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Key words: Physicians; Emergency Medicine; Internet; Social Media; Blogging

Word count for the text only: 3,042

Word count abstract: 244

Number of figures: 4

Number of tables: 2

ABSTRACT

Background Twitter is one of the fastest growing social media networks for communication between users via short messages. Technology proficient physicians have demonstrated to be enthusiastic about adopting social media for their work.

Objective To identify and create the largest directory of emergency physicians on Twitter, analyse their user accounts, and reveal details behind their connections.

Methods Several web search tools were utilize to identify emergency physicians on Twitter with biographies completely or partially written in English. NodeXL software was used to calculate emergency physicians' Twitter network metrics and create visualization graphs.

Results We found 672 Twitter accounts of self-identified emergency physicians. Protected accounts were excluded from the study, leaving 632 of them for further analysis. Most emergency physicians were located in the United States (55.4%), had created their accounts in 2009 (43.4%), used their full personal name (77.5%), and provided a custom profile picture (92.2%). Based on at least 1 published tweet in the last 15 days, there were 345 (54.6%) active users on 31 December 2011. Active users mostly used mobile devices based on Apple operating system to publish tweets (69.2%). Visualization of emergency physicians' Twitter network revealed many users with no connections with their colleagues, and a small group of most influential users who were highly interconnected.

Conclusions Only a small proportion of registered emergency physicians use Twitter. Among them exists a smaller inner network of emergency physicians with strong social bonds who are utilizing Twitter's full potentials for professional development.

INTRODUCTION

Social media has become an integral part of both personal and professional lives of many.[1,2]

Variable rates of physicians using social networking web sites have been reported.[3,4,5]

However, it seams that those physicians who are comfortable with computers and mobile

technology are highly engaged with social media.[4]

Twitter

Twitter is one of the most popular social media networks, which became available in July of

2006, and has since seen a tremendous growth, reaching 100 million active users in 2011.[6,7,8]

Twitter allows communication between users via short messages limited to 140 characters,

commonly called tweets. Users can publish tweets, using computers or mobile devices, which

show up in the streams of the people who are subscribed to them. People who subscribe to

receive tweets from a user are called followers, while the people followed by a user are

referred to as friends. Each Twitter user has a profile page, which can be customized with a

short biography, web site address, location information, custom profile picture and

background.[9]

Goals of our study

Individual emergency physicians (EPs) have commented on the benefits of using Twitter.[10]

Nevertheless, little is known about the number of EPs utilizing Twitter, as well as their usage

characteristics and connections. The goal of our study was to identify EPs on Twitter, analyse

their profiles, and reveal details behind their mutual connections.

METHODS

Identifying emergency physicians' Twitter accounts

In order to find EPs' accounts we utilized several strategies. Firstly, we searched users'

names and biographies using the web based people search provided by Twitter and

FollowerWonk and Twiangulate tools.[11,12] Search was performed utilizing all combinations

of many variations of keywords like emergency and emergency medicine with physician and

doctor. After identifying influential EPs, their followers' biographies were also examined to

find more of their colleagues. The same was done with Twitter accounts of organizations and

journals related to emergency medicine, like those from the American College of Emergency

Physicians (@EmergencyDocs) and Emergency Medicine Journal (@EmergencyMedBMJ).

Utilizing these strategies, we were able to identify 672 Twitter accounts of self-identified EPs

with biographies completely or partially written in English language. Among these accounts,

42 (6%) were protected. Users of protected accounts do not share their tweets publicly, and

were therefore excluded from the study. The remaining 632 (94%) Twitter accounts were

included in the study.

Analysing emergency physicians' Twitter accounts

FollowerWonk tool was used to extract several parameters of all Twitter accounts.[11]

Variables including full name, biography, location information, custom profile picture, web

address in the profile, number of followers, number of friends, date of account creation, date

of last tweet, and total number of tweets were exported into Microsoft Excel (Microsoft,

Redmond, WA, USA). Another web service, TweetStats, was used to reveal information

about users' preferred platform and day for publishing tweets.[13]

Visualizing emergency physicians' Twitter accounts and their interconnections

Twiangulate tool and NodeXL software were used to identify connections among EPs'

Twitter accounts.[12,14] NodeXL was further used to calculate EPs' Twitter network metrics

and create visualization graphs for better understanding of account features and their

interconnections based on following.[14]

Statistical analysis

Pearson's Chi-Square test was used to assess the significance of an association between 2

categorical variables. Continuous variables were examined for normality of distribution by

examination of histograms and tests for skewness, rejecting the null hypothesis that the data

is normally distributed. Nonparametric rank sum tests were therefore used to reveal

differences between groups. Pearson's rank correlation coefficient was utilized to measure

the strength of a relationship between 2 continuous variables. All statistical values were

considered significant when the p value was less than 0.05. Statistical analysis of data was

performed using SPSS Statistics for Mac, release 20.0 (IBM Corporation, Armonk, NY,

USA).

