

# PA Vaccine Conversations and Misinformation on Twitter

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Vaccine Hesitancy Project Update based on October 29 – November 4, 2021

The CMU centers for:

Informed DEMocracy And Social cyber-security

Computational Analysis of Social and Organizational Systems



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## PA Vaccine Conversation 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 October 29 – November 4

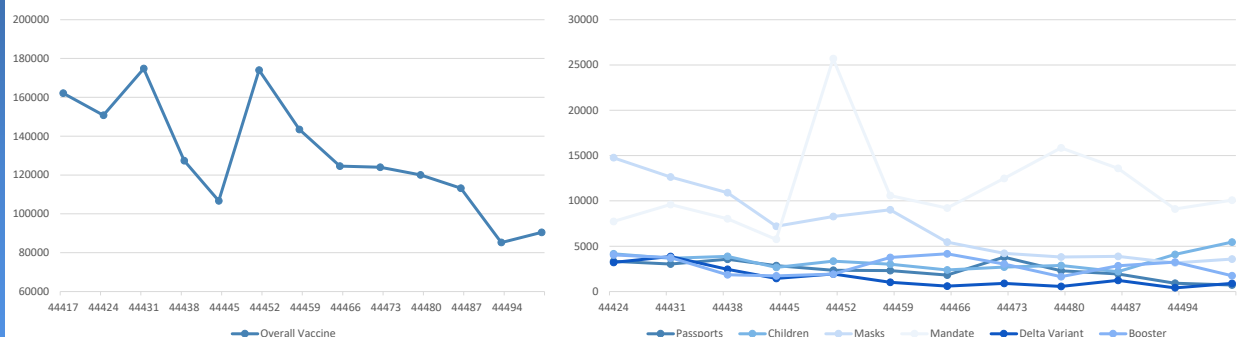
- ❑ This week's trending stories cover trends similar to the previous week such as FDA approval for Pfizer vaccine for children, vaccination mandates, sports, police;
- ❑ Trending story from Bloomberg covers a recent study that found vaccinated people who contract the Delta variant can spread it to others, confirming what previous studies have reported (<https://trib.al/lGi9E2H> Vaccinated People Also Spread the Delta Variant, Yearlong Study Shows). Top lines from the study are being **shared widely** by news outlets, as well as by anti-vaccine advocates to falsely claim that vaccines don't work.
- ❑ Other trending stories and links: <https://www.cdc.gov/mmwr/volumes/70/wr/mm7044e1.htm> Laboratory-Confirmed COVID-19 Among Adults Hospitalized with COVID-19-Like Illness with Infection-Induced or mRNA Vaccine-Induced SARS-CoV-2 Immunity — Nine States, January–September 2021 ; <https://trib.al/BDavE7h> 26 FDNY firehouse companies out of service over vaccine mandate staff shortage; <https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/> The country needs a dose of Florida Gov. Ron DeSantis to battle COVID-19; <https://trib.al/fRY1os3> Hundreds of NYPD cops get COVID-19 shot as vaccine deadline looms
- ❑ <https://www.fda.gov/news-events/press-announcements/fda-authorizes-pfizer-biontech-covid-19-vaccine-emergency-use-children-5-through-11-years-age> FDA Authorizes Pfizer-BioNTech COVID-19 Vaccine for Emergency Use in Children 5 through 11 Years of Age; <https://nyti.ms/2Y2cvTT> The F.D.A. is assessing whether the Moderna vaccine can cause heart problems in adolescents;
- ❑ Suspended disinformation tweet was widely spread in trends  
<https://twitter.com/HiDearZaki2/status/1454386707378417666/video/1>  
"A nurse was fired for not taking the vaccine. This is their disgusting weapon"

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## Trends (tweets per week) October 29 – November 4



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## High Level View by City October 29 – November 4

	Total PA	Philadelphia		Pittsburgh		Erie		Allentown/Bethlehem		Other	
Conversation	Tweets	Tweets	%	Tweets	%	Tweets	%	Tweets	%	Tweets	%
Overall Vaccine	76655	41945	54.7%	18562	24.2%	712	0.9%	12319	16.1%	3117	4.1%
Vaccine Passports	719	368	0.9%	170	0.9%	5	0.7%	158	1.3%	18	0.6%
FDA Approval	583	276	0.7%	167	0.9%	3	0.4%	122	1.0%	15	0.5%
Boosters	1728	922	2.2%	393	2.1%	23	3.2%	248	2.0%	142	4.6%
Fetal Tissue	45	21	0.1%	10	0.1%	1	0.1%	11	0.1%	2	0.1%
"Experimental"	321	164	0.4%	61	0.3%	2	0.3%	85	0.7%	9	0.3%
Children	4127	2355	5.6%	841	4.5%	39	5.5%	725	5.9%	167	5.4%
Myocarditis	308	149	0.4%	76	0.4%	3	0.4%	68	0.6%	12	0.4%
Heart	1008	485	1.2%	250	1.3%	5	0.7%	228	1.9%	40	1.3%
Masks	3551	1782	4.2%	880	4.7%	30	4.2%	600	4.9%	259	8.3%
Thrombosis/VITT	86	47	0.1%	13	0.1%	1	0.1%	21	0.2%	4	0.1%
Mandates	10037	5242	12.5%	1871	10.1%	125	17.6%	2392	19.4%	407	13.1%
Natural Immunity	2110	1522	3.6%	244	1.3%	3	0.4%	324	2.6%	17	0.5%
Efficacy	168	85	0.2%	33	0.2%	1	0.1%	39	0.3%	10	0.3%
Spike Proteins	77	36	0.1%	14	0.1%	1	0.1%	24	0.2%	2	0.1%
Delta Variant	1149	598	1.4%	265	1.4%	19	2.7%	196	1.6%	71	2.3%
Race	1726	815	1.9%	507	2.7%	22	3.1%	308	2.5%	74	2.4%
Ivermectin	269	131	0.3%	55	0.3%	2	0.3%	72	0.6%	9	0.3%
Military	423	223	0.5%	77	0.4%	3	0.4%	112	0.9%	8	0.3%
Breakthrough	1278	992	2.4%	70	0.4%	8	1.1%	193	1.6%	15	0.5%

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Trending conversations:

- Breakthrough infections
- Children
- Masks
- Immunity



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## High Level View by County October 29 – November 4

