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Exploring HIV-AIDS interests in the MENA region using Internet based searches

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Abstract

Due to the scarcity of official data on sexually transmitted diseases in the Middle East and North Africa region (MENA), it becomes important to seek alternative indications on the online information interests and possible spread of such diseases. This paper uses news stories from 10 Arabic media outlets, Wikipedia views, and data from Google Trends as well as social media on the HIV-AIDS epidemic. In order to investigate whether Internet searches are driven or influenced by media coverage, the correlation between media coverage and Internet searches is examined. The results indicate that there are very weak to moderate correlations between the two as media coverage of HIV-AIDS is not a good indicator of public attention. Data sources that are more accessible, like Google and Wikipedia searches and social media, can provide a better understanding of public information interests. Also, data retrieved from Google Trends in relation to the search terms "AIDS treatment" and "AIDS symptoms" provide important indicators on the top cities from which searches often originate. The findings of the study can aid health practitioners in identifying interest in and awareness of HIV-AIDS in the MENA region.

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Introduction

According to data retrieved from Google Trends for the period from 2004 to mid-2015. AIDS is the most common sexually transmitted disease (STD) mentioned in Arabic language Internet search queries, reflecting individuals' concern about this condition in the MENA region. The other STDs included in the search are hepatitis, herpes, syphilis, and gonorrhea (see Figure 1).

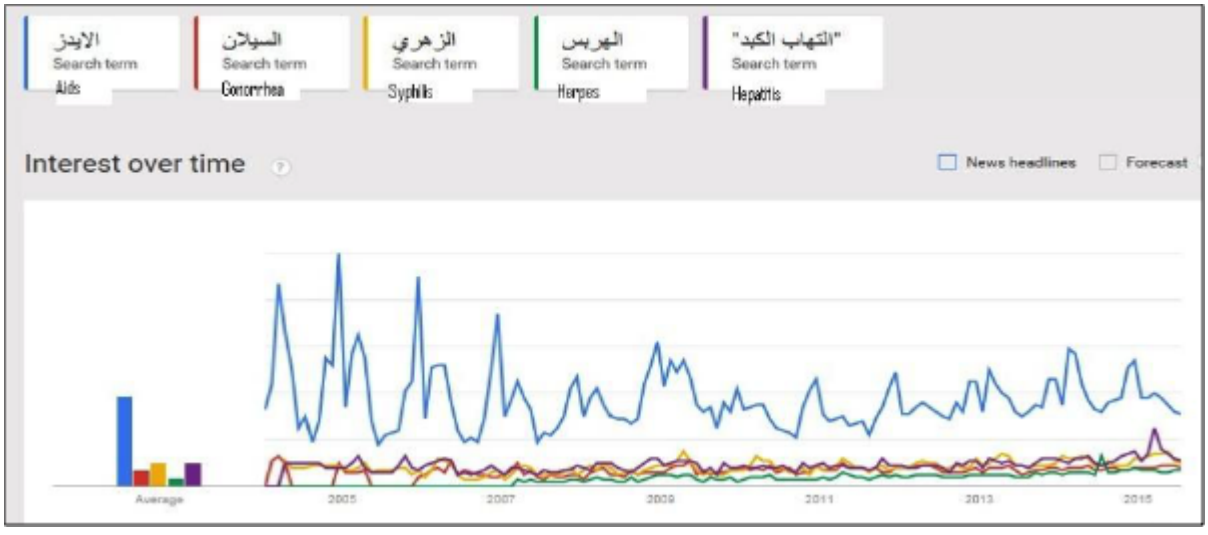

Figure 1: Google searches for five STDs in Arabic from 2004–2015.

