Online search trend reveals declining interest in AIDS-related searches relative to
HIV- related searches in South Africa.

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Abstract

The Acquired Immune Deficiency Syndrome (AIDS), caused by the Human Immunodeficiency Virus (HIV) is a leading cause of mortality on the African continent and world. HIV and AIDS are among the greatest public health challenges confronting health authorities around the world. The greatest burden of HIV and AIDS is felt in sub-Saharan countries, with Nigeria and South Africa having the greatest incidence of the disease in the world. AIDS is the final stage of HIV infection, but with effective treatment and healthy living, HIV infection will not develop into AIDS. With increased awareness campaigns by national, regional and international health institutions, there has been an increased awareness on HIV and AIDS across the world. Using data from search query trends on HIV/AIDS submitted online on the most widely used search engine Google from 2004-2019, a decline in search interest for AIDS relative to HIV is revealed in South Africa. This trend mirrors progress on the ground in South Africa, with a decline in AIDS-related deaths and people living longer with the HIV virus. This observed trend might be an indicator that multilateral efforts at combating HIV/AIDS, particularly through awareness raising and behavioural interventions in South Africa is bearing fruit, not just on the ground, but also reflected in the online information seeking on the HIV/AIDS pandemic.

Keywords: HIV/AIDS, Web search, online behaviour, Big Data.

1. Introduction

HIV/AIDS remains a major public health concern for nations of the world, despite concerted efforts aimed at combating the disease. There are an estimated 37.9 (32.7-44.0) million people living with HIV (Human Immunodeficiency Virus) – the virus which causes AIDS in the world (1). The greatest burden of the HIV/AIDS scourge is felt in sub-Saharan Africa, with South Africa and Nigeria bearing the greatest burdens of the disease in the world. An estimated 7.7 million people were living with HIV and AIDS in South Africa in

2018, with an adult prevalence rate of 20.4% (1). In 2018, 71,000 South Africans died of AIDS related causes. Nigeria has the second highest number of new HIV infections globally after South Africa, and an estimated 1.5% of the population living with HIV (1). Having the largest population on the African continent, this translates to about 1.9 million people living with HIV as at 2018.

Considerable progress has been made in the fight against HIV/AIDS globally. Globally, an estimated 37.9 (32.7–44.0) million

people were living with HIV in 2018 (1), an increase from previous years (for example 35.3 million in 2012) as more people are receiving the life-saving antiretroviral therapy. At the same time the number of AIDS deaths is also declining with 770,000 deaths in 2018 (1), from 1.6 (1.4–1.9) million deaths in 2012, down from 2.3 (2.1–2.6) million in 2005 (2). Gains have also been made towards many of the 2020 Sustainable Development Goal targets and elimination commitments, although significant challenges remain (3).

A key component of the fight against HIV/AIDS has been behavioural interventions (4). A global meta-analysis of studies determined that behavioural interventions reduce sexual risk behaviour and avert sexually transmitted infections and HIV (4). Behavioural interventions typically involve harmonizing messages and the dissemination of information about HIV transmission and various prevention approaches using television, radio, outdoor advertising and information and communications technology. The outcome of all these behavioural interventions is that in sub-Saharan Africa, the percentage of young people (15–24 years) demonstrating comprehensive and accurate understanding of HIV has generally increased over the years. For example, this understanding rose by five percentage points for men and by three for women from 2002 to 2011, although knowledge levels remain low (5) (36% for young men and 28% for young women).

In South Africa, there have been a number of nationwide communication campaigns related to raising awareness of HIV and AIDS. Soul City and MTV Shuga are two examples of such multi-media campaigns with effective outcomes and promote good sexual health and well-being (6). Research into the impact of the Soul City and other communication campaigns found that they had a positive effect on the sexual behaviour of adults that had been exposed to the campaign message, for instance by bringing about positive changes in condom use and HIV testing (7).

In Nigeria, educational campaigns in schools, where Family Life and HIV Education lessons are part of the Nigerian school curriculum (8) and nationwide multimedia campaigns like the one created by the Society for Family Health (9) are thought to have been successful in increasing knowledge and changing behaviour.

The combined effects of these awareness campaigns have been an increase in knowledge and understanding of HIV/AIDS in these two countries. An outcome of an increase in awareness of HIV/AIDS in South Africa and Nigeria is probably that a percentage of the population will turn to the Internet via search engines for information on HIV/AIDS. Internet penetration in South Africa and Nigeria is put at 56% and 42% respectively (10).

An increasing number of people are using the Internet to support their healthcare (11) and search engines such as Google, Yahoo!

and Bing are often their first port of call. One of the early studies on search engine use found that one in every 28 (3.5%) pages viewed on the Web is a search results page, making the use of a search engine the second most popular Internet task next to email (12). Another early study found that worldwide there are over 6.75 million health-related internet searches carried out every day, representing approximately 5% of all internet searches (13). Search engine use is the most important approach to online information seeking (14), and a study by the Pew research centre found that half of all Internet users now use search engines on a typical day (15).

This paper examines trends in online search on HIV and AIDS on Google which is the dominant search engine worldwide (16) and is the top search engine in most countries with a few exemptions such as Russia (Yandex) and China (Baidu). In South Africa, Google is also the dominant search engine (16). Google data have been used severally in the aid of understanding health trends and in health forecasting (17 – 23). And although the use of Google search engine data in the aid of health and development in general have been criticized (24, 25) in recent years for an unbalanced and opaque approach which did not satisfy scientific transparency, in recent years organizations such as the World Bank (26, 27) and several government departments around the world have begun revisiting the behavioural BigData methods of search engines data in the aid of international development. Drawing on feedback from

the scientific community on the best practices of BigData research (28 – 33), particularly paying attention to integrating both BigData and ‘‘small data’’ (e.g. survey data and other traditional data collection mechanisms) to create more complete and accurate datasets, they have made significant advances in this field.