County	Allegheny	Beaver	Butler	Cambria	Fayette	Indiana	Somerset	Westmoreland
Overall Vaccine	19047	25	61	24	36	6	4	54
Vaccine Passports	178							
FDA	169				1			
Boosters	418		3	1	1	1	1	5
Fetal Tissue	10							
"Experimental"	61							
Children	861		8	4	2	1	1	1
Myocarditis	76							
Heart	254	1	2	1				
Masks	924	2	5	2	1			11
Thrombosis/VITT	13							
Mandates	1920	5	5	2	9			8
Natural Immunity	245		2	1	1			
Efficacy	35							
Spike Proteins	14							
Delta Variant	284	2	1					2
Race	522	4	1		2			1
Ivermectin	55							
Military	77							
Breakthrough	71					1		2

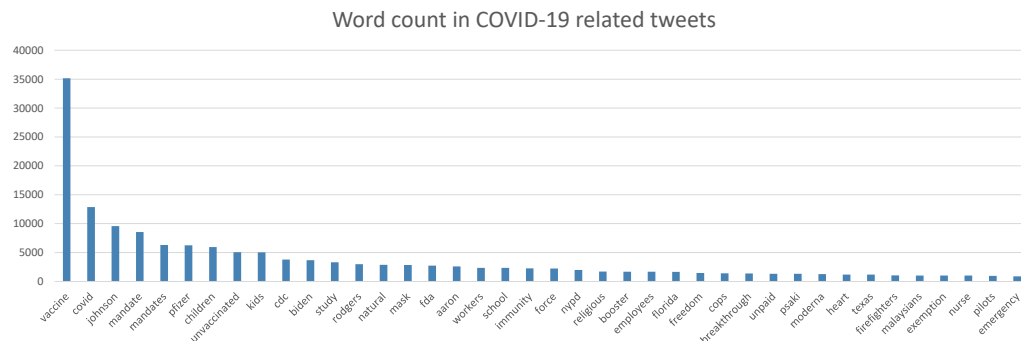
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- Tweets counted here if there is a county location attached
- Race: pulled by one of the vaccine keywords plus at least one other term in ("Black", "African American", "of color", "Latin", "Hispanic", "brown", "eugenic")



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## Top Words Used per Week October 29 – November 4



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## Top Hashtags by County October 29 – November 4

- ❑ 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	West Moreland
covid19 (527)	covid19 (10)	steelers (2)	hepatitis (1)	coercion (1)
steelers (424)	coercion (2)	freedomoverfear (1)	hepatitisb (1)	covid19 (1)
cop26 (261)	cop26 (1)	coldandflu (1)	nfl (1)	resist (1)
coercion (154)	bigpharmakills (1)	maskup (1)		
vaccine (136)	donotcomply (1)	covid19 (1)		

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## Top Hashtags by City October 29 – November 4

- ❑ 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 (1194)	covid19 (149)	covid19 (641)	covid19 (513)	covid19 (12)	covid19 (363)	covid19 (91)
bt21 (286)	pfizer (27)	coercion (43)	steelers (405)	steelers (12)	covid19 (64)	vaccine (68)
coercion (245)	vaccine (26)	vaccine (39)	cop26 (258)	covid (4)	covidvaccine (38)	steelers (28)
vaxupphilly (230)	demvoice1 (24)	demvoice1 (27)	coercion (153)	cop26 (3)	pfizer (38)	coercion (20)
vaccine (202)	utah (20)	cop26 (25)	vaccine (132)	demvoice1 (3)	coercion (37)	cop26 (13)

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## Top URLs by County October 29 – November 4

