

**TITLE:** Burden and Risk Factors for *Pseudomonas aeruginosa* Community-acquired Pneumonia: a Multinational Point Prevalence Study of Hospitalised Patients

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## ONLINE SUPPLEMENT

### SUPPLEMENTARY TABLES

**Table E1.** Prevalence of *Pseudomonas aeruginosa* at participating centers representing different countries.

| Countries      | <i>Pseudomonas aeruginosa</i> -CAP prevalence<br>n=3,193 |        |                   |          |                   |         |
|----------------|--|--------|-------------------|----------|-------------------|---------|
|                | Continent/Country  |        | Rest of the world |          | OR (95% CI)       | p value |
|                | %  | n      | %                 | n        |                   |         |
| Argentina      | 4.0  | 7/175  | 4.2               | 126/3018 | 0.95 (0.44, 2.08) | 0.91    |
| Bulgaria       | 0  | 0/37   | 4.2               | 133/3156 | .                 | 0.20    |
| Croatia        | 12.8   | 12/94  | 3.9               | 121/3099 | 3.60 (1.91, 6.77) | <0.001  |
| Denmark        | 1.2  | 1/86   | 4.2               | 132/3107 | 0.26 (0.03, 1.91) | 0.15    |
| France         | 3.2  | 2/63   | 4.2               | 131/3130 | 0.75 (0.18, 3.10) | 0.59    |
| Germany        | 5.2  | 7/134  | 4.1               | 126/3059 | 1.28 (0.58, 2.80) | 0.53    |
| Greece         | 3.5  | 3/85   | 4.2               | 130/3108 | 0.83 (0.26, 2.68) | 0.76    |
| India          | 3.3  | 5/150  | 4.2               | 128/3043 | 0.78 (0.31, 1.94) | 0.60    |
| Ireland        | 3.1  | 1/32   | 4.2               | 132/3161 | 0.74 (0.10, 5.46) | 0.76    |
| Italy          | 3.7  | 14/381 | 4.2               | 119/2812 | 0.86 (0.49, 1.51) | 0.60    |
| Moldova        | 0  | 0/31   | 4.2               | 133/3162 | .                 | 0.24    |
| Montenegro     | 0  | 0/1    | 4.2               | 133/3192 | .                 | 0.83    |
| Netherlands    | 4.7  | 2/43   | 4.2               | 131/3150 | 1.12 (0.26, 4.69) | 0.87    |
| Pakistan       | 7.5  | 8/107  | 4.1               | 125/3086 | 1.91 (0.91, 4.02) | 0.08    |
| Portugal       | 1  | 1/101  | 4.3               | 132/3092 | 0.22 (0.03, 1.62) | 0.10    |
| Saudi Arabia   | 7.1  | 3/42   | 4.1               | 130/3151 | 1.78 (0.54, 5.86) | 0.33    |
| Serbia         | 0  | 0/41   | 4.2               | 133/3152 | .                 | 0.17    |
| Spain          | 3.2  | 19/585 | 4.4               | 114/2608 | 0.73 (0.44, 1.20) | 0.21    |
| United Kingdom | 3.6  | 5/140  | 4.2               | 128/2053 | 0.84 (0.34, 2.10) | 0.71    |
| United States  | 4.5  | 20/442 | 4.1               | 113/2751 | 1.10 (0.68, 1.80) | 0.68    |

**TABLE E2.** Bivariate analyses of risk factors for *Pseudomonas aeruginosa*-CAP, drug-resistance *P. aeruginosa*-CAP and multidrug resistance *P. aeruginosa*-CAP.

| Bivariate <i>P. aeruginosa</i> -CAP |
|-------------------------------------|
|-------------------------------------|