RESULTS

Principal characteristics of 632 EPs' Twitter accounts are presented in Table 1.

Table 1. Principal characteristics of emergency physician's Twitter accounts (N=632)

Characteristics	Number (%)	
Year created		
2007	14	(2.2)
2008	69	(10.9)
2009	274	(43.4)
2010	124	(19.6)
2011	151	(23.9)
Country		
The United States	350	(55.4)
The United Kingdom	38	(6.0)
Canada	24	(3.8)
Australia	23	(3.6)
Others	87	(13.7)
No data	110	(17.4)
Full personal name		
Yes	490	(77.5)
Custom profile picture		
Yes	583	(92.2)
Website address on the profile		
Yes	241	(38.1)
Information in the biography		
Work	181	(28.6)
Family	108	(17.1)
Hobby	247	(39.1)

Location	138	(21.8)
Religion	18	(2.8)
Disclaimer	10	(1.6)

The largest number of accounts were created in April 2009, which is shown in Figure 1.

Among the users who provided location information (N=522, 82.6%), most were located in

the US (N=350, 55.4%). However, the proportion of EPs opening Twitter accounts outside

the US has been increasing. In 2007 every twelfth account was opened outside the US, while

in 2011 nearly every second account came from another country (8.3% vs 47.5%, $\chi2_4$= 27.76,

p= 0.001). The average Twitter account was 23.5±12.7 months old. Accounts of EPs from all

countries combined, except the US (N=172, 32.9%), were newer than those from the US

alone (20±12.6 vs. 26±12.4, U=21689, p=0.001).

Twitter public profile customization

Users who provided a custom profile picture were more likely to also provide a website

address on their profile (99% vs 88.2%, $\chi2_1$= 23.07, p= 0.001). The average length of user

biography was 87±45.6 characters, constituting on average 54% of allowed 160 characters.

Users who included additional information in their biographies about work (U=23740,

p=0.001), family (U=23981, p=0.01), hobbies (U=33074, p=0.001), location (U=30322,

p=0.047) or a disclaimer (U=1840, p=0.027), had significantly longer biographies. EPs

mentioning additional facts about their work in biography, where less likely to reveal

information about their families (12.2% vs 19.1%, $\chi2_1$= 4.36, p= 0.037) or hobbies (20.2% vs

34%, $\chi2_1$= 13.99, p= 0.001), but more likely to provide a full personal name (85.6% vs

74.3%, $\chi2_1$= 9.56, p= 0.002) and a website address (41.1% vs 21%, $\chi2_1$= 29.49, p= 0.001) on

their profile. On the other hand, users mentioning family information, more often shared their

hobbies in biography (23.5% vs 13%, $\chi2_1$= 11.69, p= 0.001), and were less likely to provide a

website address on their profile (13.3% vs 19.4%, $\chi2_1$=3.99, p=0.046).

Twitter activity

Main features of EPs' Twitter activity, as well as differences between active and non-active

users' accounts are presented in Table 2.

Table 2. Usage characteristics of emergency physicians' Twitter accounts and

differences between active and non-active users.