Allegheny	Butler + Beaver	Indiana	Fayette	West Moreland
<a href="https://thecovidworld.com/oe-wise-56-year-old-republican-candidate-for-allegheny-county-council-dies-shortly-after-getting-the-covid-19-vaccine/">https://thecovidworld.com/oe-wise-56-year-old-republican-candidate-for-allegheny-county-council-dies-shortly-after-getting-the-covid-19-vaccine/</a> Joe Wise: 56-Year-Old Republican Candidate For Allegheny County Council Dies Shortly After Getting COVID-19 Vaccine (484)	<a href="https://www.fda.gov/news-events/press-announcements/fda-authorizes-pfizer-biontech-covid-19-vaccine-emergency-use-children-5-through-11-years-age">https://www.fda.gov/news-events/press-announcements/fda-authorizes-pfizer-biontech-covid-19-vaccine-emergency-use-children-5-through-11-years-age</a> FDA Authorizes Pfizer-BioNTech COVID-19 Vaccine for Emergency Use in Children 5 through 11 Years of Age (5)	<a href="https://nbcnews.to/3CFoy3">https://nbcnews.to/3CFoy3</a> Children 5 to 11 can now receive Pfizer vaccine after CDC director signs off (1)	<a href="https://www.nytimes.com/live/2021/10/27/world/covid-vaccine-boosters/nypd-vaccine-mandate-ruling?referringSource=articleShare">https://www.nytimes.com/live/2021/10/27/world/covid-vaccine-boosters/nypd-vaccine-mandate-ruling?referringSource=articleShare</a> Covid-19 Updates: Judge Denies N.Y.C. Police Union Bid to Block Vaccine Mandate (3)	<a href="https://bit.ly/2X4GuU">https://bit.ly/2X4GuU</a> Q&A: Peter Salk on the Lessons Learned from Vaccine Development History (1)
<a href="https://twitter.com/HIDearZaki/status/1454386707378417666/video/1">https://twitter.com/HIDearZaki/status/1454386707378417666/video/1</a> suspended tweet (397) "A nurse was fired for not taking the vaccine. This is their disgusting weapon"	<a href="https://nyti.ms/2Y2cvIT">https://nyti.ms/2Y2cvIT</a> The F.D.A. is assessing whether the Moderna vaccine can cause heart problems in adolescents. (1)	<a href="https://nbcnews.to/3JRBSOT">https://nbcnews.to/3JRBSOT</a> FDA authorizes Pfizer vaccine for kids 5 to 11 (1)	<a href="https://cnn.it/3vZYNgA">https://cnn.it/3vZYNgA</a> Iowa governor signs law granting unemployment benefits to those fired for not being vaccinated (1)	<a href="https://www.coronavirus.pitt.edu/covid-19-vaccines/vaccine-requirement">https://www.coronavirus.pitt.edu/covid-19-vaccines/vaccine-requirement</a> (1)
<a href="https://trib.al/Gi9E2H">https://trib.al/Gi9E2H</a> Vaccinated People Also Spread the Delta Variant, Yearlong Study Shows (209)	<a href="https://nyti.ms/2ZLbccc">https://nyti.ms/2ZLbccc</a> Key Moments From Day 1 of the COP26 Climate Change Summit (1)	<a href="https://nyti.ms/310g47">https://nyti.ms/310g47</a> Kristy Swanson, actress and vaccine skeptic, is hospitalized with Covid. (1)	<a href="https://cnn.it/3w089cy">https://cnn.it/3w089cy</a> American Airlines cancels more than 600 flights on Sunday (1)	<a href="https://www.nbcboston.com/news/coronavirus/3078-new-breakthrough-cases-in-mass-35-more-deaths-in-vaccinated-people/2536785/">https://www.nbcboston.com/news/coronavirus/3078-new-breakthrough-cases-in-mass-35-more-deaths-in-vaccinated-people/2536785/</a> 3,078 New Breakthrough Cases in Mass., 35 More Deaths in Vaccinated People (1)
<a href="https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/">https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/</a> The country needs a dose of Florida Gov. Ron DeSantis to battle COVID-19 (117)	<a href="https://www.cnn.com/2021/07/30/cdc-study-shows-74percent-of-people-infected-in-massachusetts-covid-outbreak-were-fully-vaccinated.html">https://www.cnn.com/2021/07/30/cdc-study-shows-74percent-of-people-infected-in-massachusetts-covid-outbreak-were-fully-vaccinated.html</a> CDC study shows 74% of people infected in Massachusetts Covid outbreak were fully vaccinated (1)	<a href="https://www.fda.gov/news-events/press-announcements/fda-authorizes-pfizer-biontech-covid-19-vaccine-emergency-use-children-5-through-11-years-age">https://www.fda.gov/news-events/press-announcements/fda-authorizes-pfizer-biontech-covid-19-vaccine-emergency-use-children-5-through-11-years-age</a> FDA Authorizes Pfizer-BioNTech COVID-19 Vaccine for Emergency Use in Children 5 through 11 Years of Age (1)	<a href="https://helloniceworld.com/fdny-planning-big-anti-covid-vaccine-mandate-demonstration-for-thursday-morning-outside-gracie-mansion/">https://helloniceworld.com/fdny-planning-big-anti-covid-vaccine-mandate-demonstration-for-thursday-morning-outside-gracie-mansion/</a> FDNY Planning Big Anti-COVID Vaccine Mandate Demonstration For Thursday Morning Outside Gracie Mansion (1)	<a href="https://www.wtae.com/article/pittsburgh-vaccine-requirement/38124264">https://www.wtae.com/article/pittsburgh-vaccine-requirement/38124264</a> Pittsburgh to require COVID-19 vaccine for city employees (1)
<a href="https://trib.al/rY1os3">https://trib.al/rY1os3</a> Hundreds of NYPD cops get COVID-19 shot as vaccine deadline looms (103)	<a href="https://n.pr/3vZISII">https://n.pr/3vZISII</a> FDA authorizes use of Pfizer's COVID vaccine for 5- to 11-year-olds (1)	<a href="https://www.pbs.org/newshour/amp/health/how-anti-vaccine-scare-tactics-exploit-our-fertility-anxieties?fbclid=IwAR3WC2ENdeGTXDeWIPf1M2oXPJUAhtOR_CtWMLXDWHVY02yr4-yQvY06Js">https://www.pbs.org/newshour/amp/health/how-anti-vaccine-scare-tactics-exploit-our-fertility-anxieties?fbclid=IwAR3WC2ENdeGTXDeWIPf1M2oXPJUAhtOR_CtWMLXDWHVY02yr4-yQvY06Js</a> There's no evidence COVID-19 vaccines hurt fertility. Here's what's fueling the myth (1)	<a href="https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/">https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/</a> The country needs a dose of Florida Gov. Ron DeSantis to battle COVID-19 (1)	<a href="https://triblive.com/local/pittsburgh-requiring-city-employees-to-be-vaccinated-against-covid-19/">https://triblive.com/local/pittsburgh-requiring-city-employees-to-be-vaccinated-against-covid-19/</a> Pittsburgh requiring city employees to be vaccinated against covid-19 (1)

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## Top URLs by City October 29 – November 4

