

PA Vaccine Conversations on Twitter

Dr. Iuliia Alieva, Dawn Robertson, Dr. Kathleen M. Carley

Vaccine Hesitancy Project Update based on April 8, 2022 – April 14, 2022

The CMU centers for:

Informed DEMocracy And Social cyber-security

Computational Analysis of Social and Organizational Systems



Carnegie Mellon University



5/7/2022

1

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.

5/7/2022



2

Carnegie Mellon University

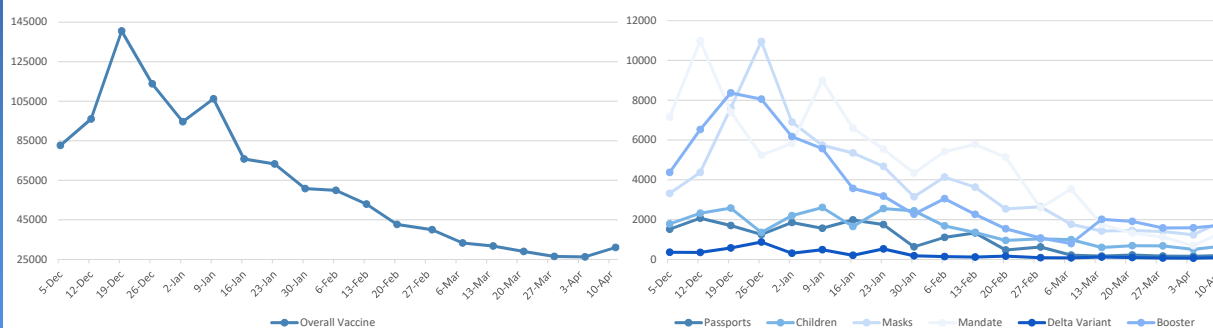
Report Overview April 8 – April 14

- ❑ This week's trending stories cover Masks, Mandates, Boosters, Breakthrough Infections;
- ❑ Trending stories: [nyti.ms/3Ivea6a](https://www.nytimes.com/2022/04/08/us/politics/philadelphia-mask-mandate.html) The city of Philadelphia will reinstate an indoor mask mandate, the first major U.S. city to do so this spring; [emilyburns.substack.com/p/vaccine-mandates-are-robbing-my-son](https://www.emilyburns.substack.com/p/vaccine-mandates-are-robbing-my-son) Vaccine Mandates Are Robbing My Son of the Chance to Play at Carnegie Hall; [bbc.in/364xut5](https://www.bbc.com/news/health-61444444) PM and chancellor apologise and pay lockdown party fines; [mediaite.com/tv/tucker-carlson-brags-hes-not-vaccinated-against-covid-19-i-skipped-the-first-three](https://www.mediaite.com/tv/tucker-carlson-brags-hes-not-vaccinated-against-covid-19-i-skipped-the-first-three/) Tucker Carlson Brags He's Not Vaccinated Against Covid-19: 'I Skipped the First Three'; [judicialwatch.org/covid-19-boosters](https://www.judicialwatch.org/covid-19-boosters) Judicial Watch Sues HHS for Records about Gov Agency Research into COVID-19 Boosters;
- ❑ Anti-vax, disinformation, and vaccine hesitancy stories: [globalresearch.ca/biggest-lie-in-world-history-the-data-base-is-flawed-there-never-was-a-pandemic-the-covid-mandates-including-the-vaccine-are-invalid/5772008](https://www.globalresearch.ca/biggest-lie-in-world-history-the-data-base-is-flawed-there-never-was-a-pandemic-the-covid-mandates-including-the-vaccine-are-invalid/5772008) Biggest Lie in World History: There Never Was A Pandemic. The Data Base is Flawed. The Covid Mandates including the Vaccine are Invalid; [newspunch.com/new-zealand-high-court-ends-jacinda-arderns-vaccine-mandate-its-a-gross-violation-of-human-rights](https://www.newspunch.com/new-zealand-high-court-ends-jacinda-arderns-vaccine-mandate-its-a-gross-violation-of-human-rights) New Zealand High Court ENDS Jacinda Ardern's Vaccine Mandate: "It's a Gross Violation of Human Rights;" [dailysceptic.org/2022/04/09/vaccinated-have-up-to-six-times-the-infection-rate-of-unvaccinated-new-zealand-government-data-show](https://www.dailysceptic.org/2022/04/09/vaccinated-have-up-to-six-times-the-infection-rate-of-unvaccinated-new-zealand-government-data-show) Vaccinated Have Up To SIX Times the Infection Rate of Unvaccinated, New Zealand Government Data Show; [theepochtimes.com/praise-and-prick-pennsylvania-pays-churches-to-convince-members-to-get-vaccinated_4384843.html](https://www.theepochtimes.com/praise-and-prick-pennsylvania-pays-churches-to-convince-members-to-get-vaccinated_4384843.html) Praise and Prick: Pennsylvania Pays Churches to Convince Members to Get Vaccinated; jamajucier.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; [AFLDS.org](https://www.afls.org) America's Frontline Doctors (Organization promotes Ivermectin and Hydroxychloroquine)
- ❑ Telegram channel link t.me/8Hda8RHdASoxOTdk that was in the list of five most popular websites in Norristown states that they sell vaccine cards "to those who need results but are not willing to take the vaccines"

