

PA Vaccine Conversations on Twitter

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Vaccine Hesitancy Project Update based on February 18, 2022 – February 24, 2022

The CMU centers for:

Informed DEMocracy And Social cyber-security

Computational Analysis of Social and Organizational Systems



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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.

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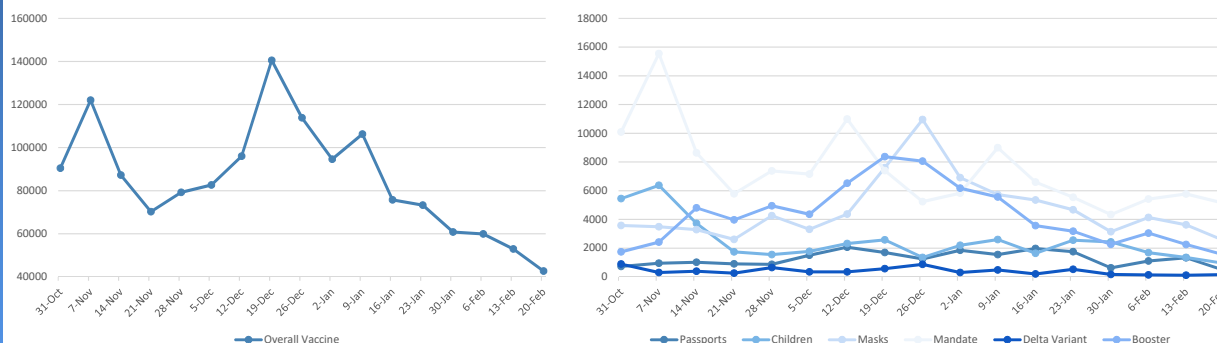
Report Overview February 18 – February 24

- ❑ This week's trending stories cover Mandates, Masks, Boosters;
- ❑ Trending stories: <https://www.npr.org/sections/health-shots/2022/02/16/1074191656/this-16-year-old-wanted-to-get-the-covid-vaccine-he-had-to-hide-it-from-his-parents> This 16-year-old wanted to get the COVID vaccine. He had to hide it from his parents; <http://ow.ly/j3o550HWE8t> Health Department Giving Away \$100 for Philadelphians Who Get Fully Vaccinated; <http://blbrd.cm/EzGZn14> Nicki Minaj Claps Back at Philadelphia Health Department, Says They're Using 'Fear Tactics' to Push COVID-19 Vaccine; <https://www.mediamatters.org/charlie-kirk/charlie-kirk-likens-restaurant-asking-him-his-vaccine-status-living-nazi-germany> Charlie Kirk likens a restaurant asking him for his vaccine status to living in Nazi Germany; <https://danaloesch.substack.com/p/freedom-convoy-critics-are-hypocrites> Freedom Convoy Critics Are Hypocrites; <https://bbc.in/3LMjtjS> Boris Johnson returns lockdown party questionnaire to police;
- ❑ Anti-vax, disinformation, and vaccine hesitancy stories: <https://www.dailymail.co.uk/news/article-10542309/Fresh-lab-leak-fears-study-finds-genetic-code-Covid-spike-protein-linked-Moderna-patent.html> Scientists claim Covid virus contains tiny chunk of DNA that 'matches sequence patented by Moderna THREE YEARS before pandemic began; <https://www.youtube.com/watch?v=IDzbc6NgutY> Jennifer Kehs of Pfizer being racist and Thomas Kehs being a pedo; https://citizengo.org/en-us/ot/206312-stop-vaccine-mandates?utm_source=tw&utm_medium=social&utm_campaign=EN_US-2022-02-11-Global-OT-GME-206312-COVID_AA-COVID_AA.05_AA_Relaunch_2&utm_content=tyflow Stop the Vaccine Mandates.

