

Systematic review

State of HIV costing in Latin America and the Caribbean: a systematic literature review

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ABSTRACT

Objectives. To summarize available data on unit costs for human immunodeficiency virus (HIV) testing, prevention, and care interventions in Latin America and the Caribbean.

Methods. We conducted a systematic literature review of costing studies published between 2012 and 2024, and selected those reporting empirically measured costing data. The available data were categorized according to predefined intervention categories and compared by time and place. We also explored variations in unit costs by intervention type.

Results. Of 1 746 studies identified, 22 met the inclusion criteria, which provided 103 unique unit cost estimates from nine countries. About 50% of the included studies were published between 2019 and 2021. Antiretroviral therapy services had the most cost data available (39% of unit costs), followed by inpatient care (27%) and HIV testing (24%). Considerable cost variations were observed both within and between interventions.

Conclusions. Our analysis underscores the need for accurate and reliable cost data to support HIV budgeting and decision-making efforts. We identified several gaps in the availability of cost data and emphasize the importance of presenting results more effectively by incorporating key contextual variables. Given the challenges of shrinking budgets and sustainability risks, robust evidence is indispensable to inform priority setting and budget allocation for HIV services.

Keywords

HIV infections; health care costs; health policy; Latin America; Caribbean Region.

Despite the steady reduction in diagnoses of new human immunodeficiency virus (HIV) cases and acquired immunodeficiency syndrome (AIDS)-related mortality worldwide, HIV continues to be a substantial public health challenge. Globally, annual numbers of newly infected people declined from 2.9 million in 2000 to 1.5 million in 2021, and the annual number of AIDS-related deaths decreased from a peak of 2 million in 2005 to a record low of 650 000 worldwide in 2021 (1). According to the Joint United Nations Programme on HIV/AIDS (UNAIDS), in 2023, 2.2 million people were estimated to be living with HIV in Latin America and the Caribbean, the number of people newly infected with HIV reached 110 000, and 27 000 AIDS-related deaths occurred in the region (2). Despite clear advances in access to treatment

and HIV prevention technologies, such as pre-exposure prophylaxis (PrEP), progress towards eliminating HIV by 2030 has stalled.

In 2019, the Latin American region scored below the 90–90–90 global targets with 77%, 60%, and 53%, respectively, for people diagnosed with HIV, on treatment, and suppressed, which was also lower than the global figures of 81%, 67%, and 59%. Even more concerning, between 2010 and 2020, the number of new infections in the region increased by 21%, compared with a global reduction of 23%, and deaths decreased by only 8% compared with 39% globally (3, 4)

Efficient implementation of HIV interventions is crucial to ending the AIDS epidemic by 2030 (5). Countries face stagnant and even shrinking donor funding and shortages of human

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resources for health (6). Taking into account the cost implications of intervention design, activities, target populations, and other similarly relevant implementation characteristics is essential to sustainable and effective program design (7,8). Considering the cost implications of interventions could also help identify opportunities for improving efficiency and enable a greater understanding of the cost of illness and health care (8), and feed into economic evaluations and modeling (9, 10). However, policy analysts, country officials, and implementing organizations face a scarcity of standardized, reliable, and easily accessible data on service costs. As a result, national HIV policies are sometimes designed based on unsound estimates and flawed assumptions (9, 10).

Although an important body of literature exists on the cost of several HIV interventions in low- and middle-income countries, available studies report information inconsistently and apply a variety of methodologies, making comparison and analysis complicated. Such inconsistencies include intervention type, output or outcome definition, analytic timeframes, and measurement and analytic methods. Moreover, most of these studies are concentrated in Africa, limiting the generalizability of their estimates to other settings, such as Latin America and the Caribbean.

In the context of shrinking budgets and sustainability risks, robust evidence to inform priority setting and budgeting is vital. In this paper, we document the availability of unit cost data for HIV testing, prevention, and care interventions for Latin American and Caribbean countries and summarize this information by country and intervention category.

METHODS

Search strategy and eligibility criteria

We conducted a systematic literature review based on the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) standards. We searched studies in Spanish, English, and Portuguese in five databases: PubMed, Literatura Latinoamericana en Ciencias de la Salud (LILACS), Scopus, EBSCO, and Web of Science. Using economic (e.g., "cost", "care cost", and "costing") and disease-specific (e.g., "HIV" and "human immunodeficiency virus") search terms, we looked for published studies between 2012 and 2024. We used the Rayyan software (Cambridge, MA, United States of America) to review summaries of the texts simultaneously and to add inclusion and exclusion labels to each text in a unique data set.

We reviewed the texts in two stages. First, we screened titles and abstracts to discard ineligible papers. Relevant titles were identified and reviewed for eligibility. Second, the selected articles were fully reviewed by two readers. At this stage, only papers reporting empirically measured costing data were included. For all papers identified through the database search, their references were reviewed for potentially relevant literature.

Data extraction

Development of the data extraction form. Following the Global Health Cost Consortium (GHCC) reference case (11), we adapted an extraction matrix developed by UNAIDS. The extraction form captured data within the following study

domains: (i) source identifiers – document title, authors, year of publication, and country; (ii) scope of interventions – description of costed activities, type of intervention, and target population; (iii) setting – facility or community-based, type of provider, ownership, and scale (i.e., the number of patients/users served) of the intervention; (iv) costing – currency, year of data collection, costing methods (i.e., micro costing, ingredients-based, financial, or economic costing), and inflation; and (v) cost breakdown, including capital and recurrent costs when available.

