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Pattern, determinants, and impact of HIV spending on care and treatment in 38 high-burden low- and middle-income countries

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In the last 15 years, significant progress has been made to combat the HIV epidemic. Nearly 7.8 million AIDS-related deaths and 30 million new HIV infections have been averted by scaling up HIV services (1). Antiretroviral therapy (ART) particularly has been expanded to 15.8 million people living with HIV (PLHIV) (1). International and domestic funding has played an important role in the HIV response. From 2004 onwards, the Global Fund to Fight AIDS, TB, and Malaria and the President's Emergency Plan for AIDS Relief (PEPFAR) have disbursed US\$14 billion and US\$46.6 billion, respectively (2,3). In 2014, an estimated US\$20.2 billion was invested in the AIDS response in low- and middle-income countries (LMICs) (1).

Despite the progress, only 41% of the estimated 36.9 million PLHIV were receiving ART in 2014 (1). There were 2 million new HIV infections and 1.2 million AIDS-related deaths the same year (1). Countries are facing significant challenges in identifying the maximum number of PLHIV through testing and subsequently engaging them in care and treatment. To fast-track the HIV response and end AIDS by 2030, the Joint United Nations Programme on HIV/AIDS (UNAIDS) called for 90-90-90 targets for 2020 (4): 90% of PLHIV aware of their HIV status, 90% of PLHIV diagnosed on sustained ART, and 90% of PLHIV on ART with viral suppression. Achieving the 90-90-90 has resource implications – it will require

increase in spending and efficient utilization of HIV funding and lead to savings by preventing illness, deaths, and new HIV infections (5). Thus, how countries decide to allocate and prioritize their HIV funding will directly impact whether the end of AIDS is achieved.

This short article examines the pattern, source, determinants, and impact of HIV spending on care and treatment from 2009 to 2013 in 38 LMICs, which are home to 73% of PLHIV (6) [Table]. Data were available from UNAIDS *AIDSinfo* (6) on HIV prevalence, new HIV infections, PLHIV, PLHIV receiving ART, AIDS-related deaths, and HIV spending from both domestic and international sources for the following program areas: (a) care and treatment (including spending on ART), (b) HIV prevention, (c) program management and administration strengthening, and (d) others (which includes spending on orphans and vulnerable children, incentives for human resources, social protection and social services, enabling environment, and research). Data on per capita income came from the World Bank (7). The methods are described in detail elsewhere (8).

Total HIV spending and spending on HIV care and treatment

South Africa, the country with the highest HIV burden (18% PLHIV), had a total HIV

spending of US\$2.3 billion (2009 data). US\$1.6 billion or 70% of total HIV spending was on care and treatment. Comparatively, total HIV spending in Nigeria (9% PLHIV) was US\$570 million in 2012. US\$190 million or 33% of total HIV spending was for care and treatment. Based on the latest available data of the 38 countries, the percentage of total HIV spending allocated for care and treatment

ranged from 10% in South Sudan to 75% in Thailand (Figure 1). A total of 23 countries (32% PLHIV) spent less than 50% of their total HIV spending on care and treatment. In 2012, care and treatment accounted for approximately 46% of total HIV spending (data from 22 countries) versus 50% in 2009 (data from 33 countries; countries vary) (Figure 2).