Indeed, the MENA region is witnessing increasing rates of AIDS which is regarded as among the fastest in the world; for example, UNAIDS estimated in 2011 that about half a million people live with AIDS [1]. The highest number of estimated infections was recorded in Sudan 34,000–70,000 [2]. 'In 2013, there were an estimated 230,000 [160,000–330,000] adults and children living with HIV in the [MENA] region. Five countries — Algeria, Islamic Republic of Iran, Morocco, Somalia and the Sudan — account for 88 percent of these' [3]. Unfortunately, many Arab governments provided very little data on such infections due to the lack of funding and reluctance to seriously address this epidemic. Also, UNAIDS reports do not include data on over a dozen Arabic-speaking countries, making if difficult to understand real numbers of estimated infections.

Most of HIV infections in the Middle East region occur due to risky practices like 'men who have sex with men, female sex workers, and people who inject drugs', while young women in particular suffer the most because of the stigma associated with the disease [4]. One of the main obstacles in understanding the spread of this disease is the 'shortage of data on HIV in countries across the region; specifically in United Arab Emirates, Iraq, Kuwait, Libya, Bahrain, Qatar and Saudi Arabia' [5]. Also, Bozicevic, *et al.* [6] confirm that data on HIV in 10 MENA countries is 'still largely unknown' as research studies on HIV in the region are highly limited [7]. For example, it has been indicated that there are needs for more efforts to collect data and pro-active screening of HIV patient in Saudi Arabia [8] because of the shortage in studies and necessary information. In 2014, there were around 21,761 AIDS patients tested positive with the virus in Saudi Arabia, amongst them 6,334 Saudis and 15,427 non-Saudis. There seems to be a steady increase in the number of infected people since the Kingdom recorded 18,762 AIDS infections in 2012 including 5,348 Saudis and 13,414 non-Saudis. The first recorded AIDS case was registered in 1984 [9].

One of the main reasons behind this lack of data is the kind of cultural stigma associated with HIV-AIDS. In fact, people with HIV are facing the 'sort of discrimination that characterized the early years of HIV in the West, including mandatory HIV testing, restrictions on international travel, barriers to employment and housing, and difficulty obtaining medical care and health insurance' [10]. As a result, many people possibly infected with HIV avoid testing for the disease due to fears like receiving poor treatment by health practitioners or suffering physical violence by family members [11].

On the other hand, there have been some positive developments in the region like establishing a few national HIV associations to create public awareness and provide support for patients. For example, the Omani HIV-positive (literal translation is co-exist) (https://twitter.com/Omani_hiv) has a famous Twitter hashtag with the same name. Another association uses the motto 'Be more aware' (https://twitter.com/CO_HIV) which targets AIDS patients who speak Arabic. 'Be more aware' has also become a popular hashtag on Twitter.

Due to the general lack of data on HIV-AIDS in the MENA region and in order to assist researchers and health practitioners in detecting information interests in HIV-AIDS, this study attempts to shed light on this important area of research by answering a couple of research questions on the correlation between media coverage and search interests in AIDS on Google, Wikipedia, and Twitter as well as exploring the top cities from which Arabic Google searches on STDs originate.

Method

For the purpose of this study, the news headlines of ten famous Arabic media outlets were retrieved from their Twitter accounts using a subscribed commercial service called Crimson Hexagon. The Arabic media outlets included variety of mainstream print and broadcast media which are among the most popular in the Middle East: Al Jazeera, BBC, Russia Today (RT), CNN, France24, SkyNews Arabia, Al Arabi, Al-Hayat, Al Sharq Al Awsat, and Al Arab. A total of 298,533 headlines of news stories from 2014 were examined using a computer assisted program called WordStat — QDA Miner. The total number of stories posted along 2014 provided an important insight into the salience of AIDS coverage (see Figure 2).

