COVID-19 Bulletin

An RSB communication on the bioscience behind the outbreak and response

5 May 2021

This eighteenth edition of the RSB COVID-19 bulletin highlights a selection of the bioscience research and news of the last month. It cannot be comprehensive and gives just a glimpse of the huge worldwide effort to understand SARS-CoV-2 and its effects.

We can all contribute to the response to COVID-19 by engaging with sound science, countering misinformation and increasing awareness. We hope this bulletin is helpful in this.

We are moving to bimensal publication of this bulletin; the nineteenth edition will reach our subscribers in early July. We would like to take this opportunity to thank you for your readership.

Views or opinions presented are those of the original author(s) and do not necessarily represent the views of the Royal Society of Biology; medical and government advice should be consulted regarding personal wellbeing decisions.

For further information and to get in touch, contact our policy team via: **policy@rsb.org.uk**.

To read previous editions and directly sign-up to future editions of this bulletin, please **visit this page**.

This bulletin is divided into six main sections:

1. RSB news: including key current updates from the RSB.
2. Research updates and expert opinion: relevant national and international research news and outputs under topic headings.
3. How else can the bioscience community help? Examples, resource and expertise calls.
4. Positive community news: community impact aiding the pandemic response.
5. Other regularly updated information sources: useful online information hubs.
6. Spotlight on personal and community wellbeing: articles on mental health and wellbeing during self-isolation and social distancing.

This newsletter provides links to published news articles from a range of sources. Views or opinions presented are those of the original author(s) and do not necessarily represent the views of the Royal Society of Biology.

RSB news

The Biologist: Working a 3 gigavolt synchrotron from home
In the latest COVID Q&A from The Biologist, Professor Sir David Stuart explains **how the UK's**

synchrotron has remained operational throughout the pandemic, with researchers operating the facility's 32 beamlines remotely to conduct crucial experiments on SARS-CoV-2. The Biologis's **COVID Q&A** series now stretches to 25 interviews on a variety of topics, from early efforts **to test** and **model** the disease to **variant tracking** and **press coverage** of the pandemic.

Education during COVID-19
Our education policy team is working with government, awarding bodies and policy partners to provide advice and support to teachers, parents and students. These pages will be updated regularly over the coming weeks.

Training
During the Covid-19 pandemic the RSB can offer training courses both online and in-person (via video conferencing). Training courses can also be delivered in-house to staff or students (via video conferencing). If you are interested in up-skilling then please contact us at **training@rsb.org.uk**. Visit our **online training platform myLearning** or send a request to sign-up to our **Training Newsletter** for regular updates.

For more current news, commentary and updates, visit the **RSB on Twitter**, **LinkedIn**, **The Biologist**, and read our latest edition of the weekly **Science Policy Newsletter**.

Research updates and expert opinion

SARS-CoV-2 is a virus in the zoonotic coronavirus family. This novel virus, discovered in 2019, was previously unidentified in humans and causes the disease COVID-19, which has since been characterized as a pandemic.

SARS-CoV-2 virus characteristics

One million coronavirus sequences: popular genome site hits mega milestone
GISAID's impressive effort to understand the spread of COVID-19 has seen scientists upload sequences from most nations on Earth, says Nature News.

Genomic characteristics and clinical effect of the emergent SARS-CoV-2 B.1.1.7 lineage in London, UK: a whole-genome sequencing and hospital-based cohort study
Authors of an article in the Lancet describe the emergence of the B.1.1.7 variant of concern (VOC), including virological characteristics and clinical severity in contemporaneous patients with and without the variant.

SARS-CoV-2 variants of concern pose a higher risk for hospitalisation and intensive care admission
A study coordinated by ECDC together with seven EU countries – Cyprus, Estonia, Finland, Ireland, Italy, Luxembourg, and Portugal – analysed data on the three VOC reported by the collaborating countries, and the research shows a higher risk for hospitalisation and intensive care admission.

