

# An Evidence-Based Educational Strategy to Improve Influenza Vaccination Rates Among Hospital Nurses

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**Sigma Theta Tau International Research Congress**

P03 – Global Disease Prevention in Influenza Sunday

July 30, 2017, 2:30 PM to 3:15 PM

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# NURSING RESEARCH CONGRESS

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# INTRODUCTION

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- Seasonal influenza, or the flu, impacts over 3 million people annually.
- Nosocomial infection and absenteeism are frequently associated with the flu.
- The CDC recommends flu vaccination for all eligible individuals, especially health care workers (HCWs).
- Interventions associated with increased HCW vaccination include educational programs and occupational health campaigns to address misconceptions regarding vaccine safety and efficacy.

# BACKGROUND

## Influenza

20th century influenza virus; Sixth leading cause of mortality in the USA.

Annual outbreaks result in 3-5 million severe cases; between 250,000 and 500,000 deaths

Adults between the ages of 25-64, unemployed and lower socio-economic status at 25% risk for the virus.

## Influenza Vaccine

Vaccine comprised of antigens 3 or 4 virulent influenza virus strains

Develop antibodies 2 weeks

Safety

CDC & ACIP recommendation as #1 prevention for influenza

## RNs and HCWs

HCW are at high risk of influenza exposure

Vaccination is primary defense for HCW

Rates are FAR below the goal of Healthy People 2020 90% recommendation

## Consequences

Absenteeism

Increased cost of employee sick care

Cost of replacement

Short Staffing = Possible Decrease in Quality

Hofman, Ferracin, Marsh, & Dumas, (2006); Zhang, While, & Norman, (2011); Anikeeva, Mayer, & Rogers, (2009).

# EVIDENCE-BASED SIGNIFICANCE

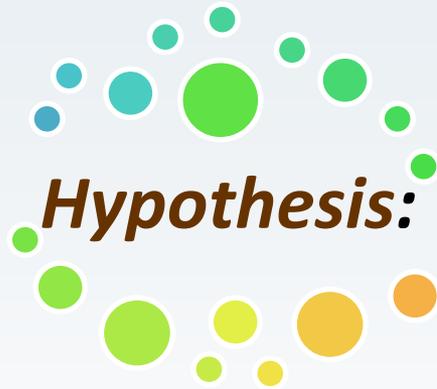
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- Gap in research literature; utilizing a conceptual framework, such as the Health Belief Model, can guide health behavior changes.
- Behavior change and health promotion initiatives designed to prevent the spread of influenza in hospitals are more effective when based on behavioral theory.
- Studies that explored the challenges and barriers of vaccination rates among RNs and HCW result in significant improvements of rates from 40% to 87% using evidence-based interventions.
- Interventions included free on-site influenza vaccine clinics, education, incentives, and feedback sessions
- Effective vaccine campaigns result in a positive ROI

Hofmann, Ferracin, Marsh, & Dumas, (2006); Toronto & Mullaney (2010); Ofstead, Tucker, Beebe, & Poland (2008).

# RESEARCH HYPOTHESIS & QUESTION

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A structured influenza vaccination educational program will improve influenza vaccination rates among an RN population in an acute care setting.

How does an internal web-based educational program impact the RN influenza vaccination rate in an acute care setting as measured by vaccine uptake rate in RNs receiving than not receiving education?

# PURPOSE

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- Seasonal influenza impacts over 3 million people each year.
- Within the health sector, nosocomial infection and absenteeism are frequently associated with the flu.
- The Centers for Disease Control and Prevention (CDC) recommend flu vaccination for all eligible individuals, especially health care workers (HCWs).
- Interventions associated with increased HCW vaccination include educational programs and occupational health campaigns to address misconceptions regarding vaccine safety and efficacy.

# GOALS & OBJECTIVES

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**Present Goal:** Improve vaccine uptake by RNs through the use of a web-based educational module.