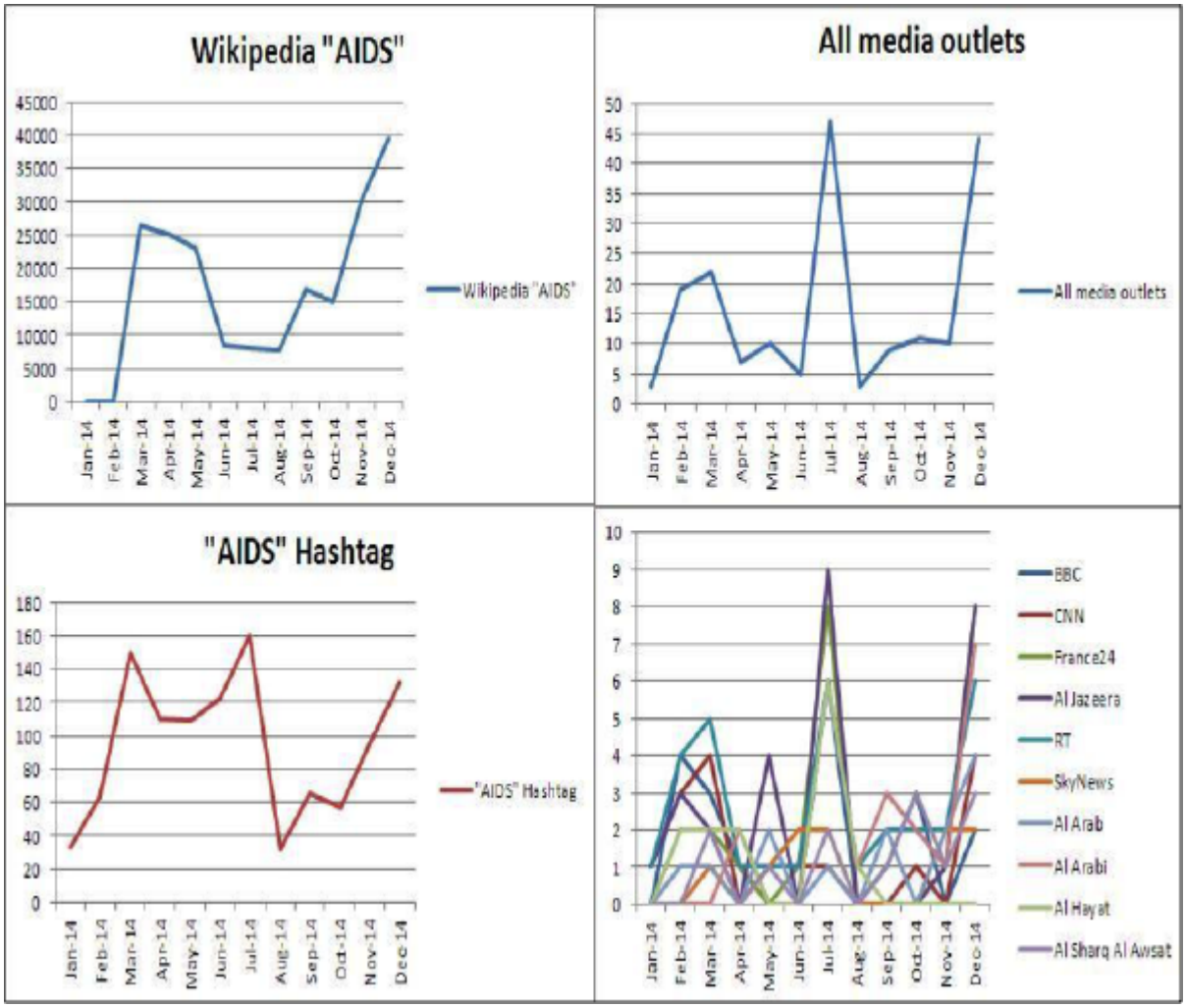

Figure 2: Monthly distribution of AIDS coverage by all Arabic media outlets, "AIDS" hashtag, and "AIDS" Wikipedia in 2014.

In relation to Arabic media coverage in 2014, a total of 190 unique news stories referred to AIDS (الأيدز), constituting 0.06 percent of the whole coverage (see Table 1). To ensure no duplicate stories were used, the sample was manually examined. Some studies examined the correlation between 'the amount of English, Spanish and French language HIV/AIDS news online and country-specific HIV/AIDS prevalence estimates' [12]. However, since HIV-AIDS estimates in the MENA region are not available for many countries as stated earlier, news coverage in Arabic will be compared to other indicators, such as Google and Wikipedia Arabic searches as well as Twitter data.