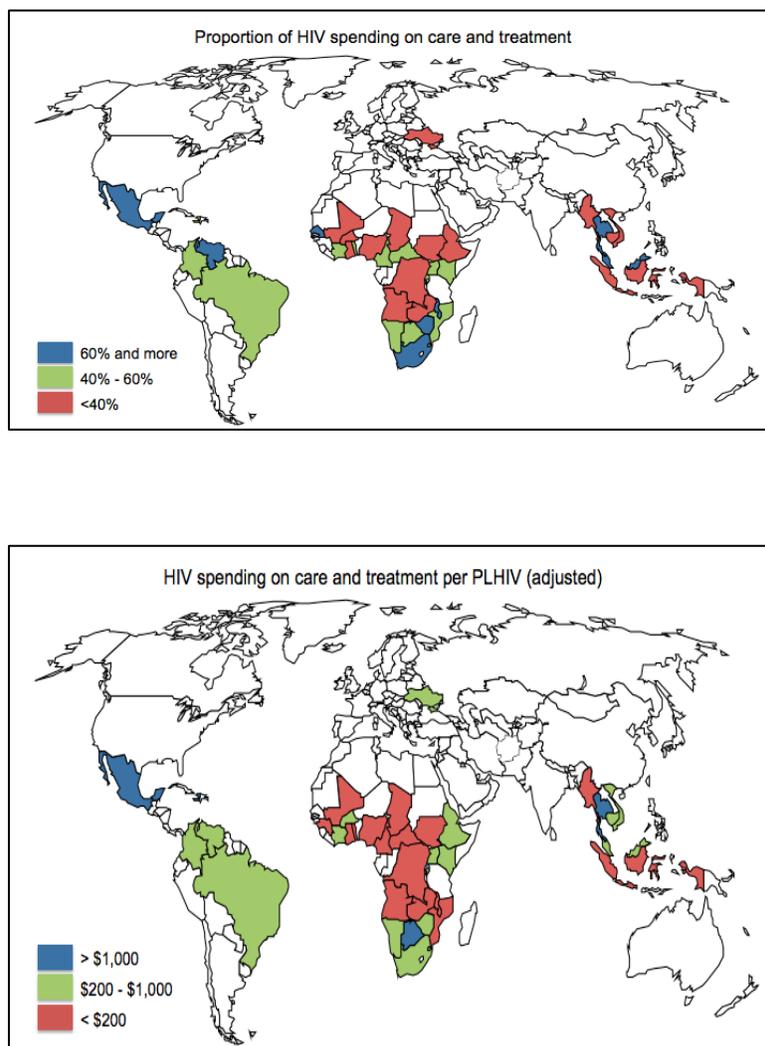


Figure 1. Proportion of HIV spending on care and treatment and HIV spending on care and treatment per PLHIV (adjusted) in 38 low- and middle-income countries, 2009 to 2013

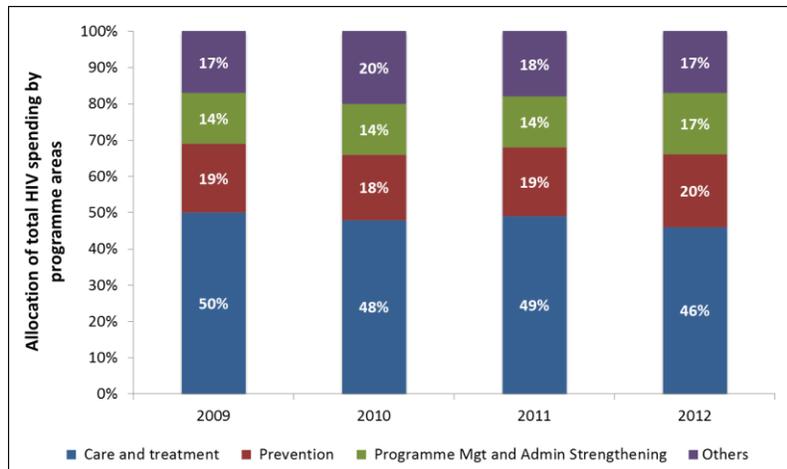


Figure 2. Spending trends by program area, 2009 to 2012. Of the 38 countries, data were available from 33 countries for 2009 (excluding South Africa), 29 countries for 2010, 33 countries for 2011, and 22 countries for 2012

Domestic and international sources of HIV spending on care and treatment

The latest data reported from 38 countries show that an average of 68% of funding for HIV care and treatment originated from domestic sources. In South Africa, 94% of HIV spending on care and treatment was from domestic sources. But 19 countries relied on international funding for more than 75% of their spending on care and treatment, with five countries funding 100% of their care and treatment spending from international sources. On average, lower-income countries had a higher proportion of HIV care and treatment spending financed from international sources.

HIV spending on care and treatment per PLHIV

‘HIV spending on care and treatment per PLHIV’ was defined as total HIV spending on care and treatment divided by number of PLHIV and was adjusted using the national price level to correct for the differences in prices of goods and services in countries. HIV spending on care and treatment per PLHIV varied from US\$33 in South Sudan to US\$3,316 in Mexico and was US\$518 in

South Africa (Figure 1). It was extremely low in Angola, Cameroon, Chad, Myanmar, and South Sudan. In most of the countries with HIV prevalence of 1%–10%, ‘HIV spending on care and treatment per PLHIV’ was below US\$200.

