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Combating HIV/AIDS prevalence in South Africa: Does foreign aid play a significant role?

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Abstract

The study employed a comprehensive graphical presentation and statistical analysis using data from 2017 to 2023 to assess how different dimensions of foreign aid impact the HIV/AIDS prevalence rate in South Africa. The finding suggests that as the proportion of foreign aid increases, HIV/AIDs prevalence tends to decrease. Consequently, result of funding for treatment has correlation (r = -0.657). This moderate negative association reinforces the traditional belief that investments in direct treatment are effective in reducing disease prevalence. The relationship between funding allocated to education reveals a notable positive correlation (r = 0.33) with HIV prevalence. Against this backdrop, the policymakers in South Africa should prioritize allocating resources to quality programs that have robust passthrough effects on HIV/AIDs reduction in the country. Also, given the current termination of about 40 USAID funded projects in South Africa, if the policymakers in South Africa desire to prevent further escalation of HIV prevalence in the country, they should explore substantive internal sources of fundings. *(Afr J Reprod Health 2025; 29 [12]: 42-50).*

Keywords: Foreign aid, HIV/AIDs, prevention, treatment

Résumé

Cette étude a utilisé une présentation graphique détaillée et une analyse statistique des données de 2017 à 2023 pour évaluer l'impact des différentes dimensions de l'aide étrangère sur le taux de prévalence du VIH/SIDA en Afrique du Sud. Les résultats suggèrent que plus la part de l'aide étrangère augmente, plus la prévalence du VIH/SIDA tend à diminuer. Par conséquent, le financement des traitements présente une corrélation (r = -0,657). Cette association négative modérée conforte l'idée reçue selon laquelle les investissements dans les traitements directs sont efficaces pour réduire la prévalence de la maladie. La relation entre le financement alloué à l'éducation et la prévalence du VIH révèle une corrélation positive notable (r = 0,33). Dans ce contexte, les décideurs politiques sud-africains devraient privilégier l'allocation de ressources à des programmes de qualité ayant un impact significatif sur la réduction du VIH/SIDA dans le pays. De plus, compte tenu de l'arrêt récent d'une quarantaine de projets financés par l'USAID en Afrique du Sud, si les décideurs politiques sud-africains souhaitent prévenir une nouvelle augmentation de la prévalence du VIH dans le pays, ils devraient explorer des sources de financement internes substantielles. *(Afr J Reprod Health 2025; 29 [12]: 42-50).*

Mots-clés: Aide étrangère, VIH/SIDA, prévention, traitement

Introduction

The international reaction to the HIV/AIDS epidemic in South Africa highlights huge contributions of the role of foreign aid in addressing public health crisis particularly being a country with the highest HIV/AIDS infection rates. South Africa portrays a case on how external assistance affects health outcomes and policy initiatives. Foreign assistance especially from the United States and other multilateral institutions has played important roles in ensuring and expanding access to antiretroviral therapy (ART) including implementing treatment, prevention, and education strategies, thereby enhancing the health infrastructure in the country[1, 2].

Foreign countries' financial assistance has been vital in fighting and containing various diseases in low- and middle-income countries which shows the continued interest in the global health. In addition, constant controversy over foreign aid reforms underscores the need to shift program ownership to South African institutions to make programs sustainable in the long term and autonomous nationally. The HIV/AIDS epidemic remains a major health concern in South Africa,

with an estimated 9.2 million infected and living with the virus[2]. The crisis is also caused by socio economic factors such as poverty and lack of immediate and quality health care accessibility, hence the need for demanding external support as a component of the nation's response.

Foreign aid has facilitated critical interventions including funding for treatment prevention, public health education and advocacy programs. Research highlights that health-focused foreign assistance improves outcomes by enhancing vaccination rates, improved access to treatment and fewer HIV/AIDS related mortality[1]**.** In addition, the connection between health emergencies and domestic stability highlights the wider ramifications of foreign assistance as proper disease control can provide social and economic stability.

