Health Care Workers & Seasonal Influenza Vaccine
2019-2020 Influenza Season

Health Protection Surveillance Centre
in collaboration with
National Immunisation Office (NIO)
Workplace Health and Wellbeing Unit

Last updated HPSC
13/08/2019
Purpose of presentation

• To provide up to date information for use by Departments of Public Health, Occupational Health Departments and others involved in delivering education to healthcare workers (HCWs) about the Seasonal Influenza vaccine

• Its aim is to increase HCW knowledge and increase vaccine uptake rates
Outline

• What is influenza?
• Transmission
• Burden
• Prevention
  o Flu vaccine (key facts, safety, effectiveness, uptake in HCWs)
  o Promotion of vaccine (organisational/institutional level)
• Respiratory hygiene and cough etiquette
• Summary
Key facts on Influenza

- Acute viral infection, spreads easily from person to person
- Three types of flu virus affecting humans – A, B and C
- Circulates worldwide, can affect anybody in any age group
- Causes annual epidemics, peaks during winter in northern hemisphere
- Serious public health problem, causes severe illness and deaths in high risk populations
- Epidemics result in increased pressure on health service delivery
- Vaccination is one of the most effective ways to prevent infection
Transmission

- Droplet i.e. coughing, sneezing, singing
- Contact i.e. hand to nose to environmental surfaces e.g. doors, pens

Courtesy: CDC/ Brian Judd
Burden of seasonal influenza

• Global*
  o 3-5 million cases of severe illness each year
  o 290,000-650,000 deaths
  o Hospitalisation/critical care admission rates vary by age group and medical condition, circulating strain and match with vaccine strain

• Europe (EU/EEA)**
  o 4-50 million symptomatic cases each year
  o 15,000-70,000 deaths associated with influenza annually

• Ireland***
  o Approx. 200-500 deaths each year due to influenza – up to 1,000 could die during a particularly severe flu season (HPSC estimates)
  o 2014/15-2017/18 seasons:
    - Confirmed flu cases hospitalised range 1009-4713
    - Confirmed flu cases admitted to ICU range 51-191

Source: *WHO, **ECDC, ***HPSC
### Estimated annual influenza-attributable hospitalisation rate in England per 100,000 (95% CI), 2000/01-2007/08

<table>
<thead>
<tr>
<th>Age group</th>
<th>Rate (95%CI)</th>
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<tbody>
<tr>
<td>&lt;6 months</td>
<td>330 (318-342)</td>
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<tr>
<td>6 months - 4 years</td>
<td>175 (170-180)</td>
</tr>
<tr>
<td>5 years - 14 years</td>
<td>14 (13.2-14.8)</td>
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<tr>
<td>15 years - 44 years</td>
<td>12 (11.7-12.3)</td>
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<tr>
<td>45 years - 64 years</td>
<td>27 (26.4-27.6)</td>
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<tr>
<td>65+ years</td>
<td>63 (60-66)</td>
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Younger and older age groups most affected
Impact of Influenza in Health Care Facilities

International

France hospital (1999)
- Lab-confirmed (influenza A) outbreak in internal medicine acute unit resulted in 9/22 cases in patients and 5/22 in staff. Vaccination rates were low in patients (43%) and staff (36%).
- Outbreak led to substantial sick leave amongst staff and postponing of multiple admissions to affected unit.

Canada hospital (NICU) (2000)
- Lab-confirmed (influenza A) -19 infant cases including one death; low uptake of flu vaccine in HCWs on unit
Impact of Influenza in Health Care Facilities (continued)

**Finland hospital A(H1N1) outbreaks in immunocompromised (2014, 2016)**
- Transplant unit in 2014 - 7 cases; oncology unit in 2016 - 17 cases; 7 died associated with these outbreaks. Low vaccination uptake in transplant unit HCWs (46%).

**Northern Ireland care homes (2011-2015)**
- 95 respiratory outbreaks reported in care homes of which 70 confirmed as flu.
- >1000 cases, 135 associated hospitalisations, and 22 deaths.