Data extraction and cleaning process. Two reviewers received training to standardize core definitions and the extraction process. Both reviewers extracted data from 10% of the manuscripts included in this review to ensure consistency. Once the data were extracted, they were transferred to Stata (StataCorp LLC, College Station, TX, USA) to review formatting issues and missing values. At each iteration of the extraction process, a summary report was created. The report highlighted inconsistencies or data quality issues that needed review by the team. After extraction and quality checks were completed, descriptive and statistical analyses were performed.

Standardization of cost data

Costs were inflated to 2022 United States dollars (US\$). All costs reported in currencies other than US\$ were converted to US\$ based on the reporting year using market exchange rates published by the World Bank (12). All costs were adjusted using the US gross domestic product price deflator, as needed, following conventional methods (13). For the two studies that did not report the year of the data presented in the study, we assumed it was the publication year minus 1 year.

Intervention categories and output units

The data were categorized into one of six types of intervention: (i) inpatient care; (ii) antiretroviral therapy (ART); (iii) HIV testing; (iv) service packages for key populations; (v) harm reduction (needle and syringe programs); and (vi) oral HIV PrEP. Output units were grouped by their primary output unit: (i) per person served; (ii) per person tested; (iii) per visit; (iv) per person per month; and (v) per person per year. For analysis purposes, some of these categories were collapsed. In some cases, we transformed the original unit costs to ensure comparability – see Table S4 in the data repository (14).

Quality assessment of studies

Quality dimensions were informed by the GHCC reference case, which presents 17 principles for high-quality costing (11). We used GHCC's proposed checklist to develop a template.

Data analysis

We describe the year of publication, country, type of intervention, and output unit for each paper. We explored changes in unit costs over time by type of intervention. Finally, we used regression analysis to assess the relationship between costs and scale. This analysis was only done with ART and HIV testing interventions for which more data points were available. We estimated a unit cost function in the following form:

$$y_i = \beta_0 + (\beta_1 \times scale) + (\beta_1 \times scale^2) + \varepsilon$$

Where y_i is the unit cost of the study i expressed in 2022 US\$; β_0 and β_1 are the regression coefficients, $scale$ is the annual number of patients/clients served, $scale^2$ is the squared annual number of patients/clients served, and ε is the residual.

RESULTS

Description of the data

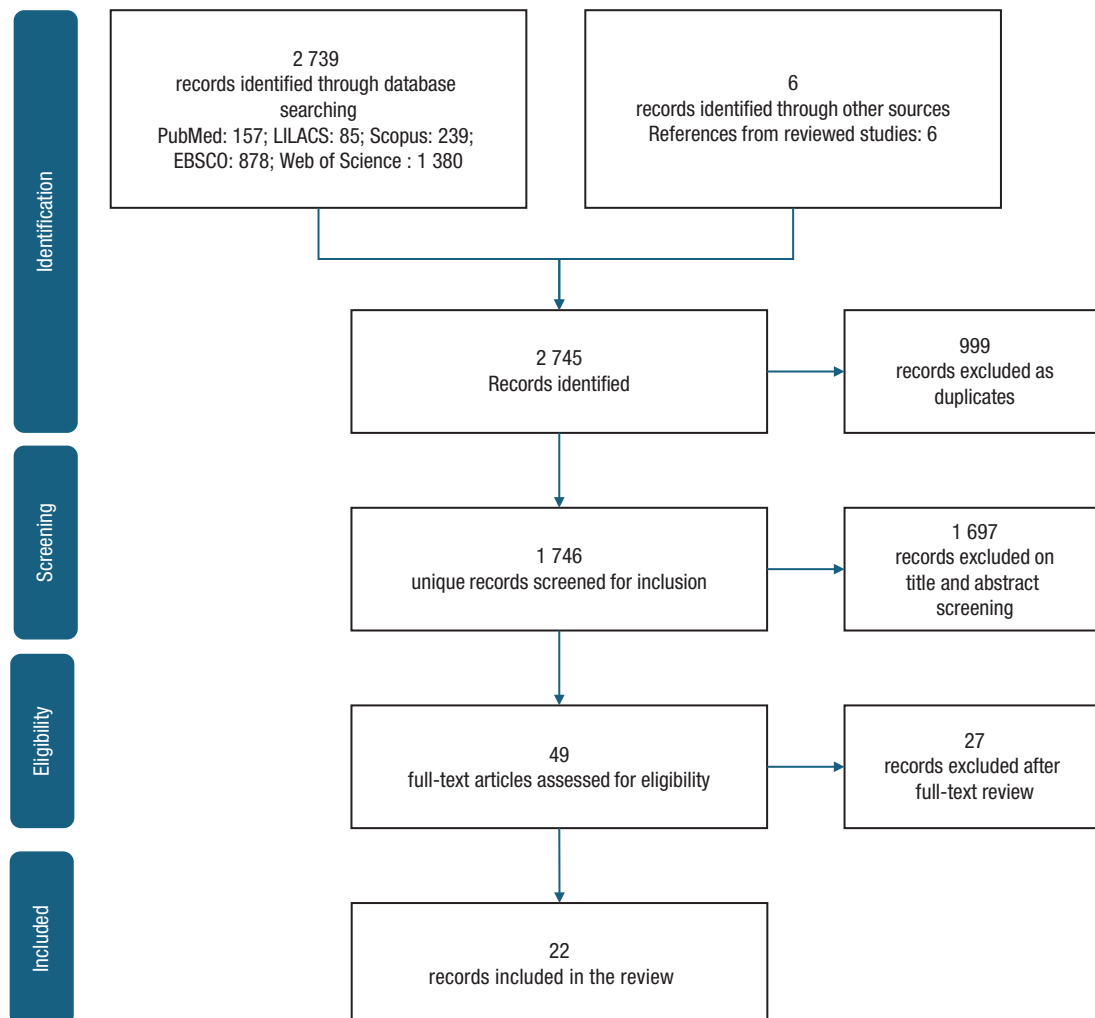
Figure 1 shows the results of the search strategy. We initially identified 2 745 studies, of which 1 746 were unique records. Based on a review of the titles and abstracts, 49 studies were selected for full-text review, of which 22 studies were included in this review. This represented 103 unique unit cost estimates. The period 2019–2021 accounted for 50% of the published studies, and almost half of the observations were published in 2021 in three relatively large studies – see Table S2 in the data repository (14).

