## **PA Vaccine Conversations on Twitter**

Iuliia Alieva, Dawn Robertson, Dr. Kathleen M. Carley Vaccine Hesitancy Project Update based on November 26 - December 2, 2021

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.
- ☐ The material contained in this report is a summary of social media content and does not represent a judgment or characterization of any individual.



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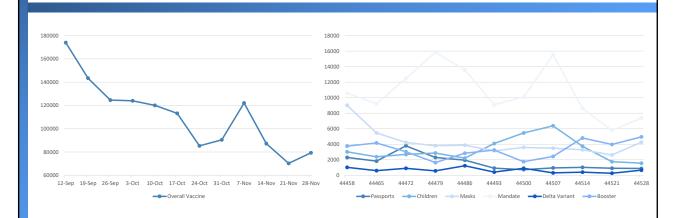
# **Report Overview November 26 - December 2**

- ☐ This week's trending stories cover new COVID-19 variant omicron, vaccination mandates, boosters, and others;
- □ Trending disinformation/vaccine hesitancy/antivax publications: <a href="https://childrenshealthdefense.org/defender/bobby-amy-bolin-lung-transplant-dies-moderna-covid-vaccine/">https://childrenshealthdefense.org/defender/bobby-amy-bolin-lung-transplant-dies-moderna-covid-vaccine/</a> Exclusive: Forced to Get Vaccine to Remain on Lung Transplant List, 49-Year-Old Who Survived COVID Dies After Second Moderna Shot; <a href="http://ch7.io/cbnA]\$Fw</a> FDA report finds all-cause mortality higher among vaccinated; <a href="http://togetherdeclaration.org">http://ch7.io/cbnA]\$Fw</a> FDA report finds all-cause mortality higher among vaccinated; <a href="http://togetherdeclaration.org">http://togetherdeclaration.org</a> "We the undersigned reject vaccine passports or any similar form of medical certification in the United Kingdom and invite you to add your voice to ours by signing this open letter;" <a href="https://rebelne.ws/3CSsT7Q">https://rebelne.ws/3CSsT7Q</a> Nova Scotia releases data on COVID vaccine adverse reaction deaths; <a href="https://childrenshealthdefense.org/defender/judge-allen-winsor-pfizer-eua-comirnaty-vaccines-interchangeable/">https://childrenshealthdefense.org/defender/judge-allen-winsor-pfizer-eua-comirnaty-vaccines-interchangeable/</a> Federal Judge Rejects DOD Claim That Pfizer EUA and Comirnaty Vaccines Are 'Interchangeable'
- Other trending stories: <a href="https://thepostmillennial.com/ny-emergency-room-closes-after-employees-refuse-to-get-vaccinated">https://thepostmillennial.com/ny-emergency-room-closes-after-employees-refuse-to-get-vaccinated</a> New York hospital emergency room ceases operation after employees refuse to get vaccinated; <a href="https://on.wsj.com/3p50UwB">https://on.wsj.com/3p50UwB</a> Biden's Covid Death Milestone; <a href="https://dlvr.it/SDHxpk">https://dlvr.it/SDHxpk</a> Anti-Vax Republican On Ventilator In ICU; <a href="https://www.foxnews.com/us/federal-judge-blocks-biden-vaccine-mandate-for-health-care-workers-nationwide">https://www.foxnews.com/us/federal-judge-blocks-biden-vaccine-mandate-for-health-care-workers-nationwide</a> Louisiana federal judge blocks Biden vaccine mandate for health care workers nationwide; <a href="https://www.businessinsider.com/bleach-among-grim-devaccination-procudres-hyped-conspiracy-theorists-2021-11?r=US&IR=T</a> Conspiracy theorists are pushing toxic bleach and other harmful treatments they claim can 'de-vaccinate' people

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# Trends (tweets per week) November 26 - December 2



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# **High Level View by City November 26 - December 2**

