

# COVID-19 on Twitter: A Sentiment Analysis of Tweets from Public Health Agencies, News Media, and Normal Users

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# Acknowledgements

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- Samah J. Fodeh, PhD (research supervisor)

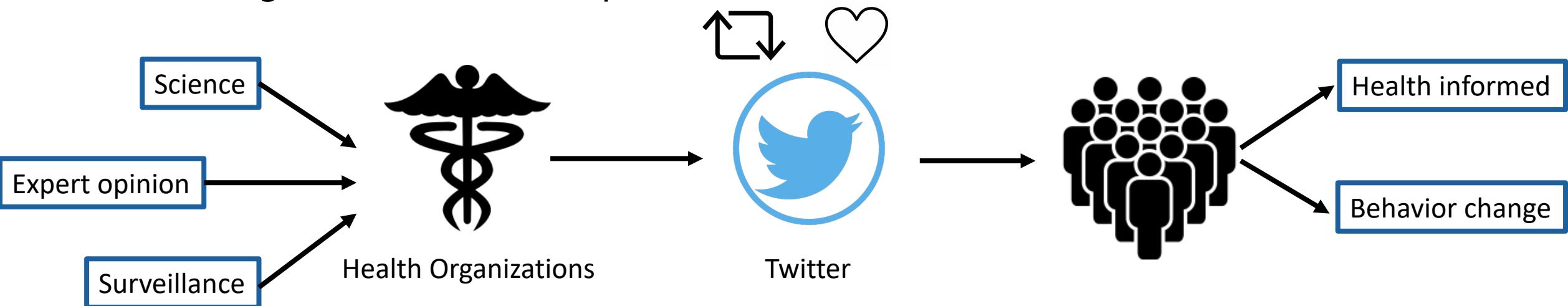


- Glen Nowak, PhD (conception)

# Background

## Twitter as a Health Communication Platform

- 65 million Americans have Twitter accounts
- Twitter users are younger than U.S. population but distribution of gender and race is equivalent
- Health organizations use Twitter to disseminate health information and encourage behaviors to improve health



# Public Health Key Players

**CDC** 

@CDCgov

3.1M Followers

**World Health Organization (WHO)** 

@WHO

8.3M Followers

**NIH** 

@NIH

1.2M Followers

**CDC Emergency** 

@CDCemergency

2M Followers

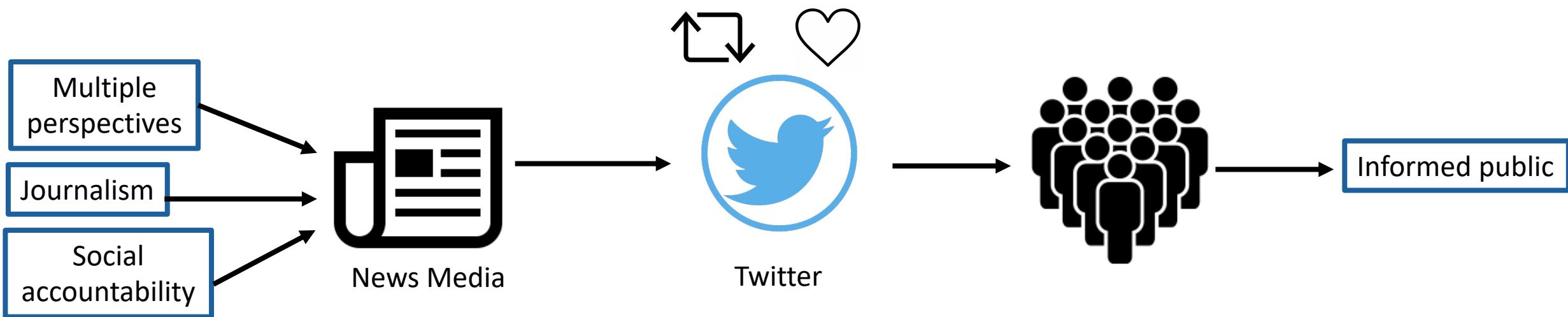
**HHS.gov** 

@HHSGov

1M Followers

# Background

- News media organizations also disseminate information during public health crises



