

# PA Vaccine Conversations and Misinformation on Twitter

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Vaccine Hesitancy Project Update based on September 10 – September 16, 2021

The CMU centers for:

Informed DEMocracy And Social cyber-security

Computational Analysis of Social and Organizational Systems



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- ❑ This report is an effort to summarize social media conversations around COVID-19 issues in Pennsylvania, focusing on vaccination. It contains an analysis of the general topics about the current pandemic, such as COVID-19 regulations, mandates, masks, pro-and anti-vaccination campaigns, as well as other topics related to COVID-19 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.

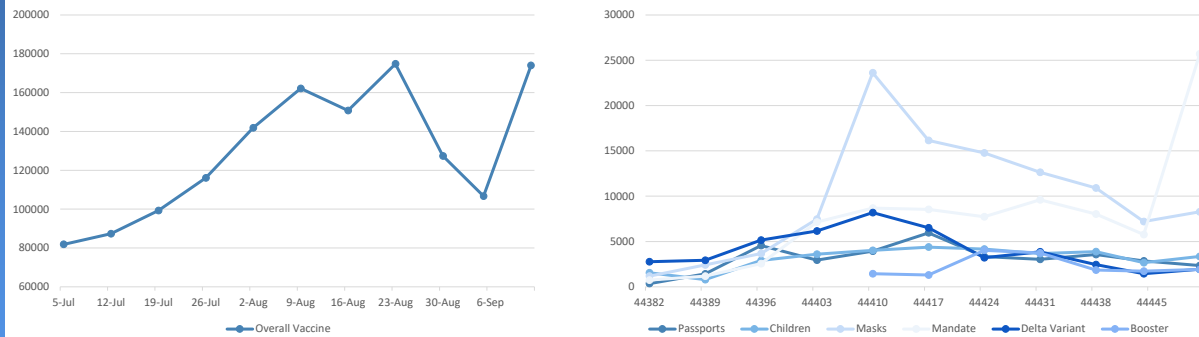
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## Trends (tweets per week) September 10– September 16



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## High Level View by City September 10 – September 16

	Total PA		Philadelphia		Pittsburgh		Erie		Allentown/Bethlehem		Other	
Conversation	Tweets	%	Tweets	%	Tweets	%	Tweets	%	Tweets	%	Tweets	%
Overall Vaccine	147376		81859	55.5%	33587	22.8%	1537	1.0%	25871	17.6%	4522	3.1%
Vaccine Passports	2313		1090	1.3%	575	1.7%	28	1.8%	580	2.2%	40	0.9%
FDA Approval	808		403	0.5%	206	0.6%	19	1.2%	147	0.6%	33	0.7%
Boosters	1905		959	1.2%	446	1.3%	8	0.5%	405	1.6%	87	1.9%
Misinfo: Shedding	32		18	0.0%	9	0.0%	1	0.1%	4	0.0%		
"Experimental"	385		184	0.2%	97	0.3%	7	0.5%	89	0.3%	8	0.2%
Children	2493		1376	1.7%	514	1.5%	28	1.8%	508	2.0%	67	1.5%
Myocarditis	356		197	0.2%	73	0.2%	4	0.3%	74	0.3%	8	0.2%
Heart	1263		679	0.8%	276	0.8%	18	1.2%	252	1.0%	38	0.8%
Masks	8159		4054	5.0%	1963	5.8%	141	9.2%	1466	5.7%	535	11.8%
Infertility	134		109	0.1%	12	0.0%	2	0.1%	11	0.0%		
Mandates	25458		13336	16.3%	5122	15.2%	333	21.7%	5811	22.5%	856	18.9%
Natural Immunity	2788		1616	2.0%	613	1.8%	21	1.4%	501	1.9%	37	0.8%
Efficacy	303		154	0.2%	73	0.2%	2	0.1%	66	0.3%	8	0.2%
Spike Proteins	122		72	0.1%	21	0.1%	5	0.3%	21	0.1%	3	0.1%
Delta Variant	2981		1708	2.1%	558	1.7%	33	2.1%	560	2.2%	122	2.7%
Race	2281		1299	1.6%	503	1.5%	29	1.9%	373	1.4%	77	1.7%
Ivermectin	618		318	0.4%	140	0.4%	12	0.8%	133	0.5%	15	0.3%
Military	1169		577	0.7%	239	0.7%	27	1.8%	286	1.1%	40	0.9%
Breakthrough	793		491	0.6%	150	0.4%	6	0.4%	124	0.5%	22	0.5%

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- President Biden's mandate announcement drove numbers this week
- Trending conversations:
  - Mandates
  - Myocarditis
  - Infertility
  - Military

## High Level View by County September 10 – September 16

County	Allegheny	Beaver	Butler	Cambria	Fayette	Indiana	Somerset	Westmoreland
Overall Vaccine	34173	61	115	31	104	8	19	116
Vaccine Passports	579				1			1
Not FDA Approved	216							
Boosters	453		2	2	1		2	5
Misinfo: Shedding	9							
"Experimental"	99							
Children	524		3		3	1		
Myocarditis	73		3					
Heart	280		1					2
Masks	2038	13	12	5	7	2	4	15
Infertility	12							
Mandates	5217	9	31		24	4	3	27
Natural Immunity	617		4		1			2
Efficacy	74				1			
Spike Proteins	21		1					
Delta Variant	574		3		3			2
Race	512		1		1			2
Ivermectin	143				1			
Military	242				4			1
Breakthrough	153				2			1

