SciDoc Publishers
Infer, Interpret & Inspire Science

International Journal of HIV/AIDS and Research (IJHR)
ISSN 2379-1586

HIV/AIDS and the Millennium Development Goals: A Public Sentiment Analysis of World AIDS Day Twitter Chat

Research Article

Odlum M[1*], Yoon S[2]

[1] Assistant Professor of Nursing, School of Nursing, Columbia University, New York, NY, USA.
[2] Associate Research Scientist, School of Nursing, Columbia University, New York, NY, USA.

Abstract

The Millennium Development Goals stimulated the belief in an AIDS-free generation and an end to the pandemic. Our study explored public sentiment on HIV/AIDS. Tweets were collected during a live three-hour, Twitter chat by ABC News' chief health editor; on World AIDS Days 2013. Content mining was conducted. Tweet topics were identified using n-gram based natural language analytic process. Aggregated Tweets were summarized. Hot topics discussed were visualized. Participant locations were also geo-mapped. Prevention, treatment, resources, vaccine, stigma and an AIDS free generation were identified as the most frequently tweeted topics. Our study systematically summarized and visualized HIV/AIDS-related tweets. Results indicate how twitter can serve as a valuable resource for communication and insight into perspectives. In the post-2015 agenda, understanding public sentiment is vital. Perceptions can motivate stakeholders to meet the needs of those infected and affected by HIV/AIDS.

Keywords: Twitter; Social Media; HIV/AIDS; Millennium Development Goals.

Abbreviations: The Millennium Development Goals (MDGs); Human Immunodeficiency Virus (HIV); Acquired Immune Deficiency Syndrome (AIDS); Pre-Exposure Prophylaxis (PrEP); The Joint United Nations Programme on HIV/AIDS (UNAIDS).

Introduction

The Millennium Development Goals (MDGs) outlined a comprehensive vision and framework for the United Nations development activities [1]. The MDGs served as a guide for priority-setting, stakeholder mobilization and for the allocation of resources [1]. In the fight to combat HIV/AIDS, MDG 6 sought to ensure universal access to treatment by 2010 and to halt and begin the reversal of the spread by 2015 [2].

HIV/AIDS efforts were fueled by political commitments, investments and aspiring targeted goals [1]. In spite of the tremendous strides made, there is still a ways to go for these goals to be realized. By the end of 2013, 26 countries reported reducing new infections by 50 percent from the 2001 infection rate. However, 90 percent of new infections remained in 21 priority countries located in sub-Saharan Africa [3]. In the same year, only 24 percent of HIV infected children and 36 percent of infected adults were actually on treatment. The end of 2013 left 2 years to achieve the original goals [3]. A great sense of optimism existed for effort, but accelerating progress by 2015 was of concern, as a refined approach was needed. Substantial barriers remain for achieving the goals for HIV prevention, treatment and care [2]. However, success is also determined by public belief and sentiment on progress to date. Public opinion present means for HIV/AIDS stakeholders to provide effective services to the public.

Twitter, a microblogging social media platform allows for fast exchange of thoughts and ideas, allowing users to post messages of 140 characters called tweets and to follow other uses to receive additional tweets [4, 5]. Social media platforms like Twitter, allow for the assessment of user-generated content to explore insights and to inform and assess a variety of outcomes [4, 6-8]. Tweets have been used successfully to track diseases, life events, natural

***Corresponding Author**:
Michelle Odlum, EdD, MPH,
Assistant Professor of Nursing, School of Nursing, Columbia University, 617 W 168 Street, New York, NY, 10032, USA.
E-mail: mlo12@columbia.edu

Received: October 21, 2016
Accepted: November 10, 2016
Published: November 14, 2016