The studies included data from nine countries across the region; however, Brazil, Colombia, and Grenada accounted for

68% (15 studies). Most unit costs (72%) were from Brazil and Colombia (Table 1). Regarding the geographic distribution of evidence, a significant proportion of the available data was from Brazil and Colombia. These are two of the continent's most populous nations with a relatively high HIV burden and both are in the South America. Central America was represented by two countries: Guatemala and Nicaragua. Four countries from the Caribbean (Dominican Republic, Haiti, Granada, and Guyana) contributed data with seven studies. Only one study was from Mexico, a country with a large population and a substantial concentrated HIV epidemic (that is, where the HIV burden is concentrated in specific key populations).

Of the 103 unit cost estimates, 98 (95%) were from the providers' perspective and only five (5%) were from the users' perspective (out-of-pocket expenditure). Overall, 64 (62%) estimates captured opportunity or economic costs, i.e., the value of all input costs regardless of whether they represented an expense, such as volunteer time or donations. In contrast, 39 (38%) estimates captured financial costs. Most unit costs (75%) were measured through micro costing or activity-based costing. Five unit costs were not reported originally in US\$ (15–18).

FIGURE 1. PRISMA diagram showing selection of papers for inclusion in the review



Source: Prepared by authors based on the results.

TABLE 1. Country characteristics and available data

Variable	Brazil	Colombia	Dominican Republic	Guatemala	Guyana	Grenada	Haiti	Mexico	Nicaragua
Unit cost data									
Number of studies	7	4	1	1	1	4	1	1	2
Number of unit costs	32	42	2	1	5	2	6	9	4
Interventions with available cost data	ART, HIV testing, inpatient care	ART, HIV testing, inpatient care	ART	ART	HIV testing, inpatient care	Inpatient care	ART, pre-exposure prophylaxis,	ART, HIV testing, needle and syringe program, service package for key populations	Service package for key populations
Country socioeconomic variables									
Income level	Upper middle class	Upper middle class	Upper middle class	Upper middle class	Upper middle class	Upper middle class	Lower middle class	Upper middle class	Lower middle class
Region	South America	South America	Caribbean	Central America	Caribbean	Caribbean	Caribbean	North America	Central America
Government spending on health (as % of GDP)	9.6	7.7	5.9	6.2	4.9	5.0	4.7	5.4	8.4
HIV-related variables									
HIV prevalence (15–49)	0.6	0.5	0.9	0.2	1.4	0.4	1.8	0.4	0.3
New HIV infections (all), 2022	50 000	8 600	4 200	1 200	530	<100	4 300	18 000	550
AIDS-related deaths, 2022, no.	13 000	1 700	2 300	730	<200	NA	1 500	4 600	<500
% change in new infections since 2010 up to 2022	5	-14	-7	19	-6	NA	-20	13	-30
% change in AIDS-related deaths since 2010 up to 2022	-15	-75	-54	-35	53	NA	-74	-23	-6
HIV testing and treatment cascade (2022)									
People living with HIV, no.	990 000	190 000	79 000	31 000	9 600	<500	140 000	370 000	12 000
People living with HIV who know their status, %	91	NA	NA	97	93	95	81	NA	92
People living with HIV who are on ART, %	74	NA	50	77	67	52	77	62	56
People living with HIV who have suppressed viral loads, %	70	NA	41	71	NA	NA	64	58	46

ART, antiretroviral therapy; HIV, human immunodeficiency virus; AIDS, acquired immunodeficiency syndrome; NA, not available.
Source: Prepared by authors based on the results.

Quality of studies

Study quality and transparency were assessed by the GHCC checklist for reporting methods of costing studies. Most of the studies included in this review contextualized their results. However, 23% (five studies) lacked information on the intended users of their cost estimates. Most of the studies accurately reported the costing approach. Most of the papers lacked information on above-site costs (i.e., costs incurred in managing and operating facilities, including monitoring, supervision, and administration), which have been shown to substantially affect the cost of health interventions (19).

Interventions, outputs, and unit costs

Of the 103 unit costs, ART services were the most frequent intervention category with 39%, followed by inpatient care (27%), and HIV testing (24%). The other interventions (service packages for key populations, needle and syringe programs, and oral PrEP) had considerably fewer cost estimates (Figure 2).

