

COVID-19 infections among school pupils in Scotland: summary statistics

August to October 2020

Publication date: 18 November 2020

This is an Experimental Statistics publication

Experimental statistics are official statistics which are published in order to involve users and stakeholders in their development and as a means to build in quality at an early stage. It is important that users understand that limitations may apply to the interpretation of this data, further details of which are presented in this report.

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Introduction

This report provides information on the number of cases of COVID-19 among school pupils in Scotland from 17th August to 18th October 2020. The covers the period from the first full week following the return to school after the summer, up to the October break, which is known as 'Term 1' of the 2020/21 school year. The report shows the number of cases among pupils during Term 1, by geographical area, and by school type.

Cases of COVID-19 among school pupils are not the same as COVID-19 incidents within schools. This is because not all pupil cases identified will have been present in school during their infectious period. Similarly, other schools will have had COVID-19 incidents, for example infections among members of staff which are not measured here.

It is planned that the data in this report will be further developed to incorporate data from the Test & Protect Case Management System (CMS), which will allow the issues above to be addressed, to some extent, in future reports.

Main Points

- More than three-quarters of schools in Scotland did not have any pupils test positive for COVID-19 in Term 1. Secondary schools were more likely to have a pupil test positive than Primary or special schools.
- Measures of COVID-19 occurrence in the school pupil population remained largely stable for the first five weeks of Term 1, with increases in the rate of positive cases and the number of schools with pupils testing positive from the week commencing 21st September.
- The proportion of schools with pupils who have tested positive for COVID-19 varied substantially by area, with those in the NHS Greater Glasgow and Clyde and NHS Lanarkshire areas most affected.
- There following limitations should be recognised in interpreting these data:
 - Cases of COVID-19 have been identified among the pupil populations of schools, but that does not necessarily mean that a pupil was present in the school at the time of their illness or infectious period.
 - The occurrence of multiple cases within the pupil population of a given school does not necessarily imply that these cases are linked or attributable to transmission within the school.
 - These data overestimate the occurrence of cases within the S5 and S6 year groups, as limitations of the data source mean that there are individuals included who have left school.
 - These data are likely to underestimate the occurrence of cases within the P1 and S1 year groups, as a proportion of these year groups do not yet have a school allocated within the source data system, particularly at S1 level.
 - These data overestimate the total number of schools, due to the allocation of a small number of pupils to incorrect year groups leading to duplicate records.
 - It is not possible to account for the occurrence of false positive tests within these data.

Methods

Period of analysis

The period reviewed for this report was 17th August to 18th October 2020, to reflect the school term dates. The majority of schools in Scotland returned on the 12th August, therefore the week commencing the 17th August was the first full week in school. October break dates vary by local authority, with the earliest commencing on the 5th October, and the latest on the 19th October. A large proportion of schools had their October break in the week commencing 12th October, therefore in the last week of presented results a substantial number of pupils will not have been in school.

Data sources

COVID-19 PCR¹ test results from both NHS laboratories in Scotland and UK laboratories are collated in Scotland in the ECOSSE database. Data were taken from the Public Health Scotland daily ECOSSE extract on 02/11/2020 for all children and young adults aged between 4 and 17 years (inclusive), with specimen dates in the above period.

The Child Health Systems Programme-School (CHSP-School) dataset is used to support the delivery and monitoring of health checks and immunisations in school pupils in Scotland. As such it aims to provide a comprehensive record of all children of school age in Scotland, and which school they attend. Local authority funded, grant-maintained and independent schools are included, as are special² schools.

CHSP-School provided the best available mechanism to identify the current school pupil population and their school of attendance. There are, however, limitations to the accuracy of these data both in general, and for the current school year in particular. CHSP-School is updated using information provided by Local Authorities through the course of the school year, to maintain the current school of attendance of pupils. This process has not yet been undertaken for the 2020/21 academic year, and therefore pupils who have changed school may be incorrectly attributed to their previous school, or have no school data available. In the S5/6 group more pupils are identified in CHSP-School than are actually in school, due to continued inclusion of some individuals on the system who have already left school. For this reason, data for S1-4 pupils and S5-6 pupils are reported separately. P1 and S1 pupils have a lower proportion of data on school attended than other year groups. More detail on these issues is presented in Appendix 1.

Data were extracted from CHSP-School on 12/10/2020 for pupils with an active status on the system, with no 'date left school' and year of birth from 2000. Records were excluded if it was documented that the individual is not attending a school in Scotland (due to home schooling, moving outside the UK, deferred entry, or attending school outside Scotland).

¹ All COVID-19 tests referred to in this report are RNA polymerase chain reaction (PCR) tests, that detect the presence of RNA from the SARS-CoV-2 virus.

² The term 'special schools' is used throughout this report to refer to dedicated specialist settings, as this is the terminology used by Scottish Government and Education Scotland.

Linkage

Test results from ECOSSE were matched to CHSP-School records using the Community Health Index (CHI) number, which is a unique identifier used on health records in Scotland. Each individual is only included once in this analysis. Where multiple test records existed for an individual, a positive result was included over a negative test, and the most recent test selected where relevant. Further details are provided in Appendix 1.