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Trends (tweets per week) February 18 – February 24



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High Level View by City February 18 – February 24

	Total PA	Philadelphia		Pittsburgh		Erie		Allentown/Bethlehem		Other	
Conversation	Tweets	Tweets	%	Tweets	%	Tweets	%	Tweets	%	Tweets	%
Overall Vaccine	34487	19482	56.5%	8828	25.6%	323	0.9%	4418	12.8%	1436	4.2%
Vaccine Passports	463	271	1.4%	96	1.1%	6	1.9%	79	1.8%	11	0.8%
FDA Approval	148	64	0.3%	48	0.5%	1	0.3%	30	0.7%	5	0.3%
Boosters	1154	704	3.6%	224	2.5%	6	1.9%	160	3.6%	60	4.2%
Employees	240	134	0.7%	49	0.6%	1	0.3%	40	0.9%	16	1.1%
"Experimental"	98	51	0.3%	18	0.2%	1	0.3%	26	0.6%	2	0.1%
Children	686	330	1.7%	239	2.7%	3	0.9%	92	2.1%	22	1.5%
Myocarditis	126	64	0.3%	26	0.3%	1	0.3%	25	0.6%	10	0.7%
Heart	331	147	0.8%	119	1.3%	1	0.3%	58	1.3%	6	0.4%
Masks	2496	1392	7.1%	539	6.1%	30	9.3%	328	7.4%	207	14.4%
Thrombosis/VITT	42	10	0.1%	21	0.2%			11			
Mandates	4943	3158	16.2%	720	8.2%	58	18.0%	814	18.4%	193	13.4%
Natural Immunity	331	199	1.0%	89	1.0%	1	0.3%	38	0.9%	4	0.3%
Efficacy	137	69	0.4%	31	0.4%	4	1.2%	29	0.7%	4	0.3%
Omicron	494	261	1.3%	124	1.4%	7	2.2%	80	1.8%	22	1.5%
Delta Variant	158	76	0.4%	30	0.3%	1	0.3%	22	0.5%	29	2.0%
Race	822	466	2.4%	200	2.3%	8	2.5%	122	2.8%	26	1.8%
Ivermectin	84	61	0.3%	13	0.1%			8	0.2%	2	0.1%
Military	142	83	0.4%	29	0.3%			24	0.5%	6	0.4%
Breakthrough	57	30	0.2%	12	0.1%			14	0.3%	1	0.1%

- Conversation topics dropped across the board

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High Level View by County February 18 – February 24

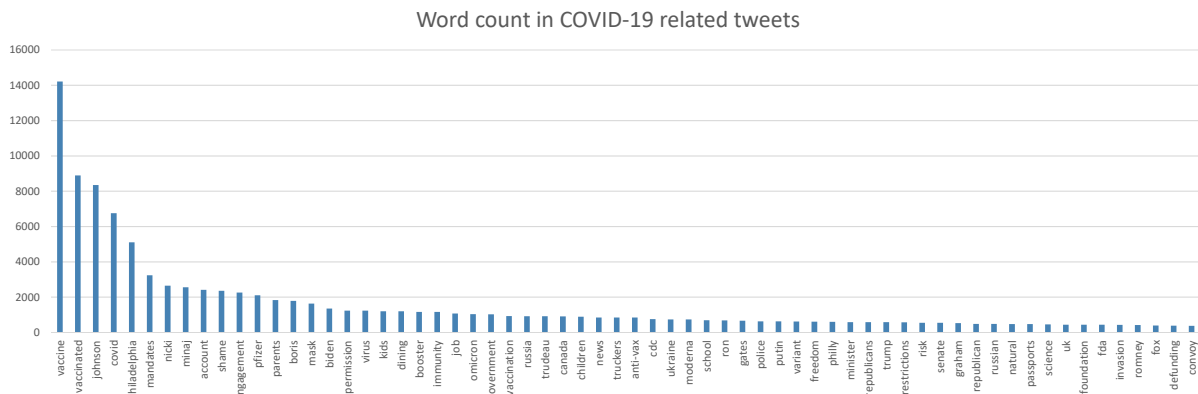
County	Allegheny	Beaver	Butler	Cambria	Fayette	Indiana	Somerset	Westmoreland
Overall Vaccine	9003	15	25	13	14	12	4	25
Vaccine Passports	96	1	1			1		
FDA	48							
Boosters	232	1						1
Employees	55							1
"Experimental"	18							
Children	245							
Myocarditis	26	1						
Heart	120							
Masks	564	3	7	9	1	3		4
Thrombosis/VITT	21							
Mandates	748	1	1		4	3		3
Natural Immunity	90							
Efficacy	31							1
Omicron	127		1		1			
Delta Variant	38		1					
Race	203		1					
Ivermectin	13							
Military	29							
Breakthrough	12							