	Total PA	Philade	elphia	Pittsb	urgh	Eri	ie	Allentown/	Bethlehem	Ot	ther
Conversation	Tweets	Tweets	%	Tweets	%	Tweets	%	Tweets	%	Tweets	%
Overall Vaccine	67193	37599	56.0%	16088	23.9%	609	0.9%	10353	15.4%	2544	3.8%
Vaccine Passports	843	500	1.3%	161	1.0%	6	1.0%	162	1.6%	14	0.6%
FDA Approval	99	52	0.1%	30	0.2%	1	0.2%	15	0.1%	1	0.0%
Boosters	4283	2405	6.4%	889	5.5%	34	5.6%	714	6.9%	241	9.5%
Employees	404	219	0.6%	108	0.7%	5	0.8%	64	0.6%	8	0.3%
"Experimental"	134	73	0.2%	38	0.2%	2	0.3%	19	0.2%	2	0.1%
Children	1219	658	1.8%	296	1.8%	10	1.6%	205	2.0%	50	2.0%
Myocarditis	391	192	0.5%	148	0.9%	2	0.3%	45	0.4%	4	0.2%
Heart	1072	456	1.2%	351	2.2%	9	1.5%	224	2.2%	32	1.3%
Masks	4222	2307	6.1%	949	5.9%	61	10.0%	651	6.3%	254	10.0%
Thrombosis/VITT	112	79	0.2%	14	0.1%	1	0.2%	11	0.1%	7	0.3%
Mandates	6207	3310	8.8%	1265	7.9%	73	12.0%	1365	13.2%	194	7.6%
Natural Immunity	1216	882	2.3%	206	1.3%	2	0.3%	104	1.0%	22	0.9%
Efficacy	226	120	0.3%	49	0.3%	5	0.8%	44	0.4%	8	0.3%
Omicron	4341	2584	6.9%	830	5.2%	33	5.4%	676	6.5%	218	8.6%
Delta Variant	644	367	1.0%	138	0.9%	3	0.5%	99	1.0%	37	1.5%
Race	1352	812	2.2%	293	1.8%	13	2.1%	182	1.8%	52	2.0%
Ivermectin	146	86	0.2%	29	0.2%	3	0.5%	25	0.2%	3	0.1%
Military	308	175	0.5%	77	0.5%	2	0.3%	48	0.5%	6	0.2%
Breakthrough	226	128	0.3%	40	0.2%	4	0.7%	44	0.4%	10	0.4%

- Trending conversations:
  - Omicron variant
  - Mandates
  - Boosters
  - Masks



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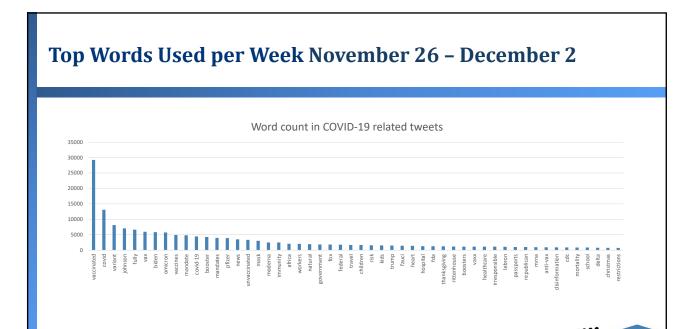
## High Level View by County November 26 - December 2

County	Allegheny	Beaver	Butler	Cambria	Fayette	Indiana	Somerset	Westmoreland
Overall Vaccine	16491	20	43	8	40	12	7	87
Vaccine Passports	166							
FDA	31							
Boosters	919	2	7		6	1	1	3
Employees	110							1
"Experimental"	38							
Children	305						1	2
Myocarditis	148							
Heart	353	1	1					3
Masks	986	1	1	1	3	3		14
Thrombosis/VITT	15							
Mandates	1293	1	1		4	2		9
Natural Immunity	209							
Efficacy	49		1					
Omicron	861	2	4	1	6	2	1	5
Delta Variant	141	1			2			1
Race	302	1			1	1		2
Ivermectin	32							
Military	77							1
Breakthrough	41							

