COVID-19 weekly update

1st Nov 2022

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**clinical management**

**Title:** COVID-19 Pandemic and Infant Neurodevelopmental Impairment: A Systematic Review and Meta-analysis  
  
jama network open| 28th october 2022  
  
Question Are neurodevelopmental outcomes during infancy changed by the COVID-19 pandemic?

Findings This meta-analysis of 8 studies including 21 419 infants found that 7% of infants who had neurodevelopmental screening during the COVID-19 pandemic were at risk of neurodevelopmental impairment, and 12% of those with gestational exposure to SARS-CoV-2 were at risk for neurodevelopmental impairment. Communication impairment was the sole neurodevelopmental domain of significantly increased risk of occurrence during the COVID-19 pandemic.

Meaning These findings suggest that overall neurodevelopment was not changed by the COVID-19 pandemic, but birth or being raised during the SARS-CoV-2 pandemic, regardless of gestational exposure, was associated with a significant risk of communication impairment among the infants.

Abstract

Importance

Primary studies proposed that aberrant maternal antiviral immunity and/or giving birth in quarantine, such as during the ongoing COVID-19 pandemic, may be associated with the risk of neurodevelopmental impairment (NDI) in offspring.

Objectives

To evaluate the associations of birth and being raised during the COVID-19 pandemic with risk of NDI among infants and to assess the association of gestational exposure to SARS-CoV-2 with risk of NDI…

Conclusions and Relevance

In this systematic review and meta-analysis examining the association between COVID-19 pandemic and the risk of NDI findings suggest that overall neurodevelopment in the first year of life was not changed by either being born or raised during the SARS-CoV-2 pandemic or by gestational exposure to SARS-CoV-2. Interestingly, the first year of life during the COVID-19 pandemic, regardless of maternal infection, was significantly associated with the risk of communication delay among the offspring.

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2797911>

**Title:** Alternative strategies to increase the immunogenicity of COVID-19 vaccines in kidney transplant recipients not responding to two or three doses of an mRNA vaccine (RECOVAC): a randomised clinical trial  
  
the lancet infectious diseases| 27th October 2022   
  
Summary

An urgent need exists to improve the suboptimal COVID-19 vaccine response in kidney transplant recipients (KTRs). We aimed to compare three alternative strategies with a control single dose mRNA-1273 vaccination: a double vaccine dose, heterologous vaccination, and temporary discontinuation of mycophenolate mofetil or mycophenolic acid.

Methods

This open-label randomised trial, done in four university medical centres in the Netherlands, enrolled KTRs without seroconversion after two or three doses of an mRNA vaccine…

Interpretation

Repeated vaccination increases SARS-CoV-2-specific antibodies in KTRs, without further enhancement by use of a higher dose, a heterologous vaccine, or 2 weeks discontinuation of mycophenolate mofetil or mycophenolic acid. To achieve a stronger response, possibly required to neutralise new virus variants, repeated booster vaccination is needed.  
<https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(22)00650-8/fulltext>

**title:** Serological responses to the first four doses of SARS-CoV-2 vaccine in patients with inflammatory boweL disease [Correspondence]  
  
the lancet gastroenetrology & hepatology|25th october 2022  
  
Three-dose SARS-CoV-2 vaccine regimens have been recommended for people with inflammatory bowel disease (IBD), with studies of third-dose vaccination indicating favourable outcomes, including for those who did not attain seroconversion after two doses.1 We examined serological response after the first, second, third, and fourth doses of SARS-CoV-2 vaccines in people with IBD; the decay of antibodies for extended periods of time; and the factors, including medications, associated with antibody titres in people with IBD.

