

# Use of Influenza and Pneumococcal Vaccine in People with Diabetes

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## DISCLOSURE STATEMENT

We have no financial disclosure to make.  
This project is based on publicly available data  
from the Centers for Disease Control and  
Prevention

## STUDY OBJECTIVES



- The purpose of our study is to examine disparities in the use of Influenza and Pneumococcal Vaccines among adult diabetic Americans

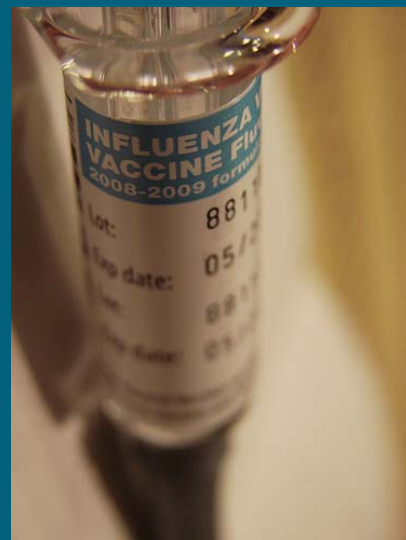
Further, through our analysis we identify systemic barriers to immunization for these two potentially life threatening conditions

In our conclusion, we offer several recommendations for improving immunization rates for influenza and pneumonia among diabetics

## LEARNING OBJECTIVES

Upon completion of this session, participants will be able to:

- Describe the potential risk of complications faced by diabetic patients who abstain from the influenza and pneumococcal vaccines
- Describe the benefits of immunization with influenza pneumococcal vaccines among diabetics
- Articulate possible strategies to uptake of the influenza and pneumococcal vaccines among diabetics



## Background

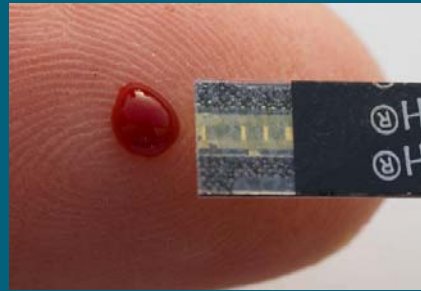
- Infection with influenza or pneumococcal disease can result in serious complications for individuals with diabetes
- Current immunization guidelines for the influenza and pneumococcal vaccines identify diabetics as one of the major target groups
- The the Advisory Committee on Immunization Practices (ACIP) has a national target immunization rate of 60% for both the ***influenza and pneumococcal*** vaccines among diabetic patients <sup>3</sup>
- Type I and II diabetic patients have shown an increased risk for lower respiratory tract infection, skin and mucous membrane infection, and urinary tract infection <sup>3</sup>

## Background

- Research has shown low immunization rates for the influenza/pneumococcal vaccines in the general US population <sup>4</sup>
- Diabetic patients infected with the influenza virus face serious complications including pneumonia, dehydration, kidney failure, heart failure, and hospitalization
- Death rates among diabetic patients have been shown to increase 5-15% during influenza epidemics <sup>2</sup>
- In diabetic patients who died between 25 - 64 years of age, the cause of death due to influenza infection was more likely to be listed on a death certificate than cause of death due to diabetes <sup>5</sup>

## Background

- Influenza and pneumococcal vaccinations have been shown to decrease diabetic patients' risk for several diseases.
- Persons with diabetes that had received the influenza vaccination during the time immediately preceding an epidemic had seen a reduction in hospitalization time <sup>1</sup>



## Methods

- We analyzed data for diabetic adult Americans (n=57,480) from the 2010 Behavioral Risk Factor Surveillance System using STATA 12 software package for Windows
- Data were weighted and adjusted for the complex sampling strategy used in the BRFSS data collection
- In addition to descriptive statistics, bivariate analysis was performed to determine associations between the covariates and uptake of influenza and pneumococcal vaccines
- Multivariate logistic regression analysis was also performed to estimate the odds of influenza and pneumococcal vaccine uptake

