

PA Vaccine Conversations on Twitter

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Vaccine Hesitancy Project Update based on March 4, 2022 – March 10, 2022

The CMU centers for:

Informed DEMocracy And Social cyber-security

Computational Analysis of Social and Organizational Systems



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PA Vaccine Conversations Project

- ❑ This report is an effort to summarize social media conversations around COVID-19 issues in Pennsylvania, with a focus on vaccination. It contains an analysis of the general topics related to COVID-19 vaccination. This includes discussions related to COVID-19 regulations, mandates, masks, pro-and anti-vaccination campaigns, science messages, misinformation, disinformation, conspiracy theories, and vaccine hesitancy messages.
- ❑ Anti-Vax messaging includes vaccine hesitancy messages, opinions, questions, policy health and science related information, misinformation, disinformation, and conspiracy theories.

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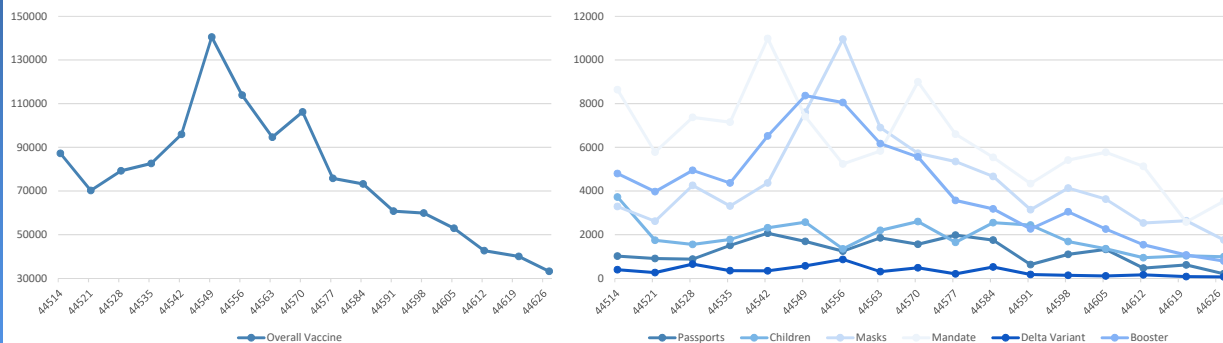
Report Overview February 25 – March 3

- ❑ This week's trending stories cover Mandates, Masks, Trucker Convoy, Ukraine, State of the Union are found in the trends this week (hashtags #sotu, #Ukraine, #Russia; trending tweets);
- ❑ Trending stories: [navytimes.com/news/your-navy/2022/03/08/destroyer-cant-deploy-because-co-wont-get-covid-vaccine-navy-says](https://www.navytimes.com/news/your-navy/2022/03/08/destroyer-cant-deploy-because-co-wont-get-covid-vaccine-navy-says) Destroyer can't deploy because CO won't get COVID vaccine, Navy says; [msn.com/en-us/news/world/vaccine-delivery-canceled-to-country-that-did-not-condemn-russia/ar-AAUKbha](https://www.msn.com/en-us/news/world/vaccine-delivery-canceled-to-country-that-did-not-condemn-russia/ar-AAUKbha) Vaccine Delivery Canceled to Country That Did Not Condemn Russia; twitter.com/i/events/1499406505254268931 Ontario government workers will no longer need to be vaccinated as of April 4; [nejm.org/doi/full/10.1056/NEJMoa2034577](https://www.nejm.org/doi/full/10.1056/NEJMoa2034577) Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine; [bloomberg.com/news/articles/2022-03-07/j-j-s-controversial-prison-testing-resurfaces-in-baby-powder-lawsuits](https://www.bloomberg.com/news/articles/2022-03-07/j-j-s-controversial-prison-testing-resurfaces-in-baby-powder-lawsuits) J&J's Controversial Prison Testing Resurfaces in Baby Powder Lawsuits; [slate.com/news-and-politics/2022/03/covid-vaccine-judge-navy-warship-religious-freedom.html](https://www.slate.com/news-and-politics/2022/03/covid-vaccine-judge-navy-warship-religious-freedom.html) An Anti-Vax Judge Is Preventing the Navy From Deploying a Warship; phmp.org/wp-content/uploads/2021/11/5.3.6-postmarketing-experience.pdf Pfizer report;
- ❑ Anti-vax, disinformation, and vaccine hesitancy stories: twitter.com/MichaelPSenger/status/1499902332980523008 Walensky: "When the CNN feed came that it was 95% effective, the vaccine, so many of us wanted it to be helpful, so many of us wanted to say, 'Ok this is our ticket out.'" Ok... But then you got millions fired and excluded from society for not taking it. (suspended); phmp.org/wp-content/uploads/2021/11/5.3.6-postmarketing-experience.pdf Pfizer report mentioned in negative tweets citing the list of side effects