The South African government has implemented various strategies to combat the disease, often with the support of international aids programs. The importance of foreign aid in addressing HIV/AIDS crisis has prompted increasing interest in assessing it effectiveness, challenges in implementation and long-term sustainability. This paper seeks to provide an in-depth analysis of the impact of foreign aids on HIV/AIDS in South Africa, examining the effectiveness of aids programs, challenges in delivering aid, and the durability of these efforts in combating the HIV/AIDS epidemic. This study will utilize mixed-methods approach, the research will use quantitative secondary data from different reliable sources including UNAIDS, government reports, academic literatures and data portals.

In this research paper, a comprehensive analysis of the effects of foreign aids in South Africa's HIV/AIDS infection rate will be examined. The research results are aimed to provide valuable information regarding foreign aid successes and limitations. The findings are expected to contribute to debate on how to design better aid to improve public health and the sustainability of South Africa's health care system.

Meanwhile, South Africa has one of the highest HIV infection rates in the world, with an estimated 9.2 million people living with HIV/AIDS in 2024[2]. The country's approach to combating the epidemic has expanded through several phases, influenced by political, social, and economic factors. In South Africa, the first reported cases of HIV/AIDS appeared in the early 1980s mostly among men who have sex with men (MSM) and individuals receiving blood transfusions[3]. By the mid-1990s an estimated 2.5 million South Africans were HIV positive[2]. The apartheid government largely ignored the crisis, with policies often racially motivated and failing to implement early prevention measures[4], this neglect resulted in a lack of early prevention measures allowing the virus to spread uncontrollably. The transition to democracy in 1994 coincided with a dramatic rise in infection rates, with an estimated 2.5 million people living with HIV/AIDS by the mid-1990s[2].

President Thabo Mbeki's initial skepticism regarding HIV/AIDS and his administration's promotion of alternative treatments led to huge challenges in tacking the epidemic promptly. He hesitated to approve antiretroviral therapy (ART) treatment while publicly questioned the link between HIV and AIDS, arguing that poverty and malnutrition were the primary causes of immunodeficiency[5]. The failure to swiftly respond and adopt the use of ART program resulted to an estimated death of 330,000 and more South Africans[5] which led to international criticism and fueled distrust in the government's response. Pressures from the civil societies who took the government to court and organized protests demanding government to adopt and implement as a policy and programs the access to ART played an important shift in the government's stance on HIV/AIDS in South Africa[6]. Interestingly, the Constitutional court in its ruling on the legal action filed by the civil society against the government compiled the government to provide ART to pregnant women to prevent mother-to child transmission[7]. President Mbeki eventual reversed course and implemented a national AIDS plan.

Under increasing pressure, the South African government began reversing its stance on HIV/AIDS in the mid-2000s. In 2003, a formal national ART program was introduced, albeit at a slow pace[8]. A turning point in South Africa's response to the pandemic was the election of President Jacob Zuma in 2009 whose government policy expanded the treatment initiative leading to substantial decline in HIV/AIDS related deaths[9]. Unlike President Mbeki, President Jacob Zuma's government public acknowledgement of the epidemic and implementing evidence-based policies prioritizing increased testing and treatment, public awareness and education resulted to positive

outcomes such as increased the numbers of people on ARV, reduction in the prevalence rate for people between the age of 15 – 49, fewer HIV related deaths, fewer babies contracting the diseases from their mothers and increased life expectancy.

South Africa by 2010 had the world's largest ART program due to the support of interventions from internationals institutions and foreign countries. The inflows of financial resources through foreign donations aided South Africa to gain momentum in tackling the epidemic. Major foreign aids came from U.S. President's Emergency Plan for AIDS Relief (PEPFAR), Global Fund to Fight AIDS, Tuberculosis, and Malaria, Multilateral Institutions such as World Bank, etc[10] led to significant improvement to accessing HIV treatments[11].

