**APPENDIX**

**Figure 1.A**. Patient Selection Flow Chart

**Table A.1.** Diagnosis and Procedure Codes Used to Define Bacteremia and Respiratory Complications during Hospitalizations for Community-Acquired Pneumonia

**Table A2.** Sensitivity Analyses of Length of Stay and Inpatient Death in Elderly Veterans Hospitalized for Community-Acquired Pneumonia in Fiscal Year 2003

**Table A.3.** Sensitivity Analyses of Bacteremia and Respiratory Complications in Elderly Veterans Hospitalized for Community-Acquired Pneumonia in Fiscal Year 2003

**Table A.4.** Sensitivity Analyses of Flu Season in Elderly Veterans Hospitalized for Community-Acquired Pneumonia in Fiscal Year 2003

**Table A.5.** Sensitivity Analyses of Time since Last PV in Elderly Veterans Hospitalized for Community-Acquired Pneumonia in Fiscal Year 2003\*

**APPENDIX**

**Figure A.1: Patient Selection Flow Chart**



**Table A.1: Diagnosis and Procedure Codes Used to Define Bacteremia and Respiratory Complications during Hospitalizations for Community-Acquired Pneumonia**

|  |  |
| --- | --- |
|  |  |
| **Bacteremia and Respiratory Complications** | **ICD-9 Diagnosis/Procedure Codes** |
| Bacteremia  | 038.0x, 038.2x, 041.0x, 041.2x, 320.1x, 790.7x |
| Septicemia  | 038.1x, 038.3x, 038.4x, 038.8x,038.9x, 020.2x |
| Acute respiratory failure, distress or insufficiency | 518.81, 518.82, 786.09, 799.1x |
| Atelectasis | 518.0x |
| Acute bronchitis | 466.0x |
| Emphysema without mention of fistula  | 510.9x |
| Systemic inflammatory response syndrome (SIRS)  | 995.90-995.92 |
| Aspiration | 787.2x, 507.0x |
| Mechanical Ventilation | 96.70, 93.90, 93.91 |

**Table A2. Sensitivity Analyses of Length of Stay and Inpatient Death in Elderly Veterans Hospitalized for Community-Acquired Pneumonia in Fiscal Year 2003**

|  |  |  |
| --- | --- | --- |
|   | **Length of Stay (Days)** | **Inpatient Death** |
|   | **IRR** | **95% CI** | **P-value** | **OR** | **95% CI** | **P-value** |
| **SA 1: Including admissions from nursing home or other inpatient facilities (n=7296)** |
| PV in previous 5 Years | 1.02 | 0.97-1.07 | 0.5503 | 1.06 | 0.84-1.35 | 0.6102 |
| FV last year | 0.97 | 0.93-1.02 | 0.2385 | 0.83 | 0.66-1.06 | 0.1332 |
| Both | 0.91 | 0.87-0.96 | 0.0002 | 0.78 | 0.61-1.00 | 0.0472 |
| Neither | Ref |   |   | Ref |   |   |
| **SA 2: Excluding zero nights admission (n=6678)** |  |  |  |   |
| PV in previous 5 Years | 1.03 | 0.97-1.08 | 0.3347 | 1.12 | 0.85-1.47 | 0.4224 |
