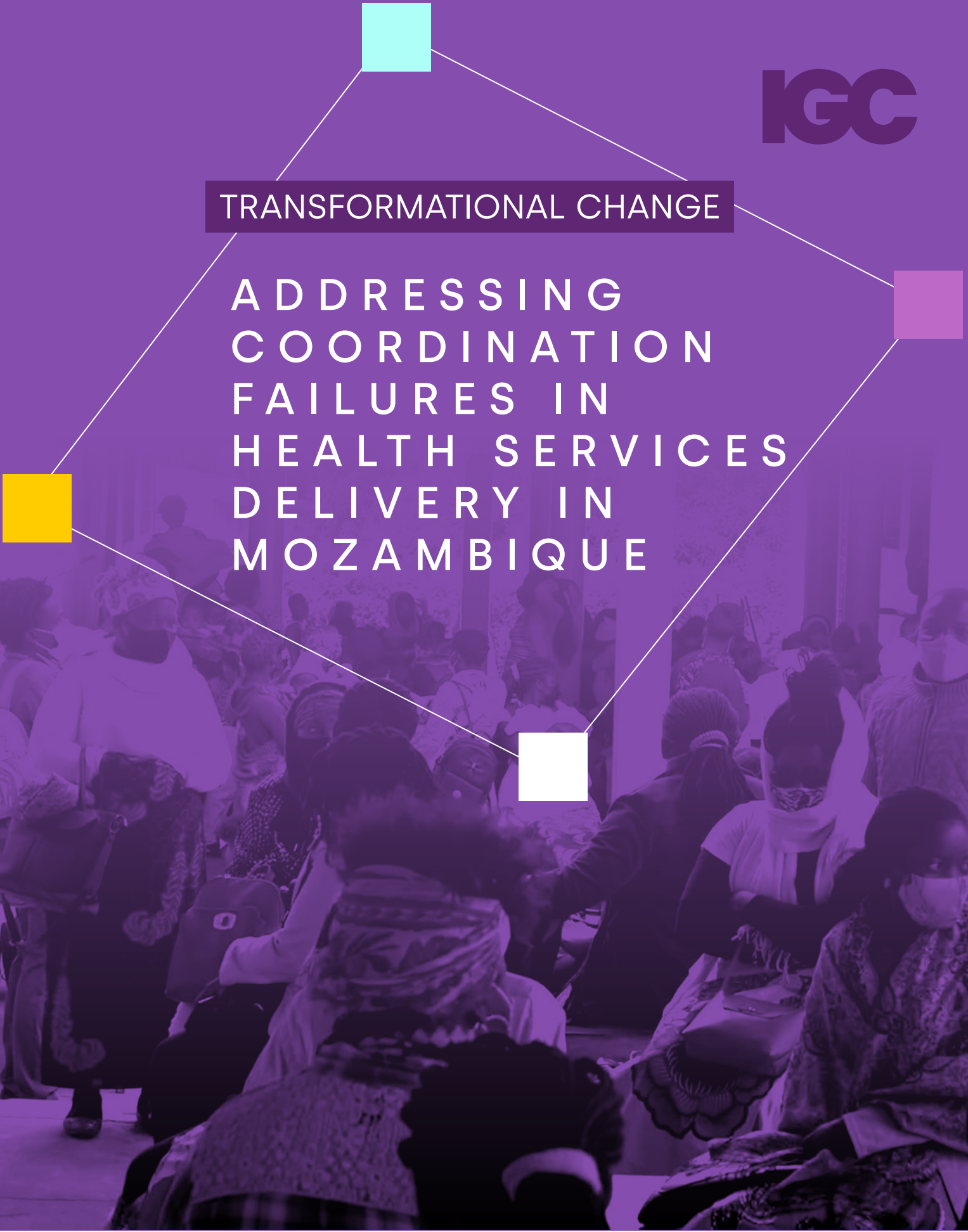




TRANSFORMATIONAL CHANGE

ADDRESSING
COORDINATION
FAILURES IN
HEALTH SERVICES
DELIVERY IN
MOZAMBIQUE

DIRECTED BY



FUNDED BY

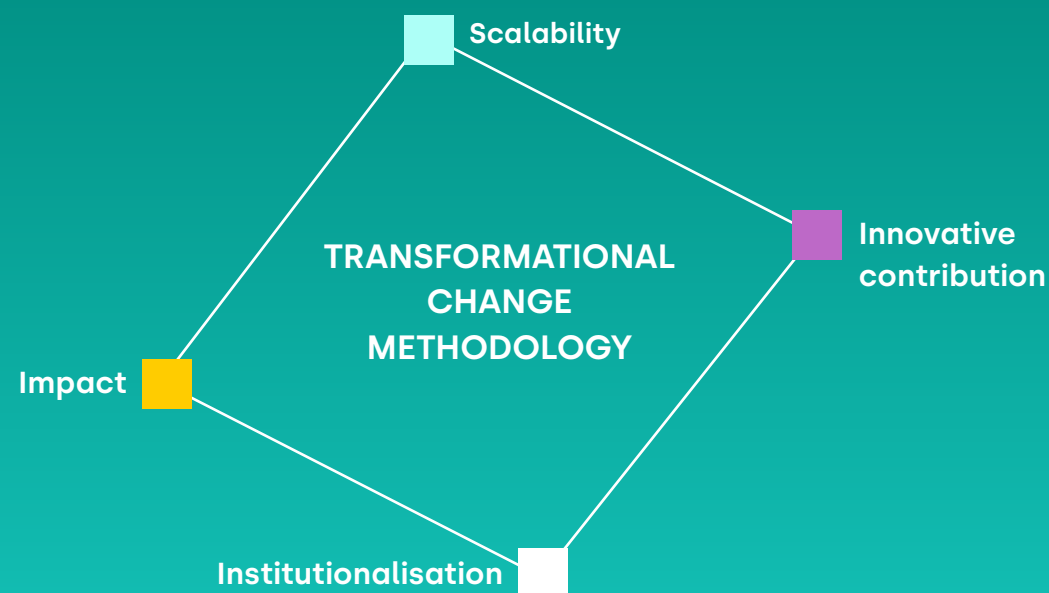




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CONTENTS

1. Understanding Transformational Change	4
2. The efficiency challenge in Mozambique's public health sector	5
Transformational Change timeline	8-9
3. The path to Transformational Change	10
a. Understanding inefficiencies in health service delivery in Mozambique	10
b. Spreading arrivals, cutting wait times: The ANC scheduling pilots	12
c. From pilots to expansion and government uptake: Building legitimacy and scaling across other chronic care facilities	16
d. Sustaining long-term change and institutionalisation	19
4. What makes this work transformational? Key achievements by dimension	22
5. Drivers of change	24
References	26



1. Understanding Transformational Change

The IGC works with policymakers in low- and middle-income countries to promote inclusive and sustainable growth through pathbreaking research. Our research and policy engagement are supported by an international network of researchers and resident country offices across Africa, South Asia, and the Middle East. The collaborative approach made possible by this model – with embedded country teams that bring senior policymakers together with leading researchers – has created an effective mechanism for collaborative idea generation.

