

Social Media and Men's Health: A Content Analysis of *Twitter* Conversations During the 2013 Movember Campaigns in the United States, Canada, and the United Kingdom

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Abstract

The Movember Foundation raises awareness and funds for men's health issues such as prostate and testicular cancers in conjunction with a moustache contest. The 2013 Movember campaigns in the United States, Canada, and the United Kingdom shared the same goal of creating conversations about men's health that lead to increased awareness and understanding of the health risks men face. Our objective was to explore *Twitter* conversations to identify whether the 2013 Movember campaigns sparked global conversations about prostate cancer, testicular cancer, and other men's health issues. We conducted a content analysis of 12,666 tweets posted during the 2013 Movember campaigns in the United States, Canada, and the United Kingdom (4,222 tweets from each country) to investigate whether tweets were health-related or non-health-related and to determine what topics dominated conversations. Few tweets ($n = 84$, 0.7% of 12,666 tweets) provided content-rich or actionable health information that would lead to awareness and understanding of men's health risks. While moustache growing and grooming was the most popular topic in U.S. tweets, conversations about community engagement were most common in Canadian and U.K. tweets. Significantly more tweets co-opted the Movember campaign to market products or contests in the United States than Canada and the United Kingdom ($p < .05$). Findings from this content analysis of *Twitter* suggest that the 2013 Movember campaigns in the United States, Canada, and the United Kingdom sparked few conversations about prostate and testicular cancers that could potentially lead to greater awareness and understanding of important men's health issues.

Keywords

health communication, public health, prostate cancer, testicular cancer, health awareness

Introduction

Health communication campaigns have been one of the primary vehicles for educating and persuading targeted audiences to adopt specific health behaviors and practices (Rogers & Storey, 1987). Campaigns such as Breast Cancer Awareness Month in the United States (Jacobsen & Jacobsen, 2011), ParticipACTION in Canada (Craig, Bauman, & Reger-Nash, 2010) and Change4Life in the United Kingdom (Piggin, 2012) have been successful in raising awareness and funding for important health issues. Inspired by such campaigns, four Australian friends turned the idea of a moustache-growing contest into a global Movember campaign to raise awareness and encourage donations for important men's health issues including prostate and testicular cancers (Movember, 2015).

In 2006, the Movember Foundation was established as a global charity with participants in Australia and New

Zealand (Movember, 2015). The Australian founders challenged men to become ambassadors of their own health by growing a moustache and collecting pledges to raise funds for local prostate cancer foundations (Jeffcott, Cagiannos, & Zorn, 2012). In 2007, the Movember Foundation established campaigns in the United States, Canada, and the United Kingdom with the stated goals of raising awareness about prostate cancer and soliciting donations for education, research, and treatment of prostate cancer. In 2013, these three countries were leaders in

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the number of registered participants and funds raised (approximately: the United States—17.8 million USD; Canada—25.2 million USD; the United Kingdom—26 million USD; Movember, 2015). In addition to expanding the reach of the campaign to more countries, the Movember Foundation broadened its scope to include testicular cancer and men's mental health.

Prostate cancer is the second most frequently diagnosed cancer in men worldwide (World Health Organization, 2015). Excluding skin cancer, prostate cancer is the most common cancer in American men with an estimated 238,590 new cases of the disease and 29,720 deaths in 2013 (Siegel, Naishadham, & Jemal, 2013). In Canada, it was projected that 23,600 men would be diagnosed with prostate cancer and 3,900 deaths would occur from the disease in 2013 (Canadian Cancer Society's Advisory Committee on Cancer Statistics, 2013). The most recent prostate cancer statistics for the United Kingdom are for 2012 with 41,736 new cases and 10,837 deaths (Cancer Research U.K., 2013a).

While prostate cancer is more prevalent in men older than 60 years, testicular cancer is most common among young men under the age of 30 years (Canadian Cancer Society's Advisory Committee on Cancer Statistics, 2013). For 2013, it was estimated that 7,920 men would be newly diagnosed with testicular cancer in the United States and 370 deaths would occur from the disease (Siegel, Naishadham, & Jemal, 2013). In Canada, approximately 960 men were diagnosed with testicular cancer in 2013 (Canadian Cancer Society's Advisory Committee on Cancer Statistics, 2013). In the United Kingdom, the most recent statistics for testicular cancer are for 2011 and 2012, with a reported incidence of 2,207 and a reported mortality of 63 deaths (Cancer Research U.K., 2013b). Low mortality and high survival rates may be a reflection of the potential for cure if treatment and care before cancer metastasis has been initiated (Verhoeven et al., 2013). Campaigns such as Movember can play an important role in disseminating messages about surveillance and detection since early treatment can prevent the cancer from progressing and metastasizing (Shanmugalingam, Soultati, Chowdhury, Rudman, & Van Hemelrijck, 2013).

The 2013 Movember campaigns in the United States, Canada, and the United Kingdom shared the same goal of creating "conversations about men's health that leads to awareness and understanding of the health risks men face" (Movember Canada, 2013b; Movember U.K., 2013b; Movember U.S., 2013b). In the 2014 Movember Global Annual Report, the Movember team reported that the 2013 global campaign stimulated 2.3 billion conversations about men's health worldwide (Movember Canada, 2015). One popular mechanism through which Movember participants shared their thoughts and experiences was the

social networking site, *Twitter*. In fact, Movember was mentioned 1,684,937 times worldwide on *Twitter* during the 2013 campaign (Movember Canada, 2015).

The influence of health communication campaigns on audience health behaviors partly depends on the ability to diffuse messages through social networks by stimulating conversations about important health issues (Hornik & Yanovitzky, 2003). Discussions about campaign messages may even have a stronger effect on individuals' beliefs and behavioral follow-up than the actual exposure to campaign messages (Hornik, 2002). For example, indirect exposure, through interpersonal discussions, to a radio campaign about family planning in Nepal was more strongly associated with contraceptive use than was direct exposure of the actual radio advertisement (Boulay, Storey, & Sood, 2002).

