#### **PA Vaccine Conversations on Twitter**

Dr. Iuliia Alieva, Dawn Robertson, Dr. Kathleen M. Carley Vaccine Hesitancy Project Update based on December 31, 2021 - January 6, 2022

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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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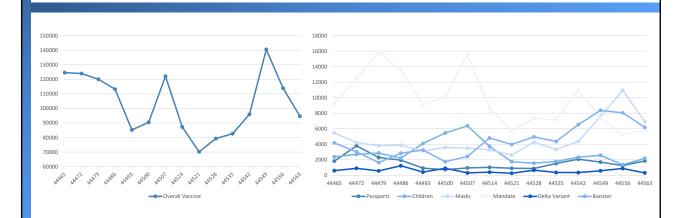
### **Report Overview December 31- January 6**

- ☐ This week's trending stories cover Mandates, Passports, Children, Sports, Breakthrough infections, Boosters, Omicron, Masks;
- □ Trending stories: <a href="https://bit.ly/3Hn90Zg">https://bit.ly/3Hn90Zg</a> Philadelphia is the most vaccinated of the 10 largest cities in America; <a href="https://www.newsobserver.com/news/nation-world/national/article256654672.html">https://www.newsobserver.com/news/nation-world/national/article256654672.html</a>
  Pennsylvania teen who dreamed of being life coach and loved BTS died of COVID;
  <a href="http://ow.ly/tfil50H9zwg">http://ow.ly/tfil50H9zwg</a> You will need to be fully vaccinated against COVID to enter any establishment that serves food in Philly; <a href="https://trib.al/WbkFFpL">https://trib.al/WbkFFpL</a> Novak Djokovic Goes to Court to Fight Deportation From Australia After Vax Fury; <a href="https://www.rawstory.com/ron-johnson-natural-immunity/">https://www.rawstory.com/ron-johnson-natural-immunity/</a> Ron Johnson escalates attack on vaccines: 'Why do we think that we can create something better than God?;'
  <a href="http://hill.cm/GUw06SQ">http://hill.cm/GUw06SQ</a> Biden says if medical team advises it, he'll issue domestic travel vaccine requirement
- □ Anti-vax, disinformation, or vaccine hesitancy stories: <a href="https://www.theepochtimes.com/dr-peter-mccullough-vaccine-mandates-should-be-repealed 4167066.html">https://www.theepochtimes.com/dr-peter-mccullough-vaccine-mandates-should-be-repealed 4167066.html</a> Dr. Peter McCullough: Vaccine Mandates Should Be Repealed; <a href="https://thenationalpulse.com/2021/12/31/vaccinated-21-times-more-likely-to-get-omicron/">https://thenationalpulse.com/2021/12/31/vaccinated-21-times-more-likely-to-get-omicron/</a> REPORT: Nearly 80% of Omicron Cases are in Vaccinated People.

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#### Trends (tweets per week) December 31- January 6



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# **High Level View by City December 31 - January 6**