**Future Goal:** To improve the RN influenza vaccination rates in the project hospital to the 90% national goal.

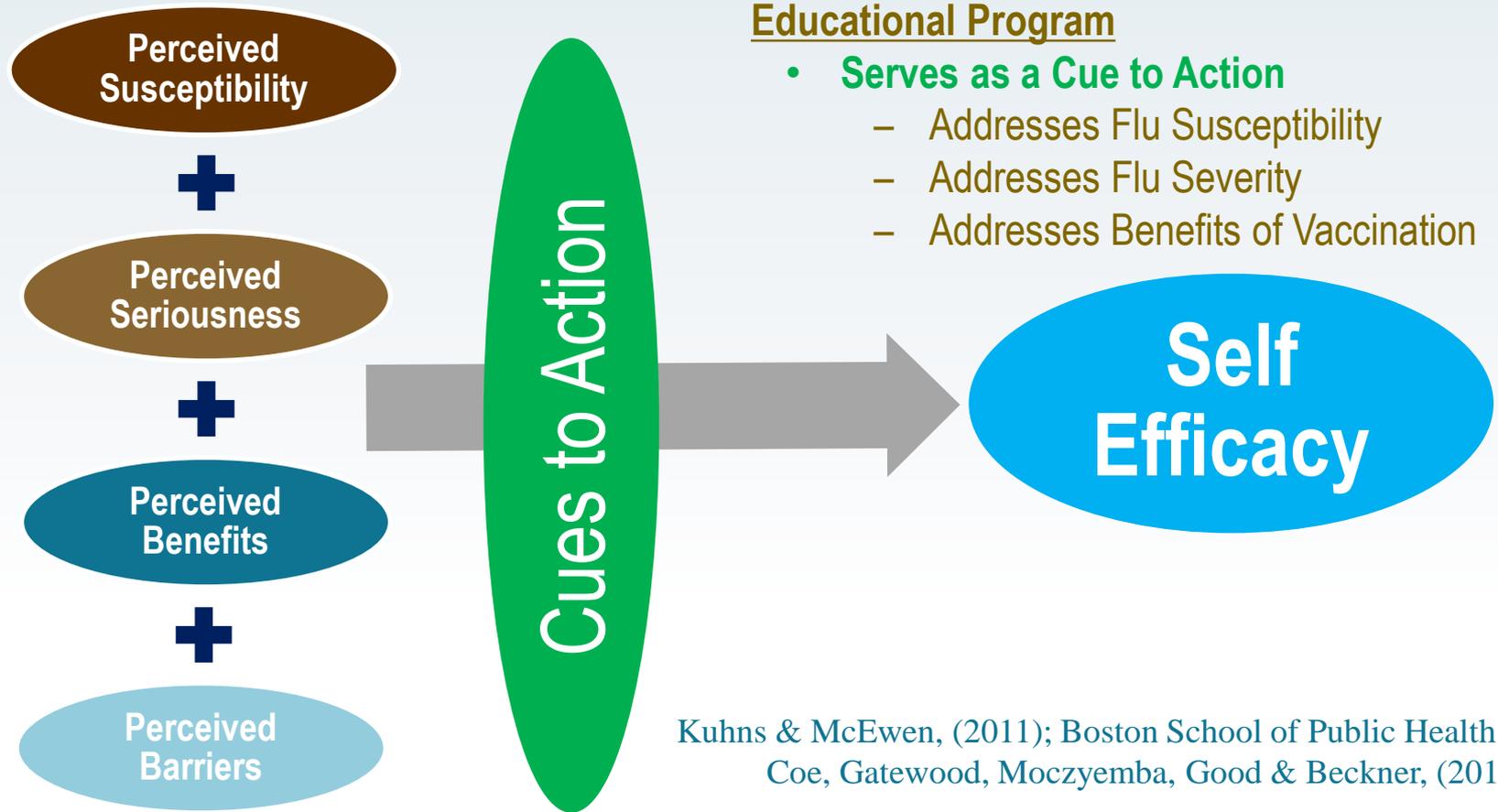
Develop and implement a web-based educational program (based on the Health Belief Model) that addresses common perceptions, beliefs and information about the influenza virus and influenza vaccination

Develop data collection tool to measure the influenza vaccination rates for RNs at IHNV.

