

PA Vaccine Conversations on Twitter

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Vaccine Hesitancy Project Update based on March 11, 2022 – March 17, 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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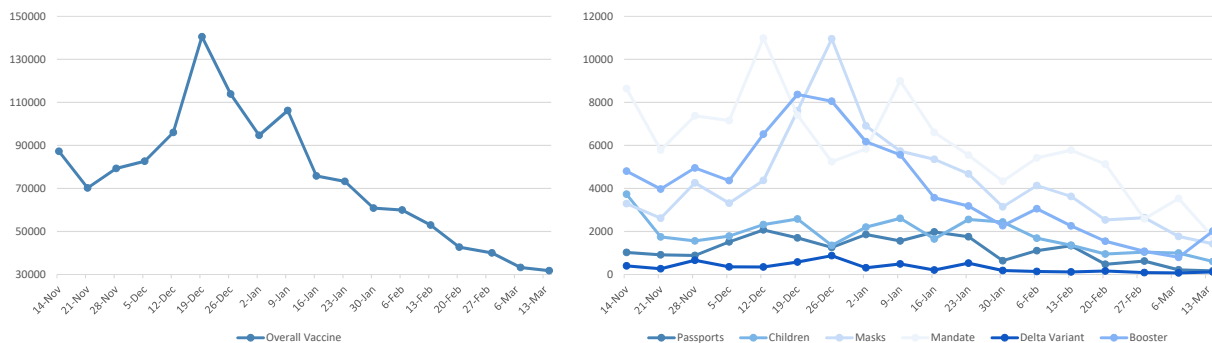
Report Overview March 11 – March 17

- ❑ This week's trending stories cover Boosters (4th COVID-19 vaccine shot became a big story) as well as Masks, Mandates, Side effects from vaccine, and new COVID-19 variant (trending on Facebook);
- ❑ Trending stories: hill.cm/5ehNUSb Pfizer CEO says a fourth booster shot 'is necessary'; morningconsult.com/2022/03/14/joe-rogan-fans-demographics-political-messaging-persuasion Few Politicians Have Appeared on Joe Rogan's Podcast. But Data Shows They Should Be Targeting His Fans; cnbc.com/2022/03/11/pfizer-planning-to-submit-data-on-4th-covid-shot-soon-while-working-on-vaccine-for-all-variants.html Pfizer planning to submit data on 4th Covid shot soon, while working on vaccine for all variants; apne.ws/nXH5IrV Obama tests positive for COVID-19, says he's 'feeling fine'; nbcnews.com/politics/white-house/white-house-warns-covid-treatment-vaccine-cuts-added-funding-rcna20097 White House warns of Covid treatment, vaccine cuts without added funding; pittsburgh.cbslocal.com/2022/03/12/port-authority-vaccination-requirement-protest Port Authority Warns Of Service Disruptions After Employees Call Off In 'Apparent Protest';
- ❑ Stories related to Russia and other actors were also trending this week: bylinetimes.com/2022/03/12/boris-johnson-evgeny-lebedev-russia-ukraine-kgb-evening-standard THE JOHNSON-LEBEDEV LETTERS A Back-Channel to Vladimir Putin?; rollcall.com/2018/07/09/after-moscow-trip-ron-johnson-says-election-meddling-overblown After Moscow Trip, Ron Johnson Says Election Meddling Overblown; news.co.uk/opinion/boris-johnson-punish-putin-begging-saudi-arabia-failing-1520419 Boris Johnson's attempts to punish Putin by going begging to Saudi Arabia are already failing; abcnews.go.com/International/live-updates/russia-ukraine Russia-Ukraine live updates: Russia threatens countries arming Ukraine
- ❑ Anti-vax, disinformation, and vaccine hesitancy stories: sharylattkisson.com/2022/03/covid-19-natural-immunity-compared-to-vaccine-induced-immunity-the-definitive-summary Covid-19 natural immunity compared to vaccine-induced immunity: The definitive summary; theepochtimes.com/9-in-10-covid-deaths-are-in-vaccinated-people-report-4339503.html 9 in 10 COVID Deaths Are in Vaccinated People: Report; express.co.uk/life-style/health/1577745/Pfizer-vaccine-side-effects-adverse-effects Pfizer vaccine: New documents uncover a shocking 158,000 adverse events