# News Media Key Players

**CNN** 

@CNN

49.8 Followers

**The New York Times** 

@nytimes

47.3M Followers

**ABC News** 

@ABC

15.9M Followers

**BBC Breaking News** 

@BBCBreaking

45.4M Followers

**The Wall Street Journal** 

@WSJ

18M Followers

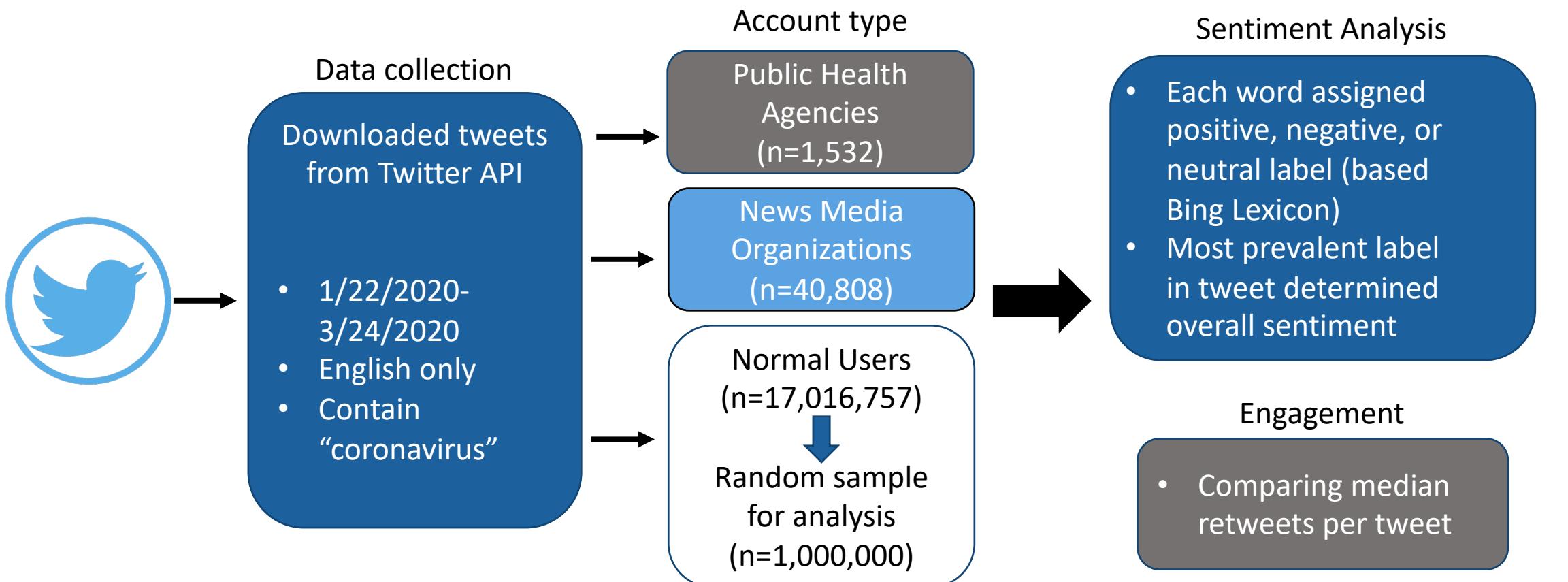
## Research Question

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During the pre-pandemic COVID-19, which entity—  
*public health agencies or news media organizations*—  
influenced people's attitudes more?