**Republic of Ireland**
- Influenza outbreaks reported each year - 73 outbreaks reported (with 517 ill) in 2018/19 season*
- Long-term stay units/hospitals/schools
- Often good vaccine coverage in patients/residents in Irish HCFs, especially in LTCFs, but suboptimal in HCWs

*Poor immune response to flu vaccine in elderly patients/residents underscores importance of high coverage amongst HCWs

*Provisional data for wk 40 2018 to wk 20 2019 - extracted from CIDR 13/08/19
Impact of influenza on a personal level

• Healthy people can develop severe illness

• Loss of earnings if self-employed

• Complications of influenza e.g. Guillain-Barré Syndrome, pneumonia

• Can affect family of HCWs – e.g. elderly parents and young children

• Pregnant women at higher risk of severe illness*

*Source:
CDC – Pregnant women and influenza (flu)
https://www.cdc.gov/flu/highrisk/pregnant.htm

Prevention

Seasonal influenza vaccine

+ 

Infection control measures
Seasonal influenza vaccine

Recommended for:

1. At risk patient populations

2. Healthcare workers (HCWs)

As early as possible each season for best protection (usually from early Oct)

At risk groups include individuals who:
• are 65 years of age and over
• are pregnant
• have a long-term health condition
• work in healthcare
• are a carer
• live in a nursing home or other long-term care facility
• in regular contact with pigs, poultry or water fowl
Influenza vaccination and HCWs

Recommended for HCWs by:

- NIAC (Ireland) since 2002*, CDC (USA) since 1981 (now mandatory in some institutions)

- RCPI cross-faculty position paper (Occ Health, Public Health, & Pathology) – Oct 2018: recommended mandatory vaccination for HCWs working in “high-risk” clinical areas including ICU, oncology wards and other areas attended by immunocompromised patients.

Vaccination potentially reduces:

- Influenza-related mortality in patients
- Staff influenza infection (US RCT showed vaccine 88-89% effective at preventing flu infection in HCWs)
- Health care associated transmission and outbreaks

**BUT** vaccination uptake among Irish HCWs is poor at 53% in public hospitals and 42% in public LTCFs (2018/19)† - target was 65% in 2018/19

- Misconceptions and lack of knowledge common

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† HSE/HPSC – based on final report on flu vaccine uptake in hospitals and LTCFs in 2018/2019
History of flu vaccine development

1933 - isolation of flu virus
Followed by the development of first generation of live attenuated vaccines

First bivalent vaccine licensed in US in 1943
1940s - inactivated flu vaccines developed

1960s - first flu vaccine licensed in Europe

1978 - first trivalent vaccine

2012 - quadrivalent vaccine licensed in US
Available in some European countries from 2013/2014
Seasonal influenza vaccine Ireland

• What is it?
  o Inactivated (killed) vaccine
  o IM injection
  o Single dose – takes just 5 minutes!
  o Available free of charge through your local HSE Occ Health Dept/peer vaccination clinic – for non-HSE HCWs may be administration charge from GP/pharmacist
Quadrivalent influenza vaccines for use in 2019/2020 northern hemisphere include (as recommended by WHO):

- A/Brisbane/02/2018 (H1N1)pdm09-like virus
- A/Kansas/14/2017 (H3N2)-like virus
- B/Colorado/06/2017-like virus (B/Victoria/2/87 lineage)
- B/Phuket/3073/2013-like virus (B/Yamagata/16/88 lineage)

HSE Flu vaccine for 2019/2020

- Called “Sanofi Pasteur Quadrivalent Influenza Vaccine split virion”
- Egg-based

Sources: WHO, NIO
Why *annual* vaccination?

*Influenza viruses always changing...*

- Strains monitored by WHO surveillance laboratories
- WHO recommends which strains are included in seasonal flu vaccine every year
- Seasonal flu vaccine formulated to ‘match’ circulating strains
Does flu vaccine give you the flu?

