NICE National Institute for Health and Care Excellence

Public Health England

NICE guideline

Flu vaccination: increasing uptake

NICE guideline

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Your responsibility

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

All problems (adverse events) related to a medicine or medical device used for treatment or in a procedure should be reported to the Medicines and Healthcare products Regulatory Agency using the Yellow Card Scheme.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Contents

This guideline is the basis of QS190 and QS22.

This guideline should be read in conjunction with NG218.

Overview

This guideline covers how to increase uptake of the free flu vaccination among people who are eligible. It describes ways to increase awareness and how to use all opportunities in primary and secondary care to identify people who should be encouraged to have the vaccination.

Who is it for?

- Commissioners and providers of primary and secondary healthcare services, including maternity providers and community pharmacies
- All employers of staff who provide NHS or social-care funded services (including maternity care, domiciliary care and care homes)
- Local authorities, and community and voluntary sector organisations that employ health and social care workers
- Occupational health services and infection prevention and control teams
- NHS England teams and Health Education England teams
- People using services, their families, carers and other members of the public, in particular those eligible for flu vaccination

Recommendations

Making decisions using NICE guidelines explains how we use words to show the strength (or certainty) of our recommendations and has information about prescribing medicines (including off-label use) professional guidelines standards and laws (including on consent and mental capacity) and safeguarding.

The recommendations in this guideline should be read together with the NICE guideline on vaccine uptake in the general population.

1.1 A multicomponent approach

1.1.1 Use a multicomponent approach to develop and deliver programmes to increase flu vaccination uptake. Combine interventions recommended in this guideline to influence both demand and supply.

1.1.2 Providers of flu vaccination should work together with other agencies (including intervention developers, commissioners and local stakeholders) to develop programmes to increase vaccination uptake. This could include assigning within organisations a lead team or flu vaccination champion to manage the programmes and be responsible for working across organisations.

See how the committee made recommendations 1.1.1 and 1.1.2.

1.2 Raising awareness

Raising awareness in health and social care staff

These recommendations are for educators, line managers and organisational leads.

1.2.1 Educate health and social care staff, particularly those in contact with eligible groups, about flu vaccination. These could include:

- Staff working in GP surgeries and community pharmacies.
- Secondary care staff, for example in clinics for children with chronic conditions or wards such as oncology or antenatal.
- Social care staff who may have contact with carers and other eligible groups, such as people with learning disabilities. This may include during home visits, individual needs assessments and carers' assessments.

1.2.2 Provide information on the following as part of an education programme on flu vaccination for health and social care staff, particularly those in contact with eligible groups:

- Who is eligible for free flu vaccination, and where to get it.
- Benefits of vaccination for people at high risk from flu and its complications. For example, those with immunosuppression, chronic liver disease or neurological disease.
- Benefits of flu vaccination for health and social care staff.
- How flu is transmitted.
- Relevant guidelines and definitions of eligible groups as outlined in chapter 19 of the UK Health Security Agency's immunisation against infectious disease (known as the 'Green Book').
- How the flu vaccine is given to children and adults.
- Evidence supporting the safety and effectiveness of flu vaccination.

1.2.3 Explain to health and social care staff how they can:

- Identify people who are eligible, for example by using GP records or medicines dispensing records (including how to identify carers who might be eligible; see the section on flu vaccination in carers).
- Make the most of opportunities to raise awareness about and offer flu vaccination to eligible groups. This could include discussing it with:
  - pregnant women during antenatal appointments
  - eligible people booking GP or other clinical appointments

— eligible people visiting community pharmacies to seek health advice, collect prescriptions or buy over-the-counter medicines.

1.2.4 Health and social care staff who are in direct contact with eligible groups (for example, practice nurses, health visitors, community pharmacists, midwives, specialist nurses and domiciliary care workers) should:

- Include training on flu and flu vaccination as part of their continuing professional development plan (see Public Health England's national minimum standards and core curriculum for immunisation training for registered healthcare practitioners).
- Be able to provide tailored information on the risks and benefits of flu vaccination, and be able to offer and administer it (see the NICE guideline on patient group directions).

Raising awareness in eligible groups

These recommendations are for providers of flu vaccination.

1.2.5 Raise awareness of free flu vaccination among people who are eligible, as listed in the Green Book and the annual flu letter. Do this at the earliest opportunity before the flu vaccination season starts in September, and ideally by the end of December.

1.2.6 Consider working with statutory and voluntary organisations, including those representing people with relevant medical conditions, to increase awareness of flu vaccination among eligible groups (and their parents or carers, if relevant).

1.2.7 Give people who are eligible (or their parents or carers, if relevant) face-to-face brief advice or a brief intervention on the importance of flu vaccination. Tell them that they can have a free flu vaccination and explain why they are being offered it, using language they can understand and taking into account cultural sensitivities. This includes explaining:

- How people get flu.

- How serious flu and its complications can be (make it clear it is not just a bad cold).
- That flu can affect anyone, but if a person has a long-term health condition the effects of flu can make it worse, even if the condition is well managed and they normally feel well.
- That flu vaccination is safe.
- That having a flu vaccination is the single best way of helping to protect against catching or spreading flu.
- That they should get the vaccination as soon as it becomes available to maximise their protection throughout the flu season.
- Any myths about flu vaccination: dispel these myths, including the belief that it can give you flu.
- The need to have a flu vaccination every year.

1.2.8 Explain to parents or carers that the nasal spray (not injection) is recommended for eligible children from the age of 2 years. Explain that the injection will be offered instead of the nasal spray only if:

- the child is in a clinical risk group and
- the child cannot have the nasal spray for medical reasons (for example, if it is contraindicated because they or a close family member is severely immunocompromised), or they choose not to because of their religious beliefs; see NHS Choices for more information.

1.2.9 Give people information about the location and opening hours of relevant flu vaccination services, including out-of-hours services and community pharmacies.

1.2.10 Include information on flu vaccination with other health-related messages and existing health-promotion or vaccination programmes for people in eligible groups.

See how the committee made recommendations 1.2.1 to 1.2.10.

1.3 Offering vaccination

These recommendations are for providers of flu vaccination services.

1.3.1 Use every opportunity throughout the flu vaccination season to identify people in eligible groups and offer them the flu vaccination. This could include when:

- People register in general practice.
- Women have a newly confirmed pregnancy.
- People are newly diagnosed with a condition that may place them in a clinical risk group, or have a BMI of 40 or over.
- People attend outpatient and antenatal clinics or drug and alcohol services.
- People (including children aged 6 months to 17 years) who are in a clinical risk group attend routine GP or outpatient clinic appointments, or for other vaccination services.
- People visit community pharmacies for health advice, a New Medicine Service, or to collect prescriptions (check whether the person taking the medicine or their carer is eligible, while taking into account confidentiality).
- People in clinical risk groups are staying in hospital.
- People who are eligible are having home visits for healthcare.

1.3.2 Establish and use links with statutory and voluntary organisations that work with carers, looked-after children and young people or other groups, to identify eligible people who have not been vaccinated. These could include drug and alcohol services, and organisations working with Traveller communities or people who are homeless.

1.3.3 Provide multiple opportunities and routes for eligible people to have their flu vaccination at a time and location convenient to them. This could include at community pharmacies, GP surgeries or clinics they attend regularly for a chronic condition.

1.3.4 Consider outreach opportunities for underserved groups in line with local

practice and patient group directions arrangements (see the NICE guideline on patient group directions).

1.3.5 Consider providing evening and weekend services in primary care, including community pharmacy, to deliver flu vaccination to people who may find it difficult to attend at other times.

1.3.6 Use clinical systems to identify eligible groups and work out supply requirements, planning for a higher uptake than the previous year. Ensure enough flu vaccine is available to meet local needs.

See how the committee made recommendations 1.3.1 to 1.3.6.

1.4 Increasing uptake among eligible groups in primary and secondary care

Primary care

1.4.1 Inform and invite children and adults in eligible groups for flu vaccination during face-to-face interactions, whenever the opportunity arises.

1.4.2 Advise parents of all children aged 2 and 3 years who are covered by the universal vaccination programme, and children aged 6 months and over who are in a clinical risk group, about the benefits of flu vaccination. Do this whenever the opportunity arises, for example when they attend routine appointments or for other vaccination programmes.

At the time of publication (August 2018), the universal vaccination programme is available for children aged 2 to 9 years (up to school year 5). Preschool children (aged 2 and 3 years) should be given the nasal flu vaccine in general practice. Older children (from reception age) are usually given the nasal vaccine by local healthcare teams working with schools. Decisions about further roll-out to include older year groups will be notified in the annual flu letter.

1.4.3 When inviting people for flu vaccination:

- Ensure the invitation comes from a healthcare practitioner that they know, such as a practice nurse, midwife, doctor, pharmacist or health visitor.
- Tailor it to the person's situation, for example link it to their pregnancy or clinical risk factors.
- Include information about the risks of not being vaccinated.
- Include educational messages to help overcome barriers to accepting the offer of a vaccination (see the section on raising awareness).

1.4.4 Use written reminders (including text messages, letters and email), phone calls from staff or an auto dialler, social media, or a combination of methods, to contact people in eligible groups whose immunisations are due ('call') or overdue ('recall').

1.4.5 For invitations and reminders using digital media:

- link to further information on trusted websites (see NHS Choices) and enable the person to ask for further information
- provide a prompt (for example, a hyperlink) so the person can make an appointment online
- encourage people to find out more during face-to-face interactions, such as with their health visitor or pharmacist.

1.4.6 Consider using peer-led approaches for inviting people in underserved groups who are eligible for flu vaccination.

Secondary care

1.4.7 Consider providing flu vaccination during routine appointments in specialist clinics to people who are at high risk from flu and its complications. For example, people with immunosuppression, chronic liver or neurological disease, and pregnant women.

1.4.8 When the opportunity arises, for example when people attend routine hospital appointments, identify anyone in a clinical risk group who has not been vaccinated and offer them a flu vaccination. Ensure this is in

line with any local patient group directions or enhanced service arrangements that have been agreed with commissioners (see the NICE guideline on patient group directions).

1.4.9 When offering people the flu vaccination:

- Make the offer face-to-face, if possible.
- Use positive messages to encourage people to have the vaccination. For example, for a pregnant woman the message could be that the flu vaccination gives 'two for one' protection to both her and her baby before and after the birth.
- Tailor information to the person's situation, for example their pregnancy or clinical risk factors. Include the risks of not being vaccinated.
- Ensure information is simple, easy to read (if written) and provides a consistent message about flu and flu vaccination.
- Ensure a healthcare practitioner they know (for example, a midwife or a consultant from an outpatient clinic they attend) offers the vaccination.
- Make it easy for the person to get the vaccination, for example by offering and administering it during the same visit.

Patient records

1.4.10 Include prompts about people's eligibility for flu vaccination in electronic patient records or in medical notes (for example, by putting reminder stickers in antenatal notes).

See how the committee made recommendations 1.4.1 to 1.4.10.

1.5 Audit, monitoring and feedback

1.5.1 Healthcare providers should keep patient records up to date and accurate to help identify people who have not been vaccinated and are eligible for flu vaccination that season.

1.5.2 Providers of flu vaccination should record uptake rates. For example, keep records of the following:

- reason for eligibility
- numbers of people called and recalled
- vaccination setting (for example GP, community pharmacy, antenatal clinic, outpatient clinic)
- people who declined vaccination and why, by eligible group.

1.5.3 Commissioners and providers should agree approaches for sharing information with general practices about flu vaccination given outside a person's own GP surgery (for example, by a school nurse or in a diabetes outpatient clinic). Aim for timely, accurate and consistent recording of vaccination status in health records to ensure all vaccinations are included in uptake data, and to avoid wasting resources by inviting people to attend appointments unnecessarily or duplicating vaccination.

1.5.4 Use audit and monitoring systems to give providers of flu vaccination regular feedback on organisational progress towards targets throughout the immunisation season. Also use them to review past activity and impact on uptake to help plan and prioritise for the next season.

Organisational incentives

1.5.5 Commissioners should raise awareness among healthcare staff and providers of flu vaccination about enhanced services payments and provider payments linked to flu vaccination. Also keep them informed and up to date about other financial incentives linked to flu vaccination. This includes those offered in the general practice Quality and Outcomes Framework (QOF), or the Commissioning for Quality and Innovation (CQUIN) system in secondary care.

1.5.6 Commissioners should ensure that providers of flu vaccination know that submission of information on flu vaccination directly affects any linked organisational incentive payments.

1.5.7 Commissioners should highlight the need for audit, monitoring and feedback of flu vaccinations given as part of an incentives programme. Link agreed Read codes or CQUIN indicators to incentives and include the required code or indicator.

1.5.8 Organisations responsible for agreeing quality indicators in incentives programmes (such as QOF) should be aware that revising target conditions may encourage providers to meet targets for flu vaccination across all clinical risk groups.

See how the committee made recommendations 1.5.1 to 1.5.8.

1.6 Flu vaccination in carers

1.6.1 When considering increasing flu vaccination uptake in carers who are not otherwise eligible, use clinical judgement. Base decisions to offer vaccination on whether the carer looks after someone whose wellbeing may be at risk, needing hospital or other formal care, if the carer had flu.

1.6.2 Providers of flu vaccination, including primary care staff and nurses working in the community (such as district nurses, specialist nurses and those working in rehabilitation) could consider:

- Identifying and offering eligible carers a flu vaccination as the opportunity arises. For example, this could be offered during a home visit when the person they look after is being vaccinated.
- Informing the carer about other local vaccination services if a patient group direction or enhanced service arrangement has not been agreed with primary care commissioners (see the NICE guideline on patient group directions).

See how the committee made recommendations 1.6.1 and 1.6.2.

1.7 Employers of health and social care staff

Employers of health and social care staff are responsible for providing occupational flu vaccinations. This includes: NHS organisations, independent contractors, local authorities, and private and voluntary sector employers of social care staff. Immunisation should be

provided by occupational health services, infection prevention and control teams, or using arrangements with private healthcare providers.

1.7.1 Provide flu vaccination to all front-line health and social care staff who have direct contact with patients or clients. This includes employees who provide community-based care services to people in their own homes, or who care for people in residential care homes or other long-stay care facilities (see the Green Book).

1.7.2 Use audit and monitoring systems to review previous strategies and flu vaccination uptake rates among eligible staff and to plan what methods to use to increase uptake and manage the supply for the next flu season. Start planning each year when the annual flu letter for the forthcoming season is published.