STOP COVID-19 in IBD is a prospective, observational cohort study of adults with IBD who have been vaccinated against SARS-CoV-2…

Geometric mean titres consecutively increased significantly from the first to the fourth dose…

The data showed a substantial increase in antibody titres after a third dose of vaccine compared with a second dose, similar to studies in the USA and UK…Novel data showed a robust antibody response after fourth-dose vaccination analogous in magnitude to third-dose vaccination. Future studies should define the timing of additional doses and quantify rates of decay after fourth-dose vaccination…

<https://www.thelancet.com/journals/langas/article/PIIS2468-1253(22)00340-5/fulltext>

**VACCINATION & infection control**

**title:** Recurrence of Symptoms Following a 2-Day Symptom Free Period in Patients With COVID-19 [Research Letter]  
  
jama network open|27th october 2022  
  
Introduction

Recurrence of symptoms after finishing treatment for COVID-19 with nirmatrelvir-ritonavir (Paxlovid) has become increasingly recognized…The biological underpinning of this phenomenon is unclear, and its etiology may be multifactorial, including rapid clearance of nirmatrelvir coupled with delayed immune responses or possible development of drug resistance…The contribution of treatment to symptom rebound needs to be differentiated from symptom rebound that might occur during the natural history of COVID-19. In this cohort study, we sought to determine how often COVID-19 symptoms recurred when the disease was untreated.

Methods

We assessed COVID-19 symptoms for 29 days in untreated participants who received a placebo in the ACTIV-2/A5401 trial between August and November 2020, following Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cohort studies…

Results

…Median (IQR) time from symptom onset to enrollment was 6 days (4-7 days). Sixty-six (42%) reported a high-risk condition, with the highest frequency conditions being hypertension (44 participants [28%]) and obesity (ie, body mass index [calculated as weight in kilograms divided by height in meters squared] greater than 35) (17 participants [11%])…

During 28 days of follow-up, 108 participants (68%) achieved symptom resolution, of which 48 (44%; 30% of the 158 participants) subsequently reported recurrence by the end of the 28 days of follow-up of at least 1 of the 13 targeted symptoms… Among those reporting recurrence of symptoms after reporting resolution of symptoms for 2 consecutive days, 41 participants (85%) reported their symptoms as mild, 7 (15%) reported at least 1 moderate symptom and none reported severe symptoms during recurrence. The most common symptoms reported at time of relapse were cough (21 participants [44%]), fatigue (17 participants [35%]), and headache (17 participants [35%]); these results were similar to symptoms at enrollment, with the exception that body pain and aches were reported more often at enrollment than on recurrence…

Discussion

Using daily symptoms data from a prospective trial, we found the natural history of untreated COVID-19 was variable and undulating. Over one-third of participants who experienced symptom resolution for at least 2 consecutive days within the first 4 to 5 weeks of COVID-19 symptoms reported recurrent symptoms. Reported symptoms are inherently subjective, and our observed variation may explain some of the rebound of symptoms after treatment for COVID-19, like in cases of what has been described as Paxlovid rebound…

…Consistent with an earlier report,…our results in persons with untreated COVID-19 shows that recurring symptoms are common among those who initially improve, but these recrudescent symptoms do not portend progression to severe COVID-19.  
<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2797789>

**title:** Association of COVID-19 Vaccinations With Intensive Care Unit Admissions and Outcome of Critically Ill Patients With COVID-19 Pneumonia in Lombardy, Italy  
  
jama network open| 27th october 2022

Question Does COVID-19 vaccination prevent intensive care unit (ICU) admission for COVID-19 pneumonia and improve patient outcomes?

Findings In this cohort study of more than 10 million people, vaccines based on mRNA technology or adenoviral vectors significantly decreased the risk of ICU admission for COVID-19 pneumonia. ICU and hospital mortality, adjusted for age, heart disease and PaO2/FiO2 at ICU admission, were similar between vaccinated and unvaccinated patients.

Meaning COVID-19 vaccines were associated with a lower ICU admission for COVID-19 pneumonia, while no significant association was detected with ICU and hospital mortality.

Abstract

Importance Data on the association of COVID-19 vaccination with intensive care unit (ICU) admission and outcomes of patients with SARS-CoV-2–related pneumonia are scarce.

Objective To evaluate whether COVID-19 vaccination is associated with preventing ICU admission for COVID-19 pneumonia and to compare baseline characteristics and outcomes of vaccinated and unvaccinated patients admitted to an ICU.

Design, Setting, and Participants This retrospective cohort study on regional data sets reports: (1) daily number of administered vaccines and (2) data of all consecutive patients admitted to an ICU in Lombardy, Italy, from August 1 to December 15, 2021 (Delta variant predominant). Vaccinated patients received either mRNA vaccines (BNT162b2 or mRNA-1273) or adenoviral vector vaccines (ChAdOx1-S or Ad26.COV2). Incident rate ratios (IRRs) were computed from August 1, 2021, to January 31, 2022; ICU and baseline characteristics and outcomes.