The purpose of this exploratory study was to examine conversations during the 2013 Movember campaign that occurred in social media networking sites in order to identify whether the 2013 Movember campaign sparked conversations about prostate and testicular cancers that could potentially lead to greater awareness and understanding of the health risks men face. In an effort to provide a global perspective, conversations from three participating countries were chosen for analysis. The United States, Canada, and the United Kingdom were selected for several reasons: the Movember campaign began in 2007 in all three countries; the United States, Canada, and the United Kingdom were among the top fundraising countries for the 2013 Movember global campaign; and these three countries had the largest number of registered participants for the 2013 Movember global campaign (Movember, 2015). Since popular social network sites such as *Twitter* promote rapid dissemination of information via the Internet (Eysenbach, 2008) and social media played a critical role in information dissemination during the 2013 Movember campaign (Movember, 2015), this study investigated messages posted on *Twitter* by individuals from the United States, Canada, and the United Kingdom during the 2013 Movember campaign. The hypothesis for this study was that the three countries would not differ in the volume or emphasis of *Twitter* conversations over the 2013 Movember campaign period that were focused on raising awareness about and increasing donations (support) for prostate or testicular cancers.

Method

Tweets were collected using the dedicated *Twitter* search engine. The inclusion criteria for tweets examined were (a) written in English; (b) contained the "#Movember" hashtag; (c) posted during November 2013; and (d) geographically located in the United States, Canada, or the United Kingdom. Geographic location of the user was determined using the methodology for *Twitter* research described by

Sullivan et al. (2013): The geolocation was manually determined by clicking on the user profile and identifying where the *Twitter* account was registered. A total of 24,573 tweets that met the search criteria were imported into Excel for data organization. Approximately 750 Canadian tweets were extracted for each day of November 2013 with the exception of November 10 ($n = 740$), November 11 ($n = 745$), and November 28 ($n = 588$) where technical difficulties with the *Twitter* search engine did not allow for collection of 750 tweets. The Canadian sample resulted in 4,222 tweets for analysis. A random sample of 4,222 tweets each for the United States and the United Kingdom was extracted over the month of November 2013, resulting in a total study sample of 12,666 tweets (three countries).

Only unique tweets, rather than retweets, were analyzed in an effort to capture conversations that represented original thoughts, attitudes, or opinions of the user. Additionally, duplicates of tweets from the same user were removed in an effort to capture as many unique tweets and themes as possible. Finally, only text content of the tweet was evaluated. Videos, images, and website links were not analyzed for the purposes of this study.

Tweets were imported into NVivo (v.10) for a directed content analysis of *Twitter* content where each tweet served as one unit of analysis. NVivo, a qualitative software program, facilitated both the process of coding tweets and analysis of tweets since organizing tweets into nodes allows researchers to more easily identify patterns in the data. Additionally, word queries were conducted in NVivo to capture the frequency of important terms, such as prostate cancer, in *Twitter* conversations. The maximum length for a tweet is, by default, 140 characters (www.twitter.com). Content analysis is widely used research method “for making replicable and valid inferences from text (or other meaningful matter) to the contexts of their use” (Krippendorff, 2004, p. 18). For example, Lyles, López, Pasick, and Sarkar (2013) employed content analysis methodology to identify major discussion categories in cervical and breast cancer screening dialogue on *Twitter*. Sullivan et al. (2013) conducted a content analysis of concussion-related discussion on *Twitter* with the aim to understand how tweets are used to convey information about concussions. Directed content analysis uses key concepts or variables from existing research to inform the codebook (Hsieh & Shannon, 2005).

Details about the codebook have been published elsewhere (Bravo & Hoffman-Goetz, 2015). Tweets were first categorized as either health-related or non-health-related. Health-related tweets were defined as a tweet that referenced one of the four main health issues of the 2013 Movember campaigns in the United States, Canada, and the United Kingdom. These were prostate cancer, testicular cancer, men’s mental health, and men’s general health issues. Examples of health-related tweets from the United States, Canada, and the United Kingdom are given below:

#Movember is almost over! It’s not too late to donate, help fund prostate cancer research . . . <http://instagram.com/xxx>. (U.S.; November 27, 2013)

Happy @Movember! <http://us.movember.com/#Movember> is the official month for guys to grow #mustaches & spread the word about #MensHealth! (U.S.; November 8, 2013)

Very cool, 3 Guys Biking Across Canada to Raise Money for Men’s Health, Check it Out Here: <http://buff.ly/1d5MBeU#moridecan#movember>. (Canada; November 8, 2013)

Growing my mustache all month in support of mental health. Awful mustache, great cause. Please donate! <http://mobro.co/xxx#Movember>. (Canada; November 9, 2013)

@brandryorkshire Please RT We are raising awareness for TESTICULAR CANCER #Movember Just a £1 donation would Help <http://bit.ly/19YVNR>. (U.K.; November 23, 2013)

Nearly £100 raised to fight prostate cancer just by growing some facial hair. Ta! #movember <http://mobro.co/xxxpic.twitter.com/xxx>. (U.K.; November 24, 2013)

Non-health-related content was defined as a tweet that did not explicitly or directly mention any of the four main health issues of the 2013 Movember campaigns in the countries under investigation. Representative non-health-related tweets from the United States, Canada, and the United Kingdom are as follows:

#Movember is nearly over, which means I’ll be losing this ‘stache. Donate while I’ve still got it? <http://mobro.co/xxx>. (U.S.; November 26, 2013)

Shut it down, #Movember bros. I saw a kid today (who couldn’t have been more than 11-years-old) with a legit mustache. He wins. #stacheenvy. (U.S.; November 30, 2013)

Worked off another \$100 donation to #Movember with a 2 hour bike ride across #LdnOnt. Respect to @MoRideCanada. pic.twitter.com/xxx. (Canada; November 15, 2013)

