PA Vaccine Conversations on Twitter

Dr. Iuliia Alieva, Dawn Robertson, Dr. Kathleen M. Carley Vaccine Hesitancy Project Update based on August 26, 2022 - September 1, 2022

The CMU centers for:

Informed DEmocracy And Social cyber-security

Computational Analysis of Social and Organizational Systems



Carnegie Mellon University



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.

Carnegie Mellon University

Report Overview August 26 - September 1

- ☐ Mandates, Masks, Boosters, Children, Race are trending this week; FDA Approval, Passports, Breakthrough Infections, Myocarditis are trending this week over last;
- □ Trending stories: npr.org/sections/health-shots/2022/08/22/1118788439/vaccine-maker-asks-fda-to-greenlight-updated-omicron-booster-shot Pfizer asks FDA to greenlight new omicron booster shots, which could arrive this fall; <a href="mailto:gov.uk/government/publications/regulatory-approval-of-pfizer-biontech-vaccine-for-covid-19/summary-public-assessment-report-for-pfizer-biontech-covid-19-vaccine-summary of the Public Assessment Report for COVID-19 Vaccine Pfizer/BioNTech; nyti.ms/3PT840f Moderna Sues Pfizer and BioNTech Over Covid Vaccine Technology;
- □ Popular anti-vax tweets: It Is Now Undeniable Vaccine can cause more Myocarditis in Men Under 40 Than COVID-19; Just OUT! Patrone Circ 2022; I have said repeatedly Moderna should be banned in Men<40 FDA failed Americans & this analysis is more complicated Everyone gets breakthrough eventually 1/7 https://t.co/CBmWcgYl1; I deeply regret being vaccinated for COVID-19; US Open today but Novak was not allowed to play because he is unvaccinated. Does anyone notice? Moderna is a sponsor of the US Open. https://t.co/2FiWI01klp

9/26/2022

Carnegie Mellon University

Popular anti-vax stories sorted by the number of retweets

Anti-vax, disinformation, and vaccine hesitancy stories sorted by the number or shares:

- □ expose-news.com/2022/08/27/9-in-10-covid-deaths-past-year-vaccinated UK Gov. confirms 9 in every 10 COVID Deaths over the last year have been among the Fully/Triple Vaccinated
- NoForcedBoosters.com No Forced Boosters Some Canadian universities are forcing students, faculty, staff and visitors to receive a COVID-19 booster shot
- sensiblemed.substack.com/p/before-we-push-the-new-omicron-vaccine

 Before We Push the New Omicron Vaccine, Let's See The Data



Countering disinformation August 26 - September 1

Articles and fact-checking stories debunking disinformation for the last week:

- □ VERIFY: Fact-checking claims about the new COVID boosters https://www.khou.com/article/news/health/coronavirus/covid-booster-fact-checking/285-28ad51f3-33a1-4072-85ce-f427b2d3bd7a
- ☐ Fact Check Team: Vaccine hesitancy remains as FDA approves new COVID booster <a href="https://local21news.com/news/nation-world/fact-check-team-vaccine-hesitancy-remains-as-fda-approves-new-covid-booster-coronavirus-covid-19-boosters-targeting-newest-variants-united-states-delta-omicron-fda-coronavirus-pandemic-pfizer-moderna-strain-americ" | The provided Heritage | The provided Herit
- ☐ UK did not change Covid-19 vaccination guidance for pregnant people https://factcheck.afp.com/doc.afp.com.32HR6NH
- □ Fact Check: Has the U.K. revoked covid vaccine for pregnant women? https://www.thip.media/health-news-fact-check/fact-check-has-the-u-k-revoked-covid-vaccine-for-pregnant-women/34713/
- UK didn't change guidance on COVID vaccines and pregnancies https://apnews.com/article/fact-check-uk-pfizer-covid-vaccine-update-guidance-pregnancy-477737215303
- ☐ FACT CHECK: DID ROBERT KENNEDY JR. WIN A SUPREME COURT CASE DECLARING COVID-19 VACCINES WERE NOT VACCINES? https://checkyourfact.com/2022/09/07/fact-check-robert-kennedy-jr-vaccines/