| Variable   | Odds ratio (95% CI)  | p-value |
|--|----------------------|---------|
| Underweight  | 1.46 (0.71, 2.96)    | 0.30    |
| Obesity  | 0.76 (0.45, 1.28)    | 0.31    |
| Either current or former smoker                            | 0.99 (0.68, 1.42)    | 0.94    |
| Alcoholism   | 0.79 (0.39, 1.56)    | 0.49    |
| COPD   | 2.20 (1.55, 3.14)    | <0.01   |
| COPD with FEV1<30%   | 5.52 (3.12, 9.77)    | <0.01   |
| Oxygen therapy at home                                     | 3.84 (2.44, 6.05)    | <0.01   |
| Asthma   | 0.80 (0.39, 1.66)    | 0.55    |
| Non-cystic fibrosis bronchiectasis                         | 6.48 (4.18, 10.04)   | <0.01   |
| Interstitial Lung Disease                                  | 1.65 (0.71, 3.86)    | 0.24    |
| Lung transplant  | 3.85 (0.46, 32.26)   | 0.21    |
| OSAS   | 1.19 (0.51, 2.75)    | 0.69    |
| Chronic aspiration   | 1.79 (1.03, 3.12)    | 0.04    |
| Arrhythmia   | 1.07 (0.66, 1.74)    | 0.79    |
| CAD  | 1.72 (1.15, 2.58)    | <0.01   |
| Heart failure  | 1.57 (1.00, 2.46)    | 0.05    |
| Essential arterial hypertension                            | 1.06 (0.75, 1.50)    | 0.74    |
| Stroke   | 1.29 (0.72, 2.32)    | 0.39    |
| HIV infection  | 0.66 (0.20, 2.09)    | 0.48    |
| AIDS   | 0.41 (0.06, 2.96)    | 0.37    |
| Active solid tumor   | 1.09 (0.58, 2.05)    | 0.79    |
| Active lung cancer   | 1.33 (0.53, 3.34)    | 0.54    |
| Hematological malignancy                                   | 0.46 (0.14, 1.45)    | 0.18    |
| Chemotherapy in the last 3 months                          | 0.70 (0.25, 1.92)    | 0.49    |
| Neutropenia  | 0.53 (0.07, 3.89)    | 0.53    |
| Biological drug use  | 2.18 (0.66, 7.22)    | 0.20    |
| Other immunosuppressive condition                          | 2.33 (1.22, 4.44)    | 0.01    |
| Liver disease  | 0.73 (0.26, 2.00)    | 0.54    |
| Cirrhosis  | 1.55 (0.55, 4.33)    | 0.40    |
| Mental illness   | 1.10 (0.57, 2.13)    | 0.77    |
| Dementia   | 1.01 (0.57, 1.78)    | 0.97    |
| Diabetes mellitus  | 0.98 (0.64, 1.50)    | 0.94    |
| Chronic renal failure                                      | 1.04 (0.60, 1.80)    | 0.90    |
| Hemodialysis   | 1.99 (0.70, 5.60)    | 0.19    |
| Prior mycobacterial diseases                               | 4.254(2.30, 7.87)    | <0.01   |
| Recurrent skin infections                                  | 1.83 (0.65, 5.14)    | 0.25    |
| Prior MRSA infection                                       | 3.42 (1.72, 6.80)    | <0.01   |
| Prior ESBL-producing bacterial infection                   | 2.40 (0.94, 6.13)    | 0.07    |
| Prior <i>Pseudomonas aeruginosa</i> infection/colonization | 28.60 (18.18, 45.01) | <0.01   |
| Inhaled corticosteroids use                                | 2.92 (2.02, 4.21)    | <0.01   |
| Statins use  | 1.48 (1.00, 2.18)    | 0.05    |
| Steroids use   | 2.13 (1.32, 3.46)    | <0.01   |
| Proton pump inhibitor use                                  | 2.01 (1.42, 2.86)    | <0.01   |
| ICU admission, n (%)                                       | 2.15 (1.47, 3.13)    | <0.01   |
| Invasive mechanical ventilation, n (%)                     | 2.36 (1.53, 3.64)    | <0.01   |
| Non-invasive mechanical ventilation, n (%)                 | 1.09 (0.63, 1.89)    | 0.75    |
| Treatment with inotropes, n (%)                            | 3.69 (1.41, 9.64)    | <0.01   |
| Treatment with vasopressors, n (%)                         | 2.21 (1.33, 3.67)    | <0.01   |
| Malnutrition   | 1.84 (1.12, 3.00)    | 0.01    |
| Bedridden  | 2.24 (1.46, 3.46)    | <0.01   |
| Living in crowded conditions                               | 0.82 (0.52, 1.29)    | 0.39    |