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Trends (tweets per week) March 11 – March 17



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High Level View by City March 11 – March 17

	Total PA	Philadelphia		Pittsburgh		Erie		Allentown/Bethlehem		Other	
Conversation	Tweets	Tweets	%	Tweets	%	Tweets	%	Tweets	%	Tweets	%
Overall Vaccine	26199	13831	52.8%	7670	29.3%	221	0.8%	3041	11.6%	1436	5.5%
Vaccine Passports	165	82	0.6%	52	0.7%	1	0.5%	26	0.9%	4	0.3%
FDA Approval	47	30	0.2%	11	0.1%			5	0.2%	1	0.1%
Boosters	1118	623	4.5%	331	4.3%	7	3.2%	96	3.2%	61	4.2%
Employees	389	116	0.8%	179	2.3%	2	0.9%	33	1.1%	59	4.1%
"Experimental"	91	69	0.5%	8	0.1%			11	0.4%	3	0.2%
Children	422	264	1.9%	87	1.1%	1	0.5%	54	1.8%	16	1.1%
Myocarditis	104	32	0.2%	41	0.5%	1	0.5%	24	0.8%	6	0.4%
Heart	293	125	0.9%	117	1.5%	2	0.9%	43	1.4%	6	0.4%
Masks	1381	739	5.3%	327	4.3%	11	5.0%	157	5.2%	147	10.2%
Thrombosis/VITT	86	33	0.2%	11	0.1%			31	1.0%	11	0.8%
Mandates	1651	814	5.9%	518	6.8%	10	4.5%	154	5.1%	155	10.8%
Natural Immunity	161	111	0.8%	31	0.4%			17	0.6%	2	0.1%
Efficacy	48	33	0.2%	7	0.1%			8	0.3%		
Omicron	307	146	1.1%	61	0.8%	1	0.5%	56	1.8%	43	3.0%
Delta Variant	106	36	0.3%	21	0.3%	1	0.5%	15	0.5%	33	2.3%
Race	613	334	2.4%	165	2.2%	10	4.5%	77	2.5%	27	1.9%
Ivermectin	14	5	0.0%	6	0.1%	1	0.5%	2	0.1%		
Military	84	46	0.3%	18	0.2%	1	0.5%	14	0.5%	5	0.3%
Breakthrough	28	15	0.1%	4	0.1%	1	0.5%	4	0.1%	4	0.3%

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- Conversation topics trending this week over last
 - Boosters – over double previous week
 - Thrombosis/VITT



High Level View by County March 11 – March 17

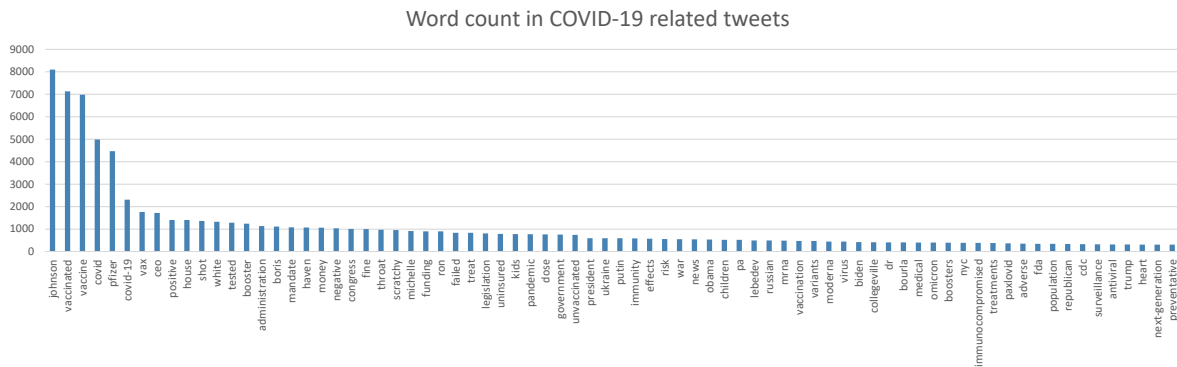
County	Allegheny	Beaver	Butler	Cambria	Fayette	Indiana	Somerset	Westmoreland
Overall Vaccine	8008	21	15	17	9	9	1	38
Vaccine Passports	55							
FDA	11							
Boosters	342		1		2			2
Employees	216	1	1					4
"Experimental"	8							
Children	91		1					
Myocarditis	42							1
Heart	119							
Masks	353	2		12	1			2
Thrombosis/VITT	11				1			
Mandates	596	1	1	1				11
Natural Immunity	31							
Efficacy	7							
Omicron	64		2					
Delta Variant	26	1						1
Race	168	1	1					1
Ivermectin	6							
Military	18		1					
Breakthrough	4							

