



# ECONOMIC BURDEN OF COMMUNITY ACQUIRED PNEUMONIA IN OLDER ADULTS IN THE CENTRAL EUROPE

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## Introduction

Older adults are in an increased risk of respiratory infections including community acquired pneumonia (CAP)<sup>1</sup>. The former socialistic countries of the central Europe form a unique region with specific health care and epidemiology characteristics such as the etiology pattern, and where the local evidence on the underlying epidemiology is scarce.

## Purpose

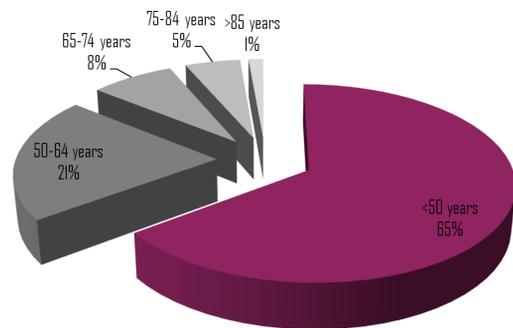
The objective was to estimate the economic burden of CAP in adults ≥50 years of age in the Czech Republic (CR), Slovakia (SK), Poland (PL), and Hungary (HU) using smoothed epidemiology data from 2008, 2009 and 2010 and the most recent cost data available throughout 2010 and 2011 from the societal perspective.

## Methods

- The national demographics data stratified by age were obtained from the respective statistical office in each country.
- The incidence and the CFR for hospitalized CAP were estimated using the national surveillance and reporting systems (PL, CR, SK)<sup>2-5</sup> and national insurance records (HU)<sup>6</sup>.
- National retrospective patient chart reviews (CZ, SK) were used to estimate the direct medical resource use, indirect costs due to sick leaves, and the non-hospitalized CAP incidence as a portion of the hospitalized CAP. In PL we used national surveillance data and in HU the national insurance fund records to estimate outpatient CAP incidence.
- Direct costs from the payer's perspective were based on reimbursement lists and the resource use analyses (CR, SK), DRG lists (PL) and the insurance records (HU).

## Results

The older adults present a substantial part of the population with 40% of those older than 65 years (figure 1).