GASOS Carnegie Mellon University

9/26/2022

Measures for countering health disinformation

- ☐ Anti-vaccine narratives are still pervasive on social media, while there are not that many counter-narratives about the positive effects of vaccines;
- ☐ There is a need for a reframing of social media as a medically and socially valuable resource and platform because of its high impact on society;
- ☐ Healthcare organizations need to implement social media strategies to create and expand conversations countering disinformation on social media;
- □ It would be helpful for health communicators to cooperate with local influencers who could spread pro-vaccination messages. Another strategy could be to motivate health practitioners to use social media as a channel for communication with the public;
- □ "Strategies focused on meaningfully and safely engaging HCPs on social media, promoting interconnectivity across the medical and public health communities on COVID-19 vaccine truths, and sustaining these messaging efforts across vaccine implementation stages will be our best hope of preventing any more missed doses and promoting "misinformation immunity" for all." (Hernandez et al. 2021. "The COVID-19 vaccine social media infodemic: healthcare providers' missed dose in addressing misinformation and vaccine hesitancy.")

Measures for countering health disinformation

- ☐ As a trusted source of information on vaccines, family physicians play a crucial role in driving vaccine acceptance;
- □ Sharing stories, building trust with patients, addressing pain associated with vaccination, presenting vaccination as the default approach early on, focusing on the benefits of protection, and being honest about side effects could also help to promote pro-vaccination attitudes (Shen & Dubey 2019. "Addressing vaccine hesitancy: Clinical guidance for primary care physicians working with parents");
- □ It is helpful to provide more information for the patients about the possible disinformation strategies they may deal with, such as manipulating emotions to promote misinformation and conspiracy theories to sow confusion and create division. Inoculation strategy may help to prepare the community by presenting counterarguments to misinformation and raising awareness of negative emotional appeals spread by anti-vaccine campaigns;
- ☐ Framing vaccination as a concrete, actionable strategy to reduce COVID-19 risk may help to address negative emotions, increase self-efficacy and ensure the feelings of control over reducing COVID-19 risk.

9/26/2022

Carnegie Mellon University

High Level View by City August 26 - September 1

	Total PA	Philade	elphia	Pittsb	urgh	Eri	ie	Allentown/	Bethlehem'	Ot	her
Conversation	Tweets	Tweets	%	Tweets	%	Tweets	%	Tweets	%	Tweets	%
Overall Vaccine	28396	15071	53.1%	8360	29.4%	215	0.8%	3138	11.1%	1612	5.7%
Vaccine Passports	240	69	0.5%	148	1.8%	2	0.9%	20	0.6%	1	0.1%
FDA Approval	97	46	0.3%	20	0.2%	2	0.9%	25	0.8%	4	0.2%
Boosters	741	326	2.2%	271	3.2%	4	1.9%	87	2.8%	53	3.3%
Employees	91	25	0.2%	28	0.3%	1	0.5%	31	1.0%	6	0.4%
"Experimental"	46	30	0.2%	8	0.1%			6	0.2%	2	0.1%
Children	326	207	1.4%	76	0.9%	2	0.9%	32	1.0%	9	0.6%
Myocarditis	183	114	0.8%	37	0.4%	1	0.5%	28	0.9%	3	0.2%
Heart	138	66	0.4%	40	0.5%	1	0.5%	23	0.7%	8	0.5%
Masks	789	394	2.6%	182	2.2%	11	5.1%	88	2.8%	114	7.1%
Thrombosis/VITT	8	3	0.0%	2	0.0%			3	0.1%		
Mandates	1233	737	4.9%	246	2.9%	18	8.4%	196	6.2%	36	2.2%
Natural Immunity	59	32	0.2%	18	0.2%	1	0.5%	7	0.2%	1	0.1%
Efficacy	40	23	0.2%	8	0.1%			6	0.2%	3	0.2%
Omicron	230	125	0.8%	54	0.6%			38	1.2%	13	0.8%
Delta Variant	44	28	0.2%	4	0.0%					12	0.7%
Race	572	311	2.1%	156	1.9%	5	2.3%	68	2.2%	32	2.0%
Ivermectin	25	11	0.1%	12	0.1%			2	0.1%		
Military	122	69	0.5%	25	0.3%	2	0.9%	22	0.7%	4	0.2%
Breakthrough	90	50	0.3%	19	0.2%	1	0.5%	18	0.6%	2	0.1%

