

ADVISORY SUB-GROUP ON EDUCATION AND CHILDREN'S ISSUES
SUMMARY OF THE LATEST EVIDENCE ON CHILDREN, SCHOOLS,
EARLY LEARNING AND CHILDCARE SETTINGS AND TRANSMISSION
FROM COVID-19

9 August 2021

Overview

In advance of the start of the new school term in August, this paper provides a summary of the latest evidence on the current state of the epidemic; the role of schools in transmission of COVID-19; the risks to children and young people from COVID-19 or from being out of school; workplace-associated risks to staff from COVID-19; and a brief summary of the sub-group's advice to date on how to keep schools open and safe.

There is a continuing need to consider the balance of risks and harms in the light of new trends in data, evidence and scientific advice, including with regard to the potential direct health risks to children and staff from COVID-19; the wider impact on community transmission of schools reopening; and the direct risks to mental health, wellbeing, development, educational attainment and health outcomes from school closures.

Current state of the epidemic

Scotland, and the wider UK, has been experiencing the third wave of the pandemic since May 2021. The profile of the third wave differs from that of the first two waves in that most positive cases tend to be in younger adults and there are many fewer COVID-related hospitalisations and deaths¹. The number of people now being admitted to hospital with COVID-19 (with a 7 day lag after the specimen date for a positive case) has fallen as a percentage of reported cases during 2021 from around 10% in January 2021 to around 4% in June.

Between March and July 2020, adults older than 40 years of age contributed to more than half of the confirmed COVID-19 cases in Scotland, with those older than 60 years of age making up the highest proportion in this group. Between August 2020 and March 2021, the majority of the cases were still seen in adults older than 40 years of age. However, those older than 60 years of age began to make up a decreasing proportion of this group, and the majority of cases began to be observed in 40-59 year olds. Since April 2021, over 60% of all confirmed COVID-19 cases in Scotland are younger than 40 years of age. In July 2021, 42.5% of all confirmed cases were 20-39 year olds. Those younger than 20 years of age contributed to 25.2% of total cases.² These differences are significantly due to the success of the roll-out of the COVID-19 vaccination programme.

Between March 2020 and 18 July 2021, 43,516 (4.6%) children and young people between the ages of 2 to 17 years have tested positive for COVID-19 in Scotland. During the recent third wave, positive COVID-19 cases increased among children and young people aged 2-18 years (not including 18 years), peaking at a weekly total of 4,378 cases in the week ending 4 July. The most recent data published by Public Health Scotland, which covers cases identified up until the week ending 1 August, identified a weekly total of 1,848 cases in these age groups. The majority (56%) of these cases were seen in children aged between 12 and 18 years. Throughout the pandemic in Scotland, the lowest rates of confirmed COVID-19 cases among children and young people have been observed in younger children under 5 years of age.³

Most recent data from the ONS Infection Survey estimate that 1 in 110 (95% credible interval: 1 in 140 to 1 in 85) people in Scotland had tested positive for COVID-19 in the week ending 24 July 2021.⁴ This represents a decrease from previous weeks.

The Delta variant of concern (VOC) replaced the Alpha VOC as the most common variant in Scotland in May 2021. The latest Public Health England Surveillance of Variants of Concern or Under Investigation indicates that around 253,049 confirmed or probable cases of the Delta variant have occurred in the UK, 32,708 in Scotland⁵.

The Delta variant is more transmissible than the previously dominant variants (about 60% more transmissible than the Alpha VOC)^{6,7} and is also associated with an increased risk of hospitalisation compared with the Alpha VOC.^{8,9} [Public Health England](#) estimates the secondary attack rates for the Delta variant to be 11.0% (95% CI 10.9% to 11.1%) among household contacts of cases that have not travelled or unknown. The secondary attack rate among non-household contacts of cases that have not travelled or unknown was 5.8% (5.6% to 5.9%).

Vaccination

The COVID-19 vaccination programme has been rolled out in Scotland since December 2020, in line with JCVI guidance on priority groups. From July 2021, all individuals over 18 years have become eligible to get a COVID-19 vaccine. Under certain conditions, individuals aged 16 and 17 years can also receive the vaccine,¹⁰ and most recently JCVI has advised the roll-out of first doses to all 16 and 17 year olds.¹¹

In the context of the Delta VOC, vaccines continue to be effective in reducing symptomatic disease and protecting against severe disease^{12 13}. Protection against Delta is a little lower than against Alpha after a single dose,¹⁴ but this is much less marked after the full dose schedule. Protection against hospitalisation provided by completion of the full dose schedule is similar for both the Alpha and Delta VOCs (over 90%)¹⁵.

