

Operations strategies in the recruitment process pre-exposure prophylaxis to HIV

Carlos Jefferson de Melo Santos¹[0000-0002-0612-1220], Ângelo Márcio Oliveira Sant'Anna²
[0000-0001-8332-8877], Maria Inês Costa Dourado³[0000-0003-1675-2146], Ava Santana Bar-
bosa⁴[0000-0001-5590-9754] and Thais Regis Aranha Rossi⁵[0000-0002-2561-088X]

¹ Polytechnic School, Federal University of Bahia, UFBA, Aristides Novis street, 2, 40210-630, Salvador, Bahia, BRA cj.ufba@gmail.com

² Polytechnic School Federal University of Bahia, UFBA, Aristides Novis street, 2, 40210-630, Salvador, Bahia, BRA angelo.santanna@ufba.br

³ Collective Health Institute, Federal University of Bahia, UFBA, Basílio da Gama street, S/N, 40110-140, Salvador, Bahia, BRA inesdourado@gmail.com

⁴ Polytechnic School Federal University of Bahia, UFBA, Aristides Novis street, 2, 40210-630, Salvador, Bahia, BRA avasb@ufba.br

⁵ Department of Life Sciences - DCV, UNEB, Silveira Martins street, 2555, 41150000, Salvador, Bahia, BRA trossi@uneb.br

Abstract. Making HIV pre-exposure prophylaxis (PrEP) easily accessible to adolescents requires enabling and strategic recruitment and linkage to PrEP services. The PrEP1519 project is a single-arm, demonstration cohort study of daily oral antiretrovirals as PrEP among adolescent men who have sex with men (AMSM) and transgender women (ATGW) aged 15-19 years old in Brazil. The objective was to apply and analyze operational strategies in recruitment methods for prospecting adolescents in the context of social vulnerability. Participants were recruited by trained peer educators who engage with youth at gatherings, venues, events, and schools; through online social media and mobile apps. The data were collected between 2019-2020 in Salvador, Brazil. Based on a literature review, statistical methods were used to apply decision-making and operations management methods to direct recruitment strategies. Gender identity ($p=0.006$) and sexual orientation ($p=0.007$) were significantly relevant to recruitment methods. Even without a large Pearson relationship, the construction of the cross-tabulation for the other variables facilitated decision-making to direct recruitment resources. Well-trained youth peer educators effectively recruit aMSH and aTGW for PrEP. However, recruiting needs direction for consistent decision-making to rethink or reinvent strategies or new paths when a strategy reaches its limit.

Keywords: Healthcare, Strategy and Organizational Engineering, Quality Management.

1 Introduction

The definitions of new methodologies in scientific research satisfy the need to improve the results obtained in bibliographic background and the new technologies become

a reality after studying and re-engineering them. Defining what the improvements will do not cancel the concepts previously defined as a rule. In surveys related to HIV/AIDS, the recruitment of new participants has been continually reformulated. With more virtual communication and a decrease in face-to-face communication, which was the biggest form of recruitment in older surveys.

In the case of research PrEP1519 (study aimed at adolescents aged 15 to 19 years old who identify themselves as gay, bisexual, non-binary cisgender men registered with male biological sex, transgender women, and transvestites that demonstrates the effectiveness of the use of PrEP, pre-exposure prophylaxis to HIV, orally and daily, in three Brazilian cities, Salvador, Belo Horizonte, and São Paulo), studies of recruitment technologies that are explored within the field research project must be related to the study population and only then can the results demonstrate the reductions proposed by the WHO targets by 2020: 90% of all people living with HIV will know they have the virus; 90% of all people with diagnosed HIV infection will receive antiretroviral therapy around the clock and 90% of all people receiving antiretroviral treatment will have viral suppression [1].

The continuity of the tools and strategies established as a priority, such as the use of Peer Educators, must be reviewed and/or improved. However, some tools and concepts emphasize the involvement of some of them to achieve the minimum expected efficiency. Operations strategies, combined with various complementary performance assessment tools, can make targeting access to combined prevention and PrEP easier for the key study population (men who have sex with men, transgender women, and transvestites).