# Methods

## Sentiment analysis of tweets



# Twitter Accounts Classified

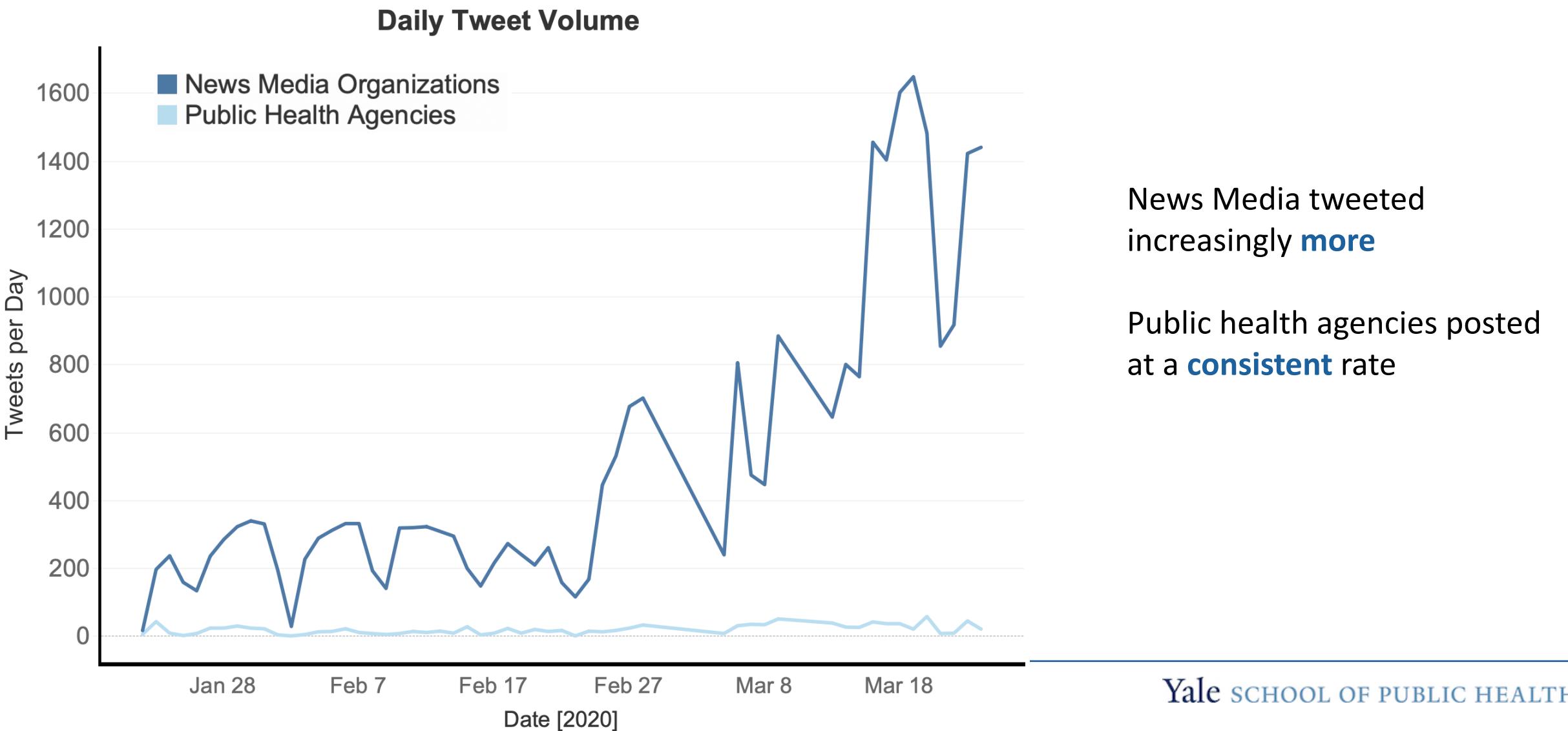
## Public Health Agencies

@CDCGlobal	@who
@CDCEmergency	@WHOWPRO
@CDCgov	@WHOSEARO
@HHSGov	@who_europe
@Drtedros	@whoafro
@pahoemergencies	@nih
@us_fda	@icrc
@whoemro	@hhs_ash
@pahowho	

## News Media Organizations

@CNNBRK	@washingtonpost	@newsweek
@CNN	@ap	@breakingnews
@Nytimes	@cbcnews	@huffpost
@WSJ	@independent	@XHNews
@time	@guardiannews	@BBCBreaking
@ABC	@cnbc	@rt_com
@guardian	@ndtv	@theeconomist
@reuters	@telegraph	@bbcworld
@france24_en	@skynewsbreak	@financialtimes
@france24	@skynews	@ajenglish

# Tweet Volume



# Word Frequencies

## News Media Organizations

covid u.s  
covid19 chinese global due  
19spread confirmed world news people  
health ukoutbreak updates virus  
lockdown government pandemic trump  
wuhan fears positive death live  
amid

