

PA Vaccine Conversations on Twitter

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Vaccine Hesitancy Project Update based on April 15, 2022 – April 21, 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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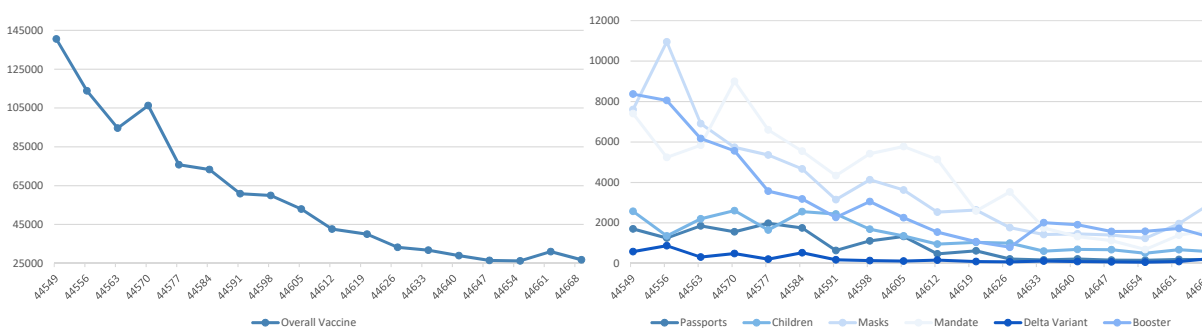
Report Overview April 15 – April 21

- ❑ Masks, Mandates, Boosters, Heart Issues are trending this week;
- ❑ Trending stories: on.nbc10.com/qadOeUj Indoor Mask Mandate Returns to Philadelphia; sfchronicle.com/health/article/covid-immunity-17085243.php Why do some people never get COVID while others get it several times, even if vaccinated?; theguardian.com/politics/2022/apr/19/1000-days-of-boris-johnson-as-prime-minister-proroguing-parliament-partygate From prorogation to partygate: 1,000 days of Boris Johnson as PM; thetimes.co.uk/article/in-the-tories-parallel-moral-universe-a-serial-liar-is-lauded-as-a-winner-sbs2xr315 In the Tories' parallel moral universe, a serial liar is lauded as a winner. The MPs backing Boris Johnson are complicit in the creeping normalisation of deceit in public life;
- ❑ Anti-vax, disinformation, and vaccine hesitancy stories: thepostmillennial.com/bill-maher-blasts-vaccinated-people-still-wearing-masks WATCH: Bill Maher blasts vaccinated people still wearing masks; zerohedge.com/political/bill-maher-asks-vaccinated-mask-wearers-if-they-keep-condom-after-sex Bill Maher Asks Vaccinated Mask-Wearers If They "Keep The Condom On" After Sex; discord.com/invite/AJwrYXundC AUNTY VAX channel on Discord; bit.ly/3KVPuVM COVID-19 is a synthetic version of "snake venom" that evil forces are spreading through remdesivir, the COVID-19 vaccines and drinking water to "make you a hybrid of Satan"; default.salsalabs.org/T7a18ad11-f627-4d8a-b2e6-30d9a438a003/34f69ea7-eee3-42d2-8426-45873549571a 7-Year-Old Died of Cardiac Arrest 13 Days After Pfizer Shot, VAERS Data Show; thedailybeast.com/the-alex-jones-pal-behind-the-anti-vaccine-rights-urine-drinking-covid-cure The Alex Jones Pal Behind The Urine-Drinking COVID 'Cure'; iamajuicer.wordpress.com/2021/11/01/why-those-getting-the-covid-vaccine-should-be-locked-down-and-wear-a-mask Why those getting the Covid vaccine should be locked down and wear a mask.
- ❑ A new platform was identified in trends this week such as Discord with the anti-vax channel discord.com/invite/AJwrYXundC AUNTY VAX