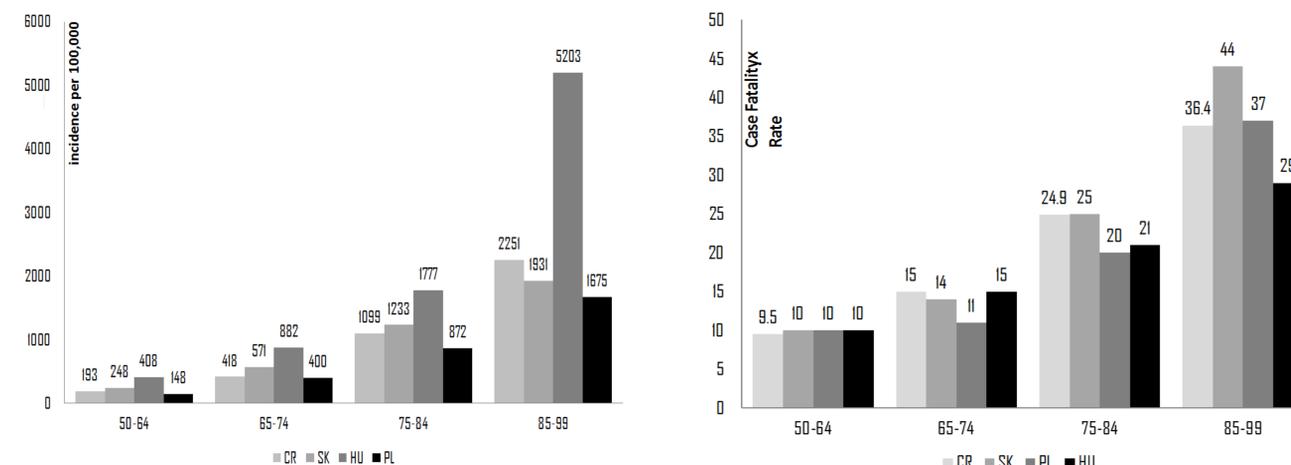


**Figure 1:** Demographics of the joint populations of CR, SK, HU and PL stratified into studied age strata

- The incidence (figure 2) and fatality (figure 3) of CAP sharply increases with growing age. Compared with adults 50-64 years of age, the incidence of hospitalised CAP were 2.3 fold higher in those 65-74, 5.2 fold higher in 75-84, 10.8 fold higher in those ≥85, manifesting an exponential trend.
- The increase in incidence of hospitalized CAP with age shows exponential trend as a consequence of increasing incidence and high hospitalization rate. By contrast, the incidence of non-hospitalized CAP was generally flat or declining with age, representing a higher likelihood of hospitalization with increasing age. The burden of disease by country in selected figures is given in table 1.
- The age-specific economic burden is driven on one side by the population size and the hospitalization rate increasing with age on the other (figures 4 and 5)

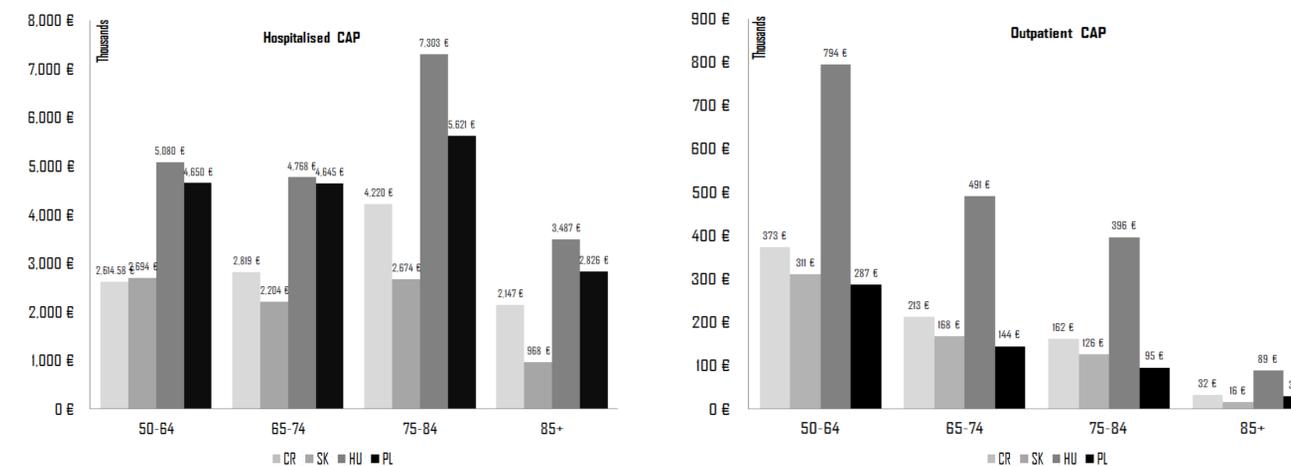
	Community Acquired Pneumonia			
	Czech Republic	Slovakia	Poland	Hungary
Cases	29444	19749	90492	152198
Deaths	2572	1322	3519	4098
Cost	€12 887 861	€10 153 834	€22 746 159	€19 216 545
PPPY	€3.38	€5.69	€1.71	€5.28
Death rate	67.49	73.99	26.50	112.51

**Table 1:** Absolute and derived CAP totals by country together with estimated costs of the illness. PPPY denotes the Per Patient Per Year costs.



**Figure 2:** Country-specific incidence of all-cause inpatient CAP by age group per 100,000

**Figure 3:** Country-specific case fatality rate per 100 hospitalized CAP cases by age group



**Figure 4 and 5:** Economic burden from the societal perspective of hospitalised and outpatient CAP by age strata and country

## Conclusions

- CAP poses a significant economic burden in all four countries among adults ≥50 years of age. The burden increases exponentially with progressing age.
- Both the morbidity and mortality of hospitalised CAP increases sharply with advancing age, signalling a likely increasing public health problem. In PL, adults over 65 represent 14% of the study population, while they account for 80% of deaths from CAP. Greater life expectancy and lower birth rates the proportion of older adults is expected to grow in these countries, making efforts to efficiently treat or prevent CAP a public health priority.
- While PL, CZ and SK can well be compared within this study, HU data were obtained from a different source and may hence be a subject of a bias.