Supplementary File S1

**Group 01 LDA unigrams and bigrams keywords**

|  |  |  |
| --- | --- | --- |
| **Group 01 LDA unigrams and bigrams keywords** | | |
| **Topic** | **T1** | **T2** |
| 1 | vaccine coronavirus say care wa don 19 vaccine expert coronavirus vaccine virus doe trial scientist really immunity government infected claim question washington pay election effort herd believe need fauci real false effective trust early provide common study post adviser won critical answer illness reason global herd immunity health care fda mean safe chinese strategy | family risk time safety government ontario life year check photography trial guideline experience taking covid appointment toronto 19 covid 19 tour future scottish booking later forced ford fact 2022 comply 19 guideline trudeau edinburgh scottish photography photography experience photography tour ontario canada |
| 2 | coronavirus government new latest restriction ha social use spread service relief stay rally crisis post video action safe news north company air medium measure hope distancing anti education south thanks seen potential watch travel federal social distancing coronavirus restriction police fine protest coronavirus crisis development home best cold reduce including shut healthy opportunity | mask like spread response safe coronavirus look did share measure social order face governor video big best watch don texas especially animal wear stop provide le help hand distance mandate critical wearing wear mask real looking public thought gym protect percent decision distancing gov germany restaurant 19 response follow air continue game |
| 3 | world country 2020 death total make million wa case update september india 20 confirmed recovery daily ha 30 number health outbreak covid19 today hit day 10 highest 000 pm news march coronavirus sept global population worldwide 12 active europe yesterday 25 11 worst recovered confirmed case recorded time coronavirus outbreak africa 21 | vaccine dos astrazeneca amp surge million johnson use shot jab receive medical 12 country confirmed gt resident human nation tuesday ha list sign moderna federal government drug group covid19 amp vaccine emergency receive covid supply coronavirus vaccine citizen fda breaking college astrazeneca vaccine 19 surge african million dos |
| 4 | school patient hospital tested home year johnson amid surge open place restriction ha safety nh ll order despite restaurant positive contact set treatment warns tested positive old staff boris gov lab bar 19 patient possible campaign taking boris johnson govt 19 restriction leadership parent clear concern non family amid covid general role measure reopening nursing | state number rate study expert got city research ha team data case area national wednesday 14 high 10 used amp member 21 office virus increase hospitalization university 03 point 29 link transmission centre contact called 31 average force affected minute highest greater trend rt north covid case michigan led police continues |
| 5 | covid 19 covid 19 19 death china wa rule high worker outbreak ha doctor say people cdc month sign mother father risk data died report know age condition 19 outbreak sister time 19 ha died covid sister brother mother father hit actually victim year understand word morning took healthcare 1000 complication canada death covid 19 wa 19 news growth fake | say covid 19 covid 19 test positive patient make positive covid tested 30 china result test positive minister lab 19 test tested positive free using employee ll death church wuhan say covid toll 19 patient man wa official coronavirus offer receiving sure won rapid news photo asian credit deal negative death toll prime pakistan 90 leading success player |
| 6 | health mask public face flu dr going cdc city end coronavirus protect national official control ve wear information research year fall public health wear mask airborne say hand news transmission 2020 season prevent continue guidance director drop october fauci winter meeting just did department important shot mental time fox follow remember week | covid 19 covid 19 school care child canada ha student amid crisis including long woman according florida doe rule treatment close important protocol food problem origin having 19 ha stage study fear learning resource education health care just opening severe closed digital 12 teacher role effective forward mask mandate contract caused flu mar amid covid |
| 7 | child impact long community did risk event challenge story study 100 great ha term fear spreading future caused spread article america don access loss financial facing severe new asymptomatic adult coronavirus especially hear antibody pre problem history long term sars damage vulnerable activity amid map cov impact covid webinar project facility used | day march year 2021 world today 2020 coronavirus time good new amp ve ha 10 think pandemic york new york 11 tell month join billion able law given market europe possible nearly let remember 1st know march 2021 life mark discus changed 13 17 page icu event region hospital guidance seen self |
| 8 | case new death 000 coronavirus state 19 case day 200 coronavirus case 200 000 report new case reported rise new covid county record new coronavirus number hour american dead data spike wearing 24 case covid dy united reporting nearly official 24 hour 29 half additional gop dying united state case death mark lack 28 14 hospitalization count 40 50 tally monday | people vaccinated 000 coronavirus lockdown testing know ha need 100 april million staff learn hit announced wave fully symptom 25 country don medium 20 fight border spring challenge 19 testing travel healthcare vaccine dos break away fully vaccinated likely 16 worker thousand needed step county 40 month dr soon ahead quarantine 50 saturday |