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Trends (tweets per week) April 15 – April 21



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High Level View by City April 15 – April 21

	Total PA	Philadelphia		Pittsburgh		Erie		Allentown/Bethlehem		Other	
Conversation	Tweets	Tweets	%	Tweets	%	Tweets	%	Tweets	%	Tweets	%
Overall Vaccine	23323	12608	54.1%	7060	30.3%	204	0.9%	2337	10.0%	1114	4.8%
Vaccine Passports	186	149	1.2%	20	0.3%			13	0.6%	4	0.4%
FDA Approval	24	12	0.1%	8	0.1%			4	0.2%		
Boosters	884	566	4.5%	163	2.3%	8	3.9%	92	3.9%	55	4.9%
Employees	64	31	0.2%	20	0.3%			7	0.3%	6	0.5%
"Experimental"	46	18	0.1%	16	0.2%	1	0.5%	9	0.4%	2	0.2%
Children	439	256	2.0%	97	1.4%	2	1.0%	68	2.9%	16	1.4%
Myocarditis	51	27	0.2%	11	0.2%			10	0.4%	3	0.3%
Heart	405	177	1.4%	128	1.8%	8	3.9%	71	3.0%	21	1.9%
Masks	2999	1906	15.1%	494	7.0%	37	18.1%	278	11.9%	284	25.5%
Thrombosis/VITT	68	40	0.3%	16	0.2%			10	0.4%	2	0.2%
Mandates	1573	894	7.1%	418	5.9%	13	6.4%	155	6.6%	93	8.3%
Natural Immunity	81	53	0.4%	18	0.3%			9	0.4%	1	0.1%
Efficacy	35	21	0.2%	3	0.0%	1	0.5%	7	0.3%	3	0.3%
Omicron	122	70	0.6%	23	0.3%			21	0.9%	8	0.7%
Delta Variant	250	139	1.1%	42	0.6%	3	1.5%	38	1.6%	28	2.5%
Race	409	211	1.7%	143	2.0%	10	4.9%	32	1.4%	13	1.2%
Ivermectin	17	4	0.0%	7	0.1%	1	0.5%	3	0.1%	2	0.2%
Military	82	46	0.4%	23	0.3%			12	0.5%	1	0.1%
Breakthrough	105	89	0.7%	8	0.1%			6	0.3%	2	0.2%

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- Conversation topics trending this week over last
 - Masks
 - Mandates
 - Heart issues



High Level View by County April 15 – April 21

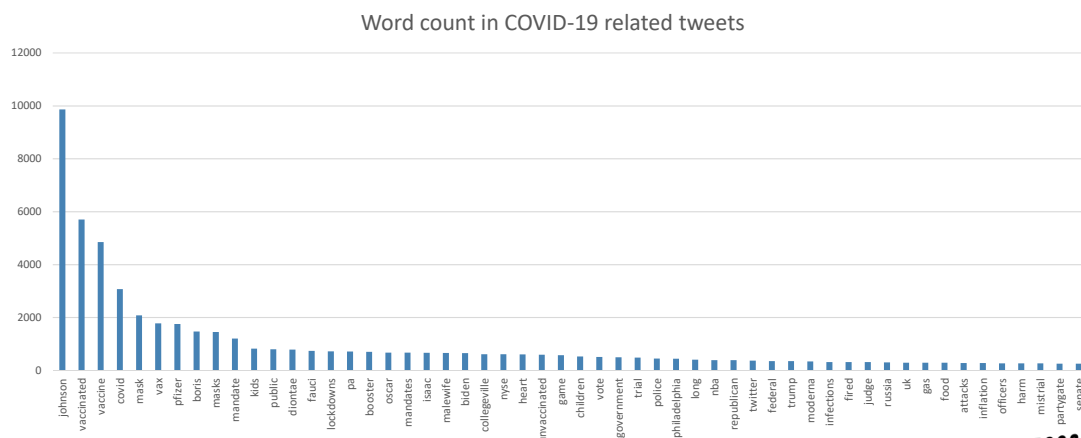
County	Allegheny	Beaver	Butler	Cambria	Fayette	Indiana	Somerset	Westmoreland
Overall Vaccine	7277	32	17	8	5	3	2	38
Vaccine Passports	20							1
FDA	8							
Boosters	170							
Employees	23							
"Experimental"	17							
Children	101							1
Myocarditis	12							
Heart	131							1
Masks	549	1	8	4		1	1	16
Thrombosis/VITT	17							
Mandates	437		3				1	3
Natural Immunity	18							
Efficacy	4							
Omicron	26							
Delta Variant	47			2				
Race	143							2
Ivermectin	8							
Military	23							
Breakthrough	9							

