Public Health Guidelines[1] on the Prevention and Management of Influenza Outbreaks in Residential Care Facilities in Ireland 2019/2020

Public Health Medicine Communicable Disease Group

These guidelines are aimed at all Public Health professionals involved in the prevention and control of influenza in residential care facilities. It is proposed that they will be reviewed on an annual basis.

Version	Date	Originator	Reviewer	Comment
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[1] These guidelines are based on the best available evidence currently available. Please note, however that they do not replace clinical judgement in individual circumstances/situations.

Contents

Glossary of Terms

CIDR	Computerised Infectious Diseases Reporting System
CIPCN	Community Infection Prevention and Control Nurse
DPH	Director of Public Health
GP	General Practitioner
HCW	Healthcare Worker
HPSC	Health Protection Surveillance Centre
HSE	Health Service Executive
ILI	Influenza-like illness
MOH	Medical Officer of Health
NVRL	National Virus Reference Laboratory
OCT	Outbreak Control Team
PPE	Personal Protective Equipment
RCF	Residential Care Facility
SI	Statutory Instrument

Introduction

Influenza remains the leading cause of death from infectious disease among elderly people, largely due to declining immune competence with age. It is a significant cause of death and hospitalisation among the elderly and frail in residential care settings. It can also cause illness among personnel working in such facilities. Studies which have examined laboratory confirmed influenza in residents of residential care facilities (RCF) cite rates of seasonal influenza of between 2-16% of residents. [1][2] During outbreaks of influenza in RCF, attack rates of laboratory confirmed influenza can be as high as 40%. [3][4] RCF are considered high risk environments for influenza due to the older age of residents, the high prevalence of chronic medical conditions, communal living arrangements, shared caregiving and the continual close proximity of residents.[5]

Influenza is highly infectious and is easily passed from person to person. The virus is mainly spread by an infected person coughing or sneezing. The incubation period (delay between infection and symptom onset) is short, typically 1-3 days. A person can spread the virus by sneezing or coughing from 1-2 days before symptom onset and continue to be infectious for a further 3-5 days. However, the infectious period may be prolonged to a week or more in the elderly, children and those who are immunosuppressed. [6] The virus can also be spread through direct contact with an infected person or contaminated surfaces, particularly via the hands of healthcare workers. In light of this, infection control and restriction measures to minimise contact between ill and well residents are an integral part of controlling outbreaks in RCFs as these measures assist in breaking the chain of transmission of the virus. [7] Additional integral outbreak control measures include vaccination and antiviral therapy. Parker et al. in Canada noted that earlier detection of an outbreak and intervention with antivirals resulted in better outbreak control. [8]

Objectives for influenza prevention and control in residential care facilities are

1. To prevent the spread of influenza among RCF residents and staff
2. To reduce morbidity and mortality from influenza among residents
3. To decrease the number of outbreaks of influenza
4. To maintain influenza immunisation coverage at a minimum of 75% for both residents and staff in RCF, with the aim of 100% immunisation coverage in both
5. To optimise the use of antivirals in the management of influenza outbreaks

Key interventions to prevent an influenza outbreak

- Annual influenza vaccination for residents and staff with appropriate documentation of same
- Planning and education
- Implementation of Standard and Transmission Based Precautions including Droplet and Contact Precautions
- Surveillance (monitoring) for influenza-like illness (ILI) and influenza
- At the start of the influenza season, it is recommended that each residential care facility has procedures in place to ensure timely access to antiviral medications (oseltamivir i.e. Tamiflu) through the normal channels/pharmacy provider in the event of an influenza outbreak
- It recommended that all facilities should have a written outbreak management plan

Immunisation

The national immunisation guidelines for Ireland 2013 (Chapter 11 – Influenza: updated February 2019) recommend annual influenza vaccination for all persons aged 50 years and older, persons with chronic medical conditions, residents of nursing homes, old people's homes and other long stay facilities where rapid spread is likely to follow introduction of infection. The guidelines also recommend annual influenza vaccine for healthcare workers and caregivers (including care attendants and family carers in the home) both for their own protection (as they are a group likely to come in contact with influenza during outbreaks) and for the protection of patients/ residents. [(9)]

Influenza vaccine

Influenza vaccine is safe and effective and prevents influenza-related complications and death. Vaccination of healthcare workers and RCF residents combined with basic infection prevention and control practices can help prevent the transmission of influenza.

The effectiveness of vaccination depends on the age and immunocompetence of the recipient and the similarity between the influenza virus strains in the vaccine and those circulating in the community. [(10)(11)] Currently available inactivated influenza vaccines provide 70-90% protection against influenza in healthy persons aged less than 65 years provided there is a good match between vaccine and circulating strains. In the elderly, protective efficacy against influenza infection is lower. In elderly nursing home residents, well matched vaccines were found to be 46% effective in preventing pneumonia and 60% effective in reducing all-cause mortality. [(12)] While few studies have examined the effect of vaccinating staff in RCF, available evidence suggests that high rates of vaccination among staff members may reduce influenza-related mortality among residents. [(13)(14)] A randomised controlled trial by Carman et al. in 2000 demonstrated that vaccinating healthcare workers in RCF was associated with decreased mortality among residents. [(15)]

As most staff members are relatively young and healthy, they are more likely to develop protective influenza antibody titres following vaccination than are the residents for whom they provide care. There is increasing evidence that immunising children and younger adults who respond well to current influenza vaccines would reduce the burden of influenza in the elderly by reducing their exposure risk. (16) High rates of vaccination among staff may contribute substantially to herd immunity within the facility, protecting residents by reducing the risk of introduction and transmission of influenza. In addition, the effectiveness of current influenza vaccines in the elderly population is often diminished by immunosenescence.[2] Increasing immunisation rates among healthcare workers and caregivers of the elderly and finding more effective vaccines for elderly people are likely to significantly improve disease prevention in the population. (17)

Recording of influenza vaccination status

It is imperative that the influenza vaccination status of all new admissions to RCF, including respite care admissions, is recorded. If new admissions have not received influenza vaccine, vaccination is strongly recommended provided there are no contraindications and informed consent is obtained. Seasonal influenza vaccine can be given until the end of April[3] and this may be extended in the event of an influenza outbreak. The influenza vaccination status of all staff should also be routinely recorded and data on the number of vaccinated staff should be readily available in aggregate format. The pneumococcal vaccination status of all residents, including new admissions as above, should also be routinely recorded.

[2] Immunosenescence is the impairment in immunity as a result of age-associated changes in function in a variety of cells: it is a phenomenon of decreased function, involving changes to both innate and adaptive immunity and a dysbalance between both. Any identified age-associated changes, if to be considered *senescence*, or "immune frailty", must be shown to contribute to deleterious clinical endpoints, such as decreased efficacy of vaccination in the elderly, for which there is some evidence (influenza, tuberculosis). A decreased ability to respond to pathogens in general is implied.

[3] The influenza season officially runs from week 40 (early October) to week 20 (late May) each year.

Residents

1. It is the responsibility of the RCF's management to ensure that all residents are vaccinated with influenza vaccine (unless there is a medical contraindication) at the beginning of the influenza season (late September or early October). Residents not previously vaccinated should also be vaccinated during an influenza outbreak.
2. All new unvaccinated residents or respite admissions during the influenza season should receive influenza vaccine, ideally at least two weeks prior to admission or else as soon as possible after admission.
3. Pneumococcal vaccination is also recommended for all residents aged 65 years and older and all residents who are in the recommended risk groups as per the Immunisation Guidelines for Ireland, 2013 (Chapter 16 - Pneumococcal Infection: updated July 19th, 2018). [(9)] Pneumococcal vaccine is not required annually (See Immunisation Guidelines for Ireland, 2013: Chapter 16 – Pneumococcal Infection: updated July 19th 2018). [(9)]
4. It is important to obtain the resident's or substitute decision maker's consent for influenza and pneumococcal vaccine on admission to the RCF.
5. The immunisation status of all residents should be recorded annually and vaccination coverage (% of residents vaccinated) estimated. This information should be easily accessible by Departments of Public Health. Since this is not a static population, vaccine coverage may change over time.

Staff

1. It is the responsibility of the nursing home to maximise uptake of influenza vaccine and to ensure that all staff members are offered vaccination with influenza vaccine, both at the beginning of the influenza season and during an influenza outbreak if they are unvaccinated.
2. Prior to, and upon employment, and then annually, each staff member should be assessed regarding their influenza vaccination status.

3. All staff should be encouraged to receive influenza vaccine at the start of each influenza season. Staff vaccinated late in the influenza season will also need vaccination at the start of the next influenza season.
4. The immunisation status of all staff should be recorded annually and vaccination coverage (% of staff vaccinated) estimated. This information should be easily accessible by Departments of Public Health.
5. Management should provide feedback to staff on influenza vaccine coverage rates.
6. Ill staff should not attend for work. A written staff exclusion policy is required.

- Each residential care facility should have written resident and staff vaccination policies for influenza and pneumococcal infections
- All healthcare workers and residents of RCF should receive annual influenza vaccination
- Vaccination status of residents and staff should be documented
- Visitors of residents should be advised of the importance of receiving influenza vaccine, both for their own protection and for the protection of residents (usually relatives) who may have a suboptimal response to their own influenza vaccinations

Planning and education

1. All RCF should appoint a staff member to lead on the development and implementation of an influenza prevention programme and on infection prevention and control policies/guidelines and protocols.
2. All RCF should develop written policies/guidelines which cover:
    a. Immunisation of residents and staff
    b. Standard and Transmission Based Precautions including Droplet and Contact Precautions

c. Outbreak management. To include contingency plans for staff shortages (due to illness during the outbreak), ensuring sufficient supplies e.g. personal protective equipment (PPE) and restriction of visitor access, with appropriate signage/posters to communicate issues regarding visitor restriction and transmission reduction.