Measures

This report presents data on the identified pupil population as a whole, including counts of cases and rates of testing and positive cases per 100,000 pupil population.

There are also data which use school as the unit of analysis, as derived from the CHSP-School dataset. These include counts and proportions of schools with any pupils testing positive, or with multiple pupils testing positive in a given period (whole term or week). This indicates that a member of the school's pupil population has tested positive in that period, but not necessarily that the pupil was present in the school during their illness or infectious period. Similarly, the measure of multiple pupils testing positive is a measure of the concentration of cases in the school's pupil population, but it should not be assumed that such instances necessarily indicate transmission within the school, or links between cases.

Results and Commentary

Matching of results and data quality

There were 755,894 pupils identified in the relevant age group within CHSP-S. Of these 753,901 were included in the data matching (following application of the exclusion criteria), and 696,547 records had adequate school data.

There were 91,148 COVID-19 test results identified for the target age group that could be used for analysis. Of these 83,678 were successfully linked to CHSP-School, with 82,583 matched to records containing adequate school data. The test results which it was not possible to match to CHSP-School records were largely among the upper and lower age extremes (4-5 years and 16-17 years), indicating that these results were likely to be from individuals who have either not yet started, or have left, school.

There were 2,766 schools identified within the results; schools with pupils identified within both primary and secondary year groups were treated as two separate entities. It is likely that this has resulted in an overestimation of the total number of school settings, due to a combination of non-standard year group ranges in some schools, and data quality issues relating to the allocation of year groups.

Further information on data quality is contained in Appendix 1, and summary populations are shown in Table 7.

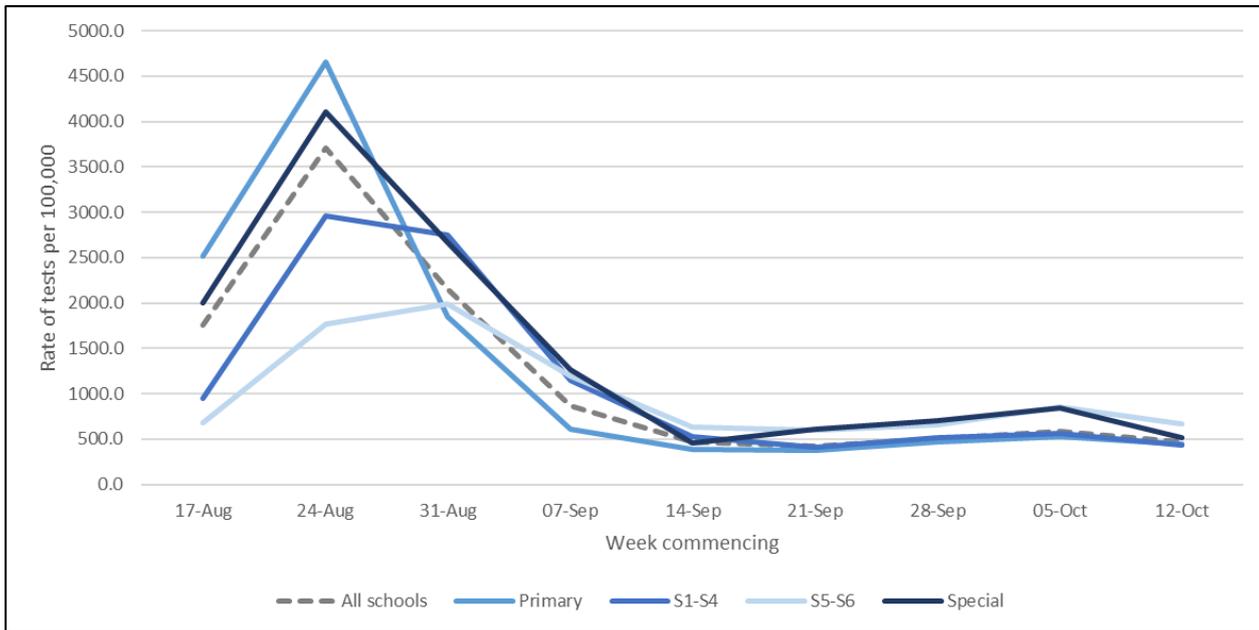
Testing among pupils

The cumulative rate of testing across the period for all pupils was 10,958 per 100,000. Pupils in special schools had the highest rate of testing (13,176 per 100,000), followed by primary schools (11,821 per 100,000), secondary pupils in S1-4 (10,256 per 100,000), with secondary pupils in S5-6 having the lowest rates of testing (9,040 per 100,000).

A large number of tests were undertaken in the first three weeks of term, with 70% of all Term 1 tests being taken in this period, and the peak week for testing was the week commencing 24th August. This represents the surge in testing that was seen in the early weeks of term that was associated with the occurrence of non-COVID-19 viral symptoms among school pupils. From week commencing 14th September the testing rates stabilise.

See Tables 1a & 1b, and Figure 1.

Figure 1: Rate of COVID-19 PCR testing, by school type and week, 17th Aug – 18th October. Scotland.