1.7.3 Consider the following as part of a multicomponent approach to increasing uptake of flu vaccination among front-line health and social care staff:

- A full participation vaccination strategy, with nationally agreed opt out criteria (A full participation strategy is one in which a range of approaches are used to maximise uptake and in which the expectation is that all front-line staff should be vaccinated. The full participation approach includes agreed mechanisms enabling staff to opt out if they wish.)
- Assigning dedicated staff (for example, a flu vaccination champion or a team with responsibility for implementing a communication strategy) to increase awareness and uptake.
- Using local broadcast media and social media.
- Getting and publicising support from high-profile organisational leaders or staff representatives.
- Providing information about the effectiveness and safety of the flu vaccine.
- Using staff incentives that fit with the organisation's culture and the values of its employees.
- Training peers to vaccinate their co-workers, or to encourage uptake and

challenge barriers, such as myths that the flu vaccine can give you flu.

- Using prompts and reminders in various printed and digital formats. Include information about on- or off-site vaccination locations and times.
- Using systems linked to named staff records to monitor uptake and to target prompts and reminders.

1.7.4 Consider promoting flu vaccination to front-line health and social care staff as a way to:

- protect the people they care for
- protect themselves and their families
- protect their co-workers
- meet professional expectations such as the General Medical Council's guidance on good medical practice and the Royal College of Nursing's duty of care statement.

1.7.5 Consider:

- Extending on-site vaccination clinic hours to fit in with staff work patterns.
- Using outreach or mobile services to offer flu vaccination in areas and at times where large numbers of staff congregate, such as staff canteens or during shift changeovers.
- Publicising information about mobile flu vaccination services.
- Offering opportunities for off-site and out-of-hours access, for example, by providing vouchers for flu vaccination at a community pharmacy.

1.7.6 Publicise flu vaccine uptake rates and the comparative performance of individual departments or sites within the organisation or locality. This could be done within the context of national targets such as the Commissioning for Quality and Innovation (CQUIN).

1.7.7 Develop the flu vaccination strategy in conjunction with staff representatives. Consider an anonymous survey of reasons for opting out, which could be used to inform future flu vaccination programmes.

1.7.8 Agree approaches for information sharing if off-site access to flu vaccination is offered to allow timely, accurate and consistent recording of people's vaccination status.

See how the committee made recommendations 1.7.1 to 1.7.8.

Terms used in this guideline

This section defines terms that have been used in a specific way for this guideline. For general definitions, please see the glossary.

Carers

People who receive a carer's allowance or who are the informal 'main carer' of an older or disabled person whose welfare may be at risk if the carer falls ill. This definition is in line with the Green Book, which recommends offering the flu vaccination on the basis of clinical judgement, regardless of whether the person receives a carer's allowance.

Clinical risk groups

People who have a medical condition that means they are more likely to develop potentially serious complications from flu. People in these groups are eligible for free flu vaccination and are specified in the Green Book and the annual flu letter. At the time of publication of this guideline, the groups are:

- chronic respiratory disease, such as asthma (requiring use of inhaled or systemic steroids, or with previous exacerbations needing hospital admission), chronic obstructive pulmonary disease, or bronchiectasis
- chronic heart disease
- chronic kidney disease (stage 3 or above)
- chronic liver disease
- chronic neurological disease such as Parkinson's disease, motor neurone disease, or a learning disability
- diabetes

- a weakened immune system caused by disease (such as HIV/AIDS) or treatment (such as chemotherapy or high-dose corticosteroids)
- asplenia or conditions that can lead to dysfunction of the spleen, such as sickle cell disease or coeliac disease
- morbid obesity (adults with a BMI of 40 or over).

Eligible groups

People who are eligible for free flu vaccination in the NHS, as outlined in the Green Book. For the purpose of this guideline, the specific eligible groups considered were:

- children and adults aged 6 months to 64 years in a clinical risk group (as listed in the annual flu letter)
- pregnant women
- people in receipt of a carer's allowance
- people who are the main informal carer of an elderly or disabled person whose welfare may be at risk if the carer falls ill.

In addition, flu vaccination with live attenuated intranasal vaccine (LAIV) is recommended for all children aged 2 to 17 years who are not in a clinical risk group. This programme is being implemented in a phased roll-out, starting with the youngest first. At the time of publication (August 2018), the universal vaccination programme is available for children aged 2 to 9 years (up to school year 5). Preschool children (aged 2 and 3 years) should be vaccinated in general practice. Older children (from reception age) are being vaccinated by local healthcare teams working with schools. Once the programme has been rolled out to all primary-school-aged children, it will be reviewed to assess whether to continue the extension into secondary schools. Decisions about further roll-out to include older year groups will be notified in the annual flu letter.

Full participation vaccination strategy

A full participation strategy is one in which a range of approaches are used to maximise uptake and in which the expectation is that all front-line staff should be vaccinated. The full participation approach includes agreed mechanisms enabling staff to opt out if they wish.

Multicomponent approach

A set of multiple interventions implemented together to increase flu vaccination uptake. These target both demand (for example, increasing awareness of eligibility and the reasons why vaccination is beneficial) and supply (for example, creating more opportunities for vaccination, such as increasing the offer by professionals).

Peer-led approaches

Approaches to reach underserved groups in which people with lived experience (for example, people who have been homeless, or who are from particular cultural backgrounds) work alongside health and social care professionals to provide information that is accessible and appropriate to the target group, acting as local 'flu champions' to promote awareness and uptake among their peers.

Providers of flu vaccination

Staff who are allowed to administer the flu vaccination, or affiliated staff (for example general practice staff who log patient demographics and could therefore see who satisfies Green Book criteria).

Statutory organisations

Organisations with legal responsibility at a national or local level for the provision, commissioning, regulation or improvement and oversight of government-funded health and care services.

Underserved groups

This term is used in this guideline to mean adults and children from any background who are 'underserved' if their social circumstances, language, culture or lifestyle (or those of their parents or carers) make it difficult to:

- recognise they are eligible for flu vaccination (for example, they have an undiagnosed clinical condition)
- access health services

- attend healthcare appointments.

The groups classified as underserved in this guideline are:

- people who are homeless or sleep rough
- people who misuse substances
- asylum seekers
- Gypsy, Traveller and Roma people
- people with learning disabilities
- young people leaving long-term care.

Putting this guideline into practice

NICE has produced tools and resources to help you put this guideline into practice.

Some issues were highlighted that might need specific thought when implementing the recommendations. These were raised during the development of this guideline. They are:

- Education of health and social care staff and support workers – there are national minimum standards for these groups (see national minimum standards and core curriculum for immunisation training for registered healthcare practitioners, the Royal College of Nursing's immunisation knowledge and skills competence assessment tool, and Public Health England's immunisation training of healthcare support workers: national minimum standards and core curriculum). Also see Health Education England's flu immunisation eLearning programme and Public Health England's national flu programme training slide set. The Royal Pharmaceutical Society's seasonal influenza hub has information and educational resources for members. These resources could be used in implementing this guideline.

- Support from national bodies, professional groups and royal colleges – organisations such as the British Medical Association (BMA), Royal College of Nursing and the Royal Pharmaceutical Society encourage their members and others to accept the flu vaccination. This includes advice that the BMA provides for occupational health providers. See also: the General Medical Council's guidance on good medical practice, the Nursing and Midwifery Council Code, advice from the General Pharmaceutical Council, the Health and Care Professions Council's standards of conduct and the Royal College of Nursing's guidance and resources on flu vaccination. This support and drive to increase flu vaccination could provide a useful lever for action in implementing this guideline.

- Existing national targets – there are a number of national targets including public health outcomes frameworks (3.03, 4.03, 4.07, 4.08) relating to population flu vaccination uptake. These targets could be used to establish the case when seeking to commission, develop and implement interventions recommended in this guideline.

- Existing incentive-based payment mechanisms to organisations to increase uptake – there are a number of incentives in primary and secondary care to increase flu vaccination, including Quality and Outcomes Framework, or QOF (secondary prevention of coronary heart disease [CHD007]; diabetes mellitus [DM018]; chronic

obstructive pulmonary disease [COPD007]; and stroke and transient ischaemic attack [STIA009]) and Commissioning for Quality and Innovation or CQUIN (improving the uptake of flu vaccinations for front-line clinical staff [CQUIN 1c]). Framing proposals to increase flu vaccination in terms of the achievement of indicator criteria, as well as stating the impact on mortality and morbidity, may positively influence development and implementation of interventions recommended in this guideline.

- Existing examples of best practice guidance for increasing flu vaccination uptake – GPs have Flu vaccine for children: best practice guide for GPs and for healthcare workers, NHS Employers have good practice guides and case studies from former flu fighter award winners as well as planning, communications and reviewing campaign guides.
- Existing resources to support targeting, tailoring and information provision for eligible groups, including template letters, posters and Easy Read leaflets, can be found at the Stay Well This Winter campaign, and in the government's annual flu letter.

Context

Each winter hundreds of thousands of people see their GP and tens of thousands are hospitalised because of flu. Deaths attributable to flu are estimated to range from around 4,000 to 14,000 per year, with an average of around 8,000 per year (Public Health England and the NHS prepare for unpredictable flu season).

Flu vaccination has been recommended in the UK since the late 1960s. Everyone aged 65 and over, those who are the main carer of an older adult or person with a disability, anyone aged 6 months to 64 years in a clinical risk group that puts them at a higher than average risk of illness and death linked to flu, and all pregnant women are offered free vaccination as part of the Public Health England and NHS England national programme. In addition, the Joint Committee on Vaccination and Immunisation has recommended extending flu vaccination to children to reduce transmission in the community and reduce the number of cases of flu-related illness and death among older adults.

At the time of publication (August 2018), the universal flu vaccination programme is available for children aged 2 to 9 years (up to school year 5). Preschool children (aged 2 and 3 years) should be vaccinated in general practice. Older children (from reception age) are being vaccinated by local healthcare teams working with schools. Once the programme has been rolled out to all primary-school-aged children, it will be reviewed to assess whether to continue the extension into secondary schools. Decisions about further roll-out to include older year groups will be notified in the annual flu letter.

In addition to the groups already mentioned, the Health and Safety at Work Act (1974) makes employers responsible for offering the flu vaccination to health and social care staff who have direct care responsibilities.

Among people aged 65 or over, annual uptake of free NHS flu vaccination is relatively high and consistent, at around 70 to 75%. For this reason, this group was not included as a target population for increasing uptake in the scope for this guideline.

Among people under 65 who are in clinical risk groups, uptake is lower and more variable: 49% overall in 2017/18, ranging from 39% in patients with morbid obesity (with a BMI of 40 or over) and 41% in patients without a spleen or with splenic dysfunction, to 65% in patients who have diabetes. Uptake is particularly low among babies and infants (aged 6 months to under 2 years) who are in a clinical risk group: the vaccination rate in 2017/18

was only 21%. Uptake increased among preschool children in a clinical risk group (52% of those aged 2 to under 5 years), but then dropped off again among those of school age (44%). Among children **not** in a clinical risk group, uptake of the universal flu vaccination programme was 43% for 2-year-olds and 44% for 3-year-olds. Among pregnant women, flu vaccination uptake was 47% in 2017/18, whereas for people under 65 years who are registered as a carer by their GP, uptake was 40% (Public Health England's seasonal flu vaccine uptake in GP patients in England: winter 2017/18).

In England, among children and adults aged 6 months to 64 years who are in a clinical risk group, the average age-adjusted risk of flu-related death is 11 times greater than for those not in a clinical risk group. However, this masks considerable variation between the different target groups. A much higher relative risk (RR) of flu-related death is associated, for example, with chronic liver disease (RR=48.2), immunosuppression (RR=47.3) and chronic neurological disease (RR=40.4). For other clinical groups, the age-adjusted relative mortality risks are: chronic renal disease, RR=18.5; chronic heart disease, RR=10.7; chronic respiratory disease, RR=7.4; diabetes, RR=5.8; and pregnant women RR=7.0.

In England 69% of healthcare workers in NHS trusts and area teams with direct patient contact were vaccinated in 2017/18, an increase from 63% the previous year (Public Health England's seasonal flu vaccine uptake in healthcare workers in England: winter 2017/18).

This guideline considers interventions to increase flu vaccination uptake in children aged 2 to 17 years (to take account of any future roll-out of the current children's universal vaccination programme); children and adults aged between 6 months and 64 years who are in clinical risk groups (see the Green Book), or adults who are morbidly obese (with a BMI of 40 or over); pregnant women, carers, and front-line health and social care staff, in line with the national flu immunisation programme plan 2022 to 2023.

See the guideline scope for more details.

The committee's discussion

Evidence statement numbers are given in square brackets. See 'The evidence' at the end of each section for details.

Current practice

The committee noted that general practice is where most vaccination of eligible groups (other than front-line health and social care staff) currently takes place and should therefore be considered the primary route by which flu vaccination is offered. Provision in general practice is driven by a national enhanced service specification. This requires all eligible patients to be called (invited); records to be kept up to date; vaccination status (or reason for declining a flu vaccine) to be recorded accurately; appropriate skills and training for those administering flu vaccine; consideration of accessibility to ensure that service users' needs are met; and regular monitoring and reporting of vaccination activity. However, current delivery of flu vaccination in primary care is variable. Results of a cross-sectional survey suggest that well-organised general practices that implement multiple strategies for promoting uptake tend to have highest rates of flu vaccination, particularly among over 65s but also among people from clinical risk groups (Strategies to increase influenza vaccination rates: outcomes of a nationwide cross-sectional survey of UK general practice, Dexter et al. 2012).

In addition to general practice provision, community pharmacies can choose to offer flu vaccination to adults aged 18 years or over who are in eligible groups, as detailed in an advanced service specification included as part of the NHS Community Pharmacy Contractual Framework. Some areas also have other local arrangements in place, such as commissioning vaccination provision in secondary care clinics or wards.

Vaccination of health and social care staff is delivered as part of employer occupational health responsibilities. This is driven by decision-making at the level of individual organisations, and rates of vaccination uptake are variable.

Economic modelling

To support committee decision-making, economic modelling was done to estimate the cost effectiveness of increasing flu vaccination uptake within each of the 4 populations

(children, people in clinical risk groups, carers, and health and social care staff).

Public Health England developed an economic model to inform the recommendations of the Joint Committee on Vaccinations and Immunisations on vaccinating children and people in clinical risk groups. We updated it to use the most recent and appropriate clinical and economic data.

We developed new economic models for carers and for health and social care staff because there were no existing models for these populations.

We considered interventions to be cost effective if they cost up to £20,000 per quality-adjusted life year (QALY). We conducted scenario analyses to determine the intervention cost that would be cost effective for a given increase in uptake.

A multicomponent approach

The discussion below explains how the committee made recommendations 1.1.1 and 1.1.2.

Rationale and impact

Why the committee made the recommendations

Flu-related illness places a strain on NHS resources every winter because many of the people whose health is most at risk from flu – as well as the staff who come into contact with them – are not vaccinated. Evidence showed that the most effective way to encourage people to have a flu vaccination every year is to use a combination of interventions. The committee agreed there is no single intervention that can improve both how likely vaccination is to be offered and also the likelihood that people will accept vaccination. Based on their knowledge of practice in the UK, the committee agreed with experts who said that organisations need to work closely together to achieve this, an approach that was supported by evidence on collaborative multi-agency working and leadership.