Table 2 shows the range of output units by type of intervention. Substantial heterogeneity was seen in output units

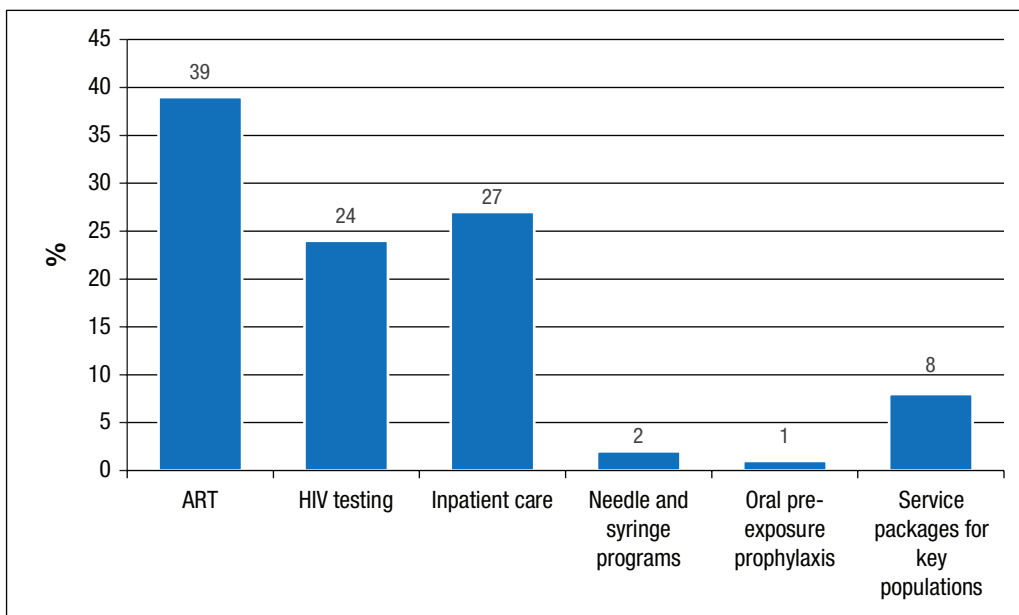
reported within the same interventions across studies, which makes quick, direct comparisons challenging.

Unit cost and their variation

We explored unit cost variation between and within four interventions (HIV testing, ART, inpatient care, and service packages for key populations) for which there were at least eight unit cost observations (Figure 3). The median cost per person tested was US\$ 43; unit costs varied from US\$ 8 to US\$ 386, while the unit cost per person positive for HIV ranged from US\$ 814 to US\$ 4 870, with a median of US\$ 894. The cost per person per year on ART ranged from US\$ 163 to US\$ 5 604, with a median unit cost US\$ 1 181. The cost per inpatient care stay varied from US\$ 110 to US\$ 11 504 (n=27), with a median cost of US\$ 2 067. Only one study gave the unit costs per person-year protected by PrEP at US\$ 117; two studies gave the cost per person served in needle and syringe programs with estimates that varied 10-fold: US\$ 4 and US\$ 45 (Table 3). The median was usually well below the average cost, signifying a tail with few studies presenting very high-cost estimates.

Table 4 shows available cost estimates from the user's perspective. Two unit costs (15, 20) provided evidence of out-of-pocket

FIGURE 2. Distribution of unit costs by type of intervention



HIV, human immunodeficiency virus.
Source: Prepared by authors based on the results.

TABLE 2. Summary of output units and unit costs by intervention, 2022

Intervention	Observations	Output unit, per person	Mean unit cost, in US\$	Median unit cost, in US\$	Unit cost range, in US\$
HIV testing	24	Tested (n=15)	134	43	8–386
		Tested positive (n=6)	1 942	894	814–4 870
		Linked to care (n=3)	7 452	7 365	1 194–13 798
Antiretroviral therapy	40	Visit (n=2)	10	10	4–15
		Per month (n=16)	172	142	26–467
		Per year (n=22)	1 365	818	64–4 283
Inpatient care	28	Served	2 938	1 889	77–11 504
		Tested (n=2)	371	371	108–635
Service packages for key populations	8	Reached (n=6)	85	14	10–441
		Served	25	25	4–45
Needle and syringe programs	2	Served	25	25	4–45
Oral pre-exposure prophylaxis	1	Per year	117	117	117–117

ART, antiretroviral therapy; HIV, human immunodeficiency virus.
 Prepared by authors based on the results.

expenditures for HIV care per person per year ranging from US\$ 312 in Colombia to US\$ 876 in the Dominican Republic, with a median of US\$ 594. The user cost per ART visit was also estimated in two studies (20, 21), ranging from US\$ 4 in the Dominican Republic to US\$ 15 in Guatemala, with a median of US\$ 10. The only user cost for inpatient care came from Grenada and was estimated at US\$ 77 (18).