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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 April 15 – April 21



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Top Hashtags by County April 15 – April 21

- ❑ 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	Cambria	West Moreland
steelers (333)	covid (1)	steelers (3)
nfl (154)	sweetmagnolias (1)	breaking (1)
covid19 (74)	trideltatuesday (1)	covid19 (1)
pfizer (50)	xevariant (1)	nausea (1)
partygate (49)	covid (1)	sarscov2 (1)

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Top Hashtags by City April 15 – April 21

- ❑ 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
philly (184)	demvoice1 (24)	covid19 (42)	steelers (326)	getvaccinated (2)	covid19 (28)	steelers (22)
covid19 (118)	covid19 (10)	partygate (28)	nfl (149)	steelers (2)	immunizeunder5s (13)	vaccine (18)
breaking (55)	children (8)	covid (14)	covid19 (71)	wtpblue (2)	covidvaxtruth (11)	covid19 (16)
covid (33)	chooselove (6)	rwanda (10)	pfizer (50)	boostyourcommunity (1)	steelers (11)	nfl (8)
vaccine (27)	europe (6)	boostyourcommunity (9)	partygate (49)	antivaxers (1)	johnsoncollege (7)	pfizer (5)

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Top URLs by County April 15 – April 21

Allegheny	Butler + Beaver	Cambria	Fayette	Somerset	West Moreland
thetimes.co.uk/article/in-the-tories-parallel-moral-universe-a-serial-liar-is-lauded-as-a-winner-sbs2xr3l5 In the Tories' parallel moral universe, a serial liar is lauded as a winner. The MPs backing Boris Johnson are complicit in the creeping normalisation of deceit in public life (148)	dailycaller.com/2022/04/16/bill-maher-masks-comedy-special-covid-19 Bill Maher On Vaccinated People Wearing Masks: 'Do You Keep The Condom On After You F**k?' (1)	foxnews.com/health/covid-19/what-to-know-about-the-xe-variant What to Know About the XE Variant (1)	washingtonpost.com/politics/2022/04/18/us-booster-gan/ The troublesome U.S. booster gap (1)	nbcphiladelphia.com/news/national-international/florida-judge-voids-us-mask-mandate-for-planes-other-travel/3210607 TSA No Longer Enforcing Masking After Federal Judge Voids CDC Mandate (1)	cbsnews.com/news/pfizer-vaccine-ask-fda-to-authorize-booster-for-kids-as-young-as-5 Pfizer and BioNTech to ask FDA to authorize COVID-19 booster for kids as young as 5 (1)
change.org/p/boris-johnson-for-all-social-service-workers-to-wear-body-cams-on-visits For all social service workers to wear body cams on visits (39)	bit.ly/3JHpRMC (1)				iwaspoisoned.com/i/73o4miz Report a food safety issue. Protect others.(1)
bbc.com/news/health-61348515 PM and chancellor apologise and pay lockdown party fines (23)	dkpittsburghsports.com/2022/04/14/wide-receiver-nfl-draft-rankings-dale-jolley-need-first-round-diontae-johnson-chase-claypool-update-analysis-steelers-fdl NFL Draft: Wide receiver a need for Steelers? You bet (1)				newsweek.com/dark-maga-donald-trump-supporters-attempt-rebrand-2024-1697855 What Is Dark MAGA? Trump Supporters Attempt Rebrand for 2024 (1)
mirror.co.uk/news/politics/boris-johnson-allies-defend-partygate-26730399 Boris Johnson allies defend Partygate fine - 'murder is different to manslaughter!' (23)	timesonline.com/story/sports/high-school/2022/04/20/beaver-county-times-top-performances-week-of-april-18/65350902007 Times' Top Performances: Week of April 18 (1)				steelersnow.com/report-steelers-wr-diontae-johnson-doesnt-report-for-optional-workouts Report: Steelers WR Diontae Johnson Doesn't Report For Optional Workouts (1)
thedailybeast.com/the-alex-jones-pal-behind-the-anti-vaccine-rights-urine-drinking-covid-cure The Alex Jones Pal Behind The Urine-Drinking COVID 'Cure' (20)					