5/7/2022



Trends (tweets per week) April 8 – April 14



5/7/2022



High Level View by City April 8 – April 14

	Total PA	Philadelphia		Pittsburgh		Erie		Allentown/Bethlehem		Other	
Conversation	Tweets	Tweets	%	Tweets	%	Tweets	%	Tweets	%	Tweets	%
Overall Vaccine	25946	13866	53.4%	7647	29.5%	230	0.9%	3047	11.7%	1156	4.5%
Vaccine Passports	191	137	1.0%	36	0.5%			14	0.5%	4	0.3%
FDA Approval	40	17	0.1%	13	0.2%			8	0.3%	2	0.2%
Boosters	1153	650	4.7%	244	3.2%	7	3.0%	173	5.7%	79	6.8%
Employees	241	124	0.9%	54	0.7%	2	0.9%	49	1.6%	12	1.0%
"Experimental"	82	45	0.3%	13	0.2%			23	0.8%	1	0.1%
Children	449	200	1.4%	168	2.2%	8	3.5%	58	1.9%	15	1.3%
Myocarditis	110	43	0.3%	40	0.5%			23	0.8%	4	0.3%
Heart	202	103	0.7%	58	0.8%			33	1.1%	8	0.7%
Masks	1930	1150	8.3%	371	4.9%	15	6.5%	222	7.3%	172	14.9%
Thrombosis/VITT	16	11	0.1%	4	0.1%			1	0.0%		
Mandates	1305	813	5.9%	259	3.4%	8	3.5%	144	4.7%	81	7.0%
Natural Immunity	171	90	0.6%	56	0.7%	1	0.4%	20	0.7%	4	0.3%
Efficacy	97	43	0.3%	22	0.3%	2	0.9%	25	0.8%	5	0.4%
Omicron	133	69	0.5%	38	0.5%			21	0.7%	5	0.4%
Delta Variant	84	40	0.3%	9	0.1%	15	6.5%	3	0.1%	17	1.5%
Race	598	307	2.2%	154	2.0%	6	2.6%	94	3.1%	37	3.2%
Ivermectin	32	18	0.1%	5	0.1%			8	0.3%	1	0.1%
Military	127	69	0.5%	22	0.3%	2	0.9%	21	0.7%	13	1.1%
Breakthrough	205	95	0.7%	47	0.6%	3	1.3%	46	1.5%	14	1.2%

5/7/2022

- Conversation topics trending this week over last
 - Breakthrough infections
 - Mandates
 - Employee vaccinations