## Public Health Agencies

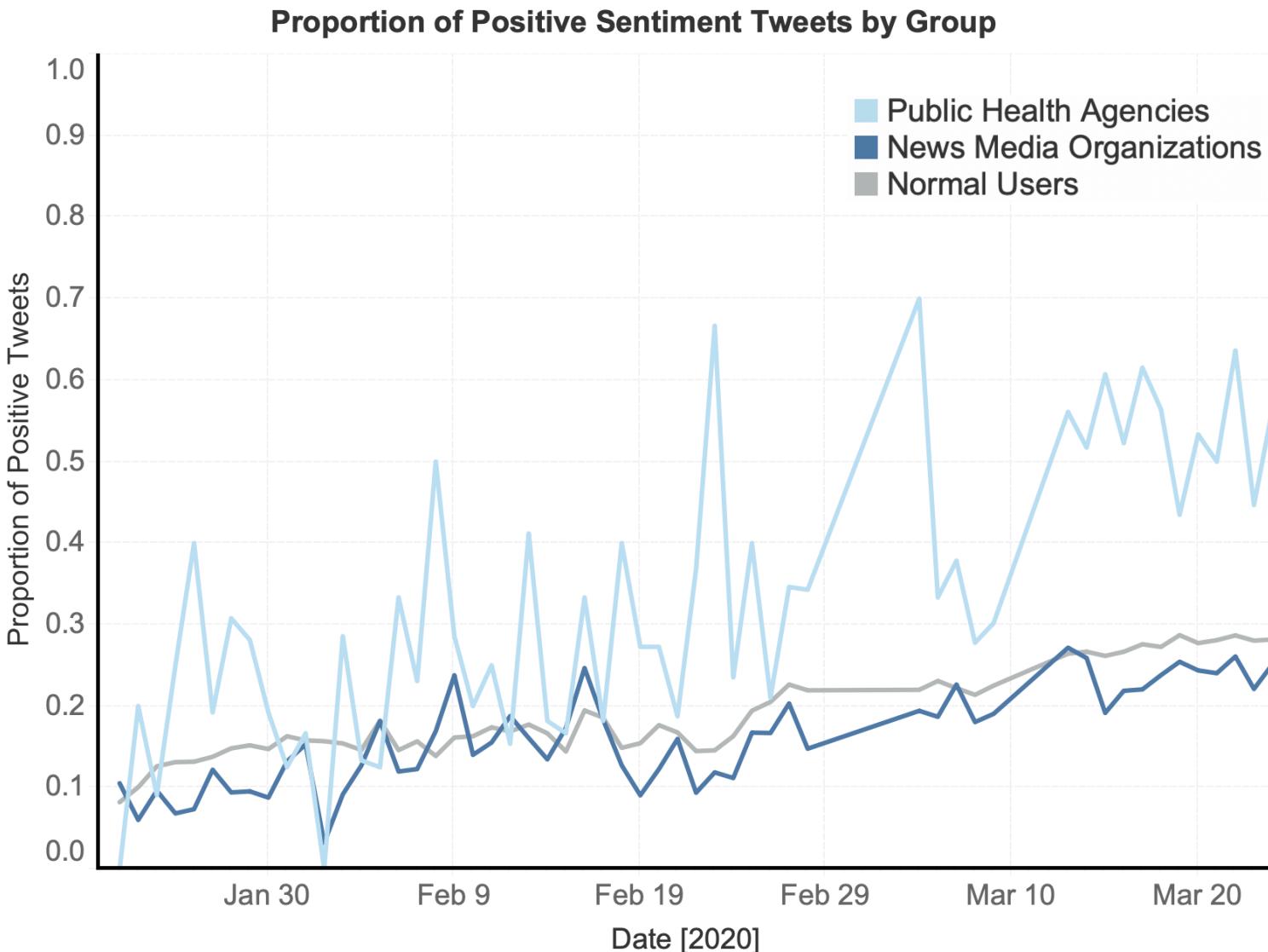
ncov virus  
public response protect risk support  
community 2019ncov prevent covid reported  
1 outbreak  
health total covid19 drtedros  
people spread china countries information  
including 19confirmed measures 2019  
care

# Word Frequencies

**Normal Users**

news chinese time wuhan home  
2 health china response due pandemic  
stop trump people positive covid19  
realdonaldtrump flu spread outbreak covid  
virus government world stay it's  
crisis 19 day