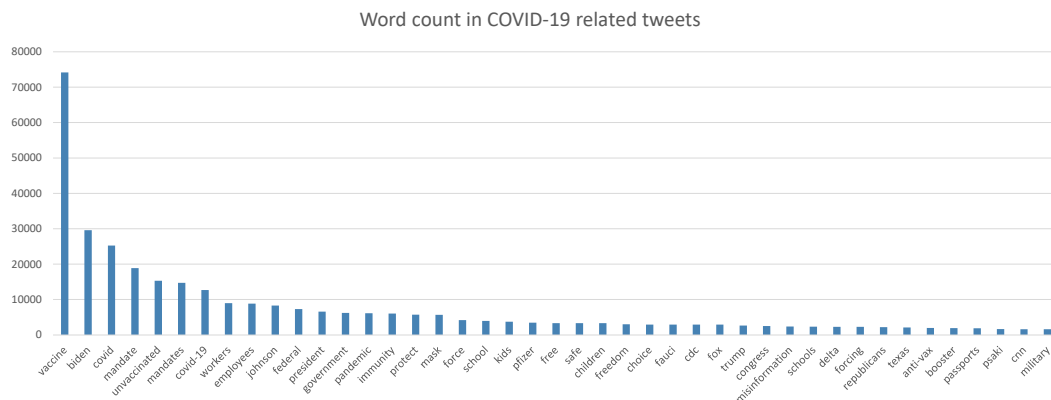
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- Tweets counted here if there is a county location attached
- Race: pulled by one of the vaccine keywords plus at least one other term in ("Black", "African American", "of color", "Latin", "Hispanic", "brown", "eugenic")



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## Top Words Used per Week September 10 – September 16



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## Top Hashtags by County September 10 – September 16

❑ 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	Butler	Cambria	Fayette	West Moreland
covid19 (584)	covid19 (4)	getvaccinated (1)	covid19 (2)	covid19 (4)
steelers (251)	getvaccinated (2)	gotmyshotpa (1)	getvaccinated (2)	bills (2)
herewego (244)	vaccinemandate (2)	herewego (1)	mycousintookthevaccine (2)	foxnews (2)
getvaccinated (212)	donotcomply (1)	paproud (1)	biden (1)	nomandates (1)
vaccinemandate (169)	massnoncompliance (1)	ratherbevaccinated (1)	deltavariant (1)	vaccinemandate (1)

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## Top Hashtags by City September 10 – September 16

❑ 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 (847)	covid19 (172)	covid19 (197)	covid19 (577)	covid19 (18)	covid19 (396)	covid19 (73)
getvaccinated (400)	getvaccinated (66)	getvaccinated (75)	herewego (242)	demvoice1 (17)	getvaccinated (150)	getvaccinated (40)
vaccinemandate (261)	vaccinemandate (51)	vaccinemandate (66)	steelers (240)	getvaccinated (16)	vaccinemandate (128)	wearamask (25)
vaxupphilly (204)	vaccine (38)	covidvaccine (26)	getvaccinated (207)	vaccinemandate (14)	donotcomply (65)	vaccinemandate (21)
donotcomply (151)	ronaron (25)	donotcomply (23)	vaccinemandate (166)	covid (8)	pfizer (51)	steelers (20)

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## Top URLs by County September 10 – September 16