An expert explains how to track coronavirus variants
New Covid-19 variants could potentially jeopardise a lot of the work that has been done so far to contain the pandemic. Sonia Gonçalves, Head of Service Delivery, Wellcome Sanger Institute, explains how genomic surveillance can help us track and contain them.

After the WHO report: what's next in the search for COVID's origins

A World Health Organization report makes a reasonable start, scientists say, but there are many questions yet to be answered, reports Nature News Explainer.

COVID-19 pathophysiology

UK's national synchrotron maps targets for COVID-19 antibodies

An international team of scientists has identified how antibodies interact with and neutralise the virus that causes COVID using the UK's national synchrotron, reports UKRI.

Antibodies and Immunity – how do they relate to one another?

A key question for science and health, and to successfully beat Covid-19 is: How much protection have we built against the virus as a result of natural infection and vaccination? Professor Sarah Walker, Professor Jeremy Farrar and Sarah Crofts explain more about antibodies and how our immune system protects us from infection in this blog for National Statistical.

New research improves our understanding of the long-term implications of covid-19

Findings by researchers from the Office for National Statistics, University College London (UCL) and University of Leicester show that people discharged from hospital after COVID-19 appear to have increased rates of organ damage ("multiorgan dysfunction") compared with similar individuals in the general population.

New study into long-term impacts of lung damage after COVID-19

UKRI reports a new national study will investigate the long-term effects of lung inflammation and scarring from COVID-19.

COVID-19 'brain fog' inspires search for causes and treatments

The true prevalence of cognitive problems in COVID-19 survivors is elusive, and the underlying causes of lingering symptoms are the subject of ongoing studies. But it's now clear that trouble thinking, concentrating, and remembering can be among the most debilitating "long-haul" symptoms and can persist for months, reports Science.

How scientists are teasing apart the biology of Long COVID

Science reports on how Emilia Liana Falcone, an infectious disease specialist at the Montreal Clinical Research Institute, and Michael Sneller, an infectious disease specialist at the National Institute of Allergy and Infectious Diseases (NIAID), are each leading a large Long COVID clinical trial.

Clear link emerges between COVID-19 and pregnancy complications

Since the start of the coronavirus pandemic, it has become increasingly clear that COVID-19 hits pregnant women harder than the general population. Now, one of the first large studies with a proper control group has firmed up earlier evidence for how the virus can alter the course of pregnancy and harm mothers and their newborns, reports Science.

Epidemiology and public health response

Forecasting COVID-19 cases and deaths in Europe - new hub will support countries' pandemic planning

LSHTM modellers join forces with international researchers to predict European COVID-19 cases and deaths four weeks in advance.

Covid-19: What do we know about airborne transmission of SARS-CoV-2?

How covid-19 spreads is one of the most debated questions of the pandemic. Writing for the

British Medical Journal, Chris Baraniuk explains what the evidence tells us about airborne transmission of the virus.

Evidence for increased breakthrough rates of SARS-CoV-2 variants of concern in BNT162b2 mRNA vaccinated individuals
Authors of a preprint in MedRxiv suggest that vaccine breakthrough infection may be more frequent with variants of concern (VOC), yet a combination of mass-vaccination with two doses coupled with non-pharmaceutical interventions control and contain their spread.

India's massive COVID surge puzzles scientists
The virus is spreading faster than ever before in India despite previous high infection rates in megacities, which should have conferred some protection, reports Nature News.

What the world can learn from New Zealand's Covid-19 bin mystery
Article in Wired describes how in New Zealand, investigators traced an outbreak to a 50-second window of exposure. The case might be a lesson for countries contemplating a future with no Covid-19.

Vaccinating adolescents could help prevent third wave of Covid in UK – study
Vaccinating older children and slowing down the relaxation of coronavirus restrictions are among measures that could help to prevent a third wave of Covid in the UK, according to a report from an organisation set up by the former prime minister Tony Blair, reports The Guardian.

COVID vaccines and kids: five questions as trials begin
Nature looks at how the trials will account for differences in children's immune systems and susceptibility to COVID-19, compared with those of adults, as well as the added safety precautions that surround medical research in kids.