Media outlets	Total no. of news stories	Frequency
1. CNN	20,562	16
2. BBC	16,516	20
3. France24	23,084	23
4. RT	38,408	32
5. Al Jazeera	33,124	28
6. SkyNews	33,097	10
7. Al Hayat	27,182	13
8. Al Arabi	60,209	22
9. Al Sharq Al Awsat	39,866	13
10. Al Arab	27,044	13
Total	298,533	190 (0.06%)

Table 1: Frequency of AIDS news coverage along the 10 Arabic media outlets in 2014.

The media coverage is then compared to aggregate data retrieved from Google Trends (www.google.com/trends/). The search term 'AIDS' in Arabic (الأيدز) was used in this study since the Arabic term 'human immunodeficiency virus' (HIV) was not as popular as the former one, based on a Google search. Google Trends has been used in previous studies to monitor, detect, and track the spread of diseases like flu and Dengue (www.google.org/flutrends — www.google.org/denguetrends) and examine their geographical locations [13] especially if the search results are compared to other indicators like CDC or WHO data. It is important to note here that using Google Trends for disease surveillance is mostly useful in higher income countries like Saudi Arabia where Internet access is high [14], whereas in other low income countries like Sudan, access to the Internet can be more difficult. For example, Internet access in Sudan is often 'challenging for Sudanese citizens in 2014–2015 as a result of increasing costs and declining quality of services. Extremely slow internet speeds were experienced during several political contentious periods, leading to strong suspicions of government throttling' [15]. In comparison to the Middle East region, Internet access is moderate (29 percent of the population) [16]. In general, Iraq (36.2 percent), Syria (29.1 percent), Yemen (24.1 percent), Palestinian territories (44.7 percent), Algeria (36.8 percent), Egypt (36.5 percent), Libya (43.7 percent), Sudan (25.8 percent), and Somalia (5.8 percent) have low Internet penetration rates in comparison to the other MENA countries [17].

In terms of the use of Internet-based searches in monitoring the spread of viruses, Jena, *et al.* [18] used Google Trends to predict new diagnosis of HIV cases, while Zheluk, *et al.* [19] found a strong correlation between HIV prevalence based on official statistics and Google searches for HIV-AIDS in the Russian Federation. Numerous other studies referred to, or emphasized, a correlation between the rates of sexually transmitted infections and Google Trends searches [20]. Finally, Schootman, *et al.* [21] rightly stresses that it is not correct to completely rely on Google searches in identifying some medical cases like cancer screening because they are 'not a suitable substitute for, but may complement, traditional data collection and analysis about cancer screening and related interests'.

Since the 'AIDS' search term is relatively broad, this study is limited to two of its most associated terms in Arabic Internet searches in 2014, 'treatment' (علاج) and 'symptoms' (أعراض), according to the top associated terms of a Google Trends search. These two associated terms give a better indication of specific information needs on this disease. The year 2014 has been chosen because of data availability as the study compares Arabic media coverage in 2014 with other sources of data to examine whether online information interests in sexually transmitted diseases are triggered by media salience. Previous studies found very strong correlations between media coverage and Google searches for current events [22]. Other studies focused on the way news media coverage directly influenced Internet searches like those conducted on Ebola virus trends [23] or the way celebrity cancer diagnoses promote primary cancer prevention [24] as well as various other issues [25].

Also, the top cities from which searches for 'AIDS treatment' and 'AIDS symptoms' are identified based on the Google Trends data, providing some indications into the possible areas of interest in this STD in the Arabic-speaking MENA region.

As for social media data that is taken from Twitter, this study examined a famous hashtag called 'AIDS' in Arabic (الأيدز) and 1,127 tweets posted in 2014 were retrieved. This hashtag is frequently used by the two HIV national associations cited above to spread their messages on social media. Data from social media has been used as a predictor for disease mortality [26].