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Trends (tweets per week) March 4 – March 10



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High Level View by City March 4 – March 10

| | Total PA | Philadelphia | | Pittsburgh | | Erie | | Allentown/Bethlehem | | Other | |
|-------------------|----------|--------------|-------|------------|-------|--------|------|---------------------|-------|--------|-------|
| Conversation | Tweets | Tweets | % | Tweets | % | Tweets | % | Tweets | % | Tweets | % |
| Overall Vaccine | 27512 | 13487 | 49.0% | 9364 | 34.0% | 269 | 1.0% | 3287 | 11.9% | 1105 | 4.0% |
| Vaccine Passports | 208 | 113 | 0.8% | 55 | 0.6% | 2 | 0.7% | 35 | 1.1% | 3 | 0.3% |
| FDA Approval | 50 | 25 | 0.2% | 11 | 0.1% | | | 13 | 0.4% | 1 | 0.1% |
| Boosters | 526 | 356 | 2.6% | 81 | 0.9% | 3 | 1.1% | 65 | 2.0% | 21 | 1.9% |
| Employees | 89 | 42 | 0.3% | 19 | 0.2% | 2 | 0.7% | 21 | 0.6% | 5 | 0.5% |
| "Experimental" | 76 | 40 | 0.3% | 23 | 0.2% | | | 12 | 0.4% | 1 | 0.1% |
| Children | 751 | 402 | 3.0% | 159 | 1.7% | 9 | 3.3% | 147 | 4.5% | 34 | 3.1% |
| Myocarditis | 185 | 67 | 0.5% | 71 | 0.8% | | | 34 | 1.0% | 13 | 1.2% |
| Heart | 320 | 144 | 1.1% | 109 | 1.2% | 5 | 1.9% | 52 | 1.6% | 10 | 0.9% |
| Masks | 1738 | 911 | 6.8% | 424 | 4.5% | 18 | 6.7% | 248 | 7.5% | 137 | 12.4% |
| Thrombosis/VITT | 32 | 21 | 0.2% | 7 | 0.1% | | | 2 | 0.1% | 2 | 0.2% |
| Mandates | 3437 | 1019 | 7.6% | 1989 | 21.2% | 22 | 8.2% | 315 | 9.6% | 92 | 8.3% |
| Natural Immunity | 146 | 65 | 0.5% | 49 | 0.5% | 2 | 0.7% | 28 | 0.9% | 2 | 0.2% |
| Efficacy | 104 | 50 | 0.4% | 20 | 0.2% | 1 | 0.4% | 31 | 0.9% | 2 | 0.2% |
| Omicron | 152 | 70 | 0.5% | 46 | 0.5% | | | 20 | 0.6% | 16 | 1.4% |
| Delta Variant | 66 | 21 | 0.2% | 9 | 0.1% | 1 | 0.4% | 7 | 0.2% | 28 | 2.5% |
| Race | 877 | 499 | 3.7% | 216 | 2.3% | 8 | 3.0% | 110 | 3.3% | 44 | 4.0% |
| Ivermectin | 37 | 20 | 0.1% | 13 | 0.1% | | | 2 | 0.1% | 2 | 0.2% |
| Military | 161 | 82 | 0.6% | 42 | 0.4% | 1 | 0.4% | 25 | 0.8% | 11 | 1.0% |
| Breakthrough | 16 | 9 | 0.1% | 4 | 0.0% | | | 1 | 0.0% | 2 | 0.2% |

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- Conversation topics trending this week over last
 - Myocarditis
 - Mandates
 - Racism