Shout out to other Canadian #Coworking spaces > Start a Team. Join the Challenge! #movember <http://bit.ly/1dLp5os> @Movember @MovemberCA. (Canada; November 8, 2013)

Oh I say! Ones facial hair is tickling me something fancy! #movember #onesie #strictlyresults <http://instagram.com/xxx>. (U.K.; November 17, 2013)

Goodbye my 30-day old bristly friend. Thanks to all for the donations. #movember pic.twitter.com/xxx. (U.K.; November 30, 2013)

After being identified as health-related or non-health-related, the tweet was coded by topic related to the campaign objectives (e.g., health information; moustache growing and grooming; community engagement; vision, values, and goals; commercial, contests, and giveaways). Table 1 identifies the topic codes, inclusion criteria, and provides exemplar tweets for each country. To ensure reliability of coding and avoid bias, intercoder reliability of *Twitter* content was calculated using a subsample of U.S., Canadian, and U.K. tweets (20% sample for each country, $n = 2,525$ total) to determine validity of the codebook. Two researchers independently coded the 2,525 tweets. The Cohen's kappa score for Canadian tweets was 0.86, for U.S. tweets was 0.87, and for U.K. tweets was 0.87; an overall Cohen kappa score of 0.85 confirmed that reliability was acceptable between the two coders. The remaining tweets ($n = 10,141$) were coded by one researcher.

The number of tweets per topic was imported into SPSS (v.22) for descriptive analyses. Chi-square tests were used to compare the number of tweets for each topic code between countries. A p value of .05 was accepted as significantly different from chance alone.

Results

A total of 12,666 tweets were analyzed for this study. The frequency of tweets by topic and country of interest is reported in Table 2. Statistical analyses were performed to determine if there was a difference between numbers of tweets per topic between each country. The results of the chi-square analyses are reported in Table 3. The number of tweets that mention each health issue by country is presented in Table 4.

Health-related Versus Non-health-related

Non-health-related tweets dominated Movember conversations from the three countries. This is demonstrated in Table 2. Of the 12,666 conversations analyzed, only 2,908 tweets (~23%) contained text that mentioned something health-related. Tweeters from the United Kingdom posted the highest number of health-related messages ($n = 1,318$ tweets; 31.2% of U.K. tweets) that explicitly mentioned prostate cancer, testicular cancer, mental health issues, or other men's general health concerns. Table 3 provides the results of chi-square analysis testing the association between country and health-related content. The number of health-related tweets from U.K. participants was significantly greater than the number of health-related tweets posted by U.S. or Canadian participants ($p < .05$; $\chi^2 = 97.845$, $\chi^2 = 273.423$, respectively). Following the United Kingdom, tweeters from the United States had the second highest number of health-related

tweets ($n = 917$; 21.7% of U.S. tweets). Canadian tweeters had the fewest number of health-related tweets ($n = 673$; 15.9% of Canadian tweets). Table 4 identifies what health issues were prioritized in health-related content. The majority of health-related tweets referenced "men's health" or men's general or other health issues such as fertility, obesity, and diabetes (the United States = 821 tweets; Canada = 570 tweets; the United Kingdom = 1,282 tweets). Few tweets explicitly referred to prostate cancer (the United States = 98 tweets; Canada = 79 tweets; the United Kingdom = 24 tweets), testicular cancer (the United States = 18 tweets; Canada = 10 tweets; the United Kingdom = 19 tweets), or men's mental health (the United States = 5 tweets; Canada = 27 tweets; the United Kingdom = 6 tweets). Representative tweets showing health information compared with health-related tweets about prostate cancer for the United States, Canada, and the United Kingdom are presented below.

Health information tweets:

80% of men will develop prostate cancer in their lifetime. Scary. Make a difference: <http://ow.ly/qBoqB#movember#ancerawareness>. (U.S.; November 13, 2013)

In 2013, 26,500 new cases of prostate cancer will be diagnosed in men and 4,000 will lose their battle. #Movember <http://Mobro.co/xxx>. (Canada; November 6, 2013)

This is exactly why I'm doing #Movember it's shocking how some men don't even know where their prostate is pic. twitter.com/xxx. (U.K.; November 26, 2013)

Health-related tweets:

so my dad is doing #Movember for #prostatecancer 10 days in! pic.twitter.com/xxx. (U.S.; November 14, 2013)

@name @name @name quick clarification—it's my awesome dad who's 15 years a prostate cancer survivor #movember. (Canada; November 13, 2013)

uk.movember.com/mospace/xxx—I am doing Movember to raise awareness of prostate cancer and other male cancer. Please donate! #Movember. (U.K.; November 5, 2013)

Health Information

All health information tweets were coded as health-related. However, not all health-related tweets were coded as health information. For example, a tweet that used the hashtag "#prostatecancer" was considered health-related since it mentioned one of the four main issues of the 2013 Movember campaign (e.g., prostate cancer in the hashtag). However, to be considered deliberate or purposive health information, the tweet needed to

Table 1. Codebook for Analysis with Topic Code, Inclusion Criteria, and Exemplar Tweets From the United States, Canada, and the United Kingdom.