High Level View by County April 8 – April 14

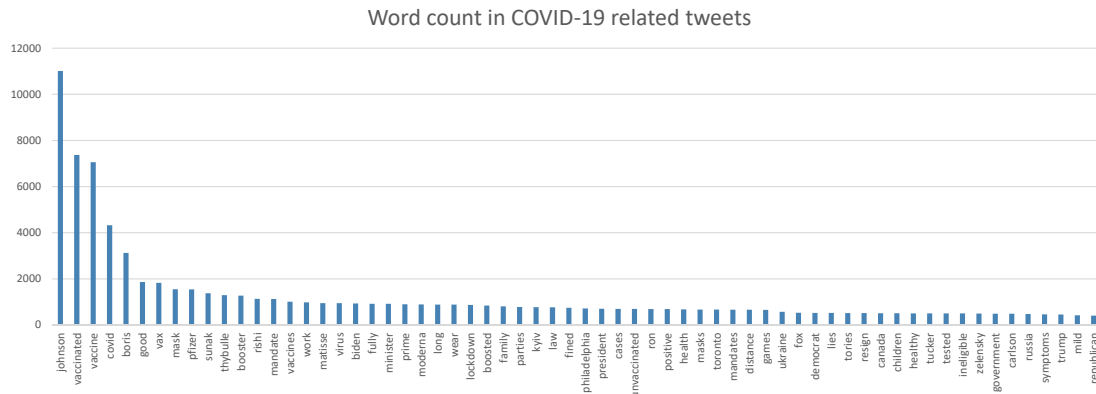
County	Allegheny	Beaver	Butler	Cambria	Fayette	Indiana	Somerset	Westmoreland
Overall Vaccine	7840	14	17	2	9	3	1	47
Vaccine Passports	37							
FDA	14				1			
Boosters	261	1			1			2
Employees	58				1			
"Experimental"	13							
Children	169							1
Myocarditis	40							
Heart	58							
Masks	394	1	1	1				5
Thrombosis/VITT	4							
Mandates	274		1	1	1			1
Natural Immunity	57							
Efficacy	23							
Omicron	38							
Delta Variant	12	1	1					
Race	158				1	1		3
Ivermectin	5							
Military	25							
Breakthrough	49				1	1		

5/7/2022

- 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 8 – April 14



5/7/2022



Top Hashtags by County April 8 – April 14

- ❑ 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	Fayette	West Moreland
partygate (186)	smartnews (1)	gobearcats (1)
steelers (105)		themaskedsinger (1)
covid19 (77)		
nfl (42)		
boristheliar (20)		

5/7/2022



Top Hashtags by City April 8 – April 14

- ❑ 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 (116)	partygate (11)	partygate (46)	partygate (186)	boostyourcommunity (1)	worldhealthday2022 (58)	covid19 (15)
partygate (53)	covid19 (9)	covid19 (39)	steelers (100)	coronavirus (1)	covid19 (30)	vaccine (10)
covid (41)	brexit (7)	ukraine (11)	covid19 (73)	demvoice1 (1)	immunizeunder5s (11)	steelers (9)
nft (38)	rishisunak (7)	johnsonout79 (10)	nfl (42)	gopdeathcult (1)	pfizer (11)	journalists (4)
pfizer (38)	toriesout (7)	vaccine (10)	boristheliar (20)	mrna (1)	partygate (6)	bigpharma (2)

5/7/2022



Top URLs by County April 8 – April 14

Allegheny	Butler + Beaver	Cambria	Fayette	West Moreland
emilyburns.substack.com/p/vaccine-mandates-are-robbing-my-son Vaccine Mandates Are Robbing My Son of the Chance to Play at Carnegie Hall (96)	pittsburgh.cbslocal.com/2022/04/12/port-authority-employees-fired-covid-19-vaccine-mandate-17-port-authority-employees-fired-over-covid-19-vaccine-mandate/ 17 Port Authority Employees Fired Over COVID-19 Vaccine Mandate (1)	cnn.it/3r7KUf6 Nancy Pelosi tests positive for Covid-19, spokesman says (1)	reuters.com/world/us/court-reinstates-biden-federal-employee-covid-vaccine-mandate-2022-04-07 U.S. court reinstates Biden federal employee COVID vaccine mandate (1)	inquirer.com/health/coronavirus/philadelphia-covid-cases-numbers-masks-restrictions-vaccine-mandate-20220405.html With COVID-19 cases inching up in Philadelphia, city urges a return of masks indoors (1)
bbc.in/364xut5 PM and chancellor apologise and pay lockdown party fines (84)	twitter.com/cmonmack1/status/1513531559479021576 Andrew Johnson's vice presidency was famously totally a good thing (1)			twitter.com/KMatovcik/status/1513918471834374144 Bidenflation is a term the Right is using to avoid the fact Donald Trump sold out the American people to the deep state and vaccine manufacturers (1)
secure.actblue.com/donate/johnsonrussia Why did Ron Johnson spend the 4 th of July in Moscow? Billboard donation(43)	wpix.com/news/local/allegheny-county/allegheny-county-leaders-respond-indoor-mask-mandate-reinstatement-philadelphia/HXZX34NF3FHZFP3BZNRUII4YFY Allegheny County leaders respond to indoor mask mandate reinstatement in Philadelphia (1)			
globalresearch.ca/biggest-lie-in-world-history-the-data-base-is-flawed-there-never-was-a-pandemic-the-covid-mandates-including-the-vaccine-are-invalid/5772008 Biggest Lie in World History: There Never Was A Pandemic. The Data Base is Flawed. The Covid Mandates including the Vaccine are Invalid (18)	cnn.it/3NZqlLo Philadelphia becomes first major US city to reinstate its indoor mask mandate as cases rise (1)			
newspunch.com/new-zealand-high-court-ends-jacinda-arderns-vaccine-mandate-its-a-gross-violation-of-human-rights New Zealand High Court ENDS Jacinda Ardern's Vaccine Mandate: "It's a Gross Violation of Human Rights" (17)				