**NO! It cannot cause flu infection**

- Influenza viruses in the vaccine are inactivated (killed) during manufacturing process
- Batches of vaccine are tested to ensure safety
- Studies have demonstrated that flu vaccines are very safe
- The flu vaccine starts to work within two weeks – sometimes people become unwell with other circulating viruses/colds in this time period and mistakenly think it was the vaccination that caused their illness

CDC. Influenza (flu) vaccine safety [https://www.cdc.gov/vaccinesafety/vaccines/flu-vaccine.html](https://www.cdc.gov/vaccinesafety/vaccines/flu-vaccine.html)
Are there any vaccine side-effects?

- Most common side effect of seasonal flu shots
  - Soreness at injection site, usually < 2 days

- Rare symptoms
  - Fever, muscle pain, and feelings of weakness
  - Usually begin soon after vaccination and last 1-2 days

- Frequency
  - Local reactions: 15-20% recipients
  - Fever, malaise: not common, resolve
  - Immediate allergic reactions: very rare (< 1 in a million)
  - Neurological reactions: very rare (e.g. Guillain-Barré Syndrome)
Contra-indications/ precautions to vaccination (inactivated flu vaccine)

• Contraindications
  o Anaphylaxis following a previous dose of influenza vaccine or any of its constituents (other than ovalbumin – see precautions)

• Precautions
  o Acute severe febrile illness - defer until recovery.
  o Egg allergy: Those with confirmed egg anaphylaxis or egg allergy.

Source: NIAC immunisation guidelines, Chapter 11 Influenza
Confirmed Egg Allergy

• Anyone with confirmed egg anaphylaxis or egg allergy can be given a flu vaccine with an ovalbumin content <0.1mcg per dose (e.g. HSE flu vaccine 2019/20)

• Decision whether to administer vaccine in primary care or hospital setting is dependent on allergy and asthma history

NIAC guidelines can be consulted for further information.
Vaccination for pregnant HCWs

• Pregnant women are at increased risk of influenza-related complications

• Pregnant HCWs should receive seasonal influenza vaccine, regardless of stage of pregnancy

• Vaccine routinely recommended for pregnant women in USA for many years

• Women who are pregnant through two flu seasons should get two flu vaccines, one in each season.
Truths & myths about the vaccine

The vaccine does...

• Protect you against influenza from 2 weeks after vaccination up to a year later
• Decreases risk of influenza disease and complications incl.:
  o Hospitalisation and severe illness incl. Guillain-Barré Syndrome (GBS) after influenza-like illness

The vaccine does not...

• Prevent “influenza-like” illnesses caused by other viruses e.g. Human Metapneumovirus, RSV, common cold

Influenza vaccination and GBS?

• Most data suggest little or no risk of GBS following vaccination.
• More likely to get GBS after flu illness than after vaccination.


  CDC Vaccine Safety – Guillain-Barré Syndrome
Vaccine effectiveness (inactivated influenza vaccine)

- Vaccine effectiveness (VE) dependent on match with circulating virus.
- In general, a **VE of ~30-60%** has been estimated for the three different influenza A (H1N1, H3N2) and B strains (Victoria or Yamagata lineages) (ECDC).
- Interim results from six influenza VE studies in Europe for the 2018/19 season indicated that VE against lab-confirmed influenza A ranged from 32% to 43% across all age groups in the primary care and hospital setting and was 59% in risk/target groups.
- Systematic r/w and meta-analysis of VE 2004-2015 (Belongia et al., 2016):
  - Average VE against flu illness caused by:
    - H3N2 = 33% (CI=26%-61%)
    - H1N1 = 61% (CI=57%-65%)
    - B = 54% (CI=46%-61%)

Substantial protection against H1N1pdm09, H1N1 (pre-2009), and type B, but lower protection against H3N2.
Vaccine effectiveness & risk groups?

