

ARTIFICIAL INTELLIGENCE AND RADIOLOGY: A SOCIAL MEDIA PERSPECTIVE

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Disclosure

- None of the authors have a conflict of interest related to this research.

Introduction

- Artificial intelligence (AI) continues to demonstrate significant potential for radiology. Its expansion in the field evokes a multifaceted discussion about its future prospects and challenges (1-3).
- Significant academic discussion has focused on whether AI may replace radiologists (3, 4).
- Limitations of AI in radiology have been described, especially related to regulatory challenges, legal liability, and patient acceptance (2).
- While industry influences have driven much of the development of AI in radiology, radiologists are now playing a larger role in these changes. On an institutional level, the American College of Radiology established the Data Science Institute one year ago in part to engage radiologists in the process of developing and applying AI to radiology (5).
- While the expansion of AI in radiology seems certain, the impact of such expansion on the field has received considerable debate.
- Twitter is a useful tool that has been employed to assess social media discussions and public opinion on clinical topics (6, 7).

Purpose: To use Twitter to characterize public perspectives regarding AI and radiology.

Methods

- Twitter was searched using the platform’s native search function for the phrase “artificial intelligence radiology.”
- Tweets posted from November 2016 through October 2017 were recorded.
- Tweet content was stratified by time period (first vs. second six-month period of the one-year study window).
- Recorded tweets were reviewed for information regarding the user, tweet text, and presence of a link within the tweet.
 - Links were excluded for: broken link (n=16), linking to non-English webpage (n=2), linking to identical content as previously recorded (n=21), linking to restricted content not publicly available (n=2), linking to a webpage without content (n=5).
- Recorded information was assessed with standard summary statistics using Excel for Windows (version 16.10; Microsoft Corporation; Redmond, Washington).

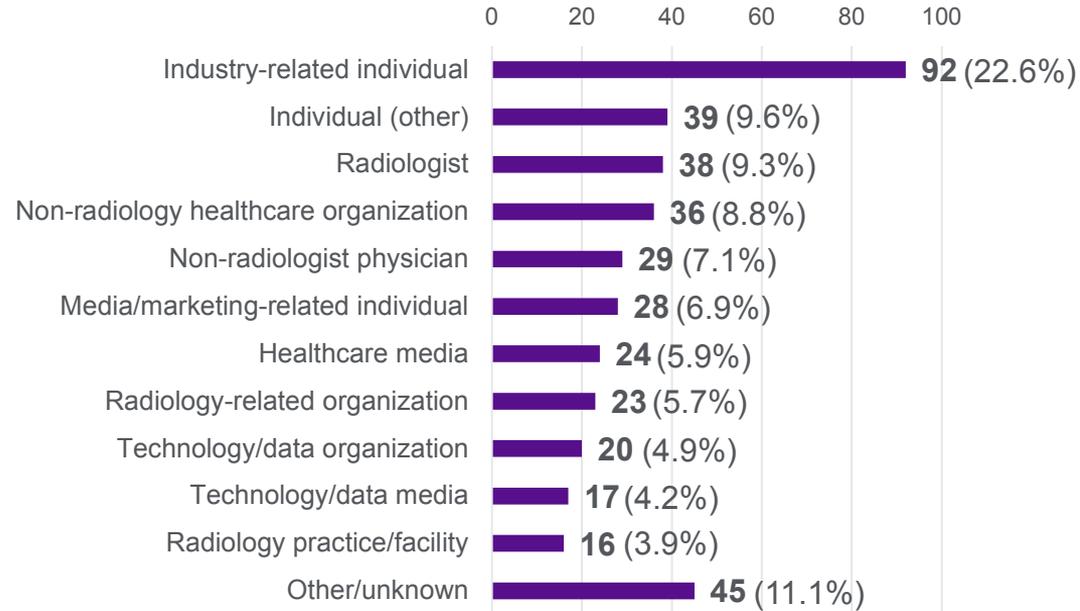
Methods (cont'd): Information collected

User information	Tweet text	Link within tweet
<ul style="list-style-type: none">• Category of user<ul style="list-style-type: none">– Determined based on user's twitter handle, biographic description and linked user website• Geographic location of user	<ul style="list-style-type: none">• Mention of specific topics• Stance of tweet regarding the impact of AI on radiology• Presence of a link to an external website	<ul style="list-style-type: none">• Category of link source• Presence of content related to AI & radiology• Mention of specific themes related to AI• Stance regarding the issue of AI replacing radiologists• Stance regarding the impact of AI on radiology

Results (Users)

- 407 unique users posted tweets related to AI & radiology during this time period.
- User location:
 - 42.5% from locations in the U.S.
 - 35.1% from locations not in the U.S.
 - 22.4% location could not be classified
- Users posting on topic represented a wide range of categories, most commonly industry-related individuals (Figure 1).