| 9 | american trump covid19 response infection people rate dead 000 like 000 american state thing thousand force medical increase death coronavirus million governor look republican level tell science just democrat share tax party task rising failed money task force dead american fact low right cut game making risk cost 19 infection election affect coronavirus infection 500 | covid 19 covid 19 health pandemic 19 pandemic variant uk infection impact public rise worker new received hospital official state doctor public health ha early scientist friday brazil department disease administered 19 variant data shot people infected united virus address 19 infection coronavirus variant health official morning prevent impact covid said ministry community nurse mental service review giving |
| 10 | coronavirus test positive lockdown week student news toll job month death toll coronavirus death disease florida university million death positive covid test positive england learn say person told college man better return positive coronavirus teacher kid sure 19 test survey percent bbc 13 coronavirus test ahead football class large 000 death breaking past player bbc news good ha app | covid 19 covid 19 case new death 19 case relief report new case county new covid reported 19 relief recovery total house 24 record restriction local biden update administration south effort hour 19 death active coronavirus trillion case covid package india daily key africa stimulus senate white republican democrat 19 restriction vote gop updated 24 hour economic 15 white house |
| 11 | read change cause effect covid19 right group le got guideline young online black won heart experience friend amp lung coronavirus novel permanent climate god work new need evidence blood week cuomo tool double novel coronavirus ed message ha save discussion worry president trump voice brain scottish super risk racial story oh young people | vaccination 19 vaccination news covid 19 covid 19 pfizer global open thanks outbreak site community register related program coming today sars return chief clinic facility center cov claim appointment mass event drive sars cov campaign start festival european begin special 19 outbreak researcher agency online sector launch pre biontech statement tweet getting covid private district |
| 12 | help business virus coronavirus plan need house crisis support family local act donald issue team likely donald trump white debate join small food emergency say economic fund member white house employee program aid center lead address hard higher billion key 19 crisis discus economy warning offer supply closed funding bank resource stimulus trillion | covid 19 covid 19 vaccine 19 vaccine dose dr eligible available second age question effective information pm visit older free fauci rollout people india old getting covid vaccine 60 passport info website urge eligible covid year old answer vaccine rollout distribution dose covid national chinese app phase 19 lockdown share 65 just pcr philippine vaccine passport today receives book |
| 13 | amp pandemic 19 pandemic life ha vote come leader economy global lost gt time woman market deadly quarantine area industry resident war demand following chief lied affected australia pandemic ha titan community nation save trend protection california tip stock america gt gt process coming suffering essential warned lose wonder allowing massive voting lesson | pandemic amp home coronavirus american help ha support retweet stay coronavirus pandemic effect died business life need access government work read cause new job covid19 stay home woman save country black blood level service cuomo restriction group pandemic ha working higher fund let act tax nh common evidence right forced stay pay young increased |
| 14 | trump coronavirus uk pandemic ha way coronavirus pandemic people president know work biden new didn died lie fight amp america time said york new york gone good killed knew talk want using forever isn threat bad failure administration lot need gone forever forever didn son gone didn way penny day doing brother daughter just american mother thank spread | wa amp covid19 trump just president people biden plan hope way work going great virus post don adult right kid time want thing astrazeneca covid said getting mean science better america following really person didn line doesn immunity joe need leader thank washington anti build party die condition single reason love |
| 15 | people coronavirus testing test live second think wave symptom just stop update minister result getting time away related check working like second wave spread son soon daughter today brother worse app joe 19 testing free rapid continues news saying daughter son feel father sister international 19 test senate book home live update different attack million people download | coronavirus week new latest news year business live read coronavirus vaccine vaccine report update case come change cdc coronavirus case director story concern ago 15 rising past term russia long daily doug new coronavirus doug ford industry data france benefit article hold california wait ford trudeau cdc director warns situation year ago small political end fox message |

**Group 02 LDA unigrams and bigrams keywords**

|  |  |  |
| --- | --- | --- |
| **Group 02 LDA unigrams and bigrams keywords** | | |
