Trends in community-acquired pneumonia hospitalisations and associated cardiovascular risk in Portugal, 2010–2018

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Conflicts of interest: Joana Carneiro is a researcher at NOVA National School of Public Health working on a project funded by Pfizer, Inc. Rita Teixeira, Maria Lahuerta, Julie Catusse, and Mohammad Ali are employees of Pfizer, Inc. and may hold stocks or stock options. Andreia Leite coordinated a project funded by Pfizer, Inc. and is employee of NOVA National School of Public Health. Sílvia Lopes coordinates a project funded by Pfizer, Inc. and is employee of NOVA National School of Public Health.

Background

- Community-acquired pneumonia (CAP) is a major cause of hospitalisation, with substantial morbidity, mortality, and costs.(1)
- Cardiovascular diseases are a leading cause of mortality worldwide and over 80% of deaths related to those diseases are attributed to heart attack and stroke.(2)
- Studies outside Portugal have shown a link between CAP and cardiovascular disease.(3-5)

Aims

We aimed to better understand CAP hospitalisations in Portugal, in terms of their trends and risk of subsequent acute cardiovascular events.

CAP-H trends **CVD after CAP-H**

Methods | CAP-H trends

Study design
- Retrospetive cohort study

Population
- Adults (≥18y) living in mainland Portugal.
- Discharged with CAP from a public hospital between 2010-18 (ICD-9/10-CM codes used).

Variables
- Frequency and incidence of CAP hospitalisation
- Subgroups: gender, age group, comorbidity, and year of discharge.

Analysis
- Joinpoint regression to study trends in CAP-H incidence (overall and subgroups).

Methods | CVD after CAP-H

Study design
- Self controlled case series

Population
- Adults (≥18y) living in mainland Portugal.
- Hospitalised with CAP and hospitalised with stroke or myocardial infarction (MI) in a public hospital between 2010-18.

Exposure, periods, and outcome
- Exposure: CAP hospitalization.
- Observation period: 2 years (of which 1 year after discharge).
- Exposure periods: 14, 28 and 91 days after discharge. Baseline periods: remaining days of observation period.
- Outcome: Acute cardiovascular (stroke or MI) hospitalisations.

Analysis
- Incidence rate ratios and 95% confidence intervals (95%CI) were computed using a conditional Poisson regression

Results | CAP-H trends

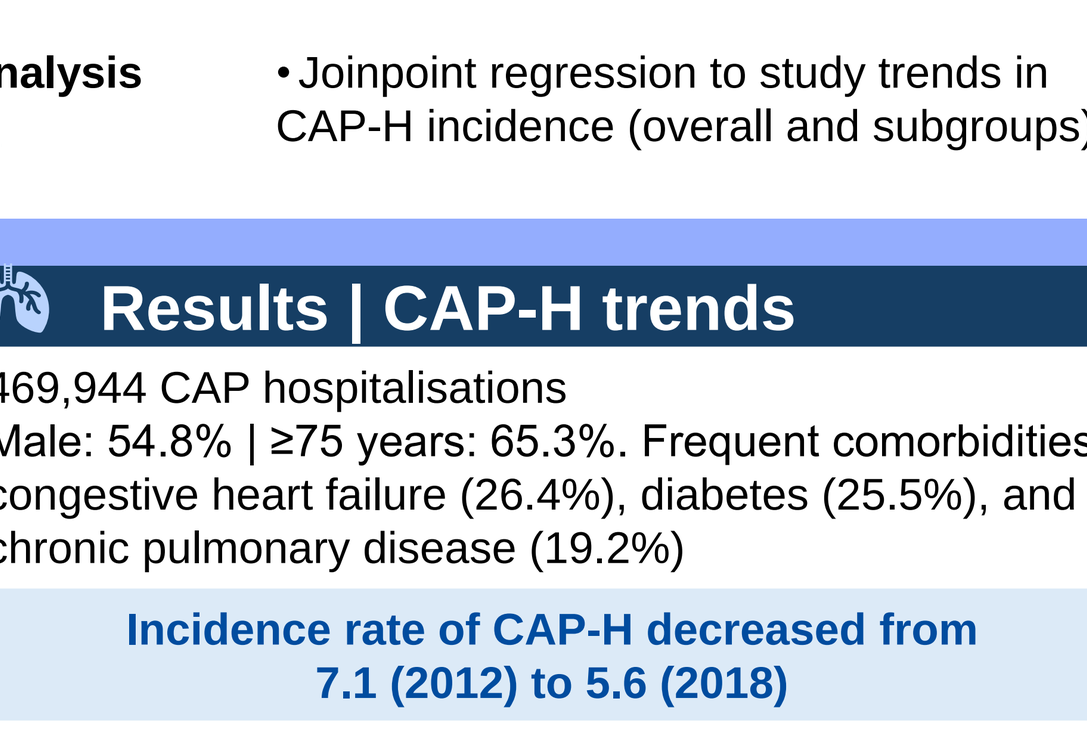
- 469,944 CAP hospitalisations
- Male: 54.8% | ≥75 years: 65.3%. Frequent comorbidities: congestive heart failure (26.4%), diabetes (25.5%), and chronic pulmonary disease (19.2%)

Incidence rate of CAP-H decreased from 7.1 (2012) to 5.6 (2018)

Sex and age group

Decrease for both genders and all age groups

Comorbidities



CPD: Chronic pulmonary disease. CHF: Congestive heart failure. PVD: Peripheral vascular disease. DIAB: Complicated and uncomplicated diabetes. REUMA: Rheumatoid arthritis/collagen vascular diseases. AIDS: Human immunodeficiency virus/ Acquired immunodeficiency syndrome. TUMOR: Solid tumor without metastases and metastatic tumor. LD: Liver disease. CRD: chronic renal disease.

- Decrease for patients with diabetes and AIDS/HIV
- Increase for patients with chronic renal disease
- For the remaining 6 comorbidities, an upward trend was followed by a decreasing trend.

Results | CVD after CAP-H

- 13,494 patients
- Male: stroke – 52%, MI – 55%
- ≥75 years: stroke – 78%, MI – 70%

Stroke/MI hospitalisation incidence was higher following a CAP hospitalisation, compared to the baseline period

Number of days after discharge

14 days	28 days	91 days
Stroke: 2.55 (2.33-2.80)	Stroke: 2.06 (1.92-2.22)	Stroke: 1.37 (1.30-1.44)
MI: 3.23 (2.78-3.75)	MI: 2.62 (2.32-2.95)	MI: 1.75 (1.60-1.91)

Incidence rate ratio (95%CI)

Take away messages

- Incidence of CAP hospitalizations declined in 2010-18 in most groups
- Higher risk of cardiovascular events following a CAP hospitalization, especially in the first two weeks after discharge
- Need to undertake continued and coordinated efforts to reduce the need for CAP hospitalisation and, when it cannot be avoided, to address possible cardiovascular risks

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Characteristics and incidence trends of adults hospitalized with community-acquired pneumonia in Portugal, pre-pandemic

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Risk of stroke or myocardial infarction hospitalisation following hospitalisation for community-acquired pneumonia in Portugal: a self-controlled case series study

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