Topic code	Inclusion criteria	U.S. exemplar tweets	Canada exemplar tweets	U.K. exemplar tweets
Health information— Prostate cancer	<ul style="list-style-type: none"> • Risk factors • Screening • Risk statistics • Mobilizing health information 	<p>In 2013, over 238,000 new cases of prostate cancer will be diagnosed and almost 30,000 men will die of it in the US #November #IMPACT Health (November 28, 2013)</p> <p>#November fact: 7,920 men will be diagnosed with testicular cancer & 370 will die in 2013. Please consider a . . . http://fb.me/xxx (November 2, 2013)</p>	<p>I in 7 men will be diagnosed with prostate cancer in their lifetime, says @ProstateCancerC. #November http://mobro.co/name (November 3, 2013)</p> <p>#HealthTip Testicular cancer is most common in American males aged 15-34. Know the #signs via @MayoClinic http://mayocl.in/U0NgIT#November (November 19, 2013)</p>	<p>This is exactly why I'm doing #November it's shocking how some men don't even know where their prostate is: pic.twitter.com/xxx (November 26, 2013)</p> <p>If you or someone close to you is to go through #testicular #cancer our documentary may help https://vimeo.com/m/4372940 #November (November 17, 2013)</p>
Health information— Testicular cancer	<ul style="list-style-type: none"> • Risk factors • Screening • Risk statistics • Mobilizing health information 	<p>November fact: Over 6 million men (7% of the population) are diagnosed with depression each year #November #IMPACTHealth (November 18, 2013)</p>	<p>Did you #November is to raise awareness for Men's Health AND Men's Mental Health? Here are some tips: http://dadsroundtable.com/health_lifestyle/2012/11/dads-mental-health/...#DadsRT (November 4, 2013)</p>	<p>—</p>
Health information— Mental health issues	<ul style="list-style-type: none"> • Risk factors • Screening • Risk statistics • Mobilizing health information 	<p>Men are 70% more likely to die from #skincancer than women. See your doc regularly & do self checks. #menshealth #November (November 2, 2013)</p>	<p>A must-view #video from our friend Dr. Mike Evans. See what "medicine" he suggests for all men. We agree! http://ow.ly/qZkOy#November (November 19, 2013)</p>	<p>—</p>
Health information— Other men's health issues	<ul style="list-style-type: none"> • Risk factors and risk statistics for other issues in men such as general cancer issues, male fertility, diabetes, etc. • Mobilizing health information 			

(continued)

Table 1. (continued)

Topic code	Inclusion criteria	U.S. exemplar tweets	Canada exemplar tweets	U.K. exemplar tweets
Moustache growing and grooming	<ul style="list-style-type: none"> Description of moustache or grooming and styling of facial hair Tweet tagged with hashtag “moustache” or equivalent synonym such as lip caterpillar 	<p>#DazzleCheck. So about this #NoShaveNovember/#Movember thing . . . are we cool with the guys in our lives partaking? #QuestionableAtBest (November 4, 2013)</p> <p>We’re half way through #Movember. Have you donated to a campaign yet? If not, please support mine. http://mo.name.com (November 15, 2013)</p>	<p>Staying bundled up behind my stache http://mobro.co/na metokeepwarm#Movember erTEAM#epicmoustachepic.twitter.com/xxx (November 25, 2013)</p> <p>Meet the Mo’s! #Movember bake sale tomorrow at Ottawa City Hall, 11:30am-12:30pm pic.twitter.com/xxx (November 25, 2013)</p>	<p>Growing a wookiee on my top lip to fly the flag for the issues, man. Chuck us a few coppers will ya? Ta! #Movember (November 27, 2013)</p> <p>Last push #MoBros. Grow and groom, fundraiser and eat. Find out more here: http://bit.ly/1c9NAdF#PR#Movember#Marketing (November 27, 2013)</p>
Community engagement	<ul style="list-style-type: none"> Calls to fundraise or donate Incentives for donation Call to join or support a team, participant, or the campaign Fundraising events 	<p>I’ve enlisted in #Movember to change the face of men’s health. Donate & join the good fight http://mobro.co/name (November 2, 2013)</p>	<p>I stood for change by donating to #Movember. Join me and support men’s health http://ca.movember.com/donate@MovemberCA (November 11, 2013)</p>	<p>Do you want to help change the face of men’s health? Donate today!! #Movember http://uk.movember.com/mospace/namevia@movemberuk (November 2, 2013)</p>
Vision, values, goals	<ul style="list-style-type: none"> Information that reflects vision, values, goals of Movember campaign such as “to change the face of men’s health,” or “to make change,” or “to stand for change” 	<p>Prices have been slashed for #movember 10% of all sales goes to prostate cancer research! RT this for FREE SHIPPING pic.twitter.com/xxx (November 4, 2013)</p>	<p>Stop by @KEYLIMEclothing today. Open until 8pm. Silent auction items and a percentage of the proceeds for #Movember http://www.keylimecanada.com/2013/11/fundraiser-for-movember/ (November 7, 2013)</p>	<p>Our special Mo-tie. Happy #Movember! We donate 50% of sales of these to your member page. #BowTies pic.twitter.com/xxx (November 17, 2013)</p>
Commercial, contests, giveaways	<ul style="list-style-type: none"> Selling merchandise Selling food or beverages Donating proceeds of products or services to the Movember campaign Chance to win or receive a product or service 	<p>Stop by @KEYLIMEclothing today. Open until 8pm. Silent auction items and a percentage of the proceeds for #Movember http://www.keylimecanada.com/2013/11/fundraiser-for-movember/ (November 7, 2013)</p>	<p>Our special Mo-tie. Happy #Movember! We donate 50% of sales of these to your member page. #BowTies pic.twitter.com/xxx (November 17, 2013)</p>	<p>Our special Mo-tie. Happy #Movember! We donate 50% of sales of these to your member page. #BowTies pic.twitter.com/xxx (November 17, 2013)</p>

Note. — Indicates no tweets identified in that topic code category

Table 2. Comparison of Counts and Percentages for Each Topic Code Categorized as Health-related and Non-health-related Tweets.

