PA Vaccine Conversations on Twitter

Dr. Iuliia Alieva, Dawn Robertson, Dr. Kathleen M. Carley Vaccine Hesitancy Project Update based on January 28, 2022 - February 3, 2022

The CMU centers for:

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Computational Analysis of Social and Organizational Systems



Carnegie Mellon University



PA Vaccine Conversations Project

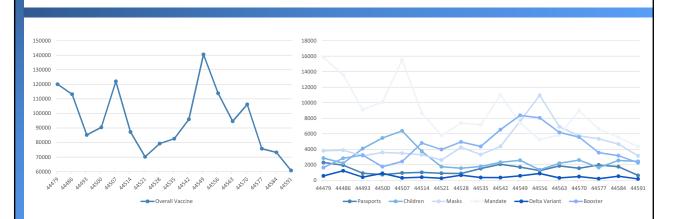
- ☐ This report is an effort to summarize social media conversations around COVID-19 issues in Pennsylvania, with a focus on vaccination. It contains an analysis of the general topics related to COVID-19 vaccination. This includes discussions related to COVID-19 regulations, mandates, masks, pro-and anti-vaccination campaigns, science messages, misinformation, disinformation, conspiracy theories, and vaccine hesitancy messages.
- □ Anti-Vax messaging includes vaccine hesitancy messages, opinions, questions, policy health and science related information, misinformation, disinformation, and conspiracy theories.



Report Overview January 28 - February 3

- ☐ This week's trending stories cover Mandates, Masks, Boosters, Omicron, FDA Approval, Vaccine as "experimental,"
- ☐ Trending stories: http://thr.cm/gcBgAyb Spotify to Pull Neil Young's Music After Artist's Objections to Joe Rogan; https://www.thedailvbeast.com/kidnev-patient-chad-carswell-rejects-transplant-to-stav-anti-vax Kidney Patient Rejects Transplant to Stay Anti-Vax; https://reut.rs/3KSzUup Thousands stage peaceful protest in Ottawa against Canada's vaccine mandates; https://gothamist.com/news/sarah-palin-dined-multiple-restaurants-after-getting-covid Sarah Palin Dined At Multiple Restaurants After Getting COVID; https://www.wsj.com/articles/the-high-cost-ofdisparaging-natural-immunity-to-covid-vaccine-mandates-protests-fire-rehire-employment-11643214336 The High Cost of Disparaging Natural Immunity to Covid; https://www.cbsnews.com/news/covid-vaccine-army-discharge/ U.S. Army will begin to discharge soldiers who refuse COVID-19 vaccine; https://www.insider.com/long-island-nursesarrested-millions-fake-covid-vaccine-card-scheme-2022-1 2 New York nurses were arrested and accused of making \$1.5 million in a fake COVID-19 vaccine card scheme; https://www.nytimes.com/2022/01/29/world/americas/canadatrucker-protest.html Canadian Trucker Convoy Descends on Ottawa to Protest Vaccine Mandates;
- Anti-vax, disinformation, and vaccine hesitancy stories: https://aaronsiri.substack.com/p/fda-asks-the-court-to-delay- first FDA Asks the Court to Delay First 55,000 Page Production Until May and Pfizer Moves to Intervene in the Lawsuit; https://summit.news/2022/01/28/marvel-actress-hounded-for-standing-up-against-vaccine-mandates/ Marvel Actress Hounded For Standing Up Against Vaccine Mandates; https://www.bitchute.com/video/BaW6oeiNILY2/STUDY REVEALS THE VACCINES MAY LEAD TO SURGE IN CANCER; https://www.theblaze.com/op-ed/horowitz-REVEALS THE VACCINES MAY LEAD TO SURGE IN CANCER; https://www.theblaze.com/op-ed/horowitz-whistleblowers-share-dod-medical-data-that-blows-vaccine-safety-debate-wide-open Horowitz: Whistleblowers DOD medical data that blows vaccine safety debate wide open DOD medical data that blows vaccine safety debate wide open