High Level View by County March 4 – March 10

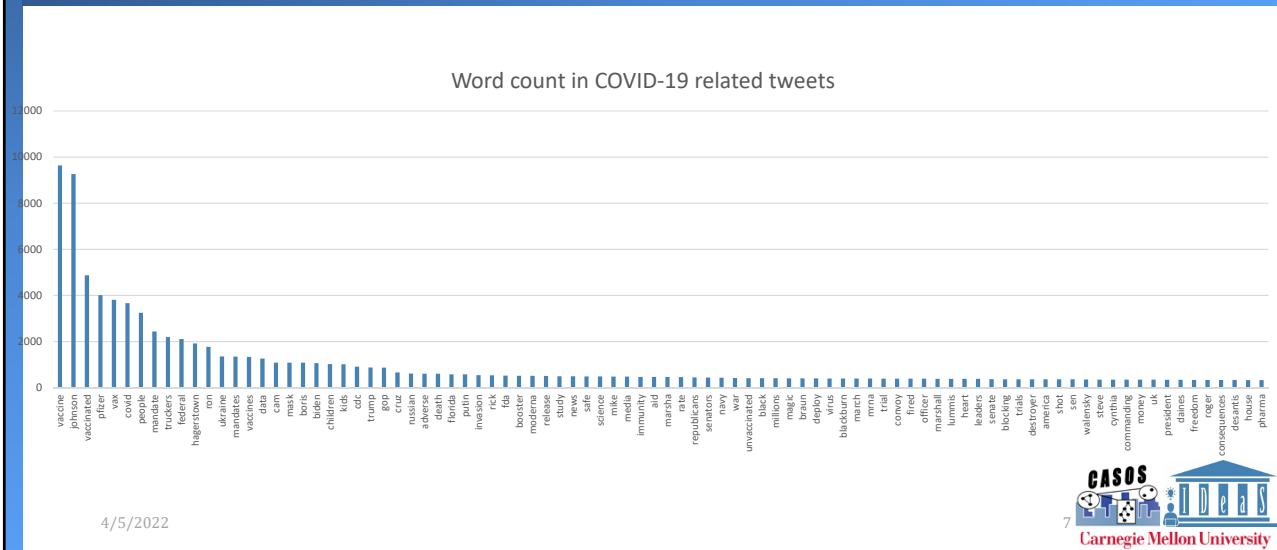
| County | Allegheny | Beaver | Butler | Cambria | Fayette | Indiana | Somerset | Westmoreland |
|-------------------|-----------|--------|--------|---------|---------|---------|----------|--------------|
| Overall Vaccine | 9556 | 15 | 16 | 6 | 13 | 9 | 0 | 27 |
| Vaccine Passports | 55 | | | | | | | |
| FDA | 12 | | | | | | | |
| Boosters | 84 | | 2 | | | | | |
| Employees | 20 | 1 | | | | | | |
| "Experimental" | 23 | | | | | | | |
| Children | 166 | | | | | 1 | | |
| Myocarditis | 72 | | | | | | | |
| Heart | 109 | | | | 1 | | | |
| Masks | 457 | 2 | 1 | 2 | 2 | 8 | | |
| Thrombosis/VITT | 7 | | | | | | | |
| Mandates | 2009 | 2 | | | 3 | | | 2 |
| Natural Immunity | 50 | | | | | | | |
| Efficacy | 20 | | | | | | | |
| Omicron | 53 | | | 1 | | | | |
| Delta Variant | 15 | | | | | | | 1 |
| Race | 221 | 1 | 2 | | | | | 2 |
| Ivermectin | 13 | | | | | | | |
| Military | 44 | | | | | | | |
| Breakthrough | 5 | | | | | | | |

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- 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 Words Used per Week March 4 – March 10



Top Hashtags by County March 4 – March 10

- ❑ 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 (171) | covid19 (1) | vaccinessavelives (1) | covid (1) | runforyourlife (1) |
| vaccinesideeffects (123) | immunizeunder5s (1) | | desantisdeathcult (1) | steelers (1) |
| pfiger (117) | pgh (1) | | traitortrumpputinsupp t (1) | |
| ukraine (112) | | | | |
| russia (99) | | | | |

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Top Hashtags by City March 4 – March 10

- ❑ 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 (278) | vaccinesideeffects (27) | covid19 (39) | covid19 (169) | demvoice1 (6) | vaccinesideeffects (52) | vaccine (22) |
| ukraine (189) | vaccinationdrive (22) | vaccinesideeffects (36) | vaccinesideeffects (120) | covid19 (3) | covid19 (44) | covid19 (17) |
| pfizer (182) | pfizer (20) | pfizer (25) | pfizer (117) | teamsouthwestern (3) | vaccine (28) | ukraine (10) |
| russia (167) | covid19 (14) | vaccinationdrive (16) | ukraine (112) | vaccinesideeffects (3) | pfizer (18) | russia (9) |
| standwithukraine (166) | melindagates (9) | ukraine (15) | russia (99) | desantisroundtable (2) | ukraine (17) | fauci (7) |