Topic code	Country	Health-related				Non-health-related			
		Number of tweets with topic	Number of tweets with topic/4,222 tweets (%)	Total number of tweets for U.S., Canada, U.K./12,666 (%)	Number of tweets with topic	Number of tweets with topic/4,222 tweets (%)	Total number of tweets for U.S., Canada, U.K./12,666 (%)	Total number of tweets for U.S., Canada, U.K./12,666 (%)	
		917	21.7	2,908	3,305	78.3	9,758	77	
Health-related vs. Non-health-related	U.S.	917	21.7	2,908	3,305	78.3	9,758	77	4,222
	Canada	673	15.9		3,549	84.1			4,222
	U.K.	1,318	31.2		2,904	68.8			4,222
Health information—Prostate cancer	U.S.	25	0.6	50	—	—	—	—	25
	Canada	24	0.6		—	—	—	—	24
	U.K.	1	0.02		—	—	—	—	1
Health information—Testicular cancer	U.S.	6	0.1	14	—	—	—	—	6
	Canada	7	0.2		—	—	—	—	7
	U.K.	1	0.02		—	—	—	—	1
Health information—Mental health	U.S.	3	0.1	8	—	—	—	—	3
	Canada	5	0.1		—	—	—	—	5
	U.K.	0	0		—	—	—	—	0
Health information—Other men's health issues	U.S.	4	0.1	12	—	—	—	—	4
	Canada	8	0.2		—	—	—	—	8
	U.K.	0	0		—	—	—	—	0
Moustache growing and grooming	U.S.	329	7.8	864	1,270	30.1	3,656	28.9	1,599
	Canada	83	2		1,383	32.8			1,466
	U.K.	452	10.7		1,003	23.8			1,455
Community engagement	U.S.	432	10.2	1,692	556	13.2	2,885	22.8	988
	Canada	443	10.5		1,386	32.8			1,829
	U.K.	817	19.4		943	22.3			1,760
Vision, values, and goals	U.S.	336	8	1,609	11	0.3	315	2.5	347
	Canada	459	10.8		283	6.7			742
	U.K.	814	19.3		21	0.5			835
Commercial, contests, and giveaways	U.S.	22	0.5	37	479	11.4	817	6.5	501
	Canada	14	0.3		232	5.5			246
	U.K.	1	0.02		106	2.5			107

Table 3. Chi-Square Analysis of the Number of Tweets per Topic Code Between Each Country.

Topic code	U.S. vs. Canada			U.S. vs. U.K.			Canada vs. U.K.		
	χ^2	df	p	χ^2	df	p	χ^2	df	p
Health-related vs. non-health-related	46.130	1	<.05	97.845	1	<.05	273.423	1	<.05
Health information—Prostate Cancer	0.021	1	.886	22.222	1	<.05	21.223	1	<.05
Health information—Testicular Cancer	0.077	1	.781	3.574	1	.059	4.504	1	<.05
Health information—Mental Health Issues	0.500	1	.479	3.001	1	.083	5.003	1	<.05
Health information—General Men's Health Issues	1.335	1	.248	4.002	1	<.05	8.008	1	<.05
Moustache growing and grooming	9.060	1	<.05	10.637	1	<.05	0.063	1	.801
Community engagement activities	367.215	1	<.05	312.649	1	<.05	2.307	1	.129
Vision, values, goals	164.487	1	<.05	234.269	1	<.05	6.744	1	<.05
Commercial, contests, giveaways	95.496	1	<.05	275.133	1	<.05	57.122	1	<.05

Note. df = degrees of freedom.

Table 4. Health-Related Tweets: The Number of Tweets That Mention Prostate Cancer, Testicular Cancer, Mental Health Issues, or “Men’s Health” and Other Men’s Health Issues.

Country	Number of tweets that mention prostate cancer	Number of tweets the mention testicular cancer	Number of tweets that mention mental health	Number of tweets that mention “men’s health” or other men’s health issues
U.S.	98	18	5	821
Canada	79	10	27	570
U.K.	24	19	6	1,282
Total	201	47	38	2,673

have content (other than just a hashtag) with text about one of the four main health issues. Indeed, to be classified as health information, content had to refer to or have messages that could potentially lead to awareness and understanding of the health risks men face, such as risk statistics or a prompt to seek out more health information. For example, health-related tweets that were also tweets containing health information are presented below:

Almost four times as many males as females die by suicide. #movember <http://ift.tt/17KHOQ0>. (U.S.; November 26, 2013)

Happy #Movember! Looking to learn more about #testicularhealth/#selfcare? Check out this fun educational poster <http://bit.ly/mRROfL>. (Canada; November 5, 2013)

If you or someone close to you is to go through #testicular #cancer our documentary may help <https://vimeo.com/m/43729401#movember>. (U.K.; November 17, 2013)

Individuals from the three countries rarely shared messages that explicitly had actionable or content-rich health information about prostate cancer, testicular cancer, men's mental health issues, or general health issues of concern for men. Table 2 reveals that only 84 tweets (0.7%) of the 12,666 tweets contained actual health information (rather than simply mentioning the terms, "prostate cancer," "testicular cancer," "mental health," etc.). Canadians posted the highest number of health information messages with a total of 44 tweets (prostate cancer = 24; testicular cancer = 7, men's mental health issues = 5; men's general health issues = 8; 1% of Canadian tweets). Tweepers from the United States shared the second highest number of health information messages with a total of 38 tweets (prostate cancer = 25; testicular cancer = 6, men's mental health issues = 3; general men's health issues = 4; 0.9% of U.S. tweets). Despite having the highest number of health-related messages ($n = 1,318$; 31.2% of U.K. tweets), few tweets ($n = 2$; 0.05% of U.K. tweets) posted by tweeters from the United Kingdom contained content-rich information related to the Movember campaign objectives (prostate cancer = 1; testicular cancer = 1; men's mental health issues = 0; general men's health = 0). Table 3 presents chi-square results that demonstrate significantly more U.S. and Canadian tweets with health information about prostate cancer compared with tweets with prostate cancer information from participants of the United Kingdom ($p < .05$; $\chi^2 = 22.222$ and $\chi^2 = 21.223$, respectively). There was also a significant difference in the number of health information tweets about testicular cancer between Canada ($n = 7$) and the United Kingdom ($n = 1$; $p < .05$; $\chi^2 = 4.504$). Canadian and U.S. participants tweeted more messages about men's general health issues than did participants in the United Kingdom.