Finally, the Wikipedia 'AIDS' page in Arabic was also studied to investigate the monthly page views throughout 2014 and compare the monthly attention to that of media coverage. Previous studies on Wikipedia were used to quantify medical-related entries [27] and to monitor and predict global diseases [28].

Results and discussion

In order to understand the correlation between media coverage and search interests in AIDS, a Spearman's correlation statistical test was run. The test determines the ranking relationships between the coverage of Arab media outlets and Arabic Google searches for 'AIDS symptoms' and 'AIDS treatment' throughout 2014. The correlation between the two data sources helps in understanding whether the two Internet searches are influenced by media coverage. Pearson Chi Square test revealed no significant differences among Arabic media outlets in relation to their frequency and volume of AIDS coverage. AIDS coverage received only 0.06 percent of media attention (n = 190) which is a very small percentage that could be linked to the cultural stigma associated with this epidemic or other unknown factors. In other words, there is no special interest in covering and reporting on this disease despite its impact and the risks associated with it. This finding corresponds with the results of another study that examined news sources and their correlation with HIV prevalence; 'some countries with elevated HIV/AIDS prevalence (>10 percent) had extremely poor HIV/AIDS-specific media attention, including South Africa, Namibia and Zimbabwe' [29].

The results indicate that the correlation between media outlets and the search for 'AIDS symptoms' is very weak: rs = .112, n = 12, p < 0.05, while the correlation with 'AIDS treatment' is moderate: rs = .552, n = 12, p < 0.05. This is due to the February and March 2014 peaks in AIDS attention (see Figure 3).

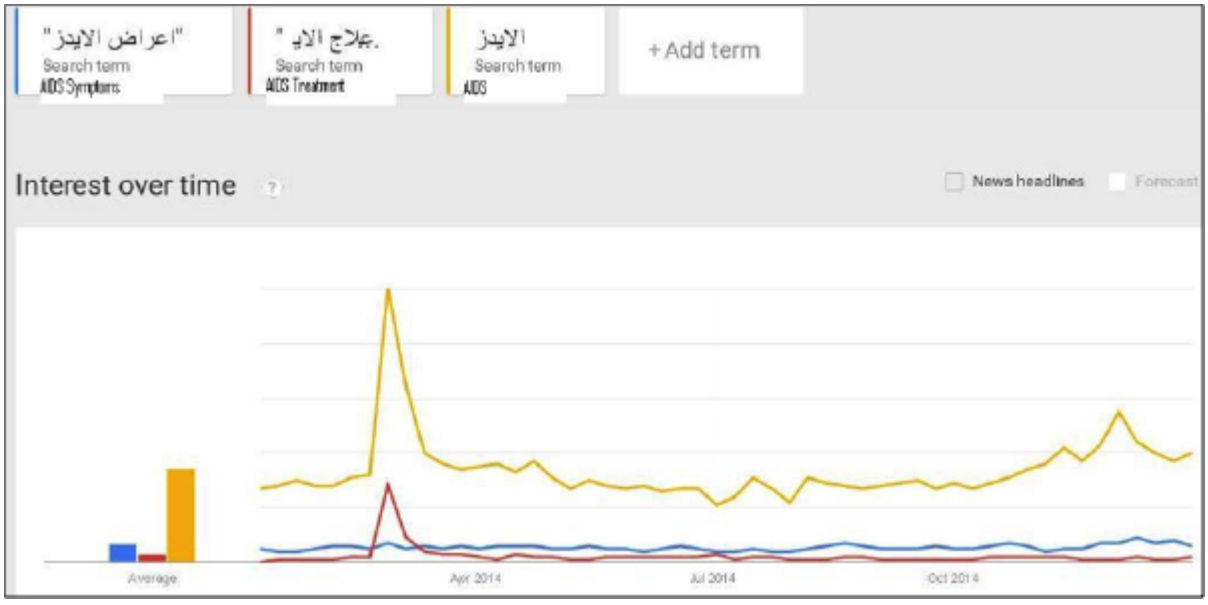

Figure 3: Google search in Arabic in 2014 for AIDS and its symptoms and treatment.