- Tweets counted here if there is a county location attached
- 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 Hashtags by County November 26 - December 2**

■ 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	Fayette	Indiana	West Moreland
covid19 (477)	covid (2)	omicronvariant (2)	covid19 (1)	covid19 (2)
steelers (211)	proscience (1)	btssofistadium (1)	fauci (1)	coronavirus (1)
omicron (147)	covid19vaccines (1)	omicron (1)	lockdown (1)	covidiots (1)
vaccine (130)	provaccines (1)		vaccine (1)	covidvariant (1)
novaccinemandates (60)	vaccines (1)			fearmongering (1)

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## **Top Hashtags by City November 26 - December 2**

☐ 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 (837)	covid19 (104)	covid19 (163)	covid19 (471)	covid19 (17)	covid19 (279)	covid19 (62)
omicron (288)	omicron (49)	novaccinepassports (83)	steelers (206)	demvoice1 (7)	omicron (64)	omicron (23)
vaccine (147)	covidvaccine (33)	together (78)	omicron (143)	omicron (6)	thedefender (30)	vaccine (21)
vaxupphilly (114)	demvoice1 (33)	omicron (62)	vaccine (128)	vaccine (4)	omicronvariant (29)	omicronvariant (14)
demvoice1 (110)	getvaccinated (17)	omicronvariant (34)	novaccinemandates (60)	covid (3)	getvaccinated (25)	getvaccinatednow (12)

