Vaccine xxx (2018) xxx–xxx

Contents lists available at ScienceDirect

Vaccine

journal homepage: www.elsevier.com/locate/vaccine

Population-level factors predicting variation in influenza vaccine uptake among adults and young children in England, 2015/16 and 2016/17

E. Tessier [a,*], F. Warburton [b,1], C. Tsang [a], S. Rafeeq [a], N. Boddington [a], M. Sinnathamby [a], R. Pebody [a]

[a] Respiratory Diseases Department, National Infection Service, Public Health England, London, UK
[b] Statistics and Modelling Economics Department, Public Health England, London, UK

ARTICLE INFO

Article history:
Received 1 February 2018
Received in revised form 6 April 2018
Accepted 25 April 2018
Available online xxxx

Keywords:
Influenza
Vaccination
Uptake
Child
Adult

ABSTRACT

England's influenza vaccination programme targets persons with clinical risk factors, pregnant women, those aged 65 years and older and children. Low vaccine uptake amongst primary school children was previously found to be significantly associated with increasing deprivation, Black or Minority Ethnic (BME) and certain religions. It is unknown whether these population predictors are associated with vaccine uptake in other groups. GP level data for target groups during the 2015/16 and 2016/17 seasons were linearly regressed against various factors to determine potential predictors associated with variation in uptake.

Adjusted uptake for 2–4 year olds during both seasons was more than 11% lower in the most deprived decile and more than 3% lower in 34%+ BME populations compared to the least deprived and non-BME populations. Pregnant women in deprived areas had significantly lower vaccine uptake than in non-deprived areas. Patients 16–64 years old at risk showed no significant variation in uptake by deprivation, whereas patients 65 years and older had more than 3% higher vaccine uptake in the least deprived populations than the most deprived populations. Areas with the highest Muslim and BME populations had a significantly higher vaccine uptake among patients ages 16 to under 65 years old in a clinical risk group than non-Muslim and non-BME populations during both seasons. Population-factors have different effects on vaccine uptake for the various target groups. These findings support segmenting public health activities to improve vaccine uptake and reduce inequalities.

Crown Copyright © 2018 Published by Elsevier Ltd. All rights reserved.

1. Introduction

Achieving high vaccine uptake is paramount in reducing the transmission of infection and protecting a population. England's longstanding selective influenza vaccination programme targets those at higher risk of severe disease following infection and is supported by key national and local bodies including, the Department of Health, the National Health Service (NHS England), Public Health England (PHE), Local Authorities, Clinical Commissioning Groups, GP practices and community pharmacies with the intention to reduce the effects of influenza in the population [1]. During the 2015/16 and 2016/17 seasons, the influenza vaccine was offered to individuals in the following eligible patient groups; all patients aged 65 years and over, all patients aged six months to under 65 years in a clinical risk group, all pregnant women and carers [1,2]. Additionally, a phased universal vaccination programme has been implemented in England offering all children aged 2, 3 and 4 years (based on age as of the 1 September) a single dose of the Live Attenuated Influenza Vaccine (LAIV) in GP practices and to children in primary schools who are eligible for the vaccine primarily through school-based programmes. Children in a clinical risk group who had not received the vaccine in a previous season were offered a second dose of the vaccine. The phased universal programme initially began as a pilot study in 2013/14 (covering children aged 4–11 years) and 2014/15 (covering children aged 4–11 years and 11 to 13 years) in selected pilot areas throughout England. In 2015/16, all children in England of school years 1 and 2 (ages 5 rising to 7 years old) were offered the influenza vaccine, while during the 2016/17 season the programme was extended to include children of school year 3 (ages 7 rising to 8 years old) [3–6]. Nonetheless, influenza vaccine uptake from this newly introduced school based programme remains lower than

Abbreviations: BME, black or minority ethnic; PHE, Public Health England; LAIV, Attenuated Influenza Vaccine; LSOA, Lower Super Output Area; IMD, Index for Multiple Deprivation; ONS, Office for National Statistics.

* Corresponding author.
E-mail address: Elise.Tessier@phe.gov.uk (E. Tessier).
[1] Present address: Oral Clinical Research Unit, King's College London, UK.

https://doi.org/10.1016/j.vaccine.2018.04.074
0264-410X/Crown Copyright © 2018 Published by Elsevier Ltd. All rights reserved.

Please cite this article in press as: Tessier E et al. Population-level factors predicting variation in influenza vaccine uptake among adults and young children in England, 2015/16 and 2016/17. Vaccine (2018), https://doi.org/10.1016/j.vaccine.2018.04.074

for other recommended vaccines in England such as the HPV, TD/IPV and MenACWY delivered school based vaccination programmes [7–9].

Previous studies on predictors for low influenza vaccine uptake in primary school aged children across England show that deprivation, ethnicity and religion are significantly associated with a lower uptake [10,11]. It is unknown whether these factors are associated with vaccine uptake among the remaining eligible groups who are offered the influenza vaccine.

The aim of this study was to assess the variation in influenza vaccine uptake across England in key eligible patient groups during the 2015/16 and 2016/17 seasons. Additionally, the study aimed to assess at an ecological level the difference in predictors of vaccine uptake during the 2015/16 and 2016/17 seasons between children and adult eligible cohorts.