To understand, enhance, and communicate IGC's impact, we created a 'Transformational Change' methodology in 2024. The methodology aims to identify the conditions in which research can achieve significant and positive policy and academic impact by focusing on four key dimensions: innovative contribution, institutionalisation, scalability, and impact. The focus of our approach is on contribution to change, rather than attribution; analysing cases where IGC's contribution was pivotal for change to happen, but recognising it was not the sole player. Our Monitoring, Evaluation, and Learning (MEL) Team is now applying this methodology to a series of case studies. The knowledge from these studies will deepen our understanding of the IGC's pivotal contributions and help us to draw actionable insights that inform future strategies and reinforce the IGC's role in driving evidence-informed policy research.

Between August and November 2025, we applied IGC's Transformational Change methodology to analyse the *Addressing coordination failures in health services delivery* research cluster, which targeted improving state capacity through operational innovations in healthcare policy in Mozambique. This decade-long body of work is anchored in IGC-funded research projects and dissemination events. At the core of this cluster is a low-cost yet transformative idea: testing whether an appointment-based scheduling system could reduce waiting times while improving the uptake and efficiency of frontline antenatal care (ANC) and HIV health services in Mozambique. Over time, the research and dissemination efforts helped shift policy, practice, and patients' perceptions

within the health system, and thus played a role in improving state capacity in the delivery of public services, with improved human capital outcomes.

This Transformational Change analysis draws on internal documents, official reports, academic publications, and insights from 14 key informant interviews.¹

2. The efficiency challenge in Mozambique's public health sector

Mozambique has long faced serious maternal and child health challenges, making timely and regular contact with the antenatal care health system essential. In 2015, Mozambique's maternal mortality ratio (MMR) was approximately 489 deaths per 100,000 live births, significantly above the global trend towards meeting the Sustainable Development Goals (SDGs) target of <70 by 2030.² In addition, Mozambique's public health system has long been constrained by persistent inefficiencies in patient flow and service delivery. In 2012, 74% of patients reported experiencing long waits in public facilities, reflecting a system without structured scheduling or clear triage (Sequeira et al., 2019). Patients often queued for hours, sometimes from before dawn, without any certainty of when, or even whether, they would be seen (J. Thembo, personal communication, 15 September 2025). These delays and overcrowded clinics eroded service quality and discouraged patients from returning for follow-up care, particularly in maternal health and HIV services. While 91% of women attended at least one ANC visit, only 55% completed the four visits recommended by the World Health Organization (MISAU, 2019). Similar challenges affected HIV treatment retention, where regular follow-up is critical for sustained care. Considering that in Mozambique, HIV prevalence among adults aged 15-49 was 13.2% in 2015, follow-up is extremely relevant. (MISAU, 2018).

Against this backdrop, persistent bottlenecks in frontline health services became emblematic of a broader challenge for the Mozambican state: how to deliver reliable public services with limited resources and rising citizen demand. Improving operational efficiency was, therefore, not only a health-sector concern, but a core governance priority. This thinking aligned with a wider government agenda to strengthen state effectiveness in areas such as education, civil registration, and other high-demand public services. Within this reform context, the health sector presented an opportunity for improving coordination failures through simple tools like appointment scheduling, which could visibly reduce congestion, improve

¹ Interviews for this case study were conducted in September 2025 with the following stakeholders: Anum Anis (Research Programme team, IGC), Anibal Naftal (Provincial Director Office, Ministry of Health), Carla Alberto (Health Systems Programme Team, National Institute of Health – INS), Claudio Frischtak (Country Director, IGC Mozambique), Domingos Lambo (Former Permanent Secretary, Ministry of Economy and Finance), Edite Tuzine (National Directorate of Medical Assistance, Ministry of Health), Egas Daniel (Senior Country Economist, IGC Mozambique), Eusebio Chaquisse (Head of Central Department of Primary Health Care, Ministry of Health), Janet Dula (Researcher, National Institute of Health – INS), Jose Thembo (Health Centre Director, Malhangalene Health Centre, Maputo Health Directorate), Khatia Munguambe (Human Development Advisor, FCDO Mozambique), Laurentino Cumbi (Project Manager, National Institute of Health – INS), Sandra Sequeira (Lead Principal Investigator and Lead Academic for Mozambique, IGC), Sergio Chicumbe (Researcher Director, National Institute of Health – INS), and Shahid Vaziralli (Research Programme team, IGC).

² As of 2023, MMR has significantly reduced to approximately 99 deaths per 100,000 live births, while under-5 mortality rate is around 62 per 1,000 live births in Mozambique.

service quality, and demonstrate how better management could translate into a more responsive and capable service provision by the state (D. Lambo, personal communication, 9 September 2025).

This IGC-supported research cluster began in 2014, when a broad government push for better value in health spending met an everyday reality in clinics: overcrowding, long waits, and patients dropping out of recurring care. This created the conditions for a co-designed, testable scheduling reform. As early findings generated policy interest and continued demand, the work evolved into a broader cluster of research, capacity-building support, and policy engagement, including high-level dissemination with senior leadership. Together, these activities represented an IGC investment of nearly GBP 200,000. While recognising that this decade-long body of work has been possible through sustained collaboration between various government departments, international partners, and IGC researchers, this case study focuses specifically on the IGC's distinctive contribution.