Impact of the recommendations on practice

The recommendations will help to reduce current variation in practice. For example, vaccination uptake among eligible groups in general practice can range from 15 to 100%.

The greatest resource impact is therefore likely to be for those practices that are less active in promoting flu vaccination uptake. But the cost impact should be relatively small compared with the reduction in mortality and morbidity associated with flu. In addition, there are opportunities to gain incentive payments by results, which may offset organisational costs.

Evidence discussion

Interpreting the evidence

The outcomes that matter most

Uptake of flu vaccination by people in eligible groups, and its acceptability to them.

The quality of the evidence

Carers

Little research evidence was identified that met the review protocol criteria on carers as a target population for flu vaccination [Evidence review 1].

Children

For children not in any clinical risk groups [Evidence review 2], evidence for the effectiveness of both single interventions and multicomponent approaches to increasing flu vaccination uptake was of variable quality, ranging from moderate to very low. Most downgrading was due to risk of bias and imprecision of effect estimates. There was also some 'indirectness' downgrading for studies that included children outside the age range specified in the review protocol (2 to 17 years). The committee noted that all but 1 of the included studies was conducted in the USA, and that they covered a range of primary care, school-based and secondary care settings.

Overall, the evidence suggested single interventions were not effective in increasing flu vaccination uptake among children by a clinically important amount (that is, 5% or more above control group or baseline uptake levels). There was some evidence to support educational interventions aimed at parents [Evidence review 2: ES1.1], and provider prompts [Evidence review 2: ES3.4], but effects were inconsistent across studies. For

multicomponent approaches, 1 large cluster-randomised controlled trial showed a clinically important increase in vaccination uptake, and a resulting decrease in missed opportunities to vaccinate [Evidence review 2: ES123.1, ES123.4]. Another large randomised controlled trial also showed an increase in uptake, but with greater uncertainty in the effect [Evidence review 2: ES123.3]. The committee noted that both studies were conducted in primary care and that there was moderate certainty in the evidence in both cases. They also noted that the studies involved an organisational lead or vaccination champion to coordinate delivery of the multicomponent programme.

Clinical risk groups

For adults and children in clinical risk groups [Evidence review 3], the quantitative evidence relating to single interventions and to multicomponent approaches was again of variable quality, with most rated low or very low. Downgrading was largely due to risk of bias issues and imprecision of effect estimates, or small sample sizes.

In pooled analyses there was evidence of serious or very serious heterogeneity. The committee agreed this would be expected, given differences between study populations in terms of clinical risk factors and the lack of standardisation of interventions and comparators across studies. Again the majority of studies were conducted in non-UK settings and covered a range of health and social care settings.

There was evidence that some single interventions were effective in increasing vaccination uptake among adults and children in clinical risk groups [Evidence review 3: ES3.2, ES3.4b; SR-ES1.1, SR-ES1.2, SR-ES2.2, SR-ES3.1, SR-ES3.2, SR-ES3.3, SR-ES3.4, SR-ES3.5], but effects were inconsistent across different interventions. The committee noted that in 6 out of 10 evidence statements in which a clinically important increase was found, the population in question was children in clinical risk groups. Parents of children in clinical risk groups may be more risk-averse and likely to accept the protective health benefits of vaccination than adults in clinical risk groups.

For people in clinical risk groups, 9 of 14 evidence statements relating to multicomponent approaches showed an increase in flu vaccination uptake; in 7 cases the effect was clinically important (5% or more relative increase) [Evidence review 3: ES123.2, ES123.3; SR-ES123.1, SR-ES123.3, SR-ES123.5, SR-ES123.9]. These covered a range of paediatric and adult populations and different clinical risk groups. The committee noted that within the same study, effects differed depending on the particular clinical risk group [Evidence review 3: ES123.2] or, in a study of immunocompromised children, depending on the type

of cancer [Evidence review 3: ES123.3]. The committee concluded that information needs, perceptions of individual risk and other health beliefs that influence decision-making about flu vaccination are not the same for people in different clinical risk groups. This should be considered when planning and delivering interventions.

Health and social care staff

For health and social care staff [Evidence review 4] the effectiveness evidence for single and multicomponent interventions for increasing flu vaccination uptake was mostly rated very low quality. Downgrading was largely due to risk of bias issues and imprecision of effect estimates. In pooled analyses there was evidence of serious or very serious heterogeneity, which the committee agreed would be expected, given differences in the types of health and social care staff involved and the lack of standardisation of interventions and comparators across different studies. The majority of evidence was from a non-UK context and covered a range of health and social care settings.

There was inconsistent evidence that educational interventions alone increase uptake of flu vaccination among health and social care staff. However, staff education and awareness raising was included in almost all multicomponent approaches to increasing vaccination uptake, combined with interventions to increase staff access through more flexible workplace delivery. A clinically important increase in vaccination uptake among health and social care staff (of 5% or more) was reported in 19 out of 20 evidence statements relating to multicomponent programmes [Evidence review 4: ES45.1, ES45.2, ES45.3, ES45.4, ES45.5, ES45.6, ES45.7, ES45.8, ES45.9, ES45.10, ES45.11; SR-ES45.1, SR-ES45.2, SR-ES45.3, SR-ES45.4, SR-ES45.5, SR-ES45.6, SR-ES45.7, SR-ES45.8].

Advantages and disadvantages of using a multicomponent approach to increase flu vaccination

To improve uptake, the committee noted the importance of both increasing demand for flu vaccination among target groups (for example, through awareness raising, using education to overcome informational barriers or sending reminders), and addressing 'supply' factors (for example, prompts to providers to increase offers of vaccination). Accessibility and convenience of vaccination provision were consistent themes highlighted in reviews of the qualitative evidence and expert testimonies [Evidence review 2: Q-ES1.4, Q-ES1.5. Evidence review 3: Q-ES 2.3. Evidence review 4: Q-ES3.6. EP1, EP2, EP3, EP4, EP5, EP6]. A key advantage of a multicomponent approach is that it can address demand and supply factors simultaneously.

The committee acknowledged that it may be difficult to identify what specific interventions within a multicomponent approach are more or less effective in promoting uptake. This may affect the ability of programme leaders to modify and improve the approach to increase uptake of flu vaccination over successive vaccination seasons.

Cost effectiveness and resource use

No studies were identified that assessed the comparative cost effectiveness of multicomponent and single interventions for increasing uptake of flu vaccination.

Depending on the level of cost of the chosen mix of interventions needed to increase opportunities, they could be cost effective as described below. The committee's opinion was that although a multicomponent approach is likely to be more time- and resource-intensive than a single intervention, it will have greater impact on uptake because it targets multiple drivers affecting both demand and supply. Different approaches are likely to affect people differently and thus will have a greater impact at a population level. Experts emphasised the need for careful planning and coordination, which the committee agreed was best undertaken by an assigned organisational lead or team [Evidence review 2: ES123.1, ES 123.3. Evidence review 4: SR-ES45.6. EP4, EP5, EP6]. This may incur an opportunity cost to organisations if the seasonal nature of the task means that staff need to be redeployed from other important duties. However, these costs are likely to be offset by financial remuneration from enhanced services payments and from achieving incentive-based targets in the QOF and CQUIN pay-for-performance schemes.

Overall, the committee felt that because many organisations are already implementing strategies to promote flu vaccination uptake (many of which take a multicomponent approach), the recommendations should not represent a significant impact on resources. The impact of implementing the recommendations will be largely determined by the current intensity and variety of activity undertaken by an organisation. The committee agreed that the recommended interventions are in line with the current service specification for flu vaccination delivery and that they are all generally likely to have a relatively low cost.

The committee noted the results from the economic modelling. For children, interventions would be cost effective if they increased vaccination uptake from the current average at a cost of up to £3.00 per targeted person for an increase of at least 5%, £5.50 for 10% and £11.50 for 25%. Increasing uptake at lower coverage rates is more cost effective than at higher coverage rates (for the same intervention cost and increase in uptake). For the

other populations that are the focus of this guideline, interventions were considered cost effective if:

- For adults in clinical risk groups, they cost up to £4.00 per targeted person and increased vaccination uptake by at least 5%.
- For pregnant women, they cost up to £4.50 per targeted person and increased vaccination uptake by at least 5%.
- For children in clinical risk groups, they cost up to £2.40 per targeted person and increased vaccination uptake by at least 5%.
- For health and social care staff, they cost up to £2.15 per targeted person and increased vaccination uptake by at least 5%.

The committee felt that the costs per targeted person of multicomponent approaches were likely to be below the maximum costs, and achieve the necessary level of vaccination.

They also noted that wider, more consistent use of a multicomponent approach will potentially reduce current variability in rates of uptake around the country. They believe this will in turn reduce levels of circulating flu and the associated healthcare and societal costs.

Other factors the committee took into account

The committee recognised the lack of peer-reviewed evidence about carers and limited evidence about children who are not in clinical risk groups. They also acknowledged the non-UK context of the majority of evidence in the reviews. However, on the basis of expert testimony relating to carers [EP1], people in clinical risk groups [EP2, EP3, EP6] and health and social care staff [EP4, EP5], combined with their own experience of vaccination for multiple groups, the committee believed that evidence supporting the effectiveness of multicomponent approaches could be extrapolated to all eligible groups in UK settings. They noted that vaccination incurs a financial cost to the person in many of the settings the evidence relates to, whereas it is provided free to people in eligible groups in the UK. Effect sizes may therefore be greater in the UK where there are fewer financial barriers (although there may still be costs to the person, such as from taking time off work, or transport).

The committee noted that there was some evidence to indicate that the initial benefits of a

multicomponent approach are sustainable, but that the same approach may not increase uptake year on year [Evidence review 3: SR-ES123.5, SR-ES123.6. Evidence review 4: ES45.1, ES45.3, ES45.11]. Expert testimony supported the need to be flexible and innovative in order to extend the reach of a multicomponent approach over successive years [EP4, EP5, EP6].

The committee concluded that, overall, the evidence reviewed showed a more positive and consistent effect favouring multicomponent approaches over single interventions to increase uptake of flu vaccination in the populations of interest. They felt that multicomponent approaches offer opportunities to reach more groups, therefore representing a better long-term return on investment by increasing vaccination rates and so reducing the health impact and societal costs associated with flu infection.

Multicomponent approaches are complex interventions and the committee was not able, on the basis of the evidence, to recommend a specific configuration. There may be a synergistic effect of combining interventions and certain components may be more or less effective in differing target groups.

The recommendations in sections 1.2 to 1.7 present options that a commissioner or provider could use to develop an approach based on local intelligence, allowing them to apply what is most relevant to their needs.

The evidence

The committee looked at evidence in:

- Evidence review 2 on increasing flu vaccination uptake in children: ES123.1, ES123.2, ES123.3, ES123.4; Q-ES 1.4, Q-ES 1.5
- Evidence review 3 on increasing flu vaccination uptake in clinical risk groups: ES123.1, ES123.2, ES123.3, ES123.4, ES123.5; SR ES123.1, SR ES123.2, SR ES123.3, SR ES123.4, SR ES123.5, SR ES123.6, SR ES123.7, SR ES123.8, SR ES123.9; Q-ES 2.3
- Evidence review 4 on increasing flu vaccination uptake in health and social care staff: ES 45.1, ES 45.2, ES 45.3, ES 45.4, ES 45.5, ES 45.6, ES 45.7, ES 45.8, ES 45.9, ES 45.10, ES 45.11; SR-ES 45.1, SR-ES 45.2, SR-ES 45.3, SR-ES 45.4, SR-ES 45.5, SR-ES 45.6, SR-ES 45.7, SR-ES 45.8, SR-ES 45.9
- Expert testimony on increasing vaccination uptake among carers: Expert paper 1 (EP1)

- Expert testimony on increasing vaccination uptake among people with chronic liver disease: Expert paper 2 (EP2)
- Expert testimony on increasing vaccination uptake among people who are homeless or rough sleepers: Expert paper 3 (EP3)
- Expert testimony on increasing vaccination uptake among healthcare workers: Expert paper 4 (EP4) and Expert paper 5 (EP5)
- Expert testimony on increasing vaccination uptake among children and people in clinical risk groups in primary care: Expert paper 6 (EP6)

Raising awareness

The discussion below explains how the committee made recommendations 1.2.1 to 1.2.10.

Rationale and impact

Why the committee made the recommendations

Not all health and social care staff know who is at greatest risk from flu, so they are not offering it to everyone who is eligible. There is evidence that training and educating health and social care staff improves vaccination rates. The evidence also showed that people in eligible groups who understand why flu vaccination is particularly important for them are more likely to be vaccinated. Professionals need to explain the benefits of vaccination and address people's misconceptions about it. The committee also agreed that it is important to make sure people know that flu vaccination is free if they are eligible.

There was some evidence that working with statutory and voluntary organisations might be effective in raising awareness about vaccination and its benefits, although there is currently a lack of empirical evidence in this area.

Impact of the recommendations on practice

Current practice is variable in GP surgeries where most flu vaccination is given. Practices with high vaccination uptake are likely to be delivering services in line with these recommendations already; those practices with lower levels of vaccination uptake will be able to make a big impact by putting these recommendations into practice.

Evidence discussion

Interpreting the evidence

The outcomes that matter most

Uptake of flu vaccination by people in eligible groups, and its acceptability to them.

The quality of the evidence

There was some quantitative evidence supporting the effectiveness of provider education as part of a multicomponent approach to improving uptake of flu vaccination among eligible groups. There were 10 evidence statements relating to largely non-UK-based studies in which provider education explicitly formed part of the intervention being evaluated. The study populations included children not in clinical risk groups [Evidence review 2: ES123.3], pregnant women, and children and adults in clinical risk groups [Evidence review 3: SR-ES1.1; ES123.2, ES123.3, ES123.5; SR-ES123.5, SR-ES123.6, SR-ES123.7, SR-ES123.8, SR-ES123.9], and covered a range of healthcare settings. Certainty in the evidence was variable; most was rated low or very low quality. Reasons for downgrading included risk of bias (mostly observational studies), high levels of heterogeneity in pooled analyses of data, and imprecision of effect estimates in smaller studies. In 9 of the 10 evidence statements there was a reported increase in flu vaccination uptake; in 6 cases this was a clinically important increase (5% or more relative to control group or pre-intervention uptake) [Evidence review 3: SR-ES1.1; ES123.2, ES123.3; SR-ES123.5, SR-ES123.6, SR-ES123.9].

There was more available evidence on the effectiveness of education or awareness-raising interventions aimed at eligible people (or their parents, in the case of children) rather than healthcare providers. In this context, education was often combined with other interventions such as written or text message reminders. Various interventions were outlined and in many cases there was a lack of specific detail (the term 'educational materials' was frequently used).