Characteristics	Median (range)			Stat	
	All (N=632)	**Active (N=345)**	**Non-active (N=287)**	**U**	**P**
Account age (months)	26 (0 – 58)	27 (0 – 58)	26 (0 – 57)	47275	0.328*
Last tweet (days)	11 (0 – 2283)	2 (0 – 15)	155 (16 – 2283)	0.000	0.001**
Followers (N)	43.5 (0 – 69187)	77 (2 – 69187)	20 (0 – 8829)	25591	0.001**
Friends (N)	66.5 (0 – 73734)	104 (1 – 73734)	28 (0 – 9347)	23950	0.001**
Followers among emergency physicians (N)	1 (0 – 165)	1 (0 – 165)	0 (0 – 53)	35772	0.001**
Friends emergency physicians (N)	1 (0 – 126)	2 (0 – 126)	0 (0 – 46)	36713	0.001**
Total tweets (N)	81.5 (0 – 38862)	286 (1 – 38862)	20 (0 – 11308)	14920	0.001**
Tweets per month (N)	5.16 (0 – 1615)	15.63 (0 – 1138)	1.17 (0 – 1615)	13972	0.001**

* Mann-Whitney U test reveals no significant difference between active and non-active accounts
** Mann-Whitney U test reveals significant difference between active and non-active accounts

Based on at least one published tweet during the last 15 days, there were 345 (54.6%) EPs

actively using Twitter on 31 December 2011. Among the users who opened their accounts in

2007 and 2008, 70% were active, compared to 54% of the users with accounts created in

2010 and 2011 ($\chi2_4$= 10.53, p= 0.032). A larger proportion of users from the US were not

active when compared to EPs from all other countries (74.4% vs 25.6%, $\chi2_1$= 10.61, p=

0.001). Active users more frequently mentioned facts about hobbies in their biographies

(61.9% vs 49.9%, $\chi2_1$= 8.85, p= 0.003), as well as more often included custom pictures

(97.1% vs 86.4%, $\chi2_1$= 25.03, p= 0.001) and website addresses (64.3% vs 48.6%, $\chi2_1$= 14.87,

p= 0.001) on their profile. Those physicians mentioning work information in their

biographies were more often not active in the last 15 days (48.1% vs 57.2%, $\chi2_1$= 4.35, p=

0.037).

When it comes to the number of followers, those EPs mentioning work in their biographies

had a higher total number of followers (U=35885, p=0.017) and followers among other EPs

(U= 35633, p= 0.008). Users mentioning only their hobbies also had a higher total number of

followers (U= 38837, p= 0.001), but not a higher number of followers among EPs (U=

43699, p= 0.069). A significantly lower number of followers among EPs was found for users

mentioning family information in their biography (U= 24626, p= 0.025).

Users with more followers on Twitter, where also themselves following more users (r= 0.98,

p= 0.001). The same was also true among EPs, where those who were following more of their

peers, also had more of them following back (r= 0.66, p= 0.001). EPs with older accounts had

more followers overall (r= 0.10, p= 0.013), more followers among their colleagues (r= 0.19,

p= 0.001), more friends in total (r= 0.08, p= 0.046), and among EPs (r= 0.092, p= 0.021).

They also had a higher total number of tweets (r= 0.152, p= 0.001), and their last tweet was

published more recently (r= 0.173, p= 0.001). EPs who were following (r= 0.175, p= 0.001)

or were followed (r= 0.205, p= 0.001) by more of their colleagues, had a higher total number

of tweets (r= 0.124, p= 0.002) and their last tweet was published more recently (r= 0.161, p= 0.001), when compared with EPs with less connections to and from their peers.

Further analysis of solely active users revealed that among these EPs, mobile devices were most popular for publishing on Twitter (Figure 2). Early adopters, who created their accounts in 2007, predominantly used desktop applications to post tweets (desktop applications 45.5%, web 36.4%, mobile devices 18.2%), while the percentage of users mostly utilizing mobile devices rose throughout the years and peaked among those with accounts opened in 2011 (desktop applications 7.5%, web 32.6%, mobile devices 60%) (χ^2_2= 23.37, p= 0.001). Additionally to owning the oldest accounts, users primarily utilizing desktop applications had a higher number of total followers (χ^2_2= 25.4, p= 0.001), followers among EPs (χ^2_2= 10.75, p= 0.005), friends (χ^2_2= 6.92, p= 0.031), and total number of tweets (χ^2_2= 16.75, p= 0.001), than users using other platforms to publish on Twitter.

Apple iOS devices (Apple Inc., Cupertino, CA, USA) were used most often by those predominantly utilizing mobile devices to post tweets (iPhone: N=105, 67.3%; iPad: N=12, 1.9%). Mobile devices based on Android operating system (Google, Mountain View CA, USA) were used more often by the US based EPs compared to their peers from all other countries (23.6% vs. 3.4%, χ^2_2= 12.57, p= 0.002). On the contrary, physicians outside the US used BlackBerry mobile devices (Research In Motion, Ontario, Canada) more often (15.5% vs. 5.6% χ^2_2= 12.57, p= 0.002). Users were most active on Twitter during the middle of the week (Figure 3).