Moustache Growing and Grooming

Moustache growing and grooming was a dominant topic of *Twitter* conversations across all three countries ($n = 4,520$; 35.7%). Table 2 provides the number of tweets that discussed moustache growing and grooming for each country. *Twitter* conversations from the United States had significantly more tweets ($n = 1,599$; 37.8% of U.S. tweets) than both Canadian ($n = 1,466$; 34.7% of Canadian tweets) and U.K. ($n = 1,455$; 34.5% of U.K. tweets) tweets that referenced moustache or facial hair growing and grooming ($p < .05$; $\chi^2 = 9.060$ and $\chi^2 = 10.637$, respectively; Table 3). Canada had the second highest number of tweets in the moustache-growing and moustache-grooming category ($n = 1,466$), which was not significantly different from the number of tweets posted by participants in the United Kingdom ($n = 1,455$). Most tweets about moustaches did not contain health-related content ($n = 3,656$ or 80.1% of the total number of moustache-related tweets) and were solely focused on non-health-related concerns such as styles of moustache (e.g., handle bars), grooming (e.g., using beard wax), and moustache progress (e.g., "finally in the seductive stage"). Representative tweets about moustachery are given below:

It's cold here in Notre Dame, Indiana today. Good thing I have this lip sweater to keep me warm! #Movember <http://mobro.co/name>. (U.S.; November 23, 2013)

Omg I look so creepy in this pic. Can you see my mo? Ya, me neither. In due time . . . #movember #me . . . <http://instagram.com/xxx>. (Canada; November 4, 2013)

Contemplating the beard look, grown quite attached to the tash over #movember and the beard sorta works . . . thoughts? pic.twitter.com/xxx. (U.K.; November 28, 2013)

Community Engagement

Tweets that called on others to support and join fundraising efforts were frequent in across the three countries ($n = 4,577$; 36.2%). Tweepers offered fundraising incentives (e.g., highest bid gets to choose the participant's moustache style) and fundraising events (e.g., bake sales) as incentives to raise pledges for the Movember efforts. The highest number of tweets in this category was for Canadian ($n = 1,829$; 43% of Canadian tweets) and U.K. ($n = 1,760$; 41.7% of U.K. tweets) *Twitter* content, which did not differ significantly from each other. There were far fewer tweets ($n = 988$; 23.4% of U.S. tweets) related to community engagement among U.S. *Twitter* participants compared with the Canadian or British counterparts and these differences were significant ($p < .05$; $\chi^2 = 367.215$ and $\chi^2 = 312.649$, respectively). About 22.8% of

the tweets about community engagement were categorized as non-health-related for all three countries (Table 2). Exemplar tweets for each country regarding community engagement are provided below:

Stop by Section 116 to see these, donate to #Movember, & you could win tix to a suite for Friday! #letsMoJackets pic.twitter.com/xxx. (U.S.; November 27, 2013)

Donate \$5 or more to my #Movember page and you will be entered to win a custom Kory Sheets figure that I am making. http://mobro.co/name. (Canada; November 9, 2013)

http://tinylink.net/xxx SPONSOR me 2 grow a Selleck-like (hopefully) moustache 4 #Movember. Raising awareness 4 prostate&testicular cancer. (U.K.; November 13, 2013)

Vision, Values, and Goals

Tweeters reiterated the Movember campaign values in messages that called for “a change to men’s health.” Consistent branding and messaging across the three campaigns resulted in repetition of the concept of change in *Twitter* conversations ($n = 1,924$; 15.2%). These messages usually contained the term, “men’s health” and hence contributed to the overall count of health-related messages. Table 2 presents the number of tweets that contained messages about a change to men’s health. The U.K. tweeters had the highest number of tweets ($n = 835$; 19.8% of U.K. tweets) followed by the Canadian tweeters ($n = 742$; 17.6% of Canadian tweets). Both the United Kingdom and Canada had more than double the number of tweets on vision, values, and goals compared with number of U.S. tweets ($n = 347$; 8.2% of U.S. tweets) in this category. Results displayed in Table 3 indicate the three countries differed significantly ($p < .05$) in the number of tweets that reflected the vision, values, and goals of the Movember campaign (the United States vs. Canada $\chi^2 = 164.487$; the United States vs. the United Kingdom $\chi^2 = 234.269$; Canada vs. the United Kingdom $\chi^2 = 6.744$). Illustrative examples of tweets highlighting the country differences in vision, values, and goals are presented below:

I donated to #Movember to change the face of men’s health. Join Me Today! http://us.movember.com/donate. (U.S.; November 27, 2013)

To make change we need to raise it, donate to my #Movember effort. http://mosista.co/name#vancouver#menshealth. (Canada; November 1, 2013)

Check out who is changing the face of men’s health for #Movember http://uk.movember.com/namevia@movemberuk. (U.K.; November 3, 2013)

Commercial, Contests, and Giveaways

Tweets that contained content about selling products or services for a profit or advertisements for contests and giveaways were also cited in Movember conversations ($n = 854$; 6.7%). U.S. participants tweeted about commercial efforts or contests and giveaways ($n = 501$; 11.9% of U.S. tweets) significantly more often ($p < .05$) than did Canadian ($n = 246$; 5.8% of Canadian tweets; $\chi^2 = 95.496$) or U.K. ($n = 107$; 2.5% of U.K. tweets; $\chi^2 = 275.133$) tweeters. Moreover, there were very few tweets in all countries ($n = 37$; 0.3%) about commercial, contests, and giveaways that actually related to the health issues of the Movember campaigns (e.g., a company selling a product or merchandise in association with earmarking the money or a portion of sales for testicular cancer education or research). The following examples illustrate this type of tweet:

method soap for hope giveaway WIN one of 125 “soap for hope” kits in support of men’s health + #movember Ends . . . http://fb.me/xxx. (U.S.; November 15, 2013)

Aveda Men’s product back in stock at all Diva locations!! Happy Movember! @aveda #yyc #avedamens #movember pic.twitter.com/xxx. (Canada; November 21, 2013)

#LimitedEdition #MoBurger £1 to @MovemberUK for every 1 sold. Only available until 30th Nov! #Movember pic.twitter.com/xxx#norfolkhour. (U.K.; November 22, 2013)

Discussion

Health communication campaigns can influence an individual’s behavior, attitudes, beliefs, and intentions (Noar, 2006). However, the path of influence can take different routes. For example, one avenue may be by direct exposure to campaign messages through advertisements or educational programs (Hornik & Yanovitzky, 2003). Alternatively, exposure to campaign messages may come from social interaction whereby one individual transmits the campaign message to another, or the campaign may spark conversation among social networks participants (Hornik & Yanovitzky, 2003). The latter case is important to consider as individuals increasingly rely on social media for health information. In many cases, the public first looks to see what peers are saying about the health topic before accepting the advice of traditional experts, including doctors or public health institutions (Ratzan, 2011). This is especially the case among well-educated young adults (Percheski & Hargittai, 2011).