Eighteen evidence statements generated across evidence review 2 [ES1.1/4, ES1.2, ES3.2] and evidence review 3 [ES1.1, ES1.2, ES3.1, ES3.2, ES3.3, ES123.3, ES123.4; SR-ES1.1, SR-ES1.2, SR-ES3.8, SR-ES123.3, SR-ES123.6, SR-ES123.7, SR-ES123.8, SR-ES123.9], again relating to largely non-UK-based studies and covering a range of healthcare settings and populations, included an educational element targeted at the person eligible for flu

vaccination. Eleven of the 18 statements reported an increase in vaccination uptake that, in 8 cases was clinically important [Evidence review 2: ES1.1/4. Evidence review 3: ES3.2, ES123.3; SR-ES1.1, SR-ES1.2, SR-ES123.3, SR-ES123.6, SR-ES123.9]. There was generally low or very low certainty in the evidence, with downgrading due to risk of bias (mostly observational studies), high levels of heterogeneity in pooled analyses of data, and imprecision of effect estimates.

Qualitative evidence highlighted that access to information was essential to parents making vaccination decisions on behalf of their children, and for people with chronic health conditions [Evidence review 2: Q-ES1.1. Evidence review 3: Q-ES2.2]. People's perceptions of personal risk differ, and these need to be ascertained and addressed by healthcare providers, along with concerns about flu vaccine safety and effectiveness and misconceptions, for example that vaccination can give people flu [Evidence review 2: Q-ES1.1, Q-ES1.2. Evidence review 3: Q-ES2.1, Q-ES2.2].

Qualitative evidence also suggested that providers may themselves have differing risk–benefit perceptions depending on their own clinical or personal experience [Evidence review 3: Q-ES2.1, Q-ES2.2, Q-ES2.5]. Other studies highlighted that people deciding whether to have a flu vaccination place importance on the perceived strength of their healthcare provider's endorsement of the flu vaccine [Evidence review 3: Q-ES2.4], and that they want to trust that the advice they are given is credible and delivered for their own health benefit without any conflict of interest (for example, to get incentive payments) [Evidence review 2: Q-ES1.3]. Providers and people in eligible groups may be aware that flu vaccine effectiveness varies, and this may work as a barrier to uptake. Although it is not possible to predict before a flu season how well the available vaccine and circulating strains of the virus will be matched, the committee were keen to note that the flu vaccine has generally been a good match and continues to provide the best protection for those at greatest risk from flu and its complications.

The evidence reviewed reinforced the committee's decision to recommend raising and sustaining awareness not only in eligible groups, but also in those who commission and deliver vaccination programmes. Encouraging use of professional minimum standards vaccination training will help to reduce variation in professional attitudes and ensure consistency of message delivery.

The committee was satisfied that the majority of evidence favoured using information and education to raise and sustain awareness of flu vaccination as a means of increasing uptake. They agreed it was important to target both healthcare providers and people in

clinical risk groups. Based on their knowledge of this kind of approach in the UK and the generally positive direction of effect across studies in the evidence reviews, the committee felt the evidence could be extrapolated to all eligible groups specified in the Green Book and across health and social care settings, provided that individual needs underpin any information given as part of an intervention.

Advantages and disadvantages of raising awareness to increase flu vaccination

Raising and sustaining awareness – both among those with responsibility for providing and administering flu vaccination and those eligible for vaccination – should reduce barriers to offering, providing and accepting it.

Using opportunistic approaches, including brief interventions or brief advice, is in line with the principles of Making Every Contact Count and the NHS Five Year Forward View and should result in increased efficiency of service provision and access.

Raising awareness as a means of encouraging more people to be vaccinated needs to be coupled with interventions to ensure there are adequate supplies of flu vaccine to meet increased demand, and that appropriate and convenient access arrangements are in place. Otherwise there is a risk of deterring people from further engaging with vaccination services.

Cost effectiveness and resource use

Educational interventions for people in eligible groups are generally low cost with relatively low resource implications, particularly if delivered opportunistically in the form of brief interventions or brief advice by knowledgeable healthcare staff they come into contact with, in line with Making Every Contact Count. Evidence from expert testimony suggested that efficiency savings can be made if information on flu vaccination is delivered at the same time as other health-promotion messages and preventive health interventions for eligible groups [EP3, EP6].

Education and awareness-raising interventions aimed at health and social care staff are likely to incur greater costs. However, there are national minimum standards and a core curriculum for staff involved in administering vaccines. These have free training resources for local use. Some areas provide bespoke training for designated flu champions, who may not be required to meet full national standards for immunisation training if flu vaccine is the only vaccine they administer in their professional role. This training is likely to have lower

overall resource costs. For staff whose role includes delivering vaccination-related activities, in particular awareness raising and educational messages, training and educational interventions should be considered an integral part of their continuing professional development to ensure that they use safe practice and give up-to-date advice.

The committee noted the results from the economic modelling. For children, interventions would be cost effective if they increased vaccination uptake from the current average at a cost of up to £3.00 per targeted person for an increase of at least 5%, £5.50 for 10% and £11.50 for 25%. Increasing uptake at lower coverage rates is more cost effective than at higher coverage rates (for the same intervention cost and increase in uptake). For the other populations, interventions were considered cost effective if:

- For adults in clinical risk groups, they cost up to £4.00 per targeted person and increased vaccination uptake by at least 5%.
- For pregnant women, they cost up to £4.50 per targeted person and increased vaccination uptake by at least 5%.
- For children in clinical risk groups, they cost up to £2.40 per targeted person and increased vaccination uptake by at least 5%.

The committee felt that educational interventions were likely to be cost effective, and would help to achieve national targets and aspirations for flu vaccination.

Other factors the committee took into account

The committee noted the lack of detail in some studies about intervention content and how they could be potentially combined, but agreed that the evidence was consistent on the importance of increasing and sustaining awareness in professionals and in parents, children and people in clinical risk groups. The committee discussed the potential for healthcare professionals to use face-to-face interactions to identify and opportunistically engage with those eligible for flu vaccination, but agreed that this raises equity issues, because people not in contact with healthcare services may be missed. They agreed with the testimonies of experts that providers should consider partnership working with local organisations (for example, drug and alcohol services) and voluntary sector groups working with underserved populations (such as carers or people who are homeless) to identify those who might be eligible for flu vaccination and give them information about how to access services [EP1, EP2, EP3].

Educating health and social care staff and eligible groups about flu vaccination in the context of protecting others was also seen by the committee as a way to increase uptake. The committee recognised the lack of UK-based studies generally and the lack of peer-reviewed evidence about carers specifically, but it considered expert testimony and was able to make recommendations about carers [EP1].

The committee noted that the flu vaccine is administered differently in children and adults. Children over the age of 2 who are eligible for annual flu vaccination are given live attenuated influenza vaccine (LAIV) in the form of a nasal spray (see recommendation 1.2.8 in the section on raising awareness in eligible groups). Eligible adults (aged 18 and over) should be given the inactivated flu vaccine by injection. Only in exceptional circumstances, alternative options for administering flu vaccine to adults who become seriously distressed by needles may be agreed (see Public Health England's information for healthcare practitioners on administering LAIV to patients with a needle phobia, pages 23 and 24).

The evidence

The committee looked at evidence in:

Provider education (recommendations 1.2.1 to 1.2.4)

- Evidence review 2 on increasing flu vaccination uptake in children: ES123.3; Q-ES1.3
- Evidence review 3 on increasing flu vaccination uptake in clinical risk groups: SR-ES 1.1; ES 123.2, ES123.3, ES123.5; SR-ES123.5, SR-ES123.6, SR-ES123.7, SR-ES123.8, SR-ES123.9; Q-ES 2.1, Q-ES 2.2, Q-ES 2.4, Q-ES 2.5

Education for people eligible for vaccination (recommendations 1.2.5 to 1.2.10)

- Evidence review 2 on increasing flu vaccination uptake in children: ES1.1, ES1.2, ES3.2; Q-ES1.1, Q-ES1.2
- Evidence review 3 on increasing flu vaccination uptake in clinical risk groups: ES1.1, ES1.2; SR-ES1.1, SR -ES1.2; ES3.1, ES3.2, ES3.3; SR-ES3.8; ES123.3, ES123.4; SR-ES123.3, SR-ES123.6, SR-ES123.7, SR-ES123.8, SR-ES123.9; Q-ES2.1, Q-ES2.2, Q-ES2.4
- Expert testimony on increasing vaccination uptake among carers: expert paper 1 (EP1)

- Expert testimony on increasing vaccination uptake among people with chronic liver disease: expert paper 2 (EP2)
- Expert testimony on increasing vaccination uptake among people who are homeless or rough sleepers: expert paper 3 (EP3)
- Expert testimony on increasing vaccination uptake among children and people in clinical risk groups in primary care: expert paper 6 (EP6)

Offering vaccination

The discussion below explains how the committee made recommendations 1.3.1 to 1.3.6.

Rationale and impact

Why the committee made the recommendations

Many potential opportunities are being missed to offer eligible people a free flu vaccination during contacts with health, social care and other statutory and voluntary services. There is evidence that using existing systems to offer flu vaccination and extending the way services are provided can encourage more people to be vaccinated. An expert told the committee that all organisations that can reach eligible people need to work together to ensure this happens.

The committee also agreed that being flexible with the hours when GP surgeries or other providers offer flu vaccination would enable people to come for vaccination at a time convenient for them. There was limited evidence that this improves vaccination rates but it was also supported by expert testimony.

There is evidence that flu vaccine supply can also affect uptake. People who request the vaccination may not return if it is not available immediately.

Impact of the recommendations on practice

Using every opportunity to offer and provide flu vaccination will increase uptake among people who need it because they are particularly vulnerable to the complications of flu. Although this may increase costs in the short term, the committee agreed that it is likely to be cost effective.

Evidence discussion

Interpreting the evidence

The outcomes that matter most

Uptake of flu vaccination by people in eligible groups, and its acceptability to them.

The quality of the evidence

In relation to increasing offers of flu vaccination, the committee considered ways in which people who are eligible can be identified ('case-finding'), and interventions to ensure that vaccination services are accessible to those who are offered them.

Case-finding can be done opportunistically or systematically. The published evidence related mainly to systematic approaches using provider prompts embedded in healthcare records. This evidence is considered separately in the section on patient records.

Expert testimony highlighted the importance of using both opportunistic and systematic approaches to case-finding as a means of increasing opportunities to offer flu vaccination. Face-to-face interactions in primary care (including community pharmacy) provide opportunities to identify and offer vaccination to eligible people. Periodic searches of computer records can be undertaken in general practice to identify unvaccinated new patients or people who have recently become eligible (for example, people who are recently diagnosed with a condition that places them in a clinical risk group, or women with a newly confirmed pregnancy) [EP6].

Other strategies for case-finding should be considered for eligible people who may not be identifiable using existing general practice systems. The committee noted that carers are a difficult group to identify because their carer status may not be routinely recorded in GP records [EP1]. Other expert testimony highlighted that chronic liver disease is associated with the highest risk of flu-related mortality but lowest rates of vaccination uptake across all clinical risk groups specified in the Green Book. Prevalence of chronic liver disease is high among people who abuse drugs and alcohol, who may be in more regular contact with specialist services and pharmacies than with GPs [EP2]. People sleeping rough have a high prevalence of chronic respiratory illness and are usually not in regular contact with statutory healthcare services [EP3]. The committee was keen to promote links between vaccination providers and other local organisations, such as those assessing and

supporting carers, specialist drug and alcohol services, community pharmacies and voluntary groups working with carers or people who are homeless to identify eligible people and offer (or signpost them to) vaccination services.

Qualitative evidence highlighted that perceived availability and accessibility are significant barriers to or facilitators of uptake among eligible groups who are offered a flu vaccination [Evidence review 2: Q-ES1.4, Q-ES1.5. Evidence review 3: Q-ES2.3].

Fourteen evidence statements related to effectiveness studies in which access had been improved for target populations by providing vaccination services more frequently or at more convenient times or locations. The published evidence ranged from moderate to very low quality, with the majority being of very low certainty and from non-UK settings. Reasons for downgrading included risk of bias, high levels of heterogeneity in pooled analyses of data, and imprecision of effect estimates. Eight of these evidence statements reported an increase in vaccination uptake, which was clinically important in 6 cases, among populations that included children not in clinical risk groups [Evidence review 2: ES123.1/4] as well as adults and children with clinical risk factors and pregnant women [Evidence review 3: SR-ES2.2, SR-ES123.1, SR-ES123.3, SR-ES123.5, SR-ES123.9]. The majority of studies lacked specific detail about how access to vaccination services had been improved by the intervention, which made it difficult for the committee to make recommendations. One study that reported an increase in uptake compared year-round flu vaccination for children with asthma with appointments offered only during the flu season, which the committee agreed was not applicable to the UK [Evidence review 3: SR-ES2.2]. The committee discussed another before-and-after study that reported no clear improvement in uptake when 2 additional Saturday clinics were offered to children with asthma at the start of the flu vaccination season [Evidence review 3: SR-ES 2.1]. The committee felt this relatively small US-based study did not support the qualitative evidence or their own experience of the importance of out-of-hours access, particularly for people in work or education. Expert testimony confirmed that GP practices offering weekend access have been able to achieve vaccination of hundreds of patients in 1 day. This had the added benefit that it was outside usual practice hours, so reducing impact on the winter pressure for GP appointments [EP6].

In England, community pharmacies are able to provide flu vaccinations to eligible adults. Studies in which community pharmacies were part of extended access arrangements did not show increased uptake among target populations [Evidence review 1: ES2.1. Evidence review 3: ES2.1, ES2.2, ES123.1]. However, the committee noted that people of working age in clinical risk groups who are relatively well but need regular prescription medication, and

carers in particular, may be more likely to use community pharmacies as a convenient alternative to GP vaccination services. This was confirmed by expert testimony relating to carers [EP1].

The committee concluded that increasing identification of eligible people and providing sufficient routes of access to meet the needs of different groups (including out-of-hours opportunities for people with work commitments) are key to increasing vaccination uptake, as is ensuring that supplies are sufficient to meet demand. The empirical evidence linking extended hours to increased uptake was inconsistent, but the committee felt it important to provide convenient access to as many eligible people as possible.

Organisations are encouraged to use clinical systems to systematically identify people who are eligible for free flu vaccination and record uptake. Flu vaccination providers should plan to exceed the previous year's uptake when ordering supplies.

Advantages and disadvantages of increasing opportunities to offer vaccination

Opportunistic approaches are in line with the principles of Making Every Contact Count and the Five Year Forward View. But it is not easy to ensure consistency of delivery.

Systematic case-finding needs procedures to be in place, including staff routinely checking for people who are newly eligible. However, implementation of such procedures is likely to be consistent and effective. Establishing links with local statutory and voluntary organisations to promote case-finding is dependent on what resources are available locally. Using outreach to offer flu vaccination to eligible people who are not in touch with services needs careful planning to ensure that the vaccine cold chain is maintained and staff have the capacity to recognise and treat any adverse reactions.