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

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Top Words Used per Week February 18 – February 24



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Top Hashtags by County February 18 – February 24

- ❑ 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	Somerset	West Moreland
covid19 (134)	vaccine (2)	maskup (1)	antivax (1)	foxnews (1)
steelers (87)	booster (1)	besafe (1)	covid (1)	nba75 (1)
covid (77)	maskmandates (1)		longcovid (1)	
raworth (49)	pfizer (1)		qanon (1)	
johnsonout28 (46)	republicans (1)		extremist (1)	

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Top Hashtags by City February 18 – February 24

- ❑ 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 (272)	covid19 (27)	raworth (136)	covid19 (132)	steelers (5)	covid19 (67)	covid19 (24)
vaxupphilly (194)	defundvaxmandates (16)	covid19 (54)	steelers (86)	vaccine (5)	defundvaxmandates (47)	vaccine (23)
covid (97)	nba75 (12)	covaxin (14)	covid (76)	hiv (4)	vaccine (29)	steelers (10)
dowehaveaproblem (86)	pediatricssoulslosttocovid (10)	covidvaccine (13)	raworth (49)	aids (3)	covid (19)	myocarditis (8)
vaccine (66)	covid (9)	defundvaxmandates (12)	johnsonout28 (46)	nfl (3)	takebackdemocracy (18)	pfizer (8)

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Top URLs by County February 18 – February 24

Allegheny	Butler + Beaver	Indiana	West Moreland
https://www.dailymail.co.uk/news/article-10542309/Fresh-lab-leak-fears-study-finds-genetic-code-Covids-spike-protein-linked-Moderna-patent.html Scientists claim Covid virus contains tiny chunk of DNA that 'matches sequence patented by Moderna THREE YEARS before pandemic began' (71)	https://www.youtube.com/watch?v=IDzbc6NgtY Jennifer Kehs of Pfizer being racist and Thomas Kehs being a pedo. (2)	https://citizengo.org/en-us/ot/206312-stop-vaccine-mandates?utm_source=tw&utm_medium=social&utm_campaign=EN_US-2022-02-11-Global-OT-GME-206312-COVID-AA-COVID-AA.05_AA_Relaunch_2&utm_content=tyflow Stop the Vaccine Mandates (1)	https://pittsburgh.cbslocal.com/2022/02/21/port-authority-preliminary-injunction-covid-19-vaccine-mandate/ Port Authority Union Seeks Preliminary Injunction Against COVID-19 Vaccine Mandate (1)
https://danaloesch.substack.com/p/freedom-convoy-critics-are-hypocrites Freedom Convoy Critics Are Hypocrites (61)	http://apne.ws/v01k7yx UN plane at Canada airport is not related to Ottawa protest (1)		https://trib.al/o5HPPFZ7 Jamal Edwards, Music Entrepreneur Who Helped Launch Ed Sheeran, Dies at 31 (1)
https://www.mediamatters.org/charlie-kirk/charlie-kirk-likens-restaurant-asking-him-his-vaccine-status-living-nazi-germany Charlie Kirk likens a restaurant asking him for his vaccine status to living in Nazi Germany (45)	https://mobile.reuters.com/article/amp/idUSKBN2A50QE Pfizer drops India vaccine application after regulator seeks local trial (1)		https://www.foxnews.com/media/bill-maher-school-mask-mandates-kids-howie-mandel Bill Maher rails against school mask mandates for kids: 'Creating a generation of Howie Mandels' (1)
https://bbc.in/3LMjtjS Boris Johnson returns lockdown party questionnaire to police (42)	https://summit.news/2022/02/23/4-million-french-discover-their-vaccine-passport-has-expired-because-they-didnt-get-the-latest-boosters/ 4 Million French Discover Their Vaccine Passport Has Expired Because They Didn't Get the Latest Booster (1)		
http://FactCheck.Org (29)	https://trib.al/DMdWuTA Ukraine crisis: Five Russian banks and three oligarchs targeted in UK sanctions on Moscow - but MPs call for more action (1)		