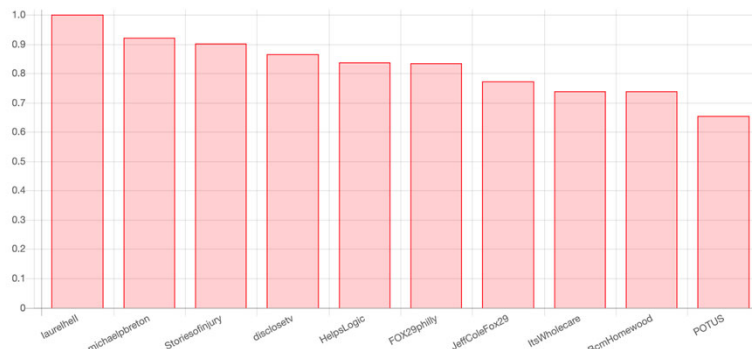


Top URLs by City April 15 – April 21

Philadelphia	Chester	Norristown	Pittsburgh	Erie	Allentown/ Bethlehem	Other
on.nbc10.com/gad0e1j Indoor Mask Mandate Returns to Philadelphia (112)	gingrich360.com/2022/04/12/boris-johnson-walking-in-kyiv-joe-biden-bicycling-in-delaware Boris Johnson Walking in Kyiv, Joe Biden Bicycling in Delaware (15)	thetimes.co.uk/article/in-the-tories-parallel-moral-universe-a-serial-liar-is-justified-as-a-winner-sbs2xr3l5 The Tories' parallel moral universe, a serial liar is lauded as a winner The MPs backing Boris Johnson are complicit in the creeping normalisation of deceit in public life (22)	thetimes.co.uk/article/in-the-tories-parallel-moral-universe-a-serial-liar-is-justified-as-a-winner-sbs2xr3l5 The Tories' parallel moral universe, a serial liar is lauded as a winner The MPs backing Boris Johnson are complicit in the creeping normalisation of deceit in public life (148)	joshbarro.com/p/travel-mask-rules-were-increasingly-absurd-and-ignored-now-they-are-gone-2 Travel Mask Rules Were Increasingly Absurd and Ignored. Now They Are Gone. (2)	jamaulicer.wordpress.com/2022/04/18/pitt-basketball-hosting-ohio-state-transfer-guard-meechie-johnson-pitt-bb RECRUITING Pitt Basketball Hosting Ohio State Transfer Guard Meechie Johnson (8)	pittsburghsportsnow.com/2022/04/18/pitt-basketball-hosting-ohio-state-transfer-guard-meechie-johnson-pitt-bb RECRUITING Pitt Basketball Hosting Ohio State Transfer Guard Meechie Johnson (8)
thepostmillennial.com/bill-maher-blasts-vaccinated-people-still-wearing-masks-watch-bill-maher-blasts-vaccinated-people-still-wearing-masks-74 WATCH: Bill Maher blasts vaccinated people still wearing masks (74)	gov.uk/government/publications/regulatory-approval-of-pfizer-biotech-vaccine-for-covid-19-information-for-uk-recipients-on-pfizerbiotech-covid-19-vaccine Information for UK recipients on Pfizer/BioNTech COVID-19 vaccine (Regulation 174) (15)	theguardian.com/politics/2022/apr/19/1000-days-of-boris-johnson-as-prime-minister-proroguing-parliament-partygate From prorogation to partygate: 1,000 days of Boris Johnson as PM (13)	change.org/p/boris-johnson-for-all-social-service-workers-to-wear-body-cams-on-visits For all social service workers to wear body cams on visits (39)	steelernation.com/steelers-receiver-diontae-johnson-honors-dwayne-haskins-with-tattoo-2 Receiver Diontae Johnson Honors Dwayne Haskins With Tattoo (2)	nbcnews.to/3En4Qzljha US must assess role of vaccine mandates for travel (9)	mesonet.agron.iastate.edu/lsr Local Storm Report App (5)