Positive cases among pupils

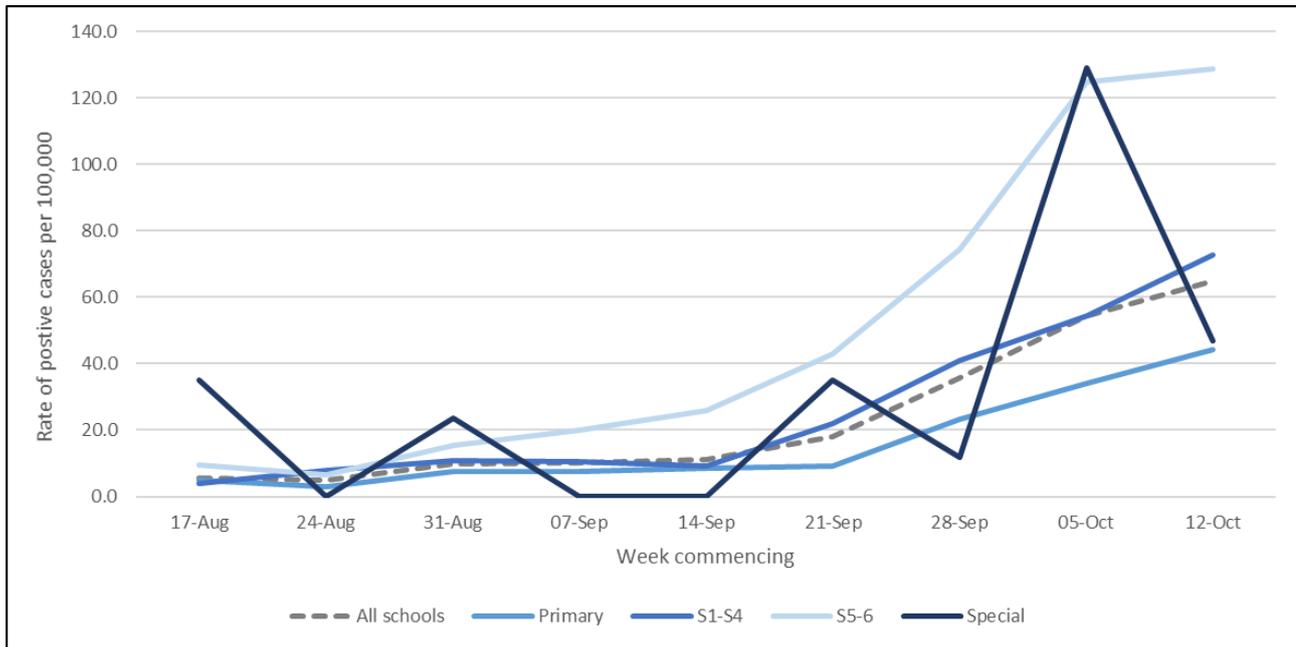
A total of 1,621 positive tests were matched to school pupils. Of these 576 were among primary school pupils, 551 were secondary years S1-4, 470 were secondary years S5-6, and 24 were pupils in special schools. Across all pupils over the 9-week period, 0.2% of the pupil population tested positive for COVID-19, and 2.0% of individuals who were tested had a positive result.

The weekly rate of positive cases increased in the latter weeks of term. Having remained low at between 5 to 10 per 100,000 for the first 4 weeks of term, it steadily increased from the week commencing 21st September, to the highest rate of 65 per 100,000 in the week commencing 12th October.

The highest rates were seen among S5-6 pupils in the week commencing 12th October, where they reached 129 per 100,000. As noted within the Methods section, results for this age group should be interpreted with caution, as they do not solely reflect occurrences among school pupils, due to a proportion of the young people identified having, in fact, left school.

See Tables 2a & 2b and Figure 2.

Figure 2: Rate of positive COVID-19 PCR tests, by school type and week, 17th Aug – 18th October Scotland.



Distribution of positive COVID-19 cases across schools

Across the total of 2,766 schools identified within the dataset, 597 (22%) had at least one pupil with a positive test for COVID-19 within the 9-week period. Not all of these cases will have resulted in a COVID-19 incident within the school, as the pupil may not have been present within school during their infectious period.

The remaining 2,169 schools (78%) did not have any pupils test positive. Some of these schools may still have been affected by a COVID-19 incident, if, for instance, a member of staff, but no pupils, tested positive.