IGC's contribution to change

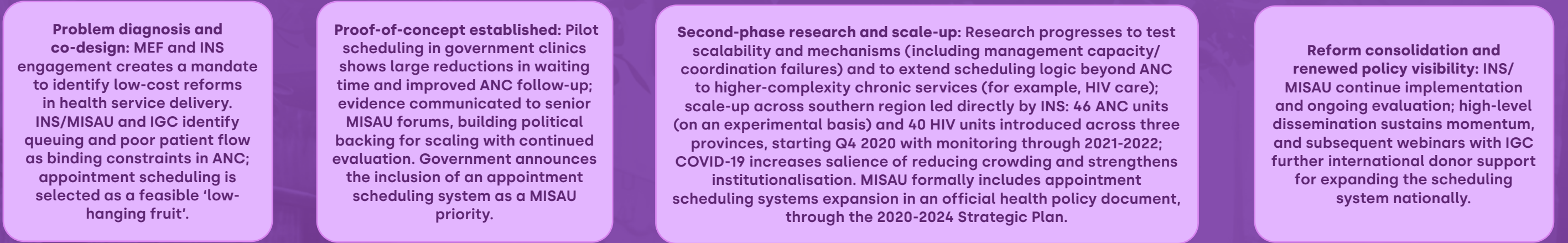
- Providing the first rigorous evidence in Mozambique that a simple, low-cost appointment-scheduling system can cut waiting times, improve patient experience and retention, and drive higher utilisation of medical care. The research helped reframe the problem of efficiency in Mozambique's health sector, from one of scarce resources to one of management and institutional practice, while showing that women held strong normative commitments to ANC and that access barriers, rather than awareness, were the binding constraint on uptake.
- Bridging research and implementation through embedded partnerships with the National Institute of Health (INS) and Ministry of Health (MISAU), enabling continuous feedback between researchers, policymakers, and frontline health staff. IGC's field collaboration strengthened INS's research capacity and allowed scheduling tools to be adapted to local realities.
- Supporting the legitimacy of a reform already under consideration by the government through high-level policy engagement. This evidence informed the inclusion of appointment scheduling in MISAU's 2020-2024 Health Strategy Plan and supported its nationwide rollout.



Transformational Change timeline

Addressing coordination failures in health services delivery in Mozambique

Main achievements



Waiting Time, Wasting Time: A pilot scheduling intervention to decrease waiting time for antenatal care in Mozambique (co-funded by J-PAL)

This project tested whether a simple, paper-based appointment system could be implemented in government clinics and reduce queuing costs for women seeking antenatal care.

The pilot showed large reductions in waiting time (around 100 minutes, roughly halving waits) and improved continuity of care (higher completion of recommended ANC visits), with very high patient acceptability.

Early implementation learning also showed that tech-first tools (apps/SMS) were not reliable in low-connectivity settings, and that pen-and-paper scheduling, along with community trust-building, were more robust for scale-up. This led to two peer-reviewed publications in BMJ Global Health and BMC Health Services Research.

Reducing Coordination Failures to Improve Adherence to HIV Treatment: A Management-level Intervention in Mozambique (co-funded by the World Bank)

Building on the ANC proof-of-concept, this phase examined whether coordination and management constraints in higher-complexity chronic-care pathways (including HIV) drive long waits and poor retention, and whether appointment scheduling/workflow reforms improve service performance. The wider programme entered an implementation-and-evaluation period in the southern region during 2020-2022, but HIV results proved harder to estimate due to implementation complexity and data-access constraints. The subsequent full-scale RCT confirmed broader efficiency gains: more ANC visits, more recommended procedures, shorter average waits, and fewer very long waits.

Advancing Healthcare Access in Mozambique

High-level dissemination and coalition-building event to share emerging evidence on appointment scheduling/clinic flow reforms and discuss extension to other chronic services. This event convened senior INS/ MISAU policymakers, researchers and international partners, refreshed political visibility, and supported continued evaluation and implementation planning.

This timeline illustrates the evolution of the Transformational Change story over time, highlighting key achievements related to IGC-funded research and policy engagement. It acknowledges the accumulation of research findings, policy efforts, and contributions from multiple actors, emphasising contribution rather than direct attribution to the observed outcomes.

Research and policy engagement



Ana Lucas Capianga, Maternal & Child Health Nurse, checks a patient's notes at Malhangalene Health Centre

3. The path to Transformational Change

a. Understanding inefficiencies in health service delivery in Mozambique

In 2014, Domingos Lambo, then the Permanent Secretary of the Ministry of Economy and Finance (MEF), invited the IGC Mozambique Country Team to identify reforms that could help maximise the efficiency of expenditure in the health sector (E. Daniel, personal communication, 12 September 2025; C. Frischtak, personal communication, 25 September 2025). IGC Mozambique, already an established partner to MEF, was uniquely positioned to respond through its model, which integrates international research excellence with on-the-ground policy engagement. This MEF engagement reinforced the political salience of 'value for money' reforms and created space for the IGC to help translate broad efficiency priorities into testable, facility-level innovations.

At the same time, health-system actors, especially within the INS and MISAU networks, were confronted by a very concrete bottleneck: overcrowded facilities, long and uncertain queues, and missed follow-up visits in recurring-care services such as antenatal care and HIV/chronic treatment. To lead the work, the IGC engaged Sandra Sequeira, its Lead Academic for Mozambique, and a development economist at the London School of Economics. The research partnership, led through IGC's Mozambique programme and co-designed with MISAU counterparts, was formed around a pragmatic question: could a simple and low-cost appointment scheduling system reduce congestion and improve continuity of care within existing fiscal and operational constraints?

Initial scoping conversations between Sequeira and Janet Dula, researcher at INS, the independent research body within MISAU, focused on identifying a low-cost, scalable reform that could improve system performance within the existing budget and resources in the health system. In this early phase, Dr Eduardo Samo Gudo, the then Scientific Director of INS, became a key figurehead to ensure the complete support and involvement of INS for this study (S. Sequeira, personal communication, 5 September 2025). As discussions progressed, the IGC conducted a series of qualitative interviews with stakeholders across the board and considered a range of approaches used elsewhere, including provider performance incentives. However, INS counterparts were reluctant, arguing that 'pay more' solutions were politically and fiscally unrealistic and that any reform had to fit within the existing budget envelope.

The joint focus therefore shifted towards a 'low-hanging fruit' approach: addressing operational bottlenecks that were visibly undermining utilisation and continuity of care, especially queues and long waiting times in clinics. This focus was reinforced by prior evidence from studies conducted by researchers at the University of Washington, which showed that initial antenatal consultations often involved over an hour of waiting even before registration, highlighting the urgent need for solutions to reduce delays and improve service responsiveness (Wagenaar et al., 2016). Antenatal care services, which require repeated visits within a fixed pregnancy window, are especially sensitive to waiting times, predictability, and clinic organisation.