A combination of bilateral donors, multilateral organizations and international NGOs played pivotal roles in funding antiretroviral therapy (ART), prevention programs and healthcare infrastructure, key among them is the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) launched in 2003 is the largest single source of foreign aids on HIV/AIDS to South Africa[12]. The PEPFAR aid programs had contributed over $8b since its inception with core focuses areas of antiretroviral therapy (ART) expansion supporting over 3 million South Africans, HIV/AIDS prevention programs including voluntary medical male circumcision (VMMC) and highly risk prone population (adolescents, women, LGBTQ+ individuals). Research studies has shown that PEPFAR funded programs had helped reduced HIV/AIDs related death by nearly 20% between 2004 and 2012[13].

Methods

This study adopted a comparative statistical analysis approach in examining the influence of foreign aid on prevalence rate of HIV/AIDS in South Africa. Using a six-year interval data spanning 2017 – 2023 (with a gap in 2022) from the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Bank Group data bank[14]. This research exams the statistical relationship between foreign aids, core allocations as well as numbers of programs undertaken and rate of HIV/AIDS prevalence in South Africa.

Data analytical procedures

To assess the relationship between HIV/AIDS prevalence, foreign aid, and its allocation in South Africa, this study employs descriptive statistics such as mean, standard deviation, trend analysis to track changes over time, and graphical representation to visualize how the variables behave over the time[2,15,16]. These methods are widely used in health economics and epidemiology, ensuring a comprehensive understanding of foreign aid effectiveness in HIV response[17,18, 19. 20]. In addition, the study employed inferential statistics such as Pearson Correlation. This is because these technique helps to provide parameter which show how aid is associated with prevalence of HIV/AIDS in the country under investigation. This determines the direction and strength of the association between variables. Together, they present a clear and understandable image of the study area.

Table 1: Measurement of variables

Variable	Measurement	Source
Foreign aid;	Total foreign aid allocation. Foreign aids allocation to treatment of HIV/AIDs. Foreign aids allocation to prevention of HIV/AIDs. Foreign aid allocation to education, infrastructures and commodities	(UNAIDS)
Programs	The numbers of HIV/AIDS combined programs undertaken	(UNAIDS)
	Variable of interest	
Prevalence of HIV	Prevalence of HIV, total (% of population ages 15-49)	WDI

Ethical consideration

Ethical approval or consent to participate not required as the study made use of no human or animal subjects. The study made use of data from the sources which are publicly available online.

Results

Figure 1 illustrates the comparison of the amounts of foreign aid allocation to treatment measured in dollar value. The chart revealed the amount allocated to treatment started relatively higher in 2017 at about $679 million which was the peak and then decreases from 2019 onward, hitting its lowest point in 2021 at about $221 million.

The chart revealed the amount allocated to prevention within the understudied period 2017 – 2023 started low at about $329 million in 2017 then gradually experienced increased allocation in 2019 when it peaked at $640million. Since 2020 flow of funds allocated to prevention began to trend downward from $626 million (2020) to $415 million (2023). However, the chart revealed the amount allocated to infrastructure and commodities within the understudied period 2017 – 2023 started lower in 2017 with a peak in 2018 at $5million, thereafter began to experience gradual decline of inflow in these areas.

Fund allocations within the 2020s saw 2021 a renewed peak in allocation at about $3.7 million while 2020 was the least at $2.9 million during this era. Also, the amount allocated to education within the understudied period 2017 – 2023 started low at about $176 million in 2017 then gradually experienced increased allocation to 2019 when it peaked at $316 million. Since 2020 flow of funds allocated to education began to experience decline from $243 million (2020) but not getting to the 2017 amount.

Figure 2 shows the prevalence of HIV/AIDS measured in percentage from 2017 – 2023 with gap in 2022. HIV/AIDS prevalence generally increased from 2017 through 2020 these possibly reflects challenges in prevention or testing which may result to continued spread of the disease as such necessitated international efforts and support to curtail the spread as depicted by increase in foreign aid. However, from 2021 to 2023 HIV prevalence rate starts to decrease possibly reflecting the impact of ongoing interventions towards treatment, preventions and engagement programs.