Citation: Odlum M, Yoon S (2016) HIV/AIDS and the Millennium Development Goals: A Public Sentiment Analysis of World AIDS Day Twitter Chat. *Int J AIDS Res.* 3(9), 134-137. **doi: http://dx.doi.org/10.19070/2379-1586-1600026**

disasters and for the assessment of public perception on health issues [4, 5, 9, 10], including the achievement of the MDGs. In addition to sending and receiving tweets, Twitter also holds chats that are thematic multilogues. Live chats hosted on Twitter allow web users to connect and discuss topics of interest or concern. Twitter chats, generally hosted by expert panelists, bond and connect individuals in discussions that take place in real time, on a particular subject matter. A predetermined hashtag is used to allow participants to identify relevant tweets. This also allows participants to search and follow the predetermined hashtag, allowing tweets to have wider visibility and for participants to engage with other chat members. Chats allow global conversation in addition to asking questions and learning about the chat topic. On December 1, 2013, ABC News conducted a Twitter Chat on Advances in HIV/AIDS. The objective of the current study was to discover and efficiently summarize the contents of HIV/AIDS Tweets from the ABC News Twitter Chat. Our analysis provides a greater understanding of public perceptions on efforts to combat HIV/AIDS. Participant Tweets can be used to inform and modify initiatives for ongoing priority setting to combat HIV/AIDS.

Materials and Methods

Tweets were collected from a three hour, live HIV/AIDS Twitter chat, by ABC News' chief health editor on Dec 3, 2013. A total of 399 unique Tweets, delivered to 7,221,990 Twitter users, were extracted with geocodes via NCapture software.

Data Analysis

Response frequencies were aggregated using n-gram based natural language processing [11, 12] and represented asan n-gram. Stop words, which are meaningless words/phrases (e.g., @ abcdrbchat) were removed from analysis. Topics were visualized in a bubble chart. An inductive thematic analysis was conducted to assess tweet content. The 399 unique tweets were aggregated and analyzed to determine public sentiment regarding the fight to eradicate HIV/AIDS. Category codes were applied to the elected tweets and refined to produce 80 categories. Coding categories were examined, cross-referenced with the data and themes identified to comprise the four overarching coding categories of Overall Perceptions, and informed by the three principal domains of HIV Prevention, Treatment and Care. Under each overarching coding categories, ordered themes were identified.

Results

Hot topics discussed during the HIV/AIDS Twitter live chat were visualized in a bubble chart with size representing response frequency. Participant locations were also geo-mapped (Figure 1). Prevention, treatment, resources, vaccine, stigma and an AIDS free generation were identified as the most frequently tweeted topics.

Thematic Analysis

The Overall Perceptions first order theme, encompasses general perceptions of the MDG's HIV-related achievements. Three second order themes emerged: 1) Strong Agents for Prevention, Treatment and Care; 2) A Call-To-Action and an 3) Assessment of HIV/AIDS Efforts. The second order theme that most represented what Twitter users believe is needed to achieve the MGS goal 6, two years prior to the 2015 deadline was strong agents for prevention, treatment and care. These included the importance of the Centers for Disease Control and Prevention and the field of Nursing. The next most representative second order theme was a call to action, Twitter users tweeted action words in support of efforts that included: Today, Now, Fight, Work, War and an AIDS Free Generation. The least most representative second order theme was an assessment of efforts. Words tweeted included: winning, progress and long, (Table 1).

The Prevention first order theme formed the two second order themes of: 1) HIV/AIDS Infection Reduction and 2) Prevention Essentials. HIV/AIDS risk reduction most represented the way Twitter users perceived prevention efforts. Words tweeted included risk reduction and stigma reduction. Prevention essentials were the next most representative perceptions of HIV/AIDS prevention. Tweets encompassed the need for vaccines, condoms, Pre-Exposure Prophyl axis (PrEP) as well as an increased need for programs and enhanced knowledge to support prevention efforts (Table 1).

The Treatment first order theme, formed the two second order

Figure 1. Hot Topics Discussed During the ABC News AIDS Twitter Live Chat and Location.

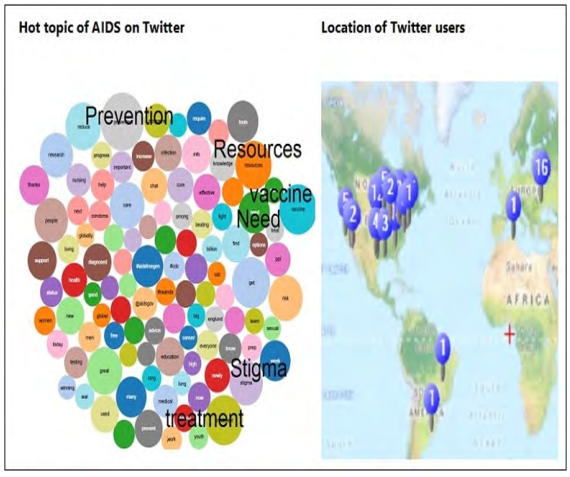

Table 1. Hierarch of Themes.