The idea of introducing an appointment-scheduling system was not new – INS had attempted to implement this practice in a few clinics in previous years. However, those initial efforts had stalled due to limited institutional follow-up and the lack of credible evidence to demonstrate impact (S. Chicumbe, personal communication, 15 September 2025). Around 2015, a Johns Hopkins (Jhpiego)-supported experiment in central Mozambique had also tested appointment scheduling and showed improvements in patient experience and staff organisation, but its findings remained anecdotal. The IGC research team revisited that study and brought in their consultant's implementation knowledge into the design stage to ensure that the new research was building on previous findings (S. Sequeira, personal communication, 5 September 2025).

Qualitative interviews conducted by the IGC, INS and the National Directorate of Public Health (DNSP) – another body within MISAU – pointed to a set of reinforcing mechanisms that drive low utilisation and poor retention in key health services. For patients, long and unpredictable waits made repeat visits difficult to reconcile with work, household responsibilities, and transport constraints, discouraging follow-up even where demand for care was high. From the provider side, unstructured queues concentrated demand in the early morning, overwhelming staff, reducing consultation time, and limiting the ability to prioritise chronic and follow-up cases. Together, poor patient experience and weak clinic responsiveness appeared to reinforce low completion rates for recommended visits and follow-up care (IGC, 2018), especially in antenatal care and HIV services for which attrition was high despite continuity of care being essential. Against this backdrop, appointment scheduling emerged as a targeted, low-cost intervention designed to address these specific bottlenecks by spreading patient arrivals across the day, reducing

uncertainty for users, and easing workload pressures for frontline staff – making it a natural candidate for rigorous testing through the pilot.

b. Spreading arrivals, cutting wait times: The ANC scheduling pilots

Given that earlier attempts to trial such an experiment were met with scepticism, especially from patients, due to lack of trust in queueing systems, the researchers proposed beginning with a small pilot to test whether an appointments-based scheduling system could function within the realities of Mozambique’s primary health facilities. In close collaboration with INS, the research team, comprising of Sandra Sequeira, Margaret McConnell, Maria Steenland, and other INS researchers,³ submitted a proposal for the IGC’s 2nd Commissioning Board⁴ round in 2014. The proposal was approved with strong support from the Mozambique Country Team, which backed this research as extremely relevant for local priorities.

The pilot was operationalised once the partnership with the Ministry of Health was formalised in 2016. This was preceded by intensive pre-intervention engagement with provincial and district authorities, as well as community leaders, with the aim of building trust in the new system and supporting adherence. The intervention introduced a simple time-block scheduling system⁵ across three health facilities – combining urban and peri-urban centres⁶ – in Boane, Malhangalene, and Quissico. A fourth facility – Machava II – operated as a control group, where the first-come, first-served queue model continued to operate. The assessment examined outcomes related to waiting times, clinic organisation and patient retention (Sequeira et al., 2019; S. Sequeira, personal communication, 5 September 2025; J. Dula, personal communication, 20 August 2025). The intervention itself was intentionally simple: women attending ANC appointments received a return date and time and were informed that, if they returned as scheduled, they would be seen within approximately one hour; nurses recorded appointments both on patient cards and in clinic registers (IGC, 2018).

The pilot generated strong early results: average ANC waiting times fell by around 100 minutes (approximately 50%), and completion of the four

³ Sandra Sequeira co-led the study, along with Margaret McConnell of Harvard TH Chan School of Public Health, with further design and data interpretation contributions from Maria Steenland (Brown University), Amanda de Albuquerque (Pontifical Catholic University of Rio de Janeiro), and Janet Dula, Quinhas Fernandes, Rosa Marlene Cuco, Sergio Chicumbe, and Eduardo Samu Gudo (Ministry of Health, Mozambique).

⁴ At the IGC, a Commissioning Board (CB) round refers to the competitive process through which research proposals are reviewed and selected for funding by the IGC’s central Commissioning Board, a panel of senior academics responsible for assessing policy relevance, methodological rigour, and the potential for real-world impact.

⁵ Patients were given a fixed date and one-hour time block for their next visit, written in an appointment card, while nurses used scheduling books to distribute visits more evenly throughout the day (Sequeira et al., 2019; S. Sequeira, personal communication, 5 September 2025).

⁶ Two intervention clinics, Boane and Malhangalene, were located in urban Maputo. A third, Quissico, located in rural Inhambane Province, was included to test scheduling in a rural environment where employment and transportation might differ. A fourth clinic, Machava II, located in urban Maputo, was used as a comparison. All clinics selected had high ANC volumes and were accessible from a main road.

WHO-recommended antenatal visits increased by 16 percentage points among women observed throughout pregnancy (Sequeira et al., 2019; LSE, 2021; Sequeira, personal communication, 5 September 2025). This work later resulted in two complementary peer-reviewed papers, with findings published in BMJ Global Health and BMC Health Services Research.

A key learning from this phase was that ‘tech-first’ approaches were not reliably feasible in this context. The team initially attempted to support scheduling with digital tools (smartphones/apps/SMS-type functionality), but connectivity, charging constraints, and operational issues made this approach unworkable. The project therefore reverted to paper-based scheduling books, which proved more robust and scalable in low-resource settings. (IGC, 2017)

For patients, the scheduling system reduced uncertainty and time costs. Knowing when they would be seen increased confidence in the health system, reduced conflict in waiting areas, and made it easier, particularly for working women and those with household responsibilities, to plan clinic visits without losing an entire day of productive time. For healthcare providers, the intervention reshaped how work was organised: predictable patient flow allowed staff to manage workloads more evenly across the day, reduced congestion during peak hours, and created space for longer, higher-quality consultations. As one health centre director noted, the calmer environment enabled better observation, follow-up, and care delivery (J. Tembo, personal communication, 15 September 2025).

The findings challenged a prevailing assumption in maternal health policy: that low uptake of antenatal care is driven primarily by limited awareness or demand.

Together, these shifts made the system politically and operationally workable: a simple organisational change produced large, measurable improvements without new clinical inputs or additional budgetary burden. Patients were more willing to return because care felt reliable and respectful, while health workers experienced less stress and greater control over their schedules. This dual response helps explain the exceptionally high acceptability of the system – 99% of the 1,600 patients interviewed reported satisfaction – and why improvements in clinic organisation translated into higher retention rather than faster throughput alone (INS, 2020). The findings challenged a prevailing assumption in maternal health policy: that low uptake of antenatal care is driven primarily by limited awareness or demand. Instead, the evidence supported an ‘access and responsiveness’ interpretation: long and uncertain waits acted like an implicit price, suppressing follow-up even when women valued care (Gong et al., 2019).