3. All RCF should ensure education and training in influenza prevention and control is provided to all new staff at induction, with regular re-training provided to all staff. Topics to include in the influenza education programme are
    a. Facts on influenza immunisation
    b. Standard and Transmission Based Precautions including Droplet and Contact Precautions
    c. Symptoms and signs of influenza infection
    d. Exclusion criteria for ill staff
4. All RCF should routinely audit the influenza prevention and control programme.

Standard Precautions

Standard Precautions are routine infection prevention and control measures that should be practiced <u>at all times by all staff in all settings</u> regardless of suspected or confirmed infectious status. The importance of these precautions should be reinforced during an outbreak.

Standard Precautions require all healthcare workers to assume that all blood, body fluids, secretions and excretions (except sweat), non-intact skin and mucous membranes are potential sources of infection. The key elements of Standard Precautions are:

- Hand hygiene
- Occupational Health
- Personal protective equipment (PPE)
- Respiratory hygiene and cough etiquette
- Management of spillages of blood and body fluids
- Management of needlestick/sharps injuries and blood and body fluid exposures

- Management of laundry and linen
- Environmental hygiene
- Safe management of resident-care equipment and medical devices
- Management of healthcare waste and sharps
- Resident placement, movement and transfer
- Safe injection practices
- Infection control practices for lumbar punctures

Respiratory hygiene/cough etiquette

Respiratory hygiene/cough etiquette is a new element in the Standard Precautions. This strategy applies at all times (i.e. not just during an outbreak) to any person with signs of illness including cough, congestion, rhinorrhoea or the increased production of respiratory secretions when entering or while resident in the healthcare facility.

The elements of respiratory hygiene/cough etiquette include

1. Source control measures e.g. covering the nose/mouth with a tissue when coughing and prompt disposal of used tissue, using surgical masks on coughing patients when tolerated and appropriate
2. Education of RCF healthcare staff, residents and visitors of source control measures (1 above)
3. Visual signage (in language(s) appropriate to the population served) with instructions directed to patients and their visitors to inform staff if they have respiratory symptoms
4. Visual signage outlining the source control measures (outlined in 1 above)
5. Hand hygiene after contact with respiratory secretions
6. Spatial separation, ideally > 3 feet (1 metre), of persons with respiratory infections in common waiting areas when possible

Covering sneezes and coughs and placing masks on coughing residents are proven means of source containment that prevent infected persons from dispersing respiratory secretions into the air. Coughing/sneezing etiquette is as follows:

Residents and staff should be encouraged to practice good respiratory hygiene which involves covering the mouth/nose when sneezing and coughing and using tissues to contain respiratory secretions. If a tissue is not readily available, residents and staff should be advised to cough or sneeze into their upper sleeve/ the crook of their elbow, and not their hands if possible. Tissues should be disposed of immediately in the general waste and the hands thoroughly washed with soap and water or cleaned with alcohol-based hand cleaner. If an ill resident is coughing persistently, the use of a surgical mask (if tolerated) may assist in preventing the dispersal of infected droplets. *(See Appendix A for sample poster on respiratory hygiene/cough etiquette)*

Additional Infection Prevention and Control Precautions

Transmission Based Precautions are additional infection prevention and control measures that are recommended when the Standard Precautions alone are not enough to prevent the spread of infectious diseases such as influenza, pulmonary tuberculosis, and chicken pox.

Unlike Standard Precautions that apply to all residents, Transmission Based Precautions only apply to particular residents based on either a suspected or confirmed infection or disease e.g. influenza.

There are three categories of Transmission Based Precautions:

1. Droplet Precautions
2. Contact Precautions
3. Airborne precautions

Note: More than one set of precautions may be required for infections spread by multiple routes.

Droplet Precautions[4,5]

Droplet Precautions are used in addition to the Standard Precautions to prevent and control infections spread over short distances, less than 3 feet (1 metre) of large droplets (≥5µm in size). Droplet transmission occurs when large droplets from the respiratory tract of an infected person are spread directly on to a mucosal surface (e.g. eyes, nose, mouth) of another person. Respiratory droplets are shed when a person is coughing, sneezing or talking and during certain healthcare procedures such as suctioning and endotracheal intubation.

Contact Precautions[4,5]

Contact Precautions are used in addition to the Standard Precautions to prevent and control infections that are transmitted by direct contact with the resident or indirectly through contact with the resident's immediate care environment.

Airborne Precautions[5]

Airborne Precautions prevent transmission of infectious agents that remain infectious over long distances when suspended in the air (e.g. measles, TB). Patients who require Airborne Precautions should be treated in an airborne infection isolation room (AIIR). While Airborne Precautions are not required for routine patient care, use of AIIRs is advisable during procedures that could generate infectious aerosols (e.g., endotracheal intubation, bronchoscopy, suctioning).

For residents aged ≥5 years: Droplet and **Standard Precautions** are required to prevent transmission of influenza in healthcare facilities.

[4] HealthCare Associated Infections & Antimicrobial Resistance Committee. HSE Dublin North East.Primary,Community and Continuing Care Infection Prevention & Control Manual (2015-2018).
[5] Siegel JD, Rhinehart E, Jackson M, Chiarello L and the Healthcare Infection Control Practices Advisory Committee, 2007 Guideline for Isolation Precautions: Preventing transmission of infectious agents in healthcare settings, June 2007. Siegel JD, Rhinehart E, Jackson M, Chiarello L and the Healthcare Infection Control Practices Advisory Committee, 2007 Guideline for Isolation Precautions: Preventing transmission of infectious agents in healthcare settings, June 2007. https://www.cdc.gov/niosh/docket/archive/pdfs/NIOSH-219/0219-010107-siegel.pdf

For residents aged <5 years: Droplet, Contact and **Standard Precautions** are required to prevent transmission of influenza in healthcare facilities.

For more specific details on Standard, Droplet, Contact and additional precautions for aerosol generating procedures, refer to ***Infection Prevention and Control for Patients with Suspected or Confirmed Influenza Virus in Healthcare Settings***.

Available at: **http://www.hpsc.ie/A-Z/Respiratory/Influenza/SeasonalInfluenza/Infectioncontroladvice/**

All RCF must have written local guidelines and an education programme in place for Standard and Transmission Based Precautions, including Droplet and Contact Precautions.

Surveillance of influenza-like illness (ILI) and influenza

Surveillance (monitoring for illness) is an essential component of any effective infection control programme. Influenza outbreaks may occur even among highly vaccinated residents of RCF, and staff of such facilities should be prepared to monitor residents and personnel each year for ILI/influenza symptoms and promptly initiate measures to control the spread of influenza within facilities where outbreaks are detected. Surveillance for ILI/influenza infections should occur year round and particularly between weeks 40 and 20 (influenza season: beginning of October to end of May), however influenza outbreaks can occur at anytime of the year, even during the summer. All staff should be aware of the early signs and symptoms of influenza-like illness.

Influenza-like illness (ILI) as per current definition in Ireland (See Appendix B)

Influenza-like illness (ILI): Sudden onset of symptoms

And

At least one of the following four systemic symptoms:

1. Fever or feverishness
2. Malaise (a general feeling of being unwell)
3. Headache
4. Myalgia (muscle pains)

And

At least one of the following three respiratory symptoms:

1. Cough
2. Sore throat
3. Shortness of breath

Clinical manifestation of influenza in the elderly

The often subtle clinical manifestations of influenza in frail elderly patients may not be recognised initially, impeding timely administration of antiviral treatment. In older adults, influenza symptoms may initially be very subtle and difficult to recognise, with non-specific symptoms including cough, fatigue and confusion. [18] [19] While younger adults and children may have fevers as high as 104^0F (40^0C), the fever response may be more blunted in older adults and elderly residents of RCF, with influenza infection often failing to produce a fever over 99^0F (37.2^0C). [19] Elderly patients are also more susceptible to pulmonary complications from influenza. ***Influenza may present in the elderly patient as an exacerbation of an underlying medical condition such as chronic pulmonary or cardiovascular disease, asthma, diabetes mellitus etc. If an increased number of residents become unwell over a short period of time with respiratory illness, influenza should be suspected.***

Surveillance by residential care facilities

Management of RCF should have a process in place to monitor staff and residents for ILI.

It is also important to monitor staff absenteeism rates for unusual patterns i.e. more than expected numbers of staff absent from work.

Definition of an ILI or influenza or acute respiratory illness outbreak

The following is the current definition for an outbreak of:

1. Influenza-like illness (ILI) ***or***
2. Laboratory confirmed influenza (Influenza A and B virus) ***or***
3. Probable or possible influenza (Influenza A and B virus) ***or***
4. Acute respiratory illness

Definition of an outbreak of influenza /ILI /acute respiratory illness (See Appendix C)

Three or more cases of influenza-like illness (ILI) or influenza or respiratory illness arising within the same 72 hour period in the RCF which meet the same clinical case definition and where an epidemiological link can be established. (34) [6]

[6] Investigation of lower numbers of cases can be undertaken if considered appropriate following public health risk assessment.