Measure the effectiveness of the education program through improvement in vaccination rates in a convenience sample population of RNs' at IHNV.

Develop a plan for dissemination plan to report the program evaluation in order to inform the organization about the outcome and to inform of future studies

# CONCEPTUAL FRAMEWORK



Kuhns & McEwen, (2011); Boston School of Public Health (n. d.);  
Coe, Gatewood, Moczyemba, Good & Beckner, (2012)

# PROJECT SETTING

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## Inspira Health Network

- Charitable nonprofit network
- 4 Hospitals
- Rural Southern NJ
- Magnet Designated
- DNV & ISO Accredited

## Inspira Health Network Vineland (IHNV)

- Primary project site
- Educational intervention
- RN surveyed at vaccine clinic

## Inspira Health Network Elmer (IHNE)

- A nearby campus
- Non-Equivalent Group for Comparison
- No Educational Intervention
- RNs surveyed at vaccine clinic

Inspira Health Network (n. d.).

# PROJECT DESIGN

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## DESIGN

- Quasi-experimental non-equivalent group design
- Convenience (non-randomized) samples
  - *Groups of participants are formed under circumstances (self-selection) that do not permit the researcher to control the assignment of the individuals to groups, therefore, the groups are pre-existing and non-equivalent*

## MEASUREMENT TOOL

- Anonymous paper survey (4 questions)

# METHODS: SAMPLE POPULATION

## Participants

- Nurses at all levels ranging from executive to leadership to clinical

## Inclusion Criteria

- All RNs employed at the IHNV and IHNE campuses
- Participate in Influenza Vaccination Campaign and Complete Study Tool

## Exclusion Criteria

- RNs' who are ineligible to receive vaccination
- RNs' temporarily assigned to IHNV
- RNs' who are non- IHNV employees
- RNs' who received were previously vaccinated at a site other than IHNV

## Sample Size

- Power analysis (*a priori*); Sample size of 80 participants for analysis
- > 220 for analysis in aggregate with power = 0.95; large effect size ( $w=0.5$ )
- Sample size crucial for strong nonparametric testing
- Chi-square goodness-of- fit test

# METHODS: INTERVENTION OVERVIEW

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Web-based influenza virus and vaccination educational learning program



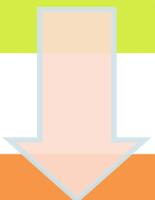
Voluntary participation in the intervention, a 15 minute education learning program



Based on knowledge gaps identified in literature review



Formatted in accordance with the principles of the HBM



Available during employee influenza vaccination campaign (Oct to Feb).

# METHODS: RECRUITMENT & ASSIGNMENT

## Recruitment to Education

Recruited via Email  
Announcement  
Flyers Posted  
Included in Staff Meetings

### Intervention Group

Receive Study Survey @  
Time of Vaccination or  
Declination  
Return Anonymous  
Surveys to Locked Drop  
Box

### Comparison Group

No Education  
Receive Study Survey @  
Time of Vaccination or  
Declination  
Return Anonymous  
Surveys to Locked Drop  
Box