A better understanding of the key predictors for lower vaccine uptake among these populations according to key groups may assist in identifying optimal strategies to improve uptake.

2. Methods

2.1. Data

Data collections were mandatory throughout England and returned cumulatively on a monthly basis from 1 September to 31 January during the 2015/16 and 2016/17 influenza seasons. The total number of eligible patients registered and the total number of patients who received at least a single dose of the influenza vaccine were collected at the GP practice level across England and submitted manually or via automated extractions through the PHE commissioned website, ImmForm [12].

2.2. Uptake

Influenza vaccine uptake was calculated by dividing the total number of patients registered in the GP practices who received at least one dose of the influenza vaccine by the total number of patients (based on age as of the 1 September 2015 and 2016 for the children and age as of the 31 of March 2016 and 2017 for the 16 to 65 patients in a clinical risk group and all patients over 65 years old during the 2015/16 and 2016/17 seasons, respectively) registered in the GP practices eligible for the vaccination during the months of September to January during both seasons. The dates used for age determination for the children reflects the birth cohorts used by the Department of Education for school rolls in order to facilitate vaccination campaign, whereas the birth cohorts for the adult populations reflects GP payment schemes.

2.3. Population-level characteristics

Data were aggregated by PHE region (North of England, Central (Midlands and East of England), London, and South of England). GP practice post codes were matched to Lower Super Output Area (LSOA), a hierarchy generated by the Office for National Statistics (ONS) to report small areas of statistics for England and decile of the Index for Multiple Deprivation (IMD) [13,14]. The 2015 IMD scores are assigned to each LSOA summarizing a relative level of deprivation based upon income, employment, health, education, crime, access and living environment [15,16]. As the score increases, the level of deprivation increases.

Data on religious beliefs, ethnicity by age and sex, urban and rural classification was matched to LSOA from Nomis provided by the ONS [17].

Information on ethnic constitution were assigned to each LSOA in the following categories: White/Mixed/Asian/Black/Other while the religious constitution of each LSOA was categorized as: Christian/Buddhist/Hindu/Jewish/Muslim/Sikh/Other/None [16,18]. The proportion of LSOA classified as black or minority ethnic (BME, defined as Black or Minority British) were categorically grouped into quartiles, while LSOA's identifying as Jewish were grouped into 0% and >0% and Muslim into 0%, 1–5%, and 6%+, based on the distribution of the data.

Additionally, each LSOA was categorized as rural (town and fringe/ village or hamlet/isolated dwelling) or urban (major conurbation/ minor conurbation/ city and town) based on the ONS 2011 census [13].

Finally, the results from the primary school age delivery programme indicate that pilot areas have a higher vaccine uptake than the remaining areas in the country [10]. As a result, the 11 Local Authorities that served as pilot areas for the primary school aged programme were included as a population-level characteristic. These areas are: Bury, Gateshead, South Tyneside, Sunderland, Southend-on-Sea, Thurrock, Essex, Leicester, Rutland, Leicestershire, and Havering [5,11].

2.4. Statistical methods

A total of four patient groups were assessed: 2–4 year olds, 16 years to less than 65 years in a clinical risk group, patients aged 65 years and older and pregnant women. Primary school aged children in school years 1 and 2 (5–7 years, during the 2015/16 season) and in school years 1, 2 and 3 (5–8 years, during 2016/17 season) were previously assessed [10,11].

Linear regression analyses were undertaken as previously described [6,19]. GP-practice level influenza vaccine uptake data for each of the four patient groups were linearly regressed against the population-level predictors (PHE region, deprivation, BME, religious constitution, rurality and pilot status) to determine variation in uptake. All population characteristics were controlled for in multiple linear regressions and the model fit was assessed as conducted by Green et al. and in the previous UK annual reports [6,10,11].

3. Results

3.1. Data

During the 2015/16 and 2016/17 seasons there were a total of 7630 and 7436 GP practices, respectively. The response rate varied for each of the eligible groups but the overall response rate was greater than 90% for all groups (Table 1).

3.2. Uptake

Variation in uptake was observed across each of the eligible patient groups and was highest for patients 65 years and older and lowest among children ages 2–4 years old during both seasons. Vaccine uptake increased among children ages 2–4 years old, patients 16 to under 65 years old in a clinical risk group and pregnant women during the 2016/17 season. However, uptake decreased among patients ages 65 year and older, The total number of patients vaccinated (numerator) and the total number of eligible patients (denominator) both increased during the 2016/17 season resulting in a lower vaccine uptake compared to the 2015/16 season (Fig. 1).

3.3. Linear regression

Results from the multivariable analyses during both seasons showed a significantly lower vaccine uptake in London compared to the North of England in all four eligible groups. Uptake was

Please cite this article in press as: Tessier E et al. Population-level factors predicting variation in influenza vaccine uptake among adults and young children in England, 2015/16 and 2016/17. Vaccine (2018), https://doi.org/10.1016/j.vaccine.2018.04.074

Download English Version:

https://daneshyari.com/en/article/8485641

Download Persian Version:

https://daneshyari.com/article/8485641

Daneshyari.com