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Guidance

COVID-19: paediatric surveillance

Description and contact details of PHE paediatric surveillance programmes for COVID-19.

From:

Public Health England (<https://www.gov.uk/government/organisations/public-health-england>)

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Paediatric surveillance for COVID-19 at Public Health England (PHE)

Children represent a small proportion of the total number of confirmed coronavirus (COVID-19) cases, with older adults and those with underlying co-morbidities particularly affected by the current global pandemic. Whilst this is reassuring for paediatricians, there are limited data on childhood SARS-CoV-19 infections, especially from Europe.

Public Health England (PHE) along with NHS partners and academic collaborators has implemented a number of ongoing surveillance programmes to monitor the course, progression and outcomes of COVID-19 in children.

PHE has legal permission, provided by Regulation 3 of the Health Service (Control of Patient Information) Regulations 2002, to process patient confidential information for national surveillance of communicable diseases. As such, individual patient consent is not required.

1. COVID-19 surveillance in schools in England

a. sKIDs COVID-19 surveillance in school children

PHE initiated enhanced surveillance of COVID-19 in staff and students in May 2020. This study aims to recruit 100 schools across England during the summer mini-term (May to July 2020) into 2 separate studies:

Serosurveillance

In some schools, we will be taking nose swabs, throat swabs, saliva swabs and blood samples from all participating staff and students attending pre-school, primary school and secondary school. Three sets of samples will be taken: at the start of the study, at the end of the term and during the autumn term. The samples will be tested for the SARS-CoV-2 virus and for antibodies against the virus. We will also collect information about the participants' health and illness during the course of the study.

Weekly swabs

In other schools, nose swabs will be taken from all participating staff and students on the same day every week until the end of the summer term. The samples will be tested for the SARS-CoV-2 virus. We will also collect information about the participants' health and illness during the course of the study.

More information about the sKIDs study can be found in the sKID protocol (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/983299/sKIDs_protocol_v1.6.pdf) (PDF, 3.2MB, 100 pages).

How to take an oral fluid swab video for primary school children between 4 and 7 years of age

sKIDS oral fluid swab video - for primary school childre...



How to take an oral fluid swab video for primary school children between 7 and 11 years of age

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The final report of the sKIDS surveillance has been published

([https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642\(21\)00061-4/fulltext](https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642(21)00061-4/fulltext)). Summary of findings:

1. Very few infections and transmission events in 131 educational settings during the 4 to 6 week summer half-term from 1 June to mid-July 2020
2. 11,966 participants in 131 schools had 40,501 swabs taken over June and July. SARS-CoV-2 infection rate was 4.1 per 100,000 per week (1 per 24,463; 95% CI, 0.10 to 21.8) in students and 12.5 per 100,000 per week (2 per 16,038; 95% CI, 1.5-45.0) in staff

3. Where a SARS-CoV-2 positive case was identified, we did not find any additional cases within the household, class bubble or wider education setting when tested
4. SARS-CoV-2 antibody positivity in June was 11.2% (91/816; 95%CI, 7.9-15.1%) in students and 15.1% (209/1,381; 95%CI, 11.9-18.9%) in staff
5. Non-white ethnicity and living in a household with a healthcare worker were significantly associated with seropositivity in both students and staff, and region was significantly associated for students, but not school attendance during lockdown
6. By December, 2020, 55 (5.1%; 95% CI 3.8–6.5) of 1,085 participants who were seronegative at recruitment (in June, 2020) had seroconverted, including 19 (5.6%; 3.4–8.6) of 340 students and 36 (4.8%; 3.4 - 6.6) of 745 staff members ($p=0.60$)

b. sKIDs PLUS: COVID-19 surveillance in secondary schools

PHE is conducting enhanced surveillance of COVID-19 in staff and students attending 20 secondary schools and colleges during the 2020 to 2021 academic year. Participants will have nasal swabs, oral fluid (saliva) and blood samples for SARS-CoV-2 virus and antibody testing at recruitment and at the end of each academic term.