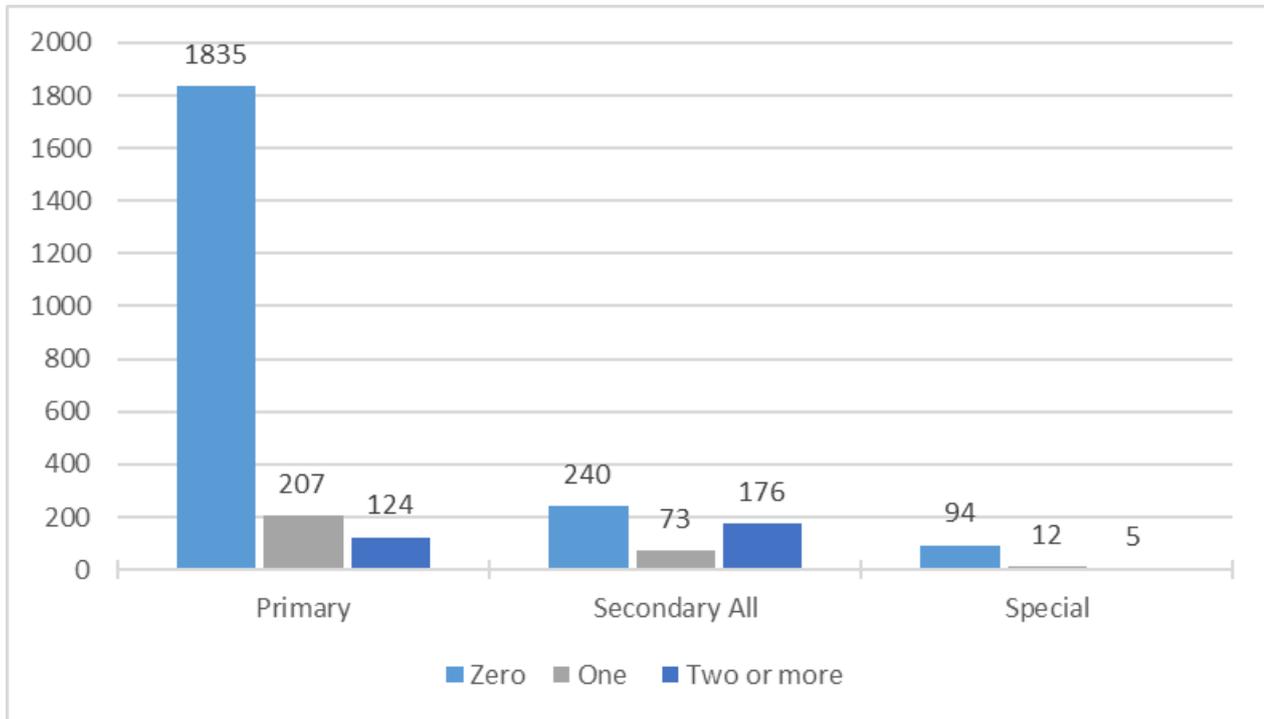
Cases by school type

Of the 597 schools with any pupils affected, 292 (49%) had only one pupil affected across the whole 9-week period. Among the 305 schools with more than one pupil who tested positive, there were 195 in which there was more than one positive case occurring in the same week, on at least one occasion. A larger proportion of secondary schools had at least 1 pupil test positive in this period (51%), than special schools (15%) and primary schools (15%). This reflects both the higher incidence of cases among secondary pupils, and the larger school size at secondary level. Among local authority and grant-aid funded schools, 85% of secondary schools have more than 399 pupils, compared with just 9% of primary schools.³

See Table 3 and Figure 3.

³ <https://www.gov.scot/collections/school-education-statistics/>

Figure 3: Number of positive pupil cases of COVID-19 per school, by school type, 17th Aug – 18th October Scotland.



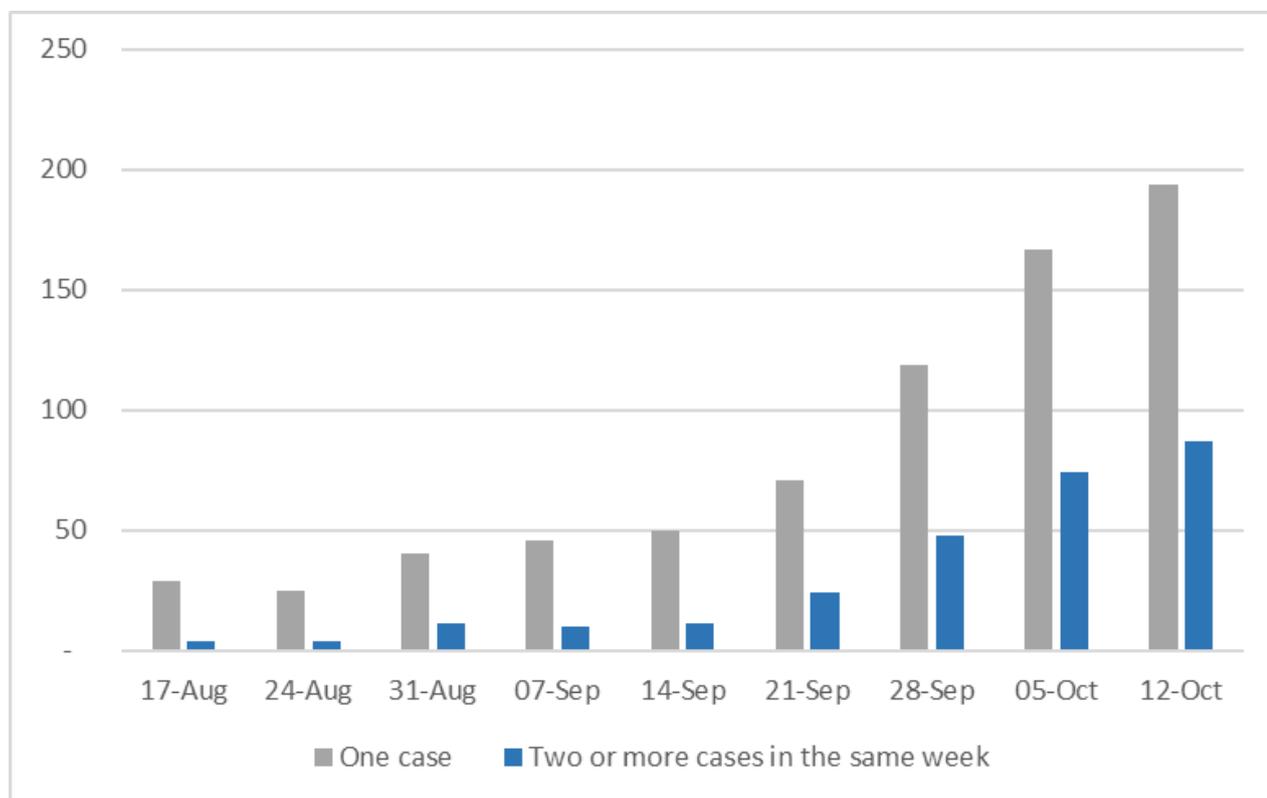
Number and proportion of schools with affected pupils, over time