Defining what these strategies will be and measuring their results are the innovation challenges that projects involving HIV/AIDS and recruitment may have and need to reinvent themselves continuously. This article discusses which strategies were used in the PrEP1519 project, at the Salvador site, in the state of Bahia. Adolescents who participate in PrEP1519 can choose or not to use pre-exposure prophylaxis (PrEP), and have access to several other methods that make up the range of Combined Prevention in this study: condoms, lubricant, PEP (post-exposure prophylaxis), counseling, test for diagnosis of HIV and other STIs (sexually transmitted infections), treatment or referral to a specialized service, self-test for HIV and vaccination for hepatitis A and B. Any adolescent who meets the participation criteria (15 to 19 years old, MSM, transsexual, and transvestite) and who lives in one of the 3 cities participating in the study (or close to them) can participate in the study. The main objective of this project is to analyze the recruitment strategies used in the research and align the strategy used through the available reference for the area of study in HIV/AIDS.

2 Literature review

2.1 Management of Operations Strategies

Operations strategy is defined as a tool whose main objective is to increase the organization's competitiveness and, to that end, seeks to organize the company's resources

and conform a coherent pattern of decisions so that they can provide a good mix of performance characteristics that enables the organization to compete effectively in the future [2]. There are three generic strategies that an organization can use, separately or together, to compete in markets: cost leadership through economies of scale, cost reduction through experience, cost minimization in areas such as research and development, services, sales, advertising, among others; differentiation, through the creation of something that the industrial sector as a whole perceives as being exclusive, such as, for example, project, brand image, technology, customer service, distribution network, among others; focus, through excellent service, on quality, services, and costs, on a restricted and well-defined market segment [3]. Porter (1980) establishes some dimensions from which a company can assemble its strategic options [3]. Among them, the item services associated with the product stand out, such as project support, technical assistance, and credit. Although this link is often neglected in companies, in academia there is already a consensus that how day-to-day operations are managed depends on the strategic direction of the production system [4][5]. In several surveys carried out in the manufacturing industry, empirical evidence has shown that the formulation of the operations strategy contributes significantly to the competitive performance and the strategic alignment of the business [6][7]. As in manufacturing, in service contexts, empirical research has found that the operations strategy causes a positive impact on business performance [8] [9] [10]. Service operations have the following peculiarities [11]: intangibility, services are intangible by nature, that is, they cannot be touched or possessed by the customer like manufactured goods; simultaneous production and consumption, the production of the service happens at the same time as the consumption; customer participation, the customer participates in the service production process, being able not only to act passively but also as a co-producer. The distinctions between manufacturing and services are also reflected in the service operations system, which can be divided into two parts: one that has customer contact and one that does not [12]. These requirements take into account the characteristics of the services and recent developments in the area of operations strategy: perceived value criteria, with performance objectives must be defined from the perspective of the value perceived by the customer [13] [14]; service concept (conceptual project), with the operations strategy must include the concept about service as a strategic tool [8] [12]; service package, with the service package should be considered as an integral element of the operations strategy [13] [15]; front and rear line, with the operations strategy must take into account the differences between front-line and back-end processes [16] [17]; cross-functional integration, with strategy formulation must take into account the interface of operations with other organizational functions [18] [19]; Resource Based View (RBV), with addition to the market-oriented view, operations strategy formulation must include the principles of the resource-based theory [20] [21]; process orientation, with the operations strategy must be formulated within a process-oriented approach, not functional areas [22] [23] and; strategy formation, with the operations strategy formulation process must be flexible, allowing capturing the construction of emerging strategies [24] [25].