Conversation topics trending this week over last:

- FDA Approval
- Passports
- Breakthrough Infections
- Mandates
- Myocarditis



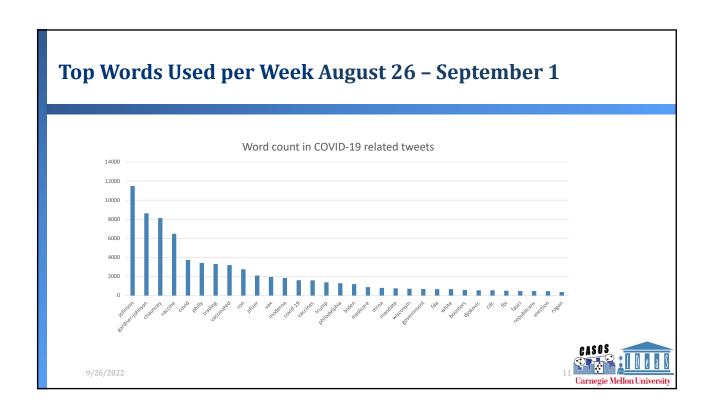
9/26/2022

High Level View by County August 26 - September 1

County	Allegheny	Beaver	Butler	Cambria	Fayette	Indiana	Somerset	Westmoreland
Overall Vaccine	8663	36	26	13	20	6	3	36
Vaccine Passports	149							
FDA	20		1					
Boosters	279		1	1		1		1
Employees	29							
"Experimental"	8							
Children	77				1	1		
Myocarditis	39							
Heart	41			1				
Masks	199	1	3		2		1	3
Thrombosis/VITT	2							
Mandates	253	1	1	1		1		
Natural Immunity	18							
Efficacy	8					1		
Omicron	55		1					
Delta Variant	5							
Race	160							
Ivermectin	12							
Military	26							
Breakthrough	20							

 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 Hashtags by County August 26 - September 1

■ 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	Somerset
covid19 (50)	covidvaccine (3)	defunddc (1)
pfizer (49)	vaccine (1)	endhomerule (1)
moderna (35)	vaccinesideeffects (1)	endvaxmandates (1)
vaccine (32)	vaccine (1)	
vaccineinjuries (23)	vaccinesideeffects (1)	



Top Hashtags by City August 26 - September 1

☐ 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 (58)	covid19 (7)	covid19 (14)	covid19 (50)	pfizer (5)	covid19 (26)	covid19 (15)
pfizer (58)	pfizer (5)	pfizer (12)	pfizer (49)	maskup (4)	pfizer (22)	moderna (7)
moderna (37)	bigpharma (3)	longcovid (11)	moderna (35)	moderna (2)	moderna (14)	pfizer (5)
vaccine (36)	longcovid (3)	moderna (10)	vaccine (32)	vaccine (2)	longcovid (10)	stoptheshots (5)
longcovid (29)	fauci (2)	vaccineinjuries (5)	vaccineinjuries (23)	covidscam (1)	mrna (10)	covidisnotover (4)