Carnegie Mellon University

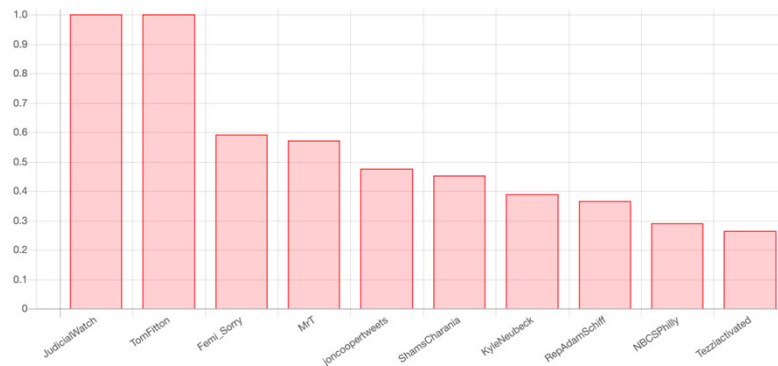
Top URLs by City April 8 – April 14

Philadelphia	Chester	Norristown	Pittsburgh	Erie	Allentown/ Bethlehem	Other
mediateteam.com/tv/tucker-carlson-brags-hes-not-vaccinated-against-covid-19-i-skipped-the-first-three Tucker Carlson Brags He's Not Vaccinated Against Covid-19: 'I Skipped the First Three' (118)	griegrich360.com/2022/04/12/boris-johnson-walking-in-kyiv-joe-biden-bicycling-in-delaware Boris Johnson Walking in Kyiv, Joe Biden Bicycling in Delaware (26)	bbc.in/364xut5 PM and chancellor apologise and pay lockdown party fines (13)	emilyburns.substack.com/p/vaccine-mandates-are-robbing-my-son Vaccine Mandates Are Robbing My Son of the Chance to Play at Carnegie Hall (96)	bbc.in/364xut5 PM and chancellor apologise and pay lockdown party fines (3)	iamajulicer.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. (12)	bit.ly/3vAYaw0 GBNews (7)
judicialwatch.org/covid-19-boosters Judicial Watch Sues HHS for Records about Gov Agency Research into COVID-19 Boosters (69)	cnn.com/2022/04/06/health/fda-vrbpac-covid-boosters-meeting/index.html FDA vaccine advisers say a plan for updating Covid-19 shots is needed (13)	theepochtimes.com/praise-and-prick-pennsylvania-pays-churches-to-convince-members-to-get-vaccinated_4384843.html Praise and Prick: Pennsylvania Pays Churches to Convince Members to Get Vaccinated (12)	bbc.in/364xut5 PM and chancellor apologise and pay lockdown party fines (83)	axios.com/axios-ipsos-poll-most-americans-say-covid-is-no-longer-a-crisis-66047d2-a476-48eb-8e2d-9cb94c425159.html Axios-Ipsos poll: Most Americans say COVID is no longer a crisis (1)	bbc.in/364xut5 PM and chancellor apologise and pay lockdown party fines (10)	foxnews.com/world/uk-boris-johnson-zelenskyy-praised-for-video-showing-them-walking-defiantly-down-streets-of-kyiv UK's Boris Johnson, Ukraine's Zelenskyy seen walking defiantly down streets of Kyiv (6)
bbc.in/364xut5 PM and chancellor apologise and pay lockdown party fines (68)	nyti.ms/3lvea6a The city of Philadelphia will reinstate an indoor mask mandate, the first major U.S. city to do so this spring. (6)	montcopa.org/covid-19-vaccine COVID-19 VACCINE (8)	secure.actblue.com/donate/johnsonruss Why did Ron Johnson spend the 4th of July in Moscow? Billboard donation (43)	bioprocessonline.com/doc/mrna-manufacturing-in-house-or-outsourced-0001 mRNA Manufacturing: In House Or Outsourced? (1)	cnn.com/2022/04/06/health/fda-vrbpac-covid-boosters-meeting/index.html FDA vaccine advisers say a plan for updating Covid-19 shots is needed (8)	pittsburgh.cbslocal.com/2022/04/12/port-authority-employees-fired-covid-19-vaccine-mandate 17 Port Authority Employees Fired Over COVID-19 Vaccine Mandate (5)