In brief, the statistical tests show there are very weak to moderate correlations between media coverage and Google search for AIDS symptoms and treatment.

As for Wikipedia 'AIDS' page in Arabic, the Spearman correlation test showed a very weak relationship: rs = .147, n = 12, p < 0.05. Yet when it comes to social media, the 'AIDS' Twitter hashtag showed a strong correlation with media outlets coverage: rs = .622, n = 12, p < 0.05. The 'AIDS' hashtag is the only data source showing a strong correlation with media coverage. On the contrary, Google search for 'AIDS symptoms' and Wikipedia 'AIDS' page showed very weak correlation with media outlets, while Google search for 'AIDS treatment' was moderately correlated with media coverage. What is important here is that the public need for information, manifested in the two Google searches and Wikipedia 'AIDS' page views, provides an indication that there is a genuine interest in HIV-AIDS that is not driven or influenced by media salience. Due to the cultural stigma associated with AIDS in the MENA region as indicated earlier, it is expected that

these Internet searches are motivated by people who are curious about this epidemic, seeking further information for possible protection or general health guidance.

It is important to note here that on 1 December 2014 the Saudi Ministry of Health launched an AIDS awareness campaign in coordination with UNAIDS and WHO that was entitled 'Cure & Prevention for Life' [30]. This awareness campaign can explain the sudden increase in references to AIDS in December along media outlets, Wikipedia search, and Twitter (see Figure 3). Indeed, other variables might be relevant here such as the launching of different awareness campaigns in other Arab countries; this is, of course, one of the limitations of this study.

As for the top cities from which searches for STDs originated, Google Trends aggregate data shows that major cities in Sudan, Saudi Arabia, Kuwait, and Jordan come first in relation to searches for hepatitis, herpes, syphilis, and gonorrhea (see Figure 4). As for searches for 'AIDS symptoms' (أعراض الأيدز) and 'AIDS treatment' (علاج الأيدز), the results indicate that Khartoum in Sudan comes first in such searches which corresponds with UNAIDS figures on the HIV epidemic in the MENA region, as cited above (see Figure 5). What is important to observe here is that Saudi Arabian cities are very prominent in the two searches especially Jeddah and Riyadh.