Interconnections between emergency physicians on Twitter

Features and interconnections of 632 emergency physician's accounts are visualized in Figure 4. Each Twitter account is represented with a circle or square. Account is represented with a circle if its user is following less than 50 EPs within the network, or with a square, if its user is following more than 50 EPs. Each individual account has a color assigned to it on a

continuous scale from green to red, depending on the number of followers among EPs. The

size of the accounts represents the total number of followers. Lines connecting accounts

represent connections between them on Twitter. Darker line signifies that one user is

following the other. On the contrary, lighter line signifies that the connection is reciprocated

and that both users are following each other.

There were 213 (34%) accounts, depicted on the edge of the Figure 4, which were isolated

from the Twitter network of EPs, meaning that they had no incoming or outgoing connections

with other EPs. Most of these users were following a small number of Twitter users, and had

a small number of followers and total tweets. Some, on the other hand, had a very large

number of followers, but all of them came from outside the network of EPs. In fact, among

35 users with more than 1000 total followers, there were 7 (20%) without a single incoming

or outgoing connection with another colleague. On the contrary, 18 accounts in the middle of

the graph had numerous connections, at least 50, coming in from other EPs. These were the

most influential users in the network, who were also greatly interconnected. Some of these

users are represented with squares, meaning that they had more outgoing connections with

other colleagues outside the small group of influential users. The most distinguishing feature

of most influential EPs was the fact that the great majority of them (N=15, 83%) maintained

their own medical blogs.

DISCUSSION

Principal findings

We managed to identify almost 700 EPs on Twitter with biographies written in English language. All of them are followed by our research Twitter account (@research_er) and also listed on a dedicated web page.[9,15] In order to facilitate future research in this subject, we will continue to add new EPs to the list, as well as expand it with those tweeting in languages other than English. A majority of EPs in our sample where from the US. They represent only 1.6% of all board-certified EPs in the US, which are estimated to be more than 20,000.[16] The same is true for Australia which has approximately 1,330 EPs,[17] but only 1.7% were found on Twitter. According to the latest available statistics, 77% of adults in the US use Internet, and 13% of them use Twitter.[18,19] If we assume the same for EPs in the US, there should be around 17,000 of them using Internet, and 2,210 using Twitter. Based on these results, we can conclude that EPs are more reluctant to adopt Twitter than the general adult population, or that there are many more currently utilizing this service who were not identified by us. Nevertheless, these numbers are substantially larger than those presented by Chretien and colleagues.[20] In 2010 they identified 523 physicians tweeting primarily in English, with EPs accounting for only 6.2%.[20] If this ratio of EPs versus physicians of all specialties on Twitter is correct, there might currently be more than 11,000 physicians using Twitter. This is a significantly greater number than 1,327 physicians presently listed in the largest directory of physicians on Twitter,[21] but is also most likely to be underestimated. Furthermore, the number of EPs on Twitter seams to be steadily increasing, although not as fast as the number of all users.[22]

When comparing the main characteristics of EPs' Twitter accounts with accounts of all users, EPs were more likely to provide location information (82.6% vs 73%) and web address (62%

vs 45%) in their profile.[22] This might suggest they are more comfortable about disclosing

information about themselves on Twitter than the average user.

Among the active users, mobile devices were the most popular platform for publishing

tweets. Usage of mobile devices has shown great growth during the years, which is consistent

with the data for all Twitter users.[23] Interestingly, users with the oldest accounts were

predominantly using desktop applications. It might be the case that desktop users, who are

more active and influential, chose desktop applications because of their benefits over other

platforms, such as better integration with other applications on the computer. Apple iOS

mobile phones and tablets were by far most popular among those EPs using mobile devices to

tweet. Such a high dominance of iPhone and iPad among physicians over other mobile

devices has also been reported by others.[24]

When the Twitter network of EPs was analysed and visualized for mutual connections, we

found three groups of users. First group was consisted of users with no connections to other