The IGC played a pivotal role in both the technical and adaptive dimensions of the pilot, leading the research design, overseeing data collection and fieldwork, and introducing simple measurement tools such as time-tracking badges to record patient waiting times. The IGC, INS and DNSP maintained close field engagement, including dedicated project management and sustained monitoring to support implementation and learning, an investment that proved pivotal. This close engagement also surfaced key behavioural insights, including the need to adapt scheduling to local timekeeping norms. In many rural areas, patients organised their

day around markers such as sunrise, school hours, or mealtimes rather than the clock (E. Tuzine, personal communication, September 2025; S. Sequeira, personal communication, 5 September 2025).

Equally important was IGC's contribution to navigating the behavioural and social barriers that shaped health-seeking practices. After decades of first-come, first-served queuing, many patients feared that arriving later would mean not being seen at all. Anticipating this resistance and as part of the pilot design, researchers collaborated with INS and clinic teams to create a community engagement strategy that built trust in the new system. Outreach through neighbourhood leaders, 'Mentors for Mothers', and 'Men Champions' helped explain that scheduled visits offered flexibility without loss of access. As Anibal Naftal, from the Provincial Director Office, MISAU, noted, community educators "helped people understand they could work in the morning and still receive care later in the day" (personal communication, September 12, 2025).

The pilot proved essential for refining implementation details, particularly:

- how appointments were recorded and communicated to patients,
- how responsibilities were allocated across staff,
- how late arrivals and missed appointments were handled,
- how appointment books/forms were supplied and replenished, and
- what supervisory routines were needed to maintain fidelity before implementing the RCT.

It also marked the start of a sustained collaboration between IGC economists, INS researchers, and frontline health officials working together to apply evidence to real health-service challenges.

"There is not much capacity to bring economics into health [...] this was the first time doing this kind of applied economic research, a randomised trial at the level of health services"

INS counterparts were co-designers and co-implementers throughout, and the partnership was explicitly described as a rare opportunity to bring economic analysis and experimental methods into health-systems reform work (IGC, 2019). For INS, the collaboration also addressed a critical capacity gap. As Sergio Chicumbe, Director of Research, INS, reflected, it contributed to "strengthening capacity in the health policy and systems research group, learning from economists. There is not much capacity to bring economics into health [...] this was the first time doing this kind of applied economic research, a randomised trial at the level of health services" (personal communication, 15 September 2025). Beyond addressing a pressing operational challenge, the partnership created an important learning platform for evidence-based management of health systems.

Following the positive pilot results, IGC and INS convened a workshop in Maputo, engaged donors, and then held a closed-door meeting with key decision-makers to walk through implementation details, which helped



secure the political support needed to proceed. Dissemination took place through two key channels: first at MISAU's Technical Council and the National Health Planning Meeting in 2016, and later, in April 2017, at MISAU's Conselho Coordenador – the Ministry's highest-level policy forum – where the results generated strong enthusiasm among senior officials. As Janet Dula, INS researcher, recalled, "Her Excellency Dr. Nazira [Abdula], the former Minister of Health, recommended that the initiative become a national policy, but implemented in phases and always coupled with evaluation" (personal communication, 20 August 2025).

By this point, MISAU had formally recognised the relevance of appointment scheduling, situating it within a broader agenda to systematise and improve the quality of care in primary health facilities. Reflecting on the study, officials noted that "we placed it within the agenda of systematising care in Mozambique as one of the pillars that can contribute to quality of care delivered in primary health care units" (Eusebio Chaquisse, personal communication, 9 September 2025).

The strength of the early evidence prompted MISAU to request a full-scale RCT and to elevate appointment scheduling as a policy priority, subsequently formalised through its inclusion in the Ministry's 2020-2024 Strategic Plan (MISAU, 2021). Credible findings, combined with the close partnership between IGC economists and INS researchers, also helped secure high-level political endorsement. Key figures such as Dr Nazira Abdula and Eduardo Samo Gudo, then INS Scientific Director (now Director-General), became influential policy champions of the reform, which enabled it to gain institutional traction.

c. From pilots to expansion and government uptake: Building legitimacy and scaling across other chronic care facilities

Building on the success of the pilot, IGC and INS expanded the research to test scalability and deepen understanding of implementation dynamics beyond antenatal care. This time, there was demand from within MISAU to extend scheduling systems beyond ANC to chronic care facilities such as HIV (IGC, 2019). In 2018, IGC funded a second Commissioning Board project, *Reducing Coordination Failures to Improve Adherence to HIV Treatment: A Management-level Intervention in Mozambique*.⁷

This next phase used a full-scale RCT to generate stronger evidence on the underlying causes of long waiting times and whether coordination failures and weak management practices were themselves binding constraints (IGC, 2019). Unlike antenatal care, HIV services required coordination across multiple points of care – clinicians, laboratories, pharmacies, and counsellors – making them a stricter test of whether organisational failures, rather than resource shortages alone, drove long waiting times and poor retention. This RCT also tested how delays impacted trust, patients' perceptions of the quality of service, and patient adherence or

retention – particularly for HIV treatment where consistent follow-up is essential (IGC, 2019).

This study was designed as a large RCT, conducted in 80 high-volume facilities in the four southern provinces, explicitly incorporating clinics' management quality (using validated management instruments) to test whether "management capital"⁸ predicts implementation fidelity and impact (IGC, 2020; J. Dula, personal communication, 20 August 2025).

The full-scale RCT provides stronger experimental evidence that appointment scheduling generated meaningful efficiency gains in frontline ANC delivery. The intervention increased antenatal care utilisation by 8% and improved adherence to recommended clinical procedures by 17%. At the same time, average waiting times fell by approximately 13 minutes, and the likelihood of very long waits above 150 minutes fell by 27%. The findings suggest that the intervention improved the organisation of care by spreading patient arrivals more evenly across hours and days, allowing clinics to provide more consultations and more complete care within existing personnel, technology, and budget constraints.

However, these objective improvements were not reflected in higher patient satisfaction, because appointment cards raised expectations of short waits. This suggests that satisfaction surveys alone may understate welfare gains from operational reforms that improve both service quality and expectations. (de Albuquerque et al., 2026)

Due to challenges in procuring relevant data and the changing delivery of schemes around HIV care in Mozambique, the implementation of the HIV study was not successful enough, either in terms of its results and or its policy uptake. Nonetheless, these studies advanced the academic literature in three important ways.