Trends (tweets per week) January 28 - February 3



High Level View by City January 28 - February 3

	Total PA	Philade	lphia	Pittsb	urgh	Eri	ie	Allentown/	Bethlehem	Of	ther
Conversation	Tweets	Tweets	%	Tweets	%	Tweets	%	Tweets	%	Tweets	%
Overall Vaccine	51007	27237	53.4%	14062	27.6%	554	1.1%	7039	13.8%	2115	4.1%
Vaccine Passports	629	348	1.3%	141	1.0%	18	3.2%	99	1.4%	23	1.1%
FDA Approval	627	264	1.0%	128	0.9%	11	2.0%	204	2.9%	20	0.9%
Boosters	1232	651	2.4%	330	2.3%	11	2.0%	182	2.6%	58	2.7%
Employees	627	402	1.5%	96	0.7%	8	1.4%	107	1.5%	14	0.7%
"Experimental"	253	168	0.6%	45	0.3%	1	0.2%	32	0.5%	7	0.3%
Children	1838	966	3.5%	501	3.6%	25	4.5%	268	3.8%	78	3.7%
Myocarditis	378	254	0.9%	58	0.4%	4	0.7%	54	0.8%	8	0.4%
Heart	1029	616	2.3%	213	1.5%	14	2.5%	152	2.2%	34	1.6%
Masks	3118	1612	5.9%	830	5.9%	47	8.5%	381	5.4%	248	11.7%
Thrombosis/VITT	48	21	0.1%	7	0.0%	0	0.0%	10	0.1%	10	0.5%
Mandates	4254	2116	7.8%	1110	7.9%	58	10.5%	787	11.2%	183	8.7%
Natural Immunity	1367	1091	4.0%	148	1.1%	8	1.4%	104	1.5%	16	0.8%
Efficacy	205	97	0.4%	38	0.3%	1	0.2%	59	0.8%	10	0.5%
Omicron	834	470	1.7%	158	1.1%	7	1.3%	144	2.0%	55	2.6%
Delta Variant	166	85	0.3%	23	0.2%	3	0.5%	27	0.4%	28	1.3%
Race	1175	685	2.5%	269	1.9%	13	2.3%	173	2.5%	35	1.7%
Ivermectin	213	82	0.3%	76	0.5%	7	1.3%	32	0.5%	16	0.8%
Military	293	185	0.7%	61	0.4%	0	0.0%	41	0.6%	6	0.3%
Breakthrough	82	44	0.2%	17	0.1%	3	0.5%	8	0.1%	10	0.5%

- Trending conversations this week:
 - FDA Approval
 - Vaccine as "experimental"
 - Military



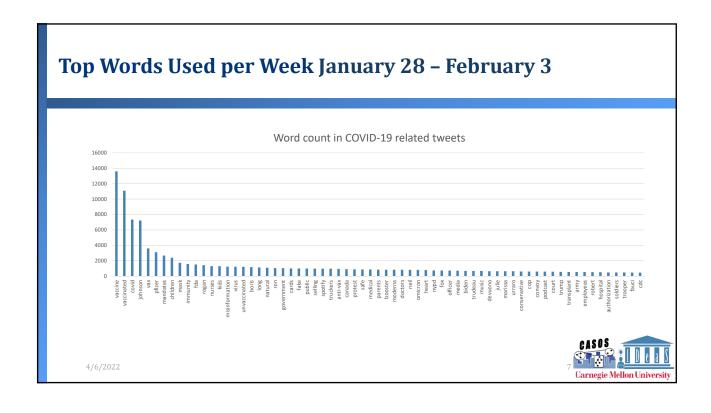
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High Level View by County January 28 - February 3