zerohedge.com/political/bill-maher-asks-vaccinated-mask-wearers-if-they-keep-condom-after-sex-bill-maher-asks-vaccinated-mask-wearers-if-they-keep-condom-after-sex-58 Bill Maher Asks Vaccinated Mask-Wearers If They "Keep The Condom On" After Sex (58)	euromomo.eu/graphs-and-maps Graphs and maps (6)	hit.ly/3KVpVM COVID-19 is a synthetic version of "snake venom" that evil forces are spreading through remdesivir, the COVID-19 vaccines and drinking water to "make you a hybrid of Satan." (9)	bbc.in/364xut5 PM and chancellor apologise and pay lockdown party fines (23)	aol.com/florida-judge-voids-us-mask-173552209-175326201.html Florida judge voids US mask mandate for planes, other travel (1)	foxnews.com/health/promising-cancer-vaccine-utilizing-similar-mrna-technology-combats-covid-duke-researchers Promising cancer vaccine in the works utilizing similar mRNA technology that combats COVID: Duke researchers (6)	dkpittsburghsports.com/2022/04/14/wide-receiver-nfl-draft-rankings-dale-lolley-need-first-round-diontae-johnson-chase-dyson-pool-update-analysis-steelers-fall-nfl-draft-wide-receiver-a-need-for-steelers-you-bet-4 Wide receiver a need for Steelers? You bet (4)
discord.com/invite/AltwrYXun AUNT VAX channel on Discord (57)	science.org/content/article/pandemic-propels-global-effort-study-rare-vaccine-side-effects Pandemic propels global effort to study rare vaccine side effects (6)	default.salsalabs.org/T7a18ad11-f627-4d8a-b2e6-30d9a438a003/34f69ea7-eee3-42d2-8426-45873549571a 7-Year-Old Died of Cardiac Arrest 13 Days After Pfizer Shot, VAERS Data Show (9)	mirror.co.uk/news/politics/boris-johnson-allies-defend-partygate-26730399 Boris Johnson allies defend Partygate fine - 'murder is different to manslaughter!' (23)	bbc.in/364xut5 PM and chancellor apologise and pay lockdown party fines (1)	bbc.in/364xut5 PM and chancellor apologise and pay lockdown party fines (5)	dkps.net/trial Subscribe to DKPS+ (4)
sichronicle.com/health/article/covid-immunity-17085243.php Why do some people never get COVID while others get it several times, even if vaccinated? (41)	walgreens.com/businesssoliti/ons/covid-19-index.jsp Walgreens COVID-19 Index (6)	inquirer.com/news/kenyatta-johnson-mistrial-jury-deadlock-dawn-chavous-philadelphia-universal-20220419.html Feds vow to retry Kenyatta Johnson and his wife, Dawn Chavous, on bribery charges after hung jury results in a mistrial (7)	thedailybeast.com/the-alex-jones-pal-behind-the-anti-vaccine-rights-urine-drinking-covid-cure-the-alex-jones-pal-behind-the-urine-drinking-covid-cure The Alex Jones Pal Behind The Urine-Drinking COVID 'Cure' (20)	bbc.in/3EjknRo Ukraine war: Russia bans Boris Johnson from country over Ukraine war (1)	dailymail.co.uk/news/article-10723515/scientists-world-cure-heart-attacks-using-mrna-technology-covid-vaccines.html Scientists discover world's first cure for heart attacks using the same mRNA technology as Covid vaccines (5)	evanhospital.com/virus Information about COVID-19 (4)