Allegheny	Butler + Beaver	Cambria	Fayette	West Moreland
<a href="https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees">https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees</a> Biden to announce vaccine mandate for companies with more than 100 employees (377)	<a href="https://pittsburgh.cbslocal.com/2021/09/13/allegheny-county-council-mask-mandate-legislation/">https://pittsburgh.cbslocal.com/2021/09/13/allegheny-county-council-mask-mandate-legislation/</a> 2 Allegheny County Councilmembers To Introduce Mask Requirement Legislation (3)	<a href="https://wjactv.com/news/local/is-it-worth-a-shot-johnstown-native-shares-covid-booster-experience">https://wjactv.com/news/local/is-it-worth-a-shot-johnstown-native-shares-covid-booster-experience</a> Is it worth a shot? Johnstown native shares COVID-19 booster vaccine experience (1)	<a href="http://hill.cm/8XJqmFb">http://hill.cm/8XJqmFb</a> Howard Stern rips vaccine opponents: 'F--- their freedom, I want my freedom to live' (3)	<a href="https://twitter.com/kdka/status/1437478846115221505">https://twitter.com/kdka/status/1437478846115221505</a> Masks would be required in Allegheny County at all indoor public gatherings and outdoor gatherings of more than 250 people under legislation that will be introduced tomorrow (2)
<a href="https://secure.actblue.com/donate/johnsongotrich?refcode=RABRD&amp;amount=25">https://secure.actblue.com/donate/johnsongotrich?refcode=RABRD&amp;amount=25</a> "Johnson got rich. Wisconsinites got sick" Help Put Up These Billboards Across Wisconsin (232)	<a href="https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees">https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees</a> Biden to announce vaccine mandate for companies with more than 100 employees (3)	<a href="https://wpxi.tv/3lsEYKb">https://wpxi.tv/3lsEYKb</a> Pittsburgh Border Protection officers seize nearly 70 counterfeit COVID-19 vaccination cards (1)	<a href="https://twitter.com/buffalobabres/status/1437841031534452747">https://twitter.com/buffalobabres/status/1437841031534452747</a> An update on the vaccination policy at @KeyBankCtr (2)	<a href="http://hill.cm/8XJqmFb">http://hill.cm/8XJqmFb</a> Howard Stern rips vaccine opponents: 'F--- their freedom, I want my freedom to live' (1)
<a href="http://reut.rs/3zQVBEU">http://reut.rs/3zQVBEU</a> U.S. CDC chief says there will be no federal mandate on COVID-19 vaccine (223)	<a href="https://pittsburgh.cbslocal.com/2021/09/09/president-joe-biden-vaccine-mandates-100-million-americans/">https://pittsburgh.cbslocal.com/2021/09/09/president-joe-biden-vaccine-mandates-100-million-americans/</a> President Joe Biden Announces Sweeping New Vaccine Mandates For 100 Million Americans (2)	<a href="https://www.cnn.com/2021/09/10/business/biden-vaccine-mandate/index.html">https://www.cnn.com/2021/09/10/business/biden-vaccine-mandate/index.html</a> Here's who loves Biden's vaccine mandate: The companies that have to enforce it (1)	<a href="http://a.msn.com/01/en-us/AAOmfpP?ocid=st">http://a.msn.com/01/en-us/AAOmfpP?ocid=st</a> A hospital says it won't deliver babies after staffers resigned over coronavirus vaccine mandate (1)	<a href="http://hill.cm/W2ZVXKG">http://hill.cm/W2ZVXKG</a> Justice Department sues Texas over 'unconstitutional' abortion law (1)
<a href="https://www.newsweek.com/members-congress-staff-exempt-biden-covid-vaccine-mandate-1627859?utm_medium=Social&amp;utm_source=Twitter#Echobox=1631289096">https://www.newsweek.com/members-congress-staff-exempt-biden-covid-vaccine-mandate-1627859?utm_medium=Social&amp;utm_source=Twitter#Echobox=1631289096</a> Members of Congress and Their Staff Are Exempt From Biden's Vaccine Mandate (164)	<a href="http://apne.ws/Frqn5LY">http://apne.ws/Frqn5LY</a> United lays out employee rules as vaccine requirement looms (2)	<a href="https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees">https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees</a> Biden to announce vaccine mandate for companies with more than 100 employees (1)	<a href="http://ow.ly/ZeKd50G6StX">http://ow.ly/ZeKd50G6StX</a> Pharmacist Removes Vaccination Barriers by Bringing Vaccines to the Public (1)	<a href="http://reut.rs/3BTRoGi">http://reut.rs/3BTRoGi</a> Moderna working on combination COVID-19 vaccine booster and flu shot (1)
<a href="https://apnews.com/article/joe-biden-business-health-coronavirus-pandemic-executive-branch-18fb12993f05be13bf760946af6fb89be">https://apnews.com/article/joe-biden-business-health-coronavirus-pandemic-executive-branch-18fb12993f05be13bf760946af6fb89be</a> Sweeping new vaccine mandates for 100 million Americans (132)	<a href="https://www.cdc.gov/mmwr/volumes/70/wr/mm7037e1.htm?s_cid=mm7037e1_w">https://www.cdc.gov/mmwr/volumes/70/wr/mm7037e1.htm?s_cid=mm7037e1_w</a> Monitoring Incidence of COVID-19 Cases, Hospitalizations, and Deaths, by Vaccination Status (2)	<a href="https://www.inquirer.com/health/coronavirus/kariko-weissman-breakthrough-prize-covid19-vaccine-biotech-20210909.html">https://www.inquirer.com/health/coronavirus/kariko-weissman-breakthrough-prize-covid19-vaccine-biotech-20210909.html</a> Penn scientists win \$3 million Breakthrough Prize for RNA research that enabled COVID-19 vaccines (1)	<a href="http://reut.rs/3zQVBEU">http://reut.rs/3zQVBEU</a> U.S. CDC chief says there will be no federal mandate on COVID-19 vaccine (1)	<a href="http://www.pa.gov/guide/get-vaccinated/">http://www.pa.gov/guide/get-vaccinated/</a> Getting the COVID Vaccine (1)

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## Top URLs by City September 10 – September 16