County	Allegheny	Beaver	Butler	Cambria	Fayette	Indiana	Somerset	Westmoreland
Overall Vaccine	14398	25	48	7	32	14	0	62
Vaccine Passports	144	1	1					
FDA	133					1		
Boosters	340	1	3		4			
Employees	96							3
"Experimental"	48							
Children	522	3	4		1	1		4
Myocarditis	58	1						
Heart	223	1		1				
Masks	880	4	10	3	3	1		14
Thrombosis/VITT	7							
Mandates	1139	7			6			7
Natural Immunity	148							
Efficacy	38	1						
Omicron	161							1
Delta Variant	23							1
Race	279	1						
Ivermectin	80				1			
Military	61				1			
Breakthrough	17							

 Race: pulled by one of the vaccine keywords plus at least one other term in ("Black", "African American", "of color", "Latin", "Hispanic", "brown", "eugenic")





Top Hashtags by County January 28 - February 3

■ We've checked hashtags in several counties such as Allegheny, Beaver, Butler, Cambria, Fayette, Indiana, Somerset, and West Moreland. After removing hashtags that were part of our search criteria, the top 5 hashtags for each county related to COVID19/vaccines are as follows*:

Allegheny	Beaver + Butler	Cambria	Fayette	Indiana	West Moreland
COVID19 (165)	covidvaccine (4)	tucker (1)	covid19 (2)	allin (1)	pittsburgh (2)
VAIDS (135)	cancelspotify (3)	tuckercarlson (1)	covid19vaccine (1)	allin22 (1)	conspiracytheory (1)
Steelers (117)	covid19 (3)		saveamerica (1)	iupnsd22 (1)	covid19 (1)
TruckersConvoy2022 (107)	vaccinemandate (2)		spotifydeleted (1)	talonsup (1)	covidisover (1)
vaccine (86)	neilyoung (2)		trumprally (1)		joerogan (1)



Top Hashtags by City January 28 - February 3

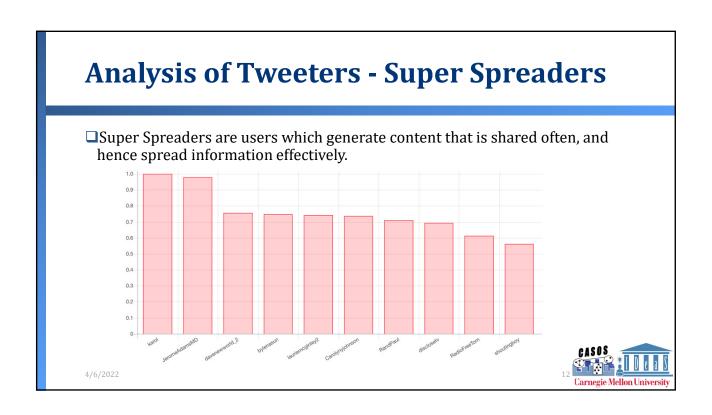
☐ After removing hashtags that were part of our search criteria, the top 5 hashtags for each region related to COVID19/vaccines are as follows:

Philadelphia	Chester	Norristown	Pittsburgh	Erie	Allentown/ Bethlehem	Other
covid19 (253)	covid19 (71)	covid19 (71)	covid19 (163)	boycott (5)	covid19 (62)	covid19 (44)
blackhistorymonth (141)	blackhistorymonth (16)	truckersforfreedom202 2 (69)	vaids (135)	freedomconvoy2022 (5)	pfizer (24)	vaccine (25)
vaccine (121)	sarahpalin (16)	cdnpoli (67)	steelers (114)	demvoice1 (4)	vaccine (22)	pfizer (12)
neilyoung (62)	vaccine (9)	johnsonout9 (48)	truckersconvoy2022 (107)	truckersforfreedom2 022 (4)	soulslosttocovid (15)	fauci (9)
pfizer (52)	truckersforfreedom2 022 (7)	pmqs (42)	vaccine (84)	covid19 (3)	truckersforfreedom2 022 (15)	steelers (8)