2.2 Recruitment in Scientific Research

In Brazil, Resolution 251 of 1997 of the National Health Council - Ministry of Health highlights the need to clearly describe the forms of recruitment, leaving the researcher

to justify the inclusion of the subject in the research project and critically analyze the risks and benefits involved in this act [26]. In a survey carried out to assess forms of recruitment in primary care clinical scientific research, using the Delphi method, nine researchers out of seven independently classified the evidence provided according to the criteria developed [27] as shown below: i. value or (no value) established in one or more RCTs or systematic review; ii. sufficient face validity so that randomized trials are unnecessary; iii. in use but which does not meet any of the above criteria. This categorization expands the provision of evidence parameters (related to the literature review on recruitment strategies) and seven attempts (according to the number of attempts that the research intends to carry out) [28]. Strategies such as newsletters, folders, regular visits, phone calls, notes and pamphlets, amendment of protocols with changes in inclusion criteria, presentations to certain community groups, training of the team involved, study days, workshops for recruiters, newspaper articles, interviews radio broadcasts, presentations at meetings, hiring extra employees on the team, training through videos, among other strategies are commonly reported in scientific articles as factors to improve the recruitment rate in the study [29]. The impact of PrEP in controlling the HIV epidemic is associated with prophylaxis coverage rates and rates of use of other preventive methods in the community [30] [31], which has led to recommendations for public and non-governmental institutions to make efforts to incorporate and promote the wider use of PrEP, preferably as part of integrated prevention policies. Despite this, the wide access and use of PrEP have been a challenge in the different contexts in which prophylaxis is available [32] [33]. Factors such as lack of knowledge and confidence in PrEP, the resistance of health professionals to indicate and prescribe prophylaxis for people who most need it, and the stigma related to AIDS and specific social groups, such as homosexuals, have been important barriers to this regard [34] [35] [36]. In Brazil, despite the increase in HIV testing in recent years, young people remain with the lowest rates of knowledge of their serological status [27]. Thus, developing strategies to identify and link vulnerable individuals to prevention services, especially when offered HIV testing and interventions in communities, is essential to increase the impact of PrEP. This becomes relevant for adolescents who historically have low demand for and attachment to health services [37].

3 Materials and methods

2.1 Data collect

The main strategy for qualitative data collect was to interview peer educators (professionals active in the sexual education of young people), who described the recruitment processes and the way each strategy is used in the field. This helps to define the standard methodological scope to replicate and guide any other educator to approach the youth through the chosen strategy.

The quantitative data collection was carried out through a virtual verification sheet, with transversal cuts, based on the quantification of all the contacts made by the peer educators with the young people. To complete this sheet, key information was considered in the collection when approaching the participant: age, sexual orientation, gender

identity, contact information (social media, chat apps, or e-mail), and the strategy that was used for the catch up with the young man in the field.

2.2 Operations strategies

Following the methodology of Hayes *et. al* (2004) [38], concepts of operations strategy are introduced with the formation of a set of objectives, policies, and self-imposed restrictions that describe how the recruitment and demand creation sector proposes to direct and develop all the resources invested in operations, directing investments and executing the mission based on the strategic planning school – a formal and top. This formal and top-down process that covers the strategic, tactical, and operational plan [39]. The methodology data collection was processed in the field based on this guideline, created in the virtual verification form completed by the peer educator.

2.3 Decision making

Analysis of decision-making through the statistical tools of cross-tabulation and statistical correlation with chi-square applied to the collected base database, directing to the most pertinent strategies, which attract more participants. There is a transformation of data and information that will help in the decision-making process of the project [40]. This analysis was carried out using the SPSS statistical software, as an aid to the data processing to generate the necessary information for decision-making. For this study, the cost base was not used empirically or applied, based only on the perception of the operator (peer educator) of the available recruitment resources.

2.4. Study time division

To establish a chronology of the use of these tools and strategies in the project, it was divided into three moments of service, with the cut-off point of 160 participants in the project, separated by months: the first moment, from April/2019 to June/2019; second moment, from July/2019 to September/2019 and; third moment, from October/2019 to February/2020. The knowledge and monitoring of the strategies with this division into moments elucidate and explain how the project behaved with the strategies that were gradually implemented and direct the positive and negative aspects, with the continuous resolution of the latter.

4 Results and discussions

3.1 Measurement of strategies

The forms of recruitment strategies identified for the project elucidated through a literature review were the basis for the creation of internal protocols on how to use each strategy. Through interviews with peer educators, recruitment strategies were listed with standardized definitions and methodology. These strategies can be divided into strategies with social media and without social media (Tables 1 and 2).

Table 1. Strategies used in the research without using a social network.