Philadelphia	Chester	Norristown	Pittsburgh	Erie	Allentown/ Bethlehem	Other
<a href="https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees">https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees</a> Biden to announce vaccine mandate for companies with more than 100 employees (434)	<a href="https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees">https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees</a> Biden to announce vaccine mandate for companies with more than 100 employees (59)	<a href="https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees">https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees</a> Biden to announce vaccine mandate for companies with more than 100 employees (67)	<a href="https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees">https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees</a> Biden to announce vaccine mandate for companies with more than 100 employees (13)	<a href="https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees">https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees</a> Biden to announce vaccine mandate for companies with more than 100 employees (13)	<a href="https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees">https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees</a> Biden to announce vaccine mandate for companies with more than 100 employees (190)	<a href="https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees">https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees</a> Biden to announce vaccine mandate for companies with more than 100 employees (35)
<a href="https://n.pr/3W491">https://n.pr/3W491</a> With Robert E. Lee's Statue Gone, Virginia Reveals Some New Plans For Its Pedestal (276)	<a href="https://rairfoundation.com/exposed-cdc-rushed-to-change-definition-of-vaccination-on-same-day-israel-study-touts-natural-immunity-over-vaccine/">https://rairfoundation.com/exposed-cdc-rushed-to-change-definition-of-vaccination-on-same-day-israel-study-touts-natural-immunity-over-vaccine/</a> Exposed: CDC Rushed to Change Definition of 'Vaccination' After Israel Study Touts Natural Immunity over Vaccine (37)	<a href="https://rumble.com/vm936v-whistleblower-nurse-destroys-delta-narrative-vaccinated-patients-fill-hosp.html">https://rumble.com/vm936v-whistleblower-nurse-destroys-delta-narrative-vaccinated-patients-fill-hosp.html</a> Whistleblower! Nurse DESTROYS "Delta" Narrative, VACCINATED Patients Fill Hospital (50)	<a href="https://secure.actblue.com/donate/johnsongotrich?refcode=RABRD&amp;amount=25">https://secure.actblue.com/donate/johnsongotrich?refcode=RABRD&amp;amount=25</a> "Johnson got rich. Wisconsinites got sick" Help Put Up These Billboards Across Wisconsin (232)	<a href="https://apnews.com/article/joe-biden-business-health-coronavirus-pandemic-executive-branch-18fb12993f05be13bf760946af6fb89be">https://apnews.com/article/joe-biden-business-health-coronavirus-pandemic-executive-branch-18fb12993f05be13bf760946af6fb89be</a> Sweeping new vaccine mandates for 100 million Americans (9)	<a href="https://www.telegraph.co.uk/news/2021/09/09/teenage-boys-risk-vaccines-covid-19/">https://www.telegraph.co.uk/news/2021/09/09/teenage-boys-risk-vaccines-covid-19/</a> Teenage boys more at risk from vaccines than Covid (95)	<a href="https://www.newsweek.com/members-congress-staff-exempt-biden-covid-vaccine-mandate-1627859?utm_medium=Social&amp;utm_source=Twitter#Echobox=1631289096">https://www.newsweek.com/members-congress-staff-exempt-biden-covid-vaccine-mandate-1627859?utm_medium=Social&amp;utm_source=Twitter#Echobox=1631289096</a> Members of Congress and Their Staff Are Exempt From Biden's Vaccine Mandate (18)
<a href="http://vaccines.gov">http://vaccines.gov</a> (189)	<a href="https://rumble.com/vm936v-whistleblower-nurse-destroys-delta-narrative-vaccinated-patients-fill-hosp.html">https://rumble.com/vm936v-whistleblower-nurse-destroys-delta-narrative-vaccinated-patients-fill-hosp.html</a> Whistleblower! Nurse DESTROYS "Delta" Narrative, VACCINATED Patients Fill Hospital! (35)	<a href="http://vaccines.gov">http://vaccines.gov</a> (43)	<a href="http://reut.rs/3zQVBEU">http://reut.rs/3zQVBEU</a> U.S. CDC chief says there will be no federal mandate on COVID-19 vaccine (223)	<a href="https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/mrna.html">https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/mrna.html</a> (9)	<a href="https://www.newsweek.com/members-congress-staff-exempt-biden-covid-vaccine-mandate-1627859?utm_medium=Social&amp;utm_source=Twitter#Echobox=1631289096">https://www.newsweek.com/members-congress-staff-exempt-biden-covid-vaccine-mandate-1627859?utm_medium=Social&amp;utm_source=Twitter#Echobox=1631289096</a> Members of Congress and Their Staff Are Exempt From Biden's Vaccine Mandate (89)	<a href="https://thefederalist.com/2015/02/03/the-insane-vaccine-debate/">https://thefederalist.com/2015/02/03/the-insane-vaccine-debate/</a> The Insane Vaccine Debate We've had mandatory vaccine policies in the U.S. since before the Emancipation Proclamation. Why are they controversial now? (14)
<a href="https://www.newsweek.com/members-congress-staff-exempt-biden-covid-vaccine-mandate-1627859?utm_medium=Social&amp;utm_source=Twitter#Echobox=1631289096">https://www.newsweek.com/members-congress-staff-exempt-biden-covid-vaccine-mandate-1627859?utm_medium=Social&amp;utm_source=Twitter#Echobox=1631289096</a> Members of Congress and Their Staff Are Exempt From Biden's Vaccine Mandate (164)	<a href="https://www.telegraph.co.uk/news/2021/09/09/teenage-boys-risk-vaccines-covid-19/">https://www.telegraph.co.uk/news/2021/09/09/teenage-boys-risk-vaccines-covid-19/</a> Teenage boys more at risk from vaccines than Covid (31)	<a href="https://apnews.com/article/joe-biden-business-health-coronavirus-pandemic-executive-branch-18fb12993f05be13bf760946af6fb89be">https://apnews.com/article/joe-biden-business-health-coronavirus-pandemic-executive-branch-18fb12993f05be13bf760946af6fb89be</a> Sweeping new vaccine mandates for 100 million Americans (38)	<a href="https://www.newsweek.com/members-congress-staff-exempt-biden-covid-vaccine-mandate-1627859?utm_medium=Social&amp;utm_source=Twitter#Echobox=1631289096">https://www.newsweek.com/members-congress-staff-exempt-biden-covid-vaccine-mandate-1627859?utm_medium=Social&amp;utm_source=Twitter#Echobox=1631289096</a> Members of Congress and Their Staff Are Exempt From Biden's Vaccine Mandate (162)	<a href="https://twitter.com/johnnie123123/status/1428705223447437318?vid=19">https://twitter.com/johnnie123123/status/1428705223447437318?vid=19</a> 'Did you see this? Pfizer: 39% effectiveness against infection with Delta.' (5)	<a href="https://twitter.com/phillipwegmann/status/1436049266548649992">https://twitter.com/phillipwegmann/status/1436049266548649992</a> Biden to direct the Labor Department to develop rule requiring any employer with 100 or more employees to get their workforce vaccinated or require unvaccinated employees to test negative on "a weekly basis." (58)	<a href="http://hill.cm/8XJqmFb">http://hill.cm/8XJqmFb</a> Howard Stern rips vaccine opponents: 'F--- their freedom, I want my freedom to live' (12)
<a href="https://rumble.com/vmbinu-study-finds-vaccinated-patients-27-times-more-likely-to-develop-covid-sympt.html">https://rumble.com/vmbinu-study-finds-vaccinated-patients-27-times-more-likely-to-develop-covid-sympt.html</a> Study finds vaccinated patients 27 times more likely to develop COVID symptoms than unvaccinated (158)	<a href="https://www.oann.com/rep-massie-points-out-cdc-changing-definition-of-vaccination/">https://www.oann.com/rep-massie-points-out-cdc-changing-definition-of-vaccination/</a> Rep. Massie Points Out CDC Changing Definition Of 'Vaccination' (26)	<a href="https://apnews.com/article/joe-biden-business-health-coronavirus-pandemic-executive-branch-18fb12993f05be13bf760946af6fb89be">https://apnews.com/article/joe-biden-business-health-coronavirus-pandemic-executive-branch-18fb12993f05be13bf760946af6fb89be</a> Sweeping new vaccine mandates for 100 million Americans (131)	<a href="https://www.bitchute.com/video/muKdUdG7w/">https://www.bitchute.com/video/muKdUdG7w/</a> ONE OF AMERICA'S FINEST DOCTORS PETER MCCULLOUGH NAILS COVID AND THE VAX (5)	<a href="https://www.kiro7.com/news/trending/ny-hospital-pause-baby-deliveries-after-staffers-quit-over-vaccine-mandate/NMBM0G6VTF1T5DDAMXV46D65194">https://www.kiro7.com/news/trending/ny-hospital-pause-baby-deliveries-after-staffers-quit-over-vaccine-mandate/NMBM0G6VTF1T5DDAMXV46D65194</a> NY hospital to pause baby deliveries after staffers quit over vaccine mandate (56)	<a href="https://bit.ly/387O83a">https://bit.ly/387O83a</a> 'Huge number' of unvaccinated Delta workers got vaccine after \$200 surcharge announcement, official says (11)	