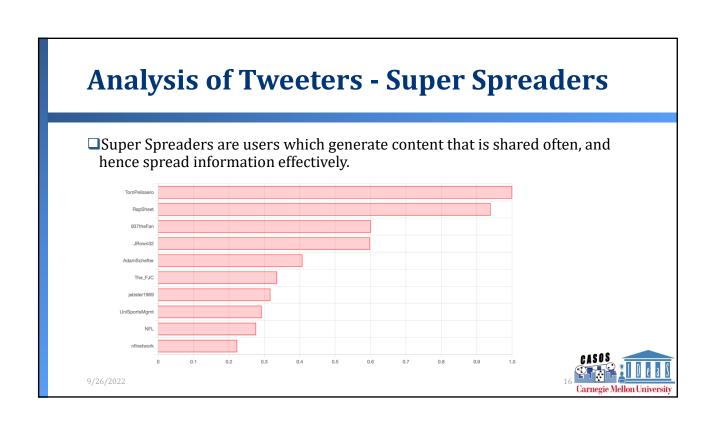
9/26/2022



Top URLs by County August 26 - September 1

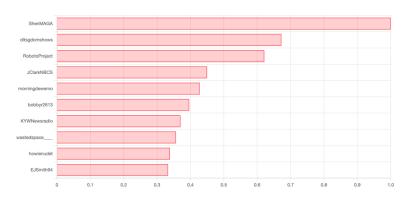
Allegheny	Beaver + Butler	Cambria	Fayette	Indiana	Moreland
trib.al/WDfaByU Nate Silver: 'Liberal elites' pressured Pfizer to delay vaccine until after 2020 election (35)	wusa9.com/article/news/health/vacri ne-mandate-unlawful-dc-superior rourt-judge-rules-mayor-muriel- howser/65-8e14bc1d-4c93-465b- a3a8-dfad98f2a1b Mayor Bowser's vaccine mandate unlawful, DC Superior Court judge rules (1)	nbcnews.to/3R4NIEZ FDA authorizes Pfizer's and Moderna's updated Covid booster shots (1)	dailysign.al/3Tf8NOR DC Mayor Says No Virtual Learning, Giving Unvaccinated Black Teens Zero Alternative Options (1)	nytimes.com/2021/07/27/opi nion/covid-vaccine-delta- variant.html Covid Is Now a Crisis for the Unvaccinated (1)	dlvr.it/SXHPLW Moderna Suing Pfizer Over COVID Vaccine (1)
NoForcedBoosters.com No Forced Boosters - Some Canadian universities are forcing students, faculty, staff and visitors to receive a COVID-19 booster shot (25)	n.pr/3Ayldbz FDA authorizes first revamp of COVID vaccines to target omicron (1)			wsi.com/articles/latest-covid- boosters-are-set-to-roll-out- before-human-testing-is- completed-11661679003 Latest Covid Boosters Are Set to Roll Out Before Human Testing Is Completed (1)	travelpulse.com/news/impacti ng-travel/japan-lifts-covid- testing-requirements-for- vaccinated-travelers.html Japan Lifts COVID Testing Requirements for Vaccinated Travelers (1)
nyti.ms/3PT84QF Moderna Sues Pfizer and BioNTech Over Covid Vaccine Technology (24)	romper.com/parenting/polio-in-the- us-vaccine-schedule Polio Is In The U.S., But Don't Freak Out Just Yet (1)			youtu.be/OLN1Z2uRGj8 Latenight hosts react to covid patients asking for ivermectin (1)	unherd.com/thepost/novak- diokovics-vaccine-ban-is-a- disgrace-to-american-sport Novak Djokovic's vaccine ban is a disgrace to American sport [1]
ov.uk/government/publications/regu latory-approval-of-pfizer-biontech- accine-for-covid-19/summary-public- ssessment-report-for-pfizerbiontech- covid-19-vaccine Summary of the Public Assessment Report for COVID- 19 Vaccine Pfizer/BioNTech (21)	youtu.be/yW0-PrC8hII. No Shots No School - Historical PSA: School vaccination promotion featuring boxer Muhammad Ali (1)				youtu.be/yWO-PrC8bII No Shots No School - Historical PSA: School vaccination promotion featuring boxer Muhammad Ali (1)
fda.gov/news-events/press- nouncements/coronavirus-covid-19- pdate-fda-authorizes-moderna-pfizer- biontech-bivalent-covid-19-vaccines- use Coronavirus (COVID-19) Update: FDA Authorizes Moderna, Pfizer- BioNTech Bivalent COVID-19 Vaccines for Use as a Booster Dose (20)					
7/ 40/ 4044				•	Carnegie Mellon Unive