Increasing identification of eligible people and offers of flu vaccination should be coupled with appropriate interventions to ensure adequate availability and ease of access.

Cost effectiveness and resource use

One cost–utility study and 1 cost effectiveness study (both low quality) were included in the review of interventions for increasing vaccination uptake in clinical risk groups [Evidence review 3]. One study suggested that opportunistically identifying, offering and administering flu vaccination may be cost saving [Evidence review 3: CE-ES 2.2]. The

other study indicated that targeting pregnant women with a comorbidity [Evidence review 3: CE-ES2.1] was also likely to be cost saving. The evidence focused on pregnant women during routine practice visits and children from clinical risk groups in a hospital setting. The committee agreed that the principle of increasing the opportunistic offer and administration of the vaccination without increasing the need for additional visits would be cost effective across all eligible populations.

The committee noted that using computerised systems for case-finding could incur higher costs than opportunistic approaches but will be more consistent and may therefore be a more effective lever for increasing uptake, with greater long-term efficiency savings. Extending access to vaccination services will incur higher outlay in terms of staff costs and overheads. Using outreach 'find and treat' methods to vaccinate eligible people who are not in regular touch with services will incur costs, but the committee were keen to recognise the health benefits of vaccinating those who will not get vaccinated elsewhere. Off-site provision offered through collaborative working (for example with community pharmacies and secondary care) needs to be negotiated by commissioners because there is potential loss of income for general practices.

The committee noted the results from the economic modelling. For children, interventions would be cost effective if they increased vaccination uptake from the current average at a cost of up to £3.00 per targeted person for an increase of at least 5%, £5.50 for 10% and £11.50 for 25%. Increasing uptake at lower coverage rates is more cost effective than at higher coverage rates (for the same intervention cost and increase in uptake). For the other populations, interventions were considered cost effective if:

- For adults in clinical risk groups, they cost up to £4.00 per targeted person and increased vaccination uptake by at least 5%.
- For pregnant women, they cost up to £4.50 per targeted person and increased vaccination uptake by at least 5%.
- For children in clinical risk groups, they cost up to £2.40 per targeted person and increased vaccination uptake by at least 5%.

The committee felt that the costs per targeted person of increasing opportunities to offer flu vaccination were likely to achieve the necessary level of vaccination to be cost effective.

Overall the committee agreed that increasing opportunities to reach more groups is a good

use of resources given the morbidity and mortality associated with flu. In turn, this may reduce some of the winter pressures on the health service associated with flu infection. Opportunistic approaches are not likely to significantly impact resources because they specifically aim to reduce the likelihood of needing additional appointments and are targeted. This is in agreement with the cost effectiveness evidence showing the approach is likely to be cost saving.

The evidence

The committee looked at evidence in:

- Evidence review 1 on increasing flu vaccination uptake in carers: ES2.1
- Evidence review 2 on increasing flu vaccination uptake in children: ES123.1/4, ES123.2, ES123.3; Q-ES1.4; Q-ES1.5
- Evidence review 3 on increasing flu vaccination uptake in clinical risk groups: ES2.1, ES2.2; SR-ES2.1, SR-ES2.2, ES123.1, SR-ES123.1, SR-ES123.3, SR-ES123.4, SR-ES123.5, SR-ES123.7, SR-ES123.8, SR-ES123.9; Q-ES2.3; CE-ES2.1, CE-ES2.3
- Expert testimony on increasing vaccination uptake among carers: expert paper 1 (EP1)
- Expert testimony on increasing vaccination uptake among people with chronic liver disease: expert paper 2 (EP2)
- Expert testimony on increasing vaccination uptake among people who are homeless or rough sleepers: expert paper 3 (EP3)
- Expert testimony on increasing vaccination uptake among children and people in clinical risk groups in primary care: expert paper 6 (EP6)

Increasing uptake among eligible groups in primary and secondary care

The discussion below explains how the committee made recommendations 1.4.1 to 1.4.10.

Rationale and impact

Why the committee made the recommendations

1.4.1 to 1.4.6

The committee agreed that most people who are particularly vulnerable to the complications of flu, or who are eligible for other reasons, are likely to be in regular contact with their GP surgery or local community pharmacy and know the staff. These routine contacts provide ideal opportunities to speak to people about flu vaccination. The evidence showed that making sure invitations to eligible people are personalised to their circumstances also helps to increase vaccination uptake. If eligible people are not in regular contact with primary care services, or have particular concerns about flu vaccination, using peers as local 'flu champions' providing information that is accessible and appropriate to the target group may help promote uptake.

1.4.7 to 1.4.9

Some people at high risk from flu and its complications visit hospital outpatients or other secondary care clinics more regularly than their GP. Existing hospital systems could be used to identify them, raise awareness and encourage them to have a free flu vaccination while they are there if this is a locally agreed route for offering vaccinations. There is evidence that this is most effective when the vaccination offer is tailored to their condition and made by a healthcare practitioner they know.

1.4.10

In both primary and secondary care, incorporating prompts in electronic health records helps to remind health and social care staff to offer flu vaccination to people who are eligible when they attend for appointments. Using already available systems to set these reminders helps the care provider raise awareness of and offer vaccination.

Impact of the recommendations on practice

General practices that have signed up to the service specification for flu vaccination are required to proactively call and recall eligible patients. Computerised systems are already in place to do this; however, the way it is carried out is variable. GP surgeries will need to

ensure that they personalise and tailor their invitations for vaccination.

A key element of the recommendations is to make the most of face-to-face interactions to offer and deliver vaccination. This may need additional time and resources initially. However, a personalised approach tailored to the person's situation is more likely to engage them with the flu vaccination programme. Embedding prompts in these eligible patients' healthcare records to remind providers to invite them for vaccination each flu season could avoid additional appointments and save costs in the longer term.

The lack of a national service specification for secondary care means that some areas don't have local enhanced services agreements to deliver vaccination and will need to set these up. Procedures for recognising and treating adverse reactions, the purchase and appropriate cold-chain storage of flu vaccine supplies, and ensuring that the setting used to administer vaccinations is appropriate are all issues that need to be taken into account when setting up these agreements with secondary care providers.

Evidence discussion

Interpreting the evidence

The outcomes that matter most

Uptake of flu vaccination to people in eligible groups and its acceptability to them.

The quality of the evidence

Call ('vaccination due') and recall ('vaccination overdue') interventions delivered using various formats are frequently used in UK primary care to remind people of their eligibility for free flu vaccination. The committee reviewed the published evidence on the effectiveness of such interventions, which was mostly from non-UK studies and ranged from high to very low quality, with the majority being of low quality. Reasons for downgrading included risk of bias, high levels of heterogeneity in pooled analyses of data, and imprecision of effect estimates.

As a single intervention strategy, there was no evidence that reminders delivered as text messages (with or without an educational element) increased flu vaccination uptake among eligible groups by a clinically important amount (5% or more, compared with control

or pre-intervention uptake rates) [Evidence review 2: ES3.1, ES3.2, ES3.3. Evidence review 3: ES3.3, ES3.4a; SR-ES3.8]. However, call and recall methods using more personalised approaches (such as letters, postcards or personal telephone calls) appear to be more effective. There were 7 evidence statements relating to the use of such approaches among people from clinical risk groups, of which 5 reported an important increase in flu vaccination uptake [Evidence review 3: ES3.2; SR-ES3.1, SR-ES3.2, SR-ES3.3, SR-ES3.5]. The committee noted that in 3 of the 5 cases the target population was children, suggesting that parents may be more amenable to personalised messages about the protective health benefits of vaccination when their children are in clinical risk groups than are adults who themselves have clinical risk factors. When reminders formed part of a multicomponent approach, an important increase in vaccination uptake was reported [Evidence review 3: SR-ES123.1, SR-ES123.3, SR-ES123.9], although 1 UK-based study that targeted children aged 2 to 4 years who were not in a clinical risk group found no increase in uptake when practices incorporated text messaging into a multicomponent approach [Evidence review 2: ES123.2]. The committee noted qualitative evidence that for parents of preschool children, a personal invitation from a healthcare professional is important for making a decision about vaccination [Evidence review 2: Q-ES1.9]. Other qualitative evidence further highlighted that people are more likely to trust advice and offers of vaccination that come from healthcare professionals they know, and that it is important for messages to be delivered with conviction [Evidence review 3: Q-ES2.4].

The committee believed strongly that reminders should be proactive. Not everyone who is eligible for free flu vaccination will visit their GP surgery regularly, so it is not sufficient to rely on posters in waiting rooms to remind them. The committee discussed the equivocal evidence on the effectiveness of text messaging to call and recall people for flu vaccination, which they felt may be perceived by the recipient as too impersonal or lacking conviction. They agreed that, if possible, reminders to eligible people should be personalised and come from a healthcare professional they know, either in person or in writing. The committee acknowledged that digital formats may be more acceptable to some population groups than others but were keen to recommend that if they are used, they should include links to additional useful information, including options for seeking further face-to-face advice and for booking an appointment to have their flu vaccination.

The committee also considered expert testimony that supported the use of peers to inform and invite people who are not in contact with primary care services for vaccination, such as people who are homeless [EP3]. They discussed that this approach could be extended to engage people who may have concerns about flu vaccination for religious reasons, as highlighted in another expert's testimony [EP6]. For example, some parents of

children eligible for flu vaccination may be reluctant for their child to take up the offer because the nasal spray that is used to vaccinate children contains a gelatine additive derived from pork, so may be considered 'forbidden' in certain faiths. In such situations, it may be worth trying to engage peers or community leaders to work with local healthcare providers to provide information and support that people feel able to trust, in a language that is accessible and appropriate to them.

The majority of published evidence considered by the committee was from the USA, where there is no distinction between primary care and secondary care that equates to the UK healthcare context. However, the committee noted there was low-quality evidence from studies in which interventions implemented in specialist healthcare settings had successfully improved vaccination uptake among children having treatment for different forms of cancer [Evidence review 3: ES123.3] and, although with greater uncertainty in the effect, among people with end-stage renal disease who were having treatment in dialysis centres [Evidence review 3: ES123.5].

In relation to UK secondary care, the committee reviewed expert testimony about people with chronic liver disease. This highlighted that these people are at high risk of flu-related morbidity and mortality but currently have the lowest rates of vaccination uptake in primary care; also that they may be more likely to have regular contact with specialist hospital clinics or other services (such as drug and alcohol services) [EP2]. The committee agreed this may also apply to other eligible groups, including those with chronic neurological or kidney disease, people who are immunocompromised due to a medical condition or ongoing treatment, and pregnant women attending hospital antenatal appointments. This offers opportunities to provide flu vaccination in secondary care to people who may otherwise not access vaccination through primary care. Existing hospital systems could be used to identify and prompt offers of vaccination to anyone attending a routine appointment during the flu season who remains unvaccinated. However, the committee were keen to underline that vaccination in secondary care needs to be done in line with local commissioning agreements. Also, arrangements should be in place to ensure that anyone who is opportunistically offered vaccination in secondary care can access it easily, because qualitative evidence suggests people are put off if they have to arrange a further appointment or go to another location to get the flu vaccine [Evidence review 3: Q-ES2.3].

The committee drew on evidence from qualitative studies with pregnant women highlighting the importance of a personalised invitation from a known professional involved with their antenatal care [Evidence review 3: Q-ES2.4]. They discounted evidence from a

number of small, low-quality studies that found no difference in vaccination decision-making among pregnant women when messages about flu vaccination were framed either 'negatively' (in terms of risks of remaining unvaccinated) or 'positively' (in terms of the benefits both to mother and baby of protection against flu both during pregnancy and after birth). There was contradictory evidence from other qualitative studies suggesting that pregnant women respond more readily to offers of vaccination when the benefits to their baby are clearly communicated [Evidence review 3: Q-ES2.6]. The committee felt this corresponded with other evidence already outlined suggesting that parents of children in clinical risk groups respond well to personalised interventions encouraging vaccination of their children. Given that flu vaccination rates are currently very low in young children, particularly babies and infants with clinical risk factors that put them at highest risk from flu, the committee felt it is important that providers help parents make decisions about flu vaccination by not only outlining the potential risks of not vaccinating but also the benefits – appealing to the parental instinct to nurture and protect their child's health.

The committee reviewed evidence for provider prompts embedded in patient medical records as an intervention to increase uptake of flu vaccination. There were 8 evidence statements relating to use of provider prompts – either as a single intervention or, more usually, combined with other approaches to increasing vaccination uptake [Evidence review 2: ES3.4. Evidence review 3: SR-ES3.4, SR-ES3.7, SR-ES3.9, ES123.3, SR-ES123.1, SR-ES123.7, SR-ES123.9]. Seven of these statements reported an increase in vaccination uptake. This was clinically important (an increased uptake of 5% or more, compared with the control or pre-intervention level), in 6 of the 7 evidence statements. The evidence was of variable quality with most rated of low or very low certainty. Reasons for downgrading included risk of bias (mostly observational studies), high levels of heterogeneity in pooled analyses and imprecision of effect estimates. The settings included primary and secondary care. Populations included children not in clinical risk groups [Evidence review 2: ES3.4], as well as adults and children with clinical risk factors and pregnant women [Evidence review 3: SR-ES3.4, SR-ES3.7; ES123.3; SR-ES123.1, SR-ES123.9]. One study suggested that timing of prompts may be important, with a greater increase in uptake when provider prompts were activated later in the flu season (January to February) compared with earlier (October to December).

Advantages and disadvantages of increasing uptake among eligible groups in primary and secondary care

Primary care is the main setting in which flu vaccinations are given in the UK. Most people who are eligible for free flu vaccination are already registered with a GP, so it is relatively

easy to use the systems already in place in primary care to implement interventions to increase uptake, such as case-finding and using provider prompts. Sending reminders to eligible people that they are due or overdue (call/recall) their flu vaccination is a useful means of sustaining awareness across successive flu seasons. However, this needs contact information to be kept up to date in patient records.

Face-to-face interactions are an opportunity to raise awareness and encourage uptake. However, some people who are eligible for flu vaccination may not be in regular contact with primary care and may remain unvaccinated, which is why the committee were keen to also include recommendations for increasing uptake in secondary care. Systems are in place to enable the identification of people receiving specialist treatment for health conditions that make them eligible for free flu vaccination so that the vaccine could be offered. However, vaccination needs to be available and easily accessible on-site, and to be organised in line with local patient group directions or enhanced services arrangements that have been agreed with commissioners.

Embedding provider prompts in health records is likely to be a more consistent and efficient method of identifying eligible people and increasing offers of flu vaccination than opportunistic approaches to case-finding. It is relatively easy to implement because systems are already in place. For example, prompts for flu vaccination could be established through coding from previous hospital admissions or primary care records and automatically generated in electronic case records. However, a disadvantage of prompts is that they are often used for many aspects of healthcare delivery, and run the risk of practitioners getting 'prompt fatigue'.