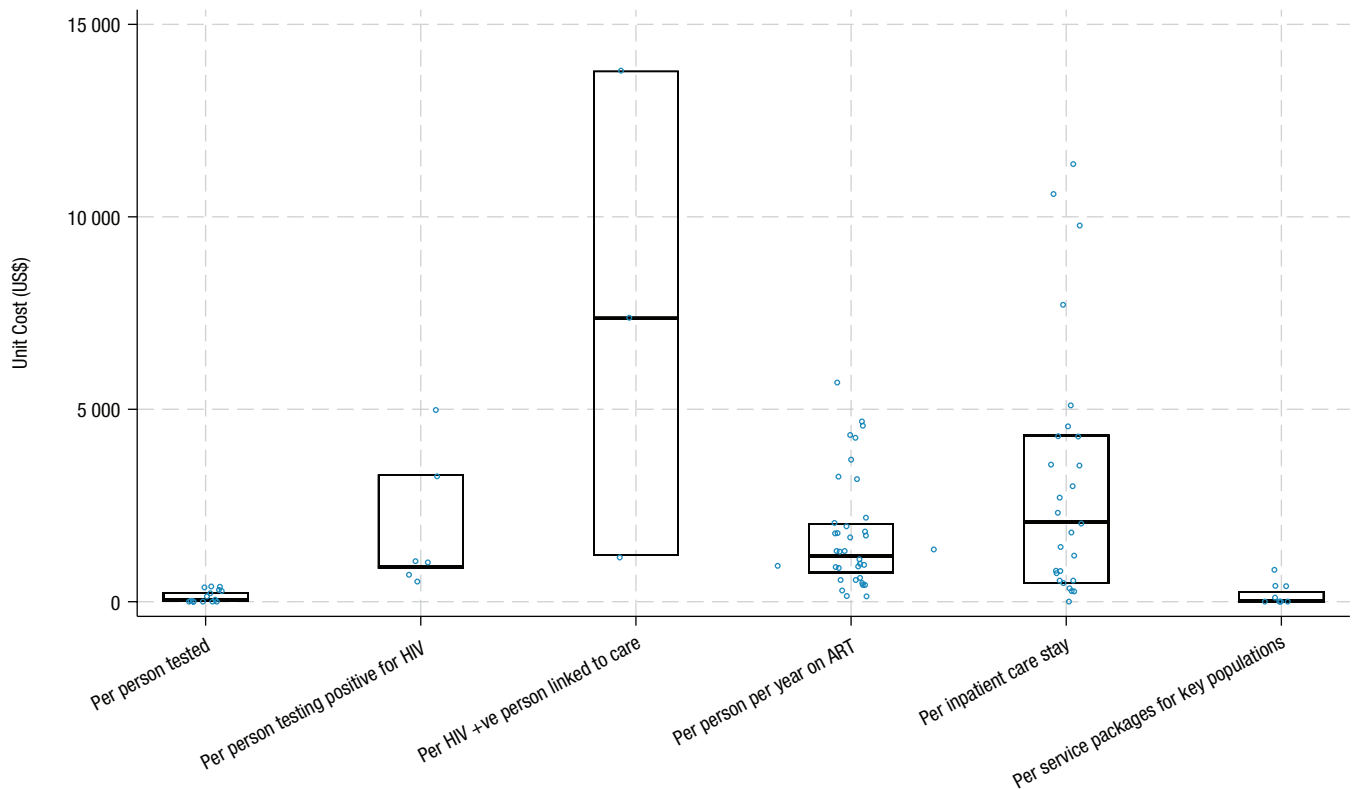
Unit costs and scale

On pooled regression analysis, a negative and statistically significant association was seen between unit cost and scale (i.e., number of people tested or who are ART clients) for both ART and HIV testing – see Figure S1 in the data repository (14). For each additional person on ART, the average cost of ART per person per year decreased by an average of US\$ 21, while the cost reduction per unit of scale in the case of HIV testing was an average of US\$ 0.89. The test results for non-linearity are given in Table S3 in the data repository (14) and did not show a significant effect, likely due to the small sample size.

DISCUSSION

We reviewed published cost data on HIV interventions from the Latin American and Caribbean region between 2012 and 2024. We identified 22 cost studies distributed across only nine countries, with 72% of observations from Brazil and Colombia. Country-specific HIV program costs in the region are important due to the diverse socioeconomic landscapes and existing infrastructure across countries (22). Most cost estimates corresponded to care, treatment, and testing (89%). We found: eight unit cost estimates for service package for key populations, and one each for PrEP and harm reduction. No data were found that estimated the cost of societal enabler interventions (that is, interventions addressing stigma and discrimination, decriminalization of sex work, drug use, sexuality, gender inequalities, and gender-based violence) or health system strengthening. More cost evidence of these types of program is necessary to understand the composition and drivers of costs to support the implementation of the 10–10–10 targets for addressing societal enablers – i.e., less than 10% of countries should have punitive policies restricting service access, less than 10% of people living with HIV and key populations should face stigma and discrimination, and less than 10% of women, girls, people living with

FIGURE 3 Costs by type of intervention



HIV, human immunodeficiency virus; ART, antiretroviral therapy.
Note: Cost are expressed in US\$ for 2022.
Source: Prepared by authors based on the results.

TABLE 3. Unit cost by intervention from the provider’s perspective

Intervention	Observations, n	Mean cost, US\$	Median cost, US\$	Minimum–maximum cost, US\$
Needle and syringe programs	2	24	24	4–45
Oral pre-exposure prophylaxis	1	117	–	–

Note: Cost are expressed in US\$ for 2022.
Source: Prepared by authors based on the results.

TABLE 4. Unit cost by intervention from the user’s perspective

Intervention	Observations, n	Mean cost, US\$	Median cost, US\$	Minimum–maximum cost, US\$
HIV care per person per year	2	594	594	312–876
Antiretroviral therapy per visit	2	10	10	4–15
Inpatient care	1	77	–	–

HIV, human immunodeficiency virus.
Source: Prepared by authors based on the results.

HIV, and key populations should experience gender inequality and violence (23–25). Such scarcity of reliable data on the costs of HIV prevention and structural interventions in the region implies that investment cases and national strategies are made without a full understanding of the context, which ultimately may compromise the quality and sustainability of programs.

Understanding access includes understanding the role of user costs. User cost data were available for only two countries – Colombia and Grenada (15, 20). Neglecting the economic and financial implications for individuals at risk of or living with HIV could potentially affect the equity and sustainability of interventions. For example, an important body of literature has documented that among people living with HIV, high out-of-pocket costs, transportation expenses, or lost wages due to medical visits may discourage individuals from consistently seeking and adhering to treatment (26–29).

Although published cost studies are few in the region, they do appear to be increasing. Our review also found that half of the studies were published between 2019 and 2021. This finding may also demonstrate the region’s growing interest in generating and using robust cost studies and economic evaluations, which are important to allow governments and multilateral organizations to use evidence-based cost estimates in planning.