Notification of outbreaks of ILI/influenza in RCF

RCF staff should suspect an outbreak of influenza if an increase in respiratory or influenza-like illness (see Appendix B) is noted during routine surveillance (monitoring) (i.e. three or more cases in a 72 hour period [(34)] [7]) (see Appendix C).

RCF staff should inform the local medical team/attending GP for the facility of the suspected cases for assessment and accurate diagnosis. The GP identifying the suspected outbreak should then notify the local Director of Public Health (Medical Officer of Health (MOH)) or the Public Health Specialist on call (under the Infectious Disease Regulations (S1 707: 2003) as amended) who will provide advice and support on control measures and the management of the outbreak. In HSE residential care facilities, RCF staff should also inform the HSE Community Infection Prevention and Control Nurse (CIPCN), where available, of all influenza and ILI outbreaks and the CIPCN will also provide advice and support to the facility.

If an ILI is suspected, it is advisable that viral swabs to check for influenza are taken from the initial symptomatic residents and sent to either the local laboratory or the National Virus Reference Laboratory (NVRL), depending on local arrangements. In an outbreak situation, combined nose and throat swabs should be collected. The RCF should ensure sufficient supplies of viral swabs are ordered in advance of the influenza season.

The attending clinician/GP/RCF may seek advice from the local laboratory regarding access to viral swabs.

In light of the adverse effects (e.g. prolonged isolation in a room) of being diagnosed as a case of influenza during an outbreak, it is imperative that cases are assessed thoroughly and diagnosed in a timely manner.

[7] Investigation of smaller numbers of cases may be undertaken if considered necessary following a risk assessment.

Active surveillance for additional cases should immediately be implemented when there is laboratory confirmation of one case of influenza in a RCF. Outbreak control measures should be implemented as soon as possible if there are three or more cases of laboratory-confirmed influenza within 72 hours of each other in residents of the same unit. (34) [8] Implementation of outbreak control measures can be considered as soon as possible if one or more residents of the RCF has suspected influenza and results of influenza laboratory testing are not available on the day on which the sample is collected and sent for testing. (37)

Management of an influenza outbreak

The main strategies for influenza outbreak control are as follows:

1. Early identification of a suspected ILI/influenza outbreak through surveillance
2. Confirmation of a suspected ILI/influenza outbreak by the attending clinician/GP[9]
3. Under the Infectious Diseases Regulations 1981, as amended, the GP/attending physician should notify Public Health (Medical Officer of Health for the region)
4. Reinforcement of Standard Precautions and immediate implementation of Transmission Based Precautions, including Droplet and Contact Precautions (where applicable), for residents with suspected or confirmed influenza
5. Public Health will undertake a risk assessment and establish an outbreak control team (OCT) if one is required
6. Prompt treatment with antivirals and provision of antiviral chemoprophylaxis where indicated following risk assessment

[8] Investigation of lower numbers of cases can be undertaken if considered appropriate following public health risk assessment.
[9] Where there are many GPs attached to a RCF, the unit may need to nominate one GP to take the lead on the outbreak.

Initial actions

RCF staff must ensure that Standard Precautions are reinforced and Transmission Based Precautions, including Droplet and Contact Precautions (where applicable), are implemented immediately if influenza or respiratory infection is suspected in any resident. Staff should not delay implementing Transmission Based Precautions pending laboratory confirmation of the infectious agent. Refer to infection prevention and control advice for patients with suspected or confirmed influenza virus in healthcare settings. Available at: http://www.hpsc.ie/A-Z/Respiratory/Influenza/SeasonalInfluenza/Infectioncontroladvice/

Once an outbreak of ILI/influenza/respiratory disease is notified to Public Health, a risk assessment should be undertaken to determine the extent and seriousness of the outbreak.

The purpose of the risk assessment is to determine:

1. The number of ill residents
2. The number of ill staff including recent absenteeism rate compared to previous rates
3. The pattern of illness in terms of the date of onset of symptoms, type of symptoms and severity of illness i.e. number hospitalised, number dead
4. If any relatives or visitors of residents have been ill with similar symptoms
5. If there is a working diagnosis for the illness
6. The layout of the facility (location of cases) and the specific infection prevention and control measures already implemented e.g. visitor restrictions, cessation of new admissions, staff exclusion etc.
7. If viral swabs have been taken for influenza or other respiratory pathogens
8. If antivirals have been initiated as treatment and/or chemoprophylaxis
9. The vaccination status of both residents and staff
10. The current level of influenza circulating in the community as per HPSC weekly influenza report available here

Following the risk assessment, and based on the extent and severity of the outbreak, Public Health will decide whether or not to convene an OCT. Public Health and the local CIPCN, where one is available (HSE facilities only), will provide advice and support to the RCF on the management of the outbreak including infection prevention and control measures e.g. Standard and Transmission Based Precautions i.e. Droplet and Contact Precautions, antiviral treatment, chemoprophylaxis and vaccination. Additional support may be provided in the event an OCT is convened.

The RCF will also notify Public Health and the CIPCN (where available) on a daily basis in relation to the status of cases (residents and staff), new cases, implementation of control measures, challenges encountered etc. This will continue until the outbreak is declared over.

The Outbreak Control Team

The OCT configuration should be decided at local level and will depend on available expertise.

The OCT **may** include the following members:

a) Specialist in Public Health medicine
b) Medical consultant/medical officer/GP to RCF (dependent on nature of RCF)
c) Management representative from the RCF i.e. manager or CEO
d) Nursing representatives from the RCF
e) Consultant microbiologist
f) NVRL representative
g) Community Infection Prevention and Control Nurse (CIPCN)
h) Community Services General Manager
i) Public Health Senior Medical Officer
j) Public Health Surveillance Scientist
k) Public Health Department Communicable Disease Control Nurse
l) Pharmacist (if attached to RCF) or else HSE Primary Care Unit Pharmacist

m) Occupational Medicine Physician (if attached to RCF)
n) Representative from HPSC (if indicated)
o) Administrative support
p) Communications officer (if indicated).

Chair of OCT: Once an outbreak is declared, the OCT should determine at its first meeting which disciplines should be represented. The Director of Public Health or designate should identify the chairperson. The chairperson may be the CEO /manager of RCF/Local Health Officer (LHO), manager or senior designate (HSE facility)/Director of Public Health or designate.

Actions following risk assessment/when an OCT is convened

1. The OCT should have, at the first meeting, information from the RCF on the following:
    a. The total number of ill people (residents and staff)
    b. The spectrum of symptoms
    c. The date of onset of illness, particularly for the first case
    d. The results of any laboratory tests available including the number of tests taken to date and the date sent to the laboratory
    e. The influenza vaccination status of residents and staff
    f. Any steps already taken to control the outbreak
2. From information obtained, determine if the cases meet ILI and influenza definitions (See Appendix B)
3. Once an outbreak of ILI or influenza is confirmed:
    a. Institute active daily surveillance for ILI in residents and staff for 8 days after the date of onset of symptoms of the last resident influenza case
    b. Institute infection prevention and control measures
4. Formulate a case definition and assign an outbreak code

5. Define the population at risk, i.e. the total number of residents on-site at the time of the outbreak and during the identified incubation period and staff (including casual workers, volunteers and non-resident staff) working in the RCF
6. Determine the number of residents and staff who meet the case definition and compile a line listing of cases (both staff and residents) (See Appendix D). Line lists should include
    a) All cases (residents and staff) by unit if applicable (new cases should be highlighted)
    b) Identification of residents who have recovered, developed complications, been transferred to acute hospitals and those who have died. Also include residents who were treated with antivirals
    c) Adverse reactions to or discontinuation of antiviral medications
    d) Details of staff cases
    e) Vaccination status of all cases (residents and staff)
    f) Vaccination status of all asymptomatic residents and staff
7. Determine if the attack rate varies between units/floors/wards or if the outbreak is confined to one unit only
8. This information will describe the extent of the outbreak and facilitate hypothesis generation regarding the index case and modes of transmission of the virus. It will also be possible to generate an epidemic curve
9. Collect viral swabs[10] from the initial cases, up to a maximum of 5 cases,[11] to determine the virus type i.e. influenza A or B and the subtype of influenza A associated with the outbreak. This helps guide antiviral treatment decisions. (20)
    a. Contact the local laboratory or the NVRL in advance to discuss. Procedures for virology testing should be confirmed with the local laboratory as per local or national arrangements
    b. In an outbreak situation, combined nose and throat swabs should be collected for reverse transcriptase polymerase chain reaction (RT-PCR) and

[10] Viral swabs can be obtained from your local laboratory.
[11] In some instances, it may be necessary to obtain further swabs from additional residents e.g. if two separate wards are involved or at the request of the attending physician, consultant microbiologist/virologist, Public Health and/or the laboratory following a risk assessment.

immunofluorescence assay (IFA). RT-PCR and IFA are generally the preferred initial diagnostic methods as results can be provided within 2 to 4 working days (personal communication NVRL). Viral culture may also be performed but results take several days [21]

c. Specimens should be taken as early as possible during the course of the illness, i.e. within 48 hours of symptom onset, as the yield is optimal at this time. However, positive results may be obtained up to one week after illness onset. Viral swabs will be required
d. Notify the laboratory of the investigation and clarify with them who will receive results (both positive and negative) and by which method i.e. phone, fax, encrypted email etc.
e. If initial laboratory tests fail to detect influenza, it is recommended that further testing of additional cohorts of recently ill residents should be performed before concluding that the current outbreak is not caused by influenza

10. Prepare internal communications for residents, family and staff groups
11. Determine if education sessions are required for staff members and confirm who will conduct these
12. Discuss whether a media release is appropriate
13. Discuss and agree control measures i.e. infection prevention and control, vaccination and antiviral treatment and chemoprophylaxis
    - Assign a designated person at the facility to ensure implementation
    - Assign responsibility for all actions agreed
14. Review and implement staffing contingency plans
15. Discuss whether a site visit is required by Public Health
16. Determine the frequency of OCT meetings
17. Ensure that the incident is promptly reported to HPSC and surveillance details entered onto the computerised infectious disease reporting system (CIDR)
18. Provide updates on the investigation to the Assistant National Director for Public Health and Child Health, Health and Wellbeing when/if required

Control measures

Infection control measures

In the outbreak situation, infection control measures should be tailored to the specific situation. This is done in conjunction with infection prevention and control staff, the local Director of Public Health (MOH) and the GP/medical officer of the RCF. In addition, all staff at the RCF should be notified of the outbreak and management should ensure that adequate supplies (i.e. gloves, masks, liquid soap, paper towels, alcohol gel/rub, tissues etc) are available as necessary.