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Top URLs by County March 4 – March 10

| Allegheny | Butler + Beaver | Cambria | Somerset | Fayette | West Moreland |
|---|---|--|---|---|---|
| navytimes.com/news/your-navy/2022/03/08/destroyer-cant-deploy-because-co-wont-get-covid-vaccine-navy-says Destroyer can't deploy because CO won't get COVID vaccine, Navy says (105) | bloomberg.com/news/articles/2022-03-07/j-j-s-controversial-prison-testing-resurfaces-in-baby-powder-lawsuits J&J's Controversial Prison Testing Resurfaces in Baby Powder Lawsuits (1) | bloomberg.com/news/articles/2022-03-01/hong-kong-virus-deaths-among-world-s-worst-on-at-risk-elderly Hong Kong's Covid Death Rate Is Now One of the World's Highest (1) | wapo.st/3H1sr2X Senate Republicans threaten to slow efforts to fund federal agencies, deliver aid to Ukraine(1) | nypost.com/2022/03/07/florida-to-become-1st-state-to-recommend-against-covid-vaccine-for-healthy-kids Florida to become 1st state to recommend against COVID vaccine for healthy kids (1) | gettr.com/post/pyd610fade COVER UP: Obama and Biden likely knew that the Ukrainian prosecutor looking into Burisma was a good guy. New information indicates that the State Department felt prosecutor Shokin, who Biden had fired, was a good guy. (2) |
| msn.com/en-us/news/world/vaccine-delivery-canceled-to-country-that-did-not-condemn-russia/ar-AAUKbha Vaccine Delivery Canceled to Country That Did Not Condemn Russia (93) | navytimes.com/news/your-navy/2022/03/08/destroyer-cant-deploy-because-co-wont-get-covid-vaccine-navy-says Destroyer can't deploy because CO won't get COVID vaccine, Navy says (1) | theatlantic.com/health/archive/1857/11/covid-us-death-rate/626972 HOW DID THIS MANY DEATHS BECOME NORMAL? (1) | | slate.com/news-and-politics/2022/03/covid-vaccine-judge-navy-warship-religious-freedom.html An Anti-Vax Judge Is Preventing the Navy From Deploying a Warship (1) | apli.us/bRoZ Deputy Director, Herbert F Johnson Museum of Art at Cornell University (1) |
| twitter.com/i/events/1499406505254268931 Ontario government workers will no longer need to be vaccinated as of April 4 (60) | reason.com/2022/03/01/covid-biden-state-of-the-union-schools-masks-over If COVID-19 Is Over for Congress, It Should Be Over for School Children Too (1) | | | | nyti.ms/37145Ah Los Angeles County is lifting its indoor mask mandate. (1) |
| nejm.org/doi/full/10.1056/NEJMoa2034572 Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine (55) | thelancet.com/journals/lanpub/article/PIIS2468-2667(22)00040-8/fulltext Maintaining face mask use before and after achieving different COVID-19 vaccination coverage levels: a modelling study (1) | | | | wsj.com/articles/new-york-city-to-drop-masking-in-schools-some-vaccine-rules-for-businesses-11646413673 New York City to Drop Masking in Schools, Some Vaccine Rules for Businesses (1) |
| twitter.com/MichaelPSenger/status/1499902332980523008 Walensky: "When the CNN feed came that it was 95% effective, the vaccine, so many of us wanted it to be helpful, so many of us wanted to say, 'Ok this is our ticket out.'" Ok... But then you got millions fired and excluded from society for not taking it. (suspended) (55) | | | | | pa.gov/get-vaccinated (1) |

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Top URLs by City March 4 – March 10

