



Public Health
England

Protecting and improving the nation's health

Investigation and management of outbreaks of influenza-like illness in schools

Guidance for PHE Centre Health Protection Teams

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Executive summary

This document provides guidance for local PHE Centre health protection teams about assessing and managing outbreaks of influenza-like illness in schools.

Central to the approach to this setting, is the communication of key preparedness messages to schools, including awareness of arrangements for reporting of outbreaks to local PHE Centre health protection teams, exclusion advice for unwell children as well as the national childhood influenza immunisation programme.

The key preventative measure for children in clinical risk groups is annual seasonal influenza vaccination. In outbreak situations, antivirals may also be considered for exposed children in clinical risk groups, in line with national guidance, such as that published by NICE and PHE.

As the extension of the childhood seasonal influenza vaccination programme continues in England, this will help provide additional protection for children in school settings.

Introduction

Seasonal influenza may transmit rapidly between children of school age, prompting the occurrence of localised outbreaks within schools. It is important to note that localised outbreaks in school settings may precede circulation of seasonal influenza in the wider population.

Seasonal influenza vaccination is available for individuals aged 6 months and older in clinical risk groups, as specified in the Green Book¹ and the national flu immunisation programme letter. The clinical risk groups are shown in Box 1.

Box 1 – Clinical risk groups for influenza for all age groups (not just children)

- Chronic respiratory disease
- Chronic heart disease
- Chronic kidney disease
- Chronic liver disease
- Chronic neurological disease
- Diabetes
- Immunosuppression
- Asplenia or dysfunction of the spleen
- Pregnant women
- Morbid obesity (BMI \geq 40)

Source: [Immunisation against Infectious Disease, Chapter 19: Influenza](#)¹

In addition, the Joint Committee on Vaccination and Immunisation (JCVI) has recommended that the routine annual influenza vaccination programme should be extended to include children up to the age of 18 years who are not in clinical risk groups, both to provide individual protection to the children themselves and to reduce influenza transmission across all age groups.

The phased introduction of this extension began in 2013 when flu vaccine was offered to all 2 and 3 year old children in primary care and to those aged 4 to 10 years (up to and including pupils in school year 6) via a schools vaccination programme in 7 different geographical pilot areas. The childhood vaccination programme is now an integral part of the national influenza vaccination programme, with the phased addition of age groups each year. The most up to date information on seasonal influenza vaccination for children can be found in the national flu immunisation programme letter, which is published in advance of each influenza season. Health Protection Teams (HPTs) should be aware that when they receive a report of influenza-like illness in school-age children

during the influenza season, some of those in the affected school may have already received seasonal influenza vaccination.

Although this document is focused on schools, the outbreak definitions, approaches to risk assessment, laboratory investigation as well as response measures, will be similarly applicable to settings such as nurseries.

Preparedness measures

The main element of seasonal influenza preparedness for schools is awareness of the vaccination programme among parents of eligible children, including those children in at-risk groups.

Many schools have existing arrangements to identify influenza-like illness among pupils such as monitoring of related absences. Schools should also be aware of existing local mechanisms to seek advice in relation to observed increases of influenza-like illness, including risk assessment of potential outbreak situations. In most localities, this will involve the local PHE Centre Health Protection Team.

It is also useful for schools to be signposted to [existing published PHE advice relating to infections in school settings](#), including exclusion advice, prior to the beginning of the influenza season.² Schools may also be aware of individual pupils who may be in clinical risk groups (as part of the schools' health and welfare arrangements). This information may be important for the rapid provision of information to families of these children during an outbreak.

Definitions

Influenza-like illness (ILI) is defined as:

- acute onset of fever AND cough (in the absence of other diagnoses) - (if measured, fever is defined as $>38^{\circ}\text{C}$)

It is acknowledged that influenza may vary in presentation in children, such as without fever or with diarrhoea, etc. These would not meet the ILI definition above, therefore if there is a suspicion of influenza in such children with these other clinical presentations, they would only be regarded as a case with a positive laboratory testing result for influenza.