Contextual characteristics have been shown to be essential to extrapolate unit costs to different contexts. Most studies in our review provided information on urbanicity, service delivery platforms, and ownership. However, we also found that many studies did not report information on the output level or scale, which is also important. Furthermore, most of the studies included in this review did not report input prices. Such contextual variables are needed to assess the quality and generalizability of cost estimates, and they also make possible the

estimation of cost functions to project costs at different scales across settings (19, 30). Another area where data were lacking is the above-site costs. This becomes crucial when ensuring comprehensive and effective HIV interventions are sustainable (19).

Our results complement previous efforts to assess the state of HIV costing in Latin America and other low- and middle-income countries. For example, in 2014, Siapka et al. documented available data on the cost and efficacy of HIV programs in low- and middle-income countries (5). In their review, cost data were available only for Brazil, Haiti, and Mexico. Our work expands the country coverage and updates cost estimates, as Siapka's study included cost studies up to 2013. More recently, the GHCC launched the Unit Cost Study Repository (31), which includes cost estimates for HIV programs in low- and middle-income countries until 2018. We complement this database by adding a considerable number of more recent studies.

Costing plays a crucial role in the development and execution of national strategic plans for HIV. By accurately estimating the resources required for prevention, treatment, care, and support services, costing enables stakeholders to allocate funds efficiently and effectively. Proper costing provides a comprehensive framework for national strategic plans to assess their feasibility, sustainability, and impact. Additionally, robust cost estimates help prioritize interventions by identifying potential funding gaps and advocating for necessary resources from domestic budgets, international aid, or donor agencies. Moreover, costing facilitates transparency and accountability in resource allocation, ensuring that every dollar spent contributes optimally to reducing the HIV burden and successfully implementing and achieving goals outlined in national strategic plans.

Although our review can potentially be a tool for stakeholders and policy-makers in developing national strategic plans, some limitations must be considered when reading and interpreting our results. First, available studies vary widely in methodology, which limited our ability to conduct cross-study comparisons. This is why we could only describe available evidence instead of running a meta-analysis. Second, reporting varies substantially, with some lacking detailed breakdowns of costs and contextual information on the interventions, such as scale, which are crucial for accurately interpreting and applying the findings. Finally, cost data on HIV interventions were scarce for many countries in the region, which restricts the generalizability of our findings. Furthermore, given the specificity of these interventions, extrapolating costs to other settings can be challenging. Where there were multiple cost estimates for the same outcome, we saw wide cost variations.

This variation makes synthesis and extrapolation across the region more difficult. However, we saw significant effects of program scale on unit costs, suggesting the importance of considering scale when applying costs in other settings. However, recently, some efforts have been made to generate accurate cost extrapolations for HIV services based on data availability in other settings (30). Such methods can be replicated using our data to generate cost estimates for countries without cost information for those interventions with sufficient sample size.

Conclusion

Our analysis of HIV cost data in the Latin American and Caribbean region over the past decade revealed some noteworthy trends and opportunities for improvement. It is crucial to continue producing accurate and reliable cost data to help enhance HIV budgeting and decision-making. Our review identified several gaps in cost availability and highlighted opportunities to present the results more effectively by providing key contextual variables. It is essential to generate transparent and high-quality cost evidence to improve service delivery efficiency and enhance planning and budgeting quality. As far as we know, this is one of the most comprehensive efforts to summarize the available evidence on HIV costing in the Latin American and Caribbean region.

Author contributions. DCG contributed to data analysis, interpretation, and writing of first and subsequent drafts of the paper. FTP contributed to study conception, data interpretation, and review of drafts of the manuscript. FMG contributed to data curation, analysis, and review of drafts of the manuscript. SBA contributed to study conception and design, data interpretation, and review of drafts of the manuscript.

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REFERENCES

1. Joint United Nations Programme on HIV/AIDS. UNAIDS data 2021. Geneva: UNAIDS; 2021 [cited 2024 Jun 15]. Available from: https://www.unaids.org/sites/default/files/media_asset/JC3032_AIDS_Data_book_2021_En.pdf
2. Joint United Nations Programme on HIV/AIDS. Regional fact sheet. Latin America. Geneva: UNAIDS; 2023 [cited 2024 Jun 15]. Available from: https://thepath.unaids.org/wp-content/themes/unaid2023/assets/files/regional_fs_latina_america.pdf
3. Joint United Nations Programme on HIV/AIDS. UNAIDS data 2020. Geneva: UNAIDS; 2020 [cited 2023 Sep 25]. Available from: https://www.unaids.org/sites/default/files/media_asset/2020_aids-data-book_en.pdf
4. Sued O, Cahn P. Latin America priorities after 40 years of the beginning of the HIV pandemic. *Lancet Reg Health Am.* 2021;1:100024. <https://doi.org/10.1016/j.lana.2021.100024>.
5. Siapka M, Remme M, Obure CD, Maier CB, Dehne KL, Vassall A. Is there scope for cost savings and efficiency gains in HIV services? A systematic review of the evidence from low- and middle-income countries. *Bull World Health Organ.* 2014;92(7):499–511AD. <https://doi.org/10.2471/BLT.13.127639>
6. Kates J, Wexler A, Lief E. Donor government funding for HIV in low- and middle-income countries in 2016. Menlo Park, CA: Kaiser Family Foundation and UNAIDS. 2017.
7. Anderson I, Maliqi B, Axelson H, Ostergren M. How can health ministries present persuasive investment plans for women's, children's

