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Costs analysis of integrating group interpersonal therapy into HIV care services in Senegal

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Abstract

Introduction Group Interpersonal Therapy (IPT), an evidence-based treatment of depression recommended by the WHO mhGAP Intervention Guide, was implemented through a task-shifting approach in Senegal, as a treatment for depressed people living with HIV (PLWH). Since a description of the resources used and the implementation costs incurred is necessary to inform policymakers better, this study aimed to estimate the costs associated with its implementation.

Methods Intervention costs were analyzed using an "ingredients-based costing approach" from the provider's perspective. We identified and described the start-up and implementation costs for the initial phase and a projection over 5 years (implementation at capacity). We estimated total annual costs and cost per beneficiary. We conducted a scenario analysis to highlight some cost uncertainties and their impacts.

Results The total annual costs were estimated at $4064 for the initial phase and $8161 for the implementation at capacity. The training was the main cost driver representing approximately 60% of the total annual costs. The cost per beneficiary receiving group IPT was estimated at $65 for the implementation at capacity. The scenario analysis also illustrated the importance of parameters like the screening strategy, training activities, and allocation to cover transport costs mobilized by participants.

Conclusion This cost analysis highlighted the costs and cost allocations required to implement group IPT in Senegal to treat depression in PLWH. This preliminary work should enable policymakers to identify the optimal resources to be mobilized to implement and ensure the sustainability of this therapy in HIV at a country-level program.

Keywords Depression, Group interpersonal therapy, Cost analyses, Sub-Saharan Africa, HIV

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Background

Globally, 970 million people live with mental disorders and depression is one of the most common (28.9%) [1]. Depression significantly impacts daily life since it is often associated with social isolation, physical decline, problem-solving difficulties, and a reduction in economic productivity.

In low-resource settings, the diagnosis and management of depression are significantly limited and frequently complex [2]. Limited human and financial resources and poor integration of mental health services contribute to difficulties in identifying and treating patients with depression [3, 4]. The World Health Organization (WHO) recommends using psychological interventions as first-line treatment through task-shifting, the training of non-mental health specialists to provide mental health care under the guidance of specialists. Widely acknowledged, task-shifting is an optimal method to sustain the implementation of psychological interventions [5, 6] by increasing the number of health services provided, reducing costs, and improving care delivery [7].

Among the psychological interventions, the WHO also recommends group Interpersonal Therapy (group IPT) as a first-line treatment for depression in resource-limited countries [8]. Group IPT is based on the premise that depressive symptoms are triggered by interpersonal problems in one or more of the following areas: disagreement or conflict; life changes (negative or even positive); grief; and loneliness or social isolation [9, 10]. The effectiveness of group IPT to treat depression was first shown with adults and adolescents in Uganda [11–13], and subsequently in vulnerable populations such as people living with HIV (PLWH) in randomized clinical trials in South Africa and Ethiopia [14, 15].

Group IPT was introduced in Senegal within the context of the National Health and Social Development Plan, which aims to strengthen mental health care policies in the country [16]. The Senegalese health system has an extensive experience in psychiatry but suffers from inequalities in access to mental health care and the scarcity of mental health specialists [17].

In this context, we assessed the feasibility of group IPT implemented through a task-shifting approach (i.e. therapy delivered by trained social or community health workers) to treat depressed PLWH in Senegal. We highlighted that group IPT was a promising therapy for closing the mental health treatment gap in Senegal (i.e. high completion rates, feasible implementation in the health departments, high patient and staff satisfaction, etc.) [18]. However, to describe another significant aspect of its feasibility and to better inform policymakers, the description of the resources and implementing costs associated with its use is necessary [19]. Few data are available to document this, especially in sub-Saharan Africa. In this study, we assessed the costs of group IPT among depressed PLWH in Senegal.

Methods

Study design & settings

The "intervention depression" project aimed to evaluate the acceptability and feasibility of group IPT in HIV care services at different levels in the health pyramid, and was conducted within the International Epidemiological Databases to Evaluate AIDS (IeDEA) West Africa collaboration [20] (http://iedea-wa.org/). The "intervention depression" project was organized in two steps. Step 1 was carried from March 2019 to March 2022 in Dakar, Senegal, at the Fann National University Hospital Center, a structure at the top of the health pyramid (level 3 hospital), specifically in the Infectious and Tropical Diseases Unit (SMIT) and the Outpatient Treatment Center (CTA). Step 2 was then carried out from March 2022 to December 2022 (10 months) at the Youssou M'Bargane Diop Hospital in Rufisque (level 1 hospital) and the Hyacinthe Thiandoum Cardinal Health Promotion Center (care center) in the suburbs of the capital.