As of 19 July 2021, 89.2% of all adults over the age of 18 have received at least one dose and 67.0% have received both doses of the vaccine. Almost all individuals over the age of 55 years have received both doses of the vaccine. In the 18 to 29-year age group, 69.4% have had one dose and 20.4% have completed both doses.¹⁶

It is estimated¹⁷ that around 85% of teachers who have taken up the offer of a first dose of vaccination will have been offered both doses of the vaccine and therefore should have developed a second dose response by 16 August 2021 (79% of the teacher population in Scotland), and this will increase to 90% by 23 August (85% of the teacher population). Furthermore, it is estimated that around 85% of the school workforce will have received both doses of the vaccine by mid-August. Due to recent activity to accelerate vaccine take-up, almost all staff will have had the opportunity to be fully vaccinated (and 14 days having elapsed to provide increased protection) by 26 September, around six weeks into the new academic year for the majority of local authority areas. This timeline of near-complete vaccination of over 18 year olds by late September also indicates widespread protection of adults in other education and learning settings, including universities and colleges, training providers etc.

Transmission and schools

The evidence base continues to suggest that children and adolescents (in particular those under the age of 14) transmit the virus at lower rates than adults, are more likely to transmit among themselves than to adults, and that cases in education settings follow and mirror transmission rates in the community where adult to adult transmission is more common.

During the first and second waves of the pandemic, research showed limited spread of COVID-19 in schools. While outbreaks have been documented in pre-schools, primary schools, and secondary schools, there are also low secondary attack rates in these settings when appropriate mitigation measures are in place. The risk of students affecting family members is also diminished if effective combinations of in-school mitigation measures are in place.¹⁸

These findings are supported by a recent pre-print systematic review and meta-analysis by Viner et al¹⁹ which found that school infection prevalence broadly reflected community infections. This study also found that in-school transmission from children (pooled estimate 0.5% (95% CI 0.1-1.6)) is much lower than in households, where it is similar to adults 7.3% (pooled estimate 95% CI 2.5-21.8). Where appropriate mitigation measures are in place, in school settings, there appears to be limited spread.

A [pre-print paper](#) reporting the results of a cluster randomised trial assessing the impact of daily testing for contacts in English secondary schools and

colleges reported low rates of symptomatic infection in contacts in both the control and intervention arms. The control arm was assigned to follow the usual policy of isolation of contacts for 10 days, and the intervention arm was assigned to a policy of offering contacts daily testing over 7 days to allow continued school attendance. The rate of symptomatic infection in contacts was 0.9% in the control arm and 1.3% in the intervention arm.

Attendance and absences

Since 2008/09, attendance rates in Scotland over the course of a whole academic year have been between 93% and 94%. Between 1-18 June 2021, attendance ranged from 84.8% to 90.2%. In the four week period up to 27 June 2021 there were 6,086 COVID-19 cases who reported having visited an educational setting in the 7 days before symptom onset. This is considerably higher than the previous 4 week period up to 30 May (2,150 cases). By the end of June 2021, COVID-19-related pupil absence in Scotland was 8.2% and at the highest rate since school buildings opened fully in April 2021.

Pupil absence due to COVID-19 includes confirmed or suspected cases, as well as pupils self-isolating, pupils whose parents chose to keep them away from school as a precaution and pupils whose schools are closed due to COVID-19. Throughout the 2020/21 school year (excluding those periods when school buildings were fully or partially closed) around 42% of pupils (291,400 children and young people) are estimated to have not been in school due to Covid-19 self-isolation at some point for at least one half day.

To illustrate the breakdown for pupils not in school for COVID-19 related reasons²⁰, the situation on 15 June (towards the end of the summer term) was as follows:

- 86.7% were because pupils were self-isolating in relation to COVID-19
- 8.3% were because parent(s) chose to keep pupils away from school as a precautionary measure contrary to public health guidance
- 3.2% were because pupils had a COVID-19 related sickness and
- 1.8% were because schools were closed because of COVID-19.