Strategy	Methodology
----------	-------------

Sociability Spaces	Carrying out active prospecting of eligible people in the project with questions from the existing standard questionnaire in the SiSPrEP system of PrEP Project 15-19.
Schools	Use of interactive games about sexuality and dissemination of information related to Combined Prevention
Media, Press, and Newspapers	Dissemination of project information through data and advertising of the PrEP project structure and components 15-19
Individual Graphic Materials (Banner)	Use of fixed materials in spaces for movement and entry of people eligible for the project.
Peer Educator	Use of self-declared Gay, Transgender, and Non-binary Peer Educators, using the contact network of the eligible target audience
Spontaneous Demand	Indirect recruitment which there is no way to measure or identify which primary source of recruitment existed. There is no methodology for such a recruitment strategy

Table 2. Strategies used in research using social networks.

Social Media	Method
Facebook	1. Recruitment via chatbot with the Trans Woman robot using its language (Pajubá) and artifices from the POP world to attract and TrTrans public.
Twitter	1. Contact users (in the pornographic environment) to inform them about PrEP and other combined prevention methods (active recruitment through appointments with users' contacts)
Grindr	1. Contacting users to inform them about PrEP and other combined prevention methods; 2. Active recruitment through appointments with contacts provided by users)
Tinder	1. Contacting users to inform them about PrEP and other combined prevention methods; 2. Active recruitment through appointments with contacts provided by users)
Badoo	1. Contacting users to inform them about PrEP and other combined prevention methods; 2. Active recruitment through appointments with contacts provided by users)
Instagram	1. Dissemination of the PrEP Project 15-19 with the PrEPPara Salvador website, with information on PrEP, combined prevention, with LGBT language and themes.
Google Forms	1. Using the Instagram boost, use the SiSPrEP information from the recruitment form for self-test delivery and recruitment for PrEP use
Whatsapp	1. Means of formal communication through dialogue with recruits for scheduling

First Scenario: Preliminary Information and Formative Research

The formative research was a process of field recognition, with the application of a questionnaire prepared by the main coordinators of the project. This questionnaire had aspects of risk vulnerability conceptions, gender identification, and sexuality. Field tools such as tablets and Google forms were used, and technological strategies facilitated filling in at parties, sociability spaces, and schools. The people interviewed had

no financial remuneration but received a distribution of combined prevention inputs, such as condoms, lubricant, intimate sanitizer, and other inputs considered routinely distributed by health services.

There was a need to insert the research data into some platform, creating a systemic database. The first recruitment strategies used in the field gave space to the first participants in the project and social media was not used as a form of active prospecting. At this first moment, after field saturation, the approach was initiated in LGBT neighborhood parades, field movements that give visibility to the cause but are more related to sexualities and gender identities. This strategy was effective in generating contacts and networking, but only some participants reached the clinic from it. Due to saturation, it was verified that there would be a possibility of actively recruiting in relationship apps aimed at the LGBT public.

Second Scenario: information management, DSS, and routine management

The changes and events in the second moment introduced new results due to the saturation of previous strategies: SiSPrEP was more robust in following up and monitoring the insertion of data, even with the systemic errors presented in its programming; the implementation of routine management in the clinic and research workspaces favored a more effective direction of information and application of improvement tools in the field and the developed strategies. The big change can be noticed in the use of social media as a form of active recruitment, which translated more participants into the project and less physical exposure in sociability places.

Table 3. Strategies used in the second moment of the research with social media.

Social Media	Frequency	Start date	Days	Numerical Result
Facebook	Daily	01/04/2019	60	3 recruitments
Grindr	Daily	01/06/2019	60	18 contacts and 10 Participants
Instagram	Daily	01/05/2019	60	2079 Followers and More than 16,236 interactions

Third Scenario: Indicator management and strategic monitoring

For the last moment surveyed, the established time of 5 months reflects the adherence to some forms of recruitment as a routine and some of them showing their effectiveness. This is shown in Table 4, as well as the follow-up of the quantitative results. In this scenario, the main modifications included in the project were: indicator management, recruitment processes, and strategies began to be monitored quantitatively and qualitatively; strategic monitoring, the information generated from the indicators served for decision making using quality tools and human resource management. Strategies related to printed graphic materials, face-to-face peer educators, and spontaneous demand without social media did not represent a significant number of recruits being disregarded from the spreadsheet.