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- 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 Words Used per Week March 11 – March 17



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Top Hashtags by County March 11 – March 17

- ❑ 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	Indiana	West Moreland
steelers (159)	blm (1)	nurembergcode (1)	daylightsavingtime (1)
nfl (106)	covid (1)		kdka (1)
covid19 (76)	lockdowns (1)		nfl (1)
pflzer (55)	reproductivehealth (1)		steelers (1)
vaccinesideeffects (53)	russiagate (1)		

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Top Hashtags by City March 11 – March 17

- ❑ 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
democratlogic (157)	goptraitors (38)	lebedev (49)	steelers (154)	covid (3)	covid19 (40)	covid19 (14)
covid19 (154)	partyoftreason (38)	covid19 (35)	nfl (104)	demvoice1 (3)	lebedev (16)	vaccine (8)
vaxupphilly (66)	covid19 (17)	biotech (20)	covid19 (73)	standwithukraine (2)	partyofputin (15)	pfizer (7)
pfizer (65)	highriskcovid19 (5)	covid (14)	pfizer (55)	trumpcrimefamily (2)	pfizer (13)	journalists (6)
covid (46)	passport (4)	pfizer (14)	vaccinesideeffects (53)	vaccinesideeffects (2)	vaccinesideeffects (13)	mask (3)

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Top URLs by County March 11 – March 17

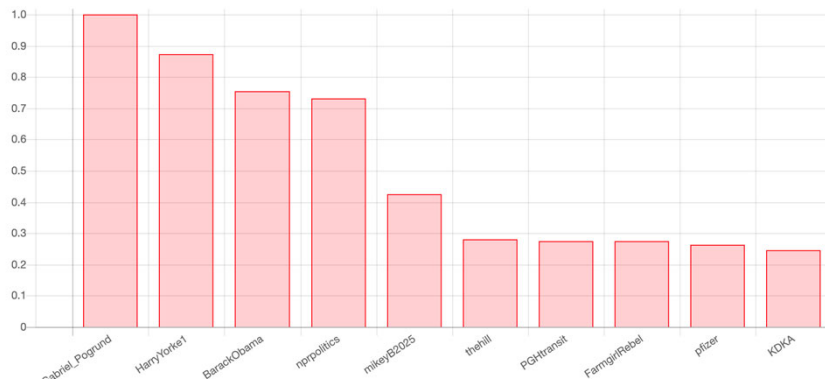
Allegheny	Butler + Beaver	Cambria	Indiana	West Moreland
hill.cm/SehNUSb Pfizer CEO says a fourth booster shot 'is necessary' (138)	cnbc.com/2022/03/11/pfizer-planning-to-submit-data-on-4th-covid-shot-soon-while-working-on-vaccine-for-all-variants.html Pfizer planning to submit data on 4th Covid shot soon, while working on vaccine for all variants (1)	wiactv.com/news/nation-world/ohio-gov-mike-dewine-signs-permitless-gun-carry-bill-senate-bill-215-senator-terry-johnson-concealed-handgun-3-14-2022 Ohio Gov. DeWine signs bill allowing concealed carry without permit (1)	hill.cm/SehNUSb Pfizer CEO says a fourth booster shot 'is necessary' (1)	post-gazette.com/ae/music/2022/03/10/stage-ae-covid-vaccine-negative-test-pittsburgh-music-venue-restrictions/stories/202203100099 Stage AE drops COVID-19 restrictions for most shows; other Pittsburgh-area venues vary (1)
bvlinetimes.com/2022/03/12/boris-johnson-evgeny-lebedev-russia-ukraine-kgb-evening-standard THE JOHNSON-LEBEDEV LETTERS A Back-Channel to Vladimir Putin? (84)	wvsportsnow.com/breaking-wvu-g-kedrian-johnson-announces-return-for-fifth-year Breaking: WVU G Kedrian Johnson Announces Return For Fifth Year (1)		nytimes.com/live/2022/03/13/world/covid-19-mandates-cases-vaccine Shenzhen imposes a lockdown and Shanghai restricts nonessential travel as China's new cases jump (1)	rumble.com/vxa34l-dr-aaron-kheriaty-on-the-potential-long-term-consequences-of-the-pfizer-vaccine Dr. Aaron Kheriaty on the potential long-term consequences of the Pfizer vaccine (1)
mirror.co.uk/news/politics/boris-johnson-ditches-pledge-ban-26452413 Boris Johnson ditches pledge to ban big game hunters from bringing trophies home (60)				pittsburgh.cbslocal.com/2022/03/15/port-authority-waives-fares-sunday-vaccine-mandate-shortage Port Authority Waives Fares Through Sunday Amid Vaccine Shortage Forced By Vaccine Mandate (1)
morningconsult.com/2022/03/14/joe-rogan-fans-demographics-political-messaging-persuasion Few Politicians Have Appeared on Joe Rogan's Podcast. But Data Shows They Should Be Targeting His Fans (33)				cbsloc.al/3MNYfCF Deadline Day Arrives As Port Authority's COVID-19 Vaccine Mandate Takes Effect (1)
rollcall.com/2018/07/09/after-moscow-trip-ron-johnson-says-election-meddling-overblown After Moscow Trip, Ron Johnson Says Election Meddling Overblown (31)				cbsnews.com/news/covid-vaccine-fourth-dose-boost-pfizer-ceo-albert-bourla Pfizer CEO says fourth dose of COVID vaccine is "necessary," submits data to FDA (1)