Key points for influenza control [21]

1. Reinforce implementation of Standard Precautions especially hand hygiene, respiratory hygiene and cough etiquette, vaccination, antiviral treatment and chemoprophylaxis for non-symptomatic patients
2. Implement additional Transmission Based Precautions, including Droplet and Contact Precautions (where applicable), for at least 7 days after symptom onset or as instructed by the OCT (See Duration of Transmission Based Precautions on P. 27)
3. Establish the diagnosis early in the outbreak by taking combined viral nose and throat swabs from ill residents
4. Use single rooms when available or else cohort ill residents
5. Mask residents (with surgical mask if tolerated) when transported out of their room
6. Prolonged duration of viral shedding (i.e. for several weeks) has been observed in immunocompromised patients; hence, the duration of precautions cannot be defined for residents who are immunocompromised. Discuss with the consultant microbiologist/virologist
7. Exclusion of symptomatic staff. All staff should be aware of what to do if they become ill. Ill staff (including those that are vaccinated or taking antiviral medication) should not attend work for at least 5 days and until they are well

enough to return. A written staff exclusion policy should be developed by each healthcare facility. Staff should be advised to practice good respiratory hygiene/cough etiquette and hand hygiene on return to work.

8. Exclusion of symptomatic visitors

Duration of Transmission Based Precautions, i.e. Droplet Precautions and Contact Precautions (where applicable)

International recommendations in relation to the duration of Droplet and Contact Precautions for cases of influenza vary from country to country. In Scotland[12] the exact duration of precautions is not specified. Australian guidelines (22) recommend discontinuing these precautions 5 days after onset of symptoms, whereas the CDC (USA) recommends continuing these precautions for at least 7 days after onset of symptoms. (21)13

Droplet and Contact Precautions should be continued for as long as residents remain symptomatic or are considered infectious. Treating clinicians should always be consulted before discontinuing precautions, taking into consideration individual resident risk factors including age, comorbidities, immunosuppression and the presence and severity of symptoms.

As a guide to assist healthcare workers, current Irish guidelines suggest following the CDC recommendation to maintain Transmission Based Precautions for at least 7 days: See **http://www.hpsc.ie/A-Z/Respiratory/Influenza/SeasonalInfluenza/Infectioncontroladvice/**

[12] National Infection Prevention and Control Manual (NIPCM), available at: http://www.nipcm.hps.scot.nhs.uk/ Produced by: Health Protection Scotland, May 2016.

[13] Centers for Disease Control and Prevention. Interim Guidance for Influenza Outbreak Management in Long Term Care Facilities. Available from: http://www.cdc.gov/flu/professionals/infectioncontrol/ltc-facility-guidance.htm

However, clinical judgment should be exercised in each instance and the time frame may be shortened in situations where residents are healthy.

In relation to infected staff (assuming that they are healthy, not severely ill and not immunosuppressed), staff should not return to work for at least 5 days after onset of symptoms (see P. 29).

Additional considerations include:

1. If an outbreak is confined to one unit, all residents from that unit should be encouraged to avoid contact with residents in the other units of the RCF
2. Limiting social activities and restricting all residents to their units as much as possible
3. Considering rescheduling of non-urgent medical appointments made prior to the outbreak

Admissions, transfers, visitors

1. When a resident is transferred to hospital from a RCF experiencing an outbreak, the RCF should advise the ambulance staff and the hospital infection prevention and control specialist in advance and provide details of the outbreak. This will ensure that appropriate infection control measures are in place when the resident arrives at the hospital
2. Admission of new residents to a RCF during an outbreak is generally not recommended
3. Non-urgent resident transfer (from anywhere in the RCF) to another RCF is not recommended
4. Post a visitor restriction sign at all entrances to the RCF indicating that there is an outbreak in the RCF
5. Limit visitors as much as possible:
    a. Exclude all children or anyone with ILI symptoms regardless of age
    b. Advise visitors to:

- Use alcohol hand gel/rub on their hands on entry to and exit from the facility
- Visit only one resident and exit the RCF immediately after the visit

The RCF should ensure that surgical masks are available for visitors with respiratory symptoms who might inadvertently enter the RCF. These visitors should be excluded except in exceptional circumstances and at the discretion of the person in charge of the RCF.

Staff

1. In the context of a suspected ILI/influenza outbreak, monitor staff and volunteer absenteeism due to respiratory symptoms consistent with influenza. Staff experiencing influenza-like symptoms or fever should not work in any healthcare setting, including a RCF. A written staff exclusion policy should be developed by each healthcare facility/RCF.
2. All staff should be aware of what to do if they become ill. Ill staff (including those that are vaccinated or taking antiviral medication) should not attend work for at least 5 days and until they are well enough to return. Staff should be advised to practice good respiratory hygiene/cough etiquette and hand hygiene on return to work.
3. Attempts should be made to minimise movement of staff between floors/units of the facility, especially if some units are unaffected. Discuss the possibility of one staff member (or group of staff) looking after ill residents and others looking after well residents.
4. During an outbreak, it is recommended that only vaccinated staff should work in the affected unit. It is strongly recommended that all staff should be vaccinated against influenza unless there are contraindications.
5. Asymptomatic vaccinated staff members are not restricted from working at other facilities.
6. Unvaccinated asymptomatic staff should wait one incubation period (3 days) from the last day that they worked at the outbreak facility/unit prior to working in a non-outbreak facility to ensure that they are not incubating influenza.

Influenza vaccination during an outbreak

1. During influenza outbreaks, influenza vaccine should be offered (unless contraindicated) to all unvaccinated residents, staff members and recommended for unvaccinated visitors and volunteers. **It takes approximately two weeks for a protective immune response to develop.**
2. Vaccination of staff may take place at the RCF as per local arrangements in accordance with best practice. Alternatively staff members may visit their GP.
3. It is the responsibility of the RCF to ensure that all unvaccinated residents are vaccinated on admission and during an influenza outbreak unless contraindicated and that this information is recorded.
4. It is the responsibility of the RCF to maximise uptake of the influenza vaccine and to offer the vaccine to all unvaccinated staff members during an influenza outbreak.

Antiviral treatment and chemoprophylaxis

Treatment

Key points

- Antiviral drugs for treatment and chemoprophylaxis of influenza are a key component in influenza outbreak control in a RCF.
- Decisions regarding treatment and chemoprophylaxis are made on a case-by-case basis by the attending physician, who may discuss with an ID consultant or consultant virologist/microbiologist.
- Treatment should be offered to:
  a. All residents with signs/symptoms of influenza/ILI who are in a high risk group for influenza
  b. All residents with severe illness (influenza/ILI) based on clinical judgement.
- Empiric treatment should be commenced as soon as possible after symptom onset (within 48 hours for oseltamivir and within 36 hours for zanamivir), without waiting for the results of viral swabs/testing.

1. Use of antiviral drugs for treatment and chemoprophylaxis of influenza is a key component in influenza outbreak control in a RCF as many of the residents are at higher risk for influenza complications. (20)
2. A recent ECDC expert opinion on the use of antivirals for the prevention and treatment of influenza states that available evidence provides support for the use of antiviral medications (neuraminidase inhibitors) as prophylaxis and treatment and thus they can be considered a reasonable public health measure for use during seasonal influenza outbreaks caused by susceptible influenza virus strains. (23)[14]
3. Neuraminidase inhibitors (i.e. oseltamivir and zanamivir) have been used successfully to control outbreaks caused by susceptible strains of influenza when combined with appropriate infection prevention and control measures.

[14] ECDC's position is consistent with guidance from WHO, many national public health organisations in Europe, North America, Southeast Asia, Australia, Japan and New Zealand

4. Antiviral drugs are effective against influenza A and B, and in reducing the severity and shortening the course of illness if given early (within 48 hours of symptom onset for oseltamivir and 36 hours for zanamivir), even in elderly adults. (23 -30)
5. Treatment decisions are the responsibility of the attending physician who should consult with an infectious disease consultant or consultant virologist/microbiologist if necessary.
6. Treatment should be offered to all ill residents in the defined risk groups for influenza[15] and to all residents with severe illness based on clinical judgement. Treatment should be started as early as possible after symptom onset for the greatest benefit (within 48 hours for oseltamivir and 36 hours for zanamivir). However, antiviral therapy may still be beneficial in patients with severe complicated or progressive illness and in hospitalised patients when administered > 48 hours of symptom onset.
7. Empiric antiviral treatment may be considered for any resident with suspected influenza without waiting for the results of viral swabs/ testing.
8. Of the neuraminidase inhibitors, oseltamivir is generally the drug of choice because of the difficulty older people have in using the inhaler device through which zanamivir is administered. (31)
9. Zanamivir should be used when persons require treatment for oseltamivir-resistant strains of influenza or if oseltamivir is contraindicated. Specialist advice should be sought.
10. Both oseltamivir and zanamivir are licensed for use in Ireland.
11. More detailed information on the use of antivirals is available in *"Guidance on the use of antiviral agents for the treatment and prophylaxis of influenza"* available here.
12. In some patients, antibiotics may also be indicated to prevent or treat secondary bacterial infection and use will be based on the physician's clinical judgement.

