The importance of flu vaccination for health and social care staff

The World Health Organization (2019) estimates globally there are one billion cases of influenza (flu) a year – of which 3-5 million are severe, leading to 290,000-650,000 influenza-related respiratory deaths annually. In England 8,000 people on average die of flu each year – although in some years, deaths have exceeded 20,000 (Public Health England, 2019a).

Flu is an acute infection of the respiratory tract caused by the influenza virus; it is characterised by fever, chills, headache, muscle and joint pain and fatigue. There are three types of influenza virus: A, B and C. Most clinical illness is caused by types A and B, with type A viruses causing outbreaks in most years.

Influenza viruses are broadly categorised according to their surface antigens – haemagglutinin (H) and neuraminidase (N) – and numbers are used to differentiate between the different types (for example, H1N1). Genetic changes in these antigens result in the virus continually evolving and, when the changes are major, they can lead to the emergence of new subtype for which population immunity may be minimal; this can result in a widespread epidemic or pandemic, as in 2009.

Flu is highly infectious with a usual incubation period of 1-3 days. For otherwise healthy individuals, it is an unpleasant but usually self-limiting disease, with recovery occurring within 2-7 days. However, flu can have serious consequences, particularly for people who are vulnerable to complications, such as:

- Babies and young children;
- Pregnant women;
- People with medical conditions that put them at increased risk;
- People aged >65 years of age (Public Health England, 2019b).

Although the number of healthcare staff having recommended flu vaccinations is growing, a third of frontline workers are still unvaccinated, and uptake is lower in social care.

Key points

- Flu causes an average of 8,000 deaths a year in England alone and contributes significantly to NHS winter pressures.
- Health and social care workers are at increased risk of contracting flu and infecting patients, colleagues, and their own family and friends.

Staff members who contract influenza virus will have mild or no symptoms, but may still be infectious.

Although the number of healthcare staff having recommended flu vaccinations is growing, a third of frontline workers are still unvaccinated, and uptake is lower in social care.

Discussion

Box 1. Conditions that increase risk of flu-related morbidity and mortality

- Respiratory disease, such as severe asthma, chronic obstructive pulmonary disease or bronchitis
- Heart disease, such as heart failure
- Kidney disease, stages 3-5
- Liver disease
- Neurological disease, such as Parkinson’s disease, motor neuron disease or learning disability
- Diabetes
- Splenic dysfunction or asplenia
- Weakened immune system due to disease (such as HIV/AIDS) or treatment (such as cancer treatment)
- Morbid obesity (body mass index of ≥40)


die from flu than those not in a risk group, while those who have renal disease, liver disease and immunosuppression have >40 times increased risk of flu-related mortality (PHE, 2019b).

Vaccination programme

The UK’s comprehensive flu vaccination programme started in 1961 and, initially, offered protection to groups of individuals who were considered to be at increased risk of complications from flu. It was expanded in 1998 to include adults aged ≥65 years, and in 2000 was made available to people ≥65 years (Lang et al, 2019). Eligibility for the programme is based on the advice of the Joint Committee on Vaccination and Immunisation (JCVI); for the programme is based on the advice of the Joint Committee on Vaccination and Immunisation (JCVI); for the coming season, that includes:

- All children aged 2-10 years (but not ≥11 years) on 31 August 2019;
- People aged six months to <65 years in clinical risk groups;
- Pregnant women;
- People aged ≥65 years;
- Individuals in long-stay residential care homes;
- Carers;
- Close contacts of individuals who are immunocompromised;

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Vaccination effectiveness

The effectiveness of the flu vaccination varies from year to year and between different patient groups, depending on:

- How well the vaccine is matched to circulating strains;
- How an individual’s immune system responds to the vaccine.

Some people, including those aged >65 years or whose illness or treatment means their immune system is compromised, may not mount an effective immune response to vaccination. Babies and young infants are also at increased risk of complications of flu, but are too young to be immunised. These groups may rely on others getting vaccinated to protect them.

In February of each year, the WHO announces the strains of influenza that have been predicted to circulate in the Northern Hemisphere the following winter. Vaccine production takes time, so starts soon after this announcement to ensure vaccines are available in the autumn. Once this process has started, it is not possible to change vaccine content so any subsequent changes to the circulating virus cannot be taken into account. This happens occasionally and can reduce the vaccine’s effectiveness against the affected strain, as was the case in 2014/15. However, the vaccine can still be effective at protecting against the unaffected strains of the virus.

In the last decade, there has generally been a good match between the strains of influenza in the vaccine, with overall effectiveness estimated at 30-60% for adults aged 18-65 years (Lang et al, 2019). There has often been poorer effectiveness against influenza A (H1N1pdm), particularly in people aged >65 years, in whom the burden of infection from this strain is highest. This has led to the introduction of an adjuvanted vaccine, which provides higher immunogenicity and effectiveness than non-adjuvanted, normal-dose flu vaccines in this age group (Lang et al, 2019).

Vaccine safety

In 2019/20, health and social care workers are eligible to receive either the standard egg-grown quadrivalent influenza vaccine (QIVc) or the cell-based quadrivalent influenza vaccine (QIVc). These are newly licensed in the UK but have been used in the US for several years. Quadrivalent vaccines offer protection against four strains of influenza; the JCVI advises that either vaccine is equally suitable (Joint Committee on Vaccination and Immunisation, 2018).

Side-effects of the flu vaccine are typically mild; compared with placebo, there has been some increase in:

- Short-lived fever (3% versus 1%);
- Malaise (9% versus 6%);
- Myalgia (18% versus 10%);
- Local reaction at the site of injection (PHE, 2018).

Allergic drug reactions are rare and there is no evidence of vaccination harm beyond these side effects.