This means that, on 15 June 2021, around 0.9% of total absences were due to pupils who had a COVID-19 related sickness, representing about 0.1% of all school pupils.

The overall absence rate due to COVID-19 rose throughout June. There were rises in each of the underlying reasons for absence. The two largest drivers for the increase were pupils who were absent due to the need to self-isolate and pupils who were absent because parents chose to keep them away from school as a precautionary measure.

The rate of absence due to COVID-related sickness varied by local authority, largely in line with the wider prevalence of the virus in those communities. Pupils living in more deprived areas were more likely to have a period of Covid-19 self-isolation, and also to have more time out of school in total as a result of this:

- Half (50%) of pupils who lived in the most deprived areas of Scotland experienced a spell of self-isolation of at least ½ a school day, compared to only 39% of pupils who lived in the least deprived areas;
- Almost three-in-ten (29%) pupils who lived in the most deprived areas of Scotland were not in school throughout the school year for a total of at least one week due to self-isolating, compared to only 17% of pupils who lived in the least deprived areas; and
- 10% of pupils who lived in the most deprived areas in Scotland were not in school throughout the school year for a total of at least 2 weeks due to self-isolating compared to only 4% of pupils who lived in the least deprived areas.

Occupational exposure in education settings

The percentage of COVID-19 cases aged 18 or older in Scotland who reported working in education or childcare was between 2.4% and 6.5% in the period from September 2020 and July 2021.²¹ However, it is important to note that this figure does not account for the setting in which transmission occurred nor whether the infection was during a holiday period.

In line with the evidence that children transmit the virus at a lower rate than adults, the likelihood of SARS-CoV-2 transmission appears to be higher from teachers than students in educational settings.²² During the summer half-term in schools in England in 2020, there were 177 COVID-19 related events in educational settings; 113 were single cases, nine were co-primary cases and there were 55 outbreaks. The probable direction of transmission was staff-to-staff in 26 outbreaks, student-to-staff in 16 outbreaks and student-to-student in five.²³

In general, studies have not revealed a higher occupational risk to educational staff compared to the general population²⁴. Analysis of mortality statistics based on Office for National Statistics (ONS) data for England and Wales, found that the absolute mortality risk was lower among those working in schools compared to many other occupations. Secondary school teachers had an estimated higher risk of death than the general working-age population²⁵ but the analysis did not take potential confounders such as existing comorbidities into account.

In a separate report, COVID-19 related deaths among teaching and education professionals were reported by the ONS to be statistically significantly lower than the rate of death among those of the same age and sex in the general

population. Rates of COVID-19 related deaths among secondary education teaching professionals were not statistically significantly different from those of the same age and sex in the wider population. However, the rate of COVID-19 related deaths among male secondary school teachers was statistically significantly higher than the rate of COVID-19 related deaths in men of the same age in professional occupations.²⁶

However, in Scotland, after the schools re-opened in August 2020, the risk of hospitalisation among teachers and their household members was found to be broadly like the general working age population, and the relative risk of severe COVID-19 was lower.²⁷

These studies were carried out, in the main, before the more transmissible Alpha and Delta variants of SARS-CoV-2 became dominant and before the vaccination programme had been widely rolled out in the UK.

The health and wider consequences of COVID-19 for children and young people

COVID-19 related health harms

Compared to adults, children and young people under the age of 18 are at much lower risk of severe COVID-related health outcomes such as hospitalisation and requirement for intensive care, or death.²⁸ Children are susceptible to and can transmit SARs-COV-2 but are less likely to acquire the virus.²⁹ Once infected, they are more likely to experience mild or asymptomatic infection. Severe illness, hospitalisation and mortality are thankfully rare³⁰.

Although the Delta variant of concern (VOC) has higher transmissibility and a higher risk of hospitalisation than the Alpha VOC, there is no current evidence suggesting that it impacts children and young people disproportionately. While the Delta VOC is more transmissible across all the age groups, children and young people will make up a greater proportion of cases in countries like Scotland where there is very high vaccination coverage among adults.