|  |                      |       |
|--|----------------------|-------|
| Healthcare worker  | 2.34 (0.82, 6.64)    | 0.11  |
| Nursing home resident  | 1.84 (1.10, 3.07)    | 0.02  |
| Enteric tube feeding   | 4.83 (2.21, 10.54)   | <0.01 |
| Tracheostomy   | 10.99 (5.84, 20.67)  | <0.01 |
| Prosthetic material  | 0.46 (0.11, 1.89)    | 0.28  |
| Indwelling catheter  | 4.84 (2.42, 9.46)    | <0.01 |
| Injection of illicit drugs   | 0.64 (0.09, 4.67)    | 0.66  |
| Lower respiratory tract infections during the last 12 months       | 2.51 (1.77, 3.56)    | <0.01 |
| Emergency room admission during the last 12 months                 | 2.13 (1.50, 3.02)    | <0.01 |
| Hospitalization during the last 12 months                          | 2.44 (1.72, 3.66)    | <0.01 |
| Antibiotic infusion at home during the last 12 months              | 2.27 (1.22, 4.22)    | <0.01 |
| IV antibiotics during the last 12 months                           | 2.87 (2.02, 4.07)    | <0.01 |
| Oral antibiotics during the last 12 months                         | 3.48 (2.32, 5.22)    | <0.01 |
| <b>Bivariate drug resistance <i>Pseudomonas aeruginosa</i>-CAP</b> |                      |       |
| Underweight  | 1.35 (0.474 3.82)    | 0.58  |
| Obesity  | 0.86 (0.42, 1.75)    | 0.67  |
| COPD   | 2.72 (1.66, 4.47)    | <0.01 |
| COPD with FEV1<30%   | 3.75 (1.57, 8.93)    | <0.01 |
| Oxygen therapy at home   | 5.10 (2.84, 9.15)    | <0.01 |
| Asthma   | 0.84 (0.30, 2.33)    | 0.74  |
| Non-cystic fibrosis bronchiectasis                                 | 4.39 (2.30, 8.41)    | <0.01 |
| Interstitial Lung Disease  | 1.70 (0.52, 5.52)    | 0.38  |
| OSAS   | 2.16 (0.85, 5.49)    | 0.10  |
| Chronic aspiration   | 3.274 (1.72, 6.23)   | <0.01 |
| Arrhythmia   | 1.25 (0.65, 2.42)    | 0.50  |
| CAD  | 2.18 (1.27, 3.76)    | <0.01 |
| Heart failure  | 1.89 (1.03, 3.45)    | 0.04  |
| Essential arterial hypertension                                    | 1.68 (1.02, 2.77)    | 0.04  |
| Stroke   | 2.23 (1.12, 4.43)    | 0.02  |
| HIV infection  | 0.45 (0.06, 3.29)    | 0.45  |
| Active solid tumor   | 1.25 (0.53, 2.93)    | 0.61  |
| Active lung cancer   | 1.68 (0.52, 5.46)    | 0.39  |
| Hematological malignancy   | 0.65 (0.16, 2.68)    | 0.55  |
| Chemotherapy in the last 3 months                                  | 0.36 (0.05, 2.59)    | 0.31  |
| Neutropenia  | 1.14 (0.15, 8.40)    | 0.90  |
| Biological drug use  | 3.03 (0.71, 12.89)   | 0.13  |
| Other immunosuppressive condition                                  | 2.12 (0.84, 5.39)    | 0.11  |
| Liver disease  | 0.76 (0.18, 3.15)    | 0.71  |
| Cirrhosis  | 2.47 (0.75, 8.10)    | 0.13  |
| Mental illness   | 1.41 (0.60, 3.30)    | 0.43  |
| Dementia   | 1.61 (0.81, 3.19)    | 0.17  |
| Diabetes mellitus  | 0.94 (0.51, 1.74)    | 0.84  |
| Chronic renal failure  | 1.52 (0.77, 3.02)    | 0.23  |
| Hemodialysis   | 2.21 (0.48, 8.52)    | 0.33  |
| Prior mycobacterial diseases                                       | 1.74 (0.53, 5.66)    | 0.36  |
| Recurrent skin infections  | 2.91 (0.88, 9.58)    | 0.08  |
| Prior MRSA infection   | 5.98 (2.75, 12.99)   | <0.01 |
| Prior ESBL-producing bacterial infection                           | 5.33 (2.05, 13.85)   | 0.01  |
| Prior <i>Pseudomonas aeruginosa</i> infection/colonization         | 32.36 (18.66, 56.12) | <0.01 |
| Inhaled corticosteroids use  | 3.68 (2.22, 6.11)    | <0.01 |
| Statins use  | 1.37 (0.78, 2.40)    | 0.27  |
| Steroids use   | 1.81 (0.89, 3.71)    | 0.10  |