The number of schools with at least one pupil testing positive in a given week increased from 33 in the first week analysed, to over 200 in the last two weeks.

In the first two weeks analysed just 1% of all schools had a case of COVID-19 among their pupil population. This increased to 10% in the week commencing 12th October. The levels of occurrence of both single and multiple cases in the same school were substantially higher in the three weeks from 28th Sept, than earlier in the period.

See Table 4 and Figure 4.

Figure 4: Number of schools with positive pupil cases of COVID-19, by week, 17th Aug – 18th October Scotland.¹



¹Within the 597 schools with any affected pupils in Term 1, some will have had pupils affected across more than one week, therefore the total number of ‘affected weeks’ totals greater than 597.

Number and proportion of schools with affected pupils, by area

Health Board areas

NHS Greater Glasgow and Clyde and NHS Lanarkshire had the largest number of schools with at least one pupil testing positive, with 196 and 131 respectively, representing 42% and 40% of schools in these areas. NHS Lothian also had a large number of schools affected (86) but this represented a smaller proportion of schools in the area (26%).

Local Authority areas

The proportion of schools which have had one or more pupils test positive varies widely by area, with 10 Local Authority areas having fewer than 10% of schools affected, and 11 areas with more than 25% of schools affected.

In Glasgow City 113 schools (52%) had at least one pupil test positive, and 73 schools in North Lanarkshire (44%). East Dunbartonshire and Renfrewshire had smaller numbers of schools affected, 22 and 29 respectively, but this represented a substantial proportion of all schools in those areas (41% and 39%).

See Tables 5 and 6.

Schools with more than one pupil testing positive in the same week

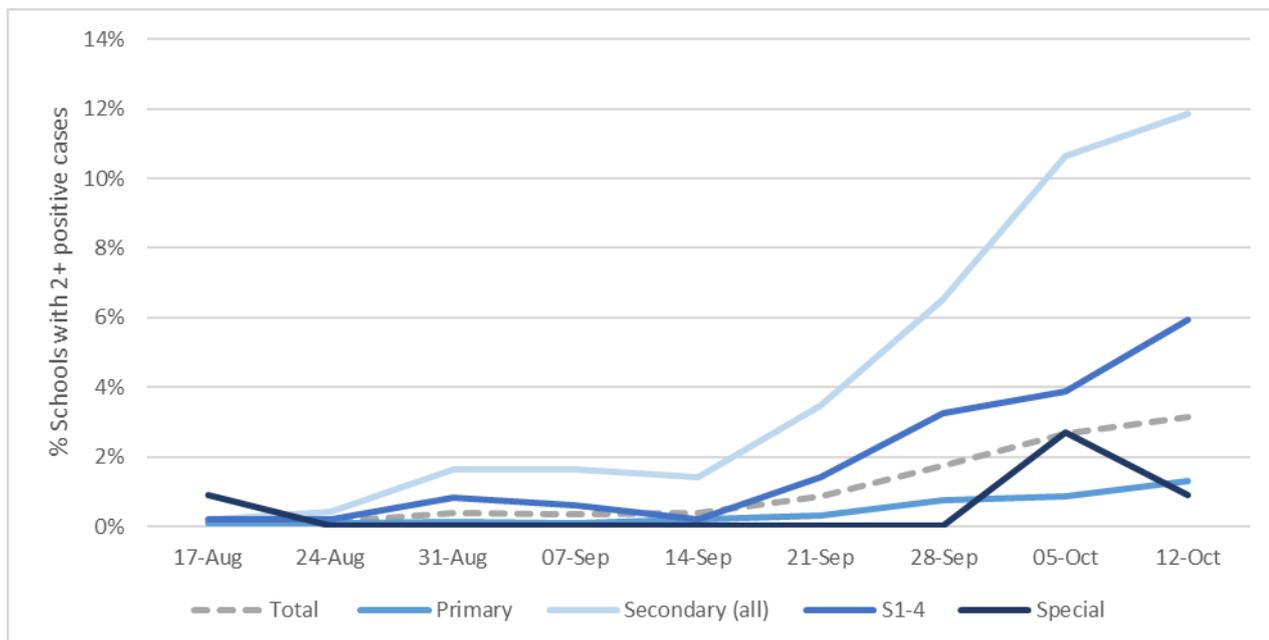
A total of 195 schools had more than one pupil test positive within the same week. This is used as a general measure of the concentration of cases and should not be interpreted as an indication that cases are necessarily linked. Of these 118 were secondary schools, 72 primary schools, and 5 special schools.