This exploratory study assessed the content of *Twitter* conversations posted by individuals from the United States, Canada, and the United Kingdom during the 2013

Movember campaigns. The goal of this research was to examine what topics were prioritized in Movember *Twitter* messages in order to have a better understanding of whether the 2013 Movember campaigns stimulated global conversations about men's health, and prostate and testicular cancers, specifically.

The hypothesis of the study was that the number of tweets that were focused on raising awareness about and increasing donations (support) for prostate or testicular cancers would not differ between the United States, Canada, and the United Kingdom during the 2013 Movember campaigns. This hypothesis was based on the assumption the Movember campaigns focused on the same health issues with the same messaging (e.g., website content and creative design) and had been running in these three countries for the same length of time (since 2007). However, an important finding of this study is that there were differences in the number of health-related tweets between each country: the United Kingdom referenced men's health issues significantly more than did the United States and Canada. Nevertheless, few tweets contained health-related content, regardless of which country was the focus of the campaign. More than three quarters of the conversations did not mention prostate cancer, testicular cancer, men's mental health, or men's general health issues. Individuals in the United Kingdom posted the highest number of health-related tweets ($n = 1,318$). This may reflect an effort by the National Health Service to raise awareness about "five urgent male health issues," which include testicular cancer, prostate cancer, and depression (National Health Service, 2015). Nonetheless, few participants from the United Kingdom shared tweets that contained actionable or informative health information in comparison with the United States and Canada (e.g., 2 vs. 38 vs. 44, respectively). Social media networking sites are popular for voicing concerns about health policy in the United Kingdom (King et al., 2013); these sites may not be popular for sharing health information since the main reasons adults in the United Kingdom use *Twitter* is to follow friends, celebrities, news, and other hobbies (Ofcom, 2014).

Prostate cancer was the overwhelming focus of health information tweets by U.S. and Canadian participants. This may be due to the fact that the campaigns began with fundraising for local prostate cancer foundations (e.g., The Prostate Cancer Foundation in the United States, and Prostate Cancer Canada) and later broadened the scope to include testicular cancer and men's mental health. Additionally, prostate cancer may be considered by the public as a more serious disease given the higher incidence in comparison with testicular cancer. The Movember Global Annual Report for 2013 to 2014 stated that 75% of past Movember participants worldwide who were surveyed by IMI International became more aware

of the health issues (Movember, 2015). Given the limited number of health-related tweets in this study, it is not likely that participants learned about their health risks via conversations on *Twitter*. However, this would need to be tested empirically in further research.

While all three countries followed the same trend of emphasizing non-health-related content, there were differences in the topics that were prioritized in conversations. Moustache growing and grooming was the most common topic of conversation among U.S. tweeters. In contrast, based on the number of tweets, the topic of top priority for Canadian and U.K. conversations was community engagement.

Moustaches were the most frequent topic of U.S. conversations and the second most common topic in Canada and the United Kingdom. Given the evolution of the campaign, it is not surprising that all three countries emphasized moustache growing and grooming in Movember conversations. While health campaigns are often launched as a strategy to increase awareness and raise funds about important health issues, the Movember campaign began as a moustache contest in which four friends challenged each other to bring back the fashion trend. Inspired by their friend's mother who was raising money for breast cancer, the four Australian friends decided to pair the contest with raising funds for prostate cancer and proceeds from contest participation were given to the Prostate Cancer Foundation of Australia in 2004 (Movember Canada, 2015). In 2013, there was consistent creative messaging of moustachery across all three campaigns.

In the United States, the "#Movember" hashtag was often accompanied by the "#NoShaveNovember." A U.S. campaign called "No Shave November" encourages men to stop shaving for a month and donate the money that would regularly be dedicated to facial grooming to cancer research (No Shave November, 2015). It is unclear whether this hashtag was specifically referencing the "No Shave November" campaign, if November was branded or nicknamed "noshavenovember" because of the emergence of moustaches during the Movember campaign, or if participants were uncertain about what the actual name of the campaign that raises awareness for prostate and testicular cancers is actually called. However, the existence of a campaign that works in tandem to encourage the growing of facial hair in November may explain why the U.S. conversations focus significantly more often on moustaches than do the *Twitter* conversations originating in Canada and the United Kingdom. Developing a health campaign that captures the public's attention is difficult when there are many worthy causes that compete for funding in the public space. Campaign activities such as a moustache contest make the Movember campaign memorable and captivating. However, the focus on moustaches

can be problematic when it overshadows the opportunity for cancer education. To spark conversations about prostate and testicular cancers, campaign activities should support the goal of health education and awareness rather than have moustaches as the focus of campaign strategy.

Since official campaign resources, such as the website, may be the first communication channels explored by individuals seeking information about Movember, campaign creators and organizers should consider emphasizing health-related content on their campaign channels. For example, encouraging Movember participants to share a tweet such as, “Try a testicular self-exam: look for swelling and feel for lumps. Then check out my moustache and donate to my Movember page!” would emphasize health content while still incorporating the fun aspect of the moustache and the important task of raising donations for men’s health. Additionally, the shift by the public to think of the Movember campaign as primarily a health campaign related to prostate cancer, testicular cancer, and men’s mental health may require more than just targeted *Twitter* messaging. It will also be important for health partners and other stakeholders—cancer organizations, public health units, and frontline health providers—to share messages about risk factors related to men’s health issues; urging men to take action through social media platforms and other communication channels would contribute to raising awareness about important men’s health issues.