Philadelphia	Chester	Norristown	Pittsburgh	Erie	Allentown/Bethlehem	Other
rontosun.com/opinion/columni sts/lilley-westerns-vaccine- mandate-is-based-on-fear-not- ience LILLEY: Western's vaccine mandate is based on fear, not science (118)	thenationalpulse.com/2022/08/ 26/uk-to-pay-covid-19-vaccine- victims. The British Government Has Begun Paying \$140,000 for COVID-19 Vaccine Damage Victims (9)	govuk/government/publicati ons/regulatory-approval-of- pinzer-biontech-vaccine-for- covid-19/summary-public- assessment-report-for- pinzer-biontech-covid-19- yaccine Summary of the Public Assessment Report for COVID-19 Vaccine Pfizer/BioNTech (35)	trib.al/WDfaByU Nate Silver: 'Liberal elites' pressured Pfizer to delay vaccine until after 2020 election (35)	aol.com/moderna-sues-pfizer- over-patents-132102891- 162250810.html Moderna sues Pfizer over patents behind COVID-19 vaccine (1)	thenationalpulse.com/2022/ 08/26/uk-to-pay-covid-19- vaccine-victims The British Government Has Begun Paying \$140,000 for COVID- 19 Vaccine Damage Victims (15)	gov.uk/government/publicati regulatory-approval-of-pfize biontech-vaccine-for-covid IJ/summary-public-assessm report-for-pfizerbiontech-cov IJ-vaccine Summary of the PI Assessment Report for COVID Vaccine Pfizer/BioNTech (4
npr.org/sections/health- iots/2022/08/22/1118788439/ vaccine-maker-asks-fda-to- greenlight-updated-omicron- pooster-shot Pfizer asks FDA to creenlight new omicron booster- hots, which could arrive this fall (43)	expose- news.com/2022/08/27/9-in-10- covid-deaths-past-year- vaccinated UK Gov. confirms 9 in every 10 COVID Deaths over the last year have been among the Fully/Triple Vaccinated (6)	thenationalpulse.com/2022/ 08/26/uk-to-pay-covid-19- vaccine-victims. The British Government Has Begun Paying \$140,000 for COVID- 19 Vaccine Damage Victims (12)	NoForcedBoosters.com No Forced Boosters - Some Canadian universities are forcing students, faculty, staff and visitors to receive a COVID-19 booster shot (25)	dailysign.al/3Tf8NOR.DC Mayor Says No Virtual Learning, Giving Unvaccinated Black Teens Zero Alternative Options (1)	trib.al/WDfaByU Nate Silver: 'Liberal elites' pressured Pfizer to delay vaccine until after 2020 election (13)	nbcnews.to/3R4NIEZ FDA authorizes Pfizer's and Moder updated Covid booster shots
v.uk/government/publications/ regulatory-approval-of-pfizer- biontech-vaccine-for-covid- 9/summary-public-assessment- eport-for-pfizerbiontech-covid-	fda gov/news-events/press- announcements/coronavirus- covid-19-update-fda-authorizes- moderna-pfizer-biotrech- bivalent-covid-19-vaccines-use Coronavirus (COVID-19) Update: FDA Authorizes Moderna, Pfizer- BioNTech Bivalent COVID-19 Vaccines for Use as a Booster Dose (4)	sensiblemed.substack.com/p /before-we-push-the-new- omicron-vaccine Before We Push the New Omicron Vaccine, Let's See The Data (10)	nyti.ms/3PT84Qf Moderna Sues Pfizer and BioNTech Over Covid Vaccine Technology (24)	dlvr.it/SXKYMk Clinical trials usher brain cancer vaccine from theory to therapy (1)	onlinelibrary.wiley.com/doi// ull/10.1111/pde.15074 Toxic epidermal necrolysis after first dose of Pfizer-BioNTech (BNT162b2) vaccination with pharmacogenomic testing (12)	
yti.ms/3PT840f Moderna Sues fizer and BioNTech Over Covid Vaccine Technology (28)	, ,		covid-19/summary-public- assessment-report-for- pfizerbiontech-covid-19- vaccine Summary of the Public Assessment Report for COVID-19 Vaccine Pfizer/BioNTech (21)	drive.google.com/file/d/1_wHIY_X- <u>XX-</u> <u>tGkGBPwuax7N8BxZPR4PTTCD</u> <u>m/view</u> Explainer on COVID vaccination, fertility, pregnancy and breastfeeding (1)	expose- news.com/2022/08/27/9-in- 10-covid-deaths-past-year- yaccinated UK Gov. confirms 9 in every 10 COVID Deaths over the last year have been among the Fully/Triple Vaccinated (11)	.,
ews.com/2022/08/27/9-in-10- vid-deaths-past-year-vaccinated	delawareonline.com/story/news/local/2022/08/25/monkeypox- cases-de-public-health- recommendations- vaccine/65419563007_University	Chinese Covid test services running 24 hours. This is aerial view of , millions of	fda gov/news-events/press- announcements/coronavirus -covid-19-update-fda- authorizes-moderna-pfizer- tiontech-bivalent-covid-19- vaccines-use Coronavirus (COVID-19) Update: FDA Authorizes Moderna, Pfizer- BioNTech Bivalent COVID-19 Vaccines for Use as a Booster	foxnews.com/opinion/tucker- carlson-democrats-trying-shift- blame-about-covid-19-vaccine- trump TUCKER CARLSON: Democrats are trying to shift blame about the COVID-19 vaccine to Trump (1)	sensiblemed.substack.com/p/ before-we-push-the-new- omicron-vaccine Before We Push the New Omicron Vaccine, Let's See The Data (10)	politico.com/news/2022/08, rump-white-house-exerter pressure-on-fd-for-covid-i- emergency-use-authorizatic house-report-finds-000534 Trump White House exerter pressure on FDA for Covid- emergency use authorizatio House report finds (3)