Cost effectiveness and resource use

One cost–utility study and 1 cost-effectiveness study (both low quality) were included in the review of interventions for increasing vaccination uptake in clinical risk groups [Evidence review 3]. The studies suggest that opportunistically identifying, offering and administering flu vaccination may be cost effective. [Evidence review 3: CE-ES2.1, CE-ES2.2]. The evidence focused on pregnant women during routine practice visits and children from clinical risk groups in a hospital setting, but the committee agreed that the principle of increasing opportunities would be cost effective across all eligible populations and both primary and secondary care settings.

The recommendations support using existing primary care systems in a more structured and consistent way to send personalised reminders inviting eligible people to get

vaccinated. This may need some training but would be relatively low cost overall.

Economic modelling for children and adults in eligible groups was conducted by adapting a dynamic model which was developed by Public Health England and was used to inform recommendations from the Joint Committee on Vaccinations and Immunisations. The model considers the entire population of England from Office for National Statistics (ONS) 2016 data, stratified into age and risk groups. The age- and risk-stratified model uses a set of equations to model the interaction between groups and the transmission of flu. Baseline coverage, by age and risk group status, is informed by Public Health England's vaccine uptake guidance reports for winter 2015/16 seasons. Disease transmission parameters and flu vaccine efficacy are the same as those in the original Joint Committee on Vaccinations and Immunisations analysis.

The cost of a flu vaccine was calculated from the British National Formulary and Prescription Cost Analysis. For adults receiving an injection, the cost was £5.96. 90% of children were assumed to receive the nasal spray costing £18, and 10% to receive the injection.

The model includes flu vaccine side effects from injection and nasal spray, which have associated costs and QALY losses.

People who contract flu have an increased mortality risk (modelled as a lifetime QALY loss, depending on their age), a QALY loss of 0.008 for flu-like illness, 0.00101 for acute respiratory infection and 0.018 for hospitalisation. Hospitalisation was associated with a cost of £1,029, from NHS reference costs. The expected number of GP consultations were calculated using the same data as the original Joint Committee on Vaccinations and Immunisations analysis, with an updated cost per consultation of £31 for surgery visit, or £98 for home visit from the Unit Costs of Health and Social Care.

The perspective of the model is NHS and personal social services, and the time horizon is 1 year because each person must be vaccinated annually.

The model showed that increasing vaccination uptake in children decreased the number of cases of flu, flu-like illness, acute respiratory infection, deaths, GP consultations and hospitalisations, in both adults and children. At baseline, 13,067,472 children are vaccinated. Increasing this by 10% to 13,973,271 averts 872,015 cases of flu; 122 deaths; 55,634 GP consultations and 956 hospitalisations. The cost for the additional number of vaccinations is £10,945,753 and flu vaccine side effects costs an additional £688,942.

There are cost savings from reduced GP consultations (£1,985,574) and hospitalisations (£983,879), leading to a total cost to the NHS of £8,655,242. Flu vaccine side effects lead to an additional QALY loss of 33.34 QALYs, but the reduction in flu cases avoids a QALY loss of 3,243. The incremental cost effectiveness ratio is therefore £2,645 per QALY. This is below £20,000 per QALY and therefore implies it would be cost effective to spend money to increase the uptake of the flu vaccination. Calculating the monetary net benefit, it would be cost effective to spend up to £5.50 per targeted child to increase uptake by 10%. Similar calculations find that it would be cost effective to spend up to £11.48 per targeted child to increase uptake by 25%. The maximum that an intervention could cost and be cost effective at £20,000 per QALY depends on the baseline coverage level. Interventions with a higher cost would be cost effective where uptake levels are lower.

The model showed that increasing vaccination uptake for adults in clinical risk groups, pregnant women and children in clinical risk groups decreased the number of cases of flu, flu-like illness, acute respiratory infection, deaths, GP consultations and hospitalisations, primarily within the group targeted. Increasing the number of vaccinations and flu vaccine side effects increased costs, but there were some cost offsets from avoiding cases of flu, hospitalisation and GP consultations. There were small QALY losses from the additional side effects, but large QALY gains from avoiding cases of flu and mortality. The net monetary benefit for increasing vaccination by 5% for adults in clinical risk groups is £4.00 per targeted person, for pregnant women is £4.50 per targeted person, and for children in clinical risks groups is £2.40 per targeted person. The maximum that an intervention could cost and be cost effective at £20,000 per QALY does not vary with baseline coverage.

The committee considered that opportunistic advice and identification, using existing systems to generate invitations and reminders, and embedding provider prompts embedded health records are effective interventions that could be delivered in primary and secondary care at a relatively low cost per targeted person. They believed that such interventions would help to achieve the necessary level of vaccination and are therefore likely to be cost effective.

Other factors the committee took into account

The majority of the evidence was from non-UK settings, but the committee used expert testimony and their knowledge of the UK healthcare context to develop these recommendations. They concluded that encouraging the implementation of interventions in both primary and secondary care should result in increased identification, offer and delivery of flu vaccination to eligible people, as well as increasing the efficiency of these

processes.

The evidence

The committee looked at evidence in:

- Evidence review 2 on increasing flu vaccination uptake in children: ES3.1, ES3.2, ES3.3, ES3.4, ES123.2; Q-ES1.9
- Evidence review 3 on increasing flu vaccination uptake in people in clinical risk groups: ES3.2, ES3.3, ES3.4a; SR-ES3.1, SR-ES3.2, SR-ES3.3, SR-ES3.4, SR-ES3.5, SR-ES3.7, SR-ES3.8, SR-ES3.9, SR-ES123.1, SR-ES123.3, SR-ES123.7, SR-ES123.9; ES123.3, ES123.5; Q-ES2.3, Q-ES2.4, Q-ES2.6; CE-ES2.1, CS-ES2.2
- Expert testimony on increasing vaccination increasing uptake among people with chronic liver disease: Expert paper 2 (EP2)
- Expert testimony on increasing vaccination increasing uptake among people who are homeless or rough sleepers: Expert paper 3 (EP3)
- Expert testimony on increasing vaccination increasing uptake among children and people in clinical risk groups in primary care: Expert paper 6 (EP6)

Audit, monitoring and feedback

The discussion below explains how the committee made recommendations 1.5.1 to 1.5.8.

Rationale and impact

Why the committee made the recommendations

Providers and employers need to know whether they are reaching their vaccination targets or whether they need to change the way they are delivering their flu vaccination programme to better protect their patients or vaccinate their staff. According to both evidence and expert testimony, audit, monitoring and feedback help providers and employers to plan for and offer flu vaccination to meet their targets, including for payment by results.

The committee also agreed that if different providers across the system are offering vaccination, it is important for services to share information with each other and keep accurate records of who has been vaccinated. This will ensure general practice uptake figures are accurate and avoid them wasting resources by inviting people for vaccination unnecessarily (leading to missed appointments) or duplicating vaccinations.

Impact of the recommendations on practice

There is inconsistency among GP surgeries in how they record and use data to monitor their progress with flu vaccination during the season. To implement these recommendations some practices will need to improve their record-keeping using clinical software systems so they can monitor whether they are successfully targeting eligible people. Similarly, employers may need to improve their systems for recording and monitoring the vaccination status of staff, because some eligible health and social care staff may not be getting a free vaccination offer from their employer. This may be a particular issue in the social care sector, which has a large number of providers and currently no central requirement to submit data on the uptake of flu vaccination among front-line staff.

Monitoring uptake among eligible groups when vaccination is provided outside general practices in settings that do not have direct access to information technology (IT), or where different IT systems are used, may be a challenge. Mechanisms for sharing information need careful planning and oversight to minimise data loss.

Evidence discussion

Interpreting the evidence

The outcomes that matter most

Uptake of flu vaccination by people in eligible groups, and its acceptability to them.

The quality of the evidence

Qualitative evidence highlighted that providers need to feel that they can trust in the accuracy of computerised prompts and patient records, which should be maintained and updated in a consistent and timely fashion [Evidence review 2: Q-ES1.6]. The committee

agreed that this is an important issue given the inclusion of recommendations in this guideline to extend vaccination provision to other settings to increase uptake, including schools (as part of the universal programme for vaccinating children), community pharmacies, secondary care and social care settings.

The committee reviewed very low- to moderate-quality evidence showing that audit and feedback interventions are associated with increases in flu vaccination when delivered individually or as part of a multicomponent strategy to increase uptake in clinical risk groups. The committee agreed there was some uncertainty in the size of effect because of study quality, or because it was difficult to be sure how much of the effect in multicomponent approaches was due specifically to audit, monitoring and feedback activities. However, the consistent direction of effect for the majority of patients enabled the committee to make recommendations.

The committee also heard expert testimony from a practice nurse [EP6] who leads on increasing uptake in a general practice and also supports flu vaccination campaigns across her region for the clinical commissioning group. She stated that using audit and monitoring enabled them to improve their targeting of particular clinical groups in which uptake was low. It also helped her to spot any other general practices in her region that may need advice or support.

Published evidence on audit and feedback and the impact of QOF on increasing uptake is mixed. One study showed that practice audits increased uptake in some clinical risk groups but not others [Evidence review 3: ES3.4b], although the committee agreed that the difference in impact between clinical risk groups may be due to relatively low numbers of post-splenectomy patients (in whom no significant effect was found) compared with other groups studied (coronary heart disease and diabetes).

In 2 studies looking at the impact of QOF, 1 showed that pay-for-performance targets increased flu vaccination rates in a target clinical risk group of people with coronary heart disease compared with control conditions of chronic obstructive pulmonary disease, diabetes and stroke [Evidence review 3: ES3.5]. The other showed that removing pay-for-performance targets (in a condition previously incentivised) did not result in the uptake rate decaying over the 8-year study period, with uptake rate being maintained at over 75%, which is above the national target. In 2 multicomponent studies that included audit and feedback, a cluster-randomised controlled trial indicated education plus audit increased vaccination in clinical risk groups [Evidence review 3: ES123.2]. This was supported by a retrospective cohort of 6 years' repeated measures after the intervention

showing provider feedback combined with education and nurse standing orders (PGD) increased and maintained uptake compared with baseline [Evidence review 3: SR-ES123.6]. The committee acknowledged the overall quality of the evidence was very low to moderate, but felt this was to be expected given the evidence is driven by the quality improvement cycle. They agreed that the consistency and in some cases durability of effect over time, in real-world circumstances, reduced any uncertainty resulting from study quality.

Expert testimony on increasing uptake in healthcare workers also highlighted the importance of monitoring and feedback because it encouraged staff to accept the vaccination and helped to show senior managers that the campaign was working. Evidence on feedback as an intervention to increase uptake in health and social care staff is mixed. One study showed it was a component in a successful approach on hospital wards and in outpatient clinics to increase uptake [Evidence review 4: ES45.10]. However, this was not the case in a before-and-after study in which director-level feedback was a component in a multicomponent approach [Evidence review 4: ES45.9]. The committee considered the inconsistency in the evidence, including the small numbers in the study that showed no effect and the fact that uptake had been corroborated with lab-confirmed cases of flu in the other study. Based on this, along with the expert testimony, the committee considered feedback to be a key component that should be recommended as an important approach to support increasing uptake. Additionally, the recent introduction of a CQUIN to increase uptake meant that monitoring and using feedback to improve programmes was likely to become increasingly important to meet targets, and to show that these targets have been met.

Advantages and disadvantages of audit, monitoring and feedback

Overall, the committee agreed that healthcare records can be used effectively to identify and increase offers of flu vaccination to eligible groups. However, it is important that patient records are accurate and up to date to ensure all vaccinations are included in uptake data and that people are not inadvertently vaccinated more than once in a season. The committee confirmed that, although not in itself likely to be harmful to the person, over-vaccination will incur unnecessary costs and increase the burden of any associated short-term side effects such as pain, swelling or redness at the injection site.

If eligible people are vaccinated in settings other than their own GP surgery, poor information transfer may waste time and resources if practices invite and remind people unnecessarily, or booked flu clinic appointments go unused. Mechanisms for sharing

information across providers need careful planning and oversight to minimise data loss.

Audit, monitoring and feedback activities are useful for needs assessment, enabling a practice to determine where extra effort or resources may be needed to increase uptake among particular groups. Monitoring uptake will also help in planning activities as well as in ordering and maintaining stock; this will have a knock-on effect of reducing inefficiency by reducing potential waste and allowing effort to be focused on targeting the most needed groups.

Recording why people decline vaccination helps to identify barriers and adapt interventions to address and overcome those issues in future activities or campaigns. However, this needs to be done accurately and consistently to support a better understanding of barriers to vaccination.

Payments will offset the resource impact of campaigns to increase vaccination uptake in some organisations, such as GP surgeries, community pharmacies and NHS trusts. This may motivate organisations to increase uptake and encourage staff to succeed, which in turn may improve job satisfaction if incentive targets are reached.

The social care sector and some NHS organisations may be disadvantaged by a current lack of systems to collect flu vaccination data and by the lack of payment by results incentivisation to increase uptake among staff. Resource impact from implementing the recommendations may therefore be greater in the social care sector in particular.

Cost effectiveness and resource use

The committee noted the results from the economic modelling. For children, interventions would be cost effective if they increased vaccination uptake from the current average at a cost of up to £3.00 per targeted person for an increase of at least 5%, £5.50 for 10% and £11.50 for 25%. Increasing uptake at lower coverage rates is more cost effective than at higher coverage rates (for the same intervention cost and increase in uptake). For the other populations, interventions were considered cost effective if:

- For adults in clinical risk groups, they cost up to £4.00 per targeted person and increased vaccination uptake by at least 5%.
- For pregnant women, they cost up to £4.50 per targeted person and increased vaccination uptake by at least 5%.

- For children in clinical risk groups, they cost up to £2.40 per targeted person and increased vaccination uptake by at least 5%.
- For health and social care staff, they cost up to £2.15 per targeted person and increased vaccination uptake by at least 5%.

The committee felt that the costs per targeted person of audit, monitoring and feedback were likely to be below the maximum intervention costs and achieve the necessary level of vaccination.

The evidence

The committee looked at evidence in:

- Evidence review 2 on increasing flu vaccination uptake in children: ES3.4; Q-ES1.6
- Evidence review 3 on increasing flu vaccination uptake in people in clinical risk groups: ES 3.4b, ES3.5, ES3.6, ES123.2, ES123.6
- Evidence review 4 on increasing flu vaccination uptake among health and social care staff: ES45.9, ES45.10
- Expert testimony on increasing vaccination uptake among healthcare staff: Expert paper 4 (EP4) and Expert paper 5 (EP5)
- Expert testimony on increasing vaccination uptake among children and people in clinical risk groups in primary care: Expert paper 6 (EP6)

Flu vaccination in carers

The discussion below explains how the committee made recommendations 1.6.1 and 1.6.2.