[15] Children aged < 2 years; Pregnant women; People aged 65 years and older; Severely obese people (BMI≥40) ; People on medication for asthma; Children with any condition (e.g. cognitive dysfunction, spinal cord injury, seizure disorder or other neuromuscular disorder) that may compromise respiratory function, especially those attending special schools/day centres; Those with: Chronic respiratory, heart, kidney, liver or neurological disease, Immunosuppression (whether due to treatment or disease e.g. HIV), Diabetes Mellitus and Haemoglobinopathies. Those with Down Syndrome and Children with moderate to severe neurodevelopmental disorders such as cerebral palsy and intellectual disability.

Post-exposure chemoprophylaxis

Key points

- There is a paucity of scientific evidence to inform a single approach to antiviral chemoprophylaxis use in a RCF. The decision to give antiviral chemoprophylaxis should be made on a case-by-case basis by the attending physician based on clinical judgement and risk assessment.
- In the context of an influenza outbreak in a RCF, chemoprophylaxis may be considered for:
  a. all exposed **residents**, regardless of vaccination status (even when the influenza vaccine and circulating strains are well matched, immunosenescene results in reduced vaccine effectiveness in the elderly)
  b. RCF **staff** who have not received the current seasonal influenza vaccine (including those in whom the vaccine is contraindicated) **and** are in a high risk group for influenza (including pregnancy)
- If a decision is made to administer chemoprophylaxis to exposed **residents,** chemoprophylaxis should be administered to residents on outbreak affected units/ wards only, with active daily surveillance of new cases throughout the facility.
- Chemoprophylaxis should be started as soon as possible after contact with an influenza case (ideally within 48 hours for oseltamivir and within 36 hours for zanamivir) and may be continued for up to 10 days. If there are concerns about high attack rates or high case fatality rates, prophylaxis may be considered more than 48 hours after contact with a case, or for longer durations; however it should be noted that such use is currently unlicensed.
- Chemoprophylaxis should be discontinued if a causative organism other than influenza is identified.

See Appendix I: Risk assessment - antiviral chemoprophylaxis use during an outbreak of influenza/ ILI in a residential care facility (RCF)

1. Chemoprophylaxis involves giving a drug to prevent infection occurring. It differs from a vaccine in that protection only lasts while the drug is being taken. Chemoprophylactic drugs are not a substitute for vaccination, but can be used as adjuncts in the prevention and control of influenza. (32)
2. There is a lack of evidence from recent studies to inform a single approach for antiviral prophylaxis use in RCF. The decision to give antiviral prophylaxis should be based on clinical judgement, risk assessment and the severity of the outbreak. (33) (34)
3. The decision to use antivirals for post-exposure prophylaxis will be guided by Public Health following the initial risk assessment and in conjunction with the OCT if one is convened.
4. Chemoprophylaxis is usually offered to close contacts and to those who fall within the defined risk groups for influenza. In the context of an influenza outbreak in a RCF, chemoprophylaxis may be considered for residents and staff who have been exposed to a person with influenza but are themselves asymptomatic.
5. Use of antiviral prophylaxis may be particularly important during seasons when influenza vaccine effectiveness is expected to be low due to vaccine strain mismatch although early in the influenza season this information may not be readily available. The relatively low effectiveness of influenza vaccine in the elderly population should also be taken into consideration. (34)
6. Chemoprophylaxis should be prescribed by the patient's physician and persons requiring post-exposure chemoprophylaxis should be provided with the most effective antiviral medications for the particular influenza virus causing the outbreak, if known.
7. Persons needing chemoprophylaxis due to exposure to persons with laboratory confirmed influenza A(H1N1)pdm09, influenza A(H3N2) or influenza B should receive oseltamivir or zanamivir. [16]
8. The decision to use either oseltamivir or zanamivir as chemoprophylaxis should take into account the health status of the resident, the characteristics of the dominant

[16] One randomised controlled study on the use of oseltamivir to prevent influenza in elderly residents in nursing homes found that it was 90% effective in preventing laboratory confirmed influenza (23)

circulating influenza strains, preferences regarding the delivery of the drug, potential adverse effects and contraindications.

9. Zanamivir should be used when persons require chemoprophylaxis as a result of exposure to influenza virus strains that are suspected of being oseltamivir-resistant.
10. When chemoprophylaxis is indicated, it should be started as early as possible after contact with a case of influenza infection (ideally within 48 hours for oseltamivir and 36 hours for zanamivir). [34] If there are concerns about high attack rates or high case fatality rates, prophylaxis may be considered more than 36/48 hours after contact with a case, or for longer durations, following a risk assessment of the situation; however, it should be noted that such use is currently unlicensed and should be based on specialist advice only. [36]

Residents

1. In the context of an influenza outbreak in a RCF, antiviral chemoprophylaxis may be considered for all exposed residents who are asymptomatic, regardless of their vaccination status. Even when the vaccine and circulating strains are well matched, vaccine effectiveness is lower in the elderly due to immunosenescence. [34]
2. The decision of whether or not to administer chemoprophylaxis is a clinical decision made on a case-by-case basis and informed by a risk assessment, including consideration of risk of exposure and underlying medical conditions.
3. If a decision is made to administer chemoprophylaxis to exposed residents, chemoprophylaxis should be administered to residents on outbreak affected units/ wards only, with active daily surveillance of new cases throughout the facility.
4. In the RCF setting, post-exposure chemoprophylaxis should be commenced as soon as possible after contact with a case due to the short incubation period of influenza, and may be continued for up to 10 days after the most recent exposure to a case of influenza. [34] [35]
5. When determining the timing and duration of influenza antiviral therapy for post-exposure chemoprophylaxis, factors related to compliance and potential adverse events should be considered.

6. Chemoprophylaxis should be discontinued if a causative agent other than influenza, e.g. RSV, is identified.

Staff

1. No studies have evaluated the effectiveness of giving antiviral chemoprophylaxis to health care workers during influenza outbreaks in RCF. However, studies have shown that antiviral chemoprophylaxis is effective in preventing symptomatic influenza in individuals and household contacts; therefore, staff in RCF may benefit from a protective effect offered by antiviral chemoprophylaxis. (34) As the majority of HCWs are likely to be healthy adults they may benefit from the protective effect not only on a personal level, but may also protect those in their care and benefit the RCF by decreasing staff absenteeism during the outbreak.
2. Antiviral chemoprophylaxis should be considered following a risk assessment for staff[17] who provide care to residents at high risk for influenza complications, who have not had the current seasonal influenza vaccine (including those in whom influenza vaccine is contraindicated) and are in an at-risk group for influenza (including pregnant women) as defined by the *"Guidance on the use of antiviral agents for the treatment and prophylaxis of influenza"* available here. (36)
3. Chemoprophylaxis should be prescribed by the person's own GP, or Occupational Health or the RCF's attending physician/GP.
4. Unvaccinated staff in whom the vaccine is not contraindicated should receive the vaccine. However, as it may take up to two weeks for the protective effect of the vaccine to develop, chemoprophylaxis may be maintained for two weeks after receipt of the vaccine in all staff vaccinated during the outbreak.
5. Consider the possibility of antiviral resistant virus in those who become ill after starting chemoprophylaxis. Carefully exclude non- compliance. Naso-pharyngeal, throat or nasal swabs from additional symptomatic people should be taken when new ILI cases arise ≥ 72 hours after commencing antiviral prophylaxis to check for the emergence of a resistant strain.

[17] This relates to staff who do not have laboratory confirmed flu and who are not ill.

6. An emphasis on close monitoring for signs and symptoms of influenza and initiation of early antiviral treatment if indicated is an alternative to chemoprophylaxis for health care personnel.
7. All workers must be aware of the symptoms and signs of influenza and should be excluded from work if these develop (see P. 29).
8. Chemoprophylaxis should be discontinued if a causative agent other than influenza, e.g. RSV, is identified.

At the start of the influenza season, it is recommended that each RCF has procedures in place to ensure timely access to antiviral medications (oseltamivir i.e. Tamiflu) through the normal channels/pharmacy provider in the event of an influenza outbreak.

To limit the potential transmission of an antiviral drug resistant influenza virus during outbreaks in institutions, whether in acute-care settings or other closed settings, measures should be taken to reduce contact between persons taking antiviral drugs for treatment and other persons including those taking antiviral drugs for chemoprophylaxis. Where contact is unavoidable, e.g. patient care by staff, infection control measures should be strictly enforced. [20][22][33]

Persons taking antivirals should be monitored for side-effects by the prescribing doctor.

More detailed information on the use of antivirals is available in *"Guidance on the use of antiviral agents for the treatment and prophylaxis of influenza"* available here.

For more information on dosing and side effects of oseltamivir and zanamivir,
See www.hpra.ie.

Monitoring the outbreak

Monitoring the outbreak will include ongoing surveillance to identify new cases and to update the status of ill residents and staff.