The epidemiological likelihood of a respiratory outbreak being due to influenza is increased if influenza has been declared to be circulating in the general community and particularly if there is evidence of local influenza transmission.

A confirmed case of influenza is an individual with laboratory detection of influenza virus.

An outbreak is defined as:

- the occurrence of 2 or more cases of ILI and/or confirmed cases, with a shared exposure such as attending the same school group (such as a class group), with onset dates within a single 7 day period and with epidemiological evidence of transmission within the school

Epidemiological evidence of transmission within the school includes both cases having attended the school on at least one of the 3 days before onset in the absence of a known, alternative source of infection (eg a household member reported to have influenza-like illness).

The end of the outbreak is defined as:

- a single 7 day period following symptom onset of the last outbreak case during which there are no new cases of ILI and/or confirmed cases within the same school group

Investigation of outbreaks

Risk assessment

In order to support the HPT risk assessment, information that should be collected includes:

- size of the school (number of staff and number of pupils), and the size of year group(s) affected if illness is limited to specific years
- whether the school is for day pupils only, boarders or both
- whether the school is for pupils with special educational or disability needs (SEND) or whether there are SEND pupils within the mainstream school (see also appendix below: Additional considerations for special schools settings)
- details of the contact person at the school (including their job title and direct contact number)
- dates of childhood influenza vaccination and coverage rates in the school (if relevant)
- nature of the symptoms
- number of cases of ILI or laboratory confirmed influenza (for example reported from local hospital) among pupils and/or staff
- number of virologically confirmed cases and specific results (for example influenza subtype), if known
- distribution of cases over time, including onset date of the first and most recent cases, and according to class/year group
- number of hospitalisations, ICU admissions and deaths associated with the outbreak
- information on whether there are any children in clinical risk groups in the school, if known

Laboratory investigation

Laboratory confirmation is most useful in the inter-seasonal period and early in the influenza season, when national surveillance schemes have not confirmed that influenza is circulating widely in the community. During these time periods, other respiratory viruses may be as likely as seasonal influenza to cause ILI presentations and so there is a role for laboratory confirmation to inform the risk assessment and subsequent management of the outbreak/suspected outbreak.

When influenza is circulating in the community (as per national surveillance), routine virological investigation of school outbreaks is not essential but could be informative in complex situations, such as where multiple year groups are affected, prolonged

outbreak duration, or influenza-related hospitalisations, critical care admission or deaths among school children.

In these situations, laboratory testing should be sought for 5 symptomatic cases. In complex outbreaks (for example involving hospitalisations or high attack rates) virological advice should be sought to consider widening testing to better understand the epidemiology of the outbreak.

Testing should be undertaken as per local arrangements. Sampling should be undertaken as close as possible to illness onset (and no more than 7 days after onset). One possibility is the use of swabbing kits if swabbing of those aged 15 years or less is undertaken by a relevant adult such as a parent or guardian. Those aged 16 years or older may be considered for self-swabbing. When considering swabbing, it is particularly useful if swabs can be returned via a central point so that transport of samples can be co-ordinated and the timeline for reporting of the overall results can be estimated.

Declaration of outbreak

The information gathered as suggested above in the sections on Risk Assessment and Laboratory Investigation, including the potential role of swabbing, will inform a decision by the local PHE Centre Health Protection Team as to whether the situation meets the definition of an outbreak as outlined in the definitions section.

Once an outbreak has been declared, local stakeholders (for example directors of public health and local authority public health teams) should be informed as per local protocols, and where necessary (for example complex situations, with large numbers of cases) an incident management team (IMT) should be considered.