wp.me/pC8uak-1A5dd Magic Johnson's Next Shot: The NBA Legend on Changing Lakers History, HIV Activism and His Revealing Apple Docuseries (66)	bbc.in/364xut5 PM and chancellor apologise and pay lockdown party fines (5)	yorkshirepost.co.uk/news/opinion/boris-johnson-and-rishi-sunak-are-not-fit-to-lead-this-nation-of-good-people-the-yorkshire-post-says-3651723 Boris Johnson and Rishi Sunak are not fit to lead this nation of good people - The Yorkshire Post says (8)	globalresearch.ca/biggest-lie-in-world-history-the-data-base-is-flawed-there-never-was-a-pandemic-the-covid-mandates-including-the-vaccine-are-invalid/5772008 Biggest Lie in World History: There Never Was A Pandemic. The Data Base is Flawed. The Covid Mandates including the Vaccine are Invalid (18)	cnn.com/2022/04/06/health/fda-vrbpac-covid-boosters-meeting/index.html FDA vaccine advisers say a plan for updating Covid-19 shots is needed (1)	AFLADS.org America's Frontline Doctors (7)	twitter.com/kyleneubeck/status/1513335575956410369 Thyballe: "This was a decision I made a long time ago...I was raised in a holistic household, anti vax is not a term that was ever used...we grew up with Chinese medicine and naturopathic doctors." Says he has had to reconsider and look at situation differently (56)
twitter.com/kyleneubeck/status/1513335575956410369 Thyballe: "This was a decision I made a long time ago...I was raised in a holistic household, anti vax is not a term that was ever used...we grew up with Chinese medicine and naturopathic doctors." Says he has had to reconsider and look at situation differently (56)	dailysceptic.org/2022/04/09/vaccinated-have-up-to-six-times-the-infection-rate-of-unvaccinated-new-zealand-government-data-show Vaccinated Have Up To SIX Times the Infection Rate of Unvaccinated, New Zealand Government Data Show (4)	t.me/BHda8RHdaSowQtdk Telegram channel Unvaccinated Legends – "Hello, We produce and offer covid 19 vaccine cards to those who need results but are not willing to take the vaccines." (7)	news.punch.com/new-zealand-high-court-ends-jacinda-arderns-vaccine-mandate-its-a-gross-violation-of-human-rights New Zealand High Court ENDS Jacinda Ardern's Vaccine Mandate: "It's a Gross Violation of Human Rights" (17)	dailysceptic.org/2022/04/09/vaccinated-have-up-to-six-times-the-infection-rate-of-unvaccinated-new-zealand-government-data-show Vaccinated Have Up To SIX Times the Infection Rate of Unvaccinated, New Zealand Government Data Show (1)	dailysceptic.org/2022/04/09/vaccinated-have-up-to-six-times-the-infection-rate-of-unvaccinated-new-zealand-government-data-show Vaccinated Have Up To SIX Times the Infection Rate of Unvaccinated, New Zealand Government Data Show (7)	bbc.in/364xut5 PM and chancellor apologise and pay lockdown party fines (4)

11 Carnegie Mellon University

Analysis of Tweeters - Super Spreaders

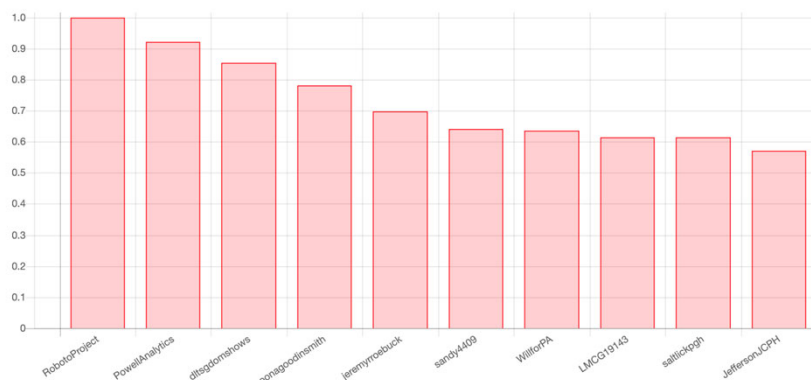
- ☐ Super Spreaders are users which generate content that is shared often, and hence spread information effectively.