	Total PA	Philade	lphia	Pittsb	ourgh	Eri	ie	Allentown/	Bethlehem'	01	ther
Conversation	Tweets	Tweets	%	Tweets	%	Tweets	%	Tweets	%	Tweets	%
Overall Vaccine	80539	47470	58.9%	17745	22.0%	717	0.9%	11117	13.8%	3490	4.3%
Vaccine Passports	1844	1221	2.6%	303	1.7%	22	3.1%	259	2.3%	39	1.1%
FDA Approval	290	162	0.3%	58	0.3%	5	0.7%	51	0.5%	14	0.4%
Boosters	3808	2117	4.5%	790	4.5%	34	4.7%	630	5.7%	237	6.8%
Employees	458	256	0.5%	85	0.5%	3	0.4%	88	0.8%	26	0.7%
"Experimental"	235	129	0.3%	49	0.3%	4	0.6%	48	0.4%	5	0.1%
Children	1697	937	2.0%	360	2.0%	13	1.8%	308	2.8%	79	2.3%
Myocarditis	208	99	0.2%	52	0.3%	1	0.1%	50	0.4%	6	0.2%
Heart	651	351	0.7%	171	1.0%	5	0.7%	101	0.9%	23	0.7%
Masks	6821	3849	8.1%	1344	7.6%	98	13.7%	1042	9.4%	488	14.09
Thrombosis/VITT	227	117	0.2%	50	0.3%	3	0.4%	45	0.4%	12	0.3%
Mandates	5781	3390	7.1%	985	5.6%	54	7.5%	1091	9.8%	261	7.5%
Natural Immunity	629	336	0.7%	179	1.0%	2	0.3%	97	0.9%	15	0.4%
Efficacy	161	69	0.1%	45	0.3%	3	0.4%	40	0.4%	4	0.1%
Omicron	3086	1838	3.9%	502	2.8%	32	4.5%	531	4.8%	183	5.2%
Delta Variant	301	172	0.4%	53	0.3%	3	0.4%	45	0.4%	28	0.8%
Race	1206	677	1.4%	343	1.9%	10	1.4%	120	1.1%	56	1.6%
Ivermectin	201	103	0.2%	46	0.3%	1	0.1%	44	0.4%	7	0.2%
Military	484	222	0.5%	114	0.6%	6	0.8%	120	1.1%	22	0.6%
Breakthrough	295	165	0.3%	51	0.3%	2	0.3%	62	0.6%	15	0.4%

- Trending conversations this week:
  - Mandates
  - Passports
  - Children
  - Thrombosis



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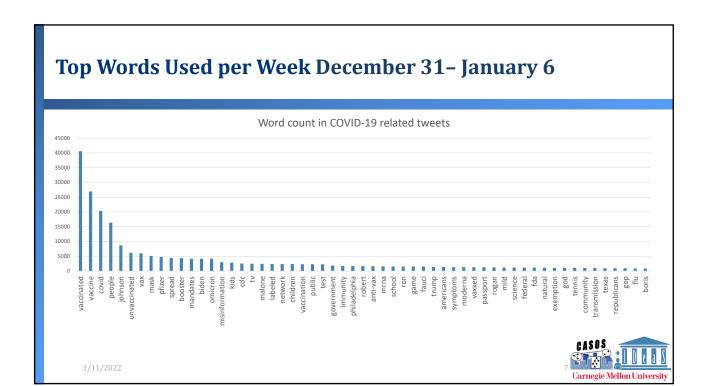
## High Level View by County December 31- January 6

County	Allegheny	Beaver	Butler	Cambria	Fayette	Indiana	Somerset	Westmoreland
Overall Vaccine	18310	39	86	18	48	23	19	87
Vaccine Passports	306		3			1		1
FDA	59	1	1				1	
Boosters	833	5	2	2	4			3
Employees	87	1			1			
"Experimental"	49	1	1					1
Children	371	2	1					2
Myocarditis	52							
Heart	175		1	1	1			
Masks	1432	6	12	4	4	3	4	14
Thrombosis/VITT	53		1					
Mandates	1020	3	7	3	2	3	3	4
Natural Immunity	181							1
Efficacy	47							
Omicron	532	2	2	1	2	3	1	5
Delta Variant	56			2	1	2		1
Race	356	1	1	1	1	1		4
Ivermectin	47							
Military	115	2					2	1
Breakthrough	56		1					

 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 December 31- January 6**

■ 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	Fayette	Indiana	Somerset	West Moreland
covid19 (382)	covid19 (1)	eagles (1)	notaboutavirus (1)	omicronvariant (2)	america (2)	covidvaccine (5)
steelers (226)	maskup (1)		novaxpassports (1)	covid19 (1)	antivax (2)	steelers (4)
covid (154)	omicronvirus (1)		omicron (1)	covidvaccine (1)	insurrectionists (2)	covid (3)
omicron (154)	datamatters (1)		texas (1)	deltavariant (1)	covid19 (1)	science (2)
vaccinate (87)	steelersnation (1)		vaccine (1)	maskmandate (1)	mandated (1)	trump (2)

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## **Top Hashtags by City December 31- January 6**