Philadelphia	Chester	Norristown	Pittsburgh	Erie	Allentown/ Bethlehem	Other
<a href="https://www.cdc.gov/mmwr/volumes/70/wr/mm7044e1.htm">https://www.cdc.gov/mmwr/volumes/70/wr/mm7044e1.htm</a> Laboratory-Confirmed COVID-19 Among Adults Hospitalized with COVID-19—Like Illness with Infection-Induced or mRNA Vaccine-Induced SARS-CoV-2 Immunity — Nine States, January–September 2021 (413)	<a href="https://www.foxnews.com/politics/mcauliffe-coronavirus-stat-youngkin-vaccinated-anti-vaxer">https://www.foxnews.com/politics/mcauliffe-coronavirus-stat-youngkin-vaccinated-anti-vaxer</a> McAuliffe repeats '4 Pinocchio' coronavirus stat; calls Youngkin, who was vaccinated, an 'anti-vaxer' (42)	<a href="https://www.cdc.gov/mmwr/volumes/70/wr/mm7044e1.htm">https://www.cdc.gov/mmwr/volumes/70/wr/mm7044e1.htm</a> Laboratory-Confirmed COVID-19 Among Adults Hospitalized with COVID-19—Like Illness with Infection-Induced or mRNA Vaccine-Induced SARS-CoV-2 Immunity — Nine States, January–September 2021 (466)	<a href="https://thecovidworld.com/oe-wise-56-year-old-republican-candidate-for-allegheeny-county-council-dies-shortly-after-getting-the-covid-19-vaccine/">https://thecovidworld.com/oe-wise-56-year-old-republican-candidate-for-allegheeny-county-council-dies-shortly-after-getting-the-covid-19-vaccine/</a> Joe Wise: 56-Year-Old Republican Candidate For Allegheny County Council Dies Shortly After Getting COVID-19 Vaccine (483)	<a href="https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/">https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/</a> The country needs a dose of Florida Gov. Ron DeSantis to battle COVID-19 (6)	<a href="https://www.cdc.gov/mmwr/volumes/70/wr/mm7044e1.htm">https://www.cdc.gov/mmwr/volumes/70/wr/mm7044e1.htm</a> Laboratory-Confirmed COVID-19 Among Adults Hospitalized with COVID-19—Like Illness with Infection-Induced or mRNA Vaccine-Induced SARS-CoV-2 Immunity — Nine States, January–September 2021 (133)	<a href="https://trib.al/Gi9E2H">https://trib.al/Gi9E2H</a> Vaccinated People Also Spread the Delta Variant, Yearlong Study Shows (69)
<a href="https://bit.ly/3EG6iTK">https://bit.ly/3EG6iTK</a> Gucci to Stage Fashion Show in Front of TCL Chinese Theatre on Hollywood Boulevard (300)	<a href="https://aaronisri.substack.com/p/he-obvious-wins-again-natural-immunity">https://aaronisri.substack.com/p/he-obvious-wins-again-natural-immunity</a> The Obvious Wins Again: Natural Immunity Superior to Vaccine Immunity (28)	<a href="https://twitter.com/HiDearZaki2/status/1454386707378417666/video/1">https://twitter.com/HiDearZaki2/status/1454386707378417666/video/1</a> suspended tweet "A nurse was fired for not taking the vaccine. This is their disgusting weapon" (81)	<a href="https://twitter.com/HiDearZaki2/status/1454386707378417666/video/1">https://twitter.com/HiDearZaki2/status/1454386707378417666/video/1</a> suspended tweet "A nurse was fired for not taking the vaccine. This is their disgusting weapon" (396)	<a href="https://trib.al/BDave7h">https://trib.al/BDave7h</a> 26 FDNY firehouse companies out of service over vaccine mandate staff shortage (6)	<a href="https://trib.al/Gi9E2H">https://trib.al/Gi9E2H</a> Vaccinated People Also Spread the Delta Variant, Yearlong Study Shows (97)	<a href="https://trib.al/Gi9E2H">https://trib.al/Gi9E2H</a> suspended tweet "A nurse was fired for not taking the vaccine. This is their disgusting weapon" (24)
<a href="https://twitter.com/HiDearZaki2/status/1454386707378417666/video/1">https://twitter.com/HiDearZaki2/status/1454386707378417666/video/1</a> suspended tweet "A nurse was fired for not taking the vaccine. This is their disgusting weapon" (280)	<a href="https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/">https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/</a> The country needs a dose of Florida Gov. Ron DeSantis to battle COVID-19 (25)	<a href="https://theexpose.uk/2021/11/01/dr-mike-yeardon-just-when-you-thought-things-couldnt-get-any-worse/">https://theexpose.uk/2021/11/01/dr-mike-yeardon-just-when-you-thought-things-couldnt-get-any-worse/</a> Dr Mike Yeardon – "The findings that 100% of Covid-19 Vaccine deaths have been caused by just 5% of the batches produced are unprecedented" (39)	<a href="https://trib.al/Gi9E2H">https://trib.al/Gi9E2H</a> Vaccinated People Also Spread the Delta Variant, Yearlong Study Shows (149)	<a href="https://www.wgrz.com/article/news/local/erie-county-to-double-the-number-of-sanitarians-at-sundays-bills-game-when-fans-have-to-be-fully-vaccinated/71-bd9a294-d388-4cc8-bd1b-2617b14db763">https://www.wgrz.com/article/news/local/erie-county-to-double-the-number-of-sanitarians-at-sundays-bills-game-when-fans-have-to-be-fully-vaccinated/71-bd9a294-d388-4cc8-bd1b-2617b14db763</a> Erie County to double the number of sanitarians at Sunday's Bills game, when fans have to be fully vaccinated (5)	<a href="https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/">https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/</a> The country needs a dose of Florida Gov. Ron DeSantis to battle COVID-19 (89)	<a href="https://trib.al/Gi9E2H">https://trib.al/Gi9E2H</a> suspended tweet "A nurse was fired for not taking the vaccine. This is their disgusting weapon" (15)
<a href="https://trib.al/Gi9E2H">https://trib.al/Gi9E2H</a> Vaccinated People Also Spread the Delta Variant, Yearlong Study Shows (205)	<a href="https://twitter.com/HiDearZaki2/status/1454386707378417666/video/1">https://twitter.com/HiDearZaki2/status/1454386707378417666/video/1</a> suspended tweet "A nurse was fired for not taking the vaccine. This is their disgusting weapon" (23)	<a href="https://news.yahoo.com/vaccine-confers-better-protection-than-natural-immunity-cdc-finds-201511956.html">https://news.yahoo.com/vaccine-confers-better-protection-than-natural-immunity-cdc-finds-201511956.html</a> Vaccine confers better protection than natural immunity, CDC finds (36)	<a href="https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/">https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/</a> The country needs a dose of Florida Gov. Ron DeSantis to battle COVID-19 (116)	<a href="https://buffalonedes.com/news/local/parsing-the-numbers-why-vaccinated-residents-made-up-40-of-erie-countys-positive-covid-19/article_641c4a84-10da-11ec-a720-cf5c0cc41444.html">https://buffalonedes.com/news/local/parsing-the-numbers-why-vaccinated-residents-made-up-40-of-erie-countys-positive-covid-19/article_641c4a84-10da-11ec-a720-cf5c0cc41444.html</a> Parsing the numbers: Why vaccinated residents made up 40% of Erie County's positive Covid-19 tests (4)	<a href="https://trib.al/Gi9E2H">https://trib.al/Gi9E2H</a> suspended tweet "A nurse was fired for not taking the vaccine. This is their disgusting weapon" (78)	<a href="https://trib.al/BDave7h">https://trib.al/BDave7h</a> 26 FDNY firehouse companies out of service over vaccine mandate staff shortage (15)
<a href="https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/">https://nypost.com/2021/10/28/florida-gov-ron-desantis-has-shown-how-to-handle-covid-19/</a> The country needs a dose of Florida Gov. Ron DeSantis to battle COVID-19 (133)	<a href="https://www.cdc.gov/mmwr/volumes/70/wr/mm7044e1.htm">https://www.cdc.gov/mmwr/volumes/70/wr/mm7044e1.htm</a> Laboratory-Confirmed COVID-19 Among Adults Hospitalized with COVID-19—Like Illness with Infection-Induced or mRNA Vaccine-Induced SARS-CoV-2 Immunity — Nine States, January–September 2021 (21)	<a href="https://trib.al/Gi9E2H">https://trib.al/Gi9E2H</a> Vaccinated People Also Spread the Delta Variant, Yearlong Study Shows (36)	<a href="https://trib.al/RV1os3">https://trib.al/RV1os3</a> Hundreds of NYPD cops get COVID-19 shot as vaccine deadline looms (103)	<a href="https://www.foxnews.com/politics/mcauliffe-donor-funded-anti-vax-effort-albert-dwoskin">https://www.foxnews.com/politics/mcauliffe-donor-funded-anti-vax-effort-albert-dwoskin</a> McAuliffe raked in cash from donor who funded anti-vax effort, falsely calls Youngkin anti-vax (3)	<a href="https://trib.al/BDave7h">https://trib.al/BDave7h</a> 26 FDNY firehouse companies out of service over vaccine mandate staff shortage (61)	<a href="https://www.fda.gov/news-events/press-announcements/fda-authorizes-pfizer-biotech-covid-19-vaccine-emergency-use-children-5-through-11-years-age">https://www.fda.gov/news-events/press-announcements/fda-authorizes-pfizer-biotech-covid-19-vaccine-emergency-use-children-5-through-11-years-age</a> (12)