More information about the sKIDs study can be found in the sKIDsPLUS protocol: sKIDsPLUS protocol (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/920906/sKIDsPLUS_protocol_v1_Aug20.pdf) (PDF, 576KB, 45 pages).

COVID-19 and sKIDsPlus information video

sKIDs Plus study video - for children and young people ...



c. Outbreak surveillance in educational settings

PHE has been monitoring cases, clusters and outbreaks in educational settings since the reopening of schools on 1 June 2020. This surveillance is currently ongoing for England during the 2020 to 2021 academic year.

The first report of outbreak investigations (<https://www.gov.uk/government/publications/sars-cov-2-infection-and-transmission-in-educational-settings>) has been published. Summary of findings:

1. From 1 to 30 June 2020, the number of open educational settings in England rose from 20,500 to 23,400 and the number of children attending any educational setting increased from 475,000 to 1,646,000
2. There were 170 COVID-19-related situations in educational settings during the month of June 2020. On further investigation, there were no confirmed COVID-19 cases in 101 of these, leaving 67 confirmed single cases, 4 co-primary (at least 2 cases confirmed at the same time) and 30 outbreaks
3. There was a strong correlation between number of outbreaks in educational settings and regional COVID-19 incidence (0.51 outbreaks for each new SARS-CoV-2 infection per 100,000 in the community; $p=0.001$)
4. We estimate that there were 0.5, 4.8 and 1.6 outbreaks per 1,000 settings per month in early years, primary schools and secondary schools. However, attendance levels across open settings were much higher for early years and primary schools than secondary schools
5. The likely transmission route in 28 of the 30 outbreaks was staff-to-staff ($n=13$), staff-to-student ($n=7$), student-to-staff ($n=6$) and student-to-student ($n=2$)
6. Staff members were more likely to have COVID-19 compared to students in any educational setting and more likely to be involved in outbreaks
7. Children were more likely to acquire SARS-CoV-2 infection at home, usually from a key worker parent, than at school

d. School Infection Survey (SIS)

PHE is working with the Office for National Statistics (ONS), London School of Hygiene and Tropical Medicine (LSHTM), Department for Education (DfE) and the Department for Health and Social Care (DHSC) to conduct a large prospective school survey of staff and students in up to 150 schools across England.

The School Infection Survey (SIS) started in November 2020 and will continue until the end of the 2020 to 2021 academic year. More information can be found in the SIS protocol: School Infection Survey protocol

(https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/949467/SIS_protocol_v1.1_13102020.pdf) (PDF, 5.01MB, 152 pages) and in the Round 1

(<https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/covid19schoolsinfectedsurveyround1england/november2020>) and Round 2

(<https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/covid19schoolsinfectedsurveyround2england/december2020>) publications.

2. Clinical follow-up of laboratory-confirmed COVID-19 cases in children aged 29 days to less than 16 years

PHE receives electronic notifications of all confirmed COVID-19 cases from NHS hospital laboratories in England through the Second Generation Surveillance System (SGSS). Notified childhood cases in the surveillance age group are followed-up with their general practitioners and hospital to determine whether they were hospitalised and, if so, their responsible paediatric consultant, who are then contacted to complete a short online clinical questionnaire for each case.

Information collected includes clinical presentation, underlying co-morbidities, investigations, intensive care requirement, treatment and outcome at hospital discharge.

The first report of the paediatric surveillance has been published (<https://adc.bmj.com/content/early/2020/07/28/archdischild-2020-320042>).

In order to speed up data collection, paediatricians can directly report cases to PHE by emailing phe.paedcovid@nhs.net

If you would like more information about the surveillance, please contact Dr Shamez Ladhani at shamez.ladhani@phe.gov.uk

3. Clinical follow up of laboratory-confirmed cases in neonates up to 28 days of age

PHE is working with colleagues at the National Perinatal Epidemiology Unit and Imperial College London to conduct clinical surveillance of COVID-19 in neonates from birth up to 28 days of age through the British Paediatric Surveillance Unit (BPSU) (<https://bpsu.org.uk/>). Paediatricians across the UK and Ireland will receive weekly emails from the BPSU team to report whether they have managed a case of neonatal COVID-19 in the previous week. Those confirming a case will be asked to complete a short clinical questionnaire. Further information about the BPSU surveillance (<https://www.rcpch.ac.uk/bpsu-study-neonatal-complications-coronavirus-disease-covid-19>) is available. For more information about the BPSU surveillance, contact Dr Jenny Kurinczuk bpsu-covid@ndph.ox.ac.uk.