# Sentiment Analysis: Positive



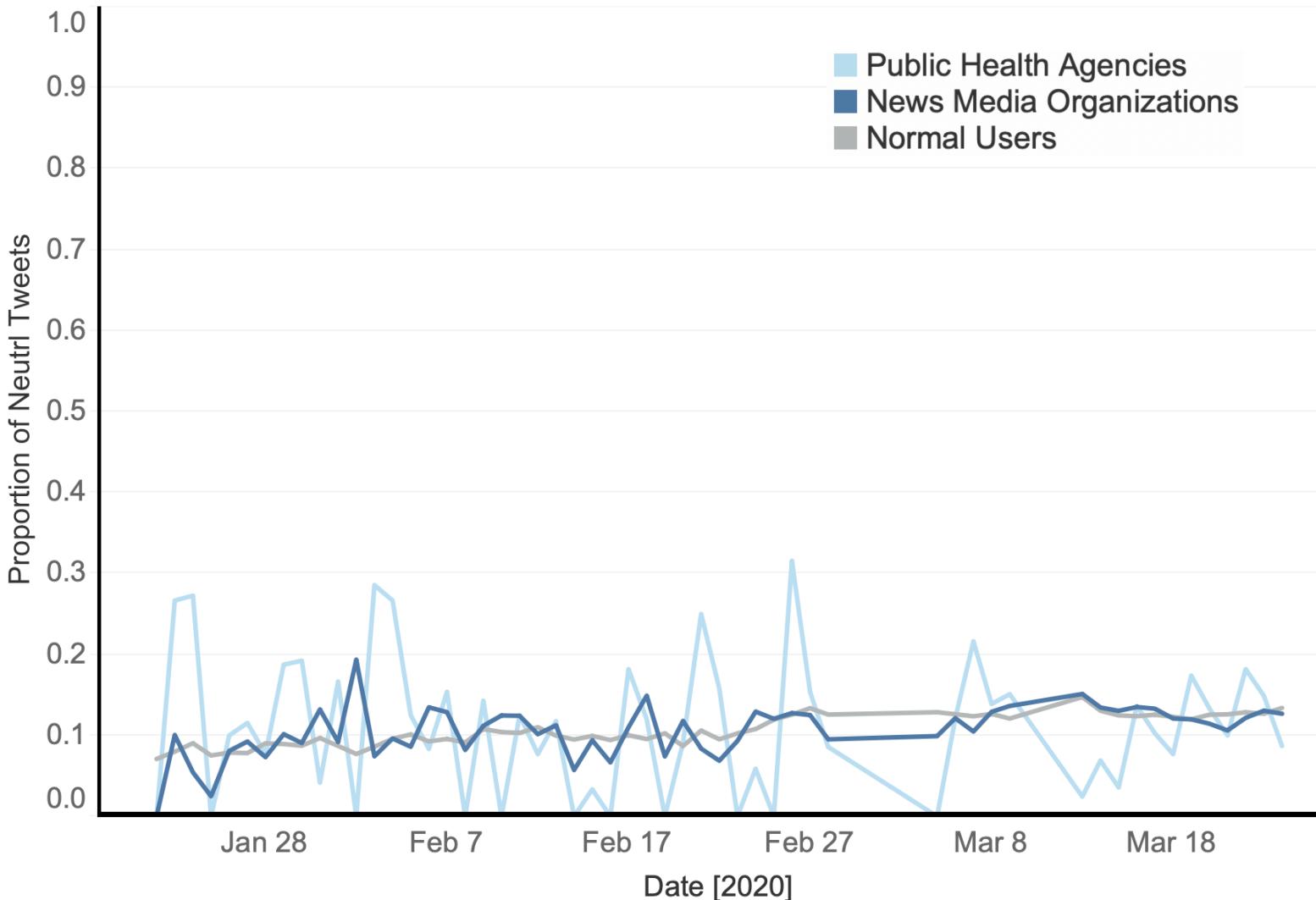
Public health agency tweets more **positive**, especially after late February

Fluctuation here explained by low volume

Proportion of news media and normal user tweets that are positive are **low** and nearly the **same**. Trended more positive during the end of February.