In this sub-study, we described all costs associated with the roll out of group IPT in both of the above steps, following the CHEERS reporting guidelines [21].

Intervention timeline

Group IPT was delivered as weekly 90-min group sessions for 8 weeks, preceded by one pre-group individual meeting (same duration) following WHO manual guidelines [8]. The groups consisted of 6 participants.

The training was led by a clinical psychologist, referred to as the "master trainer". To be trained as a group IPT facilitator, a trainee needed to (1) attend a 5-day training workshop on IPT principles, strategies, and techniques, followed by (2) facilitating 3 groups: one in pairs (co-facilitators) and two alone (single facilitator). Facilitators then benefitted from 90-min supervision sessions, on weekly basis. To be trained as a group IPT supervisor, a group IPT facilitator needed to (1) attend a 4-h training on the principles of supervision, (2) participate in supervision sessions with the master trainer and then gradually become the sole supervisor.

The implementation took place over two phases (STEP 1 and 2). During STEP 1 (Fig. 1), depression screening and diagnosis confirmation were made by a non-mental health clinician and a psychiatrist, respectively. Three social workers and one community health worker were trained in group IPT. In course of the study, one of the trained facilitators—a social worker—moved to another health department and stopped group facilitation (but he was not replaced). After the training (March 2019

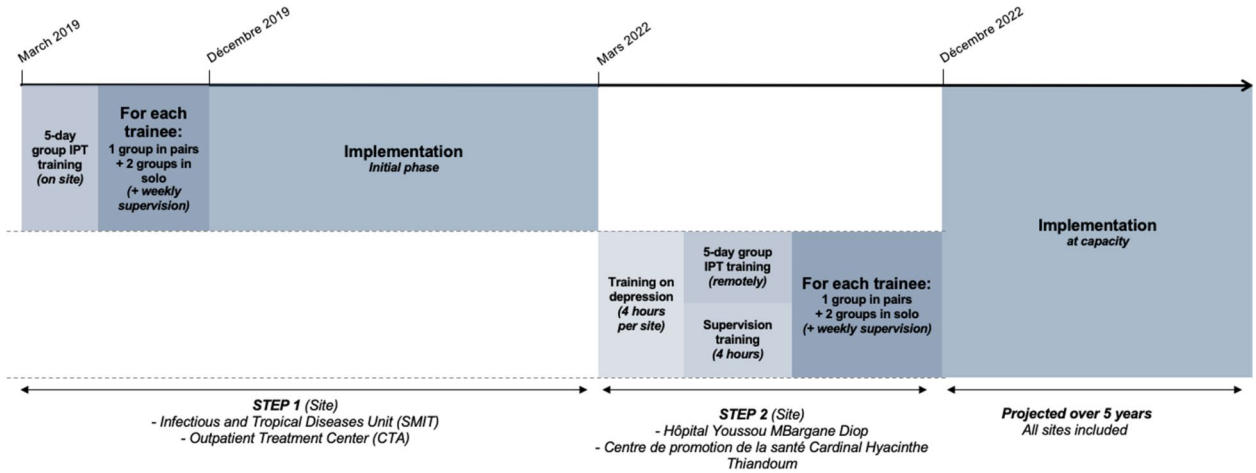

Fig. 1 Steps for group IPT implementation into 4 HIV care services in Senegal

to October 2019, 8 months), an initial implementation phase was conducted between October 2019 to March 2022, over a 12-month period (interruption due to Covid-19, delay in screening, and preparation of sessions). The first facilitators trained in STEP 1 were involved as supervision trainees in STEP 2.

During STEP 2, three social workers and one community health worker were trained in group IPT (two professionals in each site) and were also involved in the depression screening and diagnosis confirmation with a clinician. In addition to the 5-day training course held remotely, they also attended a training on depression for 4 h in each site organized by a psychiatrist.

Collection and analysis of mobilized resources and estimated costs

An ingredients-based costing approach from the provider's perspective was used to collect the costs related to group IPT. Costs were collected prospectively during the study, between April and November 2022, using the financial and administrative records related to the project. Interviews with project staff were conducted in June 2022 to assess how they allocated their time between activities, allowing to measure their salaries.