**CDC (US)**
- 50-60% effective in preventing hospitalisation among elderly persons
- 80% effective in preventing death among elderly

**Scottish data, 2000/01-2008/09**
- Pneumonia and COPD: 27% (95%CI 20%-33%)
- Lab-confirmed influenza in <65y (at risk of serious complications): 60% (95%CI 22%-79%)

**International data, 2010/11-2014/15**
- Influenza in ≥65 years: 37% (95%CI 30%-44%)

Simpson et al. Health Services and Delivery Research 2013 Nov
Influenza vaccination uptake among HCWs worldwide, 2006-2015

Source: G Dini et al., (2018), originally adapted from To et al., (2016)
Vaccine uptake among HCWs in Ireland

• Poor vaccine uptake among HCWs in Ireland but improving*

  2018/19 data:
  - Public hospitals national average: 53% (increased from 18% in 2011/12), 52% when including participating private hospitals
  - Inter-public hospital variation: range 22% to 85%
  - Public and participating private LTCFs – 40% (increased from 18% in 2011/12)

Latest data on flu vaccine uptake in HCWs available here:
http://www.hpsc.ie/a-z/respiratory/influenza/seasonalinfluenza/influenzaandhealthcareworkers/

• Potential risk of transmission in health care setting to vulnerable groups
  - HCWs frequently provide care for elderly or immunosuppressed who tend not to be able to mount as good an immune response to the vaccine as younger, healthy individuals – highlights importance of vaccination among HCWs to potentially prevent transmission to these groups.

• High risk of complications in risk groups

• Human and economic impact of influenza
  - Disease among patients, burden on health services

*HPSC/HSE
Why should HCWs get the flu vaccine?

• HCWs have been potentially implicated as the source of influenza transmission in health care settings
  o Employees continue to work while sick with influenza
  o Unvaccinated workers who are not sick can still spread the virus (viral shedding can begin 1-2 days before until 5-7 days after symptom onset).

• Potential benefits of influenza vaccination of HCWs:
  o Reduce risk of outbreaks in healthcare facilities
  o Decrease staff illness and costs resulting from loss of productivity
  o Protect younger and older members of their own family and friends
Why do some HCWs not get vaccinated?

*Reasons include:*

- No or poor knowledge
- Low perception of risk to self and/or others among HCWs
- Myths and inaccurate information common
Seasonal influenza vaccination coverage rates among HCWs, 17 EU/EEA Member States, seasons 2007-08 to 2014-15

*VENICE survey. ECDC (2017)
Reasons for not getting influenza vaccine among Irish HCWs (n=118), 2012-13 season (Aug 2012)*

<table>
<thead>
<tr>
<th>Perceptions of low risk</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not needing flu vaccine</td>
<td>39</td>
<td>33</td>
</tr>
<tr>
<td>I don’t get flu</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>I am not at risk</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>I don’t like injections/going to doctor</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>It doesn’t work/is ineffective</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>I may get flu from it/fear side-effects</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>I got flu from it last time/it has side-effects</td>
<td>5</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Problems with awareness/access/affordability

<table>
<thead>
<tr>
<th>Problems with awareness/access/affordability</th>
<th>n</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>Did not think about it, forgot to ask about it this year</td>
<td>5</td>
<td>4.2</td>
</tr>
<tr>
<td>No time, I didn’t get around to it</td>
<td>7</td>
<td>5.9</td>
</tr>
<tr>
<td>Didn’t know the flu injection was available to me</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Wasn’t offered the flu injection by my family doctor/GP</td>
<td>4</td>
<td>3.4</td>
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</table>

Other reason

<table>
<thead>
<tr>
<th>Other reason</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No reason</td>
<td>5</td>
<td>4.2</td>
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</tbody>
</table>

Barriers to flu vaccination in HCWs

Irish study (2015) – LTCF managers in HSE East region

Barriers to HCW vaccination most frequently identified by LTCF managers in HSE East region included:

- **Anxiety related to vaccine** (94%) – leading anxieties were fear of adverse reaction and needle phobia
- **Lack of awareness of need to vaccinate** to protect HCWs themselves and residents (21%)