Table 4. Strategies used in the research's first, second, and third moments without social media.

Strategy	Number of contacts made	No. of People Recruited	Effectiveness of
-----------------	--------------------------------	--------------------------------	-------------------------

	Moments for MSM			Moments for TrTan			Moments for MSM			Moments for TrTan			Contacts (%)		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
LGBTQIA+ parties	5	13	29	0	0	0	4	4	2	0	0	0	80,0	30,77	6,90
Sociability Spaces	5	13	56	0	0	0	4	4	2	0	0	0	80,0	30,77	3,57
Schools	2	0	0	0	0	0	2	0	0	0	0	0	100	0,00	0,00

3.2 Analyzes, Results, and Discussions

With the measurement of the results of the strategies, it is possible to make some chi-square relations and elucidate which strategies will be used to improve the effectiveness of the recruitment processes in HIV/AIDS research. For this, all the strategies exposed were summarized in 3 to facilitate the interpretation of the chi-square and minimize errors in the statistical table: peer education, with care network/navigator, events and actions and peer educator; social media, with all social media in the study and; participant's spontaneous demand, with participant indication, formative research, study site contact network, and spontaneous demand.

The neighborhoods were categorized into five macro-regions with a categorization not informed by the participants: seafont, railway suburb, outskirts, downtown, RMS (metropolitan region of Salvador), and uninformed. For the chi-square test for all variables:

Table 5. Sectorization of neighborhoods in Salvador.

Variable	Pearson chi-square	Cramer value	Likelihood ratio
Gender Identity	$p = 0,006$	0,283	0,001
Sexual orientation	$p = 0,007$	0,237	<0,001
Education	$p = 0,399$	0,157	0,346
Place of Residence	$p = 0,262$	0,221	0,275
Race/Color	$p = 0,729$	0,119	0,750
Age	$p = 0,340$	0,189	0,260

Relationship Recruitment Strategy x Macro-region

The categorization made for macro-regions of the Salvador study site was based on how the management of the city hall classifies the division of neighborhoods, associating the demographic density of the region, characteristics of mobility and culture, facilitating the approach and conclusions of the studies [41] [42].

The descriptive statistical analysis shows that there is a greater relationship between recruitment strategies 1 and 2 in areas 3 and 4, which are crucial for the research since they are characterized as regions with low income and education in the face of a survey by the competent bodies in the city of Salvador. There is a significant correlation

between virtual recruitment strategies and the most vulnerable regions, strategies that require a network of people with the same profile as young people were the most effective in attracting them, which can demonstrate the effectiveness of using peer educators with an identity profile and age close to the young people to be recruited [43]. That makes it possible to enter social networks and relationship applications, the same conclusion can be drawn from the relationship between schooling and study macro-region. Those with less education live in the most vulnerable socioeconomic regions and would need face-to-face recruitment to join the project and have access to information about PrEP [43] [44].

Recruitment strategy ratio x Age group

The operation carried out in strategy 1 (mainly in the peer educator subcategory, related to the person who carries out the dissemination of combination prevention methods in person or through his/her network of contacts) proved to be the most effective in covering the entire age group of the study [45]. In the next stages of data collection for new participants, investing in peer education strategies would be necessary to cover more participants in the 15 to 17 age groups, reduced in the other strategies [46].

Virtual strategies show an impact like those used with peer educators when all age groups are observed. Understanding that young people have greater access and affinity to relationship apps and social networks reflected in the impact in a similar amount to strategy 2. With difficulty in the research field in attracting young people in the 15 to 17 age group, strategies 1 and 2 are shown to be more effective in recruiting these adolescents [47].

5 Conclusions

Methods and strategies for operations in recruitment for the prevention, diagnosis, and treatment of sexually transmitted infections (STIs), especially HIV/AIDS, must be discussed, studied, and widely measured. The recruitment chain is essential for further study as there are several primary sources that the PrEP1519 project participant was aware of but were not linked to the project at this first moment. The perpetuation of the strategies, as the young person becomes aware of a health service or research providing basic and prolonged care in the treatment and prevention of STIs, favors a greater bond with the participant arriving at the study clinic, encouraging a greater number of people who are treated and carry out preventive diagnosis regularly.