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## Top Influencers by County October 29 – November 4

❑ The top 5 influencers\* for each region related to COVID19/vaccines are as follows:

Allegheny	Butler	Cambria	Fayette	West Moreland	Beaver	Indiana
TotalSportsEnt	BloomsburgU	sreed151	dustinjohns	MartyGriffinKD	colin_dunlap	mikaylavangelo
NFL	DeniseSmith67 (high bot score)	TumbleDrunk	MichRxConsult	MeghanKDKA	TribLiveHSSN	IUPfootball
PatMcAfeeShow	PittsburghTom	mleblond1	ToddEury	chris_d477	YinzerBecky	hiltongnar412
WVUfootball	MakiJohnson3	CSonafelt	BroncoBaby10 (high bot score)	JoeHill80	PghSportsNation	SysterJeff
KDKA	MadisonKingPA	Antagonizer11	irishpatriot386	Deedee15644	kree803	Skelyaa

\*influencers are defined as accounts with tweets often spread by others (ordered by out-degree centrality)

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## Top Influencers by City October 29 – November 4

□ The top 5 influencers\* for each region related to COVID19/vaccines are as follows:

Philadelphia	Chester	Norristown	Pittsburgh	Erie	Allentown/ Bethlehem	Other
business	dr craig wax	LeftYvonne	TotalSportsEnt	ECDOH	vcurranw (high bot score)	DrEricDing
catturd2		SeivwrightTrudy	NFL	PaulSorrentino3	GodandtheBear	GovRonDeSantis
Liz_Wheeler	honeybadger5012	American_ka1	WVUfootball	Mr_Consistent_2	McmastrsMoose	nypost
ElectionWiz	axios	maresh_shenai	KDKA	BlyntJames (high bot score)	crazyjo43424351	disclosetv
6abc	GeenaJagger (high bot score)	conspiracyb0t	Jimmy_Jeans	Pravduh15 (high bot score)	Joegooding (high bot score)	trcyjntm

\*influencers are defined as accounts with tweets often spread by others (ordered by out-degree centrality)

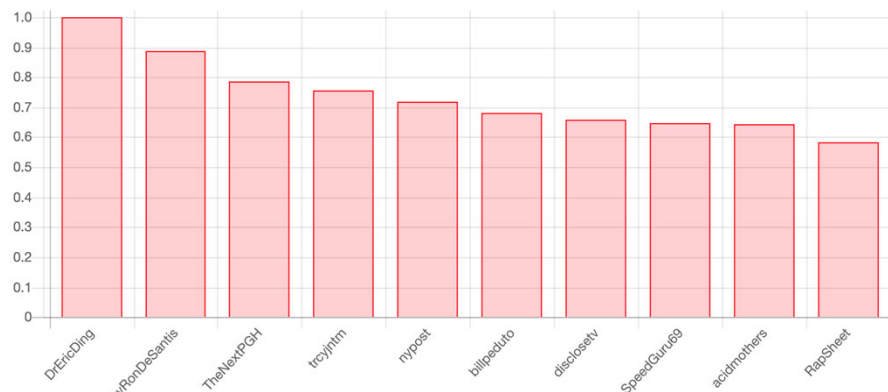
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## Analysis of Tweeters - Super Spreaders

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



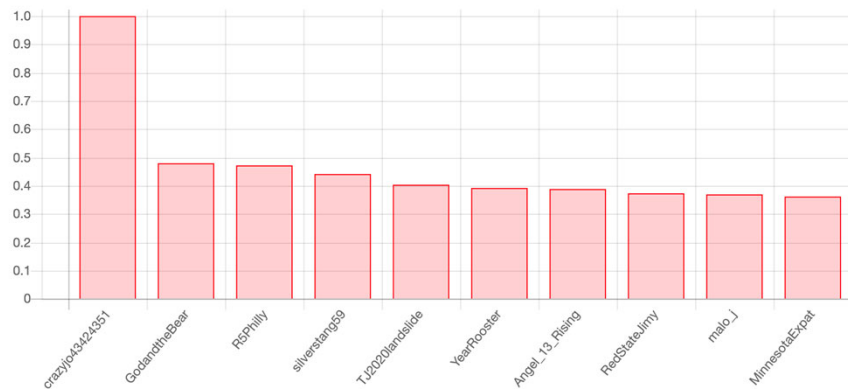
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## Analysis of Tweeters - Super Friends

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



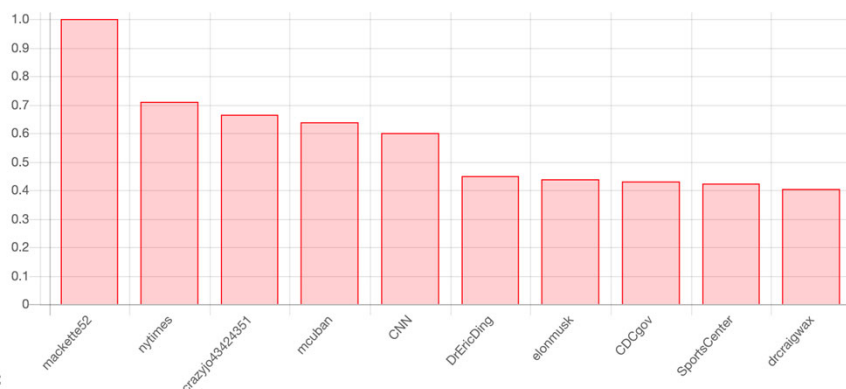
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## Analysis of Tweeters - Other Influencers

- ❑ 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
<a href="#">GovRonDeSantis</a>	812
<a href="#">nypost</a>	615
<a href="#">CDCgov</a>	548
<a href="#">catturd2</a>	544
<a href="#">RapSheet</a>	540
<a href="#">GovernorTomWolf</a>	442
<a href="#">EmeraldRobinson</a>	422
<a href="#">nytimes</a>	382
<a href="#">POTUS</a>	372
<a href="#">KristySwansonXO</a>	366

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## Trending Tweets October 29 – November 4