In Scotland, between March 2020 and 5 July 2021, there was one death due to COVID-19 in the <1 year age group and two deaths in the 1–14-year age group. As the vaccination programme rolls out in the older age groups in the population, it is expected that children and younger people will form a greater proportion of new COVID-19 cases, but that the health harm associated with these cases will remain much lower than was seen among unvaccinated adults.

Since the start of the pandemic in Scotland, there have been 329 admissions to hospital of children aged 0-9 years, and 259 admissions of children and young people aged 10-19 years, with a recent COVID-19 diagnosis (which is up to 0.05% of the population of the 0-19 age group). The proportion of

children and young people who have tested positive for COVID-19 who are admitted to hospital within 14 days has remained low and stable, at between 0.5% and 2% in the period December 2020 to June 2021.³¹

Across the UK and the Republic of Ireland, COVID-19 paediatric intensive care admissions have been monitored by Paediatric Intensive Care Audit Network (PICANet) and in the most recent report to 11 June 2021, there had been a total of 291 children under 18 years admitted to intensive care with a positive COVID test across all areas.³² It should also be noted that the need for individuals to be included in the Highest Clinical Risk group is reviewed constantly, including for children and young people, and this will be updated as new evidence emerges.

There is evidence that a small number of children have required intensive care admission having developed a Paediatric multisystem inflammatory (PIMS or PIMS-T) that is associated with COVID-19, which appears around four to six weeks after initial infection.^{15, 16} Distinct from PIMS, recent research has highlighted that children and young people can experience persistent symptoms associated with long-COVID³³ including fatigue, followed by dyspnoea and difficulties concentrating³⁴. However, the evidence base is incomplete³⁵ and rapidly developing. The precise burden of COVID-19 and enduring symptoms on children is unknown³⁶.

Long-COVID

If infected with COVID-19, children and young people are more likely than adults to experience mild or asymptomatic infection. Severe illness, hospitalisation and mortality are rare.³⁷ Over the time of the pandemic, however, concerns have grown about the longer-term effects of infection, known as 'Long-COVID'. The REACT-2 studies³⁸ of people in the community in England found that around a fifth of those surveyed reported having had a COVID-19 symptom previously, with over a third of these reporting at least one symptom lasting 12 weeks or more. The prevalence of persistent symptoms increased with age, with a 3.5 percentage point increase in likelihood in each decade of life. The prevalence of long-COVID was higher among women, people who are overweight or obese, who smoke, live in deprived areas, or had been admitted to hospital. These studies did not look at long-COVID in children.

Children and young people can experience symptoms associated with long-COVID³⁹ including fatigue, followed by dyspnoea and difficulties concentrating⁴⁰. However, the evidence base is incomplete⁴¹ and rapidly developing. The JCVI statement on COVID-19 vaccination of children and young people aged 12-17 years⁴² confirms the low risk of prolonged symptoms in this age group, stating:

“Concerns have been raised regarding post-acute COVID-19 syndrome (long COVID) in children. Emerging large-scale epidemiological studies

indicate that this risk is very low in children, especially in comparison with adults, and similar to the sequelae of other respiratory viral infections in children.”

The sub-group will continue to review the evidence on acute and prolonged health effects of COVID-19, and will update advice if required in light of new findings.

Wider health and wellbeing

There is consistent international review-level and UK evidence that the COVID-19 pandemic and the related public health control measures have adversely affected the mental health and wellbeing of children and young people with a range of negative emotional, behavioural and wellbeing outcomes reported.^{43 44 45 46 47 48 49} Adolescents and girls were reported to be more affected than children and boys, respectively.^{50 51 52}

Levels of stress, depression and anxiety among caregivers of young children (0-8 years) has been found to be associated with reduced responsive caregiving.⁵³ Financial insecurity was consistently identified as an important source of stress.⁵⁴ However, a number of studies found that the restrictions during lockdown were linked with improved family relationships^{55 56} improved mental health and wellbeing scores among adolescents with pre-existing mental health issues^{57 58} and a decrease in challenging or disruptive behaviours reported by parents of children with attention deficit hyperactivity disorder.⁵⁹

There is inconsistent evidence about the impact on children and young peoples' physical activity and dietary habits during COVID-19 related school closures.⁶⁰ Several studies report that levels of physical activity decreased⁶¹ and sedentary behaviours increased⁶², while others report an increase in physical activity levels.^{63 64} In a Welsh study, the number of takeaways consumed per week had significantly decreased during the school closures in the first national lockdown, while sugary snack consumption had increased.⁶⁵