Exposures COVID-19 vaccination status (no vaccination, mRNA vaccine, adenoviral vector vaccine).

Main Outcomes and Measures The incidence IRR of ICU admission was evaluated, comparing vaccinated people with unvaccinated, adjusted for age and sex. The baseline characteristics at ICU admission of vaccinated and unvaccinated patients were investigated. The association between vaccination status at ICU admission and mortality at ICU and hospital discharge were also studied, adjusting for possible confounders…

Conclusions and Relevance In this cohort study, mRNA and adenoviral vector vaccines were associated with significantly lower risk of ICU admission for COVID-19 pneumonia. ICU and hospital mortality were not associated with vaccinated status. These findings suggest a substantial reduction of the risk of developing COVID-19–related severe acute respiratory failure requiring ICU admission among vaccinated people.

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2797781>

**title:** Analysis of Serious Adverse Event Reporting for Patients Enrolled in Cancer Clinical Trials During the COVID-19 Pandemic [Research Letter]  
  
jama oncology| 27th october 2022

The COVID-19 pandemic affected cancer treatment in the context of usual care and clinical trials. Clinical trial activity and routine care were disrupted, allowing for limited new enrollments early in the pandemic… The proportion of remote visits and delayed nonessential surgeries or systemic therapies increased…Trials were prioritized based on disease severity and resource allocation…

Increased remote monitoring on clinical trials may have implications for identification of toxic effects from treatment even while potentially increasing flexibility in trial participation and communication with physicians…Given the likely durable use of remote monitoring even after the pandemic abates,…it is important to understand the implications of pandemic-related care delivery changes for safety monitoring in oncology clinical trials. The aim of the study was to evaluate the implications of the COVID-19 pandemic for serious adverse event (SAE) reporting for patients enrolled in oncology therapeutic clinical trials.

Methods

This single-site, retrospective cross-sectional study included all adult patients (age ≥18 years) with a nongynecologic cancer enrolled in a phase 1 through 3 therapeutic investigator-initiated oncology clinical trial for at least 14 days between January 1, 2019, and December 31, 2021…

Discussion

To our knowledge, this is the first study to evaluate the implications of the COVID-19 pandemic for SAE reporting in oncology clinical trials. This study observed a significant decline in frequency of SAE reporting during the pandemic. Although this pattern was not explained by increasing telehealth use, other long-term consequences of the pandemic, such as staffing shortages, higher administrative burdens, and frequent protocol changes, could have been associated with lower SAE reporting and should be explored in future studies. A similar proportion of patients with metastatic disease were enrolled before and during the pandemic, suggesting that lower SAE reporting during the pandemic may not be explained by enrollment of healthier patients, although we did not capture the intensity of trial therapy. Limitations of the study include not adjusting for changes in types of open trials before and during the pandemic and being confined to a single center. The findings suggest that remote monitoring may be safe for patients enrolled in oncology clinical trials; however, larger studies are needed to validate the association between virtual visits and SAE reporting.

<https://jamanetwork.com/journals/jamaoncology/fullarticle/2797854>

**title:** FDA urged to publish follow-up studies on covid-19 vaccine safety signals [Feature]

bmj | 25th october 2022  
  
The FDA has been criticised for taking more than a year to follow up a potential increase in serious adverse events in elderly people receiving Pfizer’s covid-19 vaccine…

In July 2021 the US Food and Drug Administration (FDA) quietly disclosed findings of a potential increase in four types of serious adverse events in elderly people who had had Pfizer’s covid-19 vaccine: acute myocardial infarction, disseminated intravascular coagulation, immune thrombocytopenia, and pulmonary embolism… Little detail was provided, such as the magnitude of the increased potential risk, and no press release or other alert was sent to doctors or the public…   
  
The BMJ has also learnt that the FDA has not publicly warned of similar signals detected in a separate observational cohort study it conducted of the third dose (first booster dose) in the elderly…; nor has the agency publicly acknowledged other published observational studies or clinical trial reanalyses reporting compatible results. Experts spoke to The BMJ about their concerns about the data and have called on the FDA to notify the public immediately…