## Results

- Descriptive Statistics
- Bivariate Statistics
- Logistic Regression Results

Table 1: Demographic Characteristics

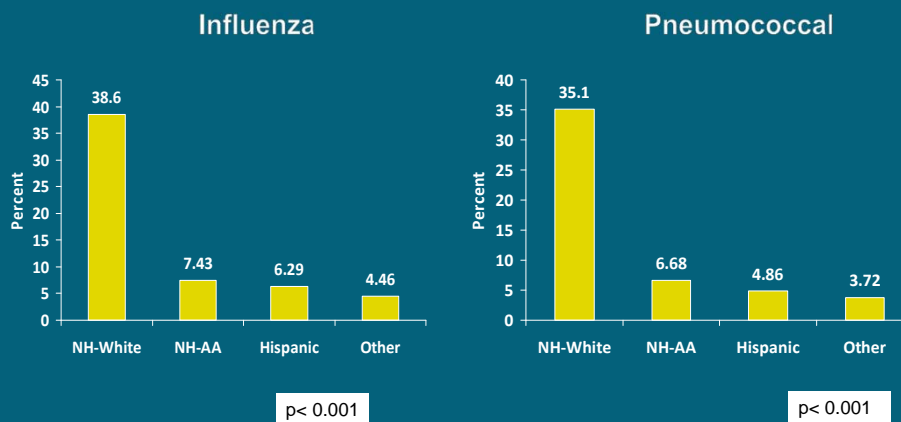
	No. Obs	Weighted %
<b><i>Age</i></b>		
< 35	972	5.21
35 -49 yrs	5610	17.6
50 -64 yrs	20867	38.1
> 64	29592	38.4
Missing	439	0.66
<b><i>Gender</i></b>		
Female	34193	49.5
Male	23287	50.5

Table 2: Distribution of Vaccine Use by Gender

	Females		Males	
	No. Obs	Weighted %	No. Obs	Weighted %
<i>Influenza</i>				
Yes	21169	28.5	14627	28.3
No	13024	21.0	8660	22.2
<i>Pneumococcal</i>				
Yes	20840	26.5	12957	23.9
No	13353	23.0	10330	26.6

\*\* p < 0.001

Figure 1: Influenza and Pneumococcal Vaccine Uptake by race/ethnicity among Diabetics



### Distribution of Vaccine Use by Gender

	Females		Males		Chi-square
	No. Obs	Weighted %	No. Obs	Weighted %	
<b>Influenza</b>					3.00 <sup>+</sup>
Yes	21169	28.5	14627	28.3	
No	13024	21.0	8660	22.2	
<b>Pneumococcal</b>					58.91 <sup>***</sup>
Yes	20840	26.5	12957	23.9	
No	13353	23.0	10330	26.6	

Significance Level: + = not significant \*\*\* p < 0.0001

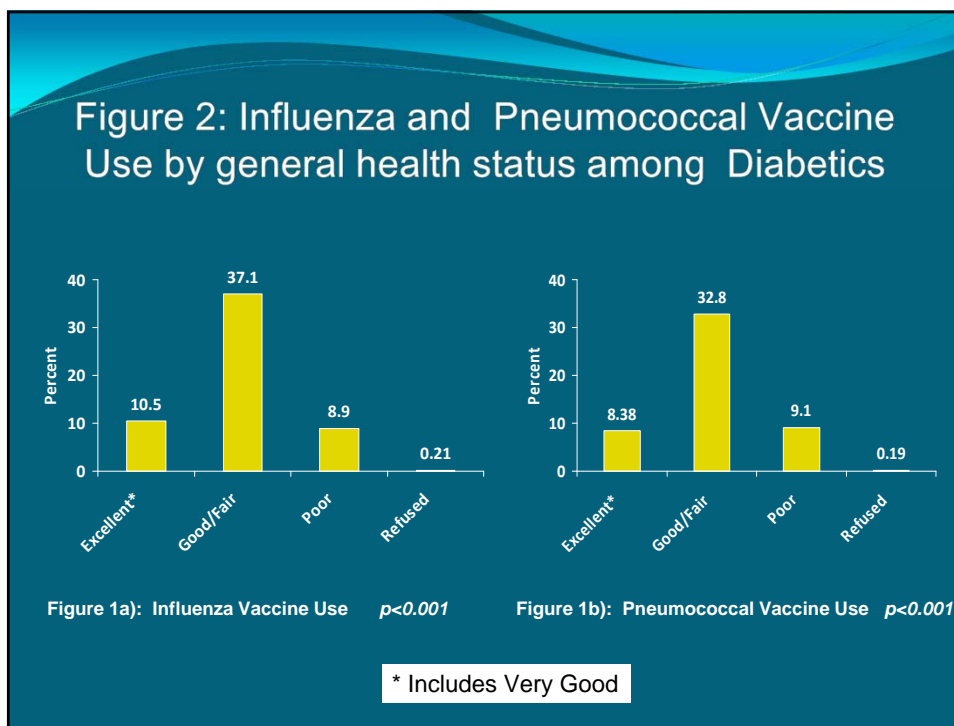
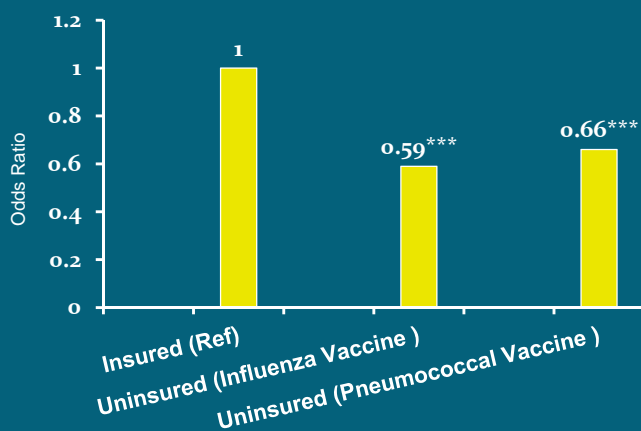