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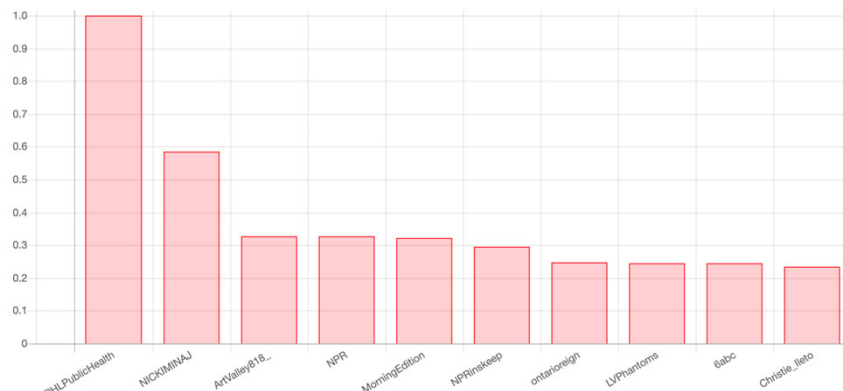
Top URLs by City February 18 – February 24

Philadelphia	Chester	Norristown	Pittsburgh	Erie	Allentown/ Bethlehem	Other
https://twitter.com/NICKMINAJ/status/149385860424304452 Nothing like watching someone speak confidently about something they know nothing about. (2183)	https://townhall.com/tipsheet/mattvespa/2022/02/22/oh-so-thats-why-the-cdc-is-burying-their-report-on-the-effectiveness-on-covid-vaccine-boosters-n2603605 CDC did a Study on COVID Vaccine Boosters. It was Beyond Brutal. (10)	https://bbc.in/3LMmIS Boris Johnson returns lockdown party questionnaire to police (136)	https://www.dailymail.co.uk/news/article-10542309/Fresh-lab-leak-fears-study-finds-genetic-code-Covid-spike-protein-linked-Moderna-spatent.html Scientists claim Covid virus contains tiny chunk of DNA that 'matches sequence patented by Moderna THREE YEARS before pandemic began' (71)	https://cdn.local.com/documents/47656/47656_e41yu6vd2x117dq.pdf Defendants Pfizer Inc., Icon PLC, and Ventavia Research Group, LLC (collectively, "Defendants") conducted a clinical trial to test one of the COVID-19 vaccine candidates. In the race to secure billions in federal funding and become the first to market, Defendants deliberately withheld crucial information from the United States that calls the safety and efficacy of their vaccine into question. (3)	http://FactCheck.Org (18)	https://www.npr.org/sections/health-shots/2022/02/16/1074191656/his-16-year-old-wanted-to-get-the-covid-vaccine-he-had-to-hide-it-from-his-parents This 16-year-old wanted to get the COVID vaccine. He had to hide it from his parents (9)
https://www.npr.org/sections/health-shots/2022/02/16/1074191656/his-16-year-old-wanted-to-get-the-covid-vaccine-he-had-to-hide-it-from-his-parents This 16-year-old wanted to get the COVID vaccine. He had to hide it from his parents (1174)	https://www.nature.com/articles/s41577-022-00695-3 Vaccine safety in an era of novel vaccines: a proposed research agenda (10)	https://www.npr.org/sections/health-shots/2022/02/16/1074191656/his-16-year-old-wanted-to-get-the-covid-vaccine-he-had-to-hide-it-from-his-parents This 16-year-old wanted to get the COVID vaccine. He had to hide it from his parents (20)	https://danaloesch.substack.com/p/freedom-convoys-critics-are-hypocrites Freedom Convoy Critics Are Hypocrites (61)	https://cbsn.ws/3ofoze8C Infants born to vaccinated mothers are less likely to be hospitalized with COVID, CDC study finds (2)	https://cdn.local.com/documents/47656/47656_e41yu6vd2x117dq.pdf (17)	https://twitter.com/NICKMINAJ/status/149385860424304452 (6)