|   |                      |       |
|---|----------------------|-------|
| Proton pump inhibitor use   | 2.58 (1.57, 4.23)    | <0.01 |
| Severe CAP  | 2.35 (1.43, 3.86)    | <0.01 |
| Malnutrition  | 2.63 (1.42, 4.90)    | <0.01 |
| Bedridden   | 2.53 (1.40, 4.56)    | <0.01 |
| Living in crowded conditions  | 0.78 (0.40, 1.49)    | 0.45  |
| Healthcare worker   | 3.70 (1.12, 12.29)   | 0.03  |
| Nursing home resident   | 2.42 (1.25, 4.70)    | <0.01 |
| Enteric tube feeding  | 3.37 (1.02, 11.14)   | 0.05  |
| Tracheostomy  | 10.50 (4.71, 23.39)  | <0.01 |
| Prosthetic material   | 0.99 (0.24, 4.14)    | 0.99  |
| Indwelling catheter   | 6.28 (2.75, 14.34)   | <0.01 |
| Lower respiratory tract infections during the last 12 months            | 2.83 (1.72, 4.66)    | <0.01 |
| Emergency room admission during the last 12 months                      | 2.33 (1.42, 3.82)    | <0.01 |
| Hospitalization during the last 12 months                               | 2.96 (1.79, 4.90)    | <0.01 |
| Antibiotic infusion at home during the last 12 months                   | 4.83 (2.46, 9.46)    | <0.01 |
| IV antibiotics during the last 12 months                                | 3.90 (2.36, 6.43)    | <0.01 |
| Oral antibiotics during the last 12 months                              | 4.05 (2.31, 7.07)    | <0.01 |
| <b>Bivariate Multidrug Resistance <i>Pseudomonas aeruginosa</i>-CAP</b> |                      |       |
| Underweight   | 0.55 (0.07, 4.09)    | 0.56  |
| Obesity   | 0.94 (0.36, 2.44)    | 0.90  |
| Either current or former smoker   | 1.07 (0.52, 2.18)    | 0.86  |
| Alcoholism  | 1.10 (0.33, 3.62)    | 0.88  |
| COPD  | 3.45 (1.73, 6.87)    | <0.01 |
| COPD with FEV1<30%  | 2.25 (0.53, 9.56)    | 0.27  |
| Oxygen therapy at home  | 3.96 (1.70, 9.24)    | <0.01 |
| Asthma  | 1.76 (0.61, 5.04)    | 0.29  |
| Non-cystic fibrosis bronchiectasis                                      | 4.11 (1.67, 10.10)   | <0.01 |
| Interstitial Lung Disease   | 1.07 (0.14, 7.89)    | 0.95  |
| OSAS  | 2.53 (0.76, 8.42)    | 0.13  |
| Chronic aspiration  | 2.47 (0.94, 6.46)    | 0.06  |
| Arrhythmia  | 1.63 (0.70, 3.78)    | 0.25  |
| CAD   | 2.23 (1.05, 4.71)    | 0.04  |
| Heart failure   | 1.48 (0.61, 3.61)    | 0.39  |
| Essential arterial hypertension   | 1.46 (0.73, 2.91)    | 0.28  |
| Stroke  | 1.18 (0.36, 3.89)    | 0.79  |
| HIV infection   | 0.90 (0.12, 6.65)    | 0.92  |
| Active solid tumor  | 1.21 (0.36, 3.98)    | 0.76  |
| Hematological malignancy  | 0.63 (0.09, 4.65)    | 0.65  |
| Biological drug use   | 6.11 (1.40, 26.60)   | 0.02  |
| Other immunosuppressive condition                                       | 2.49 (0.75, 8.27)    | 0.14  |
| Cirrhosis   | 1.53 (0.21, 11.42)   | 0.67  |
| Mental illness  | 1.88 (0.65, 5.40)    | 0.24  |
| Dementia  | 1.19 (0.41, 3.40)    | 0.75  |
| Diabetes mellitus   | 0.82 (0.34, 1.99)    | 0.66  |
| Chronic renal failure   | 1.12 (0.39, 3.22)    | 0.83  |
| Recurrent skin infections   | 1.80 (0.24, 13.39)   | 0.57  |
| Prior MRSA infection  | 3.95 (1.18, 13.22)   | 0.03  |
| Prior ESBL-producing bacterial infection                                | 3.86 (0.90, 16.54)   | 0.07  |
| Prior <i>Pseudomonas aeruginosa</i> infection/colonization              | 24.10 (11.59, 50.08) | <0.01 |
| Inhaled corticosteroids use   | 3.22 (1.59, 6.51)    | <0.01 |
| Statins use   | 1.21 (0.54, 2.69)    | 0.64  |