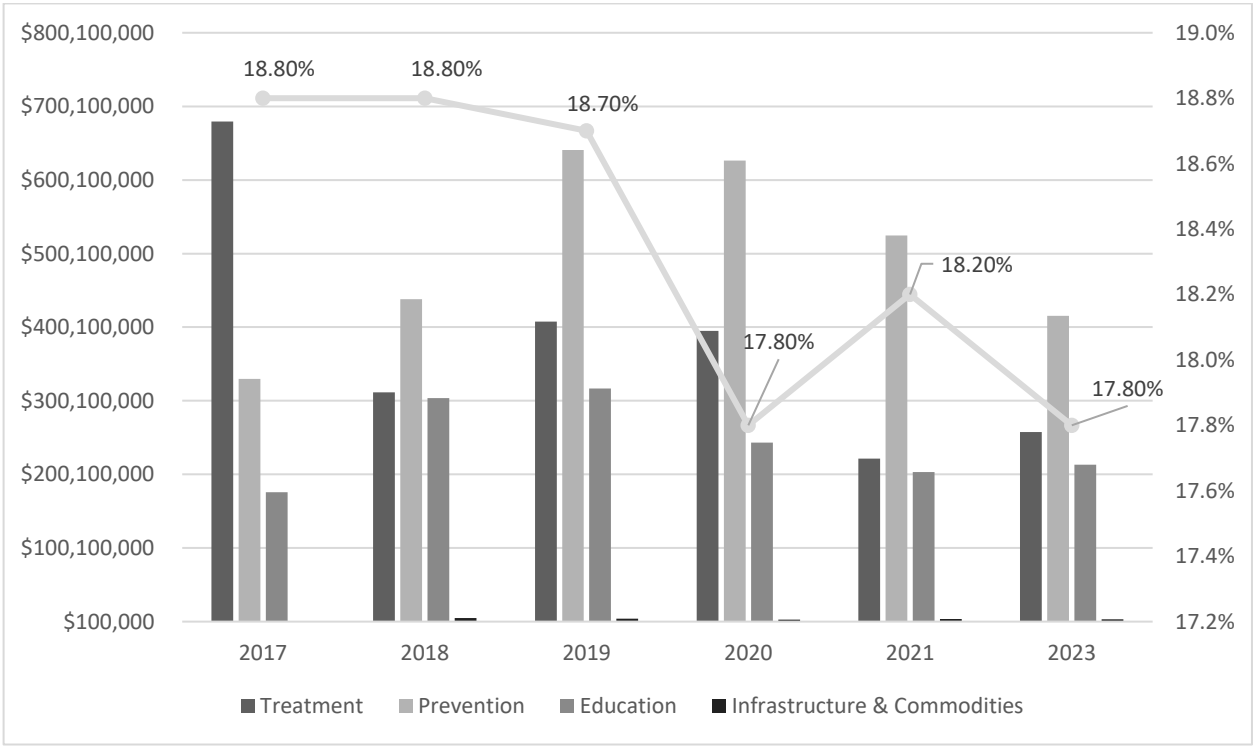

Figure 1: Foreign aids in South Africa (2017-2023)