International review-level evidence about the effect of COVID-19 related school closures on educational outcomes is mixed, with some studies reporting a negative effect and others reporting a positive effect.⁶⁶ Younger children and those from low-income households have been found to be more adversely affected.⁶⁷ In an English study, the estimated learning loss of learning in reading after the first COVID-19 related school closures was 1.8 months for primary school-aged children and 1.7 months for secondary school pupils. The learning losses in mathematics were greater. On average, pupils from disadvantaged backgrounds⁶⁸ had experienced greater learning losses than their more affluent peers.⁶⁹

There is international review-level evidence that the number of referrals to child protective services for potential abuse, neglect and maltreatment of

children and young people was reduced during the COVID-19 related restrictions in the first wave of the pandemic.^{70 71} The proportion from schools fell by up to half, highlighting the role of schools and early learning and childcare settings in identifying potential cases.⁷² There were rises in child abuse-related injuries in babies and toddlers also reported.⁷³

There is consistent international review-level and Scottish evidence that paediatric emergency department attendance fell markedly in national lockdowns during the first wave of the pandemic in comparison to previous years.^{74 75 76} The proportion of attendees who required emergency hospital admission increased.⁷⁷

While many studies do not consider how children and young people's social circumstances may modify outcomes⁷⁸, there is emerging evidence that population sub-groups of children and young people, such as those with a parent in the justice system⁷⁹, those living in low-income households^{80 81} and those with special educational needs or neurodevelopmental difficulties⁸² have been disproportionately affected by the pandemic and the related restrictions.

Many of the studies that examine the impact of the pandemic and related restrictions on children and young people's health and wellbeing use cross-sectional designs with recruitment processes that introduce a source of bias. There tends to be reliance on self-report or parent-report measures. Often, it is not possible to tell how representative the participants are of a general population.

Prevention and control measures

While the vaccination programme was being rolled out, non-pharmaceutical interventions (NPI) such as physical distancing, hand and respiratory hygiene, face coverings, ventilation, testing and zero-tolerance to symptoms were the main public health tools against COVID-19. Staff and pupil safety and wellbeing is enhanced by the application of appropriate mitigations within the school environment, commensurate with the level of risk in that environment.

The virus spreads mainly between people who are in close contact with each other.⁸³ Infection can occur when aerosols or droplets containing the virus are breathed in or come into contact with the eyes, nose, or mouth. Transmission risk is increased in indoor places that are poorly ventilated or crowded, and where people tend to spend longer periods of time, because aerosols remain suspended in the air. There is increasing evidence of airborne transmission over longer distances in some situations.⁸⁴

Looking forward, we expect that the role of NPIs in managing the epidemic in Scotland will be reduced as the protective effect of the vaccine both reduces the direct health harms of the virus and helps to reduce transmission. However, there will need to be some baseline mitigations in order to stop the

virus resurging and to protect those who do not have protection from vaccination. Behavioural responses and good risk assessment will remain crucial.

The updated coronavirus (COVID-19): guidance on [reducing the risks in schools](#) has been developed to support a safe return to school for all children, young people and staff in August 2021.

Separate guidance is in place for [ELC and childcare settings](#), providing a package of age-appropriate public health measures.

Ventilation

Letting fresh air into indoor spaces can help remove air that contains virus particles and thereby help prevent the spread of COVID-19. In poorly ventilated rooms the amount of virus in the air can build up, increasing the risk of spreading COVID-19.

The Environmental Modelling Group (EMG) has previously given guidance⁸⁵ on the importance of ventilation to mitigate transmission of COVID-19 including recommending appropriate ventilation rates and providing baseline on carbon dioxide (CO₂) concentrations in indoor air that indicate good or poor ventilation. It has since published an updated paper considering in more detail the application of CO₂ monitoring as an approach to managing ventilation to mitigate transmission of COVID-19⁸⁶. It states:

“CO₂ monitoring can be a cost-effective way of helping to identify spaces with high occupancy and/or poor ventilation and for actively managing ventilation in a space. It can be used to enable a good balance between ventilation, thermal comfort, and energy use.”