| FV last year |  0.97 |  0.92-1.02 | 0.2115 | 0.86 | 0.65-1.12 | 0.2555 |
| Both | 0.90 | 0.86-0.95 | <0.0001 | 0.86 | 0.65-1.13 | 0.2811 |
| Neither | Ref |   |   | Ref |   |   |
| **SA 3: Varying the number of VA outpatient visits each year in previous 5 years required for patient selection** |
| ***>=1 OP visit each year (main analysis, n=6723)*** |  |  |  |   |
| **>=2 OP visit each year (n=6400)** |  |  |  |  |   |
| PV in previous 5 Years | 1.03 | 0.98-1.09 | 0.2818 | 1.13 | 0.86-1.48 | 0.3938 |
| FV last year | 0.98 | 0.93-1.03 | 0.4819 | 0.88 | 0.67-1.16 | 0.3566 |
| Both | 0.91 | 0.87-0.96 | 0.0005 | 0.88 | 0.66-1.15 | 0.3450 |
| Neither | Ref |  |  | Ref |  |   |
| **>=3 OP visit each year (n=6013)** |  |  |  |  |   |
| PV in previous 5 Years | 1.03 | 0.98-1.09 | 0.2500 | 1.15 | 0.87-1.54 | 0.3337 |
| FV last year | 0.98 | 0.93-1.04 | 0.5450 | 0.90 | 0.68-1.19 | 0.4498 |
| Both | 0.91 | 0.86-0.96 | 0.0010 | 0.90 | 0.68-1.20 | 0.4657 |
| Neither | Ref |  |  | Ref |  |   |
| **>=4 OP visit each year (n=5607)** |  |  |  |  |   |
| PV in previous 5 Years | 1.05 | 0.99-1.11 | 0.1161 | 1.13 | 0.83-1.52 | 0.4381 |
| FV last year | 0.99 | 0.94-1.05 | 0.7302 | 0.85 | 0.63-1.14 | 0.2758 |
| Both | 0.92 | 0.87-0.97 | 0.0035 | 0.96 | 0.71-1.29 | 0.7739 |
| Neither | Ref |  |  | Ref |  |   |
| **>=5 OP visit each year (n=5162)** |  |  |  |  |   |
| PV in previous 5 Years | 1.06 | 0.99-1.12 | 0.0849 | 1.06 | 0.77-1.47 | 0.7049 |
| FV last year | 0.98 | 0.93-1.04 | 0.5061 | 0.82 | 0.60-1.12 | 0.2199 |
| Both | 0.92 | 0.87-0.97 | 0.0036 | 0.96 | 0.70-1.30 | 0.7724 |
| Neither | Ref |   |   | Ref |   |   |
| **SA 4: Pneumonia Severity Score (n=3689):**  |
| **SA4.1. Adjusted for specific abnormal lab values (Hematocrit<30%, Sodium<130 mEg/L, Blood Urea Nitrogen>30mg/dL, Glucose≥250 mg/dL)** |  |
| PV in previous 5 Years | 1.02 | 0.95-1.09 | 0.6110 | 1.66 | 1.17-2.35 | 0.0047 |
| FV last year | 0.92 | 0.86-0.98 | 0.0130 | 1.05 | 0.73-1.50 | 0.8095 |
| Both | 0.92 | 0.86-0.98 | 0.0100 | 1.09 | 0.75-1.59 | 0.6493 |
| Neither | Ref |  |  | Ref |  |   |
| **SA4.2. Adjusted for the abbreviated pneumonia severity score**  |
| PV in previous 5 Years | 1.03 | 0.96-1.10 | 0.4221 | 1.64 | 1.16-2.32 | 0.0055 |
| FV last year | 0.92 | 0.86-0.98 | 0.0153 | 1.03 | 0.72-1.48 | 0.8613 |
| Both | 0.92 | 0.86-0.98 | 0.0118 | 1.12 | 0.77-1.62 | 0.5567 |
| Neither | Ref |   |   | Ref |   |   |