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

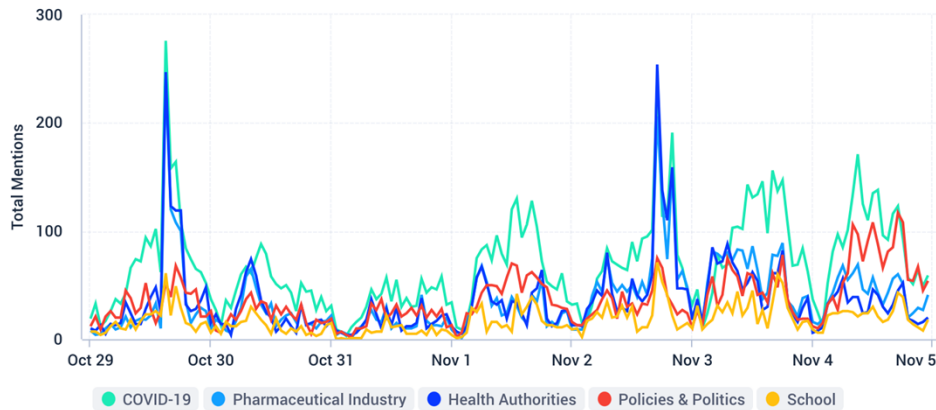
- ❑ [△ BREAKING—REINFECTION & NATURAL IMMUNITY—new CDC study in hospitalized adults finds: unvaccinated people with prior #COVID19 infection recently were \\*\\*5 times more likely\\*\\* to be reinfected / get breakthrough versus people recently fully vaccinated!](#)  
<https://t.co/VGmWPmm5IE> <https://t.co/mlt5fj3643>
- ❑ Would like to thank all Malaysians who got vaccinated! Because of you, I got to go home ❤️ <https://t.co/blbocM3G09>
- ❑ BREAKING - After threats that 10,000 NYPD officers could quit the force over the NYC vaccine mandate, the actual number going on unpaid leave today was 34.
- ❑ In Florida, there will be no vaccine mandate for children in our schools. This is a decision that belongs to parents. <https://t.co/EEu13HZ41c>
- ❑ Vaccinated people are just as likely as unvaccinated people to spread the delta variant to contacts in their household, a yearlong study found <https://t.co/2Px9LM5WcB>
- ❑ Joe Wise: 56-Year-Old Republican Candidate For Allegheny County Council Dies Shortly After Getting COVID-19 Vaccine : The COVID World <https://t.co/nsrtxYYpGT>
- ❑ Packers: "Did you lie about being vaccinated?" Aaron Rodgers: <https://t.co/VdZwYiIFPZ> asked a patient at work today if they were vaccinated. "Why are you asking me that's against hipaa?" Ma'am this is your doctor's office what do you mean
- ❑ Florida has lowest COVID-19 case rate in the country. They did it without vaccine mandates, without mask mandates in school & with no restrictions on businesses. Life simply went on. @GovRonDeSantis was right again. My latest in Friday's @nypost <https://t.co/Xx08Hh8Awf>
- ❑ Nurse fired for not accepting the you know what. Religious exemption denied.. Freedom is everything and you must never give it up #coercion <https://t.co/g7BQ8t9YMR>

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## General PA Conversation October 29 – November 4

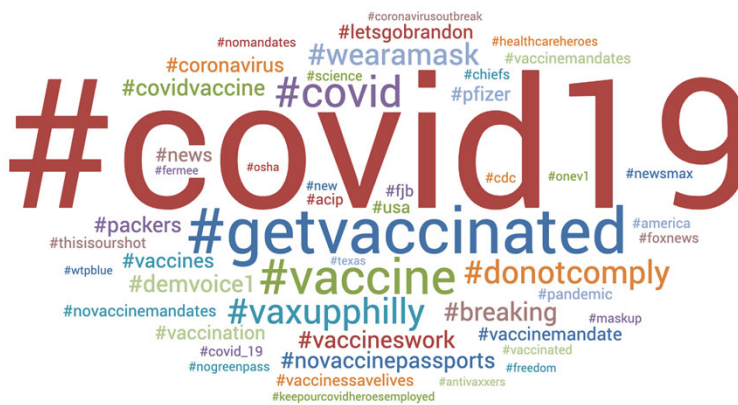


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## PA Hashtag Cloud October 29 – November 4



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## Trending PA links October 29 – November 4

- ❑ [bmi.com](https://bmi.com) - Covid-19: Researcher blows the whistle on data integrity issues in Pfizer's vaccine trial (110 Mentions)
- ❑ [bloomberg.com](https://bloomberg.com) - Vaccinated People Also Spread the Delta Variant, Yearlong Study Shows (97 Mentions)
- ❑ [nypost.com](https://nypost.com) - 26 FDNY firehouses out of service due to vax mandate staff shortage (88 Mentions)
- ❑ [vaccines.gov](https://vaccines.gov) - Vaccines.gov - Find COVID-19 vaccine locations near you (59 Mentions)
- ❑ [youtube.com](https://youtube.com) - 60 Minutes Mike Wallace Exposes the 1976 Swine Flu Pandemic Vaccine Injuries (59 Mentions)
- ❑ [dailywire.com](https://dailywire.com) - BREAKING: The Daily Wire Challenges Biden Administration Vaccine Mandate | The Daily Wire (54 Mentions)
- ❑ [cdc.gov](https://cdc.gov) - Coronavirus Disease 2019 (53 Mentions)
- ❑ [paper.li](https://paper.li) - GERMANY TO LAUNCH EU-WIDE MILITARY FORCE along with 4 other European countries seeking to establish a EU "rapid reaction force" (52 Mentions)

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## Trending PA tweets October 29 – November 4

BREAKING - After threats that 10,000 NYPD officers could quit the force over the NYC vaccine mandate, the actual number going on unpaid leave today was 34.

**311**  
Retweets

just passed a strip club with "VAXXED N' WAXED, NO PASS NO ASS" signs flashing out front, so needless to say that they are leading the way in keeping our city safe and I salute them

**119**  
Retweets

Aaron Rodgers showing the Packers his vaccination card  
<https://t.co/E5EFpW5Nm9>

**174**  
Retweets

5  **Occupy Democrats**  
[@occupydemocrats](https://twitter.com/occupydemocrats)

BREAKING NEWS: In a HUGE loss for anti-vaxxers, the U.S. Supreme Court green-lights Maine's vaccination mandate for all healthcare workers — with no religious exemption. This sets a major precedent for every hospital across America. RT IF YOU THINK THAT THIS IS GREAT NEWS!

**107**  
Retweets

My son set me up on here for my 76th birthday & this is my first tweet. Not sure ya'll will care what I have to say as a retired religion professor from Texas, who is pro-vaccine & pro-Biden. He said to ask ya'll to retweet this & follow me if you care what I have to say.