This paper shows that search data for the terms ‘‘hiv’’ and ‘‘aids’’ in South Africa for the years 2004 – 2019 both show a pattern of the search interest for ‘‘aids’’ declining relative to ‘‘hiv’’ (Figure 1) perhaps revealing increasing general understanding on the difference between HIV and AIDS, particularly the awareness that with proper treatment HIV infection may not lead to AIDS. This observed trend might be an indicator that multilateral efforts at combating HIV/AIDS, particularly through awareness raising and behavioural interventions in South Africa is bearing fruit. This relative shift in search interest mirrors the reality of the disease on the ground, with declining numbers of deaths from AIDS and with more people living with HIV in the country (Figure 2). The data from Google (34) however also shows that in the years under study 2004 – 2019, there was greater search volume for HIV relative to AIDS. This greater interest in HIV relative to AIDS is also reflected in other online information sources such as Wikipedia. For example, Pageview analysis of Wikipedia Afrikaans (35) also shows a greater interest in HIV over AIDS, from 2015 - 2020 (Figure 3).

2. Methods

Data on online searches on the terms “hiv” and “aids” were obtained on Google in order to visualize how searches were conducted on both search terms. Google trends data was obtained on the two search terms for 2004 - 2019. Data on regional interests in both search terms for South Africa were downloaded, together with the top and rising search queries related to “hiv” and “aids” was accessed via Google Trends (34).

3. Results

Search term trends for “hiv” and “aids” from 2004 – 2019 showed a decline in “aids” searches relative to “hiv” (Figure 1). This observed online behaviour mirrors progress on the ground for both HIV and AIDS where there has been a decrease in AIDS-related deaths and an increase in the number of people living with the HIV virus (Figure 2). Some of the most important search queries (top and rising) searched for by South Africans on “hiv” and “aids” can be seen in Tables 1 and 2. A complete visualization of the search data, regional interest in South Africa for the search terms “hiv” and “aids”, and rising and top search queries on “hiv” and “aids” can be accessed via Google Trends (34).

4. Discussion and conclusion

The data on the search terms “hiv” and “aids” in South Africa (2004 – 2019) reveals a decrease in interest over time in “aids” related search queries relative to “hiv” related search queries. This mirrors the progress on the ground in both countries where AIDS related deaths have reduced over the years and people have lived longer with the HIV virus as life changing medications have prolonged the lives of people living with the disease. Similarly, behavioural interventions through messages delivered through media sources, including the Internet in South Africa have increased the numbers of people with accurate understanding of the differences between HIV and AIDS (4). In response to these behavioural interventions a proportion of the populations in these countries will resort to the Internet via search engines to seek information on HIV and AIDS.

2010 marks a year when HIV infection has been accepted as a chronic condition. This is in line with WHO data, which indicates that the estimated number of people newly infected with HIV is in a declining trend since 2010, and so is the estimated number of deaths due to AIDS (36).

Figure 1: Search Interest in the search terms ‘HIV’ and ‘AIDS’ in South Africa, 2004 – 2019, accessed October 31 2020.

Figure 2: UNAIDS HIV and AIDS incidence statistics in South Africa (37)

Figure 3: Wikipedia Afrikaans pageviews statistics on hiv and aids 2015 – 2020, accessed November 5 2020.

Table 1: HIV, top and rising related queries 2014 – 2019

hiv aids	hiv/aids
aids	people with hiv
symptoms	signs of hiv
hiv symptoms	hiv negative
hiv and aids	what is hiv aids
hiv positive	what is aids
what is hiv	living with hiv
hiv test	tb
symptoms of hiv	hiv news
hiv cure	hiv aids in south africa
hiv in south africa	hiv meaning
hiv treatment	hiv prevention
hiv signs	what causes hiv
hiv infection	people living with hiv
hiv testing	effects of hiv
early hiv symptoms	how to get hiv
treatment for hiv	arv
hiv medication	hiv rash
hiv test kit	hiv and pregnancy
hiv pills	hiv symptoms men
hiv cure news	hiv positive news
meaning of hiv	hiv symptoms in men
cancer	sign of hiv
impact of hiv and aids	hiv symptoms women

Table 2: AIDS, top and rising related queries 2014 – 2019

hiv	aids symptoms
hiv aids	what is hiv
hiv and aids	what is hiv aids
aids in africa	hiv aids in south africa
aids in south africa	aids day
medical aids	hiv/aids
what is aids	what is hiv and aids
medical aids south africa	aids cure
hiv symptoms	hearing aids
hiv aids symptoms	world aids day
medical aid	people with aids
hiv and aids in south africa	medical aids in south africa
symptoms of aids	impact of hiv and aids
aids meaning	cure for aids
hiv cure	aids foundation
hiv and aids cure	symptoms of hiv and aids
visual aids	teaching aids
poverty	hiv aids statistics
aids 2016	aids statistics south africa
meaning of aids	causes of hiv and aids
discovery medical aid	aids stand for
difference between hiv and aids	definition of aids
bonitas (health cover)	aids symptoms

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