# METHODS: DATA COLLECTION

## Demographics

Nursing Role

Nursing Department

Educational Level

## Vaccine & Education

Prior Year Y/N

Education Y/N

This Year Y/N

Seasonal Flu Y/N

## Study Assignment

Location

Eligibility



### Evaluating the Effectiveness of an Educational Intervention on Influenza Vaccination

An Inspira Health Network Nursing Leader (who is also a Walden University Doctoral Nursing Student) is conducting Institutional Review Board (a committee responsible for overseeing research activities and participant welfare) reviewed Nursing Research to examine the effectiveness of an educational intervention relating to seasonal influenza vaccination practices. Although the primary investigator is an employee of Inspira Health Network, they have no jurisdiction or responsibility for the sites where this research is being conducted thus limiting any potential conflicts of interest. Data is being collected from all nurses subject to the Inspira annual influenza vaccine campaign. The purpose of this study is to examine the impact of influenza vaccination education on vaccine acceptance. The study requests that you complete the following survey after you have either consented for and received the influenza vaccination or completed the vaccination declination form. The following survey should take approximately 5 minutes to complete, you will not be compensated for your participation. Completion of the study's survey is voluntary and anonymous. Neither your name nor any identifying data will be collected or included in any report of the study. Your responses to the survey are strictly confidential. You can choose to stop completing the survey at any time with penalty or consequence. There are no foreseeable risks associated with completing the survey. The results of this study may help develop further educational programs related seasonal influenza prevention through vaccinations. After completion surveys should be deposited in the locked drop box located in the Employee Health Office or at the Employee Health Vaccination Clinic site. The act of returning the completed survey will constitute as your consent to participate in the research. You have the right to retain a copy of a duplicate of this form (if desired (marked participant copy not for analysis)). If you have questions regarding this study please contact the primary investigator (Terri Spoltore, MSN, RN, CCRN) at SpoltoreT@ihn.org or 856-853-2024. Questions regarding your rights as a research participant can also be directed to Walden University at 866-492-5336.

#### Please Indicate Your Primary Nursing Role

- Nursing Executive (VP, Director, etc.)       Nursing Leader (Manager, ANM, etc.)  
 Clinical Nurse (bedside staff nurse)       Non-Clinical Nurse (informatics, Education, Case Manager, etc.)

#### Please Indicate Your Primary Department

- Critical Care or Step Down       Medical-Surgical Unit  
 Surgical Services       Maternal Child Health  
 Emergency Department       Cancer Center  
 Cath Lab/IR       Dialysis  
 Other (please indicate)

#### Please Indicate Your Highest Educational Level

- Doctorally Prepared       Graduate Prepared  
 Bachelor's Prepared       Associate's Prepared

- Did you receive vaccine in the previous year  
 YES       NO
- Did you attend/receive/participate in education  
 YES       NO
- Did you receive vaccine this year  
 YES       NO
- Have you had seasonal flu in the past two years  
 YES       NO

Please indicate the campus where you are employed:

- Inspira Medical Center Vineland  
 Inspira Medical Center Elmer

Are you eligible to receive the influenza vaccination (i.e. no allergy to the vaccine or its components and no history OR no medical restriction prohibiting vaccination)?

- YES  
 NO

# METHODS: DATA ANALYSIS

## Descriptive statistics

Frequencies and measures of central tendency

Describe the sample population including role, education level, tenure and practice setting.

## A Chi-Square

Goodness of fit

Tests Two Dichotomous Variables:

1. Education: Y/N
2. Vaccination: Y/N

## Additional Analysis

Compare vaccine acceptance rates at the two study sites (IHNV and IHNE)

Compare participants who received the intervention education and those who did not (regardless of site).

## Additional Analysis

Assess for differences between different subgroups within the study population:

Nurse leaders vs. Clinical nurses

Nurses who had contracted influenza in the previous year vs. those who did not

Polit, (2010); Burns & Grove, (2009;) National Center for Technology and Innovation, (n. d. )