The total costs were categorized into start-up and implementation costs. Within each category, we have identified training, staff, and equipment & supplies costs (Table 1).

Table 1 Types of cost observed during the start-up and initial implementation activities

Cost item	Details
Start-up activities	
Training	• 5-day training for group IPT • IPT group practical session support • 4 h of supervision training • Depression training (8 h combined) • Others: locals for training, accommodation, travel, per diem
Staff	• Screening for depression by clinicians or social workers • Confirmation by a psychiatrist or a clinician • IPT group sessions (+ supervision) training for social workers
Equipments & supplies	• Printing: screening tools and patients' records for group IPT • Communication with participants to organize the sessions
Implementation activities	
Staff	• Screening for depression by clinicians or social workers • Confirmation by clinicians or psychiatrist • IPT group sessions by social workers (around 120 min per session)
Equipments & supplies	• Printing: screening tools and other documents needed for group IPT • Communication with participants to organize the sessions

The start-up costs were related to the activities that contributed to the training of facilitators (group facilitation and supervision). In this analysis, we distinguished two start-up activities: (1) in the initial phase (STEP 1 training activities); (2) at capacity. By capacity, we refer to the completion of group IPT without a supervision phase and a participation rate of approximately 97% of beneficiaries in the session (rate observed during the initial implementation phase) [18]. In the start-up costs, we identified costs related to the training (locals included) and supervision activities performed by the master trainer (consultant): the trainer's fees during STEPS 1&2 and other related expenses (accommodation, per diem, and travel transport mobilized only during STEP 1). We also considered the time spent by the social and community health workers for the screening of depression and in their training role as facilitators/supervisors of group IPT sessions. Finally, we included communication & printing fees for the organization and running of the sessions.

In the implementation costs, we considered the actual time spent by the facilitators to carry out group IPT sessions. Interviews with facilitators revealed that performing micro-tasks directly related to the group IPT sessions (i.e., facilitator and local, space preparation, report writing, post-meeting discussion) could extend the total time spent (90 min for the sessions) to 120 min. These costs also included the equipment and intervention to perform the screening during consultations. The cost of the locals or spaces used for the sessions were not included in the analysis, as there were no opportunity costs associated with their use (space not used for usual medical treatment). Sessions were very often held in spaces, isolated and prepared for the occasion to ensure the privacy of the participants.

We hypothesized that each facility would screen an average of 7 patients per day (5-day week) respectively over a year (i.e. 52 weeks) for an average screening time of 5 min per patient [22]. The figures were calculated based on the records at the facilities during the initial implementation phase. For cost analyses, we included 43 patients who completed group IPT during the initial implementation phase.

From the observations and results of the initial implementation phase, we modeled and projected an implementation at capacity of group IPT for all facilitators inside the health facilities involved in the project (STEP 1+2) over 5 years in line with the project's medium-term financial planning, implementation strategy and to allocate the start-up costs of the intervention over a more reasonable number of patients than those occurring in the initial implementation phase. We estimated the expected annual number of both beneficiaries and therapy groups based on the prevalence of depressive symptoms among PLWH obtained from a previous publication in Senegal (around 18%) [23], the existing list, and the annual flow of new PLWH diagnosed in each of the health facilities during the project.

The costs of implementing group IPT in this study are expressed on an annual recurring basis, therefore, we converted the start-up costs into an equivalent annual cost [24]. The start-up costs were annualized over 5 years as previously described using a discount rate of 3% [25]. All costs were estimated in 2022 US dollars (USD) using annual exchange rates of $1 = 623.76 XOF (OECD 2023, https://www.oecd.org/). We excluded research-specific costs (e.g., monitoring & administrative costs) from the analysis.

An annual cost per participant receiving group IPT was calculated based on the annualized costs divided by the number of participants expected in a year.

Sensitivity analyses were performed to assess the influence of two specific parameters on the implementation of the activities: (1) the time allocated to each patient during the screening to estimate the potential impact of an overestimation/underestimation of the time necessary for screening which can be very sensitive to the implementation context; (2) the take-up rate. Indeed, due to the innovative nature of group therapy and the specificity of our target population, the risks of refusal and/or dropout were included in the analysis. Issues of family responsibilities, employment opportunities, stigmatization, and inability to afford basic transportation costs may also influence patients' decision to attend group sessions [14, 18, 26].