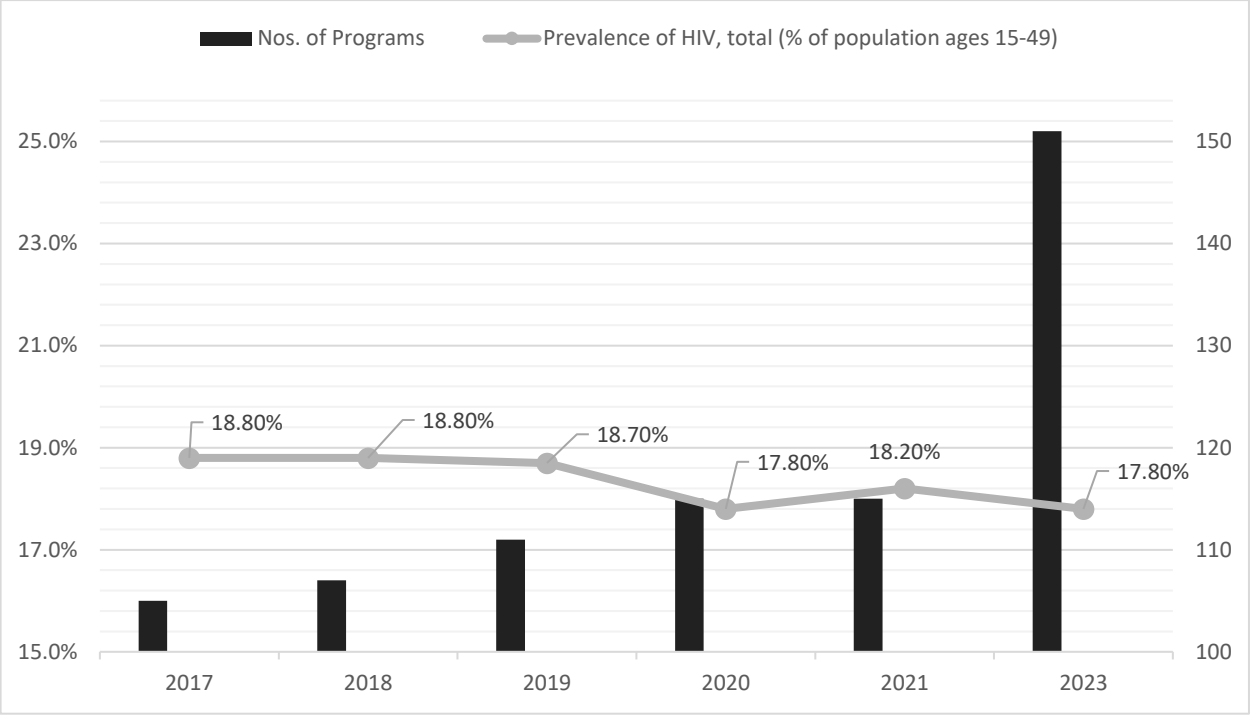

Figure 2: Numbers of HIV/AIDS combined programs undertaken and HIV/AIDS prevalence in South Africa (2017 – 2023)

Similarly foreign aid within this period of 2021 to 2023 began to experience decline potentially signaling that either donors are shifting focus to other priorities or South Africa's ability to effectively handle HIV challenges with fewer external resources. The chart further revealed that prevalence rate picked in 2017 and 2018 at 18.80% and has seen then declined gradually without reaching this level while % of foreign aid picked in 2019 at 25.62% thereafter declined.

Meanwhile, the chart showed that numbers of HIV/AIDS combined programs undertaken from 2017 to 2023 remain on a continued rise irrespective of the trend in foreign aid inflow. Despite the shrink in foreign aid from 2020 to 2023, the HIV/AIDS combined programs undertaken in South Africa continues to accelerate upward this may suggest quality of programs that influences the overall development outcome.

Table 2 shows the descriptive analysis of the percentage population of ages of 15 – 49 with HIV/AIDS prevalence rate in South Africa. The analysis revealed that the rate has mean value of 18.3% in which the median value of the population is 18.40%. Whereas fund allocation to prevention ranges from 247 million to 640 million with a mean of 496 million and standard deviation of 123 million while the fund allocation to treatment ranges from 221million to 793million with a mean of 379 million and standard deviation of 165 million. Fund allocation to education ranges from 139 million to 317 million with a mean of 243 million and standard deviation of 56 million. Fund allocation to infrastructure and commodities ranges from 79,832 to 5.02 million with a mean of 3.15 million and standard deviation of 1.6 million. Consequently, HIV/AIDS combined programs range from 98 and 151 with a mean of 117 and standard deviation of 16.