Rationale and impact

Why the committee made the recommendations

If a carer has flu, the welfare of the person they care for may be at risk. There was a lack of evidence on interventions specifically for carers, and health economic modelling showed that increasing uptake among all carers would not be cost effective. The

committee agreed that efforts to increase vaccination uptake should target carers who look after people who are particularly vulnerable and who would be at risk of needing hospital or other care if their carer was unwell with flu. Primary care staff and healthcare professionals working in the community (for example district or specialist nurses or those working in rehabilitation) could be a useful route to identify and offer vaccination to this group, for example during a home visit, if appropriate local agreements were in place.

Impact of the recommendations on practice

Increasing uptake of flu vaccination among eligible carers is not likely to involve a major change to current practice, but the key is for providers to prioritise those carers who look after someone whose health or wellbeing would be at risk if the carer fell ill with flu. This needs clinical judgement and may mean community nurses using home visits to identify and offer vaccination to these particular carers.

Evidence discussion

Interpreting the evidence

The outcomes that matter most

Uptake of flu vaccination by people in eligible groups, and its acceptability to them.

The quality of the evidence

There was a lack of published effectiveness evidence relating to interventions to increase uptake among carers. Very-low-quality evidence from 1 non-UK observational study suggested that a recommendation from a respected person may positively affect carers' uptake of flu vaccination [Evidence review 1: ES1.1]. Other very-low-quality evidence from the UK suggested that extending access by offering vaccination services in community pharmacies does not increase uptake among carers, although they may be more likely than other eligible populations to opt to use pharmacies as a convenient out-of-hours alternative to GP vaccination services [Evidence review 1: ES2.1]. This was confirmed by expert testimony relating to carers [EP1].

The committee also noted issues raised by the expert relating to carer identification, because carer status is not routinely recorded in GP records and many informal carers do

not recognise themselves as such. They agreed that community and primary care staff, such as community nurses, may be well placed to identify informal carers and assess their eligibility for flu vaccination – for example, during home visits to the person they are caring for. If a patient group direction or enhanced service arrangement has been agreed with local commissioners, nurses could offer vaccination to eligible carers. Alternatively, nurses could signpost carers to local primary care vaccination services, including any community pharmacies participating in the flu vaccination scheme.

The committee discussed at length evidence from economic modelling (outlined in more detail in the section below on cost effectiveness and resource use) and concluded that it is not cost effective to increase uptake of flu vaccination in all carers. It is important to target people who care for someone who may need to be admitted to hospital, or need alternative statutory care arrangements, if the carer falls ill with flu and is unable to look after them, or if risk of transmission for those who can't or won't be vaccinated is high, or for people for whom the flu vaccine is less efficacious, such as those who are immunocompromised.

Advantages and disadvantages of offering carers a flu vaccination

Carers are in close contact with people who are potentially at greater risk from flu. Carers have an important role; if they fall ill it can be detrimental to those they care for. In addition, they may pass the virus on to the person they care for. If the person being cared for has a weakened immune system they are still susceptible to the flu virus even if they have had the flu vaccine, because it works less well in this group. Increasing flu vaccination in carers can help sustain continuity of care and reduce the chances of onward transmission. However, the provider needs sufficient information to exercise clinical judgement on an individual carer's eligibility for flu vaccination, which should be based on the vulnerability of the person they look after.

Cost effectiveness and resource use

The economic model for carers who are not in a clinical risk group uses a decision-tree structure. A proportion of carers are vaccinated, and the remainder are unvaccinated. At baseline, 37.4% are vaccinated (taken from Public Health Engand's influenza immunisation intervention for England for winter 2015/16). A proportion of vaccinated people experience side effects, which have associated costs and QALY losses.

Costs are considered from the perspective of the NHS and personal social services.

The probability of getting the flu virus is higher for the unvaccinated population than the vaccinated population, so there are more cases of flu. A proportion of the cases of the flu virus are flu-like illness or acute respiratory illness, which are associated with QALY losses of 0.008 and 0.00101. A proportion of cases of each need hospitalisation (costing £1,029, from NHS reference costs, and losing 0.018 QALYs) or a GP consultation (costing £31 for a surgery visit or £98 per home visit, from the Unit Costs of Health and Social Care). There is a mortality risk from flu, which has an associated QALY loss depending on the person's age.

If a carer gets flu, they may be unable to look after the person they care for. In most cases it is assumed that another family member or friend will temporarily provide care. However, the model assumes that in 1% of cases the person cared for would need emergency hospital admission, costing £4,995 (NHS reference costs) to the NHS.

If a carer gets flu, there is a risk that they may transmit flu to the person they care for. The model assumes that there are 0.19 secondary cases for each case of flu, each costing £343, based on a cost for high-risk cases, and with an associated QALY loss.

The model showed that increasing vaccination uptake in carers decreased the number of cases of flu, flu-like illness, acute respiratory infection, deaths, GP consultations, hospitalisations and secondary cases of flu-like illness. At baseline, 219,295 carers are vaccinated. Increasing this by 10% to 277,930 averts 6,755 cases of flu; 293 GP consultations; 55 hospitalisations and 207 secondary cases of flu-like illness. The cost for the additional number of vaccinations is £924,305 and flu vaccine side effects cost an additional £36,354. There are cost savings from reduced GP consultations (£10,470); hospitalisations (£56,663); and secondary cases (£71,132) and replacement care (£77,602), leading to a total cost to the NHS of £744,792. Flu vaccine side effects lead to an additional QALY loss of 2 QALYs, but the reduction in flu cases avoids a QALY loss of 13. The incremental cost-effectiveness ratio from the NHS and personal social services perspective is therefore £57,547/QALY. This is above £20,000 per QALY and therefore it is not cost effective to increase the uptake of vaccination in carers. Sensitivity analysis was undertaken to determine whether changing 1 of the inputs could make it cost effective to increase the uptake of vaccination in carers. This found that if the proportion needing emergency care when their carer has flu increases, or the cost of that emergency care increases, increasing the uptake of vaccination in carers could be cost effective. In the base case the average cost of care was £50 (1% of £4,995). If this is increased to £500 (for example 1% of £50,000 or 10% of £4,995), increasing the uptake of flu vaccination could be cost effective. The committee considered that there may be people at increased

risk of needing expensive emergency care if their carer gets flu. In these cases, it is cost effective to increase the uptake of flu vaccination. Therefore the committee recommended that flu vaccination should be offered to carers who care for someone who is immunocompromised, disabled or vulnerable.

For carers, increasing the uptake of flu vaccination was not cost effective at £20,000 per QALY, even when onward transmission was considered. It could only be cost effective if there were potentially substantial costs associated with a carer getting flu, for example, if the person they care for needed expensive emergency care in their carer's absence.

The committee were of the opinion that there are various opportunities to identify carers and that these would not need significant resources because the systems were mostly in place but should be used more effectively. The only potential cost or resource implication identified was education and training to use or adapt existing systems to identify carers, and the subsequent resources associated with the increases in education of carers, and offers and delivery of vaccination.

Other factors the committee took into account

Evidence for mandatory vaccination as part of a multicomponent intervention demonstrated some effect in care home settings and with care workers but the studies did not clarify whether this was relevant to unpaid carers in the UK context. The committee did not make recommendations about mandatory vaccination. They considered the limited published evidence in conjunction with the health economic modelling, expert testimony and their own experiences. They concluded that mandatory flu vaccination of carers – even in situations in which it is likely to be cost effective – should not be recommended, for ethical reasons. Unpaid carers provide a valuable service on a voluntary basis and the committee considered it unethical to undermine this by enforcing mandatory vaccination. Qualitative studies of mandatory flu vaccination schemes in paid health and social care employees report a negative impact on morale, leaving people feeling disempowered, lacking autonomy and resentful [Evidence review 4: Q-ES3.8, Q-ES3.9]. The committee agreed that it was preferable to encourage vaccination among eligible carers by promoting it as a way of protecting the vulnerable person they care for.

The evidence

The committee looked at evidence in:

- Evidence review 1 on increasing flu vaccination uptake in carers: ES1.1, ES2.1
- Evidence review 4 on increasing flu vaccination uptake in health and social care staff: Q-ES3.8, Q-ES3.9
- Expert testimony on increasing flu vaccination in carers: Expert paper 1 (EP1)

Employers of health and social care staff

The discussion below explains how the committee made recommendations 1.7.1 to 1.7.8.

Rationale and impact

Why the committee made the recommendations

Health and social care staff are in daily contact with people who are susceptible to infection, and they could transmit flu to vulnerable people at risk of serious complications. Staff may not know they are eligible for a free vaccination through occupational health, or may not realise it may help protect their patients, family and co-workers. Evidence suggests that actions to encourage staff to be vaccinated do work. Programmes involving a combination of actions, such as awareness raising, education and flexible services were effective and acceptable. Although the evidence was uncertain in some cases, the committee recommended a range of interventions so that organisations can tailor their approach to local needs, targeting demand (by increasing awareness, education and incentives) and supply (for example using mobile vaccination carts and off-site or out-of-hours access).

Impact of the recommendations on practice

Implementing the recommendations will have a bigger impact in some organisations than others. Current variation in practice is partly because different incentives operate across the health and social care sectors. It may also be easier to provide vaccination for staff in some organisations than others. For example, a GP surgery already has access to flu vaccine supply and the skills to deliver the vaccination to staff. A social care provider may need to contract an occupational healthcare provider to carry out vaccination, or set up a scheme to help employees access community pharmacy flu vaccination.

Evidence discussion

Interpreting the evidence

The outcomes that matter most

Uptake of flu vaccination by health and social care staff, and its acceptability to them.

The quality of the evidence

The quantitative evidence relating to interventions to increase flu vaccination uptake among health and social care staff was of variable quality, with most rated low or very low. Downgrading was largely due to risk of bias and imprecision of effect estimates. In pooled analyses there was evidence of serious or very serious heterogeneity, which the committee agreed would be expected given the differences between study populations in the types of staff and the lack of standardisation of interventions and comparators across studies. The majority of studies were conducted outside the UK and covered a range of health and social care settings.

The committee noted that most studies included in the review examined combinations of interventions or their additive effects rather than a single approach, with staff education or awareness raising, and the provision of more flexible access (including off-site or out-of-hours access) forming almost universal components. There was a clinically important increase in vaccination uptake (of 5% or more compared with the control or pre-intervention rate) in 19 out of 20 evidence statements in which a multicomponent approach was evaluated [Evidence review 4: ES45.1, ES45.2, ES45.3, ES45.4, ES45.5, ES45.6, ES 45.7, ES45.8, ES45.9, ES45.10, ES45.11; SR-ES45.1, SR-ES45.2, SR-ES45.3, SR-ES45.4, SR-ES45.5, SR-ES45.6, SR-ES45.7, SR-ES45.8].

There was conflicting evidence from subgroup analyses on the effect of interventions among staff with direct or indirect patient contact [Evidence review 4: SR-ES4.6, SR-ES45.7; ES45.7; SR-ES45.8], with different professional roles [Evidence review 4: ES45.7], or working in different care settings [Evidence review 4: SR-ES4.5]. The committee noted that the Green Book recommends vaccination of all health and social care staff who have direct involvement with patient or client care, and that responsibility for providing occupational flu vaccination rests with employers.

There was evidence that mandatory vaccination (with or without mask-wearing policies for

those declining a flu vaccine) is the most effective lever of uptake among health and social care staff [Evidence review 4: ES4.6, ES4.7; SR-ES4.7, SR-ES4.8]. However, the committee expressed concerns about the challenges that mandatory vaccination of staff would have, including qualitative evidence indicating that such policies can negatively affect staff morale and undermine autonomy [Evidence review 4: Q-ES3.8, Q-ES3.9].

The committee acknowledged the concerns of policy makers and senior managers to reduce staff absenteeism. They believed that these concerns can be met by evidence that non-mandatory multicomponent interventions are also effective. This in turn will reduce transmission of flu in health and social care premises. This was confirmed by a study that found a significant decrease in the proportion of laboratory-confirmed flu cases among health and social care staff after implementation of a multicomponent vaccination programme [Evidence review 4: ES45.10].

Very low- to low-quality evidence indicated that declination policies were an effective approach [Evidence review 4: SR-ES4.4, SR-ES4.8, SR-ES 45.5, SR-ES 45.8; ES45.3, ES45.4, ES45.5, ES45.6, ES45.11]. A declination policy requires employees to submit a mandatory written statement stating that they have refused an offer of flu vaccination and citing their reasons why. A systematic review and meta-regression found that declination policies had an independent effect on flu vaccination uptake that was greater, on the whole, than all other types of intervention except mandatory vaccination [Evidence review 4: SR-ES 4.8]. Although the quality of the evidence was limited, the quantity and overall consistency of effect suggested that declination policies could work well. However, qualitative evidence indicated that employees have mixed feelings about declination policies, and stakeholder consultation on the draft version of this guideline revealed some resistance to the idea. The committee reconsidered the evidence in light of stakeholder feedback, noting that the studies included in the meta-regression analysis evaluating declination statements were all conducted in a US or Japanese setting, where organisational culture and employment relations are likely to differ markedly from the UK.

The committee also reconsidered evidence from a randomised controlled trial comparing an 'opt-in' with an 'opt-out' flu vaccination strategy for healthcare workers, conducted in 1 tertiary care provider in the Netherlands [Evidence review 4: ES4.8]. Participants in the opt-out group were emailed with a pre-scheduled appointment for flu vaccination, which could be changed or cancelled by following a web link. In the opt-in condition, participants received an email explaining that they had to book an appointment if they wanted to get vaccinated. The investigators failed to detect a statistically significant effect of either strategy on vaccination uptake, but because there were only 61 participants in each group

it is likely the study was underpowered to detect a significant difference. However, healthcare workers in the opt-out group were more likely than those in the opt-in group to have an appointment for flu vaccination, which in turn increased the probability of them getting vaccinated (RR 1.70; 95% CI 0.85 to 3.41).

The committee concluded that an opt-out strategy better respects individuals' autonomy, specifically the right to choose whether or not to accept a medical intervention, and may therefore be considered more acceptable than a declination policy for encouraging flu vaccination among front-line health and social care staff. The committee discussed the importance of involving staff representatives in developing a flu vaccination policy to minimise any negative impact on morale. The committee also agreed that it would not be appropriate to ask employees in an identifiable way to state their reasons for opting out of voluntary flu vaccination. However, it would usefully inform future flu vaccination campaigns if organisations could survey staff anonymously about their vaccination decision-making.