Face coverings

Evidence^{87 88} grows that face coverings are effective in reducing the transmission of coronavirus and the World Health Organisation recommends their use in the community and in certain workplaces. The current World Health Organisation (WHO) checklist⁸⁹ promotes the wearing of face coverings among students (by age) teachers and school staff, and especially where physical distancing cannot be achieved. It states:

“Students should be educated on the proper use of masks and the disposal of masks after use. Note that teachers and school staff may be required to wear masks if they cannot guarantee the 1 metre distance or if they are in areas experiencing established community transmission.”

Physical distancing

The EMG says that transmission is strongly associated with proximity, duration and frequency of contact, and with community prevalence. The highest risks of transmission are associated with poorly ventilated and crowded indoor settings.⁹⁰ The Scientific Advisory Group for Emergencies (SAGE) and the EMG report a significant reduction in exposure to all virus-containing droplets where around 2 metres of distance is maintained.⁹¹

While it is not possible to isolate the effects of physical distancing restrictions from other control measures, there is consistent evidence of negative societal impacts over the course of the pandemic. This includes a large reduction in social connectivity, and higher levels of loneliness and anxiety, particularly for younger people. The lockdown lowdown survey of young people in Scotland described the impact that COVID-19 had had on their relationships, including a reduced quality of friendships⁹² and psychological literature shows that children rely on social interaction with their peers to meet their broad developmental needs including learning, well-being and positive mental health outcomes.⁹³

Asymptomatic testing

Regular testing using lateral flow devices (LFDs), also known as rapid tests, helps to find positive cases in people who have no symptoms, but who are still infectious. [Evaluations from Public Health England and the University of Oxford](#) show LFD tests are accurate and sensitive enough for specific case uses within the community setting (such as schools).

Summary of sub-group advice

The sub-group has provided [advice](#) on the appropriate mitigations that should be in place to ensure a safe return to school in August . The sub-group strongly advises a precautionary, staged approach to the removal of mitigations in order to monitor the impacts of each phase, and to allow the system the flexibility to respond to data and developments.

It also advises that:

- To balance ongoing COVID-19 mitigations in schools and ELC settings with other harms, for example to children and young people's education and wellbeing, mitigations should remain in place for no longer than is necessary given the state of the epidemic and evidence about risk. There should be a presumption against placing a greater restriction on children and young people than on the rest of society as the vaccination programme progresses.
- The current position on self-isolation for children and young people as contacts of cases is not commensurate with the risk going forward and

should be revised to exempt all children and young people from isolation as close contacts unless they are symptomatic or have a positive test.

- To allow time for all adults to have the opportunity to be fully vaccinated, and to monitor the impacts of the updated policy on self-isolation in children and young people, the vast majority of other mitigations that are currently in place in schools and ELC and including school aged childcare should remain in place at the start of term and for a period up to six weeks (subject to review).
- In order to ensure that schools re-open safely, staff in all education and local authority ELC settings, and secondary pupils should be asked to undertake a Lateral Flow Device (LFD) home test no more than two days before they return to school in August. Anyone who tests positive should not return to school, and should seek a confirmatory PCR test.
- Asymptomatic LFD testing for children and young people in secondary schools and for school and ELC staff should continue for a period after the start of term, but consideration should be given to adjusting the approach thereafter so that tests are only required where indicated by community prevalence and based on the advice of the local Director of Public Health/Incident Management Team.
- When a COVID-positive case is identified, school-aged close contacts should be advised to book a PCR test as soon as possible, and only end self-isolation and return to school if/when they receive a negative PCR test result.

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² <https://publichealthscotland.scot/publications/covid-19-statistical-report/covid-19-statistical-report-4-august-2021/dashboard/>

³ https://scotland.shinyapps.io/phs-covid19-education/_w_852fb58e/

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⁵ <https://www.gov.uk/government/publications/covid-19-variants-genomically-confirmed-case-numbers/variants-distribution-of-case-data-16-july-2021>

⁶ <https://www.ecdc.europa.eu/en/publications-data/threat-assessment-emergence-and-impact-sars-cov-2-delta-variant>

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- ¹⁶ https://public.tableau.com/app/profile/phs.covid.19/viz/COVID-19DailyDashboard_15960160643010/Overview#!/vizhome/COVID-19DailyDashboard_15960160643010/Overview
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