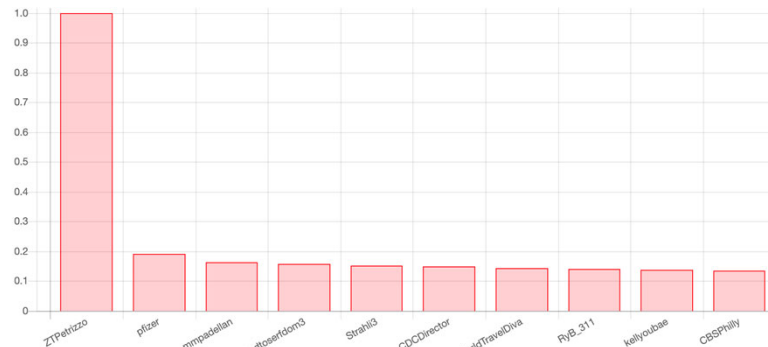
| Philadelphia | Chester | Norristown | Pittsburgh | Erie | Allentown/ Bethlehem | Other |
|---|--|--|---|---|--|---|
| msn.com/en-us/news/world/vaccine-delivery-canceled-to-country-that-did-not-condemn-russia/ar-AAUKbha Vaccine Delivery Canceled to Country That Did Not Condemn Russia (161) | bit.ly/3pZQExv (this url was blocked)(47) | aph.gov.au/e-petitions/petition/EN3886 Petition EN3886 - Cessation of vaccine mandates (18) | navytimes.com/news/your-navy/2022/03/08/destroyer-cant-deploy-because-co-wont-get-covid-vaccine-navy-says Destroyer can't deploy because CO won't get COVID vaccine, Navy says (105) | thetimes.co.uk/article/boris-johnsons-russian-crony-evgeny-lebedev-got-peerage-after-spies-dropped-warning-3dp6sw29x Boris Johnson's Russian crony Evgeny Lebedev got peerage after spies dropped warning (4) | navytimes.com/news/your-navy/2022/03/08/destroyer-cant-deploy-because-co-wont-get-covid-vaccine-navy-says Destroyer can't deploy because CO won't get COVID vaccine, Navy says (24) | bloomberg.com/news/articles/2022-03-07/j-j-s-controversial-prison-testing-resurfaces-in-baby-powder-lawsuits J&J's Controversial Prison Testing Resurfaces in Baby Powder Lawsuits (6) |
| bloomberg.com/news/articles/2022-03-07/j-j-s-controversial-prison-testing-resurfaces-in-baby-powder-lawsuits J&J's Controversial Prison Testing Resurfaces in Baby Powder Lawsuits (112) | biorxiv.org/content/10.1101/2022.02.03.479037v1.full.pdf Preprint - mRNA-1273 or mRNA-Omicron boost in vaccinated macaques elicits comparable B cell expansion, neutralizing antibodies and protection against Omicron (22) | navytimes.com/news/your-navy/2022/03/08/destroyer-cant-deploy-because-co-wont-get-covid-vaccine-navy-says Destroyer can't deploy because CO won't get COVID vaccine, Navy says (16) | msn.com/en-us/news/world/vaccine-delivery-canceled-to-country-that-did-not-condemn-russia/ar-AAUKbha Vaccine Delivery Canceled to Country That Did Not Condemn Russia (93) | erie.gov/vax (3) | icandecide.org/pfizer Pfizer Documents Produced by the FDA in FOIA Litigation (21) | navytimes.com/news/your-navy/2022/03/08/destroyer-cant-deploy-because-co-wont-get-covid-vaccine-navy-says Destroyer can't deploy because CO won't get COVID vaccine, Navy says (6) |
| slate.com/news-and-politics/2022/03/covid-vaccine-judge-navy-warship-religious-freedom.html An Anti-Vax Judge Is Preventing the Navy From Deploying a Warship (68) | rollingstone.com/culture/culture-features/jeffrey-epstein-bill-gates-connection-1206453 What Was the Real Relationship Between Jeffrey Epstein and Bill Gates? (22) | rollingstone.com/culture/culture-features/jeffrey-epstein-bill-gates-connection-1206453 What Was the Real Relationship Between Jeffrey Epstein and Bill Gates? (16) | twitter.com/jevents/1499406505254268931 Ontario government workers will no longer need to be vaccinated as of April 4 (60) | youtu.be/PQ3cqhGhfM Erie County Health Department Presents: COVID-19 Vaccine Myths & Facts (3) | washingtonpost.com/politics/2022/03/07/sen-ron-johnson-obamacare-repeal-gop-majority-midterms-2024 Sen. Ron Johnson says Obamacare should be repealed if GOP wins power back (21) | slate.com/news-and-politics/2022/03/covid-vaccine-judge-navy-warship-religious-freedom.html An Anti-Vax Judge Is Preventing the Navy From Deploying a Warship (6) |
| phmppt.org/wp-content/uploads/2021/11/5.3.6-postmarketing-experience.pdf Pfizer report(58) | slate.com/news-and-politics/2022/03/covid-vaccine-judge-navy-warship-religious-freedom.html An Anti-Vax Judge Is Preventing the Navy From Deploying a Warship (19) | bloomberg.com/news/articles/2022-03-07/j-j-s-controversial-prison-testing-resurfaces-in-baby-powder-lawsuits J&J's Controversial Prison Testing Resurfaces in Baby Powder Lawsuits (14) | nejm.org/doi/full/10.1056/NEJMoa2034577 Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine (53) | pr.io/m2MuFt4sGjM WATCH: A Local Charter School Holds COVID-19 "Vaccine Carnival Clinic," to Motivate Kids to Get Vaccinated (3) | bloomberg.com/news/articles/2022-03-07/j-j-s-controversial-prison-testing-resurfaces-in-baby-powder-lawsuits J&J's Controversial Prison Testing Resurfaces in Baby Powder Lawsuits (19) | evanhospital.com/virus_COVID-19 Vaccine Information (5) |
| navytimes.com/news/your-navy/2022/03/08/destroyer-cant-deploy-because-co-wont-get-covid-vaccine-navy-says Destroyer can't deploy because CO won't get COVID vaccine, Navy says (48) | bloomberg.com/news/articles/2022-03-07/j-j-s-controversial-prison-testing-resurfaces-in-baby-powder-lawsuits J&J's Controversial Prison Testing Resurfaces in Baby Powder Lawsuits (16) | ionline.com/story/news/politics/2022/03/07/alexander-vindman-says-ron-johnson-a-huge-disappointment-ukraine/936527202 Alexander Vindman says Ron Johnson, others have 'blood on their hands' over Russian invasion of Ukraine (14) | twitter.com/MichaelPSenger/status/1499902332980523008 Walensky: "When the CNN feed came that it was 95% effective, the vaccine, so many of us wanted it to be helpful, so many of us wanted to say, 'Ok this is our ticket out.'" Ok... But then you got millions fired and excluded from society for not taking it. (53) | theblaze.com/news/review-the-federal-government-paid-media-companies-to-advertise-for-the-vaccines Exclusive: The federal government paid hundreds of media companies to advertise the COVID-19 vaccines while those same outlets provided positive coverage of the vaccines (2) | nejm.org/doi/full/10.1056/NEJMoa2034577 Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine (19) | washingtonpost.com/politics/2022/03/07/sen-ron-johnson-obamacare-repeal-gop-majority-midterms-2024 Sen. Ron Johnson says Obamacare should be repealed if GOP wins power back (5) |