**125**  
Retweets

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## Trending PA tweets October 29 – November 4

**6**  **Occupy Democrats**  
@occupydemocrats

BREAKING: Twitter suspends Newsmax's star White House reporter Emerald Robinson over her insane tweet claiming that COVID-19 vaccines contain a Satanic "bioluminescent" tracking device. RT IF YOU THINK THEY SHOULD BAN HER PERMANENTLY!

**104**  
Retweets

**8**  **Alice Driver**  
@reporterdriver

In January 2021, I signed a contract @nytimes to publish an oped about how Tyson needed to vaccinate meat processing workers. After I informed Tyson of the oped (it had been fact-checked, translated into Spanish & the photos edited) it was suddenly killed. Nice PR story today. <https://t.co/INvYbqRoTp>

**91**  
Retweets

It's so fucking funny to be antivax. The creation of vaccines is arguably humankind's single greatest achievement. Unquestionably so in terms of the raw quantity of human misery averted. And a bunch of people are just...against that lol

**96**  
Retweets

From a friend in NYPD: This is the line at an NYPD station of officers lined up to go out sick tomorrow as that's the deadline for the vaccination. <https://t.co/U5ABl4QBaq>

**85**  
Retweets

When the head of the New York police union says 10,000 officers will quit because of the vaccine mandate but only 34 actually do you have to conclude the police union was lying and using fear tactics against the public.

**84**  
Retweets

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## Top PA Twitter Authors October 29 – November 4

By mentions	By influence
@doembon	@malcolmnance
@iridescentashes	@fox29philly
@godandthebear	@accuweather
@mishao1989	@nbcphiladelphia
@rliberalskiddin	@phillyinquirer
@kirkturner777	@wpxi
@cdekeane	@cbsphilly
@erin_vmd	@upsidestories
@chris_1791	@pittsburghpg
@jwetzel70	@kdka

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## Trending negative PA stories October 29 – November 4

- ❑ [sharylattkisson.com](https://sharylattkisson.com) - (READ) Whistleblower says Pfizer vaccine trial included falsified data' (10 Mentions)
- ❑ [aaronisiri.substack.com](https://aaronisiri.substack.com) - One Brave ICU Physician Reporting Covid-19 Vaccine Injuries Leads to a Dozen More (9 Mentions)
- ❑ [nytimes.com](https://nytimes.com) - How Often Do Covid Vaccines Cause Heart Problems in Kids? (7 Mentions)
- ❑ [sharylattkisson.com](https://sharylattkisson.com) - Covid-19 natural immunity compared to vaccine-induced immunity: The definitive summary (7 Mentions)
- ❑ [vimeo.com](https://vimeo.com) - Danny Rampling warns of the dangers of vaccine passports (7 Mentions)
- ❑ [aaronisiri.substack.com](https://aaronisiri.substack.com) - One Brave ICU Physician Reporting Covid-19 Vaccine Injuries Leads to a Dozen More (6 Mentions)
- ❑ [medrxiv.org](https://medrxiv.org) - Comparing SARS-CoV-2 natural immunity to vaccine-induced immunity: reinfections versus breakthrough infections (6 Mentions)

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## Trending Negative PA tweets October 29 – November 4

- 1 **Disclose.tv**  
@disclosetv

NOW - U.S. Army Brigade Surgeon says "in one morning I had to ground 3 out of 3 pilots due to vaccine injuries" at a panel discussion hosted by U.S. Sen. Ron Johnson.  
<https://t.co/jLlGwePPdQ>

**81**  
Retweets

4 **Sharyl Attkisson**  
@sharylattkisson

Buried headline: CDC confirms vaccinated people 6x more likely to be hospitalized w/Covid symptoms than unvaxxed who previously had Covid. Yet vaccine mandates accept the less-safe population and reject the safest.

**15**  
Retweets

So weird how the Biden administration waited until two days after the VA and NJ elections to drop their vaccine mandate rules. Almost as if they know it's extremely unpopular!

**23**  
Retweets

Hours after a long debate with me about vaccines and natural immunity, Cuban tweets this about his team:  
<https://t.co/bN49uDvPMJ>

**13**  
Retweets

3 **Sharyl Attkisson**  
@sharylattkisson

Would a vaccine normally get approved thru regular process if it: Wears off after a couple of months Doesn't prevent infection Doesn't prevent spread May still result in hospitalization/death Requires 3-4 shots in yr Has side effects Is for disease that's non-serious in most? 🤔

**17**  
Retweets

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\*support for vaccines may appear in this section if the comments on that post were expressing criticism of that post.



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## Trending Negative PA tweets October 29 – November 4



I feel like a broken record, repeating the same track again and again. The USG HHS actively lies about vaccine safety and efficacy. It is federal policy. So get over it. The whole system is corrupt. The question is, what are our action items based on those fundamental truths? <https://t.co/GPPEXRrPam>

10  
Retweets

7  **Marjorie Taylor Greene**  [@mtgreene](https://twitter.com/mtgreene)

People are getting fired daily & we're on the verge of a real critical supply chain crisis. With both vaxxed & un-vaxxed just as likely to spread covid, STOP vaccine mandates & move to saving lives with treatments that work like Ivermectin & monoclonal antibodies.


9  
Retweets

8  **Sharyl Attkisson**  [@sharylattkisson](https://twitter.com/sharylattkisson)

For workers who don't want to get the vaccine, "a limited period of counseling and education, followed by additional disciplinary measures" may be necessary, according to the White House. "Removal occurs only after continued noncompliance."

9  
Retweets

9  **Rep. Anthony Sabatini**  [@anthonySabatini](https://twitter.com/anthonySabatini)

No more defense—we need OFFENSE Issuing statements & lawsuits is NOT enough Florida & every Republican state must NULLIFY Biden's OSHA vaccine mandate NOW Any Federal agent implementing them in our State must be arrested on the spot & prosecuted under state law  
[#NoMandates](https://twitter.com/NoMandates) 

9  
Retweets

I was diagnosed with myocarditis from the Pfizer vaccine. I'm 30 years old and healthy. There should be awareness raised for people with vaccine injuries. This is important data. I'm pro-vax for those who want it, and I'm anti-vax for people who don't. Mandatory Vax is a mistake.