The nominated RCF liaison person should update the line listing with new cases or developments as they occur and communicate this to Public Health and the CIPCN where available (HSE facilities only) on a daily basis or as required and to the chair of the OCT if one is convened (see P. 23 *Actions following risk assessment/when an OCT is convened*). The review of this information should examine issues of ongoing transmission and the effectiveness of control measures including chemoprophylaxis.

Declare the outbreak over

In order to declare that the outbreak is over, the facility should not have experienced any new cases of infection (resident or staff) which meet the case definition for the period of time as defined by Public Health or the OCT (if one is convened). ***As a general rule, influenza outbreaks can be declared over if no new cases have occurred 8 days from the onset of symptoms of the last resident case.*** The rationale for this definition is that if the outbreak were continuing, new cases would have been identified within 8 days, since 8 days is the outer limit of the period of communicability of influenza in adults (5 days) plus one incubation period (3 days). [(22)(34)] This is based on practicality due to the short incubation period for influenza. Another common method of deciding when to declare an outbreak over is to use two incubation periods for the disease. This approach was used in the global severe acute respiratory syndrome (SARS) outbreak in 2003. In some instances, if considered necessary, a meeting may be arranged between the RCF and Public Health /OCT to review the management of the outbreak.

See Appendix F: Summary Table with Key Measures for the Prevention and Control of outbreaks of seasonal influenza in long-term care facilities.

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Appendices

Appendix A: Respiratory hygiene and cough etiquette poster

Appendix B: Case definitions for possible, probable and confirmed influenza

Appendix C: Interim guidance regarding surveillance to detect clusters/outbreaks of influenza or influenza-like illness

Appendix D: Details for line listing (residents and staff)

Appendix E: Checklist for outbreak management

Appendix F: Summary table with key measures for the prevention and control of outbreaks of seasonal influenza in long-term care facilities

Appendix G: ILI/Influenza outbreak surveillance form and SOPs for entering influenza outbreaks onto CIDR

Appendix H: Link to CDC website re investigation of unexplained respiratory disease outbreaks

Appendix A: Respiratory hygiene and cough etiquette poster

Appendix B: Case definitions for possible, probable and confirmed influenza

Influenza A and B virus

Clinical criteria

Any person with the following clinical syndrome:

Influenza-like illness (ILI)

Sudden onset of symptoms

AND

At least one of the following four systemic symptoms:

1. Fever or feverishness
5. Malaise (a general feeling of being unwell)
2. Headache
3. Myalgia (muscle pains)

AND

At least one of the following three respiratory symptoms:

1. Cough
2. Sore throat
3. Shortness of breath

Laboratory criteria

At least one the following four:

1. Isolation of influenza virus from a clinical specimen
2. Detection of influenza virus nucleic acid in a clinical specimen
3. Identification of influenza virus antigen by DFA test in a clinical specimen
4. Influenza specific antibody response
5. Sub typing of the influenza isolate should be performed, if possible

Epidemiological criteria

An epidemiological link by human to human transmission

Case classification

A. **Possible case**

Any person meeting the clinical criteria (ILI)

B. **Probable case**

Any person meeting the clinical criteria (ILI) and with an epidemiological link

C. **Confirmed case**

Any person meeting the clinical (ILI) and the laboratory criteria

Appendix C: Interim guidance regarding surveillance to detect clusters/outbreaks of influenza or influenza-like illness or acute respiratory disease

Interim guidance regarding surveillance to detect clusters/outbreaks of influenza or influenza-like illness or acute respiratory illness

Surveillance to detect outbreaks of influenza,[18] or influenza-like illness (ILI) or acute respiratory illness is currently in place. The purpose of this surveillance is to detect outbreaks of ILI, influenza A and influenza B and other respiratory pathogens, e.g. respiratory syncytial virus (RSV) or adenovirus, in the community.

Surveillance of outbreaks will be confined to:

1. Clusters of influenza or ILI or acute respiratory illness in institutions e.g. schools, RCF for the elderly, prisons, hospitals and special needs schools
2. Unusual clusters of serious illness suggestive of influenza

[18] Influenza includes all types/subtypes of influenza i.e. influenza A (H1)pdm09, influenza A (H3N2), influenza A (unsubtyped), influenza A (unsubtypable) and influenza B

A case definition for surveillance of clusters/outbreaks of ILI or influenza or acute respiratory illness in the above situations is outlined below:

Case Definition

Three or more cases of influenza-like illness (ILI) or influenza or acute respiratory illness arising within the same 72 hour period in the above settings/situations which meet the same clinical case definition and where an epidemiological link can be established. [(34)19]

Note:

In older adults, influenza symptoms may initially be very subtle and difficult to recognise. Elderly patients may present only with cough, fatigue and confusion. [(18) (19)] The fever response may be more blunted in older adults and in nursing home elderly: Influenza often fails to produce fever over 99^0F. [(19)] Elderly patients are also more susceptible to pulmonary complications from influenza. ***Influenza may present in the elderly patient as an exacerbation of an underlying condition such as chronic pulmonary or cardiovascular disease, Asthma, Diabetes Mellitus etc. If an increased number of residents become unwell over a short period of time with respiratory illness, influenza should be suspected.***

ILI symptoms using the new Irish influenza case definition include sudden onset of symptoms and at least one of the following **four** systemic symptoms: fever, malaise, headache, myalgia, and at least one of the following **three** respiratory symptoms: cough, sore throat and shortness of breath.

The case definition for influenza is available at:
http://www.hpsc.ie/A-Z/Respiratory/Influenza/SeasonalInfluenza/CaseDefinitions/

[19] Investigation of lower numbers of cases can be undertaken if considered appropriate following public health risk assessment.

Actions to be taken on receiving a report of a suspected cluster of ILI or acute respiratory illness

Once a suspected cluster of ILI/influenza/acute respiratory illness is reported to Public Health, the following actions should be considered:

1. Collect information on the number of suspect cases including symptoms
2. Decide if the cluster meets the criteria outlined above including the case definition. If yes,
   a. Combined nose and throat swabs are taken from the initial cases (at least 2 cases and up to 5 cases depending on local resources). This may be carried out by the attending clinician
   b. Swabs should be sent to the laboratory for routine influenza testing and in some instances testing for other respiratory pathogens using the multiplex-PCR
   c. Treatment for influenza is recommended only if cases are in a defined risk group[20] or have clinically severe illness. This decision will be based on the clinical judgement of the treating physician
   d. Following a risk assessment by Public Health, advice may be given to initiate chemoprophylaxis which should be prescribed by the patient's physician
   e. Provide advice on infection prevention and control measures, e.g. hand hygiene, respiratory hygiene/cough etiquette, staying out of work/school while symptomatic as per HPSC guidance at:
      http://www.hpsc.ie/A-Z/Respiratory/Influenza/SeasonalInfluenza/Infectioncontroladvice/

[20] Defined risk groups are those with the following: chronic respiratory disease including people on medication for asthma; chronic heart disease; chronic kidney disease; chronic liver disease; chronic neurological disease; immunosuppression (whether caused by disease or treatment); Diabetes Mellitus; haemoglobinopathies, persons aged ≥ 65 years; children <2 years of age; people on medication for asthma; severely obese people (BMI ≥40), pregnant women and children with any condition (e.g. cognitive dysfunction, spinal cord injury, seizure disorder, or other neuromuscular disorder) that can compromise respiratory function especially those attending special schools/day centres; those with Down Syndrome and children with moderate to severe neurodevelopmental disorders such as cerebral palsy and intellectual disability.

Appendix D: Details for line listing

1. Outbreak code (on top of line list as title)
2. Name of case
3. Case ID
4. Location (unit/section)
5. Date of birth/age
6. Gender
7. Status i.e. resident, staff member, volunteer, visitor
8. Vaccination status in relation to influenza vaccine and date received
9. Vaccination status in relation to pneumococcal vaccine and date received
10. Date of onset of symptoms
11. Date of notification of symptoms
12. Clinical symptoms (outline dependent on case definition) e.g. fever, cough, myalgia, headache, other
13. Samples taken and dates
14. Laboratory results including test type e.g. RT-PCR, culture
15. Date when isolation of resident was started
16. Antiviral and antibiotic medications: state name of drug, whether used for treatment or chemoprophylaxis and date treatment/chemoprophylaxis commenced
17. Date of recovery
18. Duration of illness
19. Outcomes: recovery, pneumonia, other, hospitalisation, death
20. Adverse reactions to or discontinuation of antiviral medications
21. Also include work assignments of staff and last day of work of ill staff member
22. State if staff worked in other facilities

Have separate sheets for both staff and residents

Appendix D: Part 1 – Respiratory outbreak line listing Form – Residents ONLY*

Name of Facility: …… Name of Outbreak: ……..