Testing and ongoing surveillance

SARS-CoV-2 infectivity by viral load, S gene variants and demographic factors and the utility of lateral flow devices to prevent transmission
In this preprint in MedRxiv authors estimate that 'lateral-flow' COVID-19 tests can detect most coronavirus infections that will lead to further transmission. They conclude that SARS-CoV-2 infectivity varies by case viral load, contact event type, and age. Those with high viral loads are the most infectious and B.1.1.7 increased transmission by ~50%.

Why US coronavirus tracking can't keep up with concerning variants
The country has an enormous virus-sequencing capacity, but funding and coordination roadblocks are holding it back, reports Nature News.

Findings from the latest COVID-19 REACT-1 study published
Findings from the 10th report of REACT-1, one of the country's largest studies into COVID-19 infections in England, have been published by Imperial College London and Ipsos MORI.

Resurgence of SARS-CoV-2: detection by community viral surveillance
Authors of a report in Science report a community-wide national representative surveillance program in England involving self-administered swab results from 594,000 individuals tested for SARS-CoV-2, regardless of symptoms, from May to beginning of September 2020.

Saliva as a gold-standard sample for SARS-CoV-2 detection
The authors of this study publiched in The Lancet Respiratory Medicine conclude that

standardised, inexpensive, and broadly implementable saliva-based methods could make frequent, comfortable testing for SARS-CoV-2 a reality for communities globally.

Prophylaxis and treatment

ONS Infections Survey reveals vaccine effects

Data from ONS UK COVID-19 Infection Survey are the first to show the impact of vaccination on antibody responses and new infections in the general population aged 16 years and older.

COVID-19 vaccines may protect many, but not all, people with suppressed immune systems

For Eva Schrezenmeier, a nephrologist at Charité University Hospital in Berlin, the news was sobering: Among 40 patients with transplanted kidneys at her hospital who'd been vaccinated against COVID-19, only one was churning out the antibodies that would likely protect him from the disease, reports Science.

The race for antiviral drugs to beat COVID - and the next pandemic

A Nature News Feature leads with: 'Despite dire warnings, a stockpile of ready compounds to fight viral pandemics was sorely lacking. Can drug makers finally do the right thing?'

Oxford/AstraZeneca vaccine - expert reaction

LSHTM experts analyse the findings of the regulatory reviews into the University of Oxford/AstraZeneca vaccine.

Covid: One dose of vaccine halves transmission – study

A single dose of a coronavirus vaccine can reduce household transmission of the virus by up to half, a study shows, reports the BBC.

Why is it so hard to investigate the rare side effects of COVID vaccines?

For the vast majority of people, COVID-19 vaccines are safe and effective. But further research is needed to understand the causes of rare adverse events, reports Nature News.

What drugs are working as treatments for Covid-19?

From existing antivirals to new antibody therapies; researchers are working at incredible speed to find the best drugs to treat Covid-19, reports Wellcome.

Government launches COVID-19 Antivirals Taskforce to roll out innovative home treatments this autumn

The Antivirals Taskforce will identify treatments for UK patients who have been exposed to COVID-19 to stop the infection spreading and speed up recovery time.

Asthma drug shortens recovery time in COVID-19 patients at home

Early treatment with an asthma drug budesonide shortens recovery time in COVID-19 patients aged over 50 who are treated at home or in other community settings, reports UKRI.

Opinion: Better evidence, more trust – Drug regulators can improve decision-making to reassure public on vaccines

Writing for the London School of Hygiene & Tropical Medicine, Dr Aris Angelis, Assistant Professor in Health Economics shares his expert opinion on drug regulators and vaccines.

Opinion: How Vaccine Passports Will Worsen Inequities In Global Health

Writing for Nature Microbiology, Professor Madhukar Pai, Associate Director at McGill

International TB Centre suggests vaccine passports will make it harder for global health professionals from low/middle income countries to travel, attend meetings, get training, immigrate, or assume leadership roles.

The race to curb the spread of COVID vaccine disinformation

Researchers are applying strategies honed during the 2020 US presidential election to track anti-vax propaganda, reports Nature News.