5/7/2022

Analysis of Tweeters - Super Friends

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



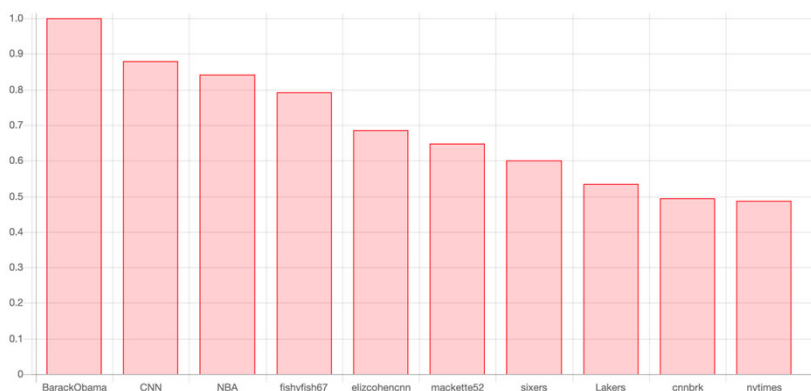
5/7/2022



13

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.



5/7/2022



14

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
NBCSPhilly[+]	164
TyJohnsonNews[+]	163
BorisJohnson[+]	154
AndrewRoseSC	150
pfizer[+]	147
TheRickWilson[+]	141
RepAdamSchiff[+]	122
CDCgov[+]	115
HouseForeign	112
SenateForeign	112

5/7/2022



Trending Tweets April 8 – April 14

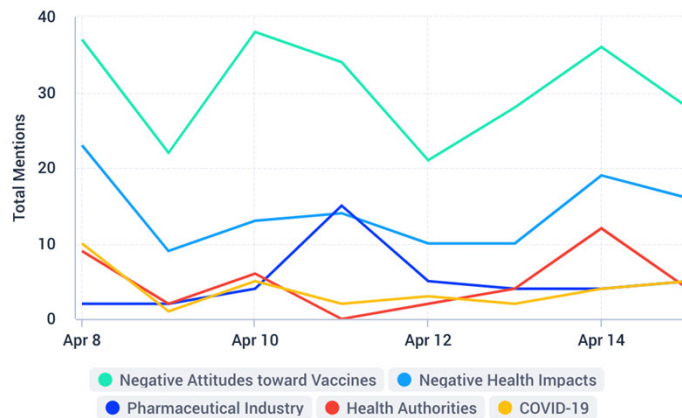
Tweets that are the most forwarded, either by retweet, reply, or quote:

- ❑ I just received my 2nd Moderna booster vaccine, and I feel good! I am still going to wear my mask and keep my distance because the virus ain't over, Fool! Grrr
- ❑ It's good that we have this information, but never forget that we're being played. These people knew about the lockdown parties for two years. They knew about Rishi Sunak's Green Card for 7 years. The Tories who want rid of Johnson and those who want rid of Sunak, timed this.
- ❑ Note for Philadelphia (4) vs. Toronto (5) series: 76ers All-Defensive wing Matisse Thybulle is currently ineligible for games in Toronto due to Canada's vaccine mandate.
- ❑ Pandemic of the vaccinated <https://t.co/pbbqFulh87>
- ❑ BREAKING: Tucker Carlson told a group of churchgoers he is NOT vaccinated against Covid. If he violated Fox News' policy that EVERYONE be vaccinated to work there, should't he be FIRED?
- ❑ Sam Coates reporting that Number 10 has not issued a statement in defence, because they don't yet know exactly for which party Johnson has been fined or how many times. Says it all.
- ❑ Anti-vaxxers are using breakthrough cases like mine to push dangerous, unscientific lies. So let me be clear: I feel fine. I don't need a ventilator. My family isn't worried about whether I'll make it. Because I'm vaccinated. Vaccines save lives. Please get yours today.
- ❑ Bloody hell this Ukrainian video needs to be seen by everyone <https://t.co/63LG0vSpQR>
- ❑ My name is Tom Nelson, and I am a Democrat running to defeat Ron Johnson. Unlike Ron, I will never go to Russia on the 4th of July. Instead, I will bring civility back to Wisconsin to build a better world for my children. Can you retweet, follow, and help get me to 30k?
- ❑ Boris Johnson is the first sitting Prime Minister in history to have broken the law