|   |                    |       |
|---|--------------------|-------|
| Steroids use  | 1.09 (0.33, 3.60)  | 0.88  |
| Proton pump inhibitor use   | 3.06 (1.54, 6.11)  | <0.01 |
| Severe CAP  | 2.80 (1.41, 5.59)  | <0.01 |
| Malnutrition  | 1.81 (0.69, 4.72)  | 0.23  |
| Bedridden   | 1.80 (0.74, 4.39)  | 0.20  |
| Living in crowded conditions  | 0.37 (0.11, 1.23)  | 0.104 |
| Healthcare worker   | 7.61 (2.23, 25.93) | <0.01 |
| Nursing home resident   | 2.05 (0.78, 5.36)  | 0.14  |
| Enteric tube feeding  | 4.37 (1.01, 18.79) | 0.05  |
| Tracheostomy  | 9.34 (3.15, 27.64) | <0.01 |
| Prosthetic material   | 2.02 (0.48, 8.54)  | 0.34  |
| Indwelling catheter   | 4.84 (1.44, 16.26) | <0.01 |
| Lower respiratory tract infections during the last 12 months  | 3.36 (1.68, 6.73)  | <0.01 |
| Emergency room admission during the last 12 months  | 2.17 (1.09, 4.31)  | 0.03  |
| Hospitalization during the last 12 months   | 2.56 (1.29, 5.10)  | <0.01 |
| Antibiotic infusion at home during the last 12 months   | 5.02 (2.04, 12.36) | <0.01 |
| IV antibiotics during the last 12 months  | 3.58 (1.79, 7.13)  | <0.01 |
| Oral antibiotics during the last 12 months  | 5.18 (2.41, 11.15) | <0.01 |
| CAD: Coronary artery disease; CAP: Community-acquired pneumonia; COPD: Chronic Obstructive pulmonary disease; OSAS: Obstructive sleep apnea syndrome; AIDS: Acquired Immune Deficiency Syndrome; HIV: Human immunodeficiency virus; FEV1: Forced expiratory volume in one second; MRSA: Methicillin-resistant staphylococcus aureus; ESBL: Extended-spectrum beta-lactamase |                    |       |



## SUPPLEMENTARY FIGURE LEGENDS

**Figure E1.** Flowchart of patients hospitalized with community-acquired pneumonia (CAP) enrolled in the study.

**Figure E2.** Multivariate analysis of the risk factors independently associated with *Pseudomonas aeruginosa*-Community-acquired pneumonia (CAP).



