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**Supplementary table 1:** Overview of pro- and anti-vaccination themes in Twitter data

Pro-vaccination theme	Description	Example tweet	Frequency
Criticism of the government's handling of vaccine rollout	Criticisms of government, ANC, President Cyril Ramaphosa, Department of Health or other govt representatives' handling of vaccine procurement and rollout	@cyrilramaphosa @drzwelimkhize @timeslive @sundaytimesza where is my vaccine ramaphosa mkhize you have both let south africa down you have let our people down you have let my fellow south africans down you are a disgrace #vaccinesnowsa	57
Concerns that the rollout is not going fast enough	Complaints and expressions of urgency that South Africa needs to be vaccinated and/or the rollout is not going fast enough	dont like saying anything but since feb south africa is still looking at around 480k fully vaccinated that is 08 of the total population little over 1mil have partial vaccination which is 17 of the population and we have it better than most of the african continent	48
Statements that the vaccine is safe and/or effective against COVID-19	Statements that vaccines are safe and effective	and just to mention the covid vaccine does not stop the spread of the virus it does however reduce the severity of your symptoms much like the influenza flu vaccine does not stop you from contracting flu	39
Personal willingness to get vaccinated	Announcements of personal or family intention to get vaccinated or having been vaccinated; disappointment when unable to get vaccinated	south africa tonight at 24h00 i am registering for my first @pfizer covid vaccine jab whoopwhoop 😄 😄 😄	36
Discussions of emerging evidence on vaccine efficacy	Discussions of vaccine efficacy data in a way that appears pro-science (this was sometimes hard to be sure of)	@healthza according to latest cominarty fact sheet covid19 vaccine safety has not been established in pregnancy why is sa government advising vaccinating pregnant women as safe study completion in 2025	29

Pro-vaccination theme	Description	Example tweet	Frequency
Discussions of rollout logistics and milestones	Discussion or celebration of milestones and logistics in South Africa's vaccination programme	happy 2nd phase of the vaccine rollout day south africa	23
Criticism of conspiracy theorists and anti-vaxxers	Tweets mocking or arguing with anti-vaxxers and conspiracy theorists, or stating that they are wrong	we dont want the vaccine to got to waste we cant force people to vaccinatethose who believe conspiracy theories let me live with their own warped decisions in an event it is closer to the expiry date just donate it to the neighbors like lesotho etc @healthza @governmentza	22
Concerns about vaccine justice	Calls for equal access to vaccines among countries; concerns with patents; hoarding of vaccines; calls for people's vaccine	on vaccine inequity its quite incredible that given the public funding and the public investment that there isnt a single manufacturing license for the global south its all fill and finish these companies are playing god	20
Concerns about vaccine fairness	Discussions about the order in which groups of people are prioritised for vaccination, e.g. health workers, the elderly, politicians, people with HIV/AIDS, prisoners, homeless people	@drzwelimkhize @cyrilramaphosa @presidencyza @un again why are prisoners receiving the vaccine before honest hardworking peopleplease explain your reasoning do they contribute to the economy so what you are saying those that contribute to the economy are expendable	16
Hope that vaccination will help us get back to normal life	Expressions of hope that vaccination will end the lockdown and/or associated economic hardships	@fullviewsabc @sabcnews we want vaccine for every south african not levels people will loose their jobs especially the poor bottle store employees are also breadwinners they have bills to pay	12
Naming vaccine hesitancy as such	Recognition that some people are hesitating or choosing not to get vaccinated	what rubbish there is massive vaccine hesitancy in south Africa	9