Per capita income as a determinant of HIV spending on care and treatment per PLHIV

HIV spending on care and treatment per PLHIV was found to be positively but weakly correlated to per capita income. On an average, middle-income countries were spending higher amounts on HIV care and treatment per PLHIV (Figure 3). But spending on care and treatment per PLHIV in some lower-income countries (Burundi, Haiti, Ethiopia, Rwanda, and Uganda) was similar to those in middle-income countries. In these low-income countries, more than 75% of the funding for care and treatment came from international sources. Regression analysis showed that the effect of per capita income on HIV spending on care and treatment per PLHIV (adjusted) was statistically significant ($P < 0.009$) (Figure 3). There was no correlation between HIV prevalence and HIV spending on care and treatment per PLHIV (figure not shown).

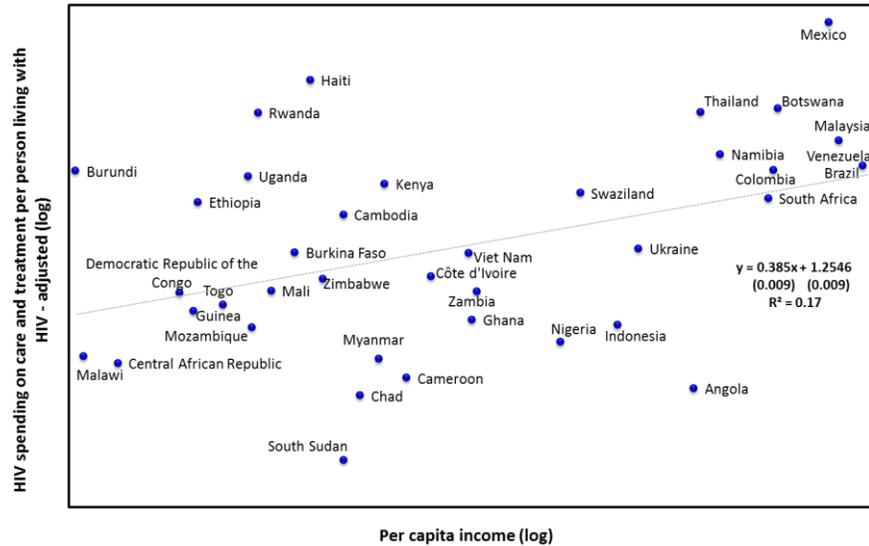


Figure 3. Scatter plot showing correlation between per capita income and HIV spending on care and treatment per person living with HIV (38 countries)

Average HIV spending on care and treatment per PLHIV (2009-2013) and association with ART coverage and AIDS death rate in 2013

Average spending on care and treatment per PLHIV between 2009 and 2013 was calculated over a varying number of years depending on the availability of data per country and adjusted using national price levels. Countries that spend more on care and treatment per PLHIV during 2009-2013 on average had higher ART coverage in

2013 and lower AIDS deaths rate (defined as AIDS-related deaths per 1,000 PLHIV) (Figures 4 and 5). Regression analyses showed that the effect of average HIV spending on care and treatment per PLHIV (2009-2013) on both ART coverage (2013) and AIDS death rate (2013) was statistically significant ($P < 0.0001$). A 10% increase in average spending on care and treatment per PLHIV was associated with an increase in ART coverage by 2.4 percentage points and a decrease in AIDS-related deaths by 2.4 for every 1,000 PLHIV (Figures 4 and 5).

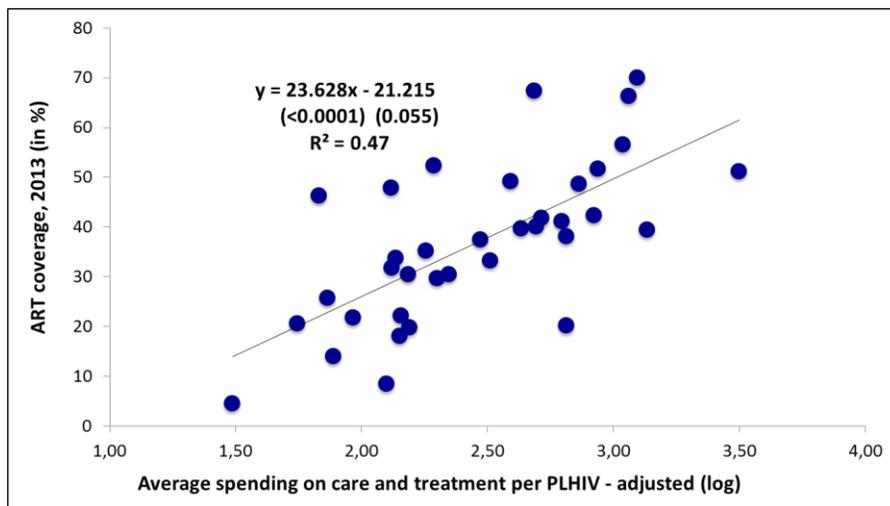


Figure 4. Correlation between average spending on care and treatment per PLHIV (between 2009 and 2013) and ART coverage in 2013