**SUPPLEMENTARY FIGURES**

**Figure E1.**

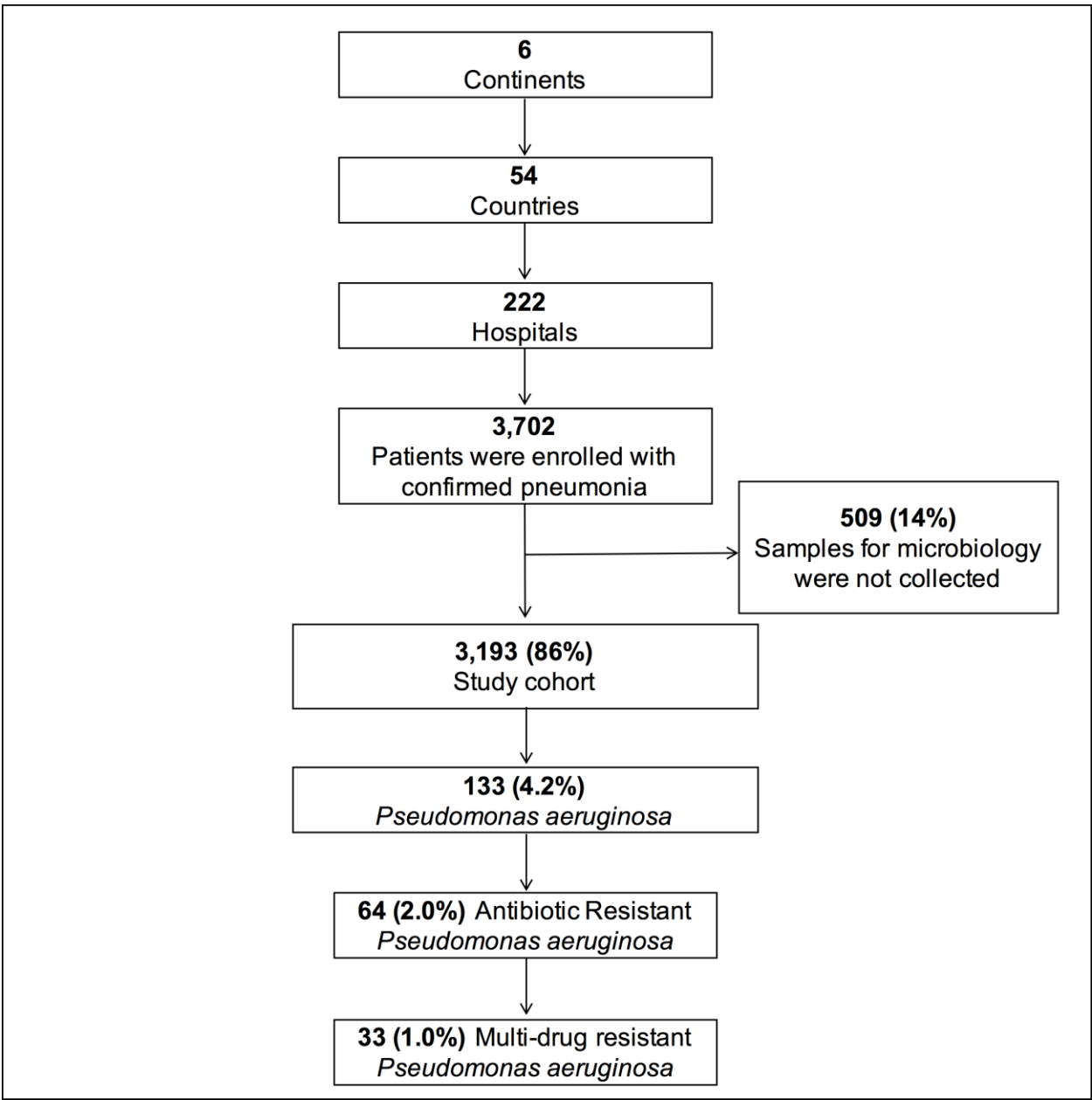
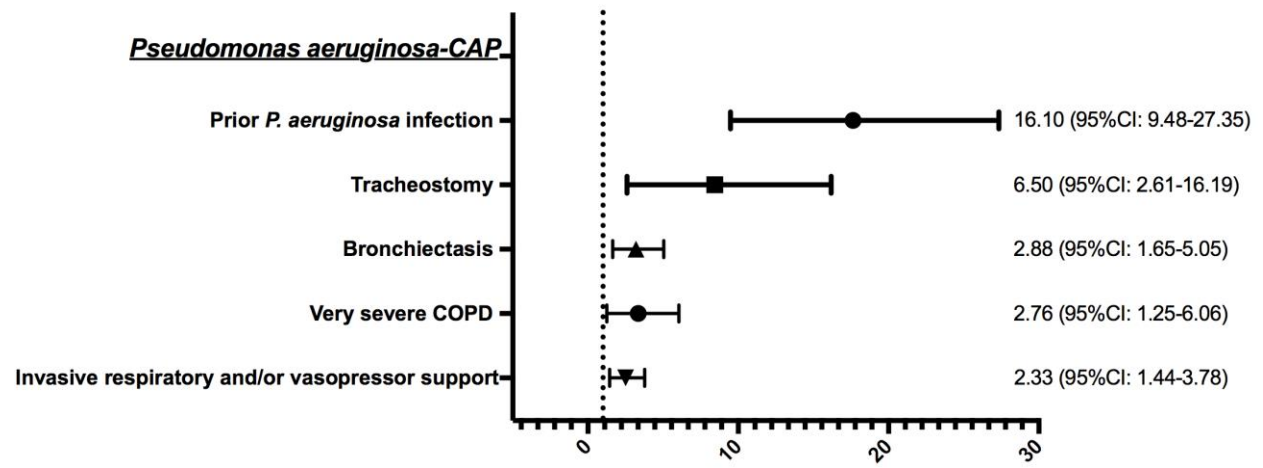


Figure E2.



## **SUPPLEMENTARY DOCUMENTS**

### **1. Study manual.**

#### **GLIMP STUDY MANUAL AND DEFINITIONS**

1. Male/female: checked box about the gender of the subject
2. Health care worker: health professional in health care services (e.g.: nurse, physicians, dentist, physiotherapist, etc.).
3. Livestock/meat industry worker: employee working with domestic animals, such as cattle, for home use or for profit, including production of meat and dairy products.
4. Nursing home resident: A patient living in a facility or institution that provides health care such as rehabilitation, restorative and skilled nursing care to patients in need of assistance with activities of daily living, especially for elderly people.
5. Bedridden/Bedbound: patient confined to a bed for at least a month prior to hospital admission, mainly because of a poor performance status.
6. Community and crowded living: a setting with close contacts such as prison, dormitories, shelter, barracks, etc.
7. Previous influenza virus vaccination: influenza vaccination during the prior and/or current influenza season.
8. Previous conjugate pneumococcal vaccination: prior pneumococcal vaccination with a conjugate vaccine (such as PCV7, PCV10 or PCV13).
9. Previous polysaccharide pneumococcal vaccination: prior pneumococcal vaccination with a 23-valent pneumococcal polysaccharide vaccine (PPSV23).