UK study (2015) – NHS staff

Survey of > 3,000 NHS staff – unvaccinated staff significantly more likely to respond that it was **too much trouble to get the vaccine**, they **felt less at risk of getting flu**, and they **thought the vaccine would make them feel unwell**.
What can be done to improve uptake rate

2019/ 2020
At the organisational level

• **Develop strong position on HCW influenza immunisation**
  
  o Seek leadership and department support within each unit/institution

• **Aim high**
  
  o Increase influenza immunisation rates (aim 65% or better – 2019/20 target)

• **Highlight benefits of HCW immunisation**
  
  o For patient, personal, and family safety

• **Decrease:**
  
  o Potential influenza transmission among staff and patients
  
  o Deaths/complications/prolonged hospital stays

• **Target HCW knowledge & attitudes**
  
  o Difference between influenza symptoms and other respiratory illnesses
  
  o Facts and fiction
At the facility level

Make it attractive

• Convenient and comfortable (site and time)

• Inter-departmental/team competition – uptake by units published

Make it accessible

• Multiple opportunities (during work day/night, week, month)
  o Continuous programme October-March

• Avoid “missed opportunities”
  o Offer immunisation during any contact

• Bring vaccine to staff
  o Mobile teams, multiple sites, target group gatherings, team meetings
Factors that influence uptake rates

• **Leadership**
  
  - Lead by example, organisational expectation, flu champions

• **Identify key person on each unit/ward/team (peer-vaccination)**
  
  - Responsible for encouraging vaccination

• **Educate early and often**
  
  - Dangers of potential influenza transmission from HCWs to patients, patient care responsibility
  - Highlight vaccine safety and efficacy - and years of safe usage
  - Dispel myths: You *cannot* get influenza from the injectable vaccine, side effects *minimum*

• **Communication tools**
  
  - Posters, leaflets, newsletter articles, e-mails, text messaging to communicate key messages to employees

See [www.hse.ie](http://www.hse.ie) flu vaccine for healthcare workers & [www.APIC.org](http://www.APIC.org) for more information/tips
Monitoring and evaluation

Monitor

- Vaccine uptake by units and professional group – awareness of vaccine status of HCWs in critical areas such as ICU may help with rostering during peak season/outbreak situations
- Health care-associated illness during season

Evaluate

- Differences between groups and units – investigate reasons for differences

Report and share information

- Demonstrate high performing areas
- Introduce competition
- Demonstrate safety and uptake
- Information may stimulate HCWs to seek vaccination
Professional responsibility

• Occupational Health: HCW vaccination one of the key elements of Standard Precaution

• Long tradition of immunisation for HCWs to protect their patients and themselves e.g.
  • Measles, mumps, rubella (MMR)
  • Hepatitis B
  • TB (BCG)
  • Varicella (chickenpox)
  • Influenza
Protect your patients, yourself, colleagues, family and friends
Infection Prevention & Control

At the personal level
Respiratory hygiene and Cough Etiquette

✓ Cover nose & mouth when coughing/sneezing
✓ Use your forearm or elbow not your hand
✓ Use disposable tissues
✓ Discard used tissues in waste bin after use
✓ Clean your hands
Stay at home if sick with influenza-like illness
Summary

- Seasonal flu is a serious disease that is spread easily and can lead to severe complications and death - particularly among risk groups.

- The flu vaccine is a safe and effective way for HCWs to help protect themselves, their families and their patients who are often in risk groups.

- Takes just 5 minutes to get the vaccine.

- Get the vaccine - not the flu!
Other resources

- @hseimm#YourBestShot
- For updated information on vaccines and vaccination recommendations please see National Immunisation Office (www.immunisation.ie)
- For updated information on epidemiology of influenza in Ireland please see Health Protection Surveillance Centre (www.hpsc.ie)
- For information on influenza vaccination uptake in HCWs (http://www.hpsc.ie/a-z/respiratory/influenza/seasonalinfluenza/influenzaandhealthcareworkers/)
- WHO (www.who.int)
- ECDC (www.ecdc.eu)
- CDC (www.cdc.gov)
THE FLU VACCINE

It's a lifesaver.