EPs in the network. It is most likely the case that these users, some of which were very active

and had a large numbers of followers and friends, were not using Twitter for work, but were

rather utilizing it to connect with families and friends who might share similar hobbies and

interests. Such users distinguished themselves in Twitter biographies by providing

information about their work less frequently and hobbies more frequently than those EPs with

more connections with their colleagues. Those EPs who provided more information about

their work in biography, were more often non-active. However, our criteria for distinguishing

active users was based merely on days since last tweet, so it might be the case that these users

were using Twitter to listen to other users in a greater extent, than share their own tweets. The

second group was represented by 2.8% of most influential EPs in the network who had many

followers among their colleagues. These users formed a small inner network characterized by

many mutual connections. Most of them also followed EPs outside this small group, but there

were only a few who were very generous in terms of following more than 50 of their colleagues. They represented a bridge between the most influential and all other users in the Twitter network of EPs. The vast majority of most influential users among EPs were also medical bloggers, who previously reported sharing practical knowledge and skills as one of their major motivators for blogging.[25] They seam to be utilizing their blogs to gain more followers on Twitter and vice versa. Finally, the third and largest group of EPs had a mixture of friends outside and inside the Twitter network of EPs, which might indicate that they were dividing attention between work related and personal topics.

Limitations and future studies

Identifying types of users on Twitter is challenging. Twitter search does not offer many advanced options and is known to fail at times. Since at the time of research no directories of emergency physicians on Twitter existed, biographies shared by users on their profiles offered the only means of identification. However, some users choose to leave their biographies empty or do not mention their profession at all. Therefore many EPs potentially using Twitter might have passed unnoticed. On the other hand, since users are the only ones responsible for writing their biographies, some might have been falsely identified as EPs. Our study can therefor draw conclusions solely regarding Twitter accounts of users who self-identified as EPs, and cannot offer information about those accounts maintained by EPs who chose not to disclose their profession. Furthermore, we included only Twitter users with biographies completely or partially written in English language, so cannot draw conclusions about EPs using Twitter in other languages. Users with protected accounts were also excluded from our analysis, and we have not provided any information about their use of Twitter. In this study we did not analyse the content of tweets published by EPs. Such future analysis could reveal more information about the way Twitter is used among EPs, as well as provide more insight regarding their mutual social connections. Visualization of the network

of conversations might offer more detailed information about characteristics and strength of

social bonds between EPs on Twitter. Finally, usage characteristics of other popular social

media networks by EPs, including Facebook, [26] should also be studied in depth to reveal

distinctive communication patterns and identify their potentials for emergency medicine.

CONCLUSIONS

There were more EPs on Twitter than expected based on available data. However, this number still represents only a small fraction of registered EPs. Among the Twitter network of EPs there was a small group of influential users using its full potentials to create strong mutual connections and utilize Twitter for their work. Hopefully other EPs will soon realize the benefits of Twitter and join their colleagues for the sake of advancing emergency medicine.

REFERENCES

1. Social media. Wikipedia, the Free Encyclopedia. URL:

   http://en.wikipedia.org/wiki/Social_media [accessed 2012 Jan 12] Archived at:

   http://www.webcitation.org/64dwbVP7e

2. Madden M, Zickuhr K. 65% of online adults use social networking sites. Washington,

   DC: Pew Internet & American Life Project; 2011. URL:

   http://www.pewinternet.org/~/media//Files/Reports/2011/PIP-SNS-Update-2011.pdf

   [accessed 2012 Jan 12] Archived at: http://www.webcitation.org/64dwZ6s5g

3. Bosslet GT, Torke AM, Hickman SE, Terry CL, Helft PR. The patient-doctor

   relationship and online social networks: results of a national survey. J Gen Intern

   Med. 2011;1168-74.

4. Modahl M, Tompsett L, Moorhead T. Doctors, Patients & Social Media. Waltham,

   MA: QuantiaMD; 2011. URL: http://www.quantiamd.com/q-

   qcp/DoctorsPatientSocialMedia.pdf [accessed 2011 Jan 12] Archived at:

   http://www.webcitation.org/64dwUz7x2

5. Manhattan Research. Manhattan Research, LLC. 2011. Taking the Pulse® U.S. v11.0

   study.