☐ 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 (554)	covid19 (80)	covid19 (175)	covid19 (377)	covid19 (15)	covid19 (206)	covid19 (66)
eagles (377)	omicron (55)	covaxin (72)	steelers (216)	breaking (7)	omicron (132)	vaccine (31)
omicron (321)	vaccine (22)	omicron (68)	breaking (170)	demvoice1 (5)	eagles (55)	omicron (23)
soulslosttocovid (238)	nobooster (13)	pfizer (59)	covid (152)	omicron (4)	vaccine (34)	journalists (14)
vaccine (138)	nolockdown (13)	vaccineinjuries (55)	omicron (148)	theview (4)	aoclovesdesantis (32)	pfizer (12)

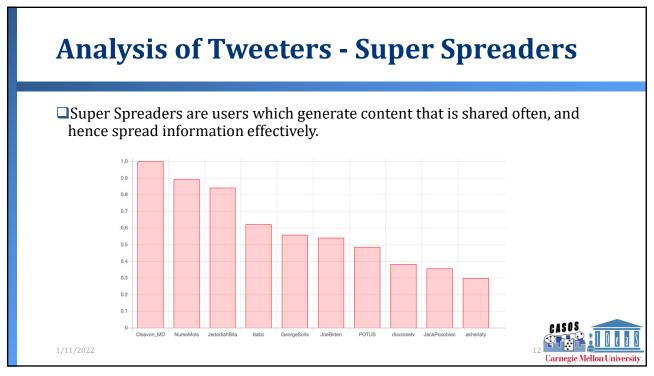
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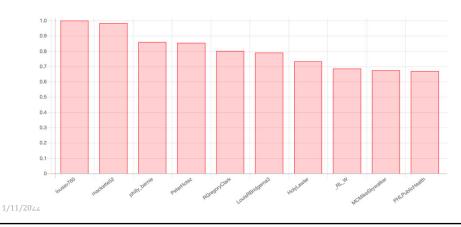
Top URLs by County December 31- January 6					
Allegheny	Butler + Beaver	Cambria	Indiana + Somerset	Fayette	West Moreland
http://hill.cm/GUw06SQ Biden says if medical team advises it, he'll issue domestic travel vaccine requirement (132)	https://bit.ly/32VgaVK Governor Abbott, TDEM, DSHS Request Federally-Supported COVID-19 Testing Sites, Medical Personnel, Increased Monoclonal Antibody Allocations (2)	news/fulltext/2021/11000/er_g		http://hill.cm/GUw06SQ Biden says if medical team advises it, he'll issue domestic travel vaccine requirement (2)	https://www.history.com/.a mp/this-day-in-history/salk- announces-polio-vaccine Dr. Jonas Salk announces polio vaccine (2)
https://trib.al/WbkFFpL Novak Djokovic Goes to Court to Fight Deportation From Australia After Vax Fury (68)	https://bit.ly/3EK88Mu Trib HSSN Head of the Class: Coach of the year in each of WPIAL football's 6 classes (1)		http://www.pharmaciststeve.com/ cdc-sued-for-vaccine-safety-app- data-after-multiple-refusals/ CDC sued for vaccine safety app data after multiple refusals (1)	http://hill.cm/huhki6b More than 200 Marines separated for refusing COVID-19 vaccine (1)	http://apne.ws/FOV6XQx Claim vaccines increase susceptibility to omicron unfounded (1)
https://www.rawstory.com/ron- johnson-natural-immunity/ Ron Johnson escalates attack on vaccines: 'Why do we think that we can create something better than God?' (59)	https://nyti.ms/31f2ILQ Covid Updates: South Africa Says Its Omicron Wave Has Passed With No Big Spike in Deaths (1)		https://www.fox13now.com/news/local-news/entrata-chair-emails-tech-ceos-claiming-covid-vaccine-part-of-sterilization-plot-by-the-jews Utah tech executive resigns after anti-Semitic email rant (1)	https://nyti.ms/3JqVZzE As Omicron Spreads, Officials Ponder What It Means to Be 'Fully Vaccinated' (1)	http://hill.cm/BNBEh36 Pence group files SCOTUS brief opposing Biden vaccine mandate (1)
https://trib.al/mnYNNzt 2021: Border Patrol Agents Faced Historic Level of Line-of-Duty Deaths (49)	https://dailycaller.com/2022/0 1/02/anthony-fauci-fully- vaccinated-indoor-dining/ Fauci Urges Fully Vaccinated Individuals To Steer Clear Of Indoor Dining (1)		https://www.wsj.com/articles/dan gerous-push-to-give-boosters-to- teens-vacccine-covid-19-omicron- vaxx-requirement-mandate- 11640107759 The Dangerous Push to Give Boosters to Teens (1)	https://trib.al/WbkFFpL Novak Djokovic Goes to Court to Fight Deportation From Australia After Vax Fury (1)	http://vaccines.gov (1)