Analysis of Tweeters - Super Spreaders

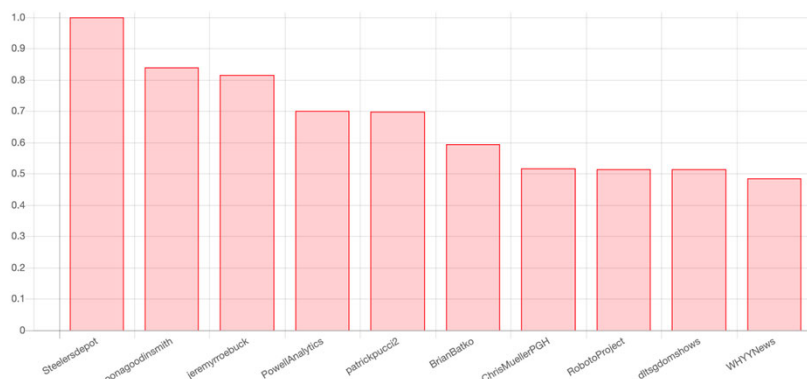
- ❑ Super Spreaders are users which generate content that is shared often, and hence spread information effectively.



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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.



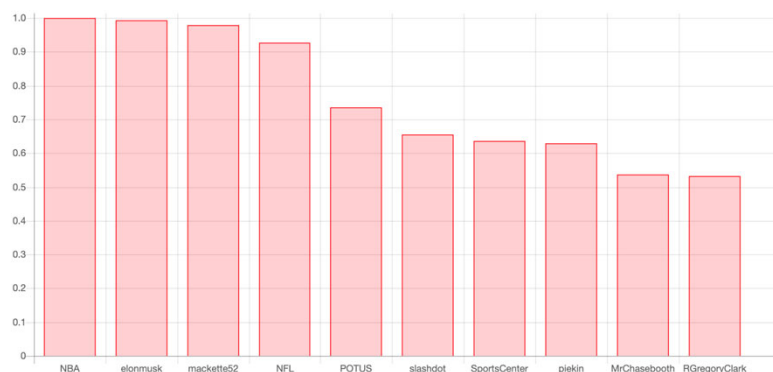
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Analysis of Tweeters - Other Influencers

- ❑ 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
POTUS[+]	374
Delta	269
CDCgov[+]	196
pfizer[+]	150
catturd2	118
RosemaryConnors	115
Hamletgarcia17[+]	113
US_FDA	102
BorisJohnson[+]	85
united[+]	79

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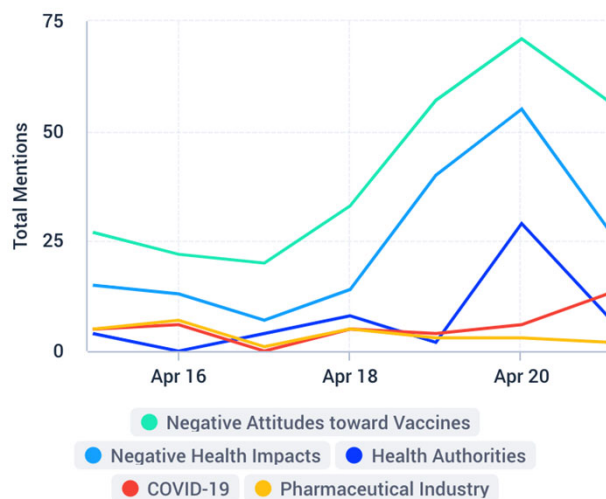
Trending Tweets April 15 – April 21