Scenario analysis

Several assumptions related to the time spent on screening for depression and the organization of activities had to be made to estimate these costs. To for this uncertainty, we conducted a series of scenario analysis. First, we varied the number of people screened per 5-day week and the period over which this screening would be carried out (scenario 1). This assumption was motivated by the idea that, according to the staff, the screening process could be reduced to a shorter period without having a profound impact on the diagnosis and recruitment process of participants for therapy sessions. Indeed, on average, patients visit the different services between 2 and 3 times a year, depending on the course of the disease and medication needed. It is, therefore, possible to screen all annual outpatient file during the 6 months following the start of activities. Second, in connection with the start-up activities, booster training (i.e. additional training to refresh knowledge and practices) every 2 years was also considered as suggested by the IPT master trainer (scenario 2). In a final scenario, we hypothesized

a contingency fund to contribute to the transport costs mobilized by the participants during the implementation at capacity up to $3.2 per beneficiary/session (scenario 3). During the qualitative interviews conducted by our team, the issue of transportation costs was reported as a major challenge to sustain group IPT in routine practice [15, 26, 27]. This average amount was chosen to cover the costs of patients coming to the therapy. This amount was agreed with the team on the condition that it was not too attractive, so as not to become the reason for participation in therapy.

Ethics

The research was conducted in accordance with the Helsinki Declaration. Ethical approval was obtained from Senegal ethics committee: Conseil National d'Éthique de la Recherche en Santé (CNERS) (approval number: SEN22/49).

Results

Annual and unit costs associated with the implementation of group IPT

In the initial phase, the total annual cost was reached $4014. In this phase, start-up costs were estimated at $2476 (62% of annual costs) (Table 2). These costs were related to the training of the 3 facilitators involved in STEP 1, driven by consultancy fees (master trainer), which represented 50% of the annual cost. Staff time and equipment allocation represented respectively 10% and 2% of the total annual cost. The costs of delivering the therapy during the implementation were $1538. The main driver of cost at this stage was staff: $1235 (31% of annual costs). The equipment category was approximately 8% of the annual costs. The annual costs per beneficiary receiving group IPT were estimated at $93.

At capacity, the total annual cost was $8161. The start-up activities in this context involved all facilitators (n = 7). The training category was estimated at $3461 (42% of the annual costs). Staff and equipment on the other hand represented respectively 14% and 3% of the annual costs. Similarly, to the initial phase, during the implementation phase, the main driver of the costs was the staff, estimated at $2657 (33% of the annual costs). Equipment necessary to deliver group IPT to participants accounted for 9% of the costs. Approximately 24 groups of IPT per year (n = 144) are expected during the upcoming implementation period in the 4 health facilities. Based on observations and feedback from field staff on the implementation of activities, we strictly considered a total of 3 groups per facilitator per year (n = 126, 21 groups) to attend the sessions, which indirectly implies a participation rate of 88%. Annual costs per beneficiary receiving group IPT were therefore estimated at $65 for this implementation at capacity.

Concerning the sensitivity analyses by varying the screening time (Table 3A): With an average screening time of 3 min (i.e. less than 2 h/week), the total annual cost was about $7628 and the cost per beneficiary around $61. With an average screening time of 10 min (i.e. about 6 h/week), the total annual cost was about $9507 and the cost per beneficiary around $76. The staff costs mobilized only for the implementation activities therefore represented 42% of the total annual cost.

Concerning the sensitivity analyses by varying take-up rates (Table 3B): A take-up rate of around 50%, as observed in the South African context using an adapted version of group IPT [14], resulted in an average of 72 beneficiaries treated per year (12 groups), over the 5-year period. The total annual cost was around $7577 and the cost per beneficiary was $105, (almost61% higher

Table 2 Start-up and implementation total annual costs for the initial phase and at capacity

	Initial phase			At capacity		
	XOF (local currency)	$	%	XOF (local currency)	$	%
Start-up costs						
Training (consultant)	1,240,723	1989	50	2,159,144	3461	42
Staff	262,356	421	10	700,413	1123	14
Equipments	41,365	66	2	132,170	212	3
Total: start-up costs	1,544,444	2476	62%	2,991,727	4796	59
Implementation costs						
Staff	770,334	1235	31	1,657,555	,657	32
Equipments	189,000	303	7	441,000	707	9
Total: implementation costs	959,334	1538	38	2,098,555	3364	41
Total: annual costs	2,503,778	4014	100	5,090,282	8161	100
Number of beneficiaries receiving group IPT	43			126		
Annual costs per beneficiary	58,227	93		40,399	65	