Considering the time spent by the participant in the clinic of the project under study and the assisted returns, the connection to the project after its arrival depends on the form of recruitment used. Knowing, measuring, and relating strategies must be carried out so that more diagnoses are performed, and prophylaxis and treatments are initiated. Reducing HIV/AIDS and other STIs starts with the study and design of recruitment strategies, which enable and categorize which and how the studied populations should be recruited. The direct impact of directing such strategies on these young people provides a reduction in infections (in terms of STIs in general) and, in particular, minimizes the ability of HIV to replicate.

References

1. WHO. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach. World Health Organization, 2016.
2. SKINNER, W. Manufacturing: the missing link in corporate strategy. *Harvard Business Review*. Boston, 47(3), 136-145, (1969).
3. PORTER, Michael. *Estratégia Competitiva: Técnicas para Análise de Indústrias e da Concorrência*. Livraria Cultura, 1980
4. HAYES, R. H.; PISANO, G. P.; UPTON, D. M.; WHEELWRIGHT, S. C. *Operations, Strategy, and Technology: Pursuing the Competitive Edge*. John Willey&Sons, EUA, 2004.
5. SLACK, Nigel; LEWIS, Michael. *Operations strategy*. Upper Saddle River: Prentice-Hall, 2003
6. ACUR, Nuran; BITITCI, Umit. Managing strategy through business processes. *Production Planning & Control*, v. 14, n. 4, p. 309-326, June 2003.
7. PAPKE-SHIELDS, Karen E.; MALHOTRA, Manoj K.; GROVER, Varun. Strategic manufacturing planning systems and their linkage to planning system success. *Decision Sciences*, v. 33, n. 1, p. 1-30, winter 2002.
8. GOLDSTEIN, Susan Meyer; WARD, Peter T. Performance effects of physicians' involvement in hospital strategic decisions. *Journal of Service Research*, v. 6, n. 4, p. 361-372, May 2004.
9. ARANDA, Daniel Arias. Service operations strategy, flexibility, and performance in engineering consulting. *International Journal of Operations & Production Management*, v. 23, n. 11, p. 1401-1421, 2003
10. SMITH, Thomas M.; REECE, James S. The relationship between strategy, fit, productivity, and business performance in a services setting. *Journal of Operations Management*, v. 17, n. 2, p. 145-161, 1999
11. SANTOS, Luciano Costa. Um modelo para a formulação da estratégia de operações de serviços. 2006. 319f. Tese (Doutorado em Engenharia de Produção) – Programa de Pós-Graduação em Engenharia de Produção, Universidade Federal de Santa Catarina, Florianópolis, 2006.
12. JOHNSTON, R.; CLARK, G. *Administração de operações de serviço*. São Paulo: Atlas, 2002. GOLDSTEIN, Susan Meyer et al. The service concept: the missing link in service design research? *Journal of Operations Management*, v. 20, n. 2, p. 121-134, 2002.
13. ROTH, Aleda V.; MENOR, Larry J. Insights into service operations management: a research agenda. *Production and Operations Management*, v. 12, n. 2, p. 145-164, summer 2003.
14. JOHNSTON, Robert. The determinants of service quality: satisfiers and dissatisfiers. *International Journal of Service Industry Management*, v. 6, n. 5, p. 53-71, 1995.
15. KELLOGG, Deborah L.; NIE, Winter. A framework for strategic service management. *Journal of Operations Management*, v. 13, n. 4, p. 323-337, 1995.
16. SAFIZADEH, M. Hossein; FIELD, Joy M.; RITZMAN, Larry P. An empirical analysis of financial services processes with a front-office or back-office orientation. *Journal of Operations Management*, v. 21, n. 5, p. 557-576, 2003.