Response measures

Key response measures

The main measures are:

- raising awareness among parents and guardians that ILI confirmed influenza has been observed in the school - this is often achieved through a written communication agreed and disseminated by the school through its existing mechanisms
- explaining that symptomatic children should be excluded from school until they are asymptomatic
- publicising clear respiratory hygiene measures within the school such as regular handwashing and 'Catch It, Bin It, Kill It' type messages
- consider highlighting, based on a local risk assessment in outbreak-related communications to parents/guardians that children in at-risk groups who have been exposed to seasonal influenza and have not received seasonal influenza vaccination (or who received this less than 14 days prior to exposure) should be considered for antiviral prophylaxis with oseltamivir; this advice is if their exposure was within the last 48 hours (or within 36 hours for zanamivir) if this is likely to be feasible within this time period; Children in at-risk groups who are symptomatic may be considered for antiviral treatment with oseltamivir within 48 hours of onset (or within 36 hours for zanamivir) in accordance with [national guidance](#)²

When the number of children in at-risk groups is thought to form a relatively small proportion of the school's pupils and the Chief Medical Officer (CMO) has advised that antivirals may be prescribed in primary care, then consider writing a letter to parents/guardians to explain the situation. An alternative would be to telephone the parents directly, if this would expedite access to antivirals within the recommended time periods for starting prophylaxis (36-48 hours depending on the individual medicine).

Parents/guardians with an exposed child in a clinical risk group should then contact their GP to be considered for antivirals; the local HPT may need to facilitate this according to local processes. This is the preferable approach, as these health professionals will have the relevant medical history for these children.

When the CMO advice is not in effect, or in situations where there are a significant number of children requiring antivirals, the local HPT should discuss the provision of antivirals with the local NHS commissioner as soon as possible.

The need for antivirals among staff in clinical risk groups should be addressed in a similar way to that outlined for children, above. Again this is reliant on the co-operation of the school itself.

Follow-up

Follow-up of individual outbreaks in schools should be undertaken according to local PHE Centre processes.

Temporary closure

It is anticipated that temporary closure of a class or school for public health reasons is likely to be an infrequent measure for seasonal influenza outbreaks. Any enquiry about potential closures on public health grounds should be discussed by the school management team directly with the local **PHE Centre Health Protection Team** (or Incident Management Team, if convened) in the first instance. Any decision to temporarily close for business continuity reasons, such as staff shortages, is a decision for the school management and local education authority, where applicable; however, it should be made clear to parents, guardians and staff that this decision has not been made on public health grounds.

National reporting

PHE Centre Health Protection Teams should complete an **acute respiratory infection outbreak reporting form** once an outbreak has been notified to them. This includes an initial set of information which can be submitted on identification of a potential outbreak. This form can be updated and re-sent as more information becomes available, or once the outbreak has ended. This allows new outbreaks to be included in national surveillance reports, so that health professionals can keep abreast of the latest epidemiology of seasonal influenza. Together with other indicators, this also informs the assessment of whether influenza is circulating in the community.

References

1. Immunisation against infectious diseases (The Green Book), Chapter 19: Influenza. Available at: www.gov.uk/government/publications/influenza-the-green-book-chapter-19
2. PHE Guidance - Health protection in schools and other childcare facilities: www.gov.uk/government/publications/health-protection-in-schools-and-other-childcare-facilities
3. PHE Guidance on the use of antiviral agents for the treatment and prophylaxis of influenza: www.gov.uk/government/publications/influenza-treatment-and-prophylaxis-using-anti-viral-agents

Appendix I: Additional considerations for boarding schools

As a closed setting, for these settings:

- transmission may vary according to individual boarding houses, so extra sampling of symptomatic persons in different boarding houses should be considered, following discussion with the local Public Health Laboratory
- ensure a consistent case definition is used with healthcare providers and a consistent method of monitoring number of cases is agreed from the outset
- clarify seasonal influenza vaccination provision and uptake among pupils
- if the school hosts international students, determine if onset has occurred within 2-3 days of arrival from a foreign country
- consider if exclusion from the school is possible; if this is not possible, then advise restriction within residential accommodation until asymptomatic
- primary care health professionals assessing suspected or confirmed cases should advise the local NHS trust in relation to the outbreak, if referred for investigation, so that appropriate infection prevention and control measures can be taken
- maintain awareness of the possibility of other respiratory infections, and consider using locally agreed arrangements to swab up to 5 symptomatic cases in the inter-seasonal period or early in the influenza season, to inform risk assessment and outbreak management