Top URLs by City March 11 – March 17

Philadelphia	Chester	Norristown	Pittsburgh	Erie	Allentown/ Bethlehem	Other
hill.cm/SehNUSb Pfizer CEO says a fourth booster shot 'is necessary' (140)	nbcnews.com/politics/white-house/white-house-warns-covid-treatment-vaccine-cuts-added-funding-rcna20097 White House warns of Covid treatment, vaccine cuts without added funding (9)	hill.cm/SehNUSb Pfizer CEO says a fourth booster shot 'is necessary' (24)	hill.cm/SehNUSb Pfizer CEO says a fourth booster shot 'is necessary' (136)	wric.com/news/virginia-news/norfolk-based-navy-ship-will-not-deploy-due-to-standoff-over-vaccine-mandate Norfolk-based Navy ship will not deploy due to standoff over vaccine mandate (3)	hill.cm/SehNUSb Pfizer CEO says a fourth booster shot 'is necessary' (41)	hill.cm/SehNUSb Pfizer CEO says a fourth booster shot 'is necessary' (14)
cbc.ca/news/canada/montreal/vaccine-passports-quebec-retail-requirement-1.6316314 Requiring vaccine passports to shop at big-box stores hurts those on Quebec's margins, critics warn (75)	http://catholicnewsagency.com/news/250642/catholic-nun-doctor-deirdre-byrne-vaccine-mandate If this nun-doctor can't get a vaccine religious exemption, who can? (5)	inews.co.uk/opinion/boris-johnson-punish-putin-begging-saudi-arabia-failing-1520419 Boris Johnson's attempts to punish Putin by going begging to Saudi Arabia are already failing (15)	bylinetimes.com/2022/03/12/boris-johnson-evgeny-lebedev-russia-ukraine-kgb-evening-standard THE JOHNSON-LEBEDEV LETTERS A Back-Channel to Vladimir Putin? (84)	abcnews.go.com/International/live-updates/russia-ukraine Russia-Ukraine live updates: Russia threatens countries arming Ukraine (2)	cnn.it/3tX8njl A 4th dose of Covid-19 vaccine will be needed, Pfizer's CEO says, but the company is working on a shot to handle all variants (13)	pittsburgh.cbslocal.com/2022/03/11/port-authority-unvaccinated-employees-service-disruptions Port Authority Warns Losing 500 Unvaccinated Employees Will Significantly Disrupt Service (7)
cnn.it/3tX8njl A 4th dose of Covid-19 vaccine will be needed, Pfizer's CEO says, but the company is working on a shot to handle all variants (61)	foxnews.com/media/sen-ron-johnson-on-the-dangers-of-china-supporting-russia World will 'take action' if China supports 'their friend,' Russia amid war with Ukraine: Sen. Ron Johnson (4)	theepochtimes.com/9-in-10-covid-deaths-are-in-vaccinated-people-report-4339503.html 9 in 10 COVID Deaths Are in Vaccinated People: Report (12)	mirror.co.uk/news/politics/boris-johnson-ditches-pledge-ban-big-game-hunters-from-bringing-trophies-home (60)	