



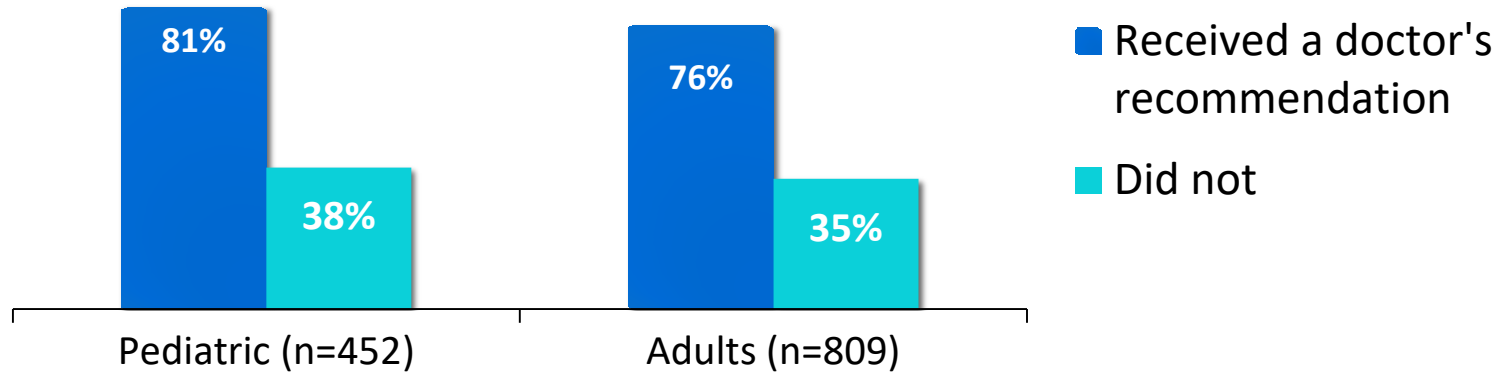
EMPOWERING CLINICIANS TO BECOME CHAMPIONS FOR INFLUENZA VACCINATION

HCP Recommendations Drive Flu Vaccinations¹

Percent Receiving Vaccination in Doctor's Office

| | |
|-------------------|----------------|
| 73% | 53% |
| Pediatric (n=427) | Adults (n=835) |

Percent Receiving Vaccination With and Without a Doctor's Recommendation



Reference: 1. Sanofi Pasteur. Data on file (2015-2016 National consumer influenza immunization study: immunization trends), July 2016. MKT32484.

Even When Vaccine Effectiveness (VE) is <50%, Current Vaccines Can Have a Major Impact^{1,2}

BRIEF REPORT

Modeling the Effect of Different Vaccine Effectiveness Estimates on the Number of Vaccine-Prevented Influenza-Associated Hospitalizations in Older Adults

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CID: Modeling Effect of VE on Preventing Hospitalizations in 65+

40% VE would prevent 60,000 hospitalizations

Older adults aged ≥65 years, a population at increased risk for complications associated with influenza. During 2012–2013, the rate of laboratory-confirmed influenza-associated hospitalizations in older adults was 3- to 6-fold higher than during the 2 previous seasons [4]. Influenza vaccination is the main prevention strategy for influenza. During 2012–2013, interim estimates of influenza vaccine effectiveness against medically attended laboratory-confirmed influenza acute respiratory illness indicated moderate effectiveness; however, the lowest estimates were reported for older adults [5]. To explore the range of hospitalizations that could be prevented with different levels of vaccine

effectiveness in mild and moderate severity seasons in this vulnerable group, we used a previously published model to estimate the number of prevented or averted hospitalizations from influenza vaccination and applied a range of hypothetical vaccine effectiveness estimates [2]. We used rates of influenza-associated hospitalizations from 2 seasons: 2012–2013, representing a moderate to severe season, and 2011–2012, a mild season.