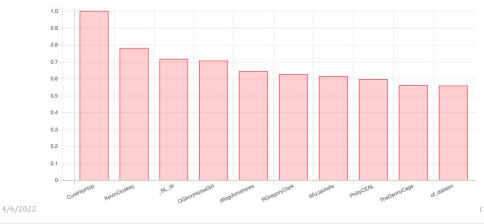
Allegheny	Butler + Beaver	Cambria	Indiana + Somerset	Fayette	West Moreland
ps://twitter.com/HelenKennedy/sta tus/1487271294005620743 temember that Washington State cop ho became a right wing hero and was noized on Fox when he taped himself telling the gov to "kiss my ass" and signed instead of getting vaccinated? He just died of Covid." (114)	https://aaronsiri.substack.com/p/f da-asks-the-court-to-delay-first FDA Asks the Court to Delay First 55,000 Page Production Until May and Pfizer Moves to Intervene in the	http://thr.cm/gcBgAyb Spotify to Pull Neil Young's Music After Artist's Objections to Joe Rogan (1)	https://www.theepochtimes.com/pfizer- moves-to-intervene-in-high-profile-case- dealing-with-covid-19-vaccine-safety- data 4238676.html?utm source=ref shar e&utm_campaign=tw&rs=SHRMHOJE& Pfizer Moves to Intervene in High-Profile Case Dealing With COVID-19 Vaccine Safety Data (2)	https://reut.rs/3KSzUup Thousands stage peaceful protest in Ottawa against Canada's vaccine mandates (2)	https://cbsn.ws/3uoP7xL asks FDA to allow COVID-1 vaccine for kids under 5 (1
ttp://thr.cm/gcBgAvb Spotify to Pull Neil Young's Music After Artist's Objections to Joe Rogan (90)	https://summit.news/2022/01/28 /marvel-actress-hounded-for- standing-up-against-vaccine- mandates/ Marvel Actress Hounded For Standing Up Against Vaccine Mandates (1)		https://bit.ly/3rSfCsy Tortorella adds Zack Johnson as co-defensive coordinator (1)	https://bitly/3gavi4P Canada Rally Against Vaccine Mandates Blocks Ottawa as Trump Praises Protest (1)	https://www.cnn.com/2022/ 0/europe/czech-singer-dea deliberate-covid-infection intl/index.html Czech anti coronavirus vaccine folk singe after deliberately getting infe with Covid-19, son says (1
ps://www.thedailybeast.com/kidney -patient-chad-carswell-rejects- transplant-to-stay-anti-vax Kidney tient Rejects Transplant to Stay Anti- Vax (86)	BaW6oejNILY2/ STUDY REVEALS		https://www.washingtonpost.com/healt h/2022/01/31/coronavirus-vaccine- children-under-52/ Pfizer-BioNTech coronavirus vaccine for children under 5 could be available by the end of February, people with knowledge say (1)	https://covid.cdc.gov/covid-data- tracker/#covidnet-hospitalizations- vaccination Rates of laboratory-confirmed COVID-19 hospitalizations by vaccination status (1)	
https://reut.rs/3KSzUup Thousands ge peaceful protest in Ottawa against Canada's vaccine mandates (60)	https://www.nytimes.com/2022/0 1/31/us/politics/children-covid- vaccine.html Pfizer is expected to ask the F.D.A. to authorize its Covid vaccine for children under 5. (1)			https://gothamist.com/news/sarah-palin- dined-multiple-restaurants-after-getting- covid Sarah Palin Dined At Multiple Restaurants After Getting COVID (1)	https://thehill.com/homenew e-watch/592184-denver-droj mask-vaccine-mandates-th week?amp Denver dropping vaccine mandates this week
https://gothamist.com/news/sarah- lin-dined-multiple-restaurants-after- getting-covid Sarah Palin Dined At Multiple Restaurants After Getting COVID (40)	https://www.washingtonpost.com/ health/2022/01/28/texas- omicron-pandemic/ America's split-screen pandemic: Many families resume their lives even as hospitals are overwhelmed (1)			https://www.theblaze.com/op- ed/horowitz-whistleblowers-share-dod- medical-data-that-blows-vaccine-safety- debate-wide-open Horowitz: Whistleblowers share DOD medical data that blows vaccine safety debate wide open (1)	https://variety.com/2022/dis ews/dwayne-johnson-joe-ro spotify-apology-123516865, Dwayne Johnson Calls Joe Ro Apology 'Great Stuff': I 'Lo Forward' to Being on the Poo