5/7/2022



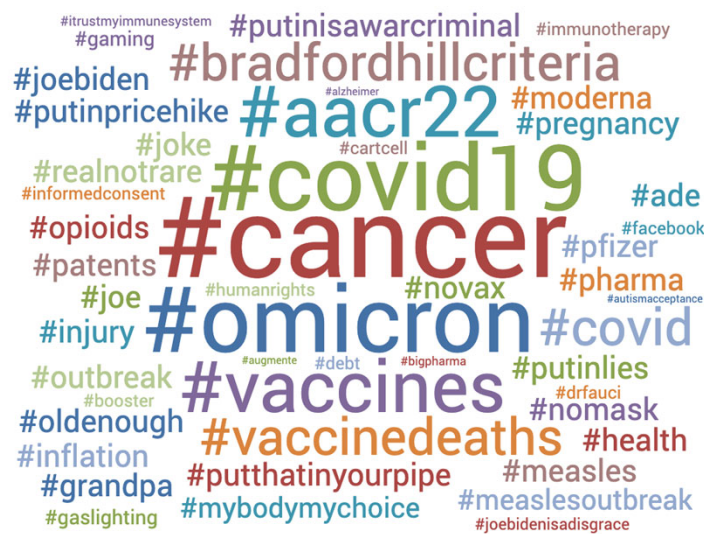
Negative Attitudes April 8 – April 14



5/7/2022



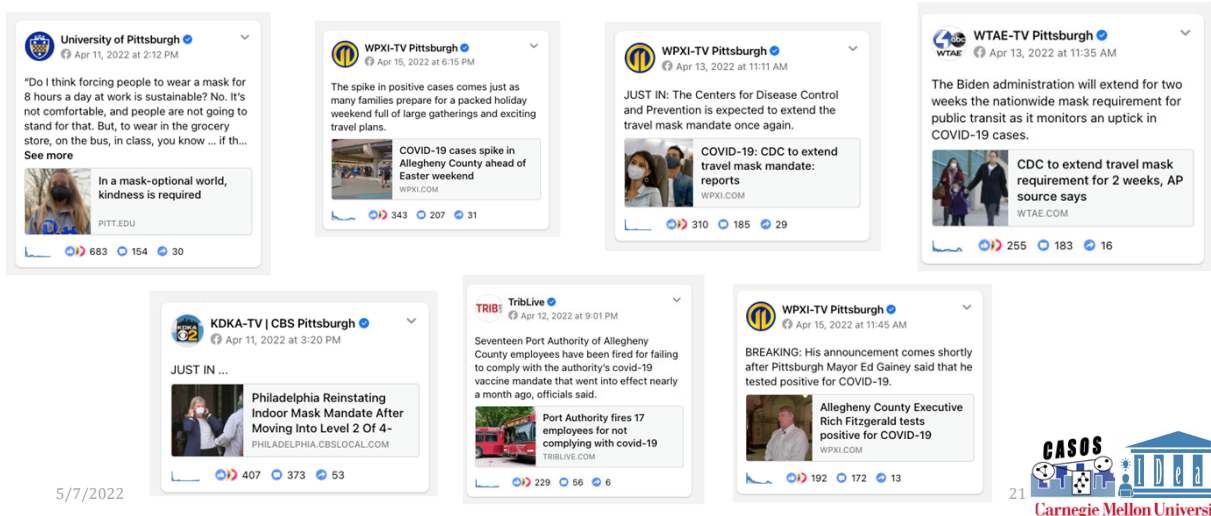
Negative Hashtag Cloud April 8 – April 14