Received 5 February 2014; accepted 28 April 2014; electronically published 8 May 2014.
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Clinical Infectious Diseases, 2014;59(3):406–409.
Published by Oxford University Press on behalf of the Infectious Diseases Society of America, 2014.
This work is written for US Government employees and is in the public domain in the US.
DOI: 10.1093/cid/cit528

406 • CID 2014:59 (1 August) • BRIEF REPORT

2011–2012 were derived from vaccination status reported by self or proxy via the Behavioral Risk Factor Surveillance System and only cover the noninstitutionalized population [7]. Using the reported vaccination coverage estimates and a range of hypothetical vaccine effectiveness estimates varying from 10% to 70%, we estimated the number of influenza-associated hospitalizations that would have occurred in the absence of vaccination; the number of reported hospitalizations was subtracted from those occurring in the absence of vaccination to estimate the number of averted hospitalizations for each hypothetical vaccine effectiveness estimate. We estimated the number needed to vaccinate to prevent 1 hospitalization (NNTV) by number vaccinated (vaccine coverage × population), divided by the number of prevented hospitalizations. The prevented fraction was the proportion of averted hospitalizations divided by the estimated number of hospitalizations without vaccination. This model does not account for indirect effects of vaccination.

Optimizing the impact of low-efficacy influenza vaccines

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Contributed by Burton H. Singer, March 30, 2018 (sent for review February 9, 2018; reviewed by Anthony S. Fauci and David Fisman)

The efficacy of influenza vaccines varies from one year to the next, with efficacy during the 2017–2018 season anticipated to be lower than usual. However, the impact of low-efficacy vaccines at the population level and their optimal age-specific distribution have yet to be ascertained. Applying an optimization algorithm to a mathematical model of influenza transmission and vaccination in the United States, we determined the optimal age-specific uptake of low-efficacy vaccine that would minimize incidence, hospitalization, mortality, and disability-adjusted life-years (DALYs), respectively. We found that even relatively low-efficacy influenza vaccines can be highly impactful, particularly when vaccine uptake is optimally distributed across age groups. As vaccine efficacy declines, the optimal distribution of vaccine uptake shifts toward the elderly to minimize mortality and DALYs. Health practitioner encouragement and concerted recruitment efforts are required to achieve optimal coverage among target age groups, thereby minimizing influenza morbidity and mortality for the population overall.

mathematical model | age structured | vaccination | DALY | hospitalization

A century since the 1918 influenza pandemic killed an estimated 50–100 million people, influenza remains a global threat. Influenza causes 9.2–35.6 million infections, 140,000–710,000 hospitalizations, and 12,000–56,000 deaths every year in the United States alone [1]. The rapid evolution of influenza antigens requires annual reformulation of the vaccine. Escalating this natural antigenic evolution, viral adaptation may occur within the chicken eggs used in the manufacture of the inactivated vaccine [2]. In the current 2017–2018 influenza season, such adaptation has reduced the efficacy against H3N2 (3), the strain that is dominating the US epidemic [4]. The lower vaccine efficacy is

45% mean. To identify socially optimal vaccine uptake for low-efficacy influenza vaccines, we applied an optimization algorithm to our model. We consider both impact and optimal uptake in terms of minimizing incidence, hospitalizations, deaths, and disability-adjusted life-years (DALYs). DALYs measure disease burden by capturing both morbidity and mortality, in which a single DALY represents 1 lost year of healthy life [9]. Our results indicate that as efficacy declines, optimal uptake to minimize mortality and DALYs shifts some doses from school-age children and young adults, who have disproportionately high transmission rates, to the elderly, who are at greater risk for severe clinical outcomes. We further show that even for vaccines with lower efficacy, optimal uptake is projected to substantially reduce incidence, hospitalizations, deaths, and DALYs compared with projections under typical US vaccine uptake.

Results

We first simulated epidemiological trajectories projected under age-specific vaccination coverages that are typical in the United States. We then considered the optimal uptake of 140 million doses (the average number of doses that have been delivered annually over the five seasons spanning 2012–2017), equivalent to a coverage of 43%. Epidemiological outcomes of infections, hospitalizations, deaths, and DALYs averted were compared with no vaccination. Specifically, in the absence of vaccination, about 77 million infections, 470,000 hospitalizations, and 130,000 deaths would be expected during an influenza season.

Significance

The efficacy of the influenza vaccine against the predominant

PNAS; Optimizing the Impact of Low-efficacy Influenza Vaccines

20% VE projected to avert 130,000 hospitalizations and 62,000 deaths

References: 1. Fry AM, et al. *Clinical Infectious Diseases*. 2014;59(3):406–409. 2. Sah P, et al. *PNAS*. 2018;115(20):5151–5156.