17. McLAUGHLIN, Curtis P.; PANNESI, Ronald T.; KATHURIA, Narindar. The different operations strategy planning process for service operations. *International Journal of Operations & Production Management*, v. 11, n. 3, p. 63-76, 1991.
18. SAMPSON, Scott E.; FROEHLE, Craig M. Foundations and implications of a proposed unified services theory. *Production and Operations Management*, v. 15, n. 2, p. 329-343, summer 2006.
19. ROTH, Aleda V.; VAN der VELDE, Marjolijn. Operations as marketing: a competitive service strategy. *Journal of Operations Management*, v. 10, n. 3, p. 303-328, 1991.
20. DE TONI, Alberto; TONCHIA, Stefano. Strategic planning and firms' competencies: traditional approaches and new perspectives. *International Journal of Operations & Production Management*, v. 23, n. 9, p. 947-976, 2003.
21. GAGNON, Stéphane. Resource-based competition and the new operations strategy. *International Journal of Operations & Production Management*, v. 19, n. 2, p. 125-138, 1999.
22. ACUR, Nuran; BITITCI, Umit. Managing strategy through business processes. *Production Planning & Control*, v. 14, n. 4, p. 309-326, June 2003.
23. SILVER, Edward A. Process management instead of operations management. *Manufacturing & Service Operations Management*, v. 6, n. 4, p. 273-279, fall 2004.
24. NIELSEN-ENGLYST, Linda. Operations strategy formation - a continuous process. *Integrated Manufacturing Systems*, v. 14, n. 8, p. 677-685, 2003.
25. BARNES, David. The complexities of the manufacturing strategy formation process in practice. *International Journal of Operations & Production Management*, v. 22, n. 10, p. 1090-1111, 2002.
26. RESOLUÇÃO nº 196 e RESOLUÇÃO nº 251. *Jornal de Pneumologia* [online]. 1999, v. 25, n. 2 [Acessado 24 Novembro 2022], pp. 94-101. Disponível em: <<https://doi.org/10.1590/S0102-35861999000200006>>. Epub 13 Set 2011. ISSN 1678-4642. <https://doi.org/10.1590/S0102-35861999000200006>.
27. ELLIS J, MULLIGAN I, ROWE J, SACKETT DL. Inpatient general medicine is evidence based. *The Lancet* 1995; 346: 407-410.
28. FOY R, PARRY J, DUGGAN A, DELANEY B, WILSON S, LEWIN-VAN DEN BROEK NTh, LASSEN A, VICKERS L and MYRES P. How evidence based are recruitment strategies to randomized controlled trials in primary care? Experience from seven studies. *Family Practice* 2003; 20: 83-92.
29. MCDONALD AM, KNIGHT R, CAMPBELL MK, et al. *BMC. Med Inform Decis Mak*2008;8(1):1-21.
30. JUUSOLA JL, BRANDEAU ML, OWENS DK, BENDAVID E. The cost-effectiveness of preexposure prophylaxis for HIV prevention in the United States in men who have sex with men. *Annals of internal medicine*. 2012;156(8):541-50.
31. LEVASSEUR MT, GOLDSTEIN ND, TABB LP, OLIVIERI-MUI BL, WELLES SL. The Effect of PrEP on HIV Incidence Among Men Who Have Sex with Men in the Context of Condom Use, Treatment as Prevention, and Seroadaptive Practices. *JAIDS Journal of Acquired Immune Deficiency Syndromes*. 2018;77(1):31-40.
32. RAVASI G, GRINSZTEJN B, BARUCH R, GUANIRA JV, LUQUE R, CÁCERES CF, et al. Towards a fair consideration of PrEP as part of combination HIV prevention in Latin America. *Journal of the International AIDS Society*. 2016;19(7S6).