Schools in five Local Authority areas accounted for two-thirds of all schools with more than one pupil testing positive in the same week, these were Glasgow City (48), North Lanarkshire (31), South Lanarkshire (26), Fife (13) and City of Edinburgh (11).

The occurrence of multiple cases in a week increased over time, with a small proportion of schools affected prior to the week commencing 21st September. The increase thereafter is most marked in secondary schools, although more moderate in this setting if the analysis is limited to pupils in the S1-S4 years. The occurrence of multiple pupil cases in the same week in the primary school setting has remained an infrequent occurrence, with fewer than 2% of schools affected per week.

See Figure 5, Table 4 and Table 6.

Figure 5: Proportion of schools with more than one pupil testing positive for COVID-19 in the same week, by school type and week, 17th Aug – 18th October 2020, Scotland.



Summary

This report shows how existing data sources can be used to measure the occurrence of COVID-19 among school pupils and across schools. It confirms what was previously known from age group data, that secondary age groups have higher rates of positive COVID-19 tests than younger age groups. This, in combination with that larger school size at secondary stage, means that a higher proportion of secondary schools have been affected by at least one pupil testing positive in Term 1.

Across Term 1, all measures of occurrence among pupils and across schools were relatively stable for the first 5 weeks of Term, with subsequent increases in cases, which are most marked in the last 3 weeks analysed.

It is important to set these findings in the context of the development of the 'second wave' of the COVID-19 pandemic in Scotland. In late-September, following the return of students to university, there was a marked spike in the occurrence of cases in the young adult age groups. From late-September into early October cases have also risen across all adult age groups.

The distribution of schools in which members of the pupil population have tested positive is also concentrated in the geographical areas that have been most affected by the 'second wave', in particular Lanarkshire and Greater Glasgow & Clyde.

Further development of this work will include measures to maximise data quality, and more detailed analysis including data from the Test&Protect system.

Cases of COVID-19 within the pupil population have been concentrated

Glossary

PCR	Polymerase Chain Reaction
CHSP	Child Health Systems Programme – see methods section for details.
CHI	Community Health Index
ECOSS	Electronic Communication of Surveillance in Scotland. The ECOSS system captures lab results from diagnostic and reference laboratories for analysis by Health Protection surveillance teams. It's a national tool for monitoring organisms, infections and microbial intoxications that are of clinical or public health importance.

Contact

Dr Diane Stockton

Email: Diane.Stockton2@phs.scot

Dr Lynda Fenton

Consultant in Public Health Medicine

Phone: 0141 201 4726

Email: Lynda.Fenton5@phs.scot

For all media enquiries please email phs.comms@phs.scot or call 07500 854 574.

Further Information

Further information and data for this publication are available from the [publication page](#) on our website.

Open data

Data from this publication is available to download from the [Scottish Health and Social Care Open Data Portal](#).

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Appendices

Appendix 1 – Data quality

CHSP-School data quality

CHSP – a total of 755,894 children and young people were identified on the system. Of these 1,993 were excluded as they were identified as having deferred school entry, having moved outside of the UK, or as being home schooled. The remaining 753,901 records were included for data matching to ECOSSE results.

Appendix table 1 below provides a comparison of the size of this identified pupil population with the pupil population from the 2019 Scottish Government Pupil Census. The size of the population in each year group will vary from year to year, therefore this is not a direct comparison, but provides an assessment of the scale of any discrepancy between the included population and the actual pupil population.

This shows that the size of the primary school population generally reflects what would be expected based on the 2019 Pupil Census, with the exception of P1, in which the included population was 7% smaller than the P1 population in 2019. The size of the secondary school pupil population was higher than expected. This is most marked in the S5 and S6 year groups, in which the populations were 22% and 65% larger than those identified in the 2019 Pupil Census. This suggests that there may be around 30,000 individuals from these year groups who have been included in this analysis as part of the pupil population, but who have, in fact, left school. The result is that the number of pupil cases in these year groups will be over-estimated.

Appendix table 1: Comparison of CHSP-School data with 2019 Pupil Census

School Year	Child Health Surveillance Programme 2020	Scottish Government 2019 Pupil Census	% difference in pupil population from 2019 Pupil Census
Year Unassigned	593	-	-
P1	51,488	55,119	-7%
P2	57,138	55,261	3%
P3	56,737	56,973	0%
P4	58,772	57,806	2%
P5	59,720	57,553	4%
P6	59,945	57,759	4%
P7	59,569	57,863	3%
S1	63,727	56,316	13%
S2	59,064	54,740	8%
S3	57,654	53,043	9%
S4	56,117	52,363	7%
S5	54,806	44,650	23%
S6	50,048	30,359	65%
Special	8,523	7,011	22%
Total	753,901	696,816	8%

Within CHSP-School there were 57,323 records which were allocated to a year group, but which did not have a current school assigned in the system; the majority of these (52,050) were in the S1 year group, with the remainder in the P1 year group. This reflects pupils who have been advanced a year group within the system, but for whom updated information on school has not been received at these points of transition.