#### **Section 2**

2. Low respiratory tract infections: respiratory infections including pneumonia, acute exacerbation of COPD and acute exacerbation of bronchiectasis.

3. COPD Exacerbation: an event in the natural course of the COPD characterized by a worsening of the patient's baseline dyspnea, cough and/or sputum beyond day-to-day variability sufficient to warrant a change in management.
4. Emergency room visits: emergency room visits for any reason.
5. Hospitalizations: hospital admission for more than 24 hours for any reason.
6. Home antibiotic infusion therapy: intravenous antibiotic administration through a permanent or temporary catheter for any reason at home.
7. Intravenous antibiotic courses: intravenous antibiotic courses for any reason.
8. Oral antibiotic courses: antibiotic administered through the mouth for any reason.

### **Section 3**

1. Aspiration: history of previous episodes of aspiration, with or without dysphagia.
2. Chronic renal failure: an estimated glomerular filtration rate  $< 60 \text{ mL/min/1.73m}^2$  during at least six months before hospital admission.
3. Chronic arrhythmia: presence of any of the following arrhythmias: atrial flutter, atrial fibrillation, junctional supraventricular, paroxysmal supraventricular tachycardia, ventricular tachycardia during at least six months before hospital admission.
4. Aplastic anemia: deficiency of all types of blood cells or pancytopenia (anemia, leukopenia and thrombocytopenia) due to failure of the bone marrow.
5. HIV: human immunodeficiency virus infection, regardless of the number of CD4+ lymphocytes/mm<sup>3</sup>.
6. Asthma: prior clinical diagnosis of bronchial asthma during at least six months before hospital admission.

7. Chronic hemodialysis: need of hemodialysis during at least six months before hospital admission.
8. Mental illness: any psychiatric disorder including depression and excluding dementia during at least six months before hospital admission.
9. Asplenia: absence of the spleen (anatomical asplenia) or presence of a spleen that does not function (functional asplenia).
10. AIDS: either human immunodeficiency virus infection with  $< 200 \text{ CD4}^+$  lymphocytes/mm<sup>3</sup> or acquired immune deficiency syndrome (AIDS)-defining conditions.
11. Heart failure: A clinical diagnosis of left ventricular failure of congestive cardiac failure for at least six months before hospital admission.
12. Bronchiectasis: presence of abnormal dilatation of bronchi on computed tomography scan of the thorax.
13. Dementia: impairment of at least two brain functions, including memory, thinking, judgment, language and social abilities such as performing daily activities during at least six months before hospital admission.
14. Active solid tumor: any active solid tumor, excluding lung cancer and hematological malignancy before hospital admission.
15. Stroke: either ischemic and/or hemorrhagic stroke before hospital admission.
16. Homeless: people without a regular home before hospital admission.
17. Injectable drugs: any current use of injectable drugs (e.g. cocaine, heroin, etc.) before hospital admission.
18. Myocardial infarction: a past medical history consistent with acute myocardial infarction.

19. Interstitial lung diseases: any diffuse parenchymal lung disease before hospital admission (e.g. idiopathic pulmonary fibrosis [IPF], nonspecific interstitial pneumonia [NSIP], etc.).
20. Lung transplantation: having one or both lungs transplanted.
21. Alcoholism: chronic condition characterized by excessive use of alcohol on a regular basis.
22. Coronary artery disease: history of coronary artery disease, including angina (stable or unstable), before hospital admission.
23. Neutropenia: less than 500 neutrophils/dL on the complete blood count before hospital admission.
24. Obesity: body mass index (BMI)  $\geq 30$ . BMI calculation:  $\text{weight (Kg)} / (\text{height (m)})^2$ .
25. Hematological malignancy: any active hematological malignancy (including lymphoma, acute or chronic leukemia and multiple myeloma) before hospital admission.
26. Contact sport: currently participating in any sport requiring skin-to-skin contact before hospital admission (e.g. rugby, wrestling, soccer, basketball, etc.).
27. Chronic liver disease: any liver disease **excluding** cirrhosis during at least six months before hospital admission (e.g. chronic viral hepatitis, nonalcoholic hepatitis, etc.).
28. Chronic biological drugs: use of biological drugs, including anti-cancer therapies such as trastuzumab and therapies for autoimmune diseases such as anti-TNF $\alpha$ , during at least six months before hospital admission.
29. Recurrent skin infections: more than one skin infection during one year before hospital admission (e.g. skin abscess, folliculitis, chronic skin ulceration).