Research Shows “Words that Work” Can Change Behavior

- Parents, patients, and the healthcare team underappreciate impact of influenza
 - Each year, the flu is one of the deadliest vaccine-preventable diseases. It kills more children in the U.S. than meningococcal meningitis and whooping cough combined
 - This past season adults 50 yrs of age. and older had the highest rates of hospitalization
 - Seniors 65 and adults with chronic conditions tend to have the worst outcomes from influenza
- Similar messages on risk of influenza resonated between HCPs and Parents
 - Parent’s and patients appreciated understanding role of vaccination on reducing severe outcomes
 - Influenza affects all, not only very young or very old or those who are immunocompromised

Root Causes for Flu Vaccination Hesitancy and Where to Focus

Root Causes:

- Perceived lack of vaccine efficacy
- Lack of understanding of the devastation influenza has and the benefits of vaccination

Where to Focus:

- HCP
 - Presumptive approach – “Flu shot today, left or right arm?”, flu vaccination not optional
 - Arm with key facts that are simple to address with patients
- Parents and Patients
 - Increase awareness of the devastation of influenza and the importance of vaccination at point of care

FLUency

Share the facts. Not the flu.

SUPPORTING YOUR INFLUENZA IMMUNIZATION EFFORTS ACROSS ALL AGES

FLUency Share the facts. Not the flu.
SEE THIS POSTER COME TO LIFE!
DOWNLOAD FLU AR, OUR AUGMENTED REALITY APP TO EXPLORE THE POSTER BEHIND THE POSTER.

FLUency Share the facts. Not the flu.
SEE THIS POSTER COME TO LIFE!
DOWNLOAD FLU AR, OUR AUGMENTED REALITY APP TO EXPLORE THE POSTER BEHIND THE POSTER.

WHEN IT COMES TO THE FLU, YOUR CHILD IS AT RISK.

171* FLU-RELATED PEDIATRIC DEATHS WERE REPORTED IN THE 2016-2017 INFLUENZA SEASON.

75% OF CHILDREN WHO DIED FROM THE FLU HAD NOT BEEN VACCINATED.

56% OF CHILDREN WHO DIED FROM THE FLU WERE OTHERWISE HEALTHY.

33,000 CHILDREN WERE HOSPITALIZED WITH FLU-RELATED COMPLICATIONS.

6 MILLION ADULTS 50+ VISITED THEIR DOCTOR DUE TO THE FLU.

500,000 ADULTS 50+ WERE HOSPITALIZED DUE TO THE FLU.

10X A RECENT STUDY SHOWS THAT THE RATES OF HEART ATTACKS INCREASED ALMOST 1-3 DAYS AFTER FLU INFECTION.

FLUency Share the facts. Not the flu.

FLUENCY AR POSTER

*Poster and AR app are also available in Spanish

DON'T DELAY. GET VACCINATED TODAY.

FLUENCY AR POSTER

*Poster and AR app are also available in Spanish



FLU AR APP/ EXPERIENCE

FLUency Share the facts. Not the flu.

THE FLU: MORE THAN JUST A SICK DAY.
UNDERSTAND THE SERIOUS RISKS OF FLU IN ONE HOUR.

30 MILLION CASES OF THE FLU ARE REPORTED EACH YEAR.

17 MILLION WORK DAYS ARE MISSED DUE TO FLU IN A FAMILY OF SIX.

\$1,844 IN MEDICAL EXPENSES AND LOST WAGES.

WORK TOWARD BETTER HEALTH. GET VACCINATED TODAY!

NAME: _____
LOCATION: _____

EMPLOYEE HEALTH POSTER

FLUency Share the facts. Not the flu.

30 MILLION CHILDREN REMAINED UNVACCINATED AGAINST THE FLU.

IN THE 2016-2017 FLU SEASON, MORE THAN 500,000 ADULTS 50+ WERE HOSPITALIZED DUE TO THE FLU.

IT'S NOT TOO LATE FOR A FLU VACCINATION. GET YOUR CHILD VACCINATED TODAY.

GET THE VACCINATION THAT'S RIGHT FOR YOU TODAY.

FACEBOOK CONTENT

IN 2016, OVER 30 MILLION CHILDREN 6 MONTHS TO 17 YEARS OF AGE REMAINED UNVACCINATED AGAINST THE FLU.

IN THE 2016-2017 FLU SEASON, MORE THAN 500,000 ADULTS 50+ WERE HOSPITALIZED DUE TO THE FLU.

GET THE VACCINATION THAT'S RIGHT FOR YOU TODAY.

FLUency Share the facts. Not the flu.

TWITTER CONTENT

FLUency

Share the facts. Not the flu.