Analysis of Tweeters - Super Friends

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

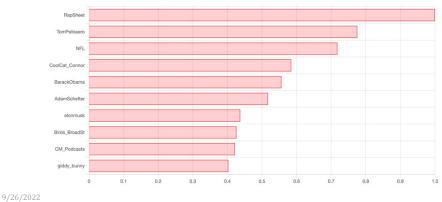


9/26/2022



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.

Value			
3006			
2168			
621			
611			
517			
475			
435			
410			
355			
351			
3006			
2168			
621			



9/26/2022

Trending Tweets August 26 - September 1

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

BIG: Moderna SUEING Pfizer over Covid vaccines for mRNA technology from 2010-2016. Get it?
https://t.co/K7zpU5UjtF;

Senator Ron Johnson wants Social Security and Medicare on the chopping block every year. He's the same guy who said if Republicans get control of Congress, they'll try to get rid of the ACA again—denying insurance to people with preexisting conditions. These guys never stop.

Ron Johnson is the guy who wants to slash Social Security and Medicare. I'm the guy who's going to beat him.

It Is Now Undeniable Vaccine can cause more Myocarditis in Men Under 40 Than COVID-19; Just OUT! Patrone Circ 2022; I have said repeatedly Moderna should be banned in Men<40 FDA failed Americans & this analysis is more complicated Everyone gets breakthrough eventually 1/7 https://t.co/CBmWcgYII

I deeply regret being vaccinated for COVID-19

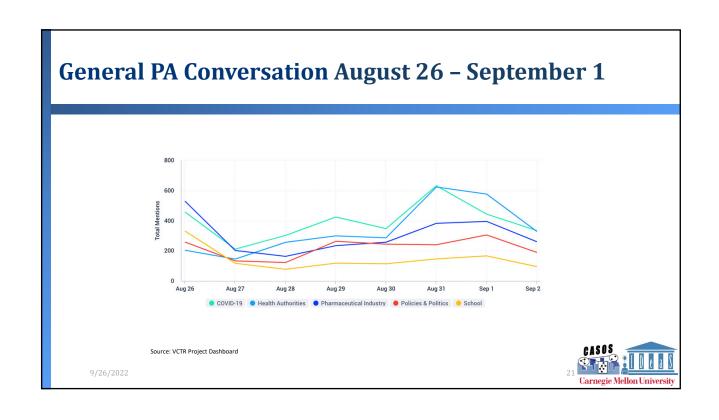
We haven't had mask mandates for most indoor activities in Ontario since March. There are hospitals operating without vax mandates for nurses and doctors. Why is Western mandating boosters and masks for students against public health guidelines? Read & RT https://t.co/F9EtRaniu9