8  
Retweets

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## Top PA Negative Twitter Authors October 29 – November 4

By mentions	By influence
@cdekeane	@fox29philly
@doembon	@abc27news
@richrobby	@jodyfield
@dansmeriglio	@chris_1791
@jwetzels70	@ameshaa
@phillygirl741	@upmcnews
@pjmugs	@eric_kavanagh
@sandersonnoreen	@joegooding
@activistchick7	@rxjef77
@mishao1989	@godandthebear

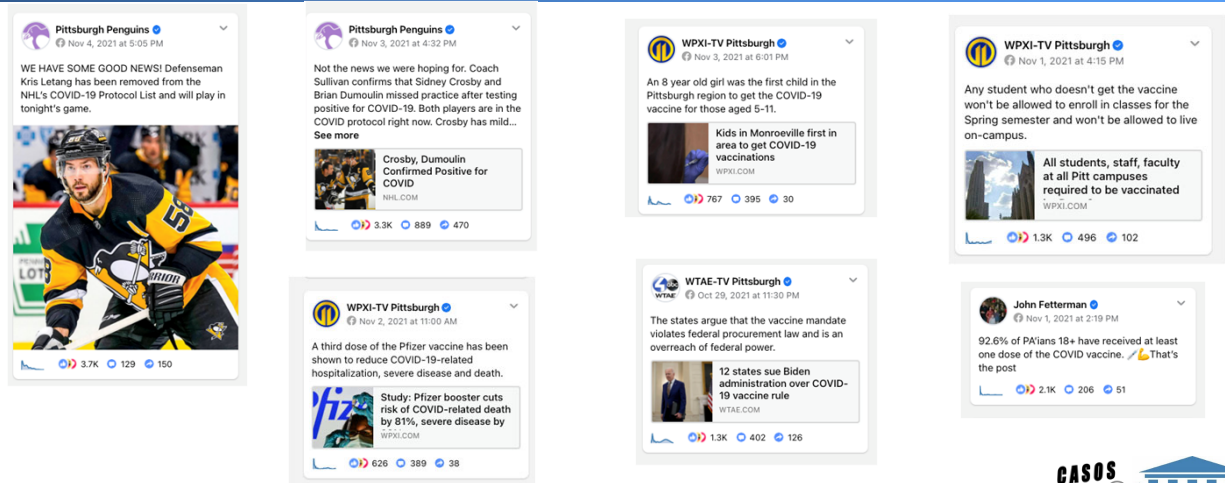
\*support for vaccines may appear in this section if the comments on that post were expressing criticism of that post.

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## Trending Posts on Facebook October 29 – November 4

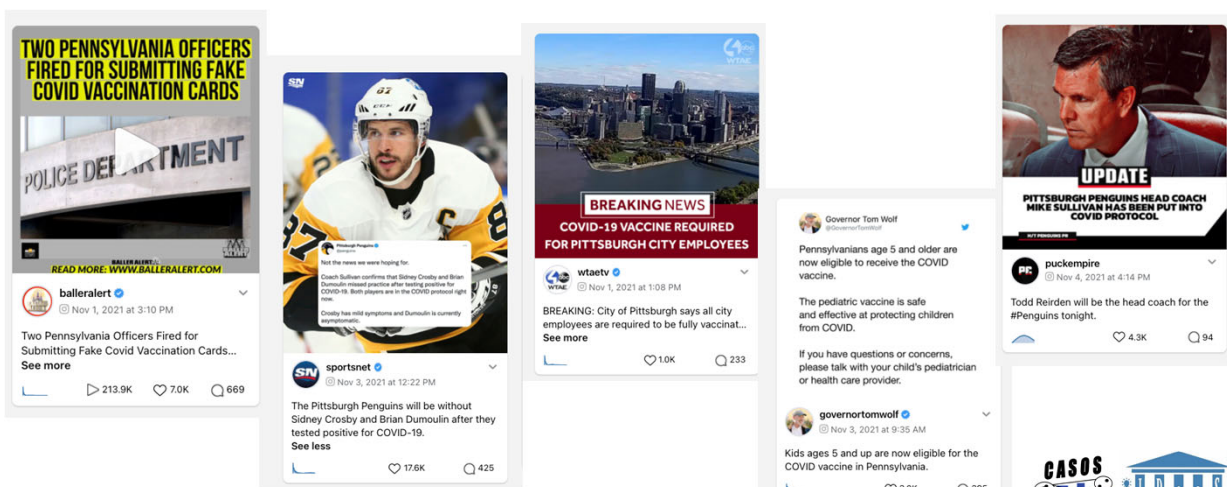


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## Trending Posts on Instagram October 29 – November 4



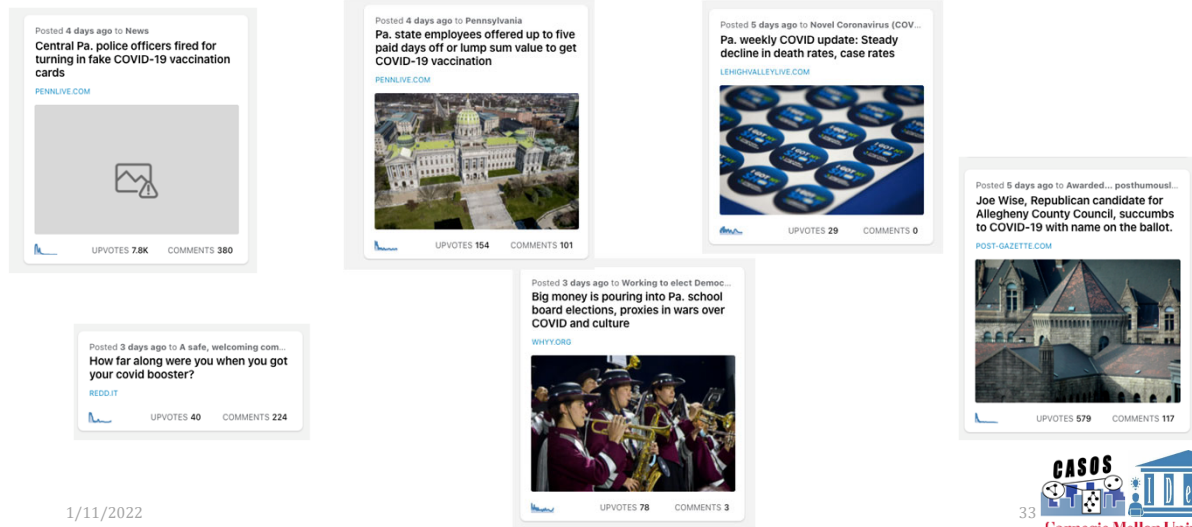
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## Trending Posts on Reddit October 29 – November 4



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## For More Information

- ❑ Director Kathleen M. Carley - [kathleen.carley@cs.cmu.edu](mailto: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

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