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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.

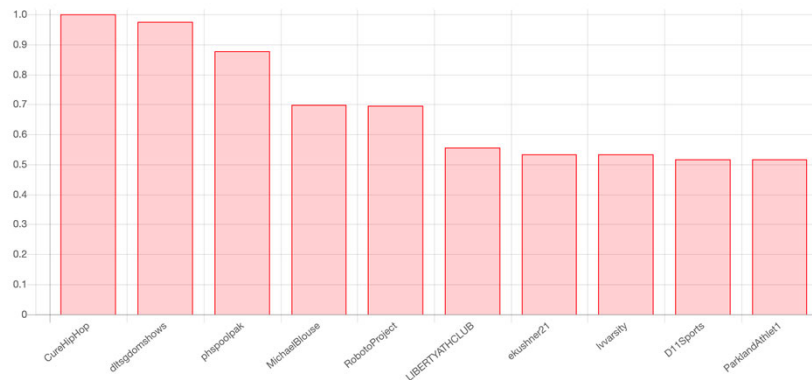


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Analysis of Tweeters - Super Friends

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

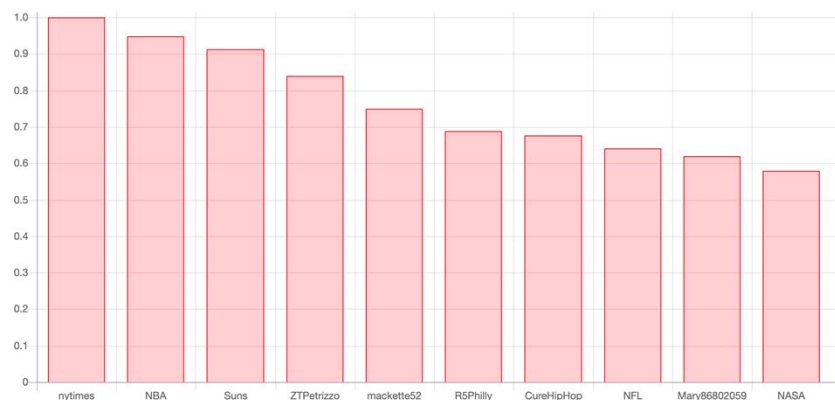


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Analysis of Tweeters - Other Influencers