breaking911.com/pfizer-biotech-seek-fda-authorization-for-fourth-covid-19-vaccine-doses-for-people-65-and-up Pfizer asks US to allow 4th COVID vaccine dose for seniors (2)	youtu.be/imhbtclFjIs Tony Blair on Iraq over the years: From WMDs to removing Saddam Hussein (12)	pittsburgh.cbslocal.com/2022/03/12/port-authority-vaccination-requirement-protest Port Authority Warns Of Service Disruptions After Employees Call Off In 'Apparent Protest' (7)
apnews.com/health/obama-tests-positive-for-covid-19-says-he-is-feeling-fine (49)	hill.cm/SehNUSb Pfizer CEO says a fourth booster shot 'is necessary' (4)	express.co.uk/life-style/health/1577745/pfizer-vaccine-side-effects-adverse-effects Pfizer vaccine: New documents uncover a shocking 158,000 adverse events (9)	morningconsult.com/2022/03/14/joe-rogan-fans-demographics-political-messaging-persuasion Few Politicians Have Appeared on Joe Rogan's Podcast. But Data Shows They Should Be Targeting His Fans (32)	erie.gov/vax (2)	inews.co.uk/opinion/boris-johnson-punish-putin-begging-saudi-arabia-failing-1520419 Boris Johnson's attempts to punish Putin by going begging to Saudi Arabia are already failing (11)	morningconsult.com/2022/03/14/joe-rogan-fans-demographics-political-messaging-persuasion Few Politicians Have Appeared on Joe Rogan's Podcast. But Data Shows They Should Be Targeting His Fans (5)
sharylattikson.com/2022/03/covid-19-natural-immunity-compared-to-vaccine-induced-immunity-the-definitive-summary Covid-19 natural immunity compared to vaccine-induced immunity: The definitive summary (49)	bylinetimes.com/2022/03/12/boris-johnson-evgeny-lebedev-russia-ukraine-kgb-evening-standard THE JOHNSON-LEBEDEV LETTERS A Back-Channel to Vladimir Putin? (3)	npr.org/2022/03/15/1086653838/the-white-house-says-its-running-out-of-money-to-cover-covid-tests-and-vaccines The White House says it's running out of money to cover COVID tests and vaccines (9)	rollcall.com/2018/07/09/after-moscow-trip-ron-johnson-says-election-meddling-overblown After Moscow Trip, Ron Johnson Says Election Meddling Overblown (31)	khou.com/article/news/local/texas-rangers-execute-search-warrants-at-harris-county-judge-lina-hidalgo-office/285-d8803073-7d37-4ae3-adfb-0f230b2998d9 Texas Rangers, DA's office execute search warrants at Harris County administration building (2)	bylinetimes.com/2022/03/12/boris-johnson-evgeny-lebedev-russia-ukraine-kgb-evening-standard THE JOHNSON-LEBEDEV LETTERS A Back-Channel to Vladimir Putin? (10)	pittsburgh.cbslocal.com/2022/03/14/port-authority-unvaccinated-employees-service-disruptions Union Criticizes Port Authority's COVID-19 Vaccine Mandate (4)