Pro-vaccination theme	Description	Example tweet	Frequency
Mandatory vaccination is justified	Statements that vaccination should be mandatory, or mandatory in certain circumstances	@news24 hes an idiot i hope they make the vaccine shot a prerequisite for travel so tht idiots like him keep their ignorance ekasi labo god forbid some1 in france thinks sas all think like him 😬	8
Vaccination is the right choice	Statements that vaccination is a choice, but getting vaccinated is the right or responsible choice	this thread is frightening this was caused by those who wouldnt get vaccinatedsouth africa has more vaccine than those willing to take it im afraid weve missed the windowthis is our future now constant and more aggressive variants	8
Pro-science	Statements of confidence in science, scientists and scientific processes, e.g. clinical trials, peer review	100 their word against mine also likely means im going to trust the words of the coprinciple investigator of the sisonke trial over a tech and motoring journalist when it comes to vaccinerelated things 😬	7
Calls for mass vaccination	Calls and encouragements for everyone to get vaccinated	@healthza take the vaccine to the people on election day	7
Blaming the private sector for slow vaccine rollout	Criticisms of private medical aid schemes for slow vaccine rollout	@discovery_sa i live in radiokop roodepoort and am dismayed to find that you have no vaccination site anywhere near me i am quite frankly quite upset about that you can and should do better for your members 😬😬	3
Giving credit to government for successful vaccination	(There was only one tweet on this theme)	@gautenghealth i got turned away at 2 clicks pharmacies due to vacc shortages and decided to try mondeor rec center i was swept off my feet 🙌 the process is sleek super quick and the staff is friendly 🙌 😬 @david_makhura @mmkubayi #35 cohort 💉💉	1

Anti-vaccination themes	Description	Example tweets	Frequency
Vaccines are harmful, too risky, and/or insufficiently tested	Claims that vaccines are harmful, fatal, that risks of vaccination outweigh benefits, and/or that vaccines are trial vaccines and insufficiently tested	@presidencyza @cyrilramaphosa @jsteenhuisen @our_da @hermanmashaba @denedebe1 @myanc another young athlete dies of heart conditions wake up its the vaccine  ask yourself why has south africa suffered the least deaths its because we have not vaccinated the vax is the pandemic	51
Mistrust of the South African government's intentions with respect to the vaccine it promotes	Criticism or suspicion of intentions of government, ANC, President Cyril Ramaphosa, former Health Minister Zweli Mkhize, and/or other government representatives w.r.t South Africa's vaccination programme	the @governmentza wanna force us to vaccinate wow in other words its over with our lives and dreams	44
Opposition to mandatory vaccination on grounds it violates individual autonomy	Claims that the government is forcing people to get vaccinated; forced vaccination is a violation of their rights or bodily autonomy, an atrocity and/or a human rights abuse; people must be free to choose	in south africa the rape capital of the world and people still dont know what body autonomy is and they support mandatory vaccinations just because theyre vaccinated	35
Doubts about vaccine efficacy	Scepticism about whether vaccines work, and/or claims they do not work	@news24 @fin24 vaccines are unsafe and ineffective covid is nothing more than a small flu now the majority of people would have natural immunity who takes liability if the vaxx kills you	30
Anti-vaxxers are critical thinkers	People who oppose vaccination think for themselves, are wise, or have seen through the hoax; the vaxxed are gullible or "covidiot"	@presidencyza @cyrilramaphosa i believe this is for publicity soon will be cleared uninfected then hell be nagging about how vaccine helped him fight covid19   yall think were stupid enough to fall for that trap	25
Personal refusal to get vaccinated	Declarations by tweeters that they and/or their families have not been or will not be getting vaccinated	@cyrilramaphosa im not taking any vaccine yes ive said it #vaccineforsouthafrica	23