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## Top Influencers by County September 10 – September 16

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

Allegheny	Butler	Cambria	Fayette	West Moreland	Beaver	Somerset
FoxNews	Skywatcher1138	GJSDnews	mommydog67	MartyGriffinKD	colin_dunlap	markscheig
MSNBC	datavortex	ConemaughHealth	BroncoBaby10 (high bot score)	SenJudySchwank	TribLiveHSSN	j_abramowich23
KDKA	TheDanKingerski	andresintheory	wvudavis	PeaceLovePgh	QUIPDOGG34	Rosebud1668 (high bot score)
NationalFile	BubbaJumpInc	Ekodeb1 (high bot score)	mattyic3	drkomanduri	seanfitz50	MLH414
SafetyPinDaily	TaylorHaasePGH	NicoleFuschino	Gigi419 (antivax, high bot score)	j_a155	Jordan8806	BrandTran

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

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## Top Influencers by City September 10 – September 16

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

Philadelphia	Chester	Norristown	Pittsburgh	Erie	Allentown/Bethlehem	Other
ElectionWiz	drccraigwax	ThorDeplorable	FoxNews	DBChirpy (high bot score)	mdnij34	POTUS
smerconish	SicarioScott (high bot score)	0MaxCooper0	MSNBC	ErieNewsNow	CassyWearsHeels	JackPosobiec
PHLPublicHealth	TrumpPuppy9 (high bot score)	PoliticusSarah	KDKA	cap44031	JLVsTW1	joncoopertweets
zerohedg	reopenpa	crampell	NationalFile	BlyntJames (high bot score)	barstoolsports	JoeBiden
SteveDeaceShow	Varadmehta (high bot score)	ClaudetteGGibs1	SafetyPinDaily	ECDOH	AdamBaldwin	DailyCaller

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

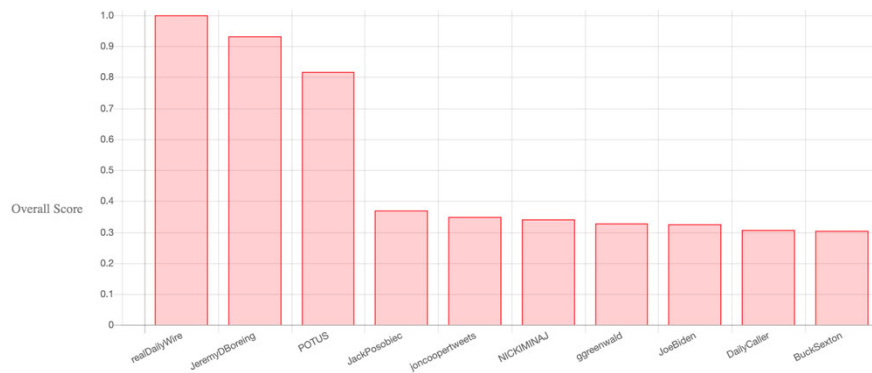
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## Analysis of Tweeters - Super Spreaders

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



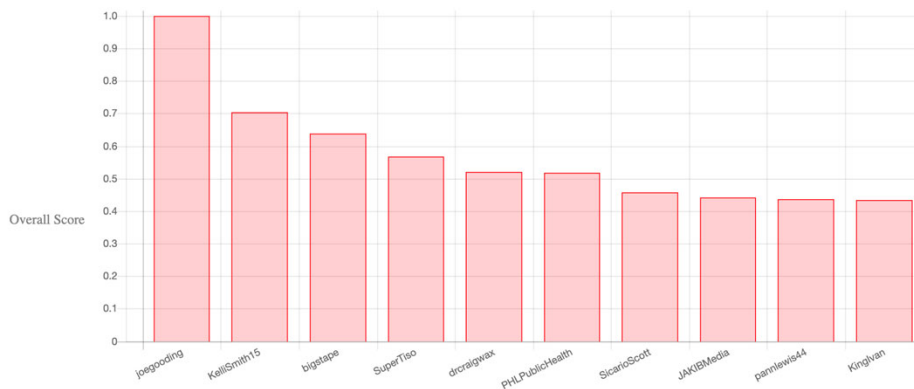
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## Analysis of Tweeters - Super Friends