Flu vaccines given to health and social care workers are made from inactivated (killed) viruses. However, not all the dead virus is used – it is usually just proteins from the surface (haemagglutinin and neuraminidase). It is impossible to contract an infection from an inactivated flu vaccine and any flu-like infection occurring shortly after vaccination is likely to have been incubating at the time of immunisation or caused by one of the other influenza-like viruses that circulate during autumn and winter.

Table 1. Number of acute respiratory illness outbreaks by institution type

<table>
<thead>
<tr>
<th>Institution type</th>
<th>Year</th>
<th>2018/19</th>
<th>2017/18</th>
<th>2016/17</th>
<th>2015/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care homes</td>
<td></td>
<td>932</td>
<td>1,700</td>
<td>875</td>
<td>231</td>
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<tr>
<td>Hospitals</td>
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<td>199</td>
<td>230</td>
<td>162</td>
<td>108</td>
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<td>Schools</td>
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<td>158</td>
<td>160</td>
<td>61</td>
<td>275</td>
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<tr>
<td>Other</td>
<td></td>
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<td>59</td>
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<td>42</td>
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<tr>
<td>Total</td>
<td></td>
<td>1,340</td>
<td>2,149</td>
<td>1,114</td>
<td>656</td>
</tr>
</tbody>
</table>

Source: Public Health England (2019a)
2018/19 flu season
In 2018/19 there were low-to-moderate levels of influenza activity in the community in England. Influenza type A(H1N1)pdm09 virus – cause of the 2009 pandemic – was the predominant virus circulating, followed by type A(H3N2). As usual with A(H1N1)pdm09, younger age groups were most affected, with the increase in GP consultations, hospitalisations and admissions to intensive care units/high dependency units (ICUs/HDUs) greatest in 15-64-year-olds.

The impact on the health service was high – there was a similar or higher peak in admissions to hospital and ICU/HDUs compared with the previous seven seasons (PHE, 2019a). During the same period, in the UK as a whole, there were 1,340 outbreaks of acute respiratory illness in settings such as care homes, hospitals and schools; of these 69% were in care homes and 15% in hospitals (PHE, 2019a) (Table 1).

Service implications
Flu significantly increases NHS winter pressures, with flu-related hospital admissions often requiring intensive care and respiratory support, affecting frontline services. Flu among staff increases the pressure further and potentially contributes to the spread of the virus, particularly if members of staff come to work when unwell.

Flu outbreaks in hospital wards and care homes can also lead to their temporary closure, reducing options for admitting or discharging patients, and resulting in fewer beds being available for other patients who are acutely ill.

Flu in healthcare staff
The spread of flu is complex and collecting evidence relating to healthcare workers in acute settings can be challenging due to the high number of interactions between patients, staff, visitors and the environment. A 2011 study found patients exposed to other 5.5 times more likely than other inpatients to develop flu; those exposed to other staff, visitors and the environment. A 2011 study found patients exposed to other patients who are acutely ill.

The researchers concluded that a policy of health worker vaccination was important for staff, employers and patients, as staff in health and social care are more likely to contract flu than the general population (Lietz et al, 2016) – probably due to coming into contact with so many people. Vaccination may also reduce the risk of them passing flu to their family and friends.

Staff vaccination programme
The UK flu vaccination programme was extended to include health workers in 2002/2003 when uptake among staff in England was only 14%; uptake gradually increased, reaching around 50% in 2015/2016 (PHE, 2019c). In 2016/2017, health worker flu vaccination was added to the Commissioning for Quality and Innovation (CQUIN) health and wellbeing framework, which boosted uptake in England to 70% in 2017/2018 (PHE, 2019c).

A recent rapid evidence appraisal of flu vaccination in healthcare workers for the WHO looked at evidence from randomised controlled trials for risk of flu, transmission risk to patients, benefits of vaccination and strategies for improving uptake among staff (Jenkin et al, 2019). It found that, although evidence was mixed and often of low quality, the majority of studies suggested:

- Staff were implicated in transmission events;
- Vaccination of health workers benefitted staff and employers;
- Benefits for patients may include reductions in all-cause mortality and influenza-like illness.

The paper emphasised that vaccinating health workers should be part of a broader infection-control policy for healthcare facilities.

Staff may feel under pressure to continue working when they feel unwell so they do not let down their colleagues. However, studies have shown that around 16-50% of people with influenza have mild illness or are asymptomatic (Furuya-Kanamori et al, 2016; Leung et al, 2015; Hayward et al, 2014). Viral shedding in such cases of flu is lower than in symptomatic cases, but transmission is still possible (Ip et al, 2017; Suess et al, 2012) – this means staff may inadvertently infect their patients.

The vaccination rate among social care workers is difficult to measure but a survey conducted in England in 2017 estimated it...
“Patients exposed to an infected health worker were 5.5 times more likely than other inpatients to develop flu”

at 25% – considerably lower than that for healthcare workers (Khan Burki, 2018).

The flu vaccine is recommended for all frontline health and social care workers in England and it is the responsibility of employers, through their occupational health provision, to protect both their staff and their patients. To increase uptake in the sector, NHS England is currently supporting vaccination of social care and hospice workers – they can access vaccination through participating community pharmacies or their registered general practice.

Conclusion
Flu can have a significant impact on NHS services, leading to pressure on staff, specialised units such as ICUs, and respiratory support equipment. Frontline health and social care workers have an important role in preventing the spread of flu. Although health worker flu vaccination rates have improved in recent years, there is still significant variation between trusts, and almost a third of frontline staff remain unvaccinated. Data on uptake in the social care setting is lacking but estimates suggest rates are particularly poor. Concerted efforts to further increase uptake across both sectors are required, and all health and social care staff are encouraged to accept the vaccine to protect themselves, their patients and their loved ones. NT