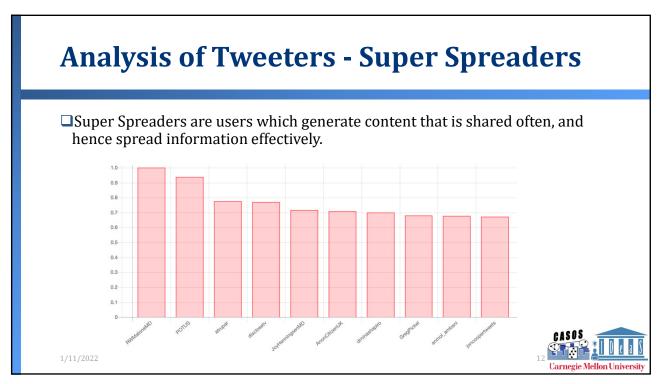
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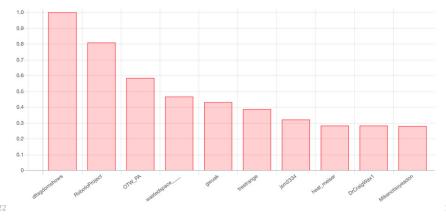
### **Top URLs by County November 26 - December 2** ttps://childrenshealthdefense.org/ https://www.bloomberg.com/opinion /articles/2021-11-30/omicron-should-s-lamb-high-flying-anti-vax-daystar-tvdefender/bobby-amy-bolin-lunghttps://qz.com/2095354/what-are-thehttps://trib.al/uHwnB3S FDA says it wants 55 symptoms-of-the-omicron-variant/ The doctor who discovered omicron described <u>push-retailers-to-deploy-vaccine-mandates</u> Omicron Should Push network-founder-dies-of-covid 19?via=twitter\_page High-Flying A ccine/ Exclusive: Forced to Get YEARS to process FOIA requests about COVID-19 Vaccine to Remain on Lung page High-Flying Anti-vaccines - meaning data may not be available to Transplant List, 49-Year-Old Who Survived COVID Dies After Second her patients' symptoms (1) Retailers to Deploy Vaccine Mandates Vax Evangelical TV Network Founder (2) Dies of COVID-19 (1) the public until 2076 (2) Moderna Shot (92) https://www.wrbl.com/community/op elika-dad-covid-and-misinformationhttps://www.dw.com/en/coronavirushttps://bit.ly/2VhJ12U Donate to https://link.chtbl.com/PWvSZXy6 1/12/01/republican-government-shutdow digest-major-companies-earn-billions-as-Mizzima Media Supporters Australia Jecorporated Australia Jecorporated Australia Jecorporated Australia Jecorporated Australia Jecorporated Australia Jecorporated mandates/ Opinion: A government Australia Incorporated Opelika Dad: COVID and Australia incorporaceo Coronavirus digest. Major composition (64) billions as poor countries left in the cold (1) shutdown to protest vaccine mandates? misinformation kills, urges vaccines in Welcome to today's GOP. (2) late son's honor (1) https://www.ctvnews.ca/health/coro navirus/oxford-university-says-no-evidence-yet-that-vaccines-won-thttps://www.thenational.scot/news /19753021.tory-sleaze-borishttps://babylonbee.com/news/pope-francis-says-covid-vaccine-will-now-ben-dodges-censure-debate/ required-to-enter-heaven Pope Francis Says protect-against-severe-disease-fromomicron-1.5686872 Oxford University says-covid-vaccine-will-now-be-required-to-enter-heaven Pope Francis Says Covid Vaccine http://vaccines.gov (1) says no evidence yet that vaccines Will Now Be Required To Enter Heaven (1) censure debate (56) Enter Heaven (1) won't protect against severe disease from Omicron (1) https://www.businessinsider.com/bleachhttps://www.spectator.co.uk/articl o/tho-tyrappy of horic inhance of hyped-conspiracy-theorists-2021https://www.nytimes.com/2021/11/2 https://thepoliticalinsider.com/fauci-on-if-new-5/business/retail-vaccinee/the-tyranny-of-boris-johnson-sappointed judges are pushing covid-19-variant-is-already-in-us-anything-is 11?r=US&IR=T Conspiracy theorists are pushing toxic bleach and other harmful mandates.html Why Retailers Are Fighting a Vaccine Mandate Before a huge right-wing lie in order to block possible/ Fauci On If New COVID-19 Variant Is Boris Johnson's mask mandate (54) treatments they claim can 'de-vaccinate' vaccine mandates (1) Already In US: 'Anything Is Possible' (1) the Holidays (1) people (1) https://jamanetwork.com/journals/jama/fullarticle/2782139 Study Suggests Lasting Immunity After COVID-19, With a Big Boost From Vaccination (1) http://dlvr.it/SDHxpk Anti-Vax https://nyti.ms/3HYErKx Covid News: Pfizer Republican On Ventilator In ICU to Seek Approval for Boosters for 16- and (45) 17-Year-Olds (1)