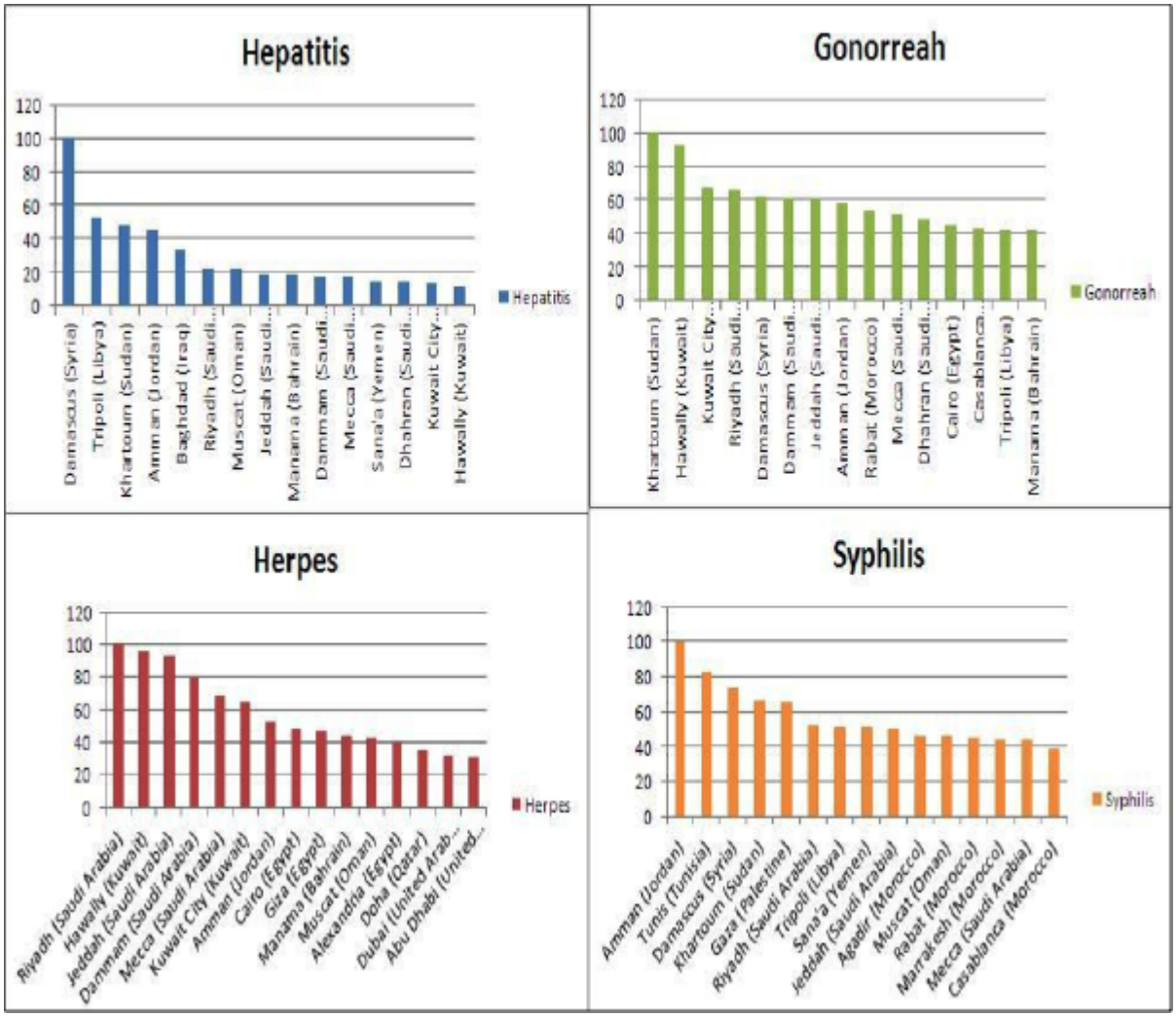

Figure 4: Top cities distribution based on their STDs Google searches in Arabic from 2004–2015.