http://ow.ly/3o55QHWE8t Health Department Giving Away \$100 for Philadelphians Who Get Fully Vaccinated (70)	https://www.itv.com/news/2022-02-21/oe-biden-agrees-in-principle-to-meeting-with-vladimir-putin Vladimir Putin orders 'peace-keeping' forces into separatist regions of Ukraine amid invasion fears (8)	http://DovesGov.com On January 8, 2022 Doug Mastriano OFFICIALLY ANNOUNCED his plan to run for Governor of Pennsylvania (19)	https://www.mediamatters.org/charlie-kirk/charlie-kirk-likes-restaurant-asking-him-his-vaccine-status-living-nazi-germany Charlie Kirk likens a restaurant asking him for his vaccine status to living in Nazi Germany (45)	https://dailyexpose.co.uk/2022/02/14/pandemic-triple-vaccinated-england/ Triple Vaccinated accounted for majority of Covid-19 Cases, Hospitalisations & Deaths in England during January (2)	https://www.npr.org/sections/health-shots/2022/02/16/1074191656/his-16-year-old-wanted-to-get-the-covid-vaccine-he-had-to-hide-it-from-his-parents This 16-year-old wanted to get the COVID vaccine. He had to hide it from his parents (17)	https://www.itv.com/news/2022-02-21/oe-biden-agrees-in-principle-to-meeting-with-vladimir-putin Vladimir Putin orders 'peace-keeping' forces into separatist regions of Ukraine amid invasion fears (6)
http://bhrd.cm/EGQn14 Nicki Minaj Claps Back at Philadelphia Health Department, Says They're Using 'Fear Tactics' to Push COVID-19 Vaccine (64)	https://www.youtube.com/watch?v=U2CvXKVP88ab COVID-19 vaccine during pregnancy protects newborns: CDC (8)	https://www.mediamatters.org/charlie-kirk/charlie-kirk-likes-restaurant-asking-him-his-vaccine-status-living-nazi-germany Charlie Kirk likens a restaurant asking him for his vaccine status to living in Nazi Germany (12)	https://bbc.in/3LMmIS Boris Johnson returns lockdown party questionnaire to police (42)	https://m.dailykos.com/stories/2022/2/17/1451370/Jesus-was-her-vaccine-now-she-has-long-haul-COVID-and-it-sounds-absolutely-terrible Jesus was her vaccine, now she has long-haul COVID and it sounds absolutely terrible (2)	https://nationalfile.com/university-funds-bidens-think-tank-hosts-factcheck-org-contract-biotech-gets-paid-vaccine-sales-fda-approvals/ University That Funds Biden's Think Tank And Hosts FactCheck.Org Has Contract With BioNTech, Gets Paid For Vaccine Sales And FDA Approvals (17)	https://bit.ly/3s5hwWj Children's Health Defense (4)
https://twitter.com/shipubliche/status/149450155162431488 8 Nicki Minaj tweets (60)	http://www.vaccines.gov (7)	https://www.newsweek.com/evangelist-franklin-graham-compares-canadian-truckers-paul-revere-1677820 Evangelist Franklin Graham Compares Canadian Truckers to Paul Revere (12)	http://FactCheck.Org (29)	https://rumble.com/vv28ai-edward-dowd-former-blackrock-portfolio-manager-pfizer-fda-fraud-financi.html Edward Dowd - Former Blackrock Portfolio Manager - Pfizer & FDA Fraud, Financial Collapse Imminent (2)	https://bit.ly/3s5hwWj Children's Health Defense (16)	https://childrenshealthdefense.org/defense/alerts-autopsies-vaccinating-teens-covid-heartbreaking/ Autopsies Show: Vaccinating Teens for COVID is Literally 'Heartbreaking' (4)

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Analysis of Tweeters - Super Spreaders