# RESULTS: VACCINE DECISION

*Educated vs. Non-Educated*  
 $\chi^2=7.210, p=0.007$

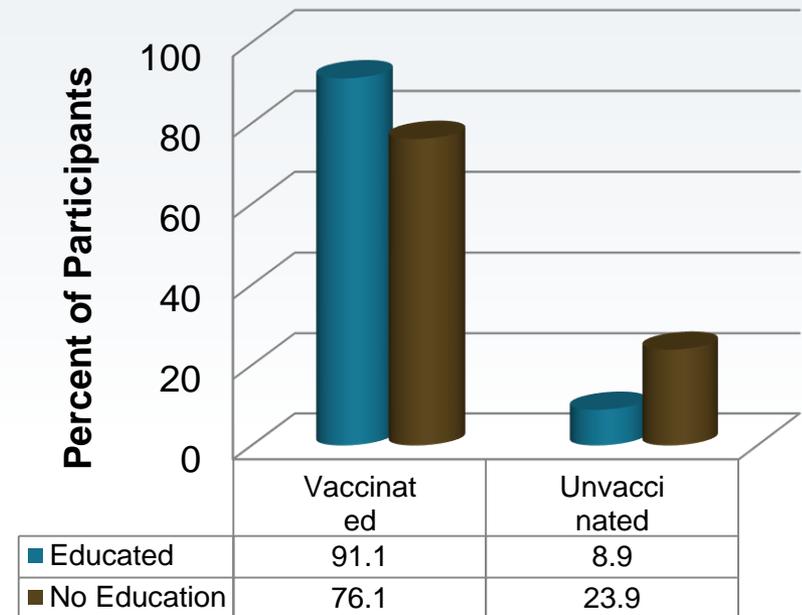
**Table 1. Analysis of Vaccine Rates (Education Status)**

|                     | <b>Educated</b><br>(IHNV) | <b>Not Educated</b><br>(IHNV & IHNE) |
|---------------------|---------------------------|--------------------------------------|
| <b>Vaccinated</b>   | <b>72</b>                 | <b>86</b>                            |
| <b>Unvaccinated</b> | <b>7</b>                  | <b>27</b>                            |

**Table 2. Analysis of Vaccine Rates (Campus)**

|                     | <b>IHNV</b> | <b>IHNE</b> |
|---------------------|-------------|-------------|
| <b>Vaccinated</b>   | <b>94</b>   | <b>64</b>   |
| <b>Unvaccinated</b> | <b>22</b>   | <b>12</b>   |

**Vaccine Rate Comparison**



# ASSUMPTIONS / LIMITATIONS

## Assumptions

(RT Anonymity & Self-Reporting)

- Assume Honesty RT:
- Role
- Eligibility
- Status

## Strengths

- Anonymous & Brief Survey
- Face Validity for Tool
- Non-equivalent, off-site comparison group (minimize bias)

## Limitations

- Convenience Sample
- Non-Equivalent Groups
- Uncontrolled Time Between Exposure to Education & Recruitment

# CONCLUSION

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RNs who participated in the educational program were vaccinated at a significantly higher rate than those did not.