Analysis of Tweeters - Super Spreaders

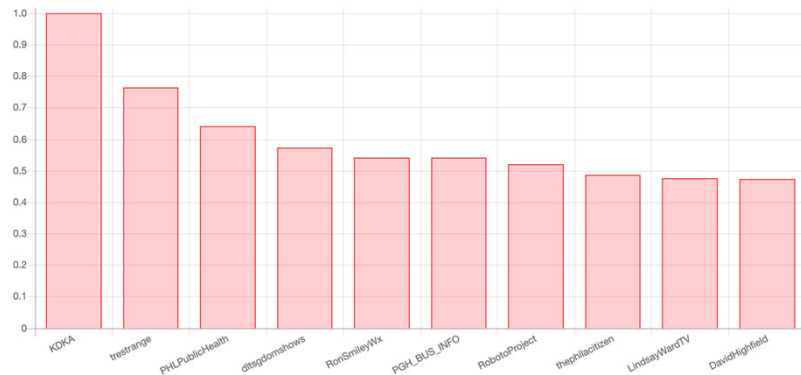
- ☐ Super Spreaders are users which generate content that is shared often, and hence spread information effectively.



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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.



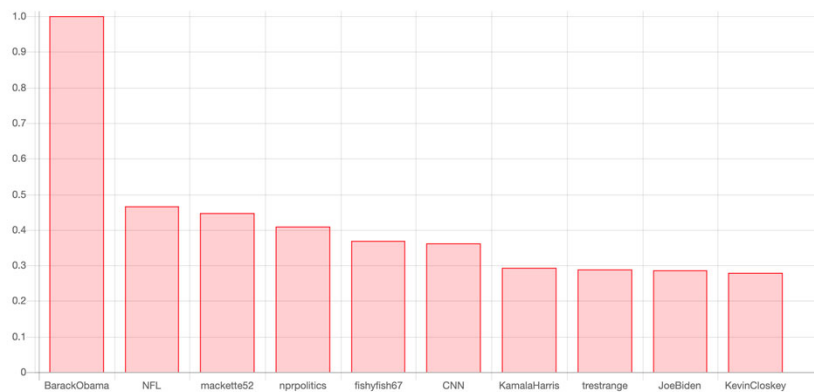
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Analysis of Tweeters - Other Influencers

- ❑ 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.



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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
BarackObama[+]	608
pfizer[+]	409
nprpolitics[+][*]	257
SebGorka[+]	179
VPrasadMDMPH[+]	173
akheriaty	171
Chicago1Ray	165
RedWineRocket	162
RubinReport[+]	157
PGHtransit[+]	152

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Trending Tweets March 11 – March 17

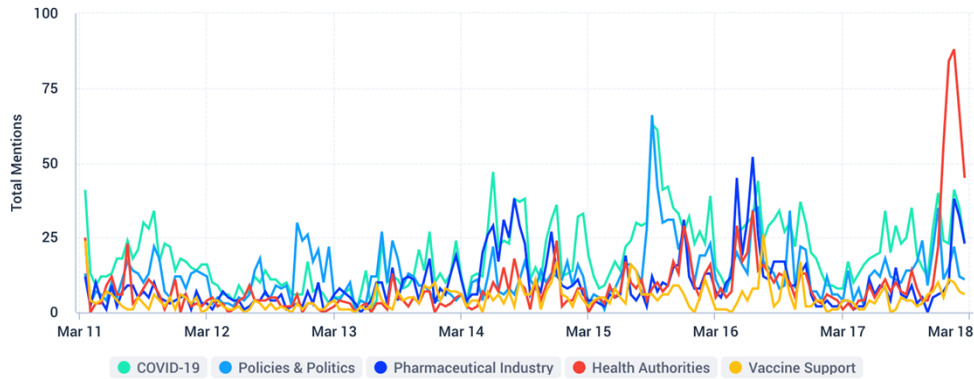
Tweets that are the most forwarded, either by retweet, reply, or quote:

- ❑ I just tested positive for COVID. I've had a scratchy throat for a couple days, but am feeling fine otherwise. Michelle and I are grateful to be vaccinated and boosted, and she has tested negative. It's a reminder to get vaccinated if you haven't already, even as cases go down.
- ❑ NEW: The White House is warning it will have to wind down a program that pays to test, treat and vaccinate uninsured people for COVID-19 because the administration has run out of money for the program, which Congress failed to include in funding legislation.
- ❑ NEW: Pfizer CEO says a fourth booster shot "is necessary" <https://t.co/zVqtOgOLXG> <https://t.co/bifqWain4G>
- ❑ Research into next-generation COVID vaccines will be curbed, and some surveillance for new variants will also be stopped, the White House said. The administration said it also will need to limit its push to help poorer countries vaccinate people.
- ❑ "I'm vaccinated and got sick so you should get the vaccine for the thing I'm now sick with." <https://t.co/q93ktHf7de>
- ❑ My 16 year old just texted from her YYC classroom in social studies where a sub decided to share his views on the residential school 'hoax' and then went on an anti vax tirade. They kids recorded him and had an appointment with the principal before I even called the school ❤
- ❑ I'm vaccinated but caught COVID. So you should get vaccinated too. #DemocratLogic <https://t.co/MSUvjUls5ej>
- ❑ Pfizer's data shows that its "vaccine" has over 1200 side effects
- ❑ Why is Pfizer being removed from the NYSE ? And why is their building deserted in Collegeville, PA? Kim Shady <https://t.co/KhsZ16L1ai>
- ❑ Call to action @akheriaty @MartyMakary @DrJBhattacharya @VPrasadMDMPH Please stand up strongly against ALL college mRNA vaccine mandates - not just boosters. The time is now to rescue incoming students and those who will be faced with "up to date" requirements. It's up to you.

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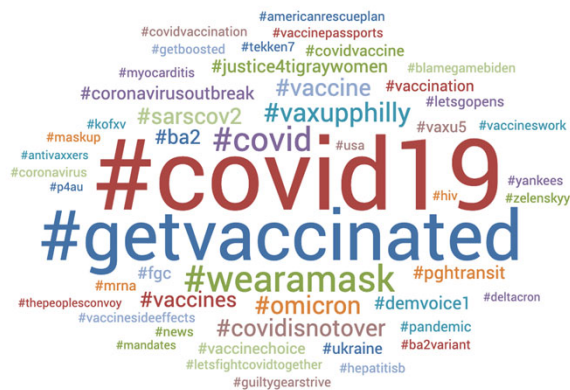
General PA Conversation March 11 – March 17



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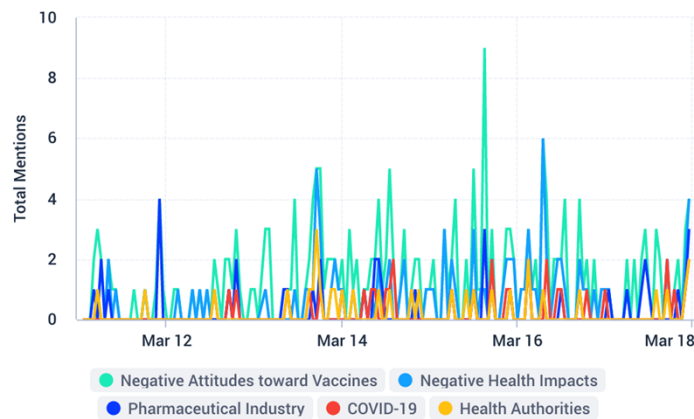
PA Hashtag Cloud March 11 – March 17



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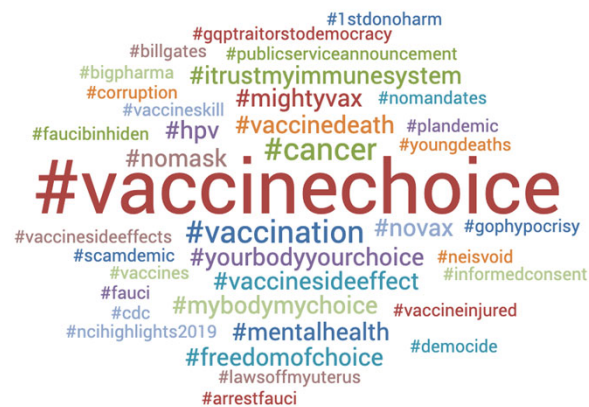
Negative Attitudes March 11 – March 17



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Negative Hashtag Cloud March 11 – March 17