33. ZABLOTSKA I, GRULICH AE, PHANUPHAK N, ANAND T, JANYAM S, POONKASETWATTANA M, et al. PrEP implementation in the Asia-Pacific region: opportunities, implementation and barriers. *Journal of the International AIDS Society*. 2016;19(7S6).
34. ARNOLD T, BRINKLEY-RUBINSTEIN L, CHAN PA, PEREZ-BRUMER A, BOLOGNA ES, BEAUCHAMPS L, et al. Social, structural, behavioral and clinical factors influencing retention in Pre-Exposure Prophylaxis (PrEP) care in Mississippi. *PloS one*. 2017;12(2):e0172354.
35. GOPARAJU L, PRASCHAN NC, WARREN-JEANPIERE L, EXPERTON LS, YOUNG MA, KASSAYE S. Stigma, PARTNERS, Providers and Costs: Potential Barriers to PrEP Uptake among US Women. *Journal of AIDS & clinical research*. 2017;8(9).
36. YI S, TUOT S, MWAI GW, NGIN C, CHHIM K, PAL K, et al. Awareness and willingness to use HIV pre-exposure prophylaxis among men who have sex with men in low-and middle-income countries: a systematic review and meta-analysis. *Journal of the International AIDS Society*. 2017;20 (1).
37. CLARO LBL, MARCH C, MASCARENHAS MTM, CASTRO IABd, ROSA MLG. Adolescentes e suas relações com serviços de saúde: estudo transversal em escolares de Niterói, Rio de Janeiro, Brasil. *Cadernos de saude publica*. 2006;22:1565-74.
38. HAYES, Robert H. et al. *Operations, strategy and technology: pursuing the competitive edge*. New York: John Wiley & Sons, 2005.
39. OLIVEIRA, D. P. R. *Planejamento Estratégico: Conceitos, metodologias e práticas*. Décima Edição, São Paulo, Atlas, Brasil, 2001.
40. SANDER, M.A. Characteristic function of the central chi-squared distribution. *Planet mathematics*. Retrieved March 6, 2009. Archived from the original (PDF) <<http://www.planetmathematics.com/CentralChiDistr.pdf>> on July 15, 2011.
41. IBGE. Instituto Brasileiro de Geografia e Estatística. *Cidades@: Bahia: Salvador: Panorama*. Available in: <https://cidades.ibge.gov.br/brasil/ba/salvador/panorama>. Accessed on: February 5, 2023.
42. BERNARDES, K; MIRANDA, S; STAUBER, C; PEREIRA, M; ARAGÃO, E; DOS SANTOS, E; LIVRAMENTO, H; BERTOLDO, J; SILVA, S; SKALINSKI, L; NATIVIDADE, M. Índice de vulnerabilidade epidêmica e a epidemia de covid-19 no município de Salvador-Bahia. *Nota Técnica*. Instituto de Saúde Coletiva, Universidade Federal da Bahia, 2021
43. KITETELE FN, LELO GM, AKELE CE, LELO PVM, MAFUTA EM, TYLLESKÄR T, KASHALA-ABOTNES E. "The Peer Educator Is the Game-Changer of My Life": Perceptions of Adolescents Living with HIV in DR Congo on Involving Peer Educators in the Process of HIV Disclosure. *Children (Basel)*. 2022 Aug 17;9(8):1239. doi: 10.3390/children9081239. PMID: 36010129; PMCID: PMC9406301.
44. KOPO, M., LEJONE, T. I., TSCHUMI, N., GLASS, T. R., KAO, M., BROWN, J. A., ... & AMSTUTZ, A. (2023). Effectiveness of a peer educator-coordinated preference-based differentiated service delivery model on viral suppression among young people living with HIV in Lesotho: The PEBRA cluster-randomized trial. *Plos Medicine*, 20(1), e1004150.
45. WHO. *Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach*. World Health Organization; 2016

46. PATEL, P., KERZNER, M., REED, J. B., SULLIVAN, P. S., & EL-SADR, W. M. (2022). Public Health Implications of adapting HIV pre-exposure Prophylaxis Programs for virtual service delivery in the context of the COVID-19 pandemic: systematic review. *JMIR Public Health and Surveillance*, 8(6), e37479.
47. MAGNO, L., SOARES, F., ZUCCHI, E. M., EUSTÓRGIO, M., GRANGEIRO, A., FERRAZ, D., & PrEP1519 Study Group. (2022). Reaching Out to Adolescents at High Risk of HIV Infection in Brazil: Demand Creation Strategies for PrEP and Other HIV Combination Prevention Methods. *Archives of sexual behavior*, 1-17.