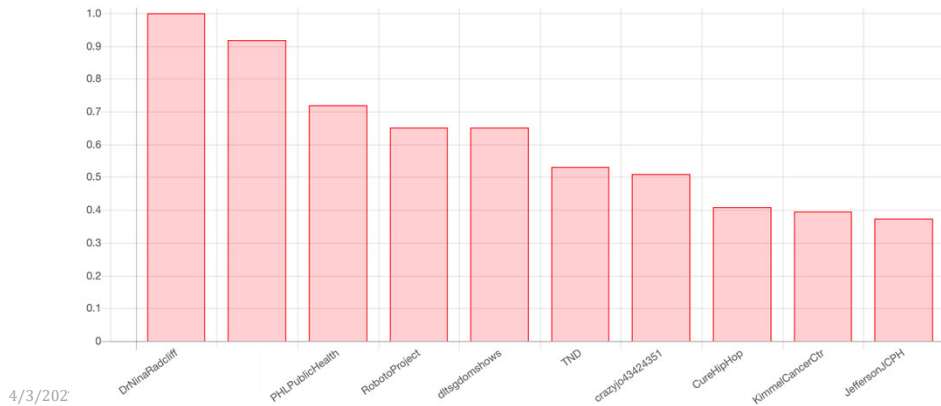
- ❑ Super Spreaders are users which generate content that is shared often, and hence spread information effectively.



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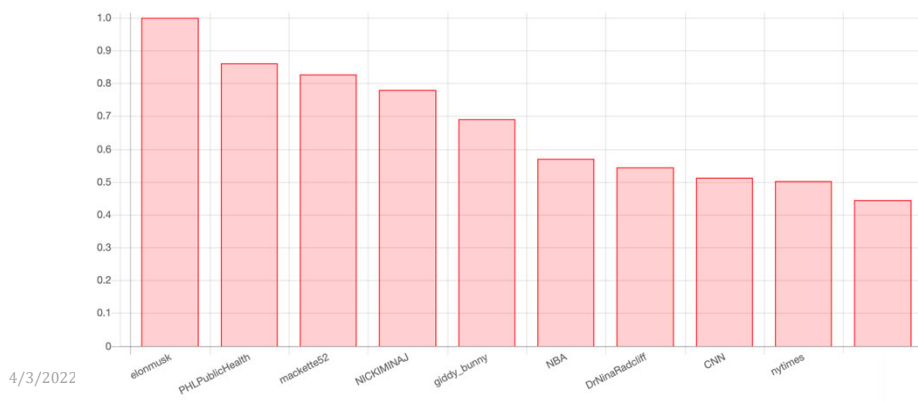
Analysis of Tweeters - Super Friends

- 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.

Agent Label	Value
NICKIMINAJ[+]	2,177
MorningEdition	1,231
NPR[+][*]	1,223
SenRonJohnson[+]	325
CDCgov[+]	238
POTUS[+]	225
pfizer[+]	205
SenMikeLee[+]	191
danielsgoldman[+]	188
thevivafrei	180

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Trending Tweets February 18 – February 24

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

- ☐ <https://t.co/58m6X1tFU6>
- ☐ His parents told him not to get vaccinated. So he learned about a Philadelphia rule that allowed him to get the shots without permission. His family found out when they got covid and he didn't. @MorningEdition @NPR <https://t.co/7TnDacv6G0>
- ☐ BREAKING: Philadelphia drops its vaccine mandate for indoor dining.
- ☐ NEW - Bill Gates: "Sadly the virus itself - particularly the variant called Omicron - is a type of vaccine, creates both B cell and T cell immunity and it's done a better job of getting out to the world population than we have with vaccines." <https://t.co/ou6zSgcApy>
- ☐ BREAKING: It's been confirmed that Trudeau's foundation owns 40% of Acuitas Therapeutics which makes mechanic lipids for Pfizer.
- ☐ Ron Johnson is blaming Biden tonight for Putin's invasion of Ukraine. <https://t.co/mlDZlOBITA>
- ☐ On Joe Rogan, Maajid Nawaz explains how the media purposely lied and labeled Olympic Gold Medal winner Szilveszter Csollany "anti-vax" to protect their COVID vaccine narrative. <https://t.co/mlZhc5UMfd>
- ☐ Boris Johnson refuses to say whether he will resign if he is found to have broken the law by police investigating No 10 parties. The PM tells #Raworth "I can't comment about a process that is underway" <https://t.co/oFF85Wy8RA> <https://t.co/ea0rGwqI8>
- ☐ This is happening because human beings didn't want to be mandated a vaccine and decided to peacefully protest against it <https://t.co/mdxjfNNEWc>
- ☐ If you're vaccinated, why the hell do you care if other people wear masks? Somebody explain this to me.