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

- ❑ Why is Pfizer being removed from the NYSE ? And why is their building deserted in Collegeville, PA? You are not supposed to know that?
- ❑ NEW - Fauci: "You use lockdowns to get people vaccinated." <https://t.co/hZ3VhWSv3D>
- ❑ @POTUS Gas prices are out of control. Food prices are out of control. Lumber prices are out of control. Inflation is taxing the working class. You fired police officers & nurses w/ your illegal vaccine mandate. This November, we will remember. Vote Republican.
- ❑ People: aRe yoU goInG to mAsK fOreVeR Me: well I still wear seatbelts & helmets, use sunscreen, get vaccinated, wash my hands, drink pasteurized milk, cook chicken before eating it, & don't drink water straight from the lake so ♀ ♀ ♀
- ❑ Definitely seeing my vaccinated patients struggling with getting over even minor infections now. The harm to their immune systems is getting more obvious as time goes by... disaster and tragedy in the making. I blame you, WHO and all the govts who took their people for a ride.
- ❑ JUST IN - White House announces second global COVID summit on May 12 aiming to "bring solutions to vaccinate the world for everyone, everywhere."
- ❑ "75 per cent of the public believe that Johnson lied about breaking the law, a finding that future historians may regard as a landmark moment. Only 12 per cent think he is telling the truth, roughly the same number who think aliens walk among us." <https://t.co/HnzCpisyRA>
- ❑ I am on a plan with my 2 not-yet-eligible for vax kids & the pilot just announced that the mask mandate has just this minute ended. Ppl clapped & took off their masks. Here we are having boarded a plane with our kids. Very upset, @Delta, that this was announced mid flight.
- ❑ Vanguard is the now the largest share holder of Twitter Vanguard is also the largest shareholder of Pfizer
- ❑ The indoor mask mandate returned to Philadelphia on Monday. @RosemaryConnors has reactions from residents: <https://t.co/CWWEpXwOo2>



Negative Attitudes April 15 – April 21



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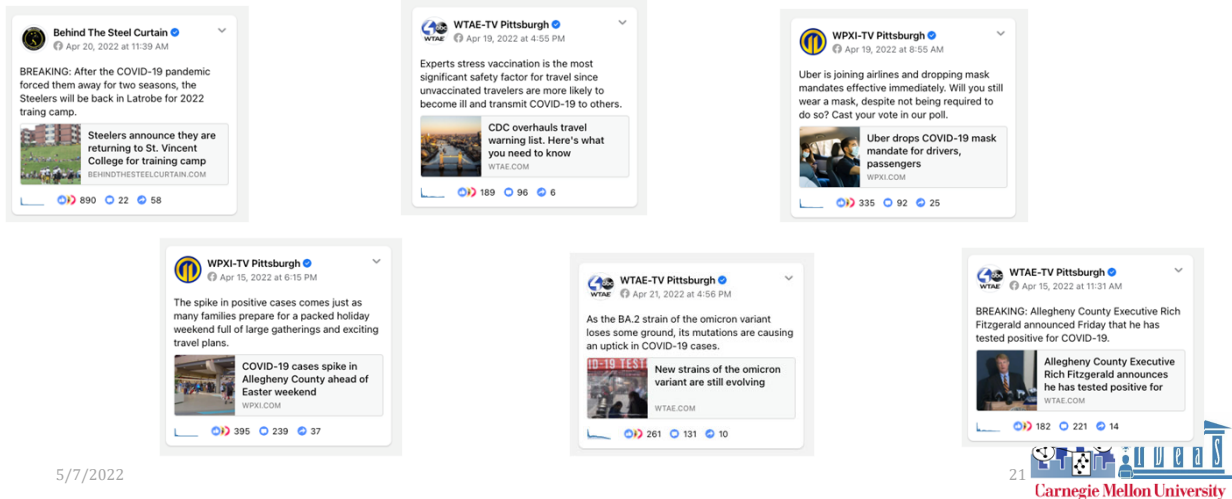
Negative Hashtag Cloud April 15 – April 21