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



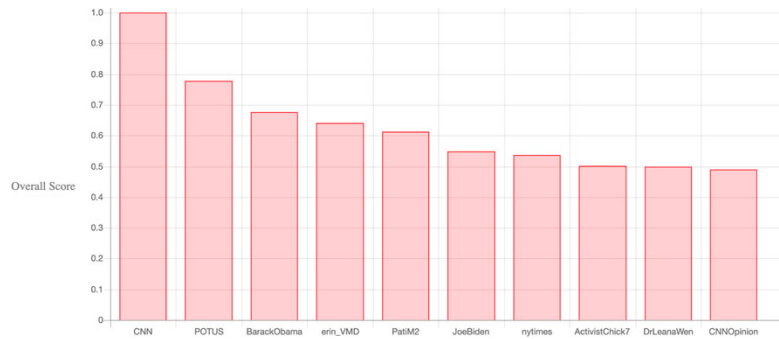
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## Analysis of Tweeters - Other Influencers

- 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="#">POTUS</a>	3135
<a href="#">JoeBiden</a>	1592
<a href="#">cheysam21</a>	1532
<a href="#">mtgreenee</a>	1367
<a href="#">NICKIMINAJ</a>	1063
<a href="#">AG4_ss</a>	968
<a href="#">RealCandaceQ</a>	872
<a href="#">FoxNews</a>	858
<a href="#">JackPosobiec</a>	839
<a href="#">catturd2</a>	638

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## Trending PA stories September 10 – September 16

- ❑ [newsweek.com](https://www.newsweek.com) - Members of Congress and their staff are exempt from Biden's vaccine mandate (220 Mentions)
- ❑ [telegraph.co.uk](https://www.telegraph.co.uk) - Teenage boys more at risk from vaccines than Covid (177 Mentions)
- ❑ [cnn.com](https://www.cnn.com) - France bans unvaccinated American travelers (136 Mentions)
- ❑ [vaccines.gov](https://www.vaccines.gov) - Vaccines.gov - Find COVID-19 vaccine locations near you (135 Mentions)
- ❑ [propublica.org](https://www.propublica.org) - A Boy Went to a COVID-Swamped ER. He Waited for Hours. Then His Appendix Burst (131 Mentions)
- ❑ [rawstory.com](https://www.rawstory.com) - Colorado pastor who mocked AIDS deaths and spread vaccine conspiracy theories dies from COVID-19 (98 Mentions)

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## Trending PA tweets September 10 – September 16

I would pay to watch footage of someone doing their "own research" on vaccines. Share your screen because I am absolutely dying to know what you're looking at

**347**  
Retweets

**3** **President Biden** [@potus](#)

My message to unvaccinated Americans is this: What more is there to wait for? What more do you need to see? We have made the vaccinations free, safe, and convenient. The vaccine has FDA approval. Over 200 million Americans have gotten at least one shot. Do the right thing.

**281**  
Retweets

A vaccine card that fits in your wallet?? With a QR code?? Must be nice living in a country ran by ppl with sense.

**295**  
Retweets

The bold move by [@POTUS](#) to impose vaccine mandates will save countless lives and protect our economy. Retweet if you agree. 🇺🇸

**273**  
Retweets

Here are the vaccines many already need(ed) just to go school: Chickenpox Diphtheria Hepatitis A&B Meningitis Measles Mumps Polio Pneumonia Rotavirus Rubella Tetanus Whooping Cough Adding one for COVID doesn't impact your freedom, it makes us all safer.

**261**  
Retweets

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20

## Trending PA tweets September 10 – September 16

I lost my father to a Covid breakthrough case today. He was 85 and fully vaxxed. So, when you see the stats today, know that one of the 18 who died from Covid was a man named Jerry Maffeo who happened to be my favorite person in the whole world. I am shattered.

**234**  
Retweets

Vaccine research is actually pretty easy. "Do I have polio? No. Why?"

**211**  
Retweets

My 9 year old still gets headaches and my 13 yr old can't smell or taste food. Nearly a month after Covid. I can't understand why anyone would want children maskless, unvaxxed and in crowded rooms at all. It breaks my heart to tell them "I don't know when you will feel better"

**222**  
Retweets

Republicans are making a big deal about Biden changing his mind about vaccine mandates, but the ability to change is the clearest sign of an intelligent mind. Biden changed because the situation changed: Delta variant.

**202**  
Retweets

i got the vaccine the minute i was allowed i would never ""do my own research"" i failed 11th grade biology 3 times

**198**  
Retweets

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## Top PA Twitter Authors September 10 – September 16

By mentions	By influence
@bob_levitt	@questlove
@rliberalskiddin	@malcolmnance
@erin_vmd	@6abc
@cdekeane	@fox29philly
@blyntjames	@accuweather
@mbfrat	@nbcphiladelphia
@pjmugs	@brithume
@mishao1989	@ericfisher
@kirkturner777	@phillyinquirer
@erickratz2	@nbcspilly

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## Trending negative PA stories September 10 – September 16

- ❑ [rawstory.com](http://rawstory.com) - 4-year-old girl dies from COVID-19 hours after developing symptoms -- now mom regrets being anti-vaxx (36 Mentions)
- ❑ [thegatewaypundit.com](http://thegatewaypundit.com) - According to VAERS Website: The US Is Averaging 70 Deaths per Day Due to COVID Vaccine Since July 24<sup>th</sup> -- Or 3,296 COVID Total Vaccine Deaths (22 Mentions)
- ❑ [childrenshealthdefense.org](http://childrenshealthdefense.org) - Biden to Lay Out 6-Prong Plan for More COVID Vaccine Mandates and Restrictions Targeting Unvaccinated (20 Mentions)
- ❑ [medrxiv.org](http://medrxiv.org) - Comparing SARS-CoV-2 natural immunity to vaccine-induced immunity: reinfections versus breakthrough infections (18 Mentions)
- ❑ [childrenshealthdefense.org](http://childrenshealthdefense.org) - Sign Up for our Free News and Updates! (13 Mentions)
- ❑ [childrenshealthdefense.org](http://childrenshealthdefense.org) - Children's Health Defense Responds to Biden's 'Declaration of War Against Unvaccinated' (13 Mentions)
- ❑ [childrenshealthdefense.org](http://childrenshealthdefense.org) - 'I Just Want My Life Back' Says 16-Year-Old Who Developed Neurological Symptoms After Pfizer Vaccine (13 Mentions)

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## Trending Negative PA tweets September 10 – September 16

My cousin got the vaccine and 3 days later, WHAM! stepped on a lego. Not saying it's vaccine-induced lego-foot, but do your own research.