6. About Twitter. Twitter. URL: https://twitter.com/about [accessed 2012 Jan 12]

   Archived at: http://www.webcitation.org/64dwCzMu2

7. Twitter. Wikipedia, the Free Encyclopedia. URL:

   http://en.wikipedia.org/wiki/Twitter [accessed 2012 Jan 12] Archived at:

   http://www.webcitation.org/64dwHQ7Uy

8. Twitter Blog: One hundred million voices. URL: http://blog.twitter.com/2011/09/one-

   hundred-million-voices.html [accessed 2012 Jan 12] Archived at:

   http://www.webcitation.org/64dwLAAFm

9. EM Research on Twitter. URL: https://twitter.com/#!/research_er [accessed 2012 Jan 12] Archived at: http://www.webcitation.org/64e2drJ7d

10. Berger E. This Sentence Easily Would Fit on Twitter: Emergency Physicians Are Learning to "Tweet". Ann Emerg Med. 2009;54,23-25.

11. Follower Wonk: Twitter analytics, follower segmentation, social graph tracking, and more. URL: http://followerwonk.com/ [accessed 2012 Jan 15] Archived at: http://www.webcitation.org/64hTY2xC6

12. Twiangulate: analyzing the connections between friends and followers. http://twiangulate.com/search/ [accessed 2012 Jan 15] Archived at: http://www.webcitation.org/64hTd4gKn

13. TweetStats :: Graphin' Your Stats. http://tweetstats.com/ [accessed 2012 Jan 15] Archived at: http://www.webcitation.org/64hTiy6SC

14. NodeXL: Network Overview, Discovery and Exploration for Excel. http://nodexl.codeplex.com/ [accessed 2012 Jan 15] Archived at: http://www.webcitation.org/64hTnjpZq

15. twittER researchER: Directory of emergency physicians on Twitter. http://emergencytwitter.ivor-kovic.com/ [accessed 2012 Jan 15] Archived at: http://www.webcitation.org/64iW0FyOg

16. Camargo CA Jr, Ginde AA, Singer AH, Espinola JA, Sullivan AF, Pearson JF, Singer AJ. Assessment of emergency physician workforce needs in the United States, 2005. Acad Emerg Med. 2008;15:1317-20.

17. The Australasian College for Emergency Medicine (ACEM). URL: http:// http://www.acem.org.au [accessed 2012 Jan 14] Archived at: http://www.webcitation.org/64grg41Rz

18. International Telecommunication Union. Yearbook of Statistics - Telecommunication/ICT Indicators 2001-2010 37th Edition. Genevea, Switzerland; 2011.

19. Madden M, Zickuhr K. Twitter Update 2011. Washington, DC: Pew Internet & American Life Project; 2011. URL: http://pewinternet.org/~/media//Files/Reports/2011/Twitter%20Update%202011.pdf [accessed 2012 Jan 14] Archived at: http://www.webcitation.org/64gc27PRp

20. Chretien KC, Azar J, Kind T. Physicians on Twitter. JAMA. 2011;305:566-8.

21. Twitter Doctors. URL: http://twitterdoctors.net [accessed 2012 Jan 12] Archived at: http://www.webcitation.org/64eA5Dcra

22. Sysomos Inc. Twitter Statistics for 2010. URL: http://www.sysomos.com/insidetwitter/twitter-stats-2010/ [accessed 2012 Jan 14] Archived at: http://www.webcitation.org/64gdfArwD

23. GigaOM. Twitter CEO: We have 100M active users. URL: http://gigaom.com/2011/09/08/twitter-ceo-we-have-100m-active-users/ [accessed 2012 Jan 14] Archived at: http://www.webcitation.org/64h4cnkzF

24. Hirsch R. Physician Mobile Use Grows 45%; Apple Dominates Android and Blackberry. Reston, VA; Bulletin Healthcare; 2011. URL: http://www.bulletinhealthcare.com/PressReleases/MobileData.pdf [accessed 2012 Jan 14] Archived at: http://www.webcitation.org/64h7y2ILJ

25. Kovic I, Lulic I, Brumini G. Examining the medical blogosphere: an online survey of medical bloggers. J Med Internet Res. 2008;10:e28.

26. Welcome to Facebook. Facebook. URL: http://www.facebook.com/ [accessed 2012 Mar 12] Archived at: http://www.webcitation.org/665wsvax2

Contributors

IL contributed to the concept and design of the study, and wrote the paper.