Table 3 Sensitivity analyses by varying the screening time and take-up rate

	Total annual cost	Annual costs per beneficiary
A. Screening time		
3 min	$7628	$61
5 min*	$8161	$65
10 min	$9507	$76
B. Take-up rate		
50%	$7577	$105
88%*	$8161	$65
100%	$8349	$58

* Screening time and take-up rate used in the implementation at capacity

than when take-up was 88%). When we considered the full participation of the expected patients (n = 144, 24 groups) over a year without any refusal to enroll, the total annual cost was around $8349 and the cost per beneficiary of $58.

Scenario analysis of costs results

Results of the scenario analysis is presented in Table 4.

Scenario 1 emphasized both a reduction in the number of patients screened per day (5 patients, 7 in the base scenario) and the period over which screening was carried out annually (26 weeks, 52 weeks in the base scenario). The cost of staff during implementation was therefore reduced, with the annual cost estimated at $7298 and the cost per beneficiary at $58, a decrease of 11% compared to the base scenario. In scenario 2, which included the delivery of two booster training sessions, every 2 years after the start of the implementation, the annual cost was approximately $9320, with start-up costs representing 64% of the annual costs. The cost per beneficiary was estimated to be $74, which is 15% more than the base scenario. In scenario 3, including incentives to compensate the travel expenses of beneficiary, the total annual cost of implementing group IPT was approximately $11,797. This contingency fund will account for 30% of the annual cost. The cost per beneficiary was estimated at $94, a 44% increase over the initial scenario.

Discussion

This study examined the annual costs associated with group IPT implementation in 4 health facilities including the start-up activities. In the initial phase, the total annual cost reached $4014, with start-up costs representing 62% of the annual costs. At capacity, the total annual cost increased to $8161, with start-up costs representing 59% of the annual cost. Major cost contributors were consultancy (training) and staff fees. The annual costs per beneficiary receiving group IPT were estimated at $93 in the initial phase and decrease to $65 at capacity; these costs increased with a longer screening time allocated per patients or when including booster training and transport costs of beneficiaries, impacting drastically the implementation of group IPT. Costs will also be naturally impacted by the take-up rate of the intervention.

The costs of implementing psychotherapies in low- and middle-income countries have been poorly documented. One recent study in Nepal reported on implementation costs of group IPT to treat adolescents in a school setting, estimating $57,457 for the initial implementation over 2 years. The annualized cost was $27,728 and increased to $34,867 if facilitators were to deliver the group IPT sessions at capacity [28]. Depending on the number of annual participants and the strategy employed, the unit cost per beneficiary varied between $74 and $142. Cost structure was not reported in this study; however, these costs are much larger than those we reported. Differences can be explained by the training organization (more trainees, 10 day-training) and the content of the therapy (larger groups, 12 weekly group sessions). In another study, carried out in Uganda, authors investigated the cost-effectiveness of a group support psychotherapy for PLWH with depression [29]. As part of this randomized trial, the implementation team also considered 5 days of training for the 60 lay health workers involved with each facilitating 8 group sessions of 3 h. The total cost of this intervention strategy was estimated at $29,718 with 70% of the costs, associated with training and supervision of

Table 4 Key parameter assumptions for the implementation at capacity—by scenario

Key parameters assumptions (by scenario)	Base scenario	Scenario 1	Scenario 2	Scenario 3
Number of patients screened per day over a week	7	5	–	–
Duration of the screening period (weeks)	52	26	–	–
Booster training	None	–	2	–
Incentives (implementation)	None	–	–	$3.12/session
Total annual cost	$8161	$7298	$9320	$11,797
Annual costs per beneficiary	$65	$58	$74	$94