**83**  
Retweets

Fox News' spreading of disinformation and lies about vaccines are causing people to die. Legal experts must find someone with standing and file a lawsuit.

**29**  
Retweets

Anyone who supports vaccine mandates forfeits their right to defend abortion with "my body, my choice."

**34**  
Retweets

LA plans to announce vaccine requirements not even 24 hours after the recall election. Coincidence? I think not. It was all about protecting Gavin. Now the flood gates of tyranny are about to bust open.

**27**  
Retweets

A forced vaccination is nothing short of violence

**26**  
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 September 10 – September 16

If you support a national vaccine mandate, but shout "my body, my choice!" in support of aborting of a baby with its OWN AUTONOMOUSLY BEATING HEART ... you might be an evil asshole.

**25**  
Retweets

Many Repubs believe face covering & vaccine mandates are government overreach. Controlling women's reproductive rights however, is not.

**16**  
Retweets

"Biden's efforts to coerce federal workers + those who have elected to remain unvaccinated is clearly in violation of Nuremberg Code, which has been incorporated into U.S. federal and state law. This is a sad day for ethics + rule of law." — Mary Holland <https://t.co/AV0HjSxxGg>

**20**  
Retweets

MY BODY, MY CHOICE. Maybe I want Candy for Breakfast, or maybe RAISIN BRAN. And maybe I got the "vaccine" and maybe I DIDN'T. The government can Stay-The-Hell-Out-Of-It.

**15**  
Retweets

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This is heart-breakin'. GET. VACCINATED. TODAY.  
<https://t.co/Uuue9GHB5n>

**15**  
Retweets



27

## Top PA Negative Twitter Authors September 10 – September 16

By mentions	By influence
@cdekeane	@malcolmnance
@mishao1989	@fox29philly
@radajjoei	@cbs21news
@faganomics1	@kywnnewsradio
@jesse_kozlowski	@ryanlcooper
@yankeegoessouth	@maxkennerly
@amyberlin16	@chris_1791
@kevskewl	@ameshaa
@kirkturner777	@phlpublichealth
@nolefturn1	@themadstone

\*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 September 10 – September 16

**WPXI-TV Pittsburgh** • Sep 10, 2021 at 11:45 PM  
30 hospital workers resigned over a Sept. 27 deadline to receive a first dose of COVID-19 vaccine.

**WPXI-TV Pittsburgh** • Sep 15, 2021 at 12:02 PM  
Pfizer's COVID-19 vaccine for children 5 to 11 years old could be authorized by Halloween.

**WPXI-TV Pittsburgh** • Sep 15, 2021 at 10:31 PM  
The family of an Illinois woman who died from COVID-19 despite receiving two Moderna doses published an obituary that blamed people who refused to get vaccinated for her death.

**KDKA-TV | CBS Pittsburgh** • Sep 15, 2021 at 1:30 PM  
Arizona has become the first state to sue the Biden administration over the COVID-19 vaccine mandates for federal workers and large companies.

**WPXI-TV Pittsburgh** • Sep 15, 2021 at 5:30 PM  
Parents reported to Channel 11 that wait times at the emergency room of UPMC Children's Hospital were up to EIGHT hours before their children were seen.

**WPXI-TV Pittsburgh** • Sep 15, 2021 at 10:31 PM  
Pittsburgh area hospitals seeing longer wait times for care

**KDKA-TV | CBS Pittsburgh** • Sep 15, 2021 at 1:30 PM  
Arizona becomes first state to sue Biden administration over

**WPXI-TV Pittsburgh** • Sep 15, 2021 at 10:31 PM  
Coronavirus: Illinois woman's obituary lists unvaccinated as cause of

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**CASOS**  
Carnegie Mellon University

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## Trending Posts on Facebook September 10 – September 16

**KDKA-TV | CBS Pittsburgh** • Sep 15, 2021 at 4:00 PM  
RARE PHENOMENON: Studies show that some folks may have hit the genetic jackpot, meaning their bodies can develop very high levels antibodies that neutralize the virus. They are also capable of fighting off present and future variants of COVID-19.

**WPXI-TV Pittsburgh** • Sep 13, 2021 at 10:14 AM  
In addition, those who are unvaccinated are 10 times more likely to be hospitalized with the most severe symptoms of the virus.

**WPXI-TV Pittsburgh** • Sep 10, 2021 at 2:08 PM  
The couple was thousands of miles away, but died hours apart from COVID-19.

**KDKA-TV | CBS Pittsburgh** • Sep 15, 2021 at 2:14 PM  
JUST IN: The feds have seized two shipments of dozens of fake COVID-19 vaccination cards in Pittsburgh.