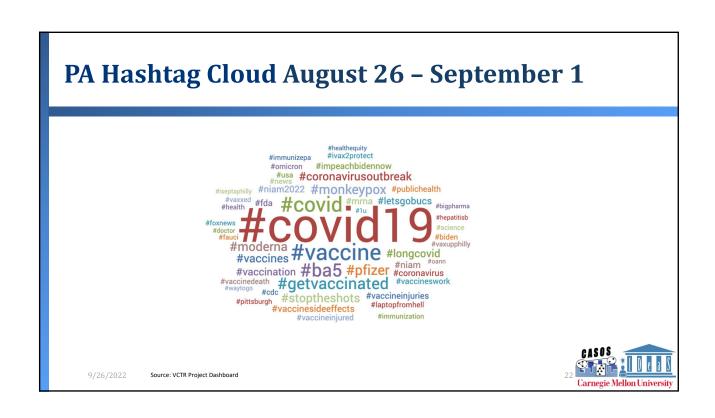
US Open today but Novak was not allowed to play because he is unvaccinated. Does anyone notice? Moderna is a sponsor of the US Open. https://t.co/2FiWI01klp

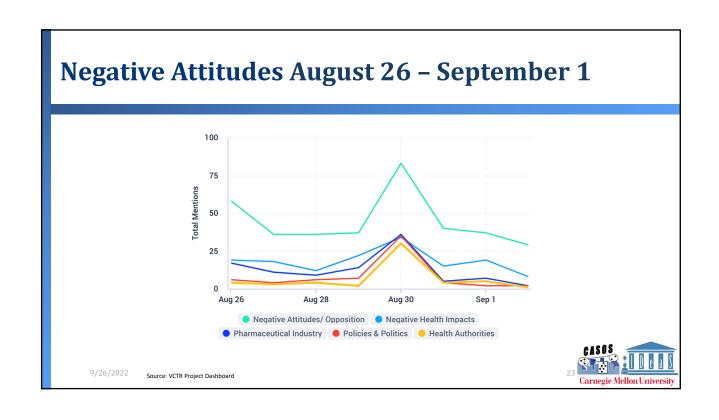
Trump did not mandate the vaccine. That was Biden.

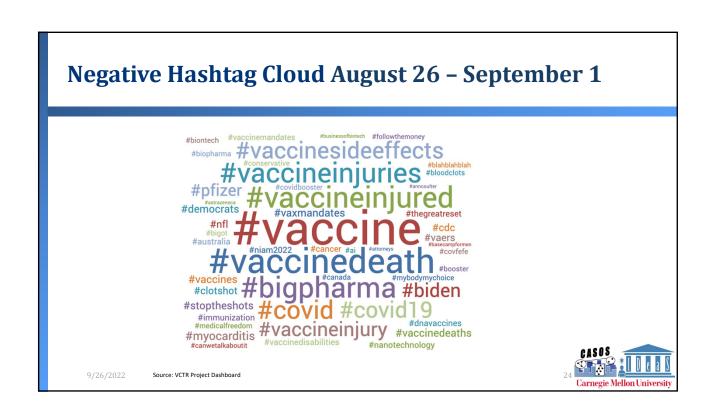
NEW - German Health Minister Lauterbach says vaccination limits the COVID pandemic because vaccinated people develop symptoms more slowly. https://t.co/IKB1nIlaXs

My cousin died in her sleep after a "mild" case of COVID. She had no pre-existing conditions and was fully vaccinated. This is the 5th relative I have lost to COVID.



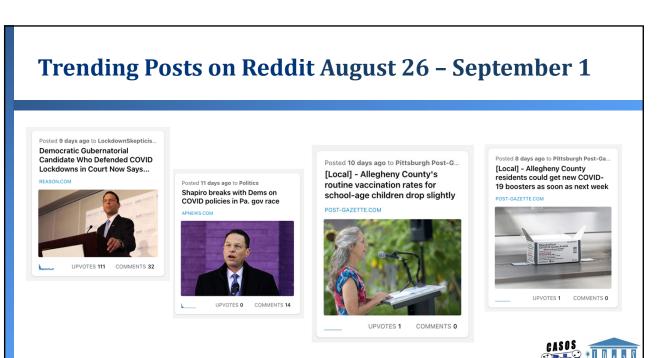












For More Information

Source: CrowdTangle Dashboard

- □ Director Kathleen M. Carley <u>kathleen.carley@cs.cmu.edu</u> □ <u>http://www.casos.cs.cmu.edu/bios/carley/carley.html</u>
- □ 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: <u>IDeaS Center</u>
- ☐ Ask to be on our Email-Distro Lists

9/26/2022

9/26/2022

Copyright © 2021 Kathleen M. Carley