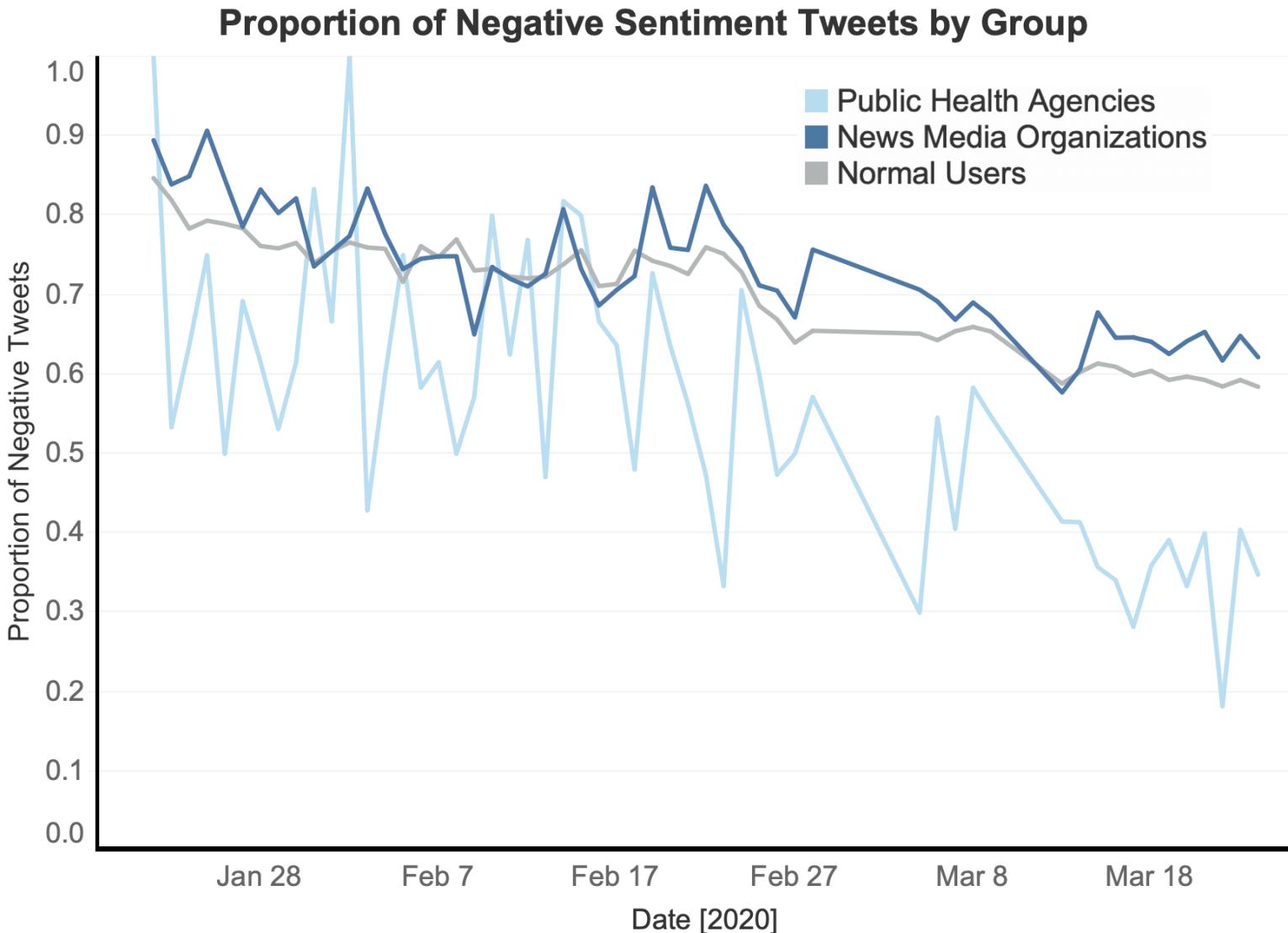
# Sentiment Analysis: Neutral

Proportion of Neutral Sentiment Tweets by Group



All types have **low** levels of neutral tweets

# Sentiment Analysis: Negative

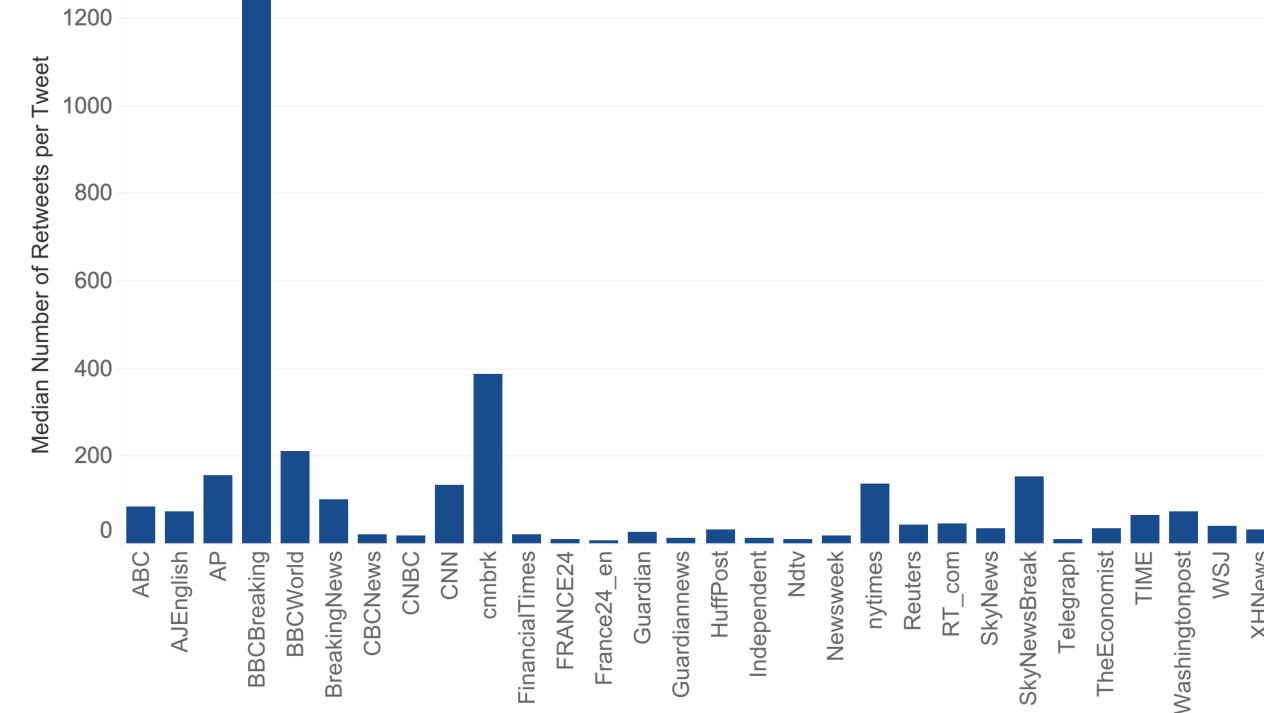