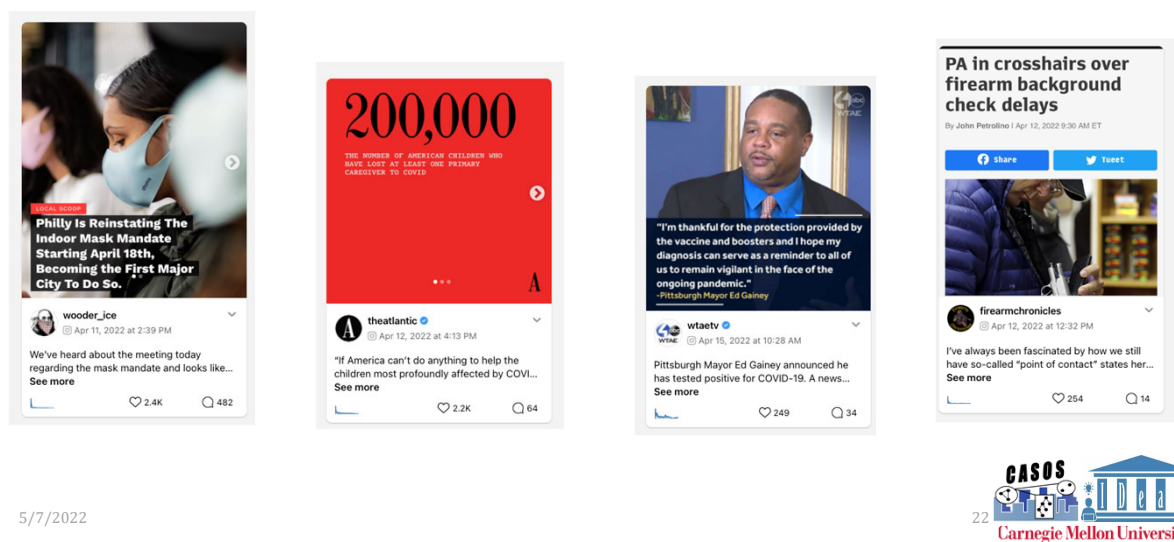
5/7/2022



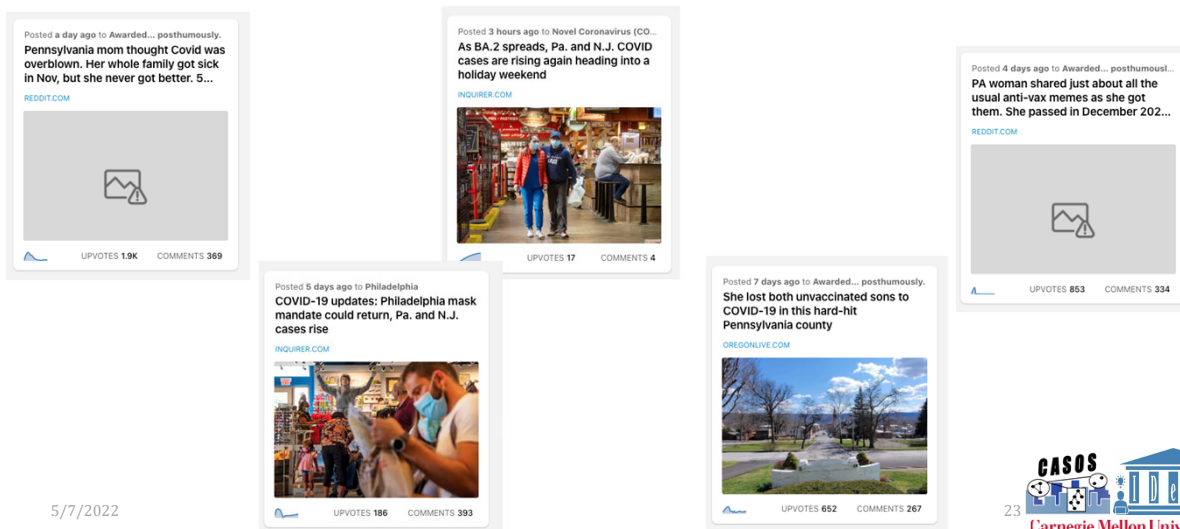
Trending Posts on Facebook April 8 – April 14



Trending Posts on Instagram April 8 – April 14



Trending Posts on Reddit April 8 – April 14



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](https://www.facebook.com/IDEasCMU)
- ❑ Twitter: [@IDeaSCMU](https://twitter.com/IDeaSCMU)
- ❑ YouTube: [IDeaS Center](https://www.youtube.com/IDeaS_Center)
- ❑ Ask to be on our Email-Distro Lists

5/7/2022

Copyright © 2021 Kathleen M. Carley