Expert testimony on increasing uptake in healthcare workers [EP4, EP5] further supported the approaches recommended by the committee based on the evidence. The experts considered audit and monitoring systems to be particularly important to help them plan their activities effectively and understand how they were progressing and whether changes were needed. The experts also stated that a multicomponent approach was important to ensure they were targeting the breadth of the workforce, because different members might be reached more effectively by different approaches. They indicated that assigning a lead and flu champions, involving media and other publicity activities along with keeping staff abreast of progress via feedback were all useful and important aspects. The experts also noted that staff incentives proved popular. Another key factor was to ensure that access to vaccination was carefully considered. One expert described taking the vaccination service to eligible staff as a useful strategy. Using mobile vaccination carts and making them available in high footfall areas such as the staff canteen, and around shift switchover times on wards, all made it more convenient for eligible staff to take up the offer of vaccination [EP5]. This testimony aligned with the qualitative and quantitative evidence considered by the committee. The committee highlighted that the recently introduced CQUIN would act as a significant lever for increasing vaccination rates among hospital-based staff for the foreseeable future.

The committee acknowledged that although the recommendation outlines a selection of interventions, it is difficult to specify what configuration would maximise any effect. They were satisfied that the recommendations outline an effective approach that can be tailored

to local needs.

Advantages and disadvantages of offering health and social care staff a flu vaccination

Increasing vaccination uptake in health and social care staff will reduce the risk of transmission and offer protection to those they come into contact with who may be more susceptible to infection. It also has the potential to reduce sickness absence and increase the continuity of care that they provide.

Raising awareness in healthcare staff about eligibility for flu vaccination and its efficacy should increase the identification of eligible groups and their subsequent vaccination, thus reducing transmission and associated mortality and morbidity.

The committee has not made recommendations about mandatory flu vaccination policies. They have recommended the adoption of a full participation vaccination strategy, with nationally agreed opt-out criteria. Nationally agreed opt-out criteria are needed to ensure consistency of approach. The committee believes they should be developed with the involvement of staff representatives. A full participation strategy is one in which a range of approaches are used to maximise uptake and in which the expectation is that all front-line staff should be vaccinated. The full participation approach includes agreed mechanisms enabling staff to opt out if they wish.

An opt-out strategy is potentially more acceptable for employment relations. But it offers less opportunity than a declination policy to engage with health and social care staff who decline vaccination in order to target support and education to overcome barriers, such as needle phobia, or misinformation about the flu vaccine's safety and effectiveness.

Cost effectiveness and resource use

The economic model for health and social care staff uses a decision-tree structure. A proportion of health and social care staff are vaccinated, and the remainder are unvaccinated. At baseline, 50.6% are vaccinated, taken from a Public Health England survey of the seasonal flu vaccine uptake among front-line health and social care workers 2015/16. A proportion of vaccinated people experience side effects, which have associated costs and QALY losses.

Costs are considered from the perspective of the NHS and personal social services. The time horizon is 1 year.

The probability of getting the flu virus is higher for the unvaccinated population than the vaccinated population, so there are more cases of flu. A proportion of the cases of the flu virus are flu-like illness or acute respiratory illness, which are associated with QALY losses of 0.008 and 0.00101. A proportion of cases of each need hospitalisation (costing £1,029, from NHS reference costs, and losing 0.018 QALYs) or a GP consultation (costing £31 for a surgery visit or £98 per home visit, from the Unit Costs of Health and Social Care). There is a mortality risk from flu, which has an associated QALY loss depending on the person's age.

If a health and social care worker gets flu, they may not be working. There will therefore be a cost to their employer of providing replacement staff. The average absence from work for a case of flu is 2.5 days from Public Health England's Flu Survey, and health and social care staff are assumed to work 7.5 hours per day, at an average cost of £26 per hour from Unit Costs of Health and Social Care.

If a health and social care worker gets flu, there is a risk that they may transmit flu to the people they care for. The model assumes that there are 0.7 secondary cases for each case of flu, each costing £289, based on a cost for high-risk cases, and with an associated QALY loss.

The model showed that increasing vaccination uptake in health and social care staff decreased the number of cases of flu, flu-like illness, acute respiratory infection, deaths, GP consultations, hospitalisations and secondary cases of flu-like illness. At baseline, 1,081,577 health and social care staff are vaccinated. Increasing this by 10% to 1,295,327 averts 24,624 cases of flu, 1,069 GP consultations, 201 hospitalisations and 16,920 secondary cases of flu-like illness. The cost for the additional number of vaccinations is £552,230, and flu vaccine side effects cost an additional £132,525. There are cost savings from reduced GP consultations (£38,166), hospitalisations (£206,560), secondary cases (£4,895,560) and replacement staff (£1,208,470) – leading to a total cost saving to the NHS of £5,664,002. Flu vaccine side effects lead to a loss of 6 QALYs, but the reduction in flu cases avoids a QALY loss of 171.5. Increasing the uptake of flu vaccination saves money and improves outcomes, and thus is 'dominant'. This is cost effective at £20,000 per QALY, and the net monetary benefit demonstrates that an intervention would be cost effective if it cost up to £4.30 per targeted person to increase uptake of the flu vaccination by 10%.

Considering only the costs of vaccination and the costs of replacement staff, increasing the uptake of flu vaccination is cost saving. Therefore it is cost saving for non-NHS

employers to vaccinate health and social care staff. The committee felt that a range of interventions could be delivered by employers of health and social care staff at a sufficiently low cost to be cost effective.

Increasing access to vaccination on and off site may incur initial set-up costs, which could include the need for additional employees and facilities. The committee were of the opinion that despite these initial costs, the benefits of reducing transmission and protecting health and social care staff from flu infection (with a potential reduction in sickness absence) outweigh these costs. Once the various systems and interventions to facilitate access have been established these services will be cost saving in the medium to longer term.

Expert testimony [EP5] from a trust where large-scale changes have occurred over a number of years indicated that although the initial investment (resource impact) was quite high, it became considerably less intensive while maintaining and further increasing uptake, as it became part of the embedded culture.

The evidence

The committee looked at evidence in:

- Evidence review 4 on increasing flu vaccination uptake in health and social care staff: ES4.1, ES4.2, ES4.3, ES4.4, ES4.5, ES4.7, ES4.8, ES45.1, ES45.2, ES45.3, ES45.4, ES45.5, ES45.6, ES45.7, ES45.8, ES45.9, ES45.10, ES45.11; SR-ES4.1, SR-ES4.2, SR-ES4.3, SR-ES4.4, SR-ES4.5, SR-ES4.6, SR-ES4.7, SR-ES4.8, SR-ES5.1, SR-ES45.1, SR-ES45.2, SR-ES45.3, SR-ES45.4, SR-ES45.5, SR-ES45.6, SR-ES45.7, SR-ES45.8, SR-ES45.9; Q-ES3.1, Q-ES3.2, Q-ES3.3, Q-ES3.4, Q-ES3.5, Q-ES3.6, Q-ES3.7, Q-ES3.8, Q-ES3.9, Q-ES3.10
- Expert testimony on increasing vaccination uptake among healthcare workers: Expert paper 4 (EP4) and Expert paper 5 (EP5)

Gaps in the evidence

The committee's assessment of the evidence on increasing uptake of flu vaccination identified a number of gaps. These gaps are set out below.

1. Effective and cost-effective interventions for increasing flu vaccination uptake in carers.

(Source: Evidence review 1)

2. Effectiveness and cost effectiveness of different configurations of multicomponent interventions in different eligible populations and across settings:

a) Differential impact by intensity.

b) Differential impact by who delivers the interventions.

c) Differential impact by where the intervention is started or delivered.

(Source: Evidence review 1; Evidence review 2; Evidence review 3; Evidence review 4)

3. Effectiveness and cost effectiveness of electronic and online approaches to increasing flu vaccination uptake.

(Source: Evidence review 1; Evidence review 2; Evidence review 3; Evidence review 4)

4. Evidence of what is effective and cost effective in increasing flu vaccination uptake in underserved groups who would be eligible for flu vaccination.

a) What is the effectiveness of recommended interventions in underserved groups?

b) What is the cost effectiveness of recommended interventions in underserved groups?

(Source: Evidence review 1; Evidence review 2; Evidence review 3; Evidence review 4)

5. Barriers and facilitators to mandatory flu vaccination in UK settings.

(Source: Evidence review 1; Evidence review 2; Evidence review 3; Evidence review 4)

6. Cost-effectiveness evidence on recommended interventions.

a) Evidence from the peer-reviewed literature on the cost effectiveness of recommended interventions.

(Source: Evidence review 1; Evidence review 2; Evidence review 3; Evidence review 4)

Recommendations for research

The guideline committee has made the following recommendations for research.

1 People in eligible groups

What are the important messages and how should they be tailored and delivered to encourage and sustain flu vaccination uptake in eligible groups?

Why this is important

There is limited qualitative, effectiveness and cost-effectiveness evidence about what is effective in increasing flu vaccination in most eligible groups. In particular, we need to know how to tailor and deliver messages, for example, to minority ethnic communities, who may have lower vaccination uptake and also be disproportionately affected by some chronic conditions that put them at greater clinical risk from flu. A key to this is understanding how to engage people, including children and young people, and how they want to be involved in decision-making. This might include carers and other decision-makers. Interventions may need to be specifically targeted for different groups, so there is a need to understand individual and cultural health beliefs underpinning decisions about vaccination. Evidence indicates that beliefs about flu vaccination (such as effectiveness and side effects) are a persistent barrier. Understanding the key messages and the best format to deliver them in (for example, using social media or other forms of electronic communication) to reach different groups will help to overcome these barriers. This will increase the precision with which commissioners and intervention developers can engage eligible groups and increase rates of flu vaccination.

2 Underserved groups

What are the most effective and cost-effective ways of reaching underserved groups and removing barriers to access in order to increase their uptake of flu vaccination?

Why this is important

The evidence reviewed did not provide specific details about the needs of people in

underserved groups. Particularly important are those people who may be disproportionately affected by chronic conditions that increase their risk of complications from flu and who may have unique barriers to accessing flu vaccination (for example, they may have an undiagnosed clinical condition and not recognise that they are eligible for free flu vaccination, or they may not be registered with a general practice). They may also be difficult to identify. Research is needed into the specific needs, barriers and facilitators of eligible people in underserved groups. This should include how and what is effective in improving access, raising awareness, and offering and delivering vaccination. This will enable commissioners and those with responsibility for flu vaccination delivery to develop interventions to reach these groups.

3 Carers

In what context is it cost effective to increase uptake of flu vaccination among carers?

Why this is important

There is a lack of peer-reviewed evidence on what is effective and cost effective in increasing flu vaccination in carers. This key target group can be difficult to identify, and people who provide care may not always identify themselves as carers. The limited evidence suggests it is not cost effective to increase uptake of vaccination in **all** carers. Better understanding is needed about the effect of increasing vaccination in carers on rates of flu transmission, and the wider social and economic benefits to the health and social care system. Research is needed on the need for targeting, how this should be done and which cared-for groups are most important. Evidence about the effect on uptake of increasing the identification and offer of vaccination to carers through opportunistic engagement in all settings would enable more specific recommendations to be made. It would also allow further assessment of the economic benefits. Evidence about why a carer would choose not to be vaccinated will also improve understanding and inform recommendations and intervention development.

4 Opt-out strategies for front-line health and social care staff

Are opt-out strategies effective and cost effective at increasing uptake of flu vaccination among front-line health and social care staff?

Why this is important

The evidence indicated that mandatory flu vaccination and the use of declination policies, either as a single intervention or part of a multicomponent approach, had a large and consistent effect in increasing vaccination uptake among health and social care staff in non-UK settings. However there are potential barriers to this in the UK; in particular, the possible negative impact on employee morale, which has also been seen in qualitative studies from other countries. The committee felt that similar increases in flu vaccination may be achievable using an opt-out strategy. But to clarify the potential of this intervention, empirical evidence is needed on whether it is more effective and cost effective than other successful approaches for promoting uptake of flu vaccination among front-line health and social care staff in different UK settings, and what barriers and facilitators there are to its implementation from the perspective of providers and recipients; in particular, attitudes to the feasibility and acceptability of an 'opt-out' flu vaccination strategy.

5 Community-based models of flu vaccination

What models of community-based flu vaccination provision (for example, community pharmacies, community nursing and midwifery teams and outreach services) are effective and cost-effective for increasing uptake in eligible groups?

Why this is important

There is high variability across England in rates of flu vaccination uptake in eligible groups. Little is known about the effectiveness and cost effectiveness of extending community-based provision to include, for example, community pharmacies, community nursing and midwifery teams and outreach services into a variety of settings. Expert testimony suggested that community outreach interventions are effective for underserved groups such as people who are homeless, but empirical evidence for the effectiveness and cost effectiveness of such interventions is lacking. Limited evidence to date suggests that community pharmacy provision of NHS flu vaccinations has displaced rather than increased overall vaccination activity, because community pharmacies may be more convenient for some people in eligible groups. As new services become better publicised and embedded, there is a need to know if they are good value for money and whether (and why) they increase uptake. More research is needed on alternative models of community-based provision to inform future interventions and recommendations, particularly if it reaches groups who are currently underserved, and who may not use

traditional routes such as GP services.

Glossary

For other public health and social care terms see the Think Local, Act Personal Care and Support Jargon Buster.

Brief intervention

A brief intervention involves oral discussion, negotiation or encouragement, with or without written or other support or follow-up. It may also involve a referral for further interventions, directing people to other options, or more intensive support. Brief interventions can be delivered by anyone who is trained in the necessary skills and knowledge. These interventions are often carried out when the opportunity arises, typically taking no more than a few minutes for basic advice.

Care home

This covers 24-hour accommodation with either non-nursing care (for example, a residential home) or nursing care.

Carer's assessment

People who care informally on an unpaid basis for a family member or friend have the right to discuss with their local council what their own needs are, separate to the needs of the person they care for. The assessment covers anything the carer thinks would help them with their own health or with managing other aspects of their life. The council will use the information to decide what help it can offer.

Full participation vaccination strategy

A full participation strategy is one in which a range of approaches are used to maximise uptake and in which the expectation is that all front-line staff should be vaccinated. The full participation approach includes agreed mechanisms enabling staff to opt out if they wish.

Primary care

The day-to-day healthcare given by a healthcare provider. Typically this provider acts as the first contact and principal point of continuing care for patients within a healthcare system, and coordinates other specialist care that the patient may need. In the UK, people access primary care services through local general practice, community pharmacy, optometrist, dental surgery and community hearing care providers.

Secondary care

Secondary care is often acute healthcare (elective care or emergency care) provided by medical specialists in a hospital or other secondary care setting. Patients are usually referred by a primary care professional such as a GP.

Finding more information and committee details

To find out what NICE has said on related topics, including guidance in development, see the NICE topic page on immunisation.

For full details of the evidence and the guideline committee's discussions, see the evidence reviews. You can also find information about how the guideline was developed, including details of the committee.

NICE has produced tools and resources to help you put this guideline into practice. For general help and advice on putting our guidelines into practice, see resources to help you put NICE guidance into practice.

Update information

Minor changes since publication

August 2022: We added a link to the NICE guideline on vaccine uptake in the general population. We removed the reference to the Medicines Use Review from recommendation 1.3.1, because pharmacies no longer offer this service.

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