Negative tweets **greatest** among news media and normal users, though trended **down** slightly

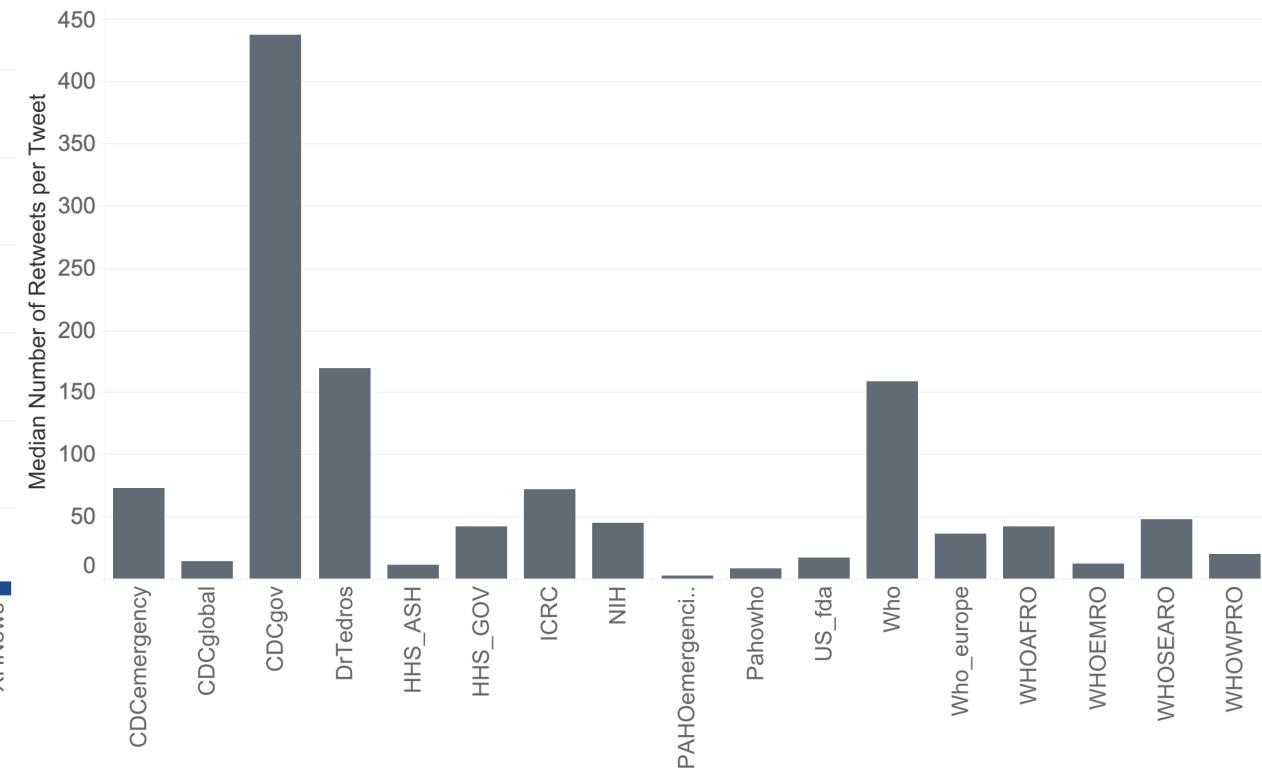
Public health agency tweets were **less negative** and trended **downward** starting in mid-February