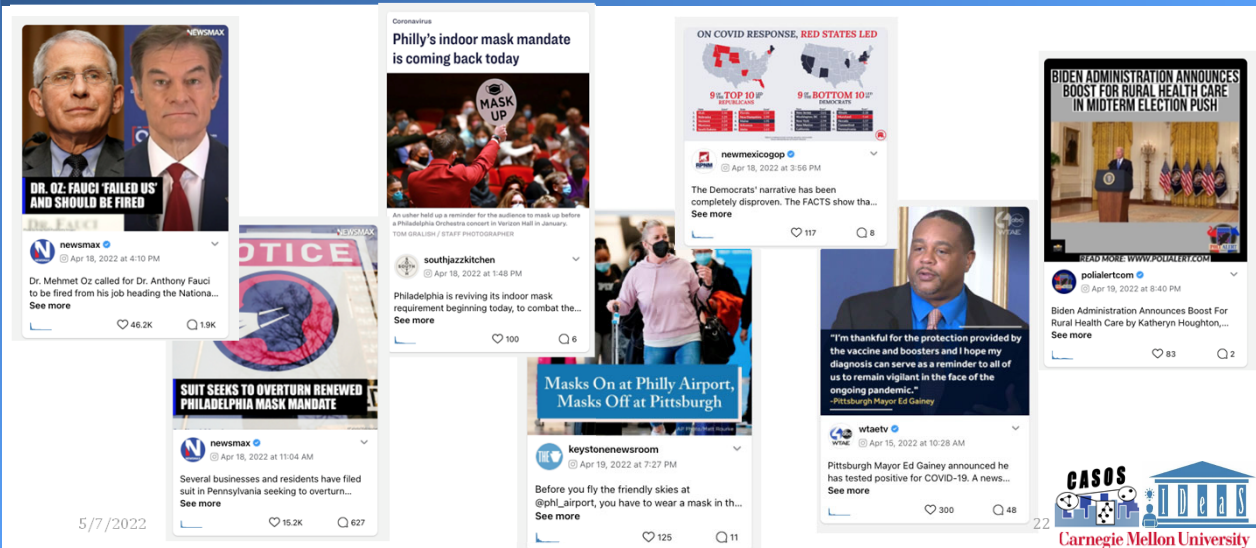
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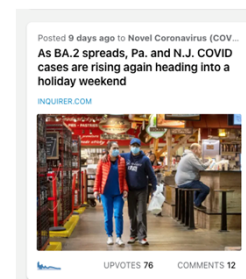
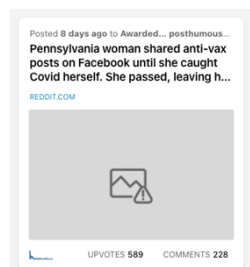
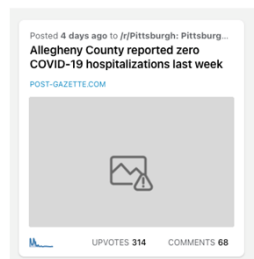
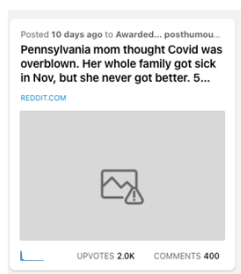
Trending Posts on Facebook April 15 – April 21



Trending Posts on Instagram April 15 – April 21



Trending Posts on Reddit April 15 – April 21



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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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