ECOSS test results

ECOSS – a total of 94,456 COVID-19 test results were identified for children aged 4-17 years, in the period 17/08/20 to 18/10/20. Of these 3,308 were excluded due to data quality (multiple results for same individual or no identifier available (CHI)), of these 73 were positive results.

There were 266 instances where there was more than one result for the same individual. Of these 260 of these were individuals who had had two negative results, the remaining six either had two positive results, or a negative result following a positive result.

Matching of ECOSS results to CHSP-School

Of the 91,148 included results, it was possible to match 82,583 (87.5%) to a record on CHSP-School that included valid information on school attended. There were 95 results that matched to CHSP-School, but there was insufficient data recorded regarding school attended. Of the 8,470 results that did not match to CHSP-School at all the majority were at the lower and upper end of the age spectrum; 59% were among children aged 4-5 years and 30% among those aged 16-17 years. These unmatched results are therefore likely to reflect children who have either not yet started or already left school. There were 1,008 unmatched results among those aged 6-15 years, of which 17 were positive.

Details of the matching process and exclusions are presented in Appendix figure 1.

Schools

A total of 2,766 schools were identified from records within the matched dataset. A separate 'school' was if pupils from primary and secondary class groups were identified from the same setting. As a result, the total number of schools reported is higher than the number of separate campuses in Scotland. Whilst the majority of schools are separated between P7 and S1, some sites, particularly island schools, special schools, and those in the independent sector span across this divide.

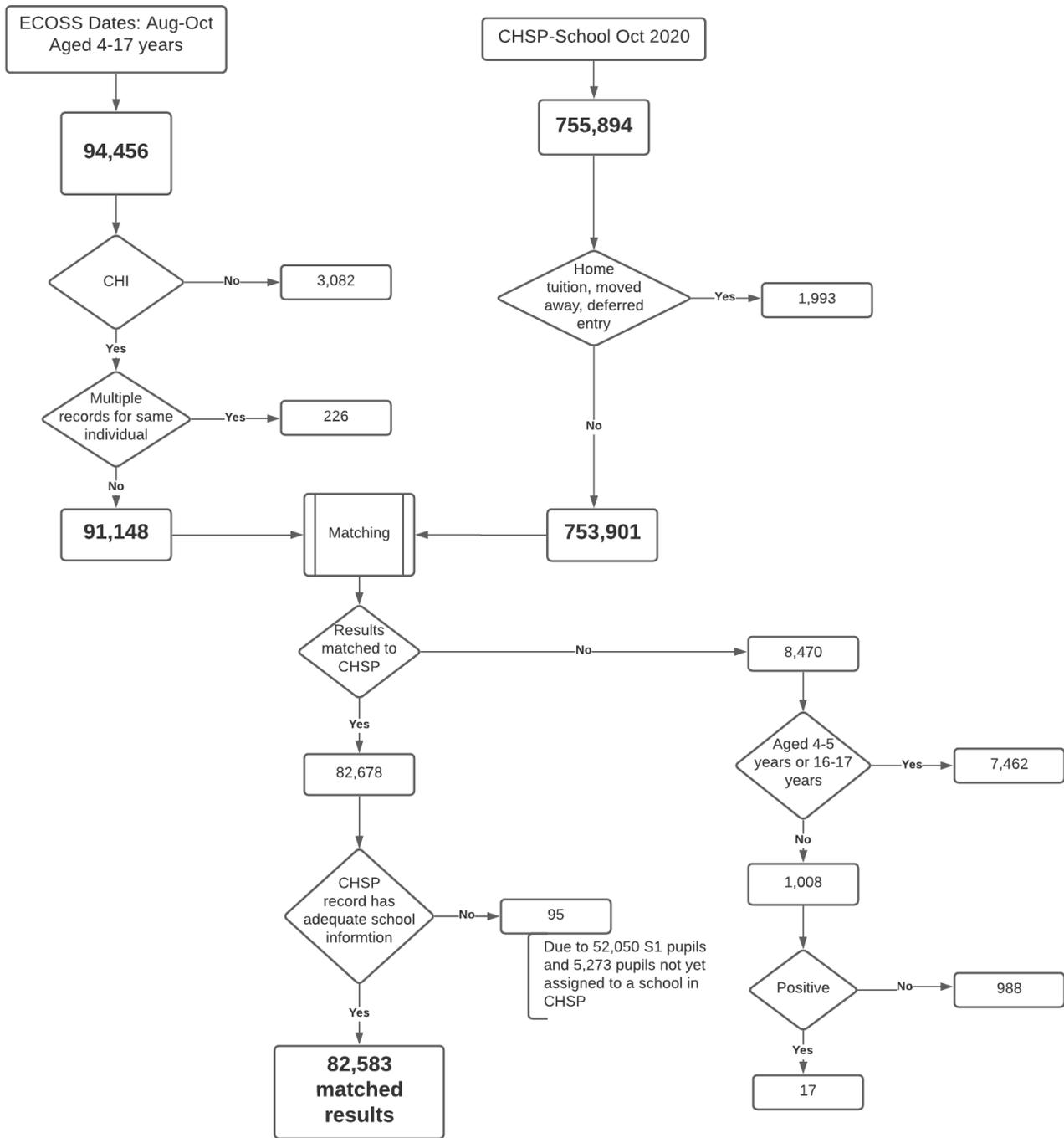
The Scottish Government 2019 Pupil Census identified 2,476 local authority and grant-aid funded schools.⁴ There is no single source providing information on the number of independent schools in Scotland. The Scottish Government provides a list of registered independent schools, which identified 95 schools in November 2020.⁵ Of these 60 accept pupil age groups which span across primary and secondary, and will therefore provide two 'schools' for the purposes of this analysis, giving a total of 155 independent school settings.