DETAILS								SYMPTOMS				
ID	**Surname Firstname**	**Location (unit/section)**	**Sex**	**DOB (dd/mm/yy)**	**Age**	**Flu vaccine (date)**	**Pneumococcal vaccine (date)**	**Onset (date)**	**Fever ≥38°c (Y/N)**	**Cough (Y/N)**	**Fatigue (Y/N)**	**Other symptoms (state)**

Key: (Y =Yes, N=No, U=Unknown)

***Please complete for all current and recovered cases**

Appendix D: Part 2 –Residents ONLY

Name of Facility: ……. Name of Outbreak: ……

	TEST/ RESULT		TREATMENT / PROPHYLAXIS		OUTCOMES			
ID	Pathology test done (yes/no) If yes, date	Type of test and result	Oseltamivir (date)	Zanamivir (date)	Pneumonia (date)	Hospitalised (date)	Death (date)	Recovered to pre-outbreak health status (yes/no) If yes -date

Key: (Y =Yes, N=No, U=Unknown)

Appendix D: Part 3 – Respiratory outbreak line listing form – Staff ONLY*

Name of Facility: …….. Name of Outbreak: ……

DETAILS								SYMPTOMS					
ID	**Firstname Surname**	**Position**	**Location**	**Sex**	**DOB (dd/mm/yy)**	**Age**	**Flu vaccine (date)**	**Onset (date)**	**Fever ≥38°c (Y/N)**	**Cough (Y/N)**	**Fatigue (Y/N)**	**Other symptoms (state)**	**Work at any other facility? (Y/N) If YES, state location**

Key: (Y =Yes, N=No, U=Unknown)

***Please complete for all current and recovered cases**

Appendix D: Part 4 –Staff ONLY*

Name of Facility: …… Name of Outbreak: …….

	TEST/ RESULT		TREATMENT (T) / PROPHYLAXIS (P)		STATUS	
ID	Pathology tests done (yes/no)	Type of test (date and result)	Oseltamivir (T/P, date)	Zanamivir (T/P, date)	Excluded until (date)	Recovered from outbreak symptoms (yes/no) If yes -date

Key: (Y =Yes, N=No, U=Unknown)

***Please complete for all current and recovered cases**

Appendix E: Checklist for outbreak management

	Discussion point	**Decision/action to be taken (tick if completed)**	**Person responsible**
1	Declare an outbreak and convene an OCT if indicated following Public Health risk assessment		
2	Agree the chair		
3	Formulate an outbreak code and working case definition		
4	Define the population at risk		
5	Active case finding, request line listing of residents and staff from the RCF		
6	Discuss whether it is a facility-wide outbreak or unit-specific		
7	Confirm how and when communications will take place between the RCF, CIPCN, Public Health and the laboratory		
8	Review the control measures (infection control, vaccination and antiviral treatment/chemoprophylaxis) necessary to prevent the outbreak from spreading. Confirm that the management of the facility is responsible for ensuring that agreed control measures are in place and enforced		
9	Discuss which specimens have been collected. Notify the laboratory of the investigation.		
10	Confirm the type and number of further laboratory specimens to be taken. Clarify which residents and staff should be tested.		

11	Confirm that the laboratory will phone or fax results (both positive and negative) directly to the requesting doctor and that this person will notify Public Health. Review the process for discussing laboratory results with the RCF's designated officer.		
12	Liaise with the RCF and laboratory regarding specimen collection and transport		
13	Identify persons/institutions requiring notification of the outbreak e.g. families of ill or all residents of the facility; health care providers e.g. GPs, physiotherapists etc.; infectious disease consultants, consultant microbiologists, infection prevention & control specialists, Emergency Departments; local hospitals, other RCF, HPSC		
14	Discuss whether a media release is required		
15	Discuss how RCF management are going to organise vaccination of unimmunised residents and staff		
16	Discuss the use of antiviral medications for the treatment of cases and/or prophylaxis of well residents and unimmunised staff		
17	Ensure that the incident is promptly reported to HPSC and surveillance details entered onto CIDR		
18	Provide updates on the investigation to the Assistant National Director, ISD-Health Protection when/if required		
19	Discuss communication arrangements with HSE management ± HSE crisis management team		
20	Discuss communication arrangements with local GPs and Emergency Departments		
21	Decide how frequently the OCT should meet and agree criteria to declare outbreak over		
22	Prepare/circulate an incident report/set date for review meeting		

Appendix F: Prevention and control of outbreaks of seasonal influenza in long-term care facilities

Summary Table (page 1 of 2)

	Domain	Action	Comment
Pre-outbreak measures	Planning and administration	Written policies	Immunisation policies Standard and transmission based precautions including droplet and contact precautions Written outbreak management plan
		LTCF Lead (named person)	To oversee development, implementation and review of policies and protocols
		Training and education	For all staff Ongoing training Measures to improve compliance
		Provision of supplies	Hand hygiene supplies, PPE, cleaning and disinfecting material Arrangements with pharmacy for supply and timely provision of antivirals
	Vaccination of residents	Influenza vaccination - residents	Offer to all residents prior to season Offer catch-up vaccination to new unvaccinated residents Document in care records
		Pneumococcal vaccination	Offer to previously unvaccinated residents
	Vaccination of staff	Influenza vaccination - staff	Maximise update prior to influenza season Named staff member responsible for coordination Record vaccination status in staff records Feedback on vaccination coverage
	Standard precautions	Standard infection control procedures	Should be practised by all staff at all times
	Surveillance	Awareness of influenza signs and symptoms	Throughout the year but particularly October to May
Early recognition	Case definition	Case definition (Appendices B & C)	In the elderly, presentation may be atypical and without fever
	Outbreak definition	Action threshold for outbreak control measures	≥ 3 epidemiologically-linked cases within 72 hours
	Communication of suspected outbreak	Notification of senior staff, management, medical staff and public health	Staff to be aware of upward notification chain Contact GP/medical team Notify public health locally
	Formation of outbreak control team (OCT)	OCT may be convened following risk assessment	Coordination with Public Health locally
	Testing	Viral swabbing	Awareness of local provision of viral swabs Coordination with Public Health and local laboratory/NVRL

Summary Table (page 2 of 2)

	Domain	Action	Comment
During an outbreak	Initial actions	Daily case list	Daily list of affected residents and staff communicated to Public Health (depending on local arrangements)
		Active daily surveillance	Daily temperature and symptom review of residents and staff to identify new cases
		Vaccination	Offer to unvaccinated residents and staff (but not as a control measure)
	Infection control measures	Standard transmission-based precautions	Standard precautions should be in place already but heightened. Transmission-based precautions (droplet, airborne, and contact) should be implemented as appropriate (see p10-p14)
		Resident placement	Single room isolation/Cohorting
		Respiratory hygiene	Cover mouth and nose for coughing/sneezing. Adequate supplies of tissues and disposal bins Hand hygiene after respiratory hygiene Masks for residents transported out of isolation area
		Hand hygiene	Five critical points in resident case: • Before patient contact • Before aseptic task • After body fluid exposure risk • After patient contact • After contact with patient's surroundings Hand hygiene after PPE removal
		Personal protective equipment	Gloves, aprons, gowns, face protection
		Aerosol generating procedures	Highest level of respiratory protection (FFP2/3) available if performing a high-risk AGP
		Environmental control measures	Resident environment cleaning and disinfection Resident care equipment Laundry Eating utensils and crockery
		Containment measures	New admissions restricted Transfers restricted Restricted communal activities Staffing precautions Visitor restrictions
	Use of antivirals	Treatment	Recommended on an individual basis following clinical assessment (see p30 & p31)
		Prophylaxis	Decision for residents based on risk assessment, clinical judgement and outbreak severity (see p30-p33) Consider for HCWs if unvaccinated and in seasons when vaccine mismatched with circulating strain; and where evidence exists for complex ongoing chains of transmission involving patients and staff
Post outbreak	Declaration of end of outbreak		As advised by Public Health (see p34)
	Final evaluation	Review of management of outbreak and lessons learned	Coordination with Public Health and OCT if this was convened

Appendix G: ILI/Influenza outbreak surveillance form and guidelines for entering outbreaks onto CIDR

Influenza-like Illness/Influenza Outbreak Reporting Form

1. Outbreak Identification

Outbreak identifier		County	
CCA/LHO		HSE-Area	
First reported date	_____/_____/_____	Onset date of *first* case	_____/_____/_____
Onset date of *last* case	_____/_____/_____	Recognition of outbreak date	_____/_____/_____
Reported by (name)		Position	
Telephone		Fax	
Email			

2. Outbreak notification source *(please tick all that apply)*

General practitioner	☐	Laboratory report	☐
Hospital Clinician	☐	Other	☐

If other, please specify _____

3. Extent of the outbreak *(please tick one)*

Local	☐	*(confined to 1 HSE-Area)*
Across HSE-Area	☐	*(2 adjacent HSE-Areas)*
National	☐	*(3 or more HSE-Areas or 2 or more non-adjacent HSE-Areas)*
Cross border	☐	
International	☐	

4. Type of outbreak *(please tick one)*

Family outbreak ☐ General outbreak ☐

5. Main location of the outbreak *(please tick one)*

Community hospital/Long stay unit	☐	Community outbreak	☐	Crèche	☐
Hospital	☐	Private house	☐	Residential institution	☐
School	☐	University/College	☐	Travel related	☐
Extended Family	☐	Workplace	☐	Unknown	☐
Other	☐				

If other, please specify _____

Describe *(include name of institution / location etc.)*:

6. Pathogen

a. Was the pathogen identified? Yes ☐ No ☐

If Yes, specify pathogen identified: _____

(if influenza specify type, subtype & strain if available)

b. Name of laboratory where tests were conducted: _____

c. Were specimens referred to the NVRL? Yes ☐ No ☐ Unknown ☐ Date referred ____/____/____

d. What pathogens were tested for?