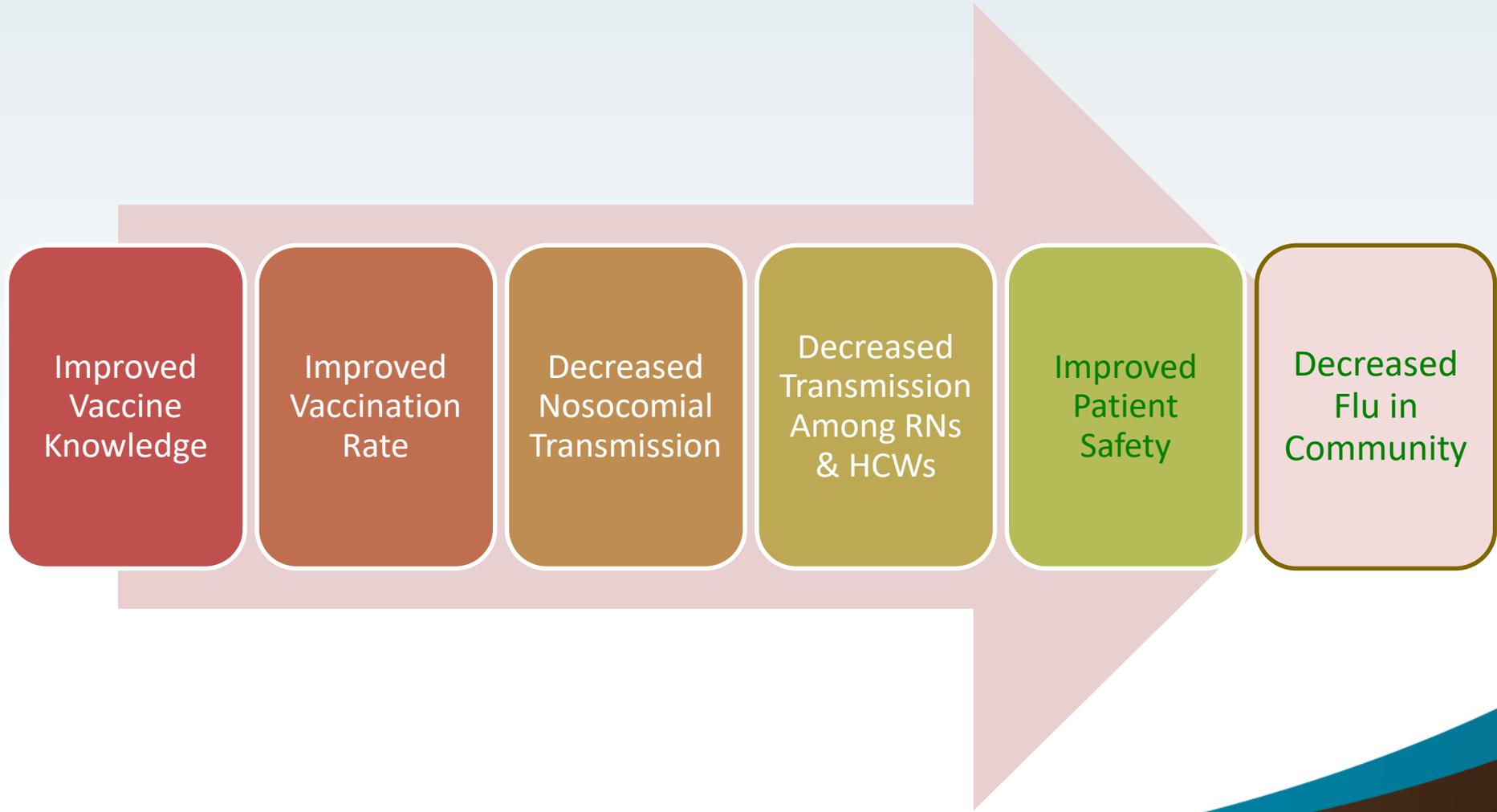
Vaccination rates at the IHNE (comparison campus) were slightly higher than the IHNV (intervention campus)

The findings suggest the educational program influenced the individual vaccination choice; however, the impact did not infiltrate the entire organization.

The web-based educational intervention was a cost-effective intervention capable of potentially providing a positive return on investment

# IMPLICATIONS: SOCIAL CHANGE

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## Contact Information:

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# APPENDICES

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# RESULTS: RETURN ON INVESTMENT (ROI)

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- National Estimates = \$2.58 per \$1 ROI
  - RT Decreased Absenteeism
  - RT Decreased Replacement Costs
  - RT Decreased Sick Care for Employees

**Potential  
Revenue:  
\$11,647**



**Less  
Expense:  
\$5,157**



**ROI:  
\$6,490**

# Sample Demographics

|   | <u>VINELAND</u> | <u>ELMER</u> |
|---|-----------------|--------------|
| <b>Total N</b>                          | 116             | 76           |
| <b>Completed Education</b>              | 79              | 0            |
| <b>Accepted Vaccination</b>             | 94              | 64           |
| <b>Previous Flu<br/>(2 Years)</b>       | 8               | 3            |
| <b>Previous Vaccine (Last<br/>Year)</b> | 98              | 55           |
| <b><u>Nursing Role</u></b>              |                 |              |
| <b>Clinical RNs</b>                     | 84              | 48           |
| <b>Non-Clinical Nurse</b>               | 13              | 9            |
| <b>Nurse Executive</b>                  | 6               | 2            |
| <b>Nurse Leader</b>                     | 13              | 17           |

|   | <u>VINELAND</u> | <u>ELMER</u> |
|---|-----------------|--------------|
| <b><u>Nursing Degree</u></b>                |                 |              |
| <b>Associate Degree</b>                     | 25              | 7            |
| <b>BSN</b>                                  | 67              | 62           |
| <b>MSN</b>                                  | 24              | 7            |
| <b><u>Most Common Practice Settings</u></b> |                 |              |
| <b>Critical Care</b>                        | 16              | 13           |
| <b>Emergency<br/>Department</b>             | 14              | 9            |
| <b>Maternal Child<br/>Health</b>            | 7               | 4            |
| <b>Medical Surgical</b>                     | 39              | 29           |
| <b>Surgical Services</b>                    | 14              | 11           |