- First, they showed that health facilities with stronger management practices were more capable of adopting innovations like appointment scheduling, providing new insights on management quality in public service delivery.
- Second, they contributed to growing evidence that patients' perceptions of quality, respect, and predictability influence their willingness to seek care, showing that calmer, more organised clinics can increase demand and follow-up.
- Third, it offered practical evidence on how health systems can achieve core principles of responsiveness, such as shorter waits and better patient experience, domains where international health guidelines offer limited operational guidance (Steenland et al., 2014).

Taken together, the pilot and full-scale RCT produced credible, policy-relevant evidence that a simple, low-cost scheduling system can substantially reduce coordination failures and improve service efficiency,

⁸ Management capital refers to the quality of an organisation's management practices, planning, coordination, supervision, monitoring, and problem-solving routines that shape day-to-day service delivery. In this study, it is measured using a validated management assessment instrument and used to examine whether better-managed facilities implement appointment scheduling more faithfully and achieve larger improvements.

⁷ Co-funded by the World Bank.

patient experience, and management practices within Mozambique's public health system (IGC, 2022; MISAU, 2022; IGC. N.d.). This phase reframed the problem from one of scarce resources to one of management and institutional practice, opening the door to broader system reforms.

Political capital and MISAU's support for appointment scheduling had been building since the initial pilots' success in 2016. By 2018, the Minister of Health approved an independent national scale-up of the appointment-scheduling system, without funding or research support from the IGC.

With direct government funding, and through support from international donors, primarily the World Bank, the programme was operationalised and rolled out on an experimental basis to 46 antenatal units and 40 HIV treatment units across three provinces by the last quarter of 2020.

The programme reached an estimated 217,000 patients – approximately half of all antenatal and HIV patients across Mozambique's four southern provinces

It reached an estimated 217,000 patients – approximately half of all antenatal and HIV patients across Mozambique's four southern provinces (Maputo City, Maputo Province, Gaza, and Inhambane). This estimate assumes an average of 1,500 antenatal care patients and 3,700 HIV patients enrolled per participating facility, reflecting a significant scaling of the original research intervention. The Ministry allocated MZN 7.3 million (GBP 85,000) in 2018 for expansion and MZN 30 million (around GBP 360,000) in 2019 – resources mobilised through MISAU's collaboration with the World Bank and other development partners – for its own HIV scale-up (LSE, 2021; MISAU & INS, 2022; World Bank, 2023; J. Dula, personal communication, 20 August 2025; S. Sequeira, personal communication, 5 September 2025).

The IGC played a pivotal role during this phase of expanded implementation. While IGC researchers provided technical support, research design oversight, and field coordination to ensure methodological rigour and data quality across sites, INS and MISAU emerged as full co-leads in the design and implementation, reflecting the institutional ownership that IGC's long-term engagement had helped cultivate. The IGC Country Team supported the training of enumerators, capacity-building workshops, and preparation of dissemination materials; facilitated high-level briefings; and translated complex findings into policy-relevant recommendations, effectively bridging the gap between evidence and decision-making (S. Sequeira, personal communication, 5 September 2025; E. Daniel, Senior Country Economist, IGC, personal communication, 12 September 2025).

As Janet Dula reflected, **"this was an innovative project, it did not just introduce a new approach to improving services, but a collaborative way of working, conducting research together with policymakers. Sandra Sequeira and the IGC team were always there to guide the process, and that was very positive"**. She further noted that IGC's hands-on support, including the presence of dedicated project managers, was **"crucial not only for the project itself but for developing new skills – preparing presentations, analysing data, and strengthening national technical capacity,"** adding that "the gains from this project were a real added value for the Health Policy and Systems Programme and for Mozambique's research community" (personal communication, 20 August 2025).



The first pilot study found a near 100-minute reduction in average waiting time when clinics shifted to appointment scheduling.

d. Sustaining long-term change and institutionalisation

The onset of COVID-19 reinforced the relevance of the appointment-scheduling system and accelerated its institutionalisation within Mozambique's public health sector. As clinics struggled to manage patient congestion safely, MISAU issued a national directive in March 2020 recommending appointment scheduling to control patient flow and reduce transmission risks (MISAU, 2020). "At the time, the Minister emphasised the necessity and importance of appointment scheduling because it reduced the number of patients in facilities and helped prevent crowding," recalled Dula (J. Dula, personal communication, 20 August 2025).

During the pandemic, INS capitalised on the rapid expansion of remote training and heightened attention to facility flow to reinforce and disseminate scheduling practices, with partners providing technical support where needed. With technical input from the INS and IGC, the Ministry adapted the system to the new operating environment. A tele-training package for nurses and facility managers was developed through MISAU's e-learning platform, which was used for COVID-19 instruction. As Laurentino Cumbi, explained: **"COVID forced us to reinvent how we worked [...] we started delivering remote trainings and reorganising services. With IGC's support, we held trainings and developed better strategies"**. The pandemic thus became a catalyst for innovation and capacity-building, embedding appointment scheduling as a routine management practice rather than a temporary response (J. Dula & L. Cumbi, personal communication, August-September 2025). The INS scale-up report further shows that clinics were able to manage rising ANC consultations while reducing crowding risks, demonstrating how the intervention was successfully adapted to pandemic conditions (INS, 2022).

Despite this momentum, progress and expansion to other regions slowed by mid-2022. The HIV study linked to the reform was not fully completed, limiting dissemination of findings and weakening the case for further expansion. At the same time, the COVID-induced pause in scale-up coincided with shifting government priorities, and direct state funding for the reform declined. Coordination challenges across departments working on the reform also contributed to uneven implementation and mismatched service delivery (multiple interviews, personal communication, Sept. 2025).

To reinvigorate momentum for this reform and bring it back to the forefront of MISAU's agenda, in November 2023, the IGC and INS co-hosted a high-level policy event, *Advancing Healthcare Access in Mozambique*, which was designed to disseminate findings from INS's scale-up, discuss the relevance of scheduling appointments when treating other chronic diseases such as HIV and malaria, and further consolidate partnerships around health-system efficiency in Mozambique. The event brought together senior government leaders, including Eduardo Samo Gudo (Managing Director, INS), Vasco Sambo (Centro de Investigação em Saúde de Manhiça (CISM)) and Dionísio Zaqueu (Ministry of Health), signalling strong institutional interest in evidence-informed reforms. Beyond dissemination of results, the event gave an opportunity for close collaboration and engagement across government, local NGOs, civil society organisations, and international partners who were in attendance, such as the World Bank, World Food Programme (WFP), Foreign, Commonwealth & Development Office (FCDO) and United Nations Children Fund (UNICEF).