**John Fetterman** • Sep 17, 2021 at 8:55 AM  
Let's Vax Pennsylvania. 🇺🇸

**WPXI-TV Pittsburgh** • Sep 13, 2021 at 10:14 AM  
CDC study: Unvaccinated people are 11 times more likely to die of COVID-19

**WPXI-TV Pittsburgh** • Sep 10, 2021 at 2:08 PM  
7 children orphaned after parents both die of COVID-19

**KDKA-TV | CBS Pittsburgh** • Sep 15, 2021 at 2:14 PM  
Dozens Of Counterfeit COVID-19 Vaccination Cards Seized in

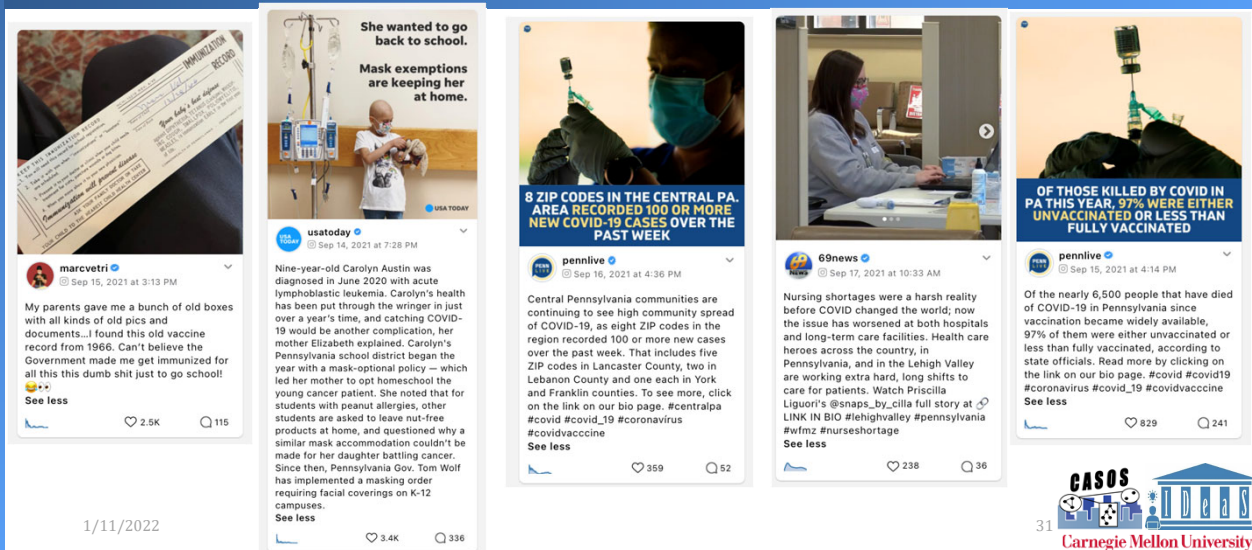
**John Fetterman** • Sep 17, 2021 at 8:55 AM  
Second Lady Fetterman, Secretary of Agriculture Promote Health, Food

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**CASOS**  
Carnegie Mellon University

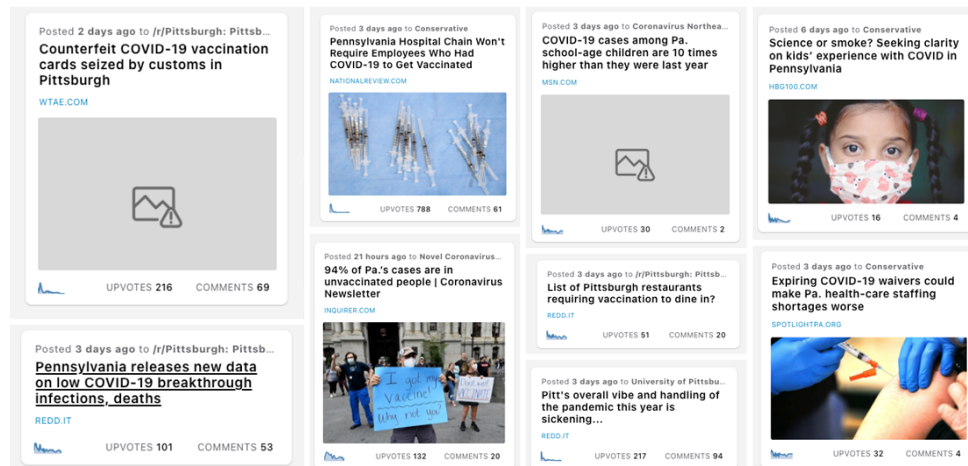
30

## Trending Posts on Instagram September 10 – September 16



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## Trending Posts on Reddit September 10 – September 16



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## General Trends September 10 – September 16

- ❑ This week, overall trending stories covered new mandates and regulations such as President Biden requiring federal workers to get vaccinated, mask mandates at schools and universities as well as vaccination requirements;
- ❑ Trending story this week: <https://www.foxnews.com/politics/biden-set-to-announce-vaccine-mandate-or-weekly-testing-for-companies-with-more-than-100-employees> Biden to announce vaccine mandate for companies with more than 100 employees
- ❑ Mandates and Masks conversations are the most popular (trending hashtags #novaccinemandates; #novaccinepassports and others were identified in trends) as well as the conversations about mandates at school, mentions of children/kids, vaccine passports, natural immunity, military, ivermectin and other topics. In addition to those issues, there are mentions of problems with hospital operations related to a high number of patients or a resignation of health workers over vaccine requirements;
- ❑ Trending disinformation stories: <https://rumble.com/vmbinu-study-finds-vaccinated-patients-27-times-more-likely-to-develop-covid-sympt.html> Study finds vaccinated patients 27 times more likely to develop COVID symptoms than unvaccinated; <https://rumble.com/vm936v-whistleblower-nurse-destroys-delta-narrative-vaccinated-patients-fill-hospt.html> Whistleblower! Nurse DESTROYS "Delta" Narrative, VACCINATED Patients Fill Hospital! ; <https://www.oann.com/rep-massie-points-out-cdc-changing-definition-of-vaccination/> Rep. Massie Points Out CDC Changing Definition Of 'Vaccination' ; <https://www.bitchute.com/video/muKdbUuDgTjw/> ONE OF AMERICA'S FINEST DOCTORS PETER MCCULLOUGH NAILS COVID AND THE VAX
- ❑ Facebook, Instagram, and Reddit messages also illustrated the overall concern about required vaccination and mask mandates, particularly for government workers and schools.

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## For More Information

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- ❑ 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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