| **Topic** | **T1** | **T2** |
| 1 | coronavirus 000 new coronavirus case state case death new coronavirus people le medium person talk set young infected announced coronavirus test info travel united class living solution normal interesting debate covid19 critical increased worldwide focus novel panic pcr pas capacity dog leave international florida package price 2019 united state young people link congress paid june | case new death coronavirus 19 case report new case rate variant reported county day update number new covid daily news infection state today rise latest related 000 coronavirus case data record brazil ontario new coronavirus le remember germany antibody hospitalization france new death case covid ha highest health 24 10 called strain positivity yesterday researcher reporting coronavirus variant |
| 2 | confirmed case confirmed case 25 stats trend 30 bot day 28 21 23 case trend day stats bot day 29 27 stats confirmed change 16 31 60 aug total confirmed 99 sep 29 sep 28 08 27 sep drop 80 total deceased bot total total stats history airline climate 21 sep island 32 sep 30 pradesh stats date 42 46 41 case confirmed 48 49 58 | patient new article disease month covid infection new article cdc expert test way wa reason treatment severe 19 19 infection 19 test 19 patient won covid 19 evidence die man control source cancer clot dr director half based understand worry negative blood clot life result failure analysis release press heart killed mortality illness medical infectious listen |
| 3 | covid 19 covid 19 19 pandemic pandemic test 19 test patient ha party business small south help result 19 death state africa wa 19 ha support season community cost symptom 19 patient risk american study spread response restriction country visit personal small business ceo city activity special awareness general south africa impacted spread covid 19 response 19 restriction icu people 19 infection | amp ha health country public world read lockdown life care support need gt community public health story local worker blood despite rule real time science including policy economy thanks watch doing government video protect hope 19 ha follow lot business development fear digital discus continue different pay situation report guideline black learn |
| 4 | amp mask support help child check face government look need long learn rule gt resource relief working business market hand protect getting wear contact plasma research johnson share effect nh term industry wearing list social response change make available fund sign important risk guideline strategy wear mask key safe service different | say people covid19 just know don mask need like ha virus home going want look think thing 100 stop did working said let great following really doe report hand job published million lost didn texas doesn way death better rising mean year wearing nursing family force quarantine trump gov chief |
| 5 | sep et pm pm et impact good 11 crisis coronavirus video 12 economic 2020 outbreak healthcare 00 18 17 webinar 19 outbreak save 19 sep 25 sep impact covid 2021 cause 24 sep 26 sep restaurant analysis onsite et video nursing video onsite died died covid protection linked raising 01 building sep 25 nursing home discussion growth sep 24 16 protest adult 22 sep | news biden restriction right american relief trump state plan act future house origin human border world america florida 19 restriction virus feel 19 relief dead sign crisis california just chinese thousand power late time republican vote governor covid joe canadian turn corona government trillion north lie virtual 19 crisis like biggest battle election |
| 6 | latest daily plan economy thanks team woman vote education food office line security warns required book voter nurse post veteran equipment discus mail govt street odisha sample voting protective equipment personal protective success reveals missouri environment status doctor rural massive wish protect investment limited survive culling weak strong calm rally required menu 19 slaughter rally tonight air culling | uk effect sars safety south cov sars cov europe face best spike africa review law european rollout region learning young 24 mar caused party fund info seen small lead affected thought education england business cell ha parent wrong level money latest 09 dy african vaccine rollout precaution remains clear aren paper season advice |
| 7 | day county 10 20 15 14 22 26 100 50 social distancing transmission safely social distancing spike shut 11 delayed average opening officer added intentionally case day help american school safely labor american work equipment help la summer ppee personal ppee indoor oh amp pls support streamer delayed eek podcasts quiz support oh quiz raising streamer support eek live fundraising day gaming amp bit gaming doing fundraising stuff pls eek | mar 21 total confirmed case day trend stats march bot confirmed case active number case trend day stats bot day total number 25 death 2021 26 stats confirmed 28 12 27 recovered 24 22 recovery 11 active case 23 29 administered march total 20 17 14 10 16 26 mar 03 13 25 mar 27 mar total confirmed 15 total active vaccine administered case death |