Building on this engagement, the INS hosted an online webinar in May 2024 titled Service Quality Improvement in Healthcare, focused on promoting cross-sector learning and showcasing Mozambique's experience as a model for low-cost public-sector reform (IGC, 2024). The IGC was invited alongside other development partners such as the World Health Organisation (WHO), Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), and the International Monetary Fund (IMF). At this webinar, Janet Dula – INS researcher and co-PI on the earlier research – presented findings from projects such as *Waiting Time*, *Wasting Time*, engaging a wide audience of health professionals, NGO representatives, provincial authorities, INS staff, and Ministry officials.

Discussions at these events, together with the earlier IGC-supported presentations at MISAU's *Conselho Coordenador*, helped rebuild support for the national expansion of appointment scheduling from ANC and HIV services to other high-traffic outpatient units, including chronic disease management and primary-care referrals (J. Dula, E. Chaquisse, & A. Naftal, personal communications, August-September 2025). Implementation, however, remained uneven. Uptake was strongest in Maputo, Gaza, and Inhambane, where trained staff and INS oversight ensured continuity, while northern provinces faced challenges related to staff turnover, resource shortages, and limited supervision. As a consequence of this irregularity and lack of continued support, health centres produced their own appointment books in some cases when official materials ran out of stock, often with external support from local NGOs. As Edite Tuzine, from MISAU's National Directorate of Medical Assistance, explained: **"If a health unit stopped [the appointment scheduling practice], it was only because of**

lack of books. Had they had books, they would have continued" (personal communication, 15 September 2025).

Despite these challenges, INS, provincial health authorities, and NGOs continued to adapt and apply the model independently, incorporating scheduling into training curricula, supervision plans, and operational protocols to address coordination failures, reflecting the simplicity and low-tech nature of the system which made it easy to institutionalise and sustain. Although NGOs have independently modified the original tools, the core principles of structured time management and predictable patient flow remained intact (S. Chicumbe, personal communication, 15 September 2025).

Furthermore, at the provincial health unit level, ownership shifted decisively to local actors. As Jose Thembo, noted: **"Since 2014, the programme has continued without interruption. Patients are already used to the system and want to use it because they see the benefit"**. In several districts, communities themselves demanded reinstatement when implementation lapsed, showing a reversal from the resistance of early years (J. Thembo, personal communication, 15 September 2025). Reflecting on the renewed support for implementation and further expansion, Sequeira said: **"Scale-up is finally happening – the INS is in charge of evaluation, and the Ministry leads implementation. This is the right division of labour"** (S. Sequeira, personal communication, 5 September 2025). The programme is expected to continue expanding under MISAU's direct leadership, subject to funding from the government and external donors.

This shift in understanding, from behavioural or informational deficits explanations to service organisation and management constraints, helped reorient policy attention towards operational reforms that strengthen state capability.

The significance of the reform goes beyond reductions in waiting times to a clearer understanding of the underlying drivers of low maternal service utilisation, and raises an agenda for assessing longer-term health outcomes. The research demonstrated that limited uptake of antenatal care was not primarily the result of low awareness or weak demand, but rather reflected uncertainty, congestion, and the high opportunity costs created by unpredictable queuing systems. By addressing these coordination failures through a simple, evidence-based management intervention, the scheduling system reduced patients' uncertainty while enabling providers to organise care more predictably and efficiently.

This shift in understanding, from behavioural or informational deficits explanations to service organisation and management constraints, helped reorient policy attention towards operational reforms that strengthen state capability. This has the potential to directly enhance state capacity through better outcomes from the healthcare sector, consistent with Mozambique's broader efforts to improve maternal and child health. While improvements in maternal and child health indicators have been observed, further research is needed to assess longer-term health outcomes.

Although appointment scheduling appears straightforward, implementing it in government clinics was not. It required a granular understanding of

how patients and providers navigate care (including norms around queuing, trust, and staff workflow), and careful navigation of institutional roles and ownership across MISAU and INS. It also required credible evidence and sustained engagement to overcome scepticism that the system would not be followed or maintained in public facilities. By combining rigorous evaluation with embedded partnership and iterative adaptation, IGC helped turn a simple idea into an implementable, scalable reform.

By institutionalising an organisational innovation, Mozambique's experience demonstrated that meaningful efficiency gains could be achieved within existing budget envelopes, contributing to the government's broader public-sector productivity agenda (MISAU, 2023). As noted by Egas Daniel, IGC Senior Country Economist, the reform's visibility **"even inspired other agencies – such as identity and passport services – to adopt similar scheduling systems during the COVID-19 period"**, indicating spillover effects beyond the health sector (E. Daniel, personal communication, 10 September 2025). The institutional legacy of this work is also visible in the INS's new ten-year Scientific Strategy for Health Research (2025-2035), which explicitly prioritises experimental, operational, and implementation research to improve public sector performance (INS, 2024). Mozambique's 2025 Digital Health Strategy also includes an action to implement an integrated information system for scheduling, confirming and rescheduling consultations, led by MISAU (MISAU, 2025).

Looking ahead, there is scope to consolidate and extend impact. The ongoing digitisation of appointment books – piloted in Maputo health centres – marks an important step towards a more integrated, data-driven system (J. Thembo, personal communication, 15 September 2025). Using high-performing provinces as demonstration hubs could facilitate peer-to-peer training across Mozambique, while INS could continue leading the evaluation of the reform and guide future policy decisions.

4. What makes this case transformational: Key achievements by dimension

Innovative contribution

The research helped reframe Mozambique's health-sector efficiency challenge from a question of scarce resources to one of management and institutional practice. It introduced a simple but powerful operational innovation: a scheduled appointment system designed to reduce waiting times and test whether shorter waits causally increase service utilisation in a low-resource context. The cluster of work trialled an appointment-based scheduling system with patient segmentation and capped slots, fully embedded within existing clinics and implemented without financial or non-financial incentives. Key design considerations – such as involving clinicians to ensure that clinical priorities like triage, continuity of care, and protected staff breaks remained central to the model, using a mixed-methods approach, and accounting for local dynamics – were crucial to its success.