First Order Themes	Second Order Themes	Tweet Samples
Overall Perceptions	1) Strong Agents for Prevention, Treatment and Care	#CDC, #Nursing
	2) A Call-To-Action	#Today, #Now, fight, #aidsfreegen
	3) Assessment of HIV/AIDS Efforts	#Progress, #Long
Prevention	1) HIV/AIDS infection reduction	#Risk, #Reduce, #Stigma
	2) Prevention Essentials	#Education, #Condom, #PrEP, #Support
Treatment	1) Effective treatment needs	#Research, #Cure, #Options
	2) Effective treatment scale-up	#Diagnosed, #Status, #Testing
Care	1) Characteristics of Care	#Increase, #Required, #Effective
	2) Types of Needed Care emerged	#Medical, #Health

themes of: 1) Effective Treatment Needs and 2) Effective Treatment Scale-Up. Expression of effective treatment needs were the most represented by Twitter users, these included the need for additional resource, research, a cure and treatment options. Ideas for Effective treatment scale-up followed with tweets that included increase in testing and diagnoses, knowing HIV status, education and information (Table 1).

For the Care first order theme, the two second order themes of: 1) Characteristics of Care and 2) Types of Needed Care emerged. Characteristics of care were most represented by Twitter users. Words regarding care characteristics tweeted included an increase in required care, effective care and supportive care. The next most representative perceptions of care encompassed care types. These included medical care and access to healthcare for everyone living with HIV/AIDS (Table 1).

Discussion

A corpus of 399 unique tweets, disseminated to over 7 million Twitter users, were analyzed using a mixed methods approach to understand how people are discussing progress in winning the fight against HIV/AIDS on World AIDS Day 2013 [1, 4, 13]. Tweet content mining and analysis can reveal public option on progress to end the AIDS epidemic and for the refinement of targeted goals and outcomes [4]. Themes provided insight into public perceptions.

Our content analysis showed the frequent tweets centered on the need for infection reduction, indicating the direct challenges in preventing the spread of the HIV virus and difficulties associated with achieving an AIDS Free Generation [1]. However, clinicians and major policy stakeholders, continue to ignore women outside of the prevention of mother to child transmission (PMTCT) efforts. Ongoing challenges exist to testing, counselling and contraception access for women [1].

Frequent tweets also centered on treatment needs, treatment options and scale up. Theses tweets directly relate to falling short of the MDG Goal 6 Target 6B, to achieve universal access to treatment by 2010 [1]. Incentives to evaluate new antiretroviral drugs are ongoing to ensure effective treatment options with no cross-resistance to existing agents. Improvement in treatment will provide additional opportunities to harmonize drug choices [1].

Characteristics of essential care and prevention efforts were the next level of frequent tweets[1]. Participants emphasized the need for effective care for those living with HIV/AIDS, to support their medical and overall health. Additionally, topping the list for prevention efforts included new (PrEP) and traditional (education, condoms) forms of contraception to contain the epidemic. Unfortunately, in high priority countries, lack of trained healthcare staff, weak linkages to care and poor decentralization of HIV/AIDS-related services remain ongoing barriers [1]. Furthermore, greater attention must be given to family-centered care to address the complications of HIV infection and treatment outcomes. This will ensure medication adherence support and optimal immunological health [1]. The increase in affordable and feasible point-of-care technologies to ensure supplies for prevention, timely diagnosis, treatment initiation and effective care, is tremendous [1]. Unfortunately, A Call-To-Action bottomed the frequency list of Tweets. This may be a concerning indicator that people are notas convinced in achieving the targeted goals.

Limitations

The majority of ABC live Twitter chat participants were from first world countries (Figure 1) and not representative of the broader population, particularly populations of people infected or directly affected by the HIV/AIDS pandemic. However, our analysis provides an important snapshot of public opinion as we seek to win the fight against HIV/AIDS. We are now in the time of the Sustainable Development Goals; the results of our analysis can provide public health professionals an understanding of the ongoing needs and provide a valuable foundation for gaining insight into perceptions of effectiveness, as we shift our focus to sustainability.