IK conceived the study, performed statistical analysis, and contributed to editing the paper.
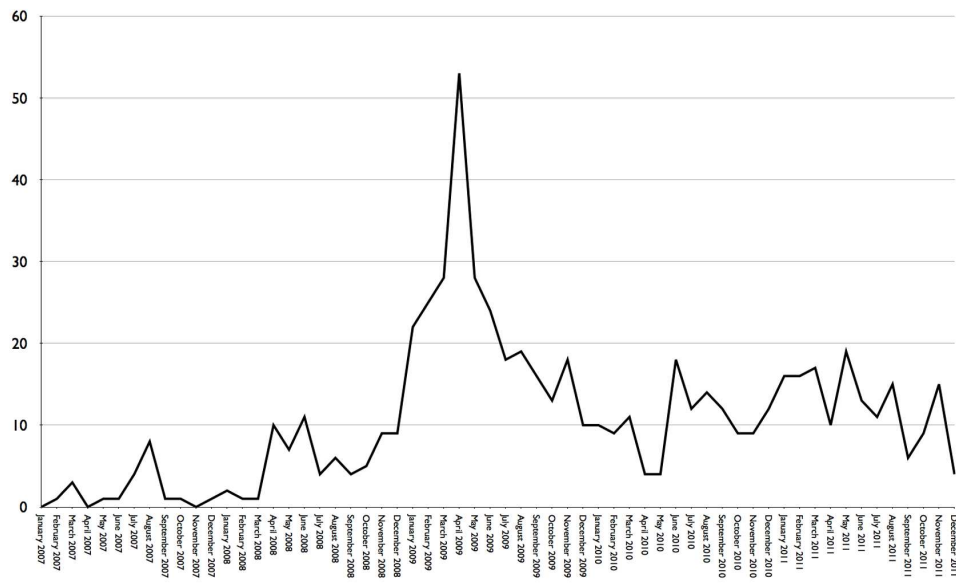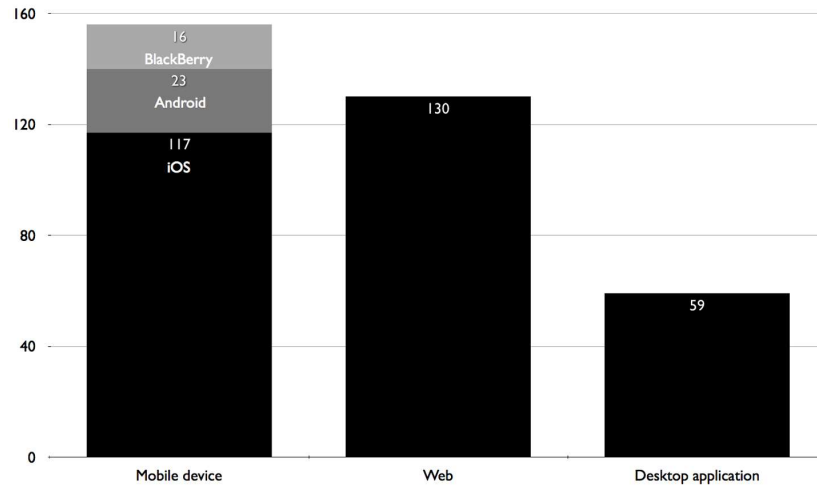
Funding

None

Competing interests

None

Distribution of number of Twitter accounts created per month, from January 2007 to December 2011.
592x370mm (300 x 300 DPI)