30. Chronic inhaled steroids: use of any kind of inhaled steroids, such as beclomethasone, budesonide, fluticasone, or mometasone, on a regular basis (at least 3 times a week) during at least six months before hospital admission.
31. Prosthetic material: any prior implantation of prosthetic material, including cardiac valves or orthopedic replacement, excluding dental implants.
32. Cirrhosis: Clinical diagnosis of features consistent with hepatic fibrosis and nodular regeneration during at least six months before hospital admission.
33. Chronic indwelling catheter: need to maintain an indwelling catheter (including bladder catheter and central venous catheter) during at least six months before hospital admission.
34. Diabetes Mellitus: diagnosis of diabetes mellitus, whether type I or Type II before hospital admission.
35. Chronic steroids: steroid treatment > 10 mg of prednisone/daily or equivalent during at least three months before hospital admission.
36. Prior mycobacteria disease: any past medical history of mycobacterial infection or colonization including *Mycobacterium tuberculosis* complex and non- tuberculous mycobacteria.
37. Malnutrition: chronic poor nutrition identified through laboratories (e.g. low levels of plasma protein), physical exam (e.g. low BMI) or medical history before hospital admission.
38. COPD: chronic obstructive pulmonary disease defined according to FEV<sub>1</sub>/FVC ratio <0.7 and a compatible clinical history (including smoking history if relevant)
39. Hypertension: chronic systolic blood pressure  $\geq$  140 mmHg and/or diastolic blood pressure  $\geq$  90 mmHg or chronic need of any antihypertensive treatment to maintain systemic arterial pressure below these levels during at least six months before hospital admission.
40. Other immunosuppression: any immunosuppressive state including congenital/genetic

immunosuppression and immunosuppressive therapy due to hematological/solid organ transplantation other than lung (excluding hematological malignancies, asplenia, aplastic anemia, neutropenia, chronic biological drugs, chronic steroid treatment, HIV/AIDS and chemotherapy) during at least six months before hospital admission.

41. Chemotherapy in the prior 3 months: any chemotherapy in the previous 3 months before hospital admission.
42. Enteral tube feedings: chronic feeding through a tube directly into the gastrointestinal tract (including nasogastric tube and percutaneous endoscopic gastrostomy tube –PEG-) before hospital admission.
43. FEV1 <30%: Forced Expiratory Volume in the 1st second < 30% of predicted reference values calculated according to gender, age, height and weight.
44. Chronic use of proton pump inhibitors: any proton pump inhibitors use on a regular basis during at least six months before hospital admission.
45. Home oxygen therapy: chronic/long term need of oxygen supply to correct hypoxia due to cardiac and/or pulmonary diseases (even at a stable state of the disease) before hospital admission.
46. Chronic statin use: any statin uses on a regular basis during at least six months before hospital admission.

#### **Section 4**

Severity of the disease within 24 hours after hospital admission, including:

1. Admission to an Intensive Care Unit (ICU) or a High-dependency unit (HDU, also known as respiratory intensive care unit or semi-intensive care unit or progressive care unit) within the first 24 hours after hospital admission.
2. Non-invasive mechanical ventilation (NIV) during the first 24 hours of hospital admission.



3. Invasive mechanical ventilation during the first 24 hours after hospital admission.
4. Vasopressors use, including epinephrine, norepinephrine or dopamine, within the first 24 hours after hospital admission.
5. Inotropes use, including dobutamine, within the first 24 hours after hospital admission.

## Section 5

Please indicate if during the past year the patient was infected or colonized with one of the following pathogens prior to hospital admission.

Mark if during the year prior of the current hospitalization the patient had documented infection due to Methicillin Resistant *Staphylococcus aureus* (MRSA); *Pseudomonas aeruginosa* or Extended Spectrum Beta-Lactamase producing Gram negative bacilli (ESBL).

## Section 6

Please indicate all the diagnostic tests performed within 24 hours of hospital admission. This question refers to the tests ordered and actually performed during the first 24 hours of hospital admission. The answers are self-explanatory.

## Section 7

Please indicate if a pathogen was identified (whether cultured or other test) as the possible responsible etiology for the patient admitted with pneumonia. In case the investigator selects the **box YES**, a series of boxes (as shown in the pdf case report form) will appear for the documentation **UP TO 2** microorganisms:

- 1 - Select the name of the pathogen
- 2 - Select the source of the pathogen (***select ALL that apply***) - Select antibiotic susceptibilities (a list of pre-specified antimicrobial resistance patterns will appear in the e-CRF. ***Please check ALL that apply***).

## Section 8

Please indicate ***ALL the antibiotics or antimicrobial agents*** administered during the first 24 hours of admission to the hospital.

- ***Select ALL THE NAMES THAT APPLY***