Figure 3: Odds Ratio of Influenza and Pneumococcal Vaccine Uptake by Insurance Status



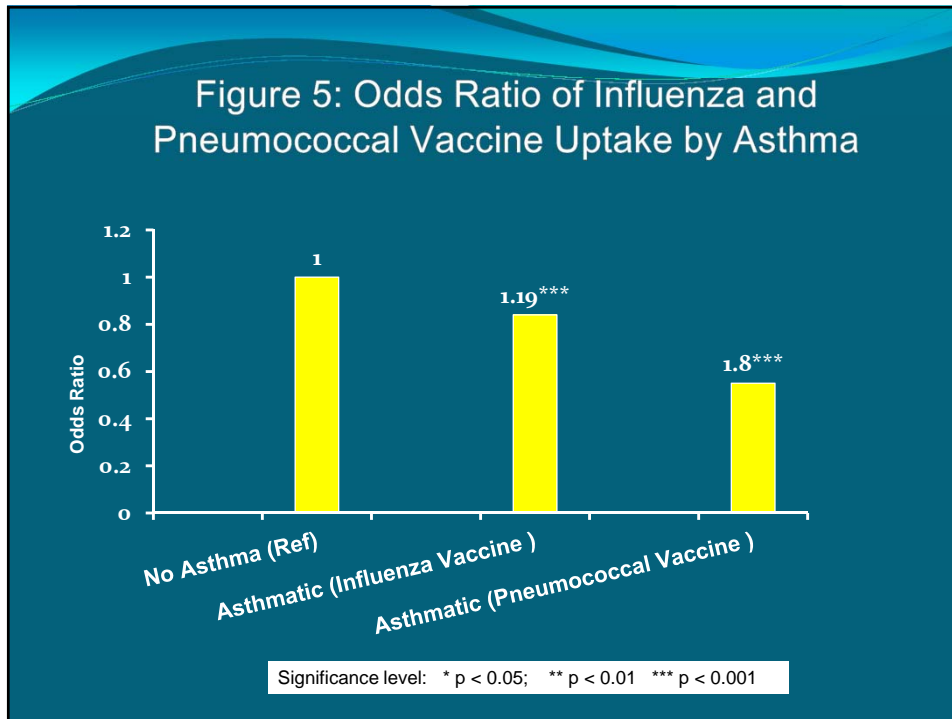
Significance level: \* p < 0.05; \*\* p < 0.001 \*\*\* p < 0.0001

Figure 4: Odds Ratio of Influenza and Pneumococcal Vaccine Use by Income



Significance level: \* p < 0.05; \*\* p < 0.001 \*\*\* p < 0.0001





## Conclusion and Recommendations

- Whereas the Advisory Committee on Immunization Practices (ACIP) recommends that all diabetic individuals receive at least one pneumococcal and influenza vaccination during their lifetime, our analysis show that disparities persist.
- These results suggest that diabetics continue to experience systemic barriers to essential preventive services such as immunizations, that can be critical to avoiding major complications including death
- These disparities remain even after controlling for other variables such as income, educational level and gender, and insurance status.



## Conclusion/Recommendations

- In order to achieve the Healthy People 2020 benchmarks for diabetes, efforts must be made to increase access to insurance coverage



## References

- <sup>1</sup> Colquhoun, A., Nicholson, K., Botha, J., & Raymond, N. (1997). Effectiveness of influenza vaccine in reducing hospital admissions in people with diabetes. *Epidemiology and Infection*, 119, p. 335-341
- <sup>2</sup> Diepersloot, R., Bouter, K., & Hoekstra, J. (1990). Influenza Infection and Diabetes Mellitus: Case for Annual Vaccination. *Diabetes Care Journal*, 13(8), p. 876-882. doi: 10.2337/diacare.13.8.876
- <sup>3</sup> Muller, L., Gorter, K., Goudzwaard, W., Schellevis, F., Hoepelman, A., & Rutten, G. (2005). Increased Risk of Common Infections in Patients with Type 1 and Type 2 Diabetes Mellitus. *Clinical Infections Diseases*, 41(3), p. 281-288. doi: 10.1086/431587
- <sup>4</sup> Smith, S. & Poland, G. (2000). Use of Influenza and Pneumococcal Vaccines in People with Diabetes. *Diabetes Care Journal*, 23(1), p. 95-108. doi: 10.2337/diacare.23.1.95
- <sup>5</sup> Valdez, R., Narayan, K., Geiss, L., & Engelgau, M. (1999). Impact of diabetes mellitus on mortality associated with pneumonia and influenza among non-Hispanic black and white US adults. *American Journal of Public Health*, 89(11), p. 1715-1721. doi: 10.2105/AJPH.89.11.1715