IRR: Incidence Rate Ratio; OR: Odds Ratio; PV: Pneumococcal Vaccine; FV: Influenza Vaccine

All analyses have adjusted for patient's age, gender, race, marital status, comorbidity index score, non-MH outpatient visits and CAP hospitalization in the previous year, development of bacteremia, and respiratory complications, and any acute respiratory conditions experienced in the previous 30 days.

**Table A.3. Sensitivity Analyses of Bacteremia and Respiratory Complications in Elderly Veterans Hospitalized for Community-Acquired Pneumonia in Fiscal Year 2003**

|  |  |  |
| --- | --- | --- |
|   | **Bacteremia**  | **Respiratory Complication**  |
|   | **OR** | **95% CI** | **P-value** | **OR** | **95% CI** | **P-value** |
| **SA 1: Including admissions from nursing home or other inpatient facilities (n=7296)** |   |
| PV in previous 5 Years | 0.71 | 0.47-1.06 | 0.0950 | 1.20 | 0.99-1.45 | 0.0572 |
| FV last year | 0.95 | 0.67-1.36 | 0.7945 | 0.91 | 0.75-1.10 | 0.3308 |
| Both | 0.75 | 0.51-1.10 | 0.1433 | 0.83 | 0.68-1.00 | 0.0552 |
| Neither | Ref |   |   | Ref |   |   |
| **SA 2: Excluding zero nights admission (n=6678)** |   |   |   |   |
| PV in previous 5 Years | 0.67 | 0.44-1.04 | 0.0721 | 1.24 | 1.01-1.52 | 0.0372 |
| FV last year | 0.99 | 0.69-1.43 | 0.9630 | 0.89 | 0.73-1.09 | 0.2524 |
| Both | 0.72 | 0.48-1.07 | 0.1064 | 0.86 | 0.70-1.05 | 0.1459 |
| Neither | ref |   |   | ref |   |   |
| **SA 3: Varying the number of VA outpatient visits each year in previous 5 years required for patient selection**  |   |
| ***>=1 OP visit each year (main analysis, n=6723, see Table 2)*** |  |  |  |   |
| **>=2 OP visit each year (n=6400)** |  |  |  |  |   |
| PV in previous 5 Years | 0.61 | 0.39-0.97 | 0.0368 | 1.19 | 0.96-1.46 | 0.1091 |
| FV last year | 1.02 | 0.71-1.48 | 0.9077 | 0.88 | 0.72-1.08 | 0.2202 |
| Both | 0.71 | 0.47-1.08 | 0.1056 | 0.86 | 0.69-1.05 | 0.1428 |
| Neither | Ref |  |  | Ref |  |   |
| **>=3 OP visit each year (n=6013)** |  |  |  |  |   |
| PV in previous 5 Years | 0.62 | 0.39-0.99 | 0.0450 | 1.15 | 0.92-1.43 | 0.2119 |
| FV last year | 0.93 | 0.64-1.37 | 0.7286 | 0.92 | 0.74-1.13 | 0.4241 |
| Both | 0.69 | 0.45-1.05 | 0.0833 | 0.88 | 0.71-1.09 | 0.2471 |
| Neither | Ref |  |  | Ref |  |   |
| **>=4 OP visit each year (n=5607)** |  |  |  |  |   |
| PV in previous 5 Years | 0.65 | 0.40-1.05 | 0.0779 | 1.04 | 0.88-1.39 | 0.3989 |
| FV last year | 0.92 | 0.61-1.38 | 0.6796 | 0.85 | 0.68-1.06 | 0.1533 |
| Both | 0.67 | 0.43-1.04 | 0.0763 | 0.85 | 0.68-1.06 | 0.1504 |
| Neither | Ref |  |  | Ref |  |   |
| **>=5 OP visit each year (n=5162)** |  |  |  |  |   |
| PV in previous 5 Years | 0.64 | 0.39-1.06 | 0.0827 | 1.14 | 0.89-1.45 | 0.2985 |
| FV last year | 0.86 | 0.56-1.31 | 0.4763 | 0.89 | 0.70-1.12 | 0.3263 |
| Both | 0.69 | 0.43=1.08 | 0.1065 | 0.87 | 0.69-1.10 | 0.2523 |
| Neither | Ref |   |   | Ref |   |   |
| **SA 4: Pneumonia Severity Score (n=3689)** |  |  |  |  |   |
| **Adjusted for specific abnormal lab values (Hematocrit<30%, Sodium<130 mEg/L, Blood Urea Nitrogen>30mg/dL, Glucose≥250 mg/dL)** |   |
| PV in previous 5 Years | 0.5 | 0.27-0.89 | 0.0197 | 1.39 | 1.07-1.82 | 0.0135 |
| FV last year | 0.78 | 0.48-1.26 | 0.3031 | 0.99 | 0.76-1.29 | 0.9453 |
| Both | 0.75 | 0.45-1.25 | 0.2738 | 0.82 | 0.61-1.08 | 0.1588 |
| Neither | Ref |  |  | Ref |  |   |
| **Adjusted for the abbreviated pneumonia severity score**  |  |  |  |   |
| PV in previous 5 Years | 0.5 | 0.27-0.88 | 0.0178 | 1.39 | 1.07-1.80 | 0.0146 |
| FV last year | 0.77 | 0.48-1.24 | 0.2846 | 0.98 | 0.76-1.28 | 0.901 |
| Both | 0.72 | 0.43-1.19 | 0.2024 | 0.80 | 0.60-1.06 | 0.1213 |
| Neither | Ref |   |   | Ref |   |   |

OR: Odds Ratio; PV: Pneumococcal Vaccine; FV: Influenza Vaccine

All analyses have adjusted for patient's age, gender, race, marital status, comorbidity index score, non-MH outpatient visits and CAP hospitalization in the previous year, and any acute respiratory conditions experienced in the previous 30 days.

**Table A.4.** **Sensitivity Analyses of Flu Season in Elderly Veterans Hospitalized for Community-Acquired Pneumonia in Fiscal Year 2003\***