https://nypost.com/2022/01/01/ mayor-adams-continues-covid- state-of-emergency-upholds- indoor-vax-mandate/ Mayor Adams continues NYC's COVID state of emergency, upholds indoor vax mandate (42)	https://wpxi.tv/3HEw0Db Why are so many vaccinated people getting COVID-19 lately? (1)		https://www.mediaite.com/tv/anti -vaxx-lisa-boothe-returns-to-fox- news-airwaves/ Anti-Vaxx Lisa Boothe Back on Fox News After Contracting Covid: 'Let's Go, Brandon' (1)	https://www.cnn.com/2021/ 12/30/health/ij-covid- booster-omicron/index.html Studies indicate J&J Covid-19 vaccine booster protects people against severe illness from Omicron variant (1)	https://www.foxnews.com/p olitics/marines-being- crushed-vaccine-refusal- political-purge Marines say they're being 'crushed' over vaccine refusal: 'A political purge' (1)
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Top URLs	by City l	December	31- Januar	y 6		
Philadelphia	Chester	Norristown	Pittsburgh	Erie	Allentown/ Bethlehem	Other
https://bit.ly/3Hn90Zg Philadelphia is the most vaccinated of the 10 largest cities in America (490)	https://nbcnews.to/3qApYfU CDC says 'avoid cruise travel, regardless of vaccination status' (43)	https://www.theepochtimes.com/dr- peter-mccullough-vaccine-mandates- should-be-repealed_4167066.html Dr. Peter McCullough: Vaccine Mandates Should Be Repealed (278)	http://hill.cm/GUw06SQ Biden says if medical team advises it, he'll issue domestic travel vaccine requirement (132)	http://erie.gov/vax (5)	https://www.rawstory.com/ron- johnson-natural-immunity/ Ron Johnson escalates attack on vaccines: 'Why do we think that we can create something better than God?' (47)	https://bit.ly/3Hn90Zg Philadelphia is the most vaccinated of the 10 large cities in America (25)
https://www.newsobserver.com/news/nations- /nations- world/national/article25665-64672.html Pennsylvania teen who dreamed of being life coach and loved BTS died of COVID (229)	https://www.rawstory.com/r on-johnson-natural- immunity/ Ron Johnson escalates attack on vaccines: 'Why do we think that we can create something better than God?' (41)	https://bit.ly/3Hn90Zg Philadelphia is the most vaccinated of the 10 largest cities in America (20)	https://trib.al/WbkFFpl. Novak Djokovic Goes to Court to Fight Deportation From Australia After Vax Fury (65)	http://vaccines.gov (5)	https://trib.al/mnYNNzt 2021: Border Patrol Agents Faced Historic Level of Line-of-Duty Deaths (39)	https://trib.al/mnYNNz 2021: Border Patrol Agen Faced Historic Level of Lin of-Duty Deaths (16)