Philadelphia	Chester	Norristown	Pittsburgh	Erie	Allentown/ Bethlehem	Other
http://ch7.io/cbnAJ\$Fw_FDA report finds all-cause mortality higher among vaccinated (561)		http://togetherdeclaration.org "We the undersigned reject vaccine passports or any similar form of medical certification in the United Kingdom and invite you to add your voice to ours by signing this open letter." (77)	https://childrenshealthdefense.org/defender/bobby-amy-bolin-lung- transplant-dies-moderna-covid- vaccine/ Exclusive: Forced to Get Vaccine to Remain on Lung Transplant List, 49-Year-Old Who Survived COVID Dies After Second Moderna Shot (90)	https://breaking911.com/just-in- cdc-now-says-all-fully-vaccinated- adults-should-get-a-covid-booster- shot/. CDC now says all fully vaccinated adults should get a COVID booster shot (4)	https://childrenshealthdefense.org/de fender/bobby-amy-bolin-lung: transplant-dies-moderna-covid- vaccine/ Exclusive: Forced to Get Vaccine to Nemain on Lung Transplant Lst, 49-Year-Jold Who Survived COVID Dies After Second Moderna Shot (65)	https://childrenshealthdei .org/defender/bobby-ar bolin-lung-transplant-di moderna-covid-vaccin Exclusive: Forced to Gi Vaccine to Remain on L Transplant List, 49-Year- Who Survived COVID Dies Second Moderna Shot J
https://thepostmillennial.com/ny- emergency-room-closes-after- employees-refuse-to-get- vaccinated New York hospital emergency room ceases operation after employees refuse to get vaccinated (206)	https://on.wsl.com/3p50UwB Biden's Covid Death Milestone (15)	https://inthesetimes.com/article/bi den-omicron-wol-trips-walver- intellectual-property-patents Documents Reveal Biden Admin Not Fighting for a Covid Vaccine Patent Waiver, Despite Public Statements (32)	https://bit.lv/2VhJ12U Donate to Mizzima Media Supporters Australia Incorporated Support Free Media in Burma (64)	https://www.nbcnews.com/health/ health-news/hospitalizations-rising- fully-vaccinated-us-fauci-says- rcna5907 Hospitalizations rising among fully vaccinated in U.S., Fauci says (4)	http://vaccines.gov (36)	http://vaccines.gov (8
https://www.foxnews.com/us/fede ral-udge-blocks-biden-vaccine- mandate-for-health-care-workers- nationwide Louisiana federal judge blocks Biden vaccine mandate for health care workers nationwide (84)	ews- hits/archives/2021/11/24/anti- vax-wayne-county-republican-is- in-icu-with-covid-19 Anti-vax Wayne County Republican is in ICU with COVID-19 (15)	https://childrenshealthdefense.org (defender/bobby-amy-bolin-lung- transplant-dies-moderna-covid- vaccine/ Exclusive: Forced to Get Vaccine to Remain on Lung Transplant List, 49-Year-Old Who Survived COVID Dies After Second Moderna Shot (29)	https://www.thenational.scot/new s/19753021.tory-sleaze-boris- johnson-dodges-censure-debate/ Tory sleaze: Boris Johnson dodges censure debate (56)	https://childrenshealthdefense.org/ defender/bobby-amy-bolin-lung- transplant-dies-moderna-covid- vaccine/ Exclusive: Forced to Get Vaccine to Remain on Lung Transplant List, 49-Year-Old Who Survived COVID Dies After Second Moderna Shot (3)	https://bit.ly/3s5twWJ Children's Health Defense SIGN UP (30)	https://on.wsi.com/3p50 Biden's Covid Death Miles (8)
https://www.rawstory.com/richard -johnson-writing-a-book-may-be- rittenhouses-only-option-to-make- money/ Writing a book may be Rittenhouse's only option to make money (77)	lung-transplant-dies-moderna- covid-vaccine/ Exclusive: Forced to Get Vaccine to Remain on	http://ch7.io/cbnAI\$Fw FDA report finds all-cause mortality higher among vaccinated (24)	https://www.spectator.co.uk/article/the-tyranny-of-boris-johnson-s-mask-mandate The problems with Boris Johnson's mask mandate (54)		https://childrenshealthdefense.org/de fender/judge-aillen-winsor-pfizer-eua- cominaty-vaccines-interchangeable/ Federal Judge Rejects DOD Coliam That Pfizer EUA and Comirnaty Vaccines Are 'Interchangeable' (30)	https://religionnews.com/ /11/30/marcus-lamb-ar covid-vaccine-christiar broadcaster-dies-at-64/ M Lamb, anti-COVID vacci Christian broadcaster, die 64 (7)
https://childrenshealthdefense.org/defender/bobby-amy-bolin-lung-transplant-dies-modema-covid-vaccine/ Exclusive: Forced to Get Vaccine to Remain on Lung Transplant List, 49-Year-Old Who Survived COVID Dies After Second Moderna Shott/31	http://vaccines.gov (11)	https://rebeine.ws/3CSsT7Q Nova Scotia releases data on COVID vaccine adverse reaction deaths (15)	http://dlvr.it/SDHxpk Anti-Vax Republican On Ventilator In ICU (45)	https://www.businessinsider.com/b leach-among.grim-devaccination- procudres-hyped-conspiracy- theorists-2021-117=US&IR=T Conspiracy theorists are pushing toxic bleach and other harmful treatments they claim can 'de- vaccinate' people (3)	http://ch7.io/cbnAJ\$Fw FDA report finds all-cause mortality higher among vaccinated (27)	http://apne.ws/vSMdu Study suggests past CO\ infection may not fend omicron (6)