At the end of the surveillance, cases will be linked to a similar surveillance of COVID-19 in pregnant women and their babies in progress through the UK Obstetric Surveillance System (UKOSS). Further information about the UKOSS surveillance (<https://www.npeu.ox.ac.uk/ukoss/current-surveillance/covid-19-in-pregnancy>) is available. For more information about the UKOSS surveillance, contact Dr Marian Knight ukoss@npeu.ox.ac.uk.

4. Multi-system inflammatory syndrome, Kawasaki disease and toxic shock syndrome

PHE is working with the British Paediatric Surveillance Unit (BPSU) of the Royal College of Paediatrics and Child Health (RCPCH) to collect detailed clinical information on a new Kawasaki-like syndrome that is temporally associated with the COVID-19 pandemic. This condition is also known as hyperinflammatory syndrome, hyperinflammatory shock, multisystem inflammatory syndrome in children (MIS-C) and Kawasaki disease shock syndrome (KDSS).

Paediatricians across the UK are asked to report all cases to the BPSU and complete a detailed questionnaire for each case. Further information on the BPSU study is available (<https://www.rcpch.ac.uk/work-we-do/bpsu/study-multisystem-inflammatory-syndrome-kawasaki-disease-toxic-shock-syndrome>).

5. The unintended consequences of COVID-19 and delayed hospital presentations in children

PHE and the British Paediatric Surveillance Unit (BPSU) of the Royal College of Paediatrics and Child Health (RCPC) undertook a rapid survey on 24 April 2020 to assess the experiences of paediatricians during the COVID-19 pandemic.

In total, 60% of paediatricians completed the survey within 7 days and one-third of frontline paediatricians had witnessed a delayed hospital presentation in the previous 2 weeks. Free text responses revealed diabetes mellitus (new diagnosis, or diabetic ketoacidosis) as by far the most common delayed presentation, but also sepsis and malignancy.

The final report has been published (<https://adc.bmj.com/content/early/2020/06/24/archdischild-2020-319848>) along with an accompanying commentary (<https://blogs.bmj.com/bmj/2020/08/06/lockdown-measures-reduced-the-risk-of-covid-19-but-had-unintended-consequences-for-children/>).

6. RAPID-19 study: COVID-19 in children of healthcare workers

PHE is working with teams across the UK to conduct surveillance in children of healthcare workers across 5 cities. RAPID-19 stands for rapid diagnostics, antibody testing and host response in children with COVID-19. Sites in London, Belfast and Glasgow have already recruited more than 200 children each, and sites in Manchester and Cardiff are nearly ready to go.

The surveillance aims to assess the seroprevalence of COVID-19 in children of healthcare workers and how that changes over time. Children will have a blood sample taken for SARS-CoV-2 antibodies at recruitment, around 8 weeks later and 4 to 6 months later. This will allow us to monitor how much the children have been exposed to the virus between the different testing periods.

Different centres will also try to answer specific important questions which are:

- what is the incidence of SARS-CoV-2 infection in children of healthcare workers?
- which swabs provide better results for SARS-CoV-2 – nose or throat?
- can oral fluid (saliva) samples be used to measure SARS-CoV-2 antibodies in children?
- can we use point-of-care finger-prick tests to diagnose COVID-19 quickly in children?
- what is the infection rate with SARS-CoV-2 in symptomatic children?
- how do children's immune systems fight the infection when they develop COVID-19?

More information about the RAPID-19 study (<https://clinicaltrials.gov/ct2/show/NCT04347408>) is available.