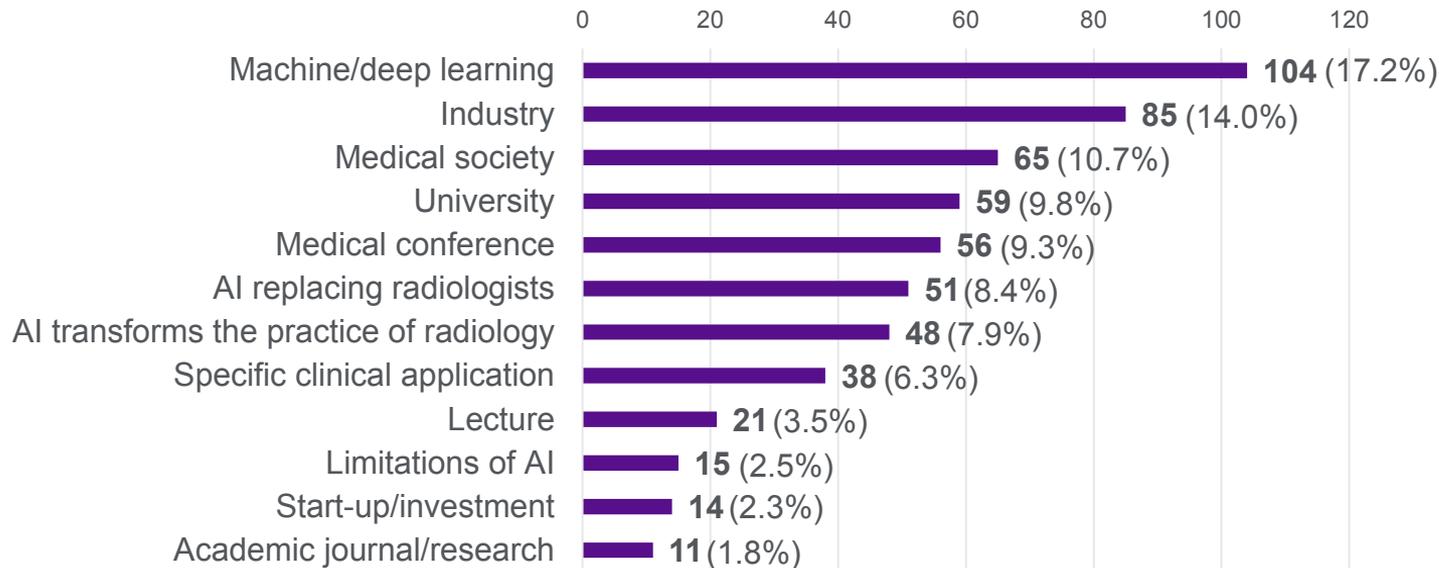
Figure 1: User Category



Results (Tweets)

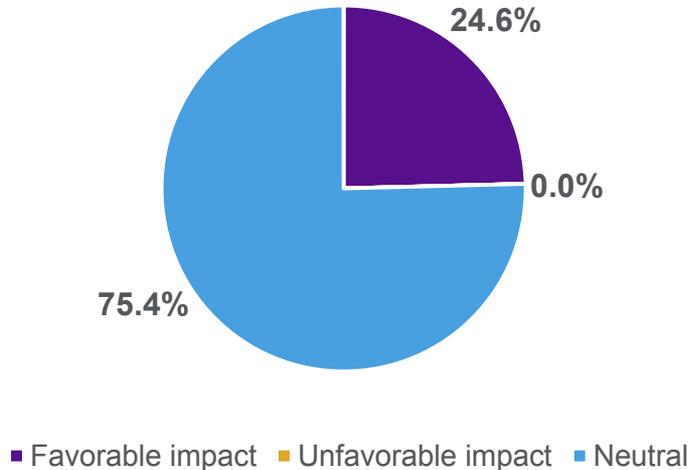
- A total of 605 tweets during this 12-month time period were identified.