- and adolescents' health? *Bull World Health Organ.* 2016;94(6):468–74. <https://doi.org/10.2471/BLT.15.168419>
8. Meyer-Rath G, van Rensburg C, Chiu C, Leuner R, Jamieson L, Cohen S. The per-patient costs of HIV services in South Africa: systematic review and application in the South African HIV investment case. *PLoS One.* 2019;14(2):e0210497. <https://doi.org/10.1371/journal.pone.0210497>
 9. Bollinger LA, Sanders R, Winfrey W, Adesina A. Lives saved tool (LiST) costing: a module to examine costs and prioritize interventions. *BMC Public Health.* 2017;17(Suppl 4):782. <https://doi.org/10.1186/s12889-017-4738-1>
 10. Forsythe S, Stover J, Bollinger L. The past, present and future of HIV, AIDS and resource allocation. *BMC Public Health.* 2009;9(Suppl 1):S4. <https://doi.org/10.1186/1471-2458-9-S1-S4>
 11. Vassall A, Sweeney S, Kahn J, Gomez Guillen G, Bollinger L, Marseille E, et al. Reference case for estimating the costs of global health services and interventions. Seattle, WA: Global Health Cost Consortium; 2017.
 12. The World Bank. Official exchange rate (LCU per US\$, period average) [internet]. World Bank; 2019 [cited 2019 Apr 3]. Available from: <https://data.worldbank.org/indicator/PA.NUS.FCRF?locations=BF>
 13. Kumaranayake L. The real and the nominal? Making inflationary adjustments to cost and other economic data. *Health Policy Plan.* 2000;15(2):230–4. <https://doi.org/10.1093/heapol/15.2.230>
 14. Cerecero-García D, Terris-Prestholt F, Macías-González F, Baustista-Arredondo S. Supplementary material for: State of HIV costing in Latin America and the Caribbean: a systematic literature review]. Zenodo; 2024. <https://doi.org/10.5281/zenodo.12168643>.
 15. Sarmiento JMH, Romero EMD, Almanza LH, Rojas MA, Ramos JMG, Sánchez LMM. Out-of-pocket expenses of patients with HIV/AIDS attending a control program in Montería, Colombia. *Enf Inf Microbiol.* 2022;41(4):148–51.
 16. Marta CB, Leite JL, de Freitas Peregrino AA, Schutz V, Francisco MTR, Magnago C. Costs of adherence to acquired immunodeficiency syndrome treatment: cross-sectional study. *UERJ Nurs J.* 2014;22(2):193–200.
 17. Van Duin MJM, Conde R, Wijnen B, Evers SMAA, Gonzalez-Rodriguez JL, Govers MJG, et al. The impact of comorbidities on costs, utilities and health-related quality of life among HIV patients in a clinical setting in Bogotá. *Expert Rev Pharmacoecon Outcomes Res.* 2017;17(3):303–10. <https://doi.org/10.1080/14737167.2017.1246185>
 18. Johns B, Masau S, Abbot M, Vogus A. Grenada general hospital costing 2012. Bethesda, MD: Health Systems 20/20 Caribbean project, Abt Associates Inc.; 2013.
 19. Marseille E, Giganti MJ, Mwangi A, Chisembele-Taylor A, Mulenga L, Over M, et al. Taking ART to scale: determinants of the cost and cost-effectiveness of antiretroviral therapy in 45 clinical sites in Zambia. *PLoS One.* 2012;7(12):e51993. <https://doi.org/10.1371/journal.pone.0051993>
 20. Chaumont C, Oliveira C, Chavez E, Valencia J, Dintrans PV. Out-of-pocket expenditures for HIV in the Dominican Republic: findings from a community-based participatory survey. *Revista Panamericana de Salud Pública.* 2019;43:e56. <https://doi.org/10.26633/RPSP.2019.56>
 21. Alvis-Estrada JP, Murray CT, Flowers K, Loya-Montiel MI, Pinzón MRC, Barrington C. PIN19 economic evaluation of the first pilot of partial decentralization of HIV care and treatment for men who have sex with men in Guatemala City from the patient's perspective. *Value Health.* 2019;22(Suppl 3):S643.
 22. Granich R, Gupta S, Montaner J, Williams B, Zuniga JM. Pattern, determinants, and impact of HIV spending on care and treatment in 38 high-burden low-and middle-income countries. *J Int Assoc Provid AIDS Care.* 2016;15(2):91–100. <https://doi.org/10.1177/2325957415623261>
 23. Joint United Nations Programme on HIV/AIDS. HIV prevention 2025 roadmap: getting on track to end AIDS as a public health threat by 2030. Geneva: UNAIDS; 2020 [cited 2024 Jan 25]. Available from: https://www.unaids.org/sites/default/files/media_asset/prevention-2025-roadmap_en.pdf
 24. De Lay PR, Benzaken A, Karim QA, Aliyu S, Amole C, Ayala G, et al. Ending AIDS as a public health threat by 2030: time to reset targets for 2025. *PLoS Med.* 2021;18(6):e1003649. <https://doi.org/10.1371/journal.pmed.1003649>
 25. Seeing the people in the percentages. *Lancet HIV.* 2021;8(1):e1. [https://doi.org/10.1016/S2352-3018\(20\)30343-X](https://doi.org/10.1016/S2352-3018(20)30343-X)
 26. Nachega JB, Leisegang R, Bishai D, Nguyen H, Hislop M, Cleary S, et al. Association of antiretroviral therapy adherence and health care costs. *Ann Intern Med.* 2010;152(1):18–25. <https://doi.org/10.7326/0003-4819-152-1-201001050-00006>
 27. Gardner EM, Maravi ME, Rietmeijer C, Davidson AJ, Burman WJ. The association of adherence to antiretroviral therapy with health-care utilization and costs for medical care. *Appl Health Econ Health Policy.* 2008;6(2–3):145–55. <https://doi.org/10.1007/BF03256129>
 28. Juday T, Gupta S, Grimm K, Wagner S, Kim E. Factors associated with complete adherence to HIV combination antiretroviral therapy. *HIV Clin Trials.* 2011;12(2):71–8. <https://doi.org/10.1310/hct1202-71>
 29. Altice F, Evuarherhe O, Shina S, Carter G, Beaubrun AC. Adherence to HIV treatment regimens: systematic literature review and meta-analysis. *Patient Prefer Adherence.* 2019;13:475–90. <https://doi.org/10.2147/PPA.S192735>
 30. Bautista-Arredondo S, Pineda-Antunez C, Cerecero-García D, Cameron DB, Alexander L, Chiwevu C, et al. Moving away from the “unit cost”. Predicting country-specific average cost curves of VMMC services accounting for variations in service delivery platforms in sub-Saharan Africa. *PLoS One.* 2021;16(4):e0249076. <https://doi.org/10.1371/journal.pone.0249076>
 31. DeCormier Plosky W, Bollinger LA, Alexander L, Cameron DB, Carroll LN, Cunnam L, et al. Developing the Global Health Cost Consortium unit cost study repository for HIV and TB: methodology and lessons learned. *Afr J AIDS Res.* 2019;18(4):263–76. <https://doi.org/10.2989/16085906.2019.1680398>