# **Analysis of Tweeters - Super Friends**

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

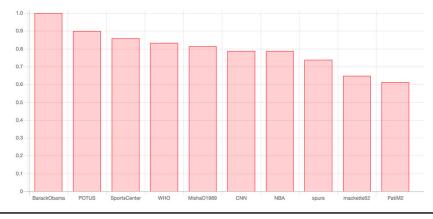




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# **Analysis of Tweeters - Other Influencers**

□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.





## **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
<u>POTUS</u>	603
<u>RepSwalwell</u>	428
<u>Twitter</u>	404
TwitterSafety	393
<u>jack</u>	381
GOP	344
<u>WHO</u>	310
<u>pfizer</u>	297
RWMaloneMD	272
WHCOS	242

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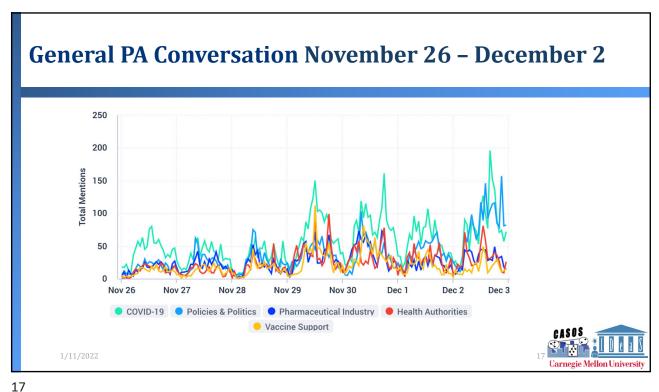
## **Trending Tweets November 26 - December 2**

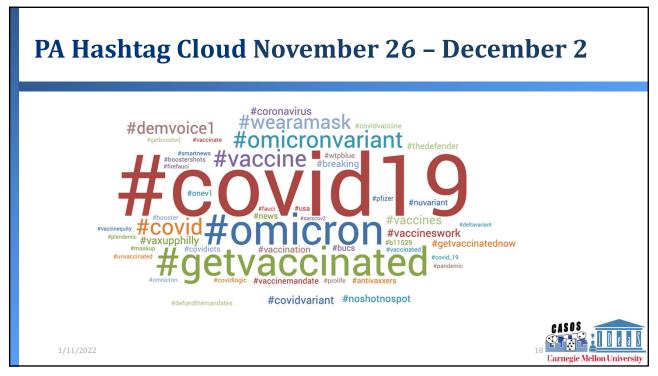
Tweets that are the most forwarded, either by retweet, reply, or quote:

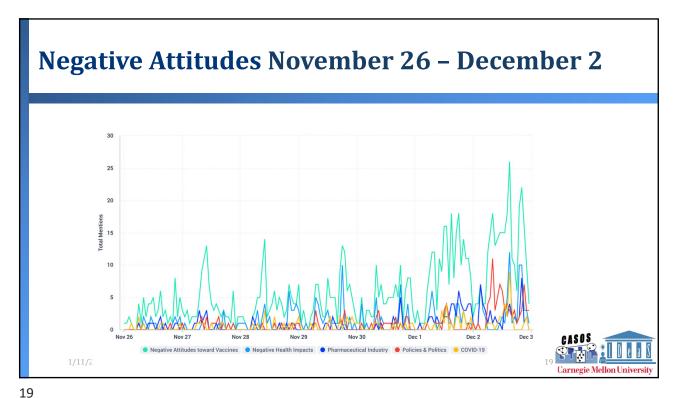
- □ Nancy Mace is on Fox News suggesting that people should get Covid rather than get vaccinated because natural immunity is preferable. Take a second to ponder how irresponsible that is. https://t.co/W1AfDZQEb1
- ☐ FDA report finds all-cause mortality higher among vaccinated https://t.co/19bzKnhbFg
- □ JUST IN Fully vaccinated NBA player LeBron James tests positive for #COVID19.
- $\hfill \square$  The new variant was detected in fully vaccinated people. Seems relevant.
- □ I reported this account, and encourage you all to as well. It is a hub for disinformation, which has bands of trolls that follow its lead for targeted harassment. It is also a spoke for vaccine disinformation. Please take the time to report! https://t.co/YBH76me873
- ☐ 'They aren't going to publish their findings, they are concerned about losing research money' Dr Aseem Malhotra reveals a cardiology researcher found similar results to a new report showing an increase in risk of heart attack following the mRNA COVID vaccine. https://t.co/63evorQwlJ
- □ #ProBowlVote Devonta Smith #ProBowlVote Dallas Goedert #ProBowlVote Jason Kelce #ProBowlVote Lane Johnson #ProBowlVote Jordan Mailata #ProBowlVote Jalen Hurts #ProBowlVote Javon Hargrave #ProBowlVote Darius Slay #ProBowlVote Jake Elliot 1 RT = 1 Vote for our guys!
- Sooo... the new variant was detected in fully vaccinated people... don't worry, I'm sure another shot will protect you.
- Catholic Priest Fr. Ed Meeks of Towson, MD said in his sermon this past week that vaccine mandates are contrary to the teachings of Jesus: "No earthly king or president or public health official .. gets to dictate what we put into our body, into these temples of the Holy Spirit." <a href="https://t.co/rrU31PvTUh">https://t.co/rrU31PvTUh</a>
- 49-year-old Texas man who recovered from COVID—but was required to be fully vaccinated against virus before being approved for a life-saving lung transplant—died when he developed a pulmonary embolism and heart issues after his second Moderna vaccine. https://t.co/YHCwKb2lIp

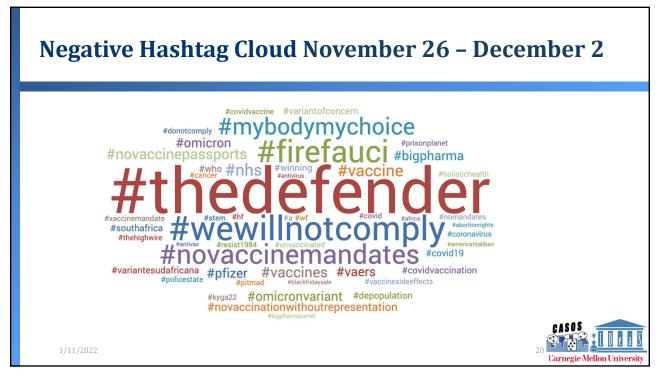


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# Trending Posts on Reddit November 26 – December 2 Protect 4 days age to Asserbide. posthumosa. Permylvaria man begins November 1 to Lose (16 s. days age to Permylvaria Politics Ps. actas (16 ps. Mark Collen tests positive for COVI) RECORDANCE 2019 LEPOSTES 276 COMMENTS 477 Protect 2 days age to Permylvaria Politics Ps. actas (16 ps. Mark Collen tests positive for COVI) RECORDANCE 2019 LEPOSTES 276 COMMENTS 276 LEPOSTES 487 COMMENTS 286 LEPOS

## **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 <a href="https://www.cmu.edu/ideas-social-cybersecurity/">https://www.cmu.edu/ideas-social-cybersecurity/</a>
- ☐ CASOS website <a href="http://www.casos.cs.cmu.edu/">http://www.casos.cs.cmu.edu/</a>
- ☐ Social Cybersecurity Working Group <a href="http://social-cybersecurity.org">http://social-cybersecurity.org</a>
- ☐ Facebook: @IDeasCMU
- ☐ Twitter: @IDeaSCMU
- ☐ YouTube: <u>IDeaS Center</u>
- ☐ Ask to be on our Email-Distro Lists

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