- 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 |
|------------------|-------|
| pfizer[+] | 416 |
| CDCDirector[+] | 332 |
| US_FDA | 177 |
| POTUS[+] | 175 |
| CDCgov[+] | 162 |
| moderna_tx[+] | 145 |
| ezrlevant | 133 |
| SenRonJohnson[+] | 105 |
| catturd2 | 105 |
| DrJBhattacharya | 97 |

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Trending Tweets March 4 – March 10

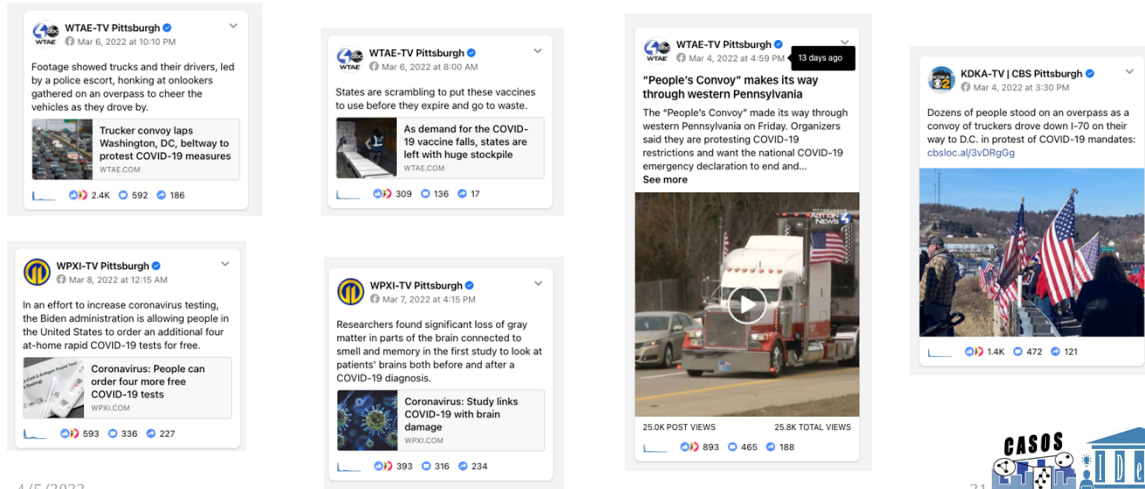
Tweets that are the most forwarded, either by retweet, reply, or quote:

- ❑ Numerous truckers I have spoken with in Hagerstown are pretty worked up over a federal Covid-19 vaccine mandate, but there is one big problem: there has never been a U.S. federal Covid-19 vax mandate.
- ❑ BOOM! #Lithuania has canceled a planned shipment of 440,000 #COVID19 #vaccines to #Bangladesh after that country refused to join other nations at the UN in condemning #Russia for its invasion of #Ukraine. Actions, meet Consequences. #StandWithUkraine <https://t.co/roDxd0KbSI>
- ❑ Trump dismantled the Pandemic task force, had no vaccination plan & tried to dismantle NATO & our alliances. Over the past year Biden vaccinated us, restored our alliances, committed to a stronger NATO & has spent the last few mos working to assist Ukraine. A tremendous 1st year.
- ❑ Why are these GOP Senators BLOCKING U.S. AID TO UKRAINE? Marsha Blackburn Mike Braun Ted Cruz Steve Daines Ron Johnson Mike Lee Cynthia Lummis Roger Marshall Rand Paul Rick Scott
- ❑ 1/ The head of pharma at Bayer proudly proclaims the COVID mRNA vaccine is gene therapy and that misleading the public was useful to create widespread adoption. <https://t.co/X5kGsgx37H>
- ❑ Walensky: "When the CNN feed came that it was 95% effective, the vaccine, so many of us wanted it to be helpful, so many of us wanted to say, 'Ok this is our ticket out.'" Ok... But then you got millions fired and excluded from society for not taking it. <https://t.co/Xcl7hUUr0i>
- ❑ This is shocking. Unsealed documents show Johnson & Johnson helped fund a study 50 years ago that involved injecting asbestos into mostly Black inmates <https://t.co/buKSZg566d>
- ❑ NEW - U.S. destroyer can't deploy because the commanding officer won't get COVID vaccine, Navy says. <https://t.co/6bS012a3HY>
- ❑ An insubordinate anti-vaxxer is currently the commanding officer of a guided-missile destroyer. Navy leaders won't deploy the warship while he's in charge—they don't trust him. But a judge won't let them reassign him, citing his "religious freedom." <https://t.co/uy6cur102c>