# Engagement: Median Retweets per Tweet

## News Media Organizations



## Public Health Agencies



## Discussion & Conclusion

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These results are suggestive that **News Media Organizations** may influence normal users' sentiments **more** than Public Health Agencies

Possibly explained by the higher number of **followers** among News Media accounts and higher median **retweets** per tweet, amplifying messages in the network

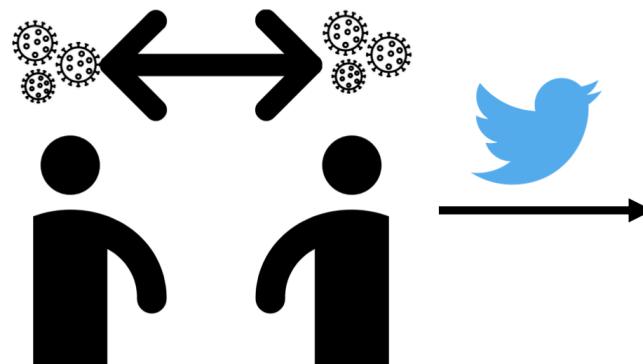
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News Media Organizations are likely the **primary source** of information during a public health crisis

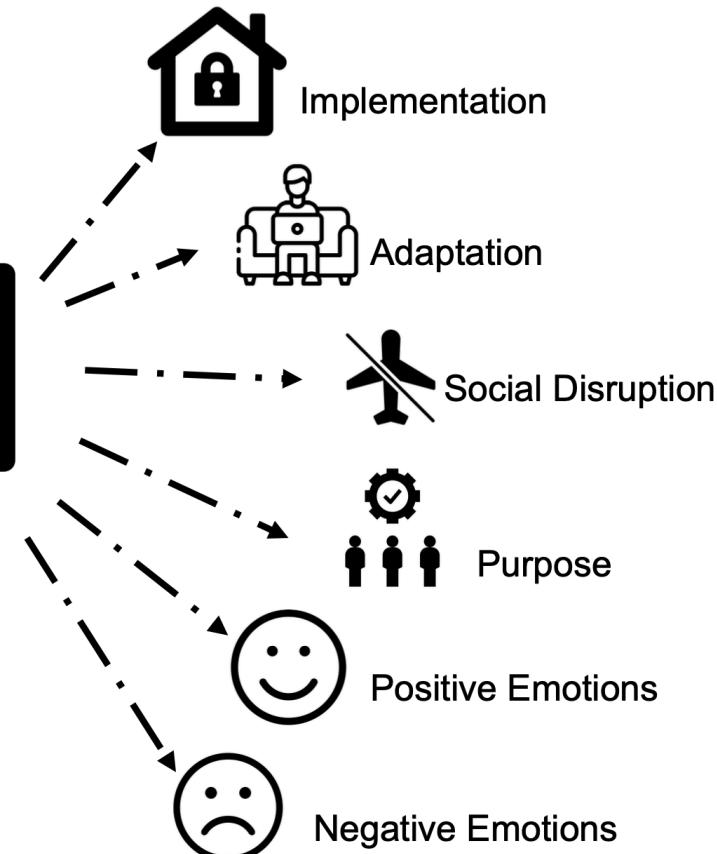
**Partnerships** between News Media and Public Health Agencies are critical to disseminate health information and prompt behavior change

# Other Work

## Social Distancing Behavior



## Social Distancing Facets



# References

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Center PR. Sizing Up Twitter Users. 2019

Hu M, Liu B. Mining and Summarizing Customer Reviews. In: *Proceedings of the Tenth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*. New York, NY, USA: Association for Computing Machinery, pp. 168–177.

# Suggested Citation

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