Overall, the cluster advanced understanding of how management practices, patient perceptions, and operational organisation interact to improve service delivery. It showed that well-managed clinics can adopt simple organisational innovations that improve patient experience and encourage care-seeking, even in resource-constrained settings. The research has produced two peer-reviewed articles (BMJ Global Health and BMC Health Services Research) with over 80 citations, demonstrating substantial reductions in waiting times. It is one of the first large-scale experimental evaluations of appointment scheduling in a low-resource setting and provides a model for future operations-focused trials in LMICs. In 2022, it was selected as an impact case study for LSE's submission to the Research Excellence Framework 2021.

Impact

The impact of this research cluster is recognised at different levels – reduction in average waiting time when appointments are scheduled, improvement in service quality and patient experience, and adoption of national health policy reforms. The first pilot study found a near 100-minute reduction in average waiting time when clinics shifted to appointment scheduling, with complementary evidence of improved completion of recommended ANC visits. Interviews corroborate behaviour change among patients and smoother days for staff, including more efficient use of time with patients and opportunities for rest and recovery.

Building on these results, INS and MISAU, with support from the government and international donors, further expanded appointment scheduling across 46 antenatal units and 40 HIV treatment units across Maputo City, Maputo Province, Gaza, and Inhambane provinces, with monitoring indicating strong acceptance and more phased patient arrivals. This expansion has the potential to reach over 217,000 patients, with a further increase expected as it spreads nationwide. By improving the efficiency and responsiveness of public health services, this cluster demonstrates how operational innovations can strengthen state capacity, increase citizen trust, and contribute to sustainable economic growth.

Institutionalisation

Over the past 10 years, the interventions and reforms have become embedded at multiple levels – within clinics for doctors and patients, among healthcare officials at INS and MISAU, and more broadly in evidence-informed government policy changes. The interventions integrated smoothly because the mechanism – uniform appointment books and simple operating rules – fit easily into the day-to-day roles of doctors and nurses and were manageable locally.

The most salient aspect of the institutionalisation of the research recommendations has been the inclusion of appointment scheduling as part of MISAU's 2020-2024 Health Strategy Plan, and a budgetary allocation of over MZN 37 million in 2018 and 2019 to expand the reform nationwide. More recently, MISAU's Digital Health Strategy 2025 also included the development of an integrated information system for scheduling. In recent

years, INS shifted to a monitoring and advisory role, while MISAU and local health units took ownership of day-to-day operations. Provincial focal points led phased implementation and peer training, ensuring strong institutionalisation across provinces.

Scalability

The model suggested by the research is easily replicable and largely paper-based, keeping costs low and facilitating straightforward adaptation and expansion. The intervention has scaled up in terms of the number of clinics reached while also moving beyond ANC facilities, into HIV services, chronic disease care and primary-care referrals, increasingly supported by patient acceptance. Importantly, greater budgetary allocations meant that the intervention could be rolled out nationwide. In recent years, MISAU has independently partnered with local NGOs to expand the services in other locations, although these have not been centrally planned. Expansion slowed in recent years due to funding constraints and competing priorities, but with renewed support, MISAU plans to scale the model nationally, highlighting its potential to strengthen healthcare delivery.

5. Drivers of change

Several factors have been instrumental in enabling the transformational change achieved through this cluster.

Responsiveness to stakeholders' research and policy priorities, and ownership from policy champions.

The research questions stemmed directly from the researchers' initial interactions with INS, where waiting times were identified as a key operational issue in the functioning of clinics. This research responded to a direct priority of MISAU on the ground. Due to this strong collaboration and the sustained support from policy champions, the intervention could be scaled up to national policy. Individuals, such as Eduardo Samo Gudo, the then INS Scientific Director and now Director General of INS, translated evidence into standard tools and backed them through supervision and phased rollout, anchoring the practice as routine policy. Dr Nazira Abdula, the then Minister for Health also remained supportive, providing the political backing needed to expand the intervention to become a part of the 2020-24 Health Strategy Plan.

Researchers' commitment to policy impact.

The Principal Investigator's commitment to achieving tangible policy impact played a crucial role in building strong relationships with policymakers and promoting capacity-building activities over 10 years. Support in the field, through a locally hired project manager, was embedded in the research design and ensured guidance and training on tools, communicating with various stakeholders, and disseminating initial results. Even after IGC's project closure, the PI's close engagement with the INS research team on elements such as providing feedback on surveys,

meant that the expansion was and remains backed by evidence-informed research.

Engaged research and capacity-building support with service delivery partners.

A close partnership between INS clinicians and the IGC research team ensured that the scheduling rules matched clinical realities when it came to rooms, staffing, and triage. The model of working closely with delivery partners and field staff on the ground ensured the buy-in and support needed to drive this reform forward. The research naturally led to components such as ongoing training and peer learning in research methods that helped health facilities sustain the mechanism and build internal capability to understand the outcomes and expand further.

Locally contextualised evidence; low-cost, replicable tools.

IGC-supported research offered a clear operating mechanism (control arrivals; segment demand; cap slots) backed by simple, clinic-facing metrics (minutes waited; arrival patterns) and a low-cost, paper-based tool. This made the change clear, simple and localised to provincial health directors and local health facility heads and supported external financing and adaptation across other government services. The tools were also adapted to local cultural contexts, encouraging uptake among patients. The RCT has reinforced this point by showing that efficiency gains came from redistributing demand across time and improving clinic workflow, rather than from adding personnel, technology, or financial incentives. This reform presented an opportunity for MISAU to drive forward a model that could be managed within existing budgets and operating systems and play a direct role in improving efficiency in delivering services.

Supporting agile research and policy engagement processes through strategic use of various funding streams.

This cluster has been developed through a strategic sequencing of funding and engagement processes – initial large research grants to generate credible evidence, followed by light-touch engagement funds to translate, convene, and align external finance, maintained momentum through grant cycles and shocks, retaining MISAU ownership while providing fresh impetus for expansion. First, IGC's competitive Commissioning Board grant funded the pilot and early expansion, with significant backing from the IGC Mozambique Country Team, financing co-design with clinicians, measurement of waiting times, and iteration on the appointment-book mechanism. Following this, the COVID-19 shock created a natural imperative to decongest facilities; INS and MISAU led the next wave of rollout directly, drawing on the earlier operational playbook, while IGC did not play a direct implementation role. As conditions stabilised, IGC re-engaged in 2023 by deploying funds to co-organise public events and webinars led by INS, and convene wider government development partners (including FCDO and the World Bank) to disseminate findings and discuss a concrete pathway to scale. IGC's role in initially supporting a seed grant to study this low-cost intervention in 2014 proved successful, leading to additional support for research from international agencies such as WHO and the World Bank.

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