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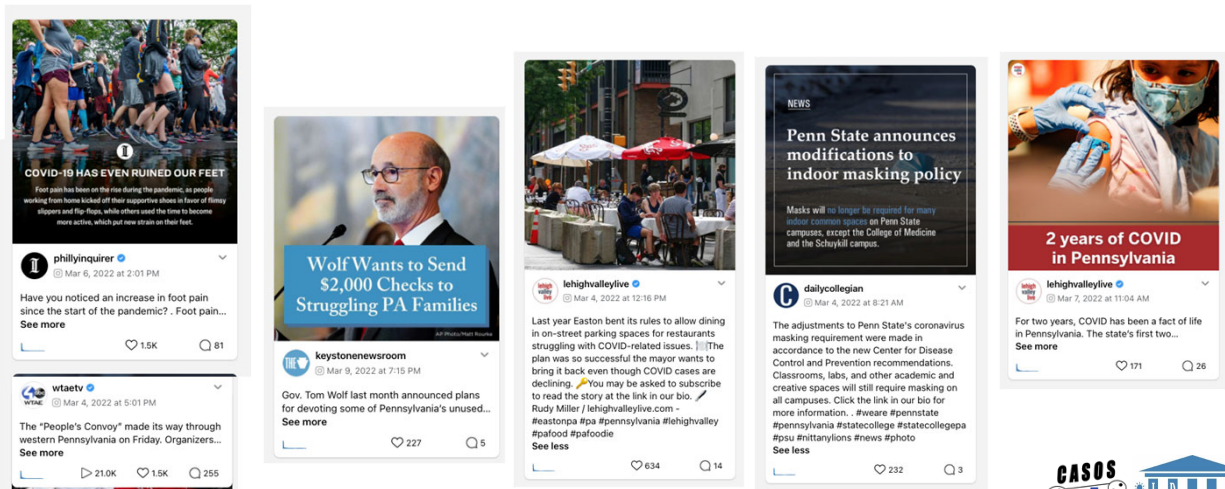
Trending Posts on Facebook March 4 – March 10



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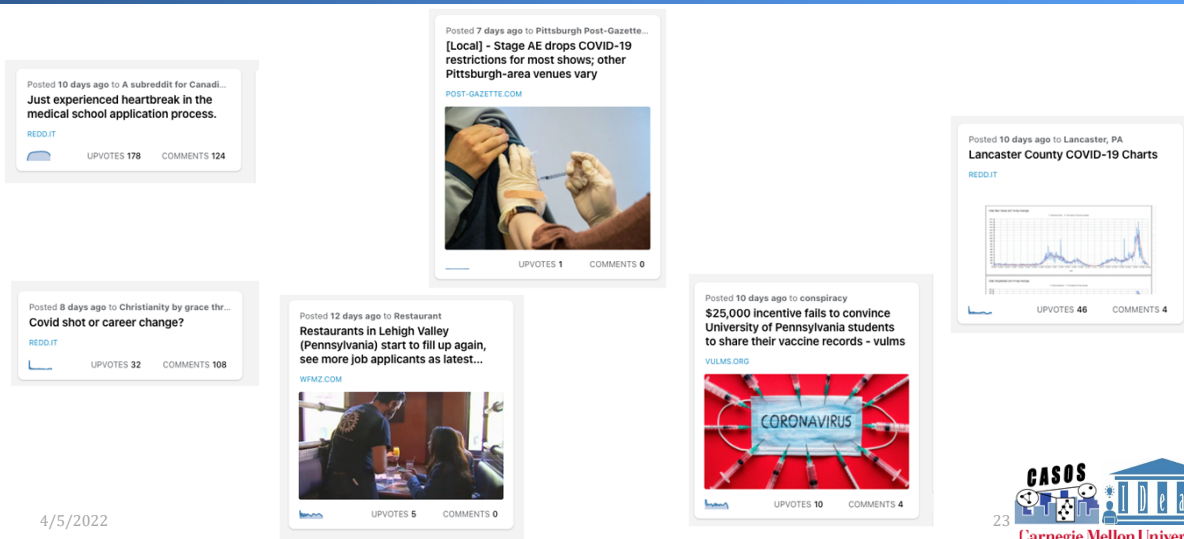
Trending Posts on Instagram March 4 – March 10



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Trending Posts on Reddit March 4 – March 10



For More Information

- ❑ Director Kathleen M. Carley - 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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