http://ow.ly/tflI50H9zwg You will need to be fully vaccinated against COVID to enter any establishment that serves food in Philly (153)	https://trib.al/mnYNNzt 2021: Border Patrol Agents Faced Historic Level of Line- of-Duty Deaths (31)	https://trib.al/mnyNNzt 2021: Border Patrol Agents Faced Historic Level of Line-of-Duty Deaths (18)	https://www.rawstory.com/ron- johnson-natural-immunity/ Ron Johnson escalates attack on vaccines: 'Why do we think that we can create something better than God?' (57)	https://www.medrxiv.org/ content/10.1101/2021.12. 27.21268278v1.full.pdf SARS-CoV-2 Omicron VOC Transmission in Danish Households (4)	https://www.telegraph.co.uk/world -news/2021/12/30/covid- outbreak-remote-polar-research- station-proves-no-escape/ Covid reaches the Antarctic: polar researchers report outbreak at remote station (35)	https://medalerts.org/vaddb/findfield.php?IDNUMI R=1406840 From the 12/31/2021 release of VAERS data: This is VAERS ID 140684 (15)
https://tribal/WbkFFpl. Novak Djokovic Goes to Court to Fight Deportation From Australia After Vax Fury (131)	https://bit.ly/3Hn90Zg Philadelphia is the most vaccinated of the 10 largest cities in America (14)	https://www.health.pa.gov/topics/dis ease/coronavirus/Pages/Post- Vaccination-Data_aspx Post- Vaccination Data (18)	https://trih.al/mnYNNzt 2021: Border Patrol Agents Faced Historic Level of Line-of-Duty Deaths (45)	https://trib.al/WbkFFpL Novak Djokovic Goes to Court to Fight Deportation From Australia After Vax Fury (3)	https://babylonbee.com/news/uny accinated-man-feeling-left-out-as- all-his-vaccinated-friends-have- covid Unvaccinated Man Feeling Left Out As All His Vaccinated Friends Have COVID (33)	https://trib.al/WbkFFp Novak Djokovic Goes to Court to Fight Deportatic From Australia After Va Fury (14)
https://thenationalpulse.com/2021/12 /31/vaccinated-21-times-more-likely- to-get-omicron/ REPORT: Nearly 80% of Omicron Cases are in Vaccinated People. (129)	https://www.fox13now.com/ news/local-news/entrata- chair-emails-tech-ceos- claiming-covid-vaccine-part- of-sterilization-plot-by-the- jews Utah tech executive resigns after anti-Semitic email rant (12)	https://www.rawstory.com/ron- johnson-natural-immunity/ Ron Johnson escalates attack on vaccines: Why do we think that we can create something better than God?' (17)	https://nypost.com/2022/01/01/may or-adams-continues-covid-state-of- emergency-upholds-indoor-vax- mandate/Mayor Adams continues NYC's COVID state of emergency, upholds indoor vax mandate (42)	https://bit.ly/32VgaVK Governor Abbott, TDEM, DSHS Request Federally- Supported COVID-19 Testing Sites, Medical Personnel, Increased Monoclonal Antibody Allocations (2)	https://www.wsi.com/articles/dang erous-push-to-give-boosters-to- teens-vacccine-covid-19-omicron- vaxx-requirement-mandate- 11640107759 The Dangerous Push to Give Boosters to Teens (29)	https://www.rawstory.cc /ron-johnson-natural- immunity/ Ron Johnson escalates attack on vaccin 'Why do we think that w can create something bett than God?' (13)