In addition to discussing moustache growing and grooming, tweeters often asked peers in their social media community to donate to their Movember pledge link or attend fundraising events. Approximately 136.6 million AUD (approximately 97.6 million USD) was raised globally during the 2013 Movember campaign (Movember, 2015). Thus, it is not surprising that community engagement was a pervasive topic in all three countries. Community engagement, which included donation messages, was the most common topic in British and Canadian conversations (both of which were the top two fundraising countries globally for the Movember Foundation in 2013) and second most common topic of American conversations. The emphasis on donation in the United Kingdom and Canada is supported by a 2013 survey of individuals in 135 countries. The United Kingdom and Canada were ranked as the fifth and sixth countries with the highest percentage of people who in the preceding month donated money to charity; the United States ranked ninth in charitable giving (Charities Aid Foundation, 2014). Despite sharing the same goal of raising funds to “combat prostate and testicular cancer and mental health challenges” (Movember Canada, 2013a; Movember U.K., 2013a; Movember U.S., 2013a), these Movember campaigns, were not always associated, at least by mention in *Twitter* messages, with fundraising

endeavors for prostate and testicular cancers. Tweeters in all countries were more likely to fundraise for their “Movember effort,” “the cause,” or “their moustache,” than they were to explicitly collect pledges for education, research, detection, or treatment of prostate cancer, testicular cancer, or men’s mental health issues.

Commercial, contests, and giveaways were uniquely prioritized in U.S. *Twitter* conversations and much more so than in tweets from Canadian and U.K. conversations. Cause-related marketing has long been a practice of U.S. corporations to develop brands, strengthen corporate reputation, generate more revenues, and establish relationship with nonprofit organizations (Berglund & Nakata, 2005). The Boston Consulting Group reported that U.S. Millennials (“Generation Y”) identify more personally and emotionally with brands, and listed “support causes” as one of the most important ways that brands engage and interest them (Barton, Koslow, & Beauchamp, 2014). In a similar way that breast cancer was a favored charity to attract female consumers (King, 2004), the Movember campaign presented an opportunity for commercial sponsors to link commercial activities with charitable donations. However, commercial efforts associated Movember were rarely linked with the health issues such as prostate and testicular cancers, at least in the U.S. *Twitter* conversations analyzed in this study.

There are limitations to this work. Conversations on *Twitter* were examined to provide insight into whether the 2013 Movember campaign sparked conversations about the important men’s health issues of prostate cancer, testicular cancer, and men’s mental health. Exploring conversations is an important first step in evaluating the impact of the Movember campaign in raising awareness and educating men about critical health issues. However, *Twitter* is only one social media platform and it will be important to consider other social media (e.g., Facebook, YouTube) to identify the impact of the Movember campaign on creating conversations about men’s health. Second, other study designs (surveys and interviews) will be needed to gauge the potential influence that the Movember campaigns on social media have on a reader’s actual behavior, attitudes, and beliefs about prostate and testicular cancers. Examining media effects of health communication campaigns is important as health organizations continue to utilize social media to engage with consumers and provide health education in the social media space. Third, this study focused on *Twitter* conversations. Not only are tweets limited in length (140 character maximum length) they do not allow users to provide rich messages about any health issue. The tweets were also archival and, as with any cross-sectional study, provide a static picture of conversations during one time point (November 2013) and give no indication of what the conversations looked like before or after the 2013

Movember campaigns. A longitudinal study to delineate the charitable trajectory over time and social media responses would provide insight into the impact of the campaign on creating conversations about men's health. Fourth, in order to make comparisons between Movember campaigns, this study was limited to conversations posted by individuals from the United States, Canada, and the United Kingdom. The Movember campaign was initiated in the same year (2007) for these three countries and focused on the same health issues. Research that included other English-speaking countries with Movember campaigns (e.g., Australia) would provide further insight into the global impact of the Movember Foundation. However, given the number of registered Movember participants in the 2013 U.S., Canada, and U.K. campaigns (648,807) and the number of tweets analyzed (12,666), the results revealed some similar patterns across countries on what conversations were sparked during the 2013 Movember campaigns. Finally, only English language tweets were evaluated in the three countries. Canada is bilingual and French language tweets may have presented different priorities for the *Twitter* 2013 Movember conversations. Similarly, the United States is de facto a country where Spanish is widely spoken and Movember tweets written in Spanish may differ in content, focus, and priorities from those in English. The United Kingdom is also a multilingual nation composed of four countries. Movember tweets written in languages other than English (e.g., Welsh or Gaelic languages) may have focused on alternative topics during the 2013 Movember campaign. Though excluding tweets that were not written in English may have contributed to a bias in the complete "national picture" of the Movember *Twitter* conversations, the 2013 Movember campaigns for the United States, Canada, and the United Kingdom were targeted to a broad demographic (e.g., no segmentation by ethnicity) and Movember content (e.g., campaign websites) was presented in English in all three countries.

In conclusion, this study represents the first step in documenting the impact of the 2013 Movember campaigns on social media conversations. Health campaigns such as Movember have the potential to draw attention to important men's health issues that may otherwise be overlooked. Examining conversations from the United States, Canada, and the United Kingdom during the 2013 Movember campaigns provides insight into what messages are adopted and diffused among social networks globally. Regardless of the geolocation, moustache growing and community engagement were the focus of *Twitter* conversations. Additionally, non-health-related content dominated the Movember conversations and few individuals from the United States, Canada, or the United Kingdom shared actionable or content-rich health information about prostate cancer, testicular cancer, or men's

mental health. As social network sites such as *Twitter* rise in popularity (eMarketer, 2013), it will be important to consider how to engage men in productive conversations and capitalize on this medium to increase awareness about important health concerns for men.

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