References

Johnson, et al. Seroepidemiologic study of pandemic (H1N1) 2009 during outbreak in a boarding school, England. *Emerging Infectious Diseases*. 2011 Sep;17(9):1670-7.
wwwnc.cdc.gov/eid/article/17/9/10-0761_article

Appendix II: Additional considerations for special school settings

Special educational needs and disabilities (SEND) include 4 different areas of need, including communicating and interacting; cognition and learning; social, emotional and mental health difficulties and sensory and/or physical needs.¹

Many children and young people with special educational needs and disabilities have one or more conditions which place them at increased risk of severe influenza infection, and as such are likely to be members of clinical risk groups. Examples of relevant conditions include, but are not limited to, cerebral palsy, hydrocephalus, neuromuscular diseases (for example spinal muscular atrophy, Duchenne muscular dystrophy).^{2,3}

Therefore, an outbreak in a special school setting, where a significant proportion of the learners are members of clinical risk groups, has the potential for serious clinical illness. Rapid public health intervention following a thorough risk assessment is therefore justified in relation to outbreaks in such settings. Advice on consideration of antivirals can be obtained from the National Infections Service, as required.

It should be noted that self-swabbing within these settings may not follow the age-based recommendations described earlier in this document and individual assessment should be made of the need for swabbing undertaken by parents or others among those aged 16 years or older.

It can be challenging for health protection teams to remotely determine if individual children attending these settings are members of clinical risk groups, due to the complexity and specialist nature of some of the conditions involved. Parents and guardians, in conjunction with the children's healthcare professionals are likely to be aware if children have been previously considered as at risk of severe influenza infection, and therefore requiring seasonal influenza vaccination.

In order to support rapid public health action, local NHS commissioners may need to determine if central distribution of antiviral treatment or prophylaxis, would be more practicable than individual children's families contacting their general practitioners (even when the Chief Medical Officer (CMO) has advised that seasonal influenza is circulating in the community). When this CMO advice is not in effect, the local HPT will need to work with NHS commissioners to identify alternative mechanisms for accessing and prescribing antivirals for treatment or prophylaxis in a timely way.

Individual children with special needs, attending other settings (for example mainstream schools), should receive information as outlined in the control measures section.

Centralised prescribing and distribution may not be required, as there may be a smaller number of children in clinical risk groups in these settings.

References

1. Department for Education and Department of Health and Social Care, Special educational needs and disability code of practice: 0 to 25 years, Paragraphs 6.27 – 6.35:
www.gov.uk/government/publications/send-code-of-practice-0-to-25
2. Chaves et al (2013) Patients hospitalized with laboratory confirmed influenza during the 2010-11 influenza season: exploring disease severity by virus type and subtype, The Journal of Infectious Diseases, (208):1305 academic.oup.com/jid/article/208/8/1305/2192793
3. Keren et al (2005) Neurological and neuromuscular disease as a risk factor for respiratory failure in children hospitalized with influenza infection, Journal of the American Medical Association, Vol 294, No. 17. jamanetwork.com/journals/jama/fullarticle/201797

Appendix III: Postal swabbing kits

The contents of a postal swabbing kit may include the following items:

- covering letter and instruction sheet
- swab packet containing:
 - pair of viral swabs (not charcoal swabs)
 - virus transport medium to insert the swab into
- absorbent sheet
- DG Pathoseal 95 bag
- test request form
- security seal
- postage, through either:
 - outer carton (cardboard box) with pre-paid return address label
 - outer carton (cardboard box) with pre-paid envelope

The introduction of swabbing kits will need to be agreed in advance with the local public health laboratory, from which swabs can be obtained. The HPTs are responsible for the postage and packaging costs associated with the kits.

The use of postal swabbing kits is a decision for local PHE Centre Health Protection Teams; these may not be needed if there are alternative existing mechanisms for undertaking rapid swabbing and testing of suspected cases of seasonal influenza.