Philadelphia	Chester	Norristown	Pittsburgh	Erie	Allentown/ Bethlehem	Other
https://www.wsi.com/articles/the- high-cost-of-disparaging-natural- immunity-to-covid-vaccine- mandates-protests-fire-rehire- maloyment-16423214336 The High ost of Disparaging Natural Immunity to Covid (469)	https://bit.ly/3llmPC4 Risk Factors for Severe COVID-19 in Children (32)	https://www.nationalreview.com/2022 (0/Jalex-beresnos-dangerous-covid- vaccine-claims-on-tucker-carlson- tonight/Traid-61/2359de941150001c8 2978&utm_campaign-trueanthem&ut m_medium-social&utm_source-twitte lakes_Beresnos's_Dangerous_Covid- Vaccine Claims on Tucker Carlson 	https://twitter.com/HelenKennedy/ /status/1487271294005620743 Remember that Washington State cop who became a right wing hero and was lionized on Fox when he taped himself telling the gov to "kiss my ass" and resigned instead of getting vaccinated? He just died of Covid (114)	https://twitter.com/ameshaa/status/ 1486173361206145027 "We urge public health and school officials to educate communities on one-way masking, emphasizing personal choice regarding self-protection and supporting those who choose to remain masked." (6)	https://trib.al/dPIoTJ9 Justin Trudeau moved to secret location during Canada vax protests: report (29)	
https://www.theblaze.com/op- ed/horowitz-whistleblowers-share- dod-medical-data-that-blows- vaccine-safety-debate-wide-open orowitz: Whistleblowers share DOD medical data that blows vaccine safety debate wide open (263)	https://bit.ly/2WqJYWV COVID- 19 Vaccine Equity (13)	http://thr.cm/gcBgAyb Spotify to Pull Neil Young's Music After Artist's Objections to Joe Rogan (14)	http://thr.cm/gcBgAyb Spotify to Pull Neil Young's Music After Artist's Objections to Joe Rogan (87)	http://thr.cm/gcBgAyb Spotify to Pull Neil Young's Music After Artist's Objections to Joe Rogan (4)	https://childrenshealthdefense.org /defender/pfizer-fda-delay- release-covid-vaccine-safety-data/ Pfizer, FDA Ask Court to Further Delay Release of COVID Vaccine Safety Data (27)	https://aaronsiri.substack.cu p/fda-asks-the-court-to-del first FDA Asks the Court to Delay First 55,000 Page Production Until May and PI Moves to Intervene in the Lawsuit (9)