Figure 2: Topics Included in Tweets



Results (Tweets, cont'd)

Figure 3: Stance on Impact of AI on Radiology

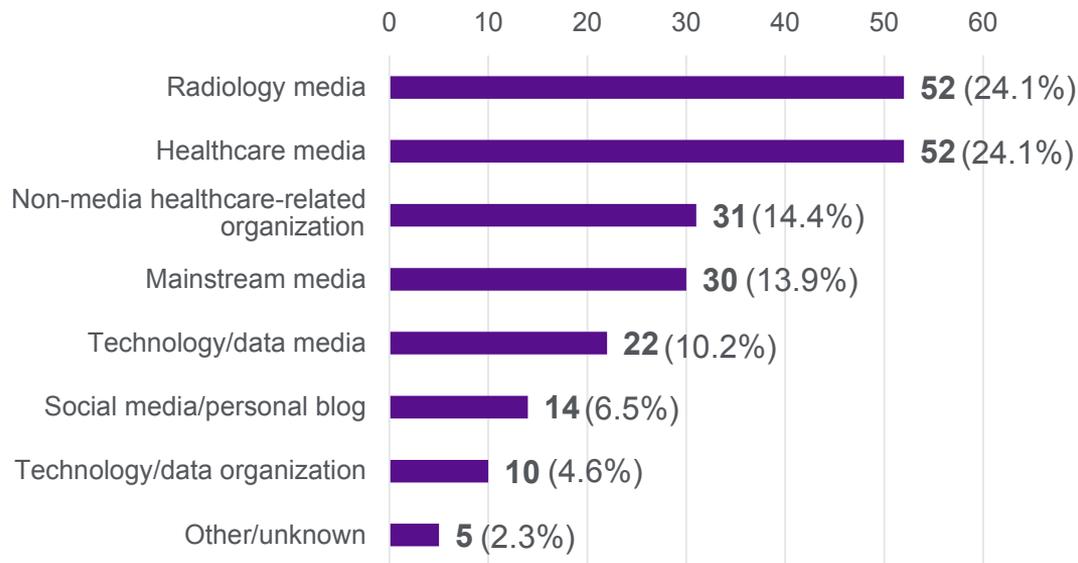


- The stance of tweets on the impact of AI on radiology (Figure 3) was further stratified by time period.
 - In the first 6 months (11/2016–4/2017):
 - 19.9% were favorable
 - 80.1% were neutral
 - No tweets were unfavorable
 - In the second 6 months (5/2017 – 10/2017):
 - 29.1% were favorable
 - 70.9% were neutral
 - No tweets were unfavorable

Results (Links)

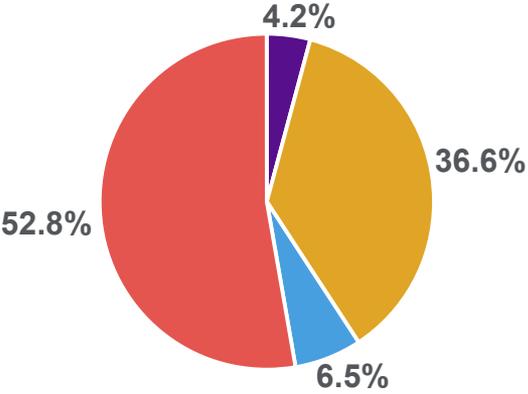
- 216 unique links were included in tweets.
- 95.8% included content specifically related to AI in radiology.
- Link sources represented a wide range of categories, most commonly radiology and healthcare media (Figure 4).
- Topics (& frequencies) mentioned in link content:
 - AI-related efficiency/workflow improvements (52.1%)
 - Legal/regulatory issues of AI (17.7%)
 - Ethical issues of AI (4.7%)
 - Other AI limitations/challenges (29.3%)

Figure 4: Link Source Category



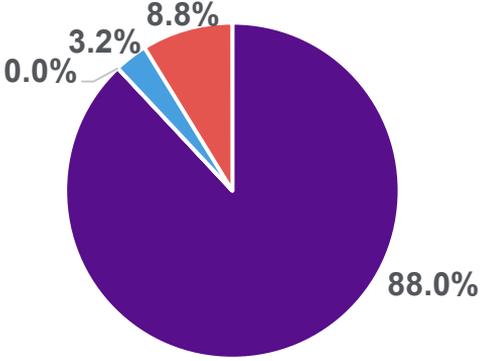
Results (Links, cont'd)

Figure 5: Link Stance on AI Replacing Radiologists



- Leans toward AI replacing radiologists
- Leans against AI replacing radiologists
- Presents both sides in a balanced way
- Does not mention this issue

Figure 6: Link Stance on How AI will Impact the Field of Radiology



- AI is positive for radiology
- AI is negative for radiology
- Presents both sides in a balanced way
- Does not address issue

Discussion

- A wide spectrum of users are engaged in online social media dialog regarding AI and radiology.
 - There is a large industry presence compared with a smaller presence by physicians.
 - While mostly centered in the U.S., this discussion also includes a large international component.
- Industry involvement was a common theme among tweets, though academic and medical themes were also well-represented.
- Efficiency/workflow improvements by AI in radiology was a theme in the majority of webpage links, though discussing limitations of AI was also very common.
- **While noting challenges, the discussions were overwhelmingly positive towards the transformative impact of AI on radiology and leaned against AI replacing radiologists.**

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