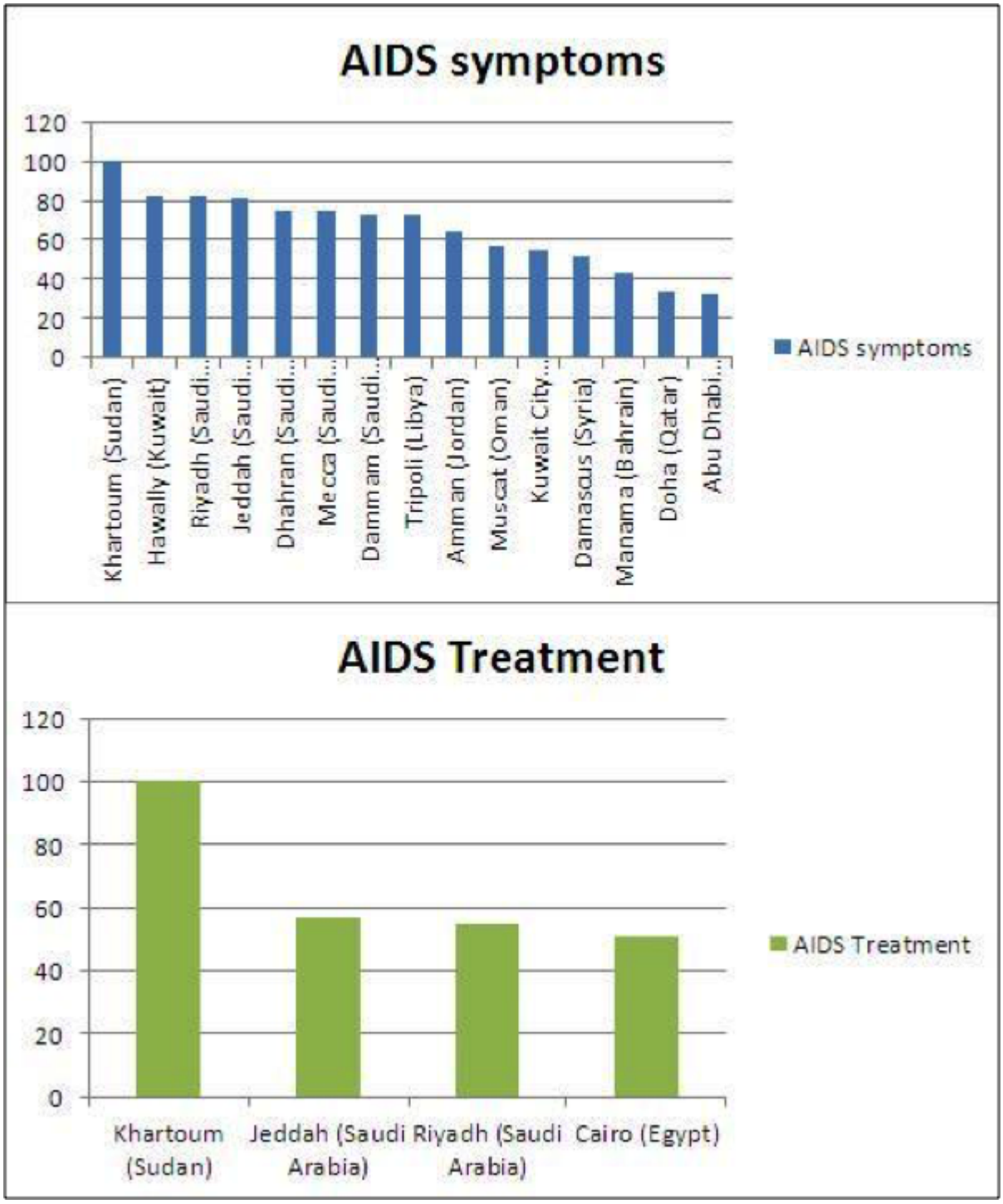

Figure 5: Top cities based on their AIDS symptoms and treatment searches in Arabic from 2004–2015.

In conclusion, Internet searches, whether on Google or Wikipedia, provide important indicators on the interests in STDs due to the shortage of data on such diseases in the MENA region. This paper can help health practitioners in understanding some of the main STDs that are 'trending' in the region. Also, it is important to examine Google and Wikipedia searches as well as social media data independently, especially since these data sources are easily accessible and are driven by public information interests rather than being produced by elite groups, like journalists and editors who manage formal outlets represented in mainstream media.

Study limitations

This study is limited to exploring Internet-based searches of AIDS in Arabic in the MENA region in 2014. Other contextual factors and variables, such as HIV/AIDS and related campaigns or other initiates whether be launched by local governments, international NGOs, or other entities in the area need to be considered, as these might also influence Internet searches on the topic. Another limitation of this study is that Facebook was not included, because it was not possible to extract data from Facebook searches. For future research, it is possible, instead, to conduct a study on public Facebook pages on the HIV/AIDS epidemic, as well as Facebook closed and open groups dealing with the same issue and in multiple languages. Further, it is important to include these different variables and compare other sources of information with Internet-based searches in order to reach a better understanding of the issue. Due to the low number of news stories covering HIV in the MENA region as well as the limited details provided by Google Trends, it was not possible to examine correlations between specific news coverage and their association with alternative specific Internet search terms.

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Notes

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