ttps://bariweiss.substack.com/p/las t-year-i-was-a-bryn-mawr-girl Last Year, I Was a Bryn Mawr Girl. Now I'm at Hillsdale. (135)	https://bariweiss.substack.com/ p/last-year-i-was-a-bryn-mawr- girl Last Year, I Was a Bryn Mawr Girl. Now I'm at Hillsdale. (12)	https://www.mediamatters.org/coron avirus-covid-19/fox-news-wanted- viewers-hear-anti-vax-troopers-story- until-he-died-covid Fox News wanted viewers to hear an anti-vax trooper's story — until he died of COVID (13)	https://www.thedailybeast.com/ki dney-patient-chad-carswell-rejects- transplant-to-stay-anti-vax Kidney Patient Rejects Transplant to Stay Anti-Vax (86)	https://abcn.ws/3KXrOAP COVID-19 live updates: US deaths at highest point in nearly 1 year (4)	https://aaronsiri.substack.com/p/f da-asks-the-court-to-delay-first FDA Asks the Court to Delay First 55,000 Page Production Until May and Pfizer Moves to Intervene in the Lawsuit (23)	https://covid.cdc.gov/covi data-tracker/#covidnet- hospitalizations-vaccinatin Rates of laboratory-confirm COVID-19 hospitalizations vaccination status (8)
ttp://thr.cm/gcBgAyb Spotify to Pull Neil Young's Music After Artist's Objections to Joe Rogan (125)	https://www.theblaze.com/op- ed/horowitz-whistleblowers- share-dod-medical-data-that- blows-vaccine-safety-debate- wide-open Horowitz: Whistleblowers share DOD medical data that blows vaccine safety debate wide open (11)	https://www.theblaze.com/op- ed/horowitz-whistleblowers-share- dod-medical-data-that-blows-vaccine- safety-debate-wide-open Horowitz: Whistleblowers share DOD medical data that blows vaccine safety debate wide open (13)	https://reut.rs/3KSzUup Thousands stage peaceful protest in Ottawa against Canada's vaccine mandates (59)	https://aaronsiri.substack.com/p/fda -asks-the-court-to-delay-first FDA Asks the Court to Delay First 55,000 Page Production Until May and Pfizer Moves to Intervene in the Lawsuit (2)		release-covid-vaccine-safe
ttps://www.thedailybeast.com/kidn ey-patient-chad-carswell-rejects- transplant-to-stay-anti-vax Kidney Patient Rejects Transplant to Stay Anti-Vax (66)		https://www.thedailybeast.com/marve L-actress-evangeline-lilly-attended-dc- anti-vax-protest Marvel Actress Evangeline Lilly Attended D.C. Anti-Vax Protest (12)	-palin-dined-multiple-restaurants- after-getting-covid Sarah Palin	https://www.reuters.com/legal/gove rnment/pfizer-pushes-intervene- lawsuit-seeking-covid-vaccine- information-fda-2022-01-26/ Pfizer pushes to intervene in lawsuit seeking COVID vaccine information from FDA (3)	http://thr.cm/gcBgAyb Spotify to Pull Neil Young's Music After Artist's Objections to Joe Rogan (22)	https://gothamist.com/new rah-palin-dined-multiple restaurants-after-getting-cc Sarah Palin Dined At Multij Restaurants After Getting COVID (6)