## **Analysis of Tweeters - Super Friends**

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

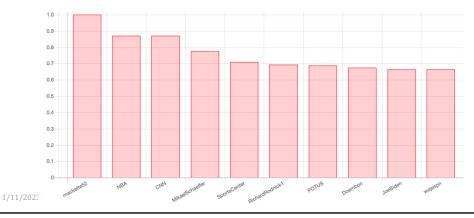




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## **Analysis of Tweeters - Other Influencers**

□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
JackPosobiec[+]	944
POTUS[+]	704
Racquelonair	576
pfizer[+]	534
joerogan	461
CDCgov[+]	451
P_McCulloughMD	381
US_FDA[+]	353
mtgreenee[+]	351
FoxNews[+][*]	334

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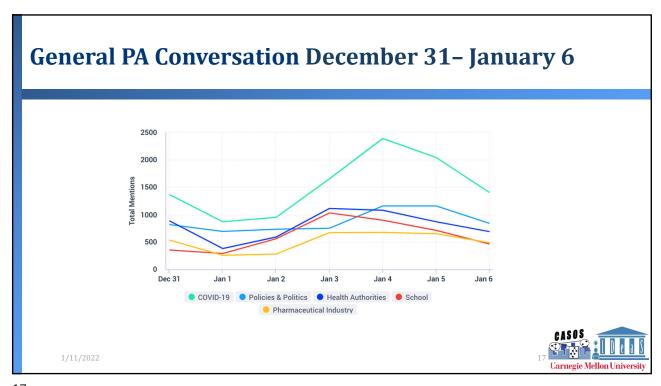
#### **Trending Tweets December 31- January 6**

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

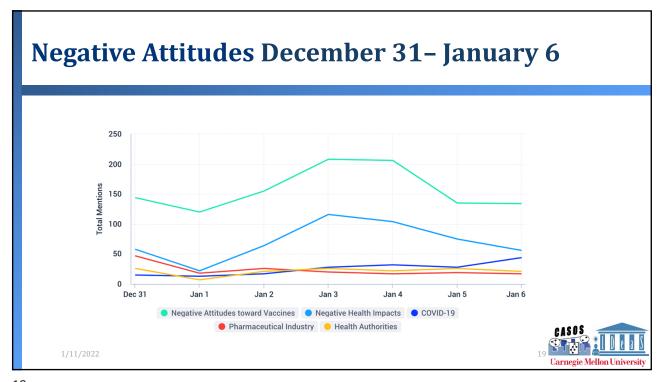
- A little over a month ago, I was shut down and labeled "misinformation" on network TV when I said that vaccinated people also get and spread COVID. Take a look around you today.
- Folks, get vaccinated.
- ☐ Friend's cousin went to Kings game: there were three lines to get in: vaccinated, rapid test, proof of negative test. He was vaccinated but figured he'd get a rapid test just to see. Tested positive, got out of that line into the vaccinated line, showed his passport, went in.
- ☐ Vaccinated or not stop getting so fuckin close to me
- ☐ Vaccinated or not stay away from me https://t.co/wu15NYV0Yn
- Just saw a tweet saying "Both the vaccinated and the unvaccinated can catch Covid." A doctor responded: "Both Serena Williams and I can play tennis."
- □ Philadelphia is the most vaccinated of America's 10 largest cities. KYW Newsradio's community impact reporter @Racquelonair has the story. https://t.co/Qm6xTqUTHM
- □ Seinfeld Today: Elaine spends six hours in a testing line, Jerry finds his new girlfriend less attractive with a mask off, George attends an anti-vax rally so he can get "super-immunity," and Kramer hoards rapid tests.
- @JackPosobiec Dr Malone is an anti-vaxxer now... https://t.co/gLl2Su6PgM
- □ A thread about vaccines and why vaccinated people are catching COVID- The vaccines that were developed were against the original (alpha) strain of the virus that causes COVID-19. Unfortunately, by the time we ramped up vaccination efforts, a mutated strain (delta) took over...



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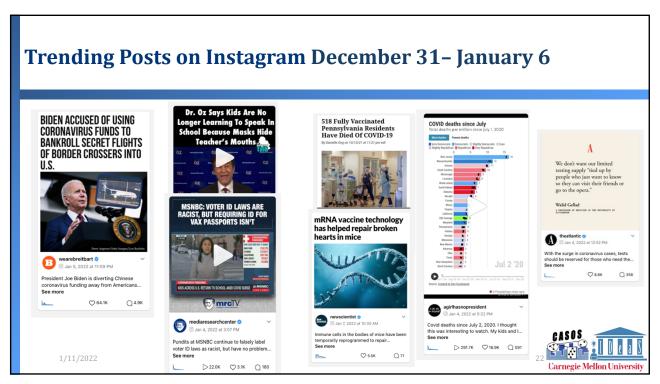














#### **For More Information**

- □ 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: IDeaS Center
- ☐ Ask to be on our Email-Distro Lists

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