SUPPORTING YOUR INFLUENZA IMMUNIZATION EFFORTS ACROSS ALL AGES

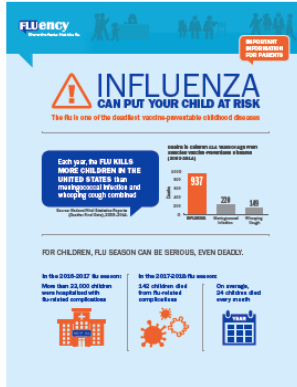
**IT'S NOT TOO LATE
VACCINES ARE STILL AVAILABLE
▶▶▶ GET VACCINATED TODAY**

FLUency FACTS: FLU ACTIVITY OFTEN PEAKS IN FEBRUARY AND CAN EVEN LAST INTO MAY

**FLU VACCINES ARE AVAILABLE!
▶▶▶ GET VACCINATED TODAY**

FLUency
Share the facts. Not the flu.

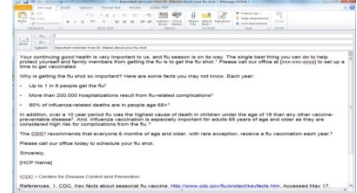
IN-SEASON CLING
*Also available in Spanish



HCP-to-Parent Flashcard



Email Templates



**HELP PROTECT YOURSELF AND YOUR FAMILY!
IF YOU'RE RISKY, APPOINTMENT**

LETTERS

M T W T F S

TEXT

CALL

DON'T FORGET—ASK ABOUT THE FLU VACCINE

EVERY YEAR, UP TO 1 IN 5 PEOPLE GETS THE FLU IN THE UNITED STATES

FLUency
Share the facts. Not the flu.

APPOINTMENT CARDS

WELLCONNECT

Importance of Influenza Vaccination

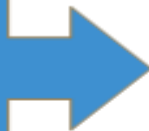
Influenza Vaccination for High-Risk Patients

SANOFI PASTEUR

WELLCONNECT® SCRIPTS

Pediatric Example

Influenza
Pediatric
Unbranded
Disease
Awareness
Flashcard

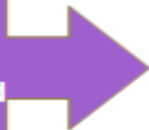


HCP Flashcard



Patient Poster & Flashcard

FLUency
Consumer
Flashcard and
Poster



Pediatric Example

■ HCP “ Words that Work”

- Influenza is the disease we are furthest from our goal
 - Influenza kills more children each year when compared to other vaccine preventable diseases
 - Last year influenza impacted 183 families
- Data From the CDC Show That Influenza Deaths Affect All Pediatric Age Groups
 - Approx. 80% of children who died from influenza last year weren't vaccinated
- Influenza impacts otherwise healthy children
 - Approx. 60% of those children who died were otherwise healthy
- Pediatric influenza immunization rates are low

■ Parent/Patient “ Words that Work”

- Influenza can put your child at risk
- Each year flu kills more children in than any disease we vaccinate to help prevent
- Influenza can be serious, even deadly for all children – including those who are otherwise healthy
- Approx. 80% of children who died last season were not vaccinated
- Approx. 60% of children who died from influenza were otherwise healthy
- Approx. 33,000 children are hospitalized annually from flu related complications
- Today we are going to give a flu shot

Fluency Resources Available to NAIIS Members

VaccineShopper.com

Welcome Search All Products and Resources

REGISTER | LOG IN

Login Products Why Sanofi Pasteur Product Information **Patient Education**

Patient Education

WELCOME to the Patient Education section, which includes downloadable materials that can help you educate your patients and their caregivers about the importance of immunization. Log-in for additional resources and to request free, printed materials.

FLUency

To request free printed materials, log-in and select from the options below.

Posters

View All Posters

Email Templates

View All Email Templates

Office Support Tools

See All Office Support Tools

Influenza **Meningococcal Disease** **Other Resources**

Posters

50+ Adults Influenza Poster

This informational poster features Augmented Reality (AR). Download 'Flu AR' from the App Store to watch this poster come to life! Display on windows and walls to share facts about influenza immunization and encourage adults aged 50+ to get vaccinated against the flu at your practice.

click image to preview

65+ Adults Influenza Poster

Informational poster for display on windows and walls to share facts about influenza immunization and encourage adults aged 65+ to get vaccinated against the flu at your practice.

click image to preview

<https://www.vaccineshoppe.com/index.cfm?fa=anon.pe>

- Email templates
- Office support tools (flashcards, posters, clingz, telephone scripts)
- Facebook social media posts
- Twitter social media posts
- Spanish materials

Thank you