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Estado actual de la información sobre los costos de la infección por el VIH en América Latina y el Caribe: Revisión bibliográfica sistemática

RESUMEN

Objetivos. Resumir los datos disponibles sobre los costos unitarios de las intervenciones en materia de pruebas de detección, prevención y atención de salud relacionadas con el virus de la inmunodeficiencia humana (VIH) en América Latina y el Caribe.

Métodos. Se realizó una revisión bibliográfica sistemática de los estudios sobre costos publicados entre el 2012 y el 2024, y se seleccionaron los estudios que presentaban datos de costos determinados de manera empírica. Los datos disponibles se clasificaron en categorías de intervención predefinidas y se compararon en función del tiempo y el lugar. También se examinaron las variaciones en los costos unitarios según el tipo de intervención.

Resultados. De los 1746 estudios encontrados, 22 cumplían los criterios de inclusión; y en ellos se obtuvieron 103 estimaciones distintas de costos unitarios procedentes de nueve países. Alrededor del 50% de los estudios incluidos se publicaron entre el 2019 y el 2021. Los servicios de tratamiento antirretroviral eran los que disponían de más datos sobre costos (39% de los costos unitarios), seguidos de los de atención hospitalaria (27%) y los de pruebas de detección del VIH (24%). Se observaron variaciones considerables en los costos en una misma intervención y entre distintas intervenciones.

Conclusiones. En este análisis se subraya la necesidad de disponer de datos de costos exactos y fiables para brindar apoyo a los esfuerzos de elaboración de presupuestos y la toma de decisiones en materia de infección por el VIH. Detectamos varias brechas en cuanto a la disponibilidad de datos sobre costos y hacemos hincapié en la importancia de presentar los resultados de manera más eficaz mediante la incorporación de variables contextuales clave. Ante los desafíos que plantean la reducción presupuestaria y los riesgos para su sostenibilidad, es indispensable contar con evidencia sólida para fundamentar la determinación de prioridades y la asignación de presupuestos a los servicios relacionados con la infección por el VIH.

Palabras clave

Infecciones por VIH; costos de la atención en salud; política de salud; América Latina; Región del Caribe.

Cálculo do custo do HIV na América Latina e no Caribe: revisão sistemática da literatura

RESUMO

Objetivos. Sintetizar os dados disponíveis sobre os custos unitários de testagem, prevenção e intervenções de saúde relacionados ao vírus da imunodeficiência humana (HIV) na América Latina e Caribe.

Métodos. Foi realizada uma revisão sistemática da literatura de estudos de custeio publicados entre 2012 e 2024, com a seleção de estudos que apresentavam dados de custeio medidos empiricamente. Os dados foram classificados em categorias predefinidas de intervenção e comparados por tempo e lugar. Variações nos custos unitários por tipo de intervenção também foram examinadas.

Resultados. Dos 1746 estudos identificados, 22 preencheram os critérios de inclusão, fornecendo 103 estimativas de custos unitários em nove países. Cerca de 50% dos estudos incluídos na análise foram publicados entre 2019 e 2021. A maior parte dos dados de custo se referiam a serviços de terapia antirretroviral (39% dos custos unitários), serviços de atenção hospitalar (27%) e serviços de testagem de HIV (24%). Foram observadas variações de custo consideráveis para uma mesma intervenção e entre diferentes intervenções.

Conclusões. Esta análise aponta a necessidade de se dispor de dados de custo exatos e confiáveis para apoiar o processo decisório e a alocação de recursos orçamentários relacionados ao HIV. Foram identificadas várias lacunas na disponibilidade de dados de custo. Enfatiza-se a importância de apresentar os resultados com mais eficiência, incorporando as principais variáveis contextuais. Diante dos desafios impostos pela retração orçamentária e pelos riscos à sustentabilidade, é imprescindível dispor de evidências robustas para subsidiar o processo de estabelecimento de prioridades e alocação de recursos orçamentários para serviços de HIV.

Palavras-chave

Infeções por HIV; custos de cuidados de saúde; política de saúde; América Latina; Região do Caribe.