“To keep this information from the scientific community and prevent us from analysing it ourselves, is irresponsible. It presumes that these organisations are perfect and cannot benefit from independent scrutiny,” says Joseph Fraiman, an emergency medicine physician in New Orleans, who recently carried out a reanalysis of serious adverse events in Pfizer’s and Moderna’s randomised trials…

Dick Bijl, physician epidemiologist in the Netherlands, says, “The FDA managed to determine the efficacy of the vaccines in a short period of time, but they have not analysed the pharmacovigilance data with the same speed. If they found signals in July 2021, they should have been analysed and published within months.”…

“The FDA should have informed doctors about any early safety signals from the vaccines,” says Bijl. “Most doctors are not trained to, nor are they focused on, recognising side effects, especially because vaccines are generally regarded as quite safe. It’s important that doctors are told what to look out for.”…

“We don’t want to create a lot of unnecessary anxiety and we can’t say there is now proof that the vaccines cause these events because the data are of poor quality, but we can say there is a danger signal, and the medical profession needs to be alerted to this,”…

The BMJ has learnt that the FDA’s medical record review and statistical analyses have recently been completed, and the overall study results are currently under internal review. “The findings to date from the fully adjusted epidemiologic study on the primary series vaccinations do not provide strong support for an association between the vaccine and any of the four outcomes described in the posting to the FDA website. Additional analyses, including evaluation of booster doses, are still being conducted. Release of the study findings is expected later this fall,” said the FDA.

<https://www.bmj.com/content/379/bmj.o2527>

**title:** Has covid-19 become milder? [Feature]

bmj|27th october 2022

Deaths and hospital admissions are falling, so does this mean that the virus is less severe? The BMJ asks the experts…

Is covid-19 really getting milder?

The short answer is no. Covid-19 is still a deadly disease, having killed almost 1.1 million people in 2022 at the time of writing. There remains a high risk of hospital admission and death for anyone without prior immunity. With some populations still largely unexposed to the virus, such as in China, and variation in the types of vaccines used in different places, it would be cavalier to call covid-19 anything but serious.

“It’s really hard to compare the severe disease aspects of [variants] because the immunity of our population is so different,” says Steve Griffin, associate professor at the University of Leeds. “When people call omicron mild, yes, there’s probably a lesser tendency for it to go deep in the lungs. But if you think about the clinical impact of it, because of its massive prevalence, even though it’s got a lower chance of causing the sorts of severe disease we’re talking about with acute covid-19, the actual clinical impact is still very, very marked.”…

The evolution of the virus, as well as the increased immunity of general populations, means that presented symptoms and the frequency of symptoms in many places are shifting, with deaths and hospital admissions falling in countries such as the UK over the course of 2022…

Eric Topol, professor of molecular medicine at the Scripps Research Institute in California, says that there’s a tension between the virus becoming more transmissible and fitter and our immune response getting slightly stronger, but “overall, the virus is winning.”…

“We’re breeding long covid with all of this,” says Topol. “It’s really unfortunate that we’ve seen this response, which is to just let it rip. It’s not acceptable. In my view, too many have given up the fight, and that’s sad because we know of really good measures that are innovative, that we have the foundation for, which we’re not advocating and we’re not putting priority and resources.

“We’re decreasing funding when in fact we should be investing, because it’s a very wise investment. The ability to get ahead of the virus will save us inordinate amounts of cost later.”

<https://www.bmj.com/content/379/bmj.o2516>

**title:** Protection against Omicron from Vaccination and Previous Infection in a Prison System

The New England Journal of Medicine| 26th october 2022  
  
Background

Information regarding the protection conferred by vaccination and previous infection against infection with the B.1.1.529 (omicron) variant of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is limited.

Methods

We evaluated the protection conferred by mRNA vaccines and previous infection against infection with the omicron variant in two high-risk populations: residents and staff in the California state prison system. We used a retrospective cohort design to analyze the risk of infection during the omicron wave using data collected from December 24, 2021, through April 14, 2022. Weighted Cox models were used to compare the effectiveness (measured as 1 minus the hazard ratio) of vaccination and previous infection across combinations of vaccination history (stratified according to the number of mRNA doses received) and infection history (none or infection before or during the period of B.1.617.2 [delta]–variant predominance). A secondary analysis used a rolling matched-cohort design to evaluate the effectiveness of three vaccine doses as compared with two doses.