|  |  |  |
| --- | --- | --- |
|   | **Recode Those FV Vaccinated during the Past Flu Season as Unvaccinated (n=6723)** | **Excluding Admissions Occurred During Non-Flu Season (n=5329)** |
|  | **Length of Stay** | **Length of Stay** |
|  **Vaccination Status** | IRR | 95% CI | P-value | IRR | 95% CI | P-value |
|  PV in previous 5 Years | 1.01 | 0.96-1.06 | 0.7232 | 1.03 | 0.97-1.09 | 0.3172 |
|  FV last year | 0.99 | 0.90-1.01 | 0.5920 | 0.95 | 0.90-1.01 | 0.0910 |
|  Both | 0.92 | 0.88-0.97 | 0.0016 | 0.89 | 0.84-0.94 | <0.0001 |
|  Neither | Ref |   |   | Ref |   |   |
|  | **Inpatient Death** | **Inpatient Death** |
|  **Vaccination Status** | OR | 95% CI | P-value | OR | 95% CI | P-value |
|  PV in previous 5 Years | 1.08 | 0.81-1.43 | 0.6151 | 1.08 | 0.80-1.45 | 0.6089 |
|  FV last year | 0.99 | 0.74-1.33 | 0.9540 | 0.98 | 0.73-1.32 | 0.8947 |
|  Both | 1.01 | 0.75-1.37 | 0.9288 | 1.01 | 0.75-1.35 | 0.9713 |
|  Neither | Ref |   |   | Ref |   |   |
|  | **Bacteremia** | **Bacteremia** |
|  **Vaccination Status** | OR | 95% CI |  |  OR | 95% CI | P-value |
|  PV in previous 5 Years | 0.68 | 0.45-1.03 | 0.0708 | 0.72 | 0.45-1.16 | 0.1812 |
|  FV last year | 1.03 | 0.71-1.48 | 0.8796 | 1.01 | 0.67-1.53 | 0.9564 |
|  Both | 0.73 | 0.49-1.10 | 0.1364 | 0.76 | 0.48-1.18 | 0.2199 |
|  Neither | Ref |   |   | Ref |   |   |
|  | **Respiratory Complications** | **Respiratory Complications** |
|  **Vaccination Status** | OR | 95% CI |  |  OR | 95% CI | P-value |
|  PV in previous 5 Years | 1.22 | 1.00-1.48 | 0.0469 | 1.41 | 1.13-1.76 | 0.0025 |
|  FV last year | 0.92 | 0.75-1.13 | 0.4404 | 0.96 | 0.76-1.20 | 0.7041 |
|  Both | 0.88 | 0.71-1.08 | 0.2215 | 0.88 | 0.70-1.11 | 0.2977 |
|  Neither | Ref |   |   | Ref |   |   |

IRR: Incident Rate Ratio; OR: Odds Ratio; PV: Pneumococcal Vaccine; FV: Influenza Vaccine

**\*** A flu season was defined as from September 1 to May 31 of the following year.

All analyses have adjusted for patient's age, gender, race, marital status, comorbidity index score, non-mental health outpatient visits and CAP hospitalization in the previous year, and any acute respiratory conditions experienced in the previous 30 days. Analyses of length of stay and inpatient death additionally adjusted for development of bacteremia, and respiratory complications.

**Table A.5.** **Sensitivity Analyses of Time since Last PV in Elderly Veterans Hospitalized for Community-Acquired Pneumonia in Fiscal Year 2003 (n=3015)\***

|  |  |
| --- | --- |
|   | **Length of Stay**  |
| **Vaccination Status** | IRR | 95% CI | P-value |
| PV within 1 year  | Ref |  |  |
| PV within 2 years | 0.96 | 0.87-1.05 | 0.3770 |
| PV within 3 years | 0.98 | 0.90-1.07 | 0.7104 |
| PV within 4 years | 1.02 | 0.93-1.11 | 0.7261 |
| PV within 5 years | 1.07 | 0.98-1.17 | 0.1095 |
|  | **Inpatient Death** |
| **Vaccination Status** | OR | 95% CI | P-value |
| PV within 1 year  | Ref |  |  |
| PV within 2 years | 1.05 | 0.63-1.73 | 0.8634 |
| PV within 3 years | 1.00 | 0.61-1.61 | 0.9832 |
| PV within 4 years | 1.03 | 0.64-1.65 | 0.9006 |
| PV within 5 years | 1.18 | 0.75-1.87 | 0.4674 |
|  | **Bacteremia** |
| **Vaccination Status** | OR | 95% CI | P-value |
| PV within 1 year  | Ref |  |  |
| PV within 2 years | 0.87 | 0.31-2.44 | 0.7939 |
| PV within 3 years | 1.57 | 0.66-3.76 | 0.3080 |
| PV within 4 years | 2.07 | 0.90-4.75 | 0.0878 |
| PV within 5 years | 1.83 | 0.80-4.19 | 0.1558 |
|  | **Respiratory Complications** |
| **Vaccination Status** | OR | 95% CI | P-value |
| PV within 1 year  | Ref |  |  |
| PV within 2 years | 0.94 | 0.65-1.35 | 0.7206 |
| PV within 3 years | 0.88 | 0.62-1.26 | 0.4953 |
| PV within 4 years | 1.03 | 0.73-1.45 | 0.8784 |
| PV within 5 years | 0.83 | 0.59-1.17 | 0.2892 |

IRR: Incident Rate Ratio; OR: Odds Ratio; PV: Pneumococcal Vaccine; FV: Influenza Vaccine

\* The analyses were conducted among 3015 patients who had prior PV.

All analyses have adjusted for patient's age, gender, race, marital status, comorbidity index score, non-mental health outpatient visits and CAP hospitalization in the previous year, and any acute respiratory conditions experienced in the previous 30 days. Analyses of length of stay and inpatient death additionally adjusted for development of bacteremia, and respiratory complications.