How else can the bioscience community help?

COVID-19 resources from the community

An RSB webpage with links to COVID-19 initiatives and resources available from other bioscience organisations and the wider community. This page is being updated regularly and if you would like to suggest additional content please **send us an email**.

Coronavirus restrictions: what you can and cannot do

Coronavirus restrictions remain in place. Find out what you can and cannot do.

What's the roadmap for lifting lockdown?

Going shopping, having a haircut and meeting up outside are no longer banned under Covid restrictions.
But some once-familiar activities are still to be given the go ahead.

Government Guidance: Regular rapid coronavirus (COVID-19) tests if you do not have symptoms

You can get regular rapid tests if you do not have symptoms of coronavirus (COVID-19). If you have symptoms of COVID-19, you need a different test called a PCR test. Get a PCR test if you have symptoms of COVID-19 on GOV.UK

Government Guidance: Coronavirus (COVID-19) vaccine

The coronavirus (COVID-19) vaccine is safe and effective. It gives you the best protection against COVID-19.

Download the NHS COVID-19 app

The NHS COVID-19 app aims to help control coronavirus (COVID-19) transmission. People across England and Wales are being asked to download the NHS COVID-19 app to help control the spread of coronavirus and protect themselves and their loved ones as case numbers rise.

Investigate SARS-CoV-2 vaccine responses and immune failure

Apply for UKRI funding to investigate SARS-CoV-2 vaccine responses or immune failure. You must be based at an eligible UK research organisation. Your project must examine one or both of these:

- the nature and quality of SARS-CoV-2 vaccine responses
- the mechanisms of immune failure that lead to either SARS-CoV-2 re-infection or vaccine breakthrough.

Your project must produce outputs that have the potential to improve pandemic management during the period of the award.
Opens: 7 May 2021
Closes: 8 June 2021

UKRI publishes an analysis of COVID-19 PhD student support

UK Research and Innovation (UKRI) has published data on the take-up of COVID-19 support by its funded PhD students.

New free vaccination learning tools for schools

The new resource for schools produced by The London School of Hygiene & Tropical Medicine's (LSHTM) Vaccine Confidence Project and the Stephen Hawking Foundation aims to tackle misinformation and conspiracy theories around vaccines, and educate children about immunisation programmes.

The WHO is fighting misinformation about Coronavirus using shareable content

Viral Facts Africa is a World Health Organisation-led initiative that aims to debunk rumours in Africa surrounding the COVID pandemic and fill the information gaps where misinformation may thrive. You can get video and graphics with facts about the pandemic on your phone and elsewhere, reports The BBC.

Contact RSB to discuss bioscience community issues or actions via **policy@rsb.org.uk**

Positive community news

Covid crisis fuels rise in UK outdoor activity, but home workers benefit most

ONS report finds outdoor exercise and park visits surged as people connected with nature in lockdown, reports The Guardian.

Other regularly updated information sources

Additional COVID-19 resources

An RSB webpage collating other regularly updated resources on COVID-19.

[WHO] Coronavirus disease (COVID-19) Situation Dashboard

WHO COVID-19 situation dashboard.

Coronavirus COVID-19 Global Cases by Johns Hopkins CSSE

COVID-19 case dashboard.

Global.health open repository and visualisation platform

An international database tracking anonymised information about individual COVID-19 cases.

Spotlight on personal and community wellbeing

National study tracks effect of pandemic on students' lives

A new study, funded by UKRI, will follow the educational, career and wellbeing outcomes for 12,000 Year 11 students across England.

Build Back Higher: dialogue and community will return to post-Covid learning

Writing for Wonkhe, academics examine what we have learned about learning during the pandemic.

Exercise boosts immunity and makes vaccines more effective - new study

An article in The Conversation suggests that a new systematic review of evidence by researchers at Glasgow Caledonian University shows that regular physical activity strengthens the human immune system, reduces the risk of falling ill and dying from infectious disease by more than a third and significantly increases the effectiveness of vaccination campaigns. This has important implications for pandemic responses.

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