Results

Among 59,794 residents and 16,572 staff, the estimated effectiveness of previous infection against omicron infection among unvaccinated persons who had been infected before or during the period of delta predominance ranged from 16.3% (95% confidence interval [CI], 8.1 to 23.7) to 48.9% (95% CI, 41.6 to 55.3). Depending on previous infection status, the estimated effectiveness of vaccination (relative to being unvaccinated and without previous documented infection) ranged from 18.6% (95% CI, 7.7 to 28.1) to 83.2% (95% CI, 77.7 to 87.4) with two vaccine doses and from 40.9% (95% CI, 31.9 to 48.7) to 87.9% (95% CI, 76.0 to 93.9) with three vaccine doses. Incremental effectiveness estimates of a third (booster) dose (relative to two doses) ranged from 25.0% (95% CI, 16.6 to 32.5) to 57.9% (95% CI, 48.4 to 65.7) among persons who either had not had previous documented infection or had been infected before the period of delta predominance.

Conclusions

Our findings in two high-risk populations suggest that mRNA vaccination and previous infection were effective against omicron infection, with lower estimates among those infected before the period of delta predominance. Three vaccine doses offered significantly more protection than two doses, including among previously infected persons.

<https://www.nejm.org/doi/full/10.1056/NEJMoa2207082?query=featured_coronavirus>

**title:** BNT162b2 vaccine effectiveness against SARS-CoV-2 omicron BA.4 and BA.5 [Correspondence]

the lancet infectious diseases| 25th october 2022  
  
SARS-CoV-2 omicron (B.1.1.529) subvariants BA.4 and BA.5 were first detected in South Africa in December, 2021. Their spike (S) proteins are identical (hereafter referred to collectively as BA.4/5) and include L452R and F486V mutations in the receptor binding domain, which might lead to increased immune evasion or the ability to infect host cells, or both…Evidence also suggests that COVID-19 vaccine responses are less effective at neutralising BA.4/5 than BA.1 or BA.2 subvariants of omicron…Subsequently, BA.4/5 have become the predominant subvariants in the USA and globally…To our knowledge, no studies evaluating the effectiveness of COVID-19 vaccines against BA.4/5 have been published to date.

Using the same test-negative design approach as in our previous analyses,…we determined the effectiveness of BNT162b2 (Pfizer–BioNTech) against BA.4/5 among members of the health insurance provider Kaiser Permanente, based in Southern California, CA, USA aged 18 years or older, who were diagnosed with an acute respiratory infection and tested for SARS-CoV-2 by PCR at one of four health-care settings…We assessed effectiveness of BNT162b2 against omicron subvariants BA.4 and BA.5, by highest level of care and number and timing of receipt of BNT162b2 doses…

Our results suggest that two doses of BNT162b2 offered little protection against all BA.4/5 outcomes measured, including hospital admission. A booster (third or fourth dose) did provide protection against BA.4/5, but this protection probably wanes after 3 months against milder outcomes like outpatient, urgent care, or emergency department encounters and after roughly 6 months against BA.4/5-related hospitalisation…

<https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(22)00692-2/fulltext#:~:text=At%20less%20than%206%20months,against%20milder%20outcomes%20(table)>

**WORKFORCE WELLBEING**

**title:** Development and implementation of centralised, cloud-based, employee health contact tracing database and predictive modelling framework in the COVID-19 pandemic [Comment]

the lancet digital health| november 2022  
  
At the onset of the COVID-19 pandemic in early March, 2020, it became apparent that non-electronic exposure investigations would not meet the demands required by the mounting number of employees with COVID-19 in the Mount Sinai Health System in New York City (NY, USA), a multicentre, academic medical institution and hospital system. New York City was an epicentre early in the pandemic, resulting in a peak of more than 6000 cases daily and more than 1000 deaths per day…Agile exposure investigation and contact tracing were crucial to containing the spread of COVID-19 among hospital staff…Unlike patient-facing electronic health records with continuously improving platforms, employee health data management methods have not developed uniformly in the USA and often rely on paper-based or non-integrated systems of record keeping…Even when electronic health records are incorporated into employee health service departments, this infrastructure lacks the required flexibility to meet the demand from changing guidance about the disease…