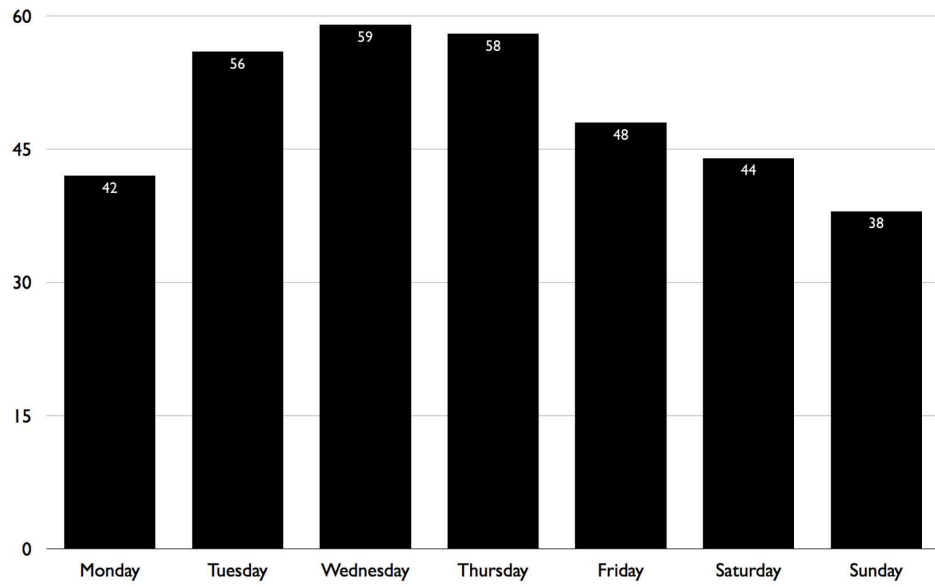Distribution of number of active emergency physicians primarily using different platforms to publish
tweets
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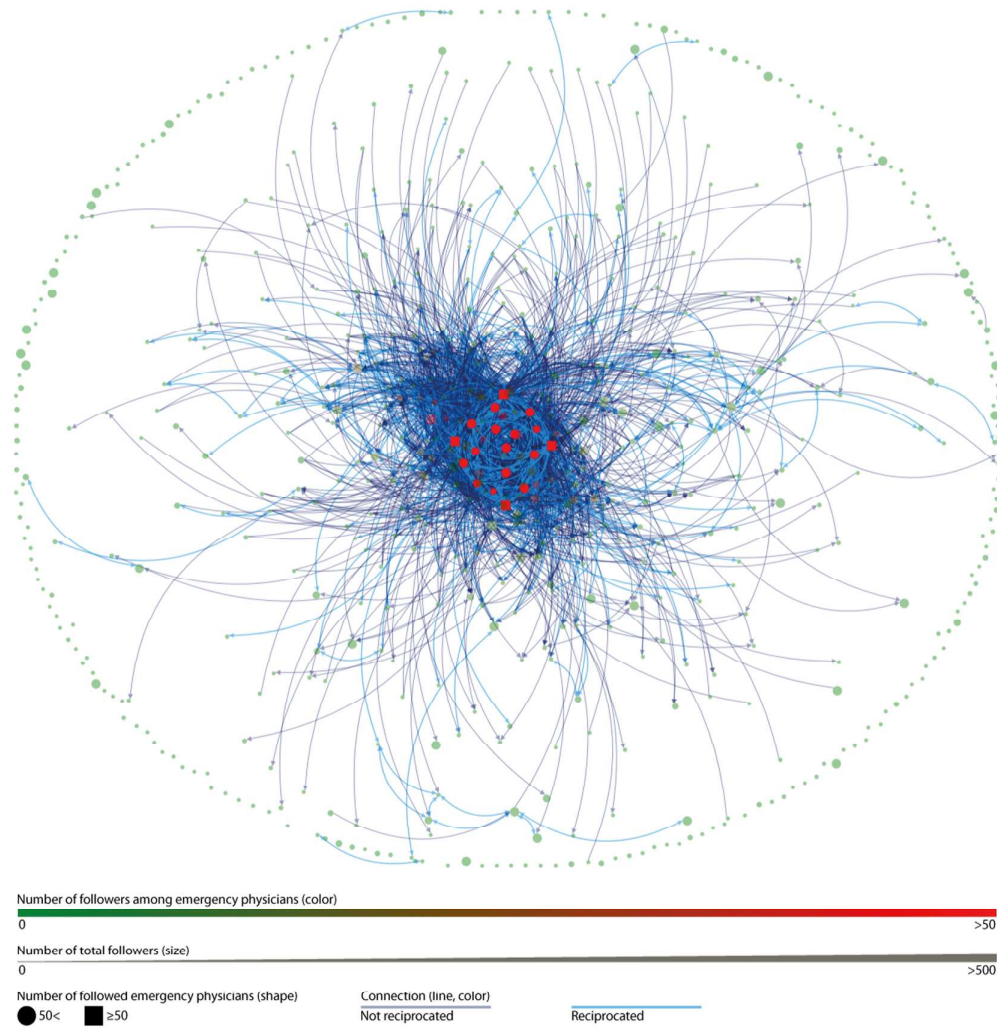
Distribution of number of active emergency physicians primarily publishing tweets on different days
of the week
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Visualization of emergency physicians' Twitter accounts features and their interconnections