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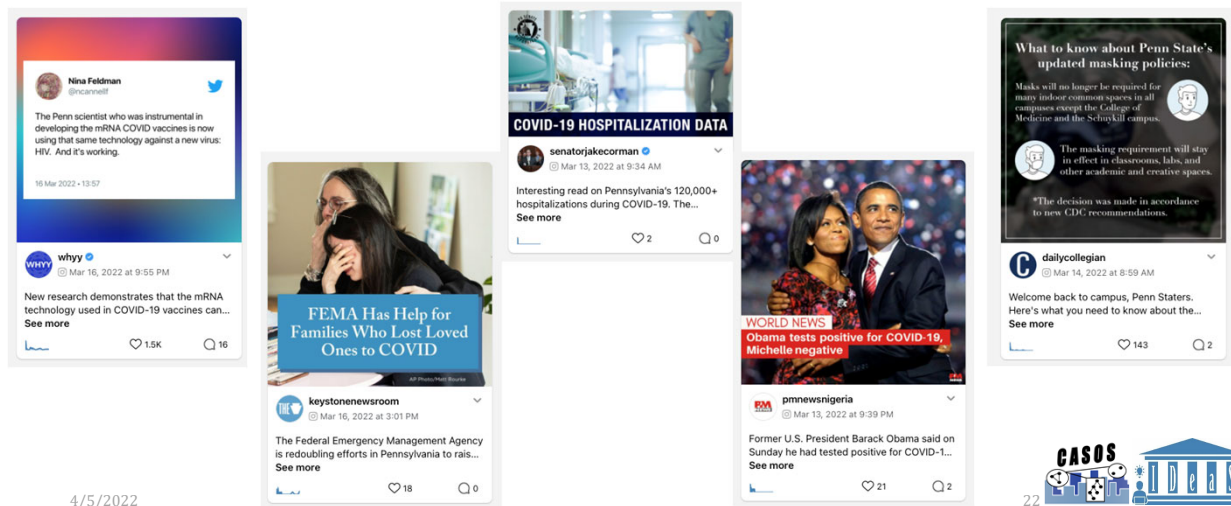
Trending Posts on Facebook March 11 – March 17



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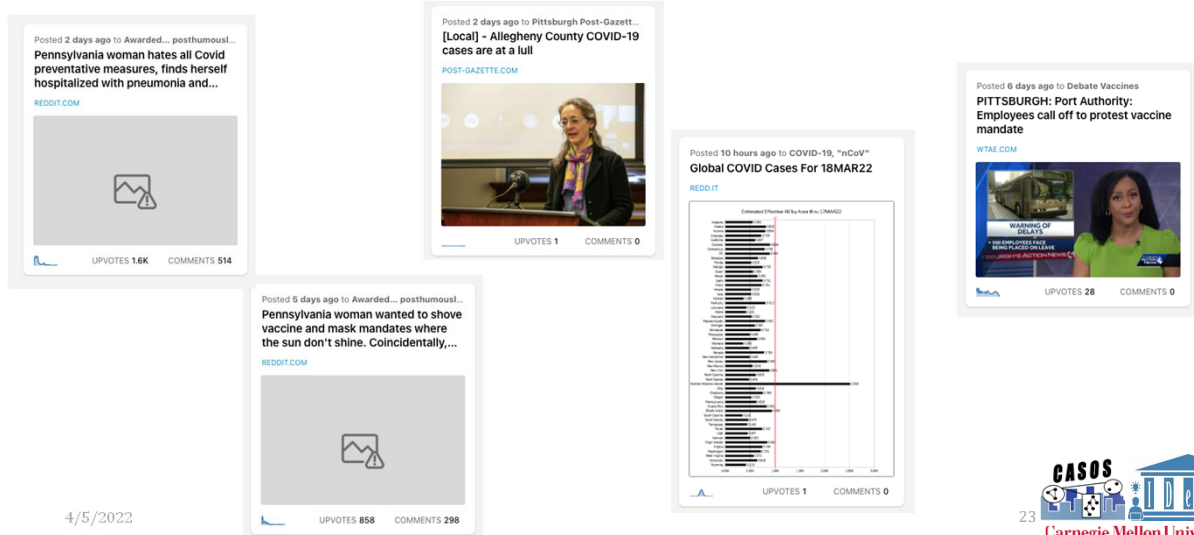
Trending Posts on Instagram March 11 – March 17



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Trending Posts on Reddit March 11 – March 17



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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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