Analysis of Tweeters - Super Friends

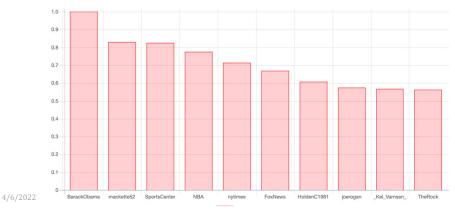
□Super Friends are users that exhibit frequent two-way communication, facilitating large or strong communication networks.





Analysis of Tweeters - Other Influencers

□Other Influencers are users which have an active network presence, by tweeting often or mentioning users often, and operate in central parts of the conversation, such as by using important hashtags, or mentioning important users.





Accounts Referenced by the Most Tweets

☐ This shows the tweeters that are most often referenced (e.g. mentioned) in PA tweets. Value is the number of tweets that reference the agent.

THEEBlackleftie 4	12
joerogan[+] 38	86
Spotify 3	12
MartyMakary[+] 24	48
CDCgov[+]	00
chrislhayes[+]	93
FoxNews[+][*]	85
US_FDA[+]	79
pfizer[+]	78
OttawaHealth 1	77

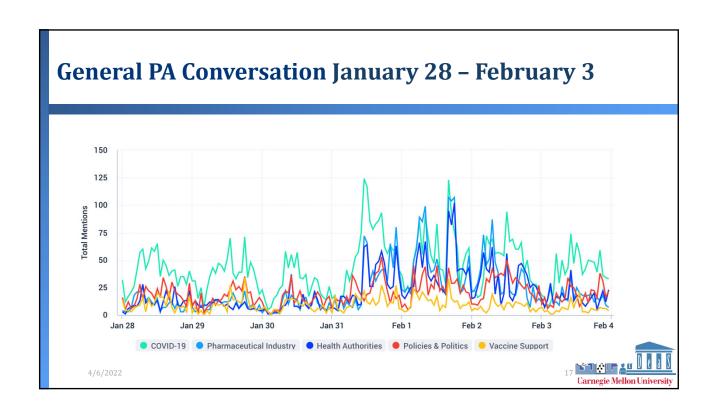
Carnegie Mellon University

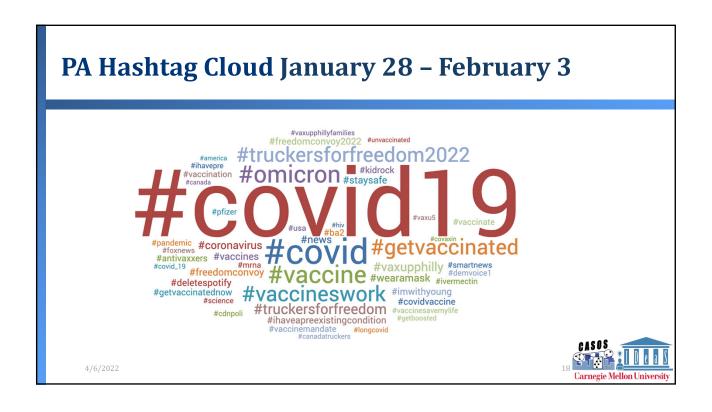
4/6/2022

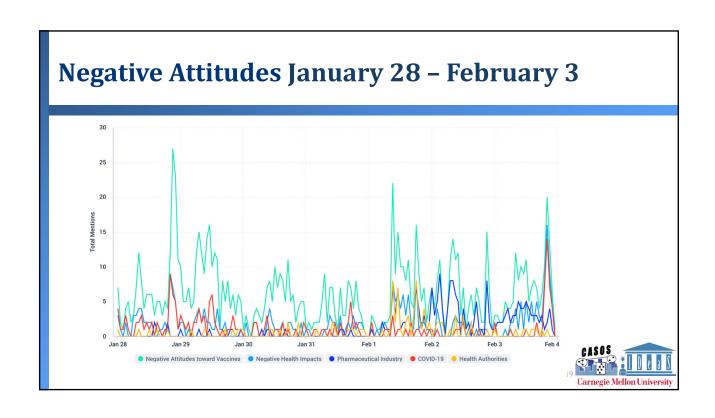
Trending Tweets January 28 - February 3

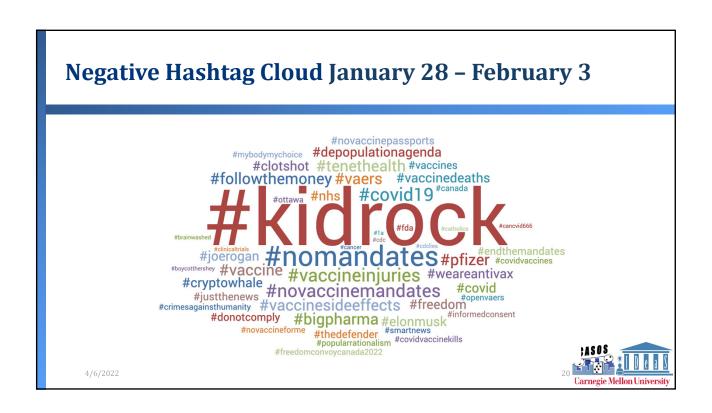
Tweets that are the most forwarded, either by retweet, reply, or quote:

- 2 nurses on Long Island, Julie DeVuono and Marissa Urraro, were caught selling fake vaccine cards and raked in over \$1.5mil. DeVuono's husband is an NYPD officer. https://t.co/siwJsUvEml
- ☐ Time to rehire unvaxxed doctors and nurses who have natural immunity to COVID! https://t.co/o4Tpmj41YB
- □ Sen. Ron Johnson asked about reducing child care costs: "Well, people decide to have families and become parents. That's something they need to consider when they make that choice. I've never really felt it was society's responsibility to take care of other people's children." https://t.co/HyJr4iTwUG
- □ Spotify is removing Neil Young's catalogue from its service after the artist published —then took down an open letter with an ultimatum: deal with the vaccine misinformation coming from Joe Rogan's podcast, or lose his music More: https://t.co/wtyE881A7j https://t.co/J5JTEmnrY3
- ☐ Give me thumbs up and retweet if you're vaccinated and still wearing a mask in public. I want EVERYONE to follow you.
- □ I appreciate everyone's support. Since I have a bit of a platform I'll use it while it lasts: Get vaccinated. Wear your mask on the bus. Have patience, show kindness. be nice to people.
- □ Lonnie Johnson, the man who created the "Super Soaker" was awarded \$72.9M in a Hasbro Settlement for unpaid royalties. The super soaker is the worlds best selling toy. #Blackhistorymonth https://t.co/yTqVAkTJBQ
- □ JUST IN Pfizer-BioNTech is expected to request "emergency use authorization" for the COVID vaccine for children 6 months to 5 years old on Tuesday, WaPo reports.
- □ Robert LaMay, the anti-vaccine state trooper who recently died of COVID, was praised as "a celebrity" by Fox's Laura Ingraham on 10/19/21. She also said she "hoped" they'd awoken "a sleeping giant." (LaMay also used that term previously in the interview.) https://t.co/MBYFyw4uvM https://t.co/UX5R8JaqLp
- Last night, I learned that I have been exposed to COVID-19. My rapid test result was negative. I am following @OttawaHealth rules days. I feel fine and will be working from home. Stay safe, everyone and please get vaccinated.

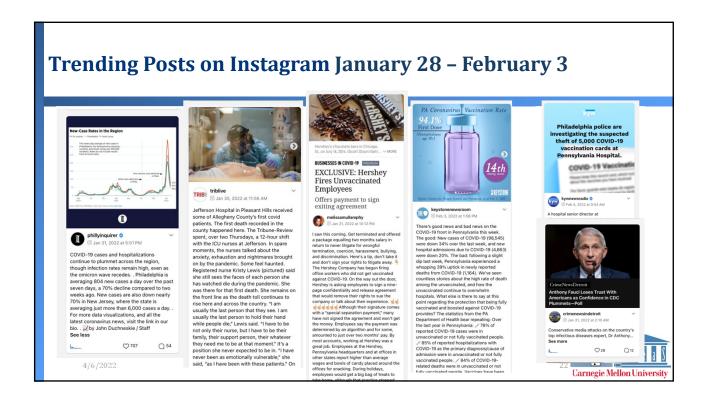


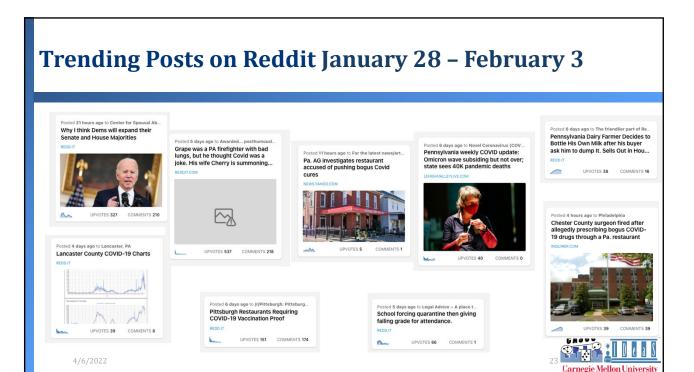












For More Information

- □ Director Kathleen M. Carley <u>kathleen.carley@cs.cmu.edu</u>
 - http://www.casos.cs.cmu.edu/bios/carley/carley.html
- ☐ IDeaS website https://www.cmu.edu/ideas-social-cybersecurity/
- □ CASOS website http://www.casos.cs.cmu.edu/
- ☐ Social Cybersecurity Working Group http://social-cybersecurity.org
- ☐ Facebook: @IDeasCMU
- ☐ Twitter: @IDeaSCMU
- ☐ YouTube: <u>IDeaS Center</u>
- ☐ Ask to be on our Email-Distro Lists

4/6/2022

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