# Results: Vaccine Decision by Demographics

|   | Vaccine: YES | Vaccine: NO | Significance             |
|---|--------------|-------------|--------------------------|
| <b>Vineland Campus</b>                      | 94           | 22          |                          |
| <b>Elmer Campus</b>                         | 64           | 12          |                          |
| <b>Previous Influenza( 2 Years)</b>         | 10           | 1           | $\chi^2=0.595, p=0.441$  |
| <b>Previous Vaccine (Last Year)</b>         | 148          | 33          | $\chi^2=14.465, p<0.001$ |
| <b><u>Nursing Role</u></b>                  |              |             | $\chi^2=5.347, p=0.148$  |
| Clinical Nurses                             | 104          | 28          |                          |
| Non-Clinical Nurse                          | 4            | 18          |                          |
| Nurse Executive                             | 0            | 8           |                          |
| Nurse Leader                                | 2            | 28          |                          |
| <b><u>Nursing Degree</u></b>                |              |             | $\chi^2=1.655, p=0.437$  |
| Associate Degree                            | 24           | 8           |                          |
| BSN   | 109          | 22          |                          |
| MSN   | 25           | 6           |                          |
| <b><u>Most Common Practice Settings</u></b> |              |             | $\chi^2=8.981, p=0.344$  |
| Critical Care                               | 23           | 6           |                          |
| Emergency Department                        | 18           | 5           |                          |
| Maternal Child Health                       | 9            | 2           |                          |
| Medical Surgical                            | 62           | 6           |                          |
| Surgical Services                           | 18           | 7           |                          |

# Results: Return on Investment (ROI)

## *Expenses*

|  | <u>Fixed Expenses</u>                                      | <u>Variable Expenses</u> |
|--|--|--------------------------|
| HealthStream® annual fee                           | \$2,500  | 0                        |
| Supplies for flyers and survey                     |  | \$100                    |
| Lock Box for Survey                                |  | \$50                     |
| Project Development (student's own time)           | \$1200   |                          |
| Completion of education program (by RN population) | 20 minutes * 145 RNs * \$27.05 (average RN salary)= \$1307 |                          |
| <b>Total</b>                                       | <b>\$5007</b>  | <b>\$150</b>             |

|                       |               |
|-----------------------|---------------|
| <b>Total Expenses</b> | <b>\$5157</b> |
| <i>Revenue</i>        |               |

Vaccinating employees and reducing absenteeism can save employers \$2.58/employee x 701 RN participants \$1,808.58

Average cost of 1 flu-related geriatric hospital admission \$9,839

|  |                    |
|--|--------------------|
| <b>Total Revenue (if one admission is avoided)</b> | <b>\$11,647.58</b> |
|--|--------------------|

# IMPLICATIONS: SOCIAL CHANGE

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- Promoted health and wellness behaviors for RNs
- Heightened commitment to community through limiting influenza virus with vaccination.
- Advance practice nurses (APNs) have the expertise to develop and communicate important health messages that address an individual's perception of susceptibility to influenza, the severity of the virus, and potential complications.
- APNs and clinical RNs are well positioned to influence health promotion practices with through educational programs, such as influenza vaccination.
- Change in practice has the potential to not only change the vaccine behaviors or HCW, but also change vaccine related information provided to patients.
- Educational program provided information about the common misconceptions related to vaccine safety and efficacy which RNs can share with colleagues, patients and families.
- This program was not complicated and can be translated into a variety of health care and non-healthcare settings (such as schools or corporate offices)

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