the lay workers who delivered the therapy. Direct comparisons with other studies remained difficult due to several differences in the context of implementation, the beneficiaries, the characteristics of the intervention (i.e. numbers of sessions, duration, numbers of patients in group therapy, etc.). Furthermore, antidepressants could also be an alternative to treat depression in the Senegalese context. Indeed, fluoxetine (20 mg/day), one of the most recommended antidepressants, significantly reduced depressive symptoms in PLWH over a 6-month treatment period [30]. In June 2022, a box of 28 fluoxetine tablets (20 mg) generally valid for 1 month of treatment, was estimated at $13 on the Senegalese market, approximately $77 for a 6-month treatment period (consultation fees for a psychiatrist not included). Compared to the results of our analysis, the cost of treatment per patient, appears to be higher than the one obtained in the estimate (at capacity). Beyond the costs, group IPT has a shorter treatment duration compared to antidepressant and in PLWH, it avoids the need to take new medications in addition to antiretroviral treatments, thus limiting side effects and drug interactions. Group IPT also encouraged the beneficiary to be an actor in his or her recovery within a given 8-week period, with group exchanges and weekly tasks.

Our Senegalese experience confirmed the feasibility and acceptability of training social and community health workers without prior mental health expertise to deliver group IPT in health facilities [18]. Since staffing costs for start-up and implementation activities were identified as a significant expense, task shifting, in addition to be suitable, appeared as a saving cost approach in accordance with previous studies [31, 32].

The scenario analysis indicated that reducing the screening period to 6 months rather than a year (always linked to the follow-up of patients of the annual outpatient file) had a substantial impact on the staff time and therefore the annual cost for implementation. Particular attention should be paid to the time spent on screening. Changes in the average time per patient (in minutes) for depression screening would have an impact on the total annual cost, and consequently on the cost per beneficiary. During this project, it is important to note that staff worked on the project in addition to their other usual activities at the health care facilities. One of our challenges for sustainability is how to integrate group IPT into routine activities: by rearranging work schedules or by paying more for these activities. Advocacy and policy changes are needed to integrate mental health services into routine practice. The cost impact of incentives was also significant. In other studies related to HIV testing and treatment, it has been reported that "incentives" were effective, particularly on clinical outcomes [33, 34]. In the context of group IPT, a consideration must be given to the provision of transport by those responsible for implementation, especially in a population with very limited income, to guarantee complete adherence of participants to all sessions [14, 15, 26]. An emergency fund to cover transportation costs of the most vulnerable beneficiaries may be of particular interest.

The present study has several limitations. First, the implementation at capacity was marked by some uncertainty and underlying assumptions, particularly in terms of the ongoing involvement of staff in the patient screening strategy. Although it was comparable to the results put forward in some studies [35, 36], the data obtained on the prevalence of depressive symptoms in PLWH remains limited due to the absence of systematic screening and figures on routine practices. Second, the "declarative" nature of the information obtained from staff on the allocation of time for the implementation of group IPT, could be subject to desirability and memory biases that could under or overestimate the time allocation given by the respondents. The presence of records did not always allow for verification the information provided. Third, the cost analysis was focused on the provider's perspective. Given the importance of non-direct health care costs in the context of depression, it might be useful to encourage their inclusion in a cost analysis, as done in other programs. A future analysis incorporating functionality and wellbeing measures (e.g., WELLBY, DALYs) will allow for an efficiency analysis (cost-effectiveness, cost-utility) of group IPT conducted in a task-shifting strategy among PLWH in Senegal.

Conclusion

This cost analysis highlighted the cost structure and helped to inform the feasibility of implementing group IPT in Senegal to treat depression among PLWH. It also offers a first perspective in defining and understanding the resources and economic effort that is mobilized for group IPT in the context of sub-Saharan African countries.

Subsequently to the clinical benefits that are made to PLWH presenting depressive symptoms, this therapy based on a task-shifting approach will allow offering a new paradigm in the management of depression in the country.

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Author contributions
YA, JW, JMT, SZ, NdR, MS and CB conceptualised the study. YA performed the analysis with support from CB, JW and SD. YA and CB wrote the first draft of the paper and approved the final manuscript as submitted. JW, JMT, IN, SZ, SD, HF, HV, NFG, NdR, AJ and MS critically reviewed the analysis, reviewed and revised the manuscript, and approved the final manuscript as submitted. All authors read and approved the final manuscript.

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Data availability
The data that support the findings of our study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
The research was conducted in accordance with the Helsinki Declaration. Ethical approval was obtained from Senegal ethics committee: Conseil National d'Éthique de la Recherche en Santé (CNERS) (approval number: SEN22/49). This paper only comprises non-identifiable, aggregated services data.

Consent for publication
Not applicable. This paper only comprises non-identifiable, aggregated services data.

Competing interests
The authors declare no competing interests.

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