Table 3 shows that the first correlation co-efficient is -0.657 indicating a moderate negative correlation between funding to treatment and HIV prevalence rate. Similarly, correlation co-efficient of 0.3324 indicating a weak positive correlation between funding to education and HIV/AIDS prevalence rate. This suggest that as funding allocation to education increases, HIV prevalence tends to increase which may indicate that education

Table 2: Descriptive statistics of the study's variables

Variables	HIV/AIDS prevalence	Prevention	Treatment	No of programs	Education	Infrastructure
Mean	0.183500	4.96E+08	3.79E+08	117.3333	2.43E+08	3153909
Median	0.184500	4.81E+08	3.53E+08	113.0000	2.28E+08	3407932.
Std. Dev.	0.004806	1.23E+08	1.65E+08	16.99019	56800188	1686551
Skewness	-0.219041	5.58E-05	1.044810	1.559038	0.301883	-0.982967
Kurtosis	1.261764	1.594261	2.953144	3.804426	1.552285	3.036426
Jarque-Bera	0.803345	0.494026	1.092176	2.592374	0.615103	0.966555
Probability	0.669200	0.781131	0.579211	0.273573	0.735245	0.616759
Sum	1.101000	2.97E+09	2.27E+09	704.0000	1.46E+09	18923451
Sum Sq. Dev.	0.000116	7.61E+16	1.36E+17	1443.333	1.61E+16	1.42E+13
Observations	6	6	6	6	6	6

Table 3: Correlations between foreign aid and HIV/AIDS prevalence in South Africa

	HIV/AIDS
Treatment	-0.6570
Education	0.3324
Infrastructure	-0.0314
No of programs	-0.7176
Prevention	-0.2763

funding is directed towards high prevalence areas with a time lag before education efforts lead to reduction in HIV/AIDS prevalence.

However, correlation co-efficient is -0.0134 indicating a very weak negative correlation between foreign aid devoted infrastructure and HIV/AIDS prevalence rate, this suggest as the proposition of foreign aid to infrastructure increases, HIV/AIDS prevalence tends to decrease, though the rate might be very weak.

The correlation co-efficient is -0.7176 indicating a strong negative correlation between number of programs and HIV prevalence rate**.** Also, funding for prevention and HIV/AIDS prevalence have correlation coefficient of -0.2763, indicating a weak negative correlation between the two variables.

Discussion

The study employed a statistical analysis using data from 2017 to 2023 (with a gap in 2022) to assess how different dimensions of foreign aid relate to the HIV/AIDS prevalence rate in South Africa. Graphs, descrpitve statistics and correlation analysis were used to discern trends and relationships between the variables of interest. These methods have long provided a foundation for empirical research in health economics and epidemiology.

The foreign aid for HIV/AIDS prevention and HIV/AIDS prevalence have a weak negative correlation (r = -0.2763). This implies that generally foreign aid could help to reduce HIV prevalence. This reinforces the important role prevention plays in curbing the spread of any disease in the society. In the case of South Africa where the study confirms the existence of a weak relationship between foreign aid for HIV/AIDS prevention and HIV/AIDS prevalence. The weak performance probably reflects a reactive allocation model: efforts at prevention are strengthened in places already suffering high HIV prefevalence. To ensure a srong performance of foreign aid for HIV/AIDS prevention in South Africa, it is instructive to state that the policymakers in South Africa to take a proactive measure in using foreign aid to prevent further escalation of HIV/AIDS in the country.

When focusing specifically on funding for treatment, the correlation improves (r = -0.657), indicating a strong negative relationship between foreign aid allocation to treatment of HIV/AIDs and HIV/AIDS prevalence in South Africa. This result reinforces the traditional belief that investments in direct treatment are effective in reducing disease prevalence. Therefore, the trend encourages policymakers to consider maintaining or even increasing treatment allocations in order to ensure a sustainable reduction of HIV/AIDS prevalence in the country. Foreign aid allocation to HIV/AIDs treatment in South Africa should be a forward-thinking approach to ensure that an enhanced treatment efficacy is sustained in the course of reducing HIV/AIDS prevalence in the country.

Moreover, the relationship between funding allocated to education reveals a positive correlation (r = 0.3324) with HIV/AIDs prevalence. This

implies that foreign aid devoted to education did not reduce HIV/AIDs prevalence. Traditionally, it's believed that educational interventions take time to show a real impact on reducing prevalence. This finding highlights the need for long-term educational interventions in the country. As such, the policymakers and other relevant stakeholders in the country should embark on educating the illiterate citizens, especially those in the rural areas about the danger of unprotected sexual intercourse and other means through which HIV/AIDs spreads.