The Joint United Nations Programme on HIV/AIDS (UNAIDS) continues its aspirations of zero new HIV infections, zero discrimination and zero AIDS-related deaths. The 2020 target was labeled as '90-90-90': with 90 percent of HIV-infected knowing their status, 90 percent diagnosed in treatment and 90 percent of treated individuals with undetectable viral load [1, 2]. The 2030 objective is the eradication of the HIV/AIDS entirely [1]. Our research contributes to the growing body of literature regarding public sentiment in efforts to combat HIV/AIDS. Although MGD 6 is unfinished, the progress to the new 2030 goal should stimulate the global community to benefit from its achievements and strive for HIV/AIDS elimination [2]. In the post 2015 landscape, the ongoing assessment of public sentiment is critical to fine tune prevention, treatment and care efforts. Furthermore,

public sentiment can be a tool to shed light on aspects of our development initiatives in desperate need of change.

Conclusions

Tweet content analysis provides a cost-effective, valuable tool that efficiently and rapidly captures public perceptions regarding public health [13]. Our study methodically summarized and visualized HIV/AIDS Twitter content. Results indicate how Twitter can serve as a valuable resource for communication and insight into perspectives.

Furthermore, our study demonstrates the use of social media tools to successfully engage the public, partners and stakeholders to refine our priority setting to foster relationship building, networking and knowledge sharing. The reach of social medial effectively allows for the engagement of individuals and cross-disciplinary collaborators to further our progress and win the war on HIV/AIDS [4, 5].

References

[1]. Prendergast AJ, Essajee S, Penazzato M (2014) HIV and the Millennium Development Goals. Arch Dis Child. 100(1): S48-52.

[2]. Sidbe M (2015) The sustainable development agenda and the end of AIDS. Lancet. 386 (9989): 108-110.

[3]. Liotta L, Marazzi MC, Mothibi KE, Zimba I, Bonje EK, et al., (2015) Elimination of Mother-To-Child Transmission of HIV Infection: The Drug Resource Enhancement against AIDS and Malnutrition Model. Int J Environ Res Public Health. 12(10): 13224-13239.

[4]. Lazard AJ, Scheinfeld E, Bernhardt JM, wilcox GB, Suran M (2015) Detecting themes of public concern: a text mining analysis of the Centers for Disease Control and Prevention's Ebola live Twitter chat. Am J Infect Control. 43(10): 1109-1111.

[5]. Goff DA, Kullar R, Newland JG (2015) Review of Twitter for infectious diseases clinicians: useful or a waste of time? Clin Infect Dis. 60(10): 1533-40.

[6]. Santos JC, Matos S (2014) Analysing Twitter and web queries for flu trend prediction. Theor bio med model. 11(1): S6.

[7]. Bosley JC, Zhao NW, Hill S, Shofer FS, Asch DA, et al., (2013) Decoding Twitter: Surveillance and trends for cardiac arrest and resuscitation communication. Resuscitation. 84(2): 206-212.

[8]. Odlum M, Yoon S (2015) What can we learn about the Ebola outbreak from tweets? Am J Infect Control. 43(6): 563-571.

[9]. Collier N, Son NT, Nguyen NM (2011) OMG U got flu? Analysis of shared health messages for bio-surveillance. J Biomed Semantics. 2(5): 1-10.

[10]. Heaivilin N, Gerbert B, Page JE, Gibbs JL (2011) Public health surveillance of dental pain via Twitter. J Dent Res. 90(9): 1047-1051.

[11]. Cavnar W, Trenkle J (1994) N-Gram-Based Text Categorization. 3rd Annual Symposium on Document Analysis and Information Retrieval SDAIR-94.

[12]. Liu B (2006) Web data mining; exploring hyperlinks, contents and usage data. Berlag Berlin Heidelberg: Springer, Newyork.

[13]. Sullivan SJ, Schneiders AG, Cheang CW, Kitto E, Lee H, et al., (2011) 'What's happening?' A content analysis of concussion-related traffic on Twitter. Br J Sports Med. 46(4): 258-263.