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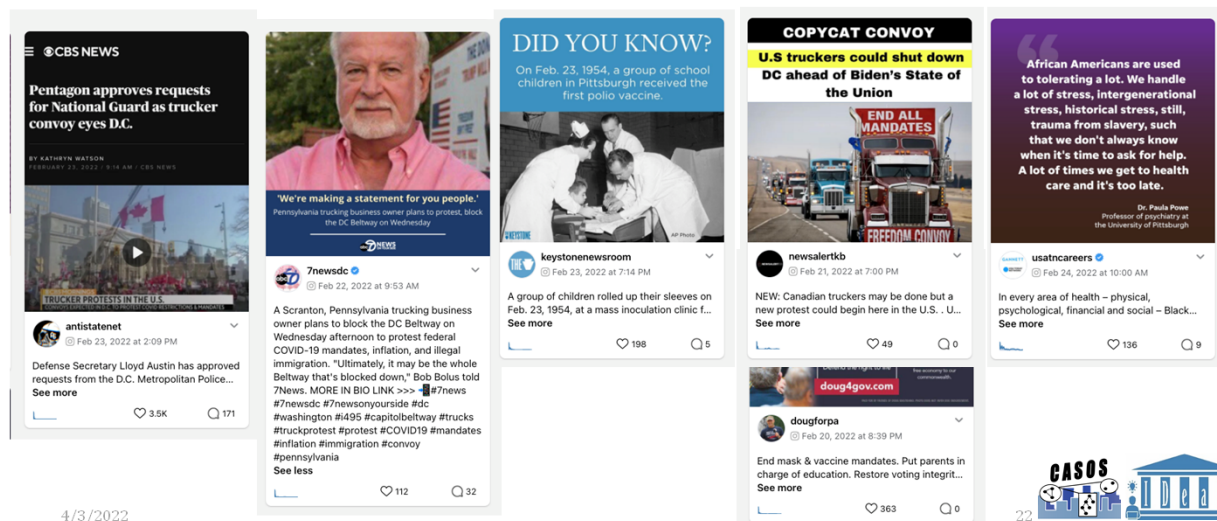
Trending Posts on Facebook February 18 – February 24



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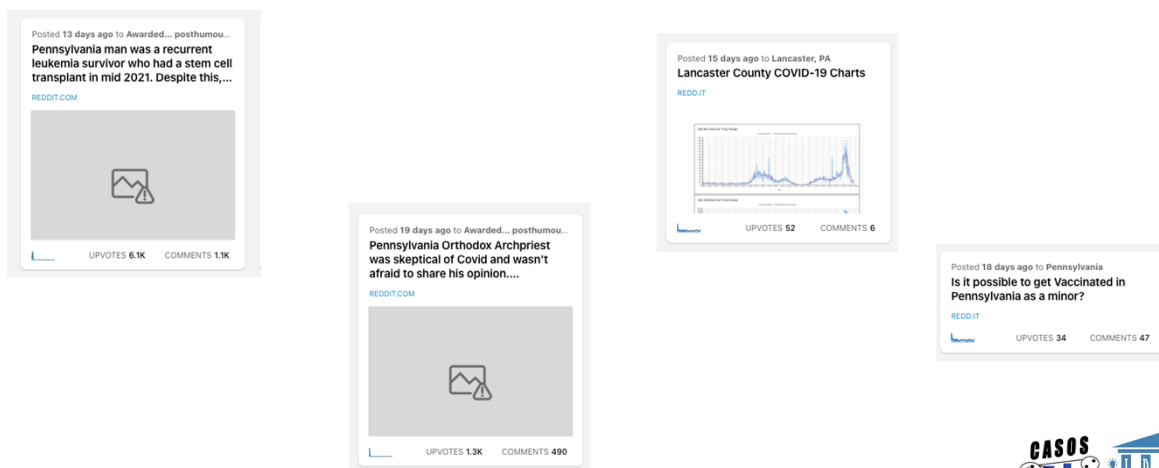
Trending Posts on Instagram February 18 – February 24



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Trending Posts on Reddit February 18 – February 24



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For More Information

- ❑ Director Kathleen M. Carley - kathleen.carley@cs.cmu.edu
 - ❑ <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: [IDeaS Center](#)
- ❑ Ask to be on our Email-Distro Lists

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