Standard ILI suite ☐ Unknown ☐

7. Exposure

Number ill		Number hospitalised	
Number dead		Number at risk/exposed	
Number laboratory confirmed		Number laboratory investigated	
Number with clinical symptoms only			

Influenza-like Illness/Influenza Outbreak Reporting Form

8. Number of cases by sex:

Males ____ Females ____ Sex Unknown ____

9. Number of cases by age group:

0–1 yr	2 –4 yrs	5–9 yrs	10 – 19 yrs	20 – 49 yrs	50 – 64 yrs	65+ yrs	Age NK

10. Symptoms: *(Please tick all that occurred)*

Cough	☐	Diarrhoea	☐	Fatigue/Malaise	☐	Fever	☐
Headache	☐	Myalgia	☐	Sore throat	☐	Dyspnoea	☐
Runny nose	☐	Sneezing	☐	Conjunctivitis	☐	Other	☐

If other, please specify _____

11. Complications: *(Please tick all that apply)*

a. Total number with pneumonia _____ b. Total number with otitis media _____

c. Total number with encephalitis _____ d. Total number with other complications _____

12. In healthcare settings:

a. Number staff ill ____ b. Number clients/hospital patients ill ____

13. Measures taken: *(Please tick all that apply)*

Outline main control measures undertaken:

Information/self-monitoring	☐	Contacts vaccinated	☐
Hygiene advice	☐	Antivirals	☐
Advice on respiratory etiquette	☐	Quarantine	☐
Closure of institution	☐	Isolation/cohorting	☐

14. Report

Will a full outbreak report be available? Yes ☐ No ☐

15. Laboratory results relating to the outbreak

	Ill people		Well people	
	No. of samples tested	No. positive	No. of samples tested	No. positive
All individuals tested during the outbreak:				

16. Any additional comments: *(include actions taken & any other aspects not covered)*

Please forward Full Outbreak Report and Epi-curve if available

Notifying Doctor: _____ **Date:** ____/____/_____

Please see ILI/Influenza outbreak reporting guidelines for CIDR v3.4 29/12/2011

Influenza-like illness/influenza
Outbreak/Cluster Reporting Guidelines for CIDR

Prompt notification all year round of clusters/outbreaks of influenza-like illness (ILI) and influenza remains important. The current EU definition of influenza-like illness (ILI) is used, see http://www.hpsc.ie/A-Z/Respiratory/Influenza/SeasonalInfluenza/CaseDefinitions/

Outbreaks of confirmed influenza

Where at least one person among a cluster/outbreak of ILI is a confirmed case of influenza regardless of type/subtype, the outbreak should be recorded on CIDR as follows:

Outbreak disease = influenza

Outbreak organism/pathogen = influenza type/subtype as appropriate (e.g. influenza A, influenza A(H1)pdm09v[21], influenza A H3, influenza B)

Outbreaks of influenza-like illness (ILI)

Where a cluster/outbreak of ILI is identified, it should be recorded on CIDR as follows:

Outbreak disease = outbreak

Outbreak organism/pathogen ='influenza-like illness' [Note the *organism/pathogen* field should state **"Influenza-like illness"** ONLY; capital I for Influenza, all the rest lower case, single space between two words]

- If any case that is part of the outbreak becomes a confirmed case of influenza, the outbreak should be reclassified on CIDR as follows:
    - *Outbreak disease* = influenza
    - *Outbreak organism/pathogen* = influenza type/subtype (e.g. Influenza A, Influenza A(H1N1)v, Influenza A H3, Influenza B)

1. Select 'Outbreak' tab
    - Record data from section 1 in the 'Outbreak Identification' section

[21] Influenza A(H1N1)v on CIDR refers to influenza A (H1) 2009, influenza A (H1N1 2009), pandemic influenza 2009 or influenza A(H1N1)pdm09.

- Record data from sections 2, 3, 4, 5 & 16 in the ‘Outbreak General’ section
- Record data from sections 6a & 7-10 in the ‘Outbreak Information’ grid
- Record data from sections 6 b, c & d, and 11-13 in section at the end of ‘Outbreak Information’ which contains specific questions relating to influenza-like illness (ILI) and influenza

2. Select ‘Factors/Actions’ tab
    - Record information from section 14

3. Select ‘Laboratory’ tab
    - Record data from section 15
    - Enter data opposite ‘All Other Individuals Tested’

4. Linking events

- It is possible to create outbreaks on CIDR with or without events. Where a cluster/outbreak of ILI or influenza includes a case which conforms to the case definition for influenza, an event should be created for that case on CIDR, and the Case classification and Overall interpreted lab result updated as appropriate. The event should be linked to the cluster/outbreak on CIDR in the usual manner, and the Outbreak disease and Outbreak organism/pathogen fields reviewed.

Appendix H: Link to CDC website re investigation of unexplained respiratory disease outbreaks

Centers for Disease Prevention and Control, CDC, Altanta, USA

Emergency Preparedness and Response

How to investigate unexplained respiratory disease outbreaks (URDO) at

http://emergency.cdc.gov/urdo/

Appendix I: Risk assessment - antiviral chemoprophylaxis use during an outbreak of influenza/ ILI in a residential care facility (RCF)

Risk assessment - antiviral chemoprophylaxis use during an outbreak of influenza/ ILI in a residential care facility (RCF)

Key points

- There is a paucity of scientific evidence to inform a single approach to antiviral chemoprophylaxis use in a residential care facility (RCF). **The decision to recommend antiviral chemoprophylaxis should be made on a case-by-case basis by the attending physician based on clinical judgement and risk assessment.**
- In the context of an influenza outbreak in a RCF, chemoprophylaxis may be considered for:
  a. all exposed **residents**, regardless of vaccination status (even when the influenza vaccine and circulating strains are well matched, immunosenescene[22] results in reduced vaccine effectiveness in the elderly compared with younger age groups)
  b. RCF **staff** who have not received the current seasonal influenza vaccine, or received the vaccine <14 days before contact with an influenza case, **and** are in a high risk group for influenza[23] (including pregnancy)
- If a decision is made to administer chemoprophylaxis to exposed **residents**, chemoprophylaxis should be administered to residents on outbreak affected units only, with active daily surveillance of new cases throughout the facility.
- Chemoprophylaxis should be started as soon as possible after contact with an influenza case (ideally within 48 hours for oseltamivir and within 36 hours for zanamivir) and may be continued for up to 10 days after the most recent exposure to an influenza case. If there are concerns about high attack rates or high case fatality rates, prophylaxis may be considered more than 36/48 hours after contact with a case, or for longer durations, following a risk assessment; however it should be noted that such use is currently unlicensed.
- Chemoprophylaxis should be discontinued if a causative organism other than influenza is identified.

Public Health Risk Assessment

In deciding whether or not to recommend chemoprophylaxis, the following factors should be considered:

Individual factors

Residents

- Duration of contact
- Intensity of contact[24]
- Duration of time elapsed since contact with an influenza case[25]
- Stringency of infection prevention and control (IPC) measures in RCF and individual's ability to comply with same, e.g. cough etiquette, hand hygiene
- Vaccination status and timing[26]
- Vaccine match/ mismatch with causative/ dominant circulating strain[27]
- Member of risk group for influenza[22], including immunosuppression

[22] Immunosenescence is impairment in immunity due to age-associated changes in function in a variety of cells
[23] https://www.hse.ie/eng/health/immunisation/hcpinfo/guidelines/chapter11.pdf
[24] e.g. sharing a room with a patient with influenza/ ILI versus resident in an unaffected unit in the same RCF
[25] Chemoprophylaxis should be started as soon as possible after contact with an influenza case
[26] >/<14 days prior to contact?
[27] This information may not be available early in the influenza season

- Contraindications to antiviral chemoprophylaxis, including medication that may interact
- Ability to tolerate chemoprophylaxis – consider potential side effects[28]
- Compliance concerns/ issues

Staff

- Duration of contact
- Intensity of contact
- Duration of time elapsed since contact with an influenza case[25]
- Stringency of IPC measures in RCF
- Evidence of ongoing chains of transmission involving residents and staff
- Provision of care to residents at high risk for influenza complications
- Vaccination status and timing[26]
- Vaccine match/ mismatch with causative/ dominant circulating strain[27]
- Member of risk group for influenza[23], including pregnancy
- Contraindications to antiviral chemoprophylaxis, including medication that may interact
- Ability to tolerate chemoprophylaxis – consider potential side effects[28]

Outbreak factors

- Pathogenicity of causative influenza virus subtype (if known) or dominant circulating strain – e.g. A(H3N2) is known to affect older people more severely[29]
- Outbreak severity[30] - including duration, attack rate, morbidity (hospitalisation rates, ICU admission rates) and mortality
- Distribution of cases within RCF
- Ability to implement and comply with IPC measures, e.g. isolation and spatial separation of susceptible individuals, and stringency of these measures
- Has a causative organism been identified – if causative organism other than influenza, e.g. respiratory syncytial virus (RSV), is identified, then discontinue influenza chemoprophylaxis

Examples

Chemoprophylaxis for residents:

A bed-ridden individual with chronic obstructive pulmonary disease residing in the same room as a patient with symptoms of ILI is likely to benefit from antiviral chemoprophylaxis regardless of vaccination status.

Chemoprophylaxis for staff:

A staff member who has not received the influenza vaccine and who provides care to frail, elderly residents with chronic medical conditions across a number of different units is likely to benefit from chemoprophylaxis. This staff member should also receive the seasonal influenza vaccine, but as the vaccine takes two weeks to mount a sufficient immune response, antiviral chemoprophylaxis may be considered in the interim.

[28] Side effects associated with oseltamivir include headaches, nausea and psychiatric events https://www.medicines.org.uk/emc/product/1194/smpc
[29] https://ecdc.europa.eu/en/publications-data/summary-influenza-2016-2017-season-europe
[30] This information may not be available until later