At our institution, the Mount Sinai Health System, this need was met with the creation of the Employee Health COVID-19 REDCap Registry (EHCRR) using the well known Research Electronic Data Capture (REDCap) platform…The EHCRR is a user-friendly, cloud-based, reproducible electronic system for tracking employee exposures to and illness due to COVID-19. We outline the development and implementation of the EHCRR at our institution… <https://www.thelancet.com/journals/landig/article/PIIS2589-7500(22)00171-6/fulltext>

**title:** Challenges and opportunities in interprofessional education and practice [Comment]  
  
the lancet | 29th october 2022  
  
The Health Policy paper by Julio Frenk and colleagues 1 in The Lancet on educating health professionals after the COVID-19 pandemic highlights the post-pandemic learning environment, use of technology to improve learning, interprofessional education (IPE), and lifelong continuing education and training for the health professions. The perpetual shortage and maldistribution of health professionals within complex health systems and unmet population health needs may require innovative approaches for the education of health professionals for effective practice. IPE is an educational approach that could positively influence health-care practices and patient outcomes…WHO defines IPE as occasions where students from two or more professions in health and social care learn from, about, and with each other during their education for effective collaboration in future practice…The Interprofessional Education Collaborative proposes four essential competencies for IPE: values and ethics, roles and responsibilities, interprofessional communication, and teamwork and team-based care…These are predicated on each profession also being trained to a high level of knowledge and skill in its own right.

Graduates with IPE experience are expected to work with other professionals in a climate of mutual respect, using theirs and others’ competencies and expertise to address the health-care needs of patients and advance the health of populations. Additionally, IPE graduates might be particularly effective in taking part in interprofessional communication to promote health and in applying team dynamics to develop collaborative practices within care teams and with patients. Collaborative practice has been shown to improve patient outcomes, such as reduced length of hospital stay and reduced clinical error rates…However, these aspirations are still to be proven in practice…

<https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(22)02086-4.pdf>

**INTERNATIONAL PERSPECTIVES**

**title:** Evaluating and mitigating the potential indirect effect of COVID-19 on control programmes for seven neglected tropical diseases: a modelling study

the lancet global health|november 2022

Background

In line with movement restrictions and physical distancing essential for the control of the COVID-19 pandemic, WHO recommended postponement of all neglected tropical disease (NTD) control activities that involve community-based surveys, active case finding, and mass drug administration in April, 2020. Following revised guidance later in 2020, and after interruptions to NTD programmes of varying lengths, NTD programmes gradually restarted in the context of an ongoing pandemic. However, ongoing challenges and service gaps have been reported. This study aimed to evaluate the potential effect of the programmatic interruptions and strategies to mitigate this effect.

Methods

For seven NTDs, namely soil-transmitted helminths, schistosomiasis, lymphatic filariasis, onchocerciasis, trachoma, visceral leishmaniasis, and human African trypanosomiasis, we used mathematical transmission models to simulate the effect of programme interruptions on the dynamics of each of these diseases in different endemic settings…

Findings

We show that the effect of the COVID-19-induced interruption in terms of delay to achieving elimination goals might in some cases be much longer than the duration of the interruption…

We also show that these delays can largely be mitigated by measures such as additional mass drug administration or enhanced case-finding.

Interpretation

The COVID-19 pandemic has brought infectious disease control to the forefront of global consciousness. It is essential that the NTDs, so long neglected in terms of research and financial support, are not overlooked, and remain a priority in health service planning and funding. <https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(22)00360-6/fulltext>

[TRFT Library & Knowledge Service](https://www.trftlibraryknowledge.com/) aim to bring together the latest guidelines, research and news on Covid-19 through our [Covid-19 portal](https://www.trftlibraryknowledge.com/coronavirus.html). For daily updates on Covid-19 visit our '[Latest Health](https://trfthealthweeklydigest.wordpress.com/)' newsfeed, or use the hashtag [#covid19rftlks](https://twitter.com/hashtag/covid19rftlks?src=hashtag_click) to see our latest tweets on Covid-19 research, guidelines and news.

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