| 8 | positive test case total virus student tested 24 reported positive covid death active today test positive amp new lockdown tested positive issue hour including coronavirus positive case recovered district state ha england number positive coronavirus active case related air age september player 24 hour staff negative case reported affected teacher single positive test employee test result ccp stand 19 positive people | vaccine astrazeneca long getting amp dos china data johnson effective pfizer million dr shot receive term low ve making drug list thank available fauci study week daily canada worse administration moderna food safe avg provide donor according use saturday long term resource white plasma daily covid left tpr tot recovery 19 trend protection |
| 9 | case new news 19 case coronavirus new case death number new covid hospital update million india record infection increase week rate area close case covid surge highest ontario bbc game point disease live toll yesterday past bbc news phase clinical weekend news coronavirus patient month outbreak heart recorded reporting campus university higher mark pub hospitalization dy | mar 21 coronavirus week pandemic response state good official coronavirus vaccine coronavirus pandemic 18 said wa place year monday lab live ago wuhan wear supply close higher employee prevent contact start department condition government avoid emergency federal billion company lockdown morning united 23 mar march 12 closed wear mask drive year ago coming outbreak spring health official |
| 10 | school testing world uk 2020 recovery september coronavirus free sept today update ha 19 testing date start join week won open return 13 year register information launch site 19 update europe month 40 online rising additional act soon virtual october high centre tomorrow power closed restriction bit level winter reopening changed usa | covid 19 covid 19 testing hospital child study woman high symptom health vaccination outbreak appointment free 19 death site book register toll area state possible university 19 outbreak loss available key centre non 19 testing center survey open death toll family game today 65 doctor 16 play offer updated test guidance ministry sector hit 11 |
| 11 | vaccine coronavirus 19 vaccine read data trial say amid coronavirus vaccine flu expert study end company article future early canada china college human access effort emergency action scientist antibody gov treatment drug learning concern effective global hold vaccine trial sars head ready exposure researcher safety cov evidence billion demand amid covid review blog use | coronavirus make president vaccine amp global covid19 national ha increase eligible crisis hour fight nation year worker eu government healthcare share past today current set recovery address immunity 24 hour point tax doctor change sure breaking scientist economic common effort leader ask covid19 vaccine political question dr fake webinar action ahead blog |
| 12 | time report coronavirus live rise spread month better lab 200 rally love parent remember news thought count nyt chief number scotland mp 45 france origin york time body case rise add new rt australia coronavirus whistleblower covid origin speaks possible whistleblower speaks virologist anti slow thing 500 origin tucker biggest spread coronavirus tucker 19 happy super coronavirus live continue 20 | covid 19 covid 19 pandemic 19 pandemic help risk new 2020 march 2021 time spread wave research social york year impact new york end april access online challenge surge join amid issue business protocol wednesday news clinic anti nyt pandemic ha believe medicine program learn 30 tuesday york time market mental distancing agency major open |
| 13 | coronavirus covid19 people wa trump ha just like say don year know life need way dr going job think make cdc american did let president said government great doe ve right watch thing question house death million come spread hope really chinese kid biden doesn stop got result election ll | covid 19 covid 19 vaccine 19 vaccine vaccination 19 vaccination dose concern ha second travel minister update virus variant received shot pm people country health jab india astrazeneca covid live million given 19 variant news phase immune question impact covid begin information campaign claim 3rd covid vaccine 20 mar use answer leading today mass dose covid college facebook reaction |
| 14 | work home want app stay best doing care safe 90 self sale safety away experience friend provide staff force oh problem checkout zapier curing curing covid sale 90 want zapier zapier app app checkout checkout sale 90 curing meeting member especially protocol advice outbreak download london condition don following keeping coronavirus outbreak conference thank stop scientific press care home | vaccinated work city age post people service group adult likely fully return 20 older flu resident restriction population sick 50 fully vaccinated 2021 critical break tomorrow gst later nurse 31 save restaurant 45 2019 year head india council life washington 60 vaccinated covid lockdown extend history government message try seeing waiting 30 mar |
| 15 | pandemic health coronavirus ha public new family country coronavirus pandemic 09 second community care global update wave died official city possible worker york people new york minister public health control lost coronavirus update service lockdown story challenge order resident say survey monday tell leader department breaking second wave lamb director opportunity thousand member health care discus | wa positive day school test amp year people date died tested ve come time today visit staff covid19 trial person student got add highlight positive covid cause care old add highlight home ll test positive kid having taking deceased talk tested positive positive case infected able facility mark self looking fact nh teacher 1st year old |