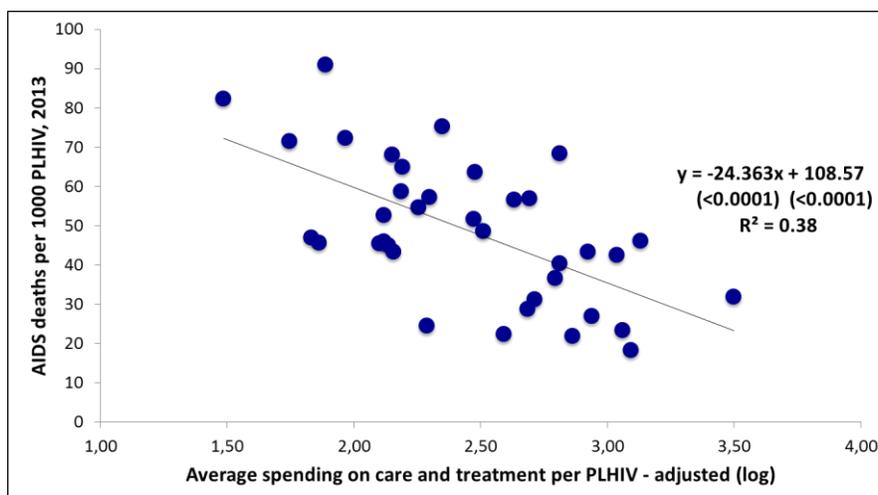


Figure 5. Correlation between average spending on care and treatment per PLHIV (between 2009 and 2013) and AIDS death rate in 2013

Increase the focus and efficiency of available investments to achieve UNAIDS targets

Investment in HIV care and treatment pays off as improved access to ART for PLHIV and subsequently few AIDS-related deaths, as shown in this article for high-burden LMICs. Despite these clear benefits, only 15 of the LMICs allocated more than 50% of their total HIV spending to care and treatment. There is a significant variation in the allocation of HIV funds for care and treatment among countries. A closer examination of the available data raises a significant concern, given that many of the high HIV burden countries in East and Southern Africa are spending less than 40% of their HIV funding on care and treatment (Figure 1). The other worrisome aspect of the trend analyses is the lack of increase in expenditure for care and treatment over time, despite a dramatic decrease in cost of ART in the past 5 years and change in WHO guidelines calling for ART for all PLHIV irrespective of CD4 count (9).

This study also illustrates a serious lack of complete financial data in the public domain. The lack of consistent reporting

over time precludes optimal trends. Thus, the results presented in this paper require cautious interpretation, particularly when examining trends. The details of care and treatment spending are not available publically, which would have helped evaluate specific costs and impact. This is also important when considering ways to more efficiently prioritize existing resources and the reduce time lag between interventions and health outcomes. Additionally, little is known about the quality and veracity of the country reported spending data. Contributions to the HIV response from communities and individuals living with HIV and their families are not captured by the spending data.

The 90-90-90 targets for 2020 come at a time when many countries, as well as PEPFAR and the Global Fund, are struggling to increase their funding levels. ART coverage is 41% (3), there are nearly 1.2 million deaths annually (3) and only 14 countries are recommending ART for all PLHIV globally (10). In this context, our study highlights the importance of increasing the focus and efficiency of available investments to ensure that all PLHIV have timely access to care and

treatment to achieve the new targets. Achieving the 90-90-90 targets will also require increased resources for care and treatment in many settings. With innovative means of service delivery including community testing and treatment delivery, decreasing the use of unnecessary laboratory tests such as CD4 counts for ART initiation, and providing patients with 6 months of ART, it will be possible to achieve efficiency gains and sustain the 90-90-90 targets.

This work benchmarks spending on HIV care and treatment in LMICs, highlights the relative lack of prioritization for care and treatment, and illustrates the gaps in available HIV spending data. It calls for efficient use of the investment to maximize the individual, community, and public health impact of the response to the global HIV epidemic.

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