As regards investment in infrastructure and commodities, the data analysis reveals that there's a weak negative correlation (r = -0.0314) between investment in infrastructure and commodities and HIV/AIDs prevalence in South Africa. This suggests that funding in infrastructure and commodities though impacted on the rate of HIV/AIDs prevalence, the relationship is weak. Conventionally, we believe infrastructure to be a supportive element rather than a key player in health outcomes. Continuous investment in health infrastructure such as establishement of well equipped hospitals, HIV testing kits and gears, blood screening machine and other medical apparatus could spur a significant reduction in HIV/AIDs prevalence in the country.

Consequently, analysis of HIV/AIDS programs numbers depicts a strong negative correlation (r = -0.7176) with HIV prevalence. This indicates that simply ramping up the number of programs could improve reduction in HIV prevalence. It highlights the crucial role of program quality and the need for targeted implementation. This understanding necessitates the need to think strategically about how we allocate resources, emphasizing the importance of efficiency and impact rather than just the sheer number of programs.

The policymakers in South Africa should prioritize allocating resources to quality programs that have robust passthrough effects on HIV/AIDs reduction in the country. Also, given the current termination of about 40 USAID funded projects in South Africa, if the policymakers in South Africa want to prevent further escalation of HIV prevalence in the country, they should explore substantive internal sources of fundings. Similar to the findings of the study, recent evidence shows that travel burdens significantly affect healthcare utilisation, revealing systemic gaps that influence disease outcomes[21]. Emerging reports on vaccine-related complications further highlight underlying health-system vulnerabilities[22]. Similar findings emphasize the need for stronger surveillance and care structures[21]. These insights justify sustained, well-targeted foreign aid to strengthen HIV/AIDS response[24]. In conclusion, studies report growing evidence on COVID-19 vaccine-related complications such as Sweet syndrome, HLH, and VKH disease[25–27]. These findings highlight the complexity of post-vaccination responses. Additionally, disparities in nutritional conditions, gender inquality, and burden for healthcare access continue to shape health outcomes[28], underscoring the need for resilient health systems and targeted interventions.

Study strengths and limitations

This study offers a comprehensive analysis in its approach and provides important and timely empirical discussion about the impact of foreign aid on HIV/AIDS prevalence in South Africa. The use of graphical representations enhances clarity, facilitating trend visualization and comparative analysis. However, there are some important limitations in the research. Its analytical scope remains confined to graphical correlations, thereby omitting other determinants of HIV/AIDS prevalence that could be present, such as multiple sex partners among the youths, prostitution, unscreened blood transfusion and lifestyle. Further, reliance on correlation-based methods rules out causality inference, as observed correlations are not always indicative of direct causality.

Conclusion

This study has examined the trends of foreign aids allocation to treatment of HIV/AIDs, foreign aids allocation to prevention of HIV/AIDs, the numbers of HIV/AIDS combined programs undertaken and prevalence of HIV/AIDs in South Africa between 2017 and 2023. The findings reveal that foreign aid for HIV/AIDS prevention and HIV/AIDS prevalence have a weak negative correlation. This reinforces the important role prevention plays in curbing the spread of HIV/AIDs in the country. Similarly, further finding indicates a strong negative relationship between foreign aid allocation

to treatment of HIV/AIDs and HIV/AIDS prevalence in South Africa. Foreign aid allocation to HIV/AIDs treatment in South Africa should be a forward-thinking approach to ensure that an enhanced treatment efficacy is sustained in the course of reducing HIV/AIDS prevalence in the country. Moreover, HIV/AIDS programs numbers depicts a strong negative correlation with HIV prevalence. This highlights the crucial role of program quality and the need for targeted implementation. The policymakers in South Africa should prioritize allocating resources to quality programs that have robust passthrough effects on HIV/AIDs reduction in the country.

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