Anti-vaccination themes	Description	Example tweets	Frequency
COVID-19 denialism and denialist conspiracy theories	Claims that COVID-19 and/or the vaccine is not real or is a hoax; references to Bill Gates' depopulation agenda; claims that 5G causes COVID-19; that the vaccine is a tracking device; that the vaccine is the pandemic; that clinical trials caused the variants; that booster shots are a cover for 'perpetual vaccination'	@presidencyza @cyrilramaphosa @jsteehuisen @our_da @hermanmashaba @denedebe1 @myanc another young athlete dies of heart conditions wake up its the vaccine 🩺 ask yourself why has south africa suffered the least deaths its because we have not vaccinated the vax is the pandemic	22
COVID-19 "minimalism"	Claims that COVID-19 is not as serious as is claimed, therefore most people do not need to be vaccinated	you dont need a vaccine for 2 reasons 1 if yr under 70 healthy yr risk is near zero 2 ivermectin works is cheap #novaccine #covid #covidiot #vaccinatetosavesouthafrica #vaccinerolloutsa #covid19insa #healthhubon405 #covid19sa #nurembergtrialsforcovid #vaccinepassports 🙄	21
Mistrust of journalists and "mainstream media"	Mistrust of the media; claims that journalists are "pushing the vaccine agenda"	@governmentza @drzwelimkhize @cyrilramaphosa entlek i agree let the #thumamediagroup journalists take the expiring vaccine stand with your president thuma mina	14
Concerns about corruption in the rollout	Opposition to South Africa's vaccination programme on grounds that it will be an opportunity for more corruption	@mrally @news24 south africans dont want the vaccine that will be an excuse to steal all the vaccine money	14
Suspicion of unspecified ulterior motives	References to a vaccine "narrative" or "agenda" (without spelling out what this is), or other oblique implication that an ulterior motive is behind the vaccination drive	@news24 @city_press its things like these that makes question this vaccine thing even more why would offer free ticket to the game just for people to protect themselves it really shows something is fishy here	13
The people do not want to be vaccinated	Claims that most people in South Africa or the world do not want the vaccine	@news24 no cyril you cant go back on your word you said no one can be forced to take vaccines theres millions marching all over the world against vax mandates so think hard and fast before trying it here the people will unite against government mandates its unlawfulnuremberg code	13

Anti-vaccination themes	Description	Example tweets	Frequency
Alternative remedies	Claims that alternative remedies are more effective, safer and/or more accessible than the vaccine (ivermectin, <i>umhlonyane</i> , weed, lemon, garlic, steaming etc.)	@news24 @bisouthafrica i dnt want this near me u can have ur vaccine mina i will stick to mhlonyane dis is not a vaccine but a device 🙄	12
Mistrust of Europe, USA, Global North, or white people	Opposition to vaccination on anti-colonial, anti-racist or black nationalist grounds	@bbcafrica propaganda trying to cause panic so the masses can take the vaccine im proudly south african theres no such @bbcafrica stop the lies with yo white masters of doom	11
Others should go first	Suggestions that those who promote vaccination should go first or “lead by example”; sometimes a cynical response to discussions of mandatory vaccination	@news24 @city_press mandatory vaccine on his family no problem	9
Pharmaceutical company conspiracy	Claims that the real force behind the emergence of so-called COVID-19 and so-called vaccines is pharmaceutical company profits	this vaccine is designed for medical profit it has nothing to do with science if they stop the virus big pharmaceuticals will essentially stop their profits sentle is comparing a real vaccine that was developed over decades comparing it 2 a In emergency trial vaccine	8
Unspecified hesitancy or opposition to vaccines	Hesitancy or opposition to the vaccine without any reasons given	as much as i want this vaccine to be rolled out i feel so uneasy about it #covidvaccine #covid_19 #covid19vaccine #coronavirusvaccine #cyrilramaphosa #familymeeting	6
Religious opposition	Claims that vaccination is evil, satanic, and/or against God’s will; that godly leaders will oppose vaccination	prayerful leaders like chief justice mogoeng mogoeg are needed in south africa thank you god for saving us from this vaccine that was going to do more harm to our people #ramaphosamustfall #vaccineforsouthafrica	5

Anti-vaccination themes	Description	Example tweets	Frequency
Mistrust of scientists and health professionals	Mistrust of scientists' and doctors' views on vaccination	@sizwelo @riddlemethat14 todote no one has challenged or rectified these statements yet health professionals and leaders confidently urge people to get vaccinated	5