On the basis of this assessment, there are 135 additional 'schools' identified in the data set, which are unaccounted for within the expected numbers on the basis of registered settings. These are likely to be attributable to data quality issues leading to duplicate records being

⁴ <https://www.gov.scot/collections/school-education-statistics/>

⁵ <https://www.gov.scot/publications/independent-schools-in-scotland-register/>

generated due to the misclassification of pupils as primary or secondary, when the school does not serve that age group.



Appendix figure 1: ECOSSE-CHSP data matching

Appendix 2 – Publication Metadata

Metadata Indicator	Description
Publication title	COVID-19 infections among school pupils in Scotland: summary statistics
Description	This report provides information on the number of cases of COVID-19 among school pupils in Scotland from 17 th August to 18 th October 2020. The covers the period from the first full week following the return to school after the summer, up to the October break, which is known as 'Term 1' of the 2020/21 school year. The report shows the number of cases among pupils during Term 1, by geographical area, and by school type.
Theme	Population Health
Topic	COVID-19
Format	PDF, Excel
Data source(s)	ECOSS, CHSP-School
Date that data are acquired	October 2020
Release date	18 November 2020
Frequency	One-off report
Timeframe of data and timeliness	COVID-19 tests with a specimen date 17 th August to 18 th October 2020
Continuity of data	N/A
Revisions statement	N/A
Revisions relevant to this publication	N/A
Concepts and definitions	Please see the glossary and methodology sections of this report, and Appendix 1.
Relevance and key uses of the statistics	This report is relevant to the understanding of the occurrence of COVID-19 in the pupil population following the return of pupils to school in August 2020.
Accuracy	Please refer to the methodology section of this report, and the detailed presentation of data quality in Appendix 1.
Completeness	Please refer to the methodology section of this report, and the detailed presentation of data quality in Appendix 1.
Comparability	This is the first presentation of these data in Scotland. Public Health England and Public Health Wales publish reports based on reporting of incidents in schools, which are not directly comparable to this report.
Accessibility	It is the policy of Public Health Scotland to make its web sites and products accessible according to published guidelines.
Coherence and clarity	
Value type and unit of measurement	Figures are shown as numbers or percentages, and rates per 100,000 population.
Disclosure	Disclosure control methods have been applied to the data in order to protect patient confidentiality, therefore some figures may not be additive. The PHS protocol on Statistical Disclosure Protocol is followed.
Official Statistics designation	Experimental statistics
UK Statistics Authority Assessment	Not put forward for assessment
Last published	N/A

Next published	N/A
Date of first publication	18 November 2020
Help email	
Date form completed	15/11/2020

Appendix 3 – Early access details

Pre-Release Access

Under terms of the "Pre-Release Access to Official Statistics (Scotland) Order 2008", PHS is obliged to publish information on those receiving Pre-Release Access ("Pre-Release Access" refers to statistics in their final form prior to publication). The standard maximum Pre-Release Access is five working days. Shown below are details of those receiving standard Pre-Release Access.

Standard Pre-Release Access:

Scottish Government Health Department

NHS Board Chief Executives

NHS Board Communication leads

Early Access for Management Information

These statistics will also have been made available to those who needed access to 'management information', ie as part of the delivery of health and care:

Scottish Government Education Department

Directors of Public Health

Early Access for Quality Assurance

These statistics will also have been made available to those who needed access to help quality assure the publication:

Mick Wilson, Scottish Government Education Analysis

Appendix 4 – PHS and Official Statistics

About Public Health Scotland (PHS)

PHS is a knowledge-based and intelligence driven organisation with a critical reliance on data and information to enable it to be an independent voice for the public's health, leading collaboratively and effectively across the Scottish public health system, accountable at local and national levels, and providing leadership and focus for achieving better health and wellbeing outcomes for the population. Our statistics comply with the [Code of Practice for Statistics](#) in terms of trustworthiness, high quality and public value. This also means that we keep data secure at all stages, through collection, processing, analysis and output production, and adhere to the ['five safes'](#).