The first report for RAPID-19 (<https://www.medrxiv.org/content/10.1101/2020.08.31.20183095v1>) has been published.

7. Serosurveys in children

PHE is conducting a number of seroprevalence surveys which include children using blood samples from a number of different sources. For more information, contact Dr Gayatri Amirthalingam gayatri.amirthalingam@phe.gov.uk. The surveys are:

- **PHE Seroepidemiology Unit (SEU)** – the SEU archive is an opportunistic collection of residual serum samples from routine microbiological testing, submitted voluntarily each year from hospital laboratories throughout England
- **RCGP Research and Surveillance Centre (RSC)** – residual sera are collected from about 100 GP practices across England participating in primary care research mainly for influenza surveillance
- **What's The Story COVID-19** – this serosurvey will build on an existing national research network and ethically-approved NIHR-funded study to collect childhood and teenage serum samples for near real-time monitoring of increases in paediatric COVID-19 sero-positivity rates across the UK in 2020
- **pertussis serology samples** – residual sera from samples submitted to the PHE reference laboratory from patients with persistent cough from all age groups across England will be used for serosurveillance

8. Risk of vertical transmission during pregnancy (periCOVID)

PHE is working with St George's University of London (SGUL) to assess the risk of vertical transmission in pregnant women with confirmed COVID-19. This surveillance will aim to collect blood, throat swab, urine and stool samples from the pregnant women and, after childbirth, from the baby.

Obstetricians and Neonatologists across England are asked to contact the periCOVID team when they have a pregnant woman with COVID-19 who hasn't yet delivered. Full details of the protocol, including the participant information leaflet and the consent form (<https://www.pericovid.com/>) are available, along with the PHE approval: PeriCOVID

(https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/880984/periCOVID_protocol_v1.2_31032020.pdf) (PDF, 900KB, 21 pages). The periCOVID team can be contacted at pericovid@sgul.ac.uk.

9. Children and young people with Long Covid (CLoCK)

PHE is working with teams across the UK tracking the impact of COVID-19 on the mental health of children, young people and families.

Further information is available in the CLoCK protocol

(https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/977177/Children_and_young_people_with_Long_Covid__CLoCK_.pdf) (PDF, 588KB, 23 pages).

References

1. Ladhani SN and others. 'Prioritising paediatric surveillance during the COVID-19 pandemic' (<https://pubmed.ncbi.nlm.nih.gov/32381519/>)
from_term=ladhani+s&from_sort=date&from_size=50&from_pos=5) Archives of Disease in Childhood May 2020

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1. 4 May 2021
Added updated sKIDs protocol.
2. 9 April 2021
Added Children and young people with Long Covid (CLoCK) study.
3. 26 March 2021
Updated sKIDs COVID-19 surveillance in school children data.
4. 4 January 2021
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5. 24 September 2020
Added new surveillance programmes, links to reports and findings and information videos.
6. 28 July 2020
Added updated sKIDs protocol.
7. 12 June 2020
Added studies 5 to 7: RAPID-19 study; sKIDs COVID-19 surveillance in school children; and Multi-system inflammatory syndrome, Kawasaki disease and toxic shock syndrome.
8. 27 April 2020
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- PHE: Prospective active national surveillance of preschools and primary schools for SARS-CoV-2 infection and transmission, 21 August 2020 (<https://www.gov.uk/government/publications/phe-prospective-active-national-surveillance-of-preschools-and-primary-schools-for-sars-cov-2-infection-and-transmission-21-august-2020>)
- Reported coronavirus (COVID-19) notifications by registered early years and childcare settings (<https://www.gov.uk/government/publications/reported-coronavirus-covid-19-cases-by-registered-early-years-and-childcare-settings>)
- SARS-CoV-2 infection and transmission in educational settings (<https://www.gov.uk/government/publications/sars-cov-2-infection-and-transmission-in-educational-settings>)
- Palliative and end of life care profiles: November 2020 data update (<https://www.gov.uk/government/statistics/palliative-and-end-of-life-care-profiles-november-2020-data-update>)

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