



SCIENTIFIC LETTER

Overdiagnosis of community-acquired pneumonia in primary care. Comparison across five European countries



Sobrediagnóstico de neumonía adquirida en la comunidad en atención primaria. Comparación entre cinco países europeos

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Inappropriate diagnosis of common infections is a widespread issue, with diagnostic errors often occurring in infectious diseases, particularly in primary care.¹ Benign viral infections, especially of the upper respiratory tract, are commonly misdiagnosed, leading to unnecessary antibiotic prescriptions, even though most respiratory infections are viral and resolve on their own.² As part of the HAPPY PATIENT project, a study was conducted in four settings across five European countries (France, Greece, Lithuania, Poland, and Spain), aimed to evaluate the impact of a multifaceted intervention designed to guide healthcare professionals in reducing inappropriate antibiotic use. For the purpose of this study, clinicians in two settings – primary care consultations and out-of-hours services – recorded lower respiratory tract infections

(LRTI) diagnoses, symptoms, prescribed antibiotics, and other patient data over two periods in 2022 and 2023. The findings revealed that while the intervention showed some improvement, its overall impact was limited.³ Descriptive statistics were used to analyse the results of the data gathered through paper-based self-registry templates.

As shown in Table 1, a total of 196 clinicians registered 2215 cases of LRTIs, with 61.3% receiving antibiotics. The percentage of community-acquired pneumonia varied by country, from 17.8% in Spain to 46.4% in Lithuania. Acute bronchitis episodes also showed wide variation, with Poland, Spain, and France reporting over 60% of cases, while Greece and Lithuania reported less than 50%. Diagnoses of acute exacerbations of COPD were more consistent across countries. Symptom presentation varied significantly, with 75.3% of pneumonia cases in Spain presenting with fever, while Lithuania had the highest proportion of fever in acute bronchitis cases (49.4%). Antibiotic prescribing varied widely, with 61.3% of LRTI patients receiving antibiotics, ranging

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Table 1 Main characteristics of patients with lower respiratory tract infections registered in the study.

	France	Greece	Lithuania	Poland	Spain	All the countries
<i>Acute bronchitis</i>						
<i>n</i> (%)	130 (60.2)	179 (47.2)	326 (49.5)	278 (63.3)	327 (62.5)	1,240 (56.0)
Age, in years, mean (SD)	33.0 (29.7)	49.9 (22.8)	31.5 (26.2)	27.5 (26.7)	56.1 (21.3)	40.3 (27.8)
Female, <i>n</i> (%)	66 (57.9)	96 (54.9)	182 (55.8)	137 (49.3)	217 (66.4)	698 (56.3)
Fever, <i>n</i> (%)	42 (32.3)	73 (40.8)	161 (49.4)	114 (41.0)	86 (26.3)	476 (38.4)
Cough, <i>n</i> (%)	126 (96.9)	161 (89.9)	305 (93.6)	271 (97.5)	314 (96.0)	1,177 (94.9)
Purulent sputum, <i>n</i> (%)	14 (10.8)	92 (51.4)	31 (9.5)	72 (25.9)	113 (34.6)	322 (26.0)
Poor general condition, <i>n</i> (%)	13 (10.0)	26 (14.5)	43 (13.2)	8 (2.9)	36 (11.0)	126 (10.2)
Antibiotics given, <i>n</i> (%)	26 (20.0)	144 (80.4)	101 (31.0)	196 (70.5)	88 (36.2)	555 (40.9)
<i>Community-acquired pneumonia</i>						
<i>n</i> (%)	52 (24.1)	114 (30.1)	305 (46.4)	140 (31.9)	93 (17.8)	704 (31.8)
Age, in years, mean (SD)	50.5 (28.7)	56.2 (22.0)	44.4 (28.4)	31.6 (30.0)	58.7 (22.8)	46.4 (28.6)
Female, <i>n</i> (%)	37 (71.2)	50 (43.9)	154 (50.5)	69 (49.3)	53 (57.0)	363 (51.6)
Fever, <i>n</i> (%)	36 (69.2)	82 (71.9)	218 (71.5)	80 (57.1)	70 (75.3)	486 (69.0)
Cough, <i>n</i> (%)	45 (86.5)	100 (87.7)	239 (78.4)	131 (93.6)	82 (88.2)	597 (84.8)
Purulent sputum, <i>n</i> (%)	21 (40.4)	51 (44.7)	66 (21.6)	41 (29.3)	48 (51.6)	227 (32.2)
Poor general condition, <i>n</i> (%)	20 (38.5)	41 (36.0)	165 (54.1)	27 (19.3)	30 (32.3)	283 (40.2)
Antibiotics given*, <i>n</i> (%)	52 (100.0)	90 (78.9)	258 (84.6)	128 (91.4)	70 (75.3)	598 (84.9)
<i>Acute exacerbations of chronic obstructive pulmonary disease</i>						
<i>n</i> (%)	34 (15.7)	86 (22.7)	27 (4.1)	21 (4.8)	103 (19.7)	271 (12.2)
Age, in years, mean (SD)	67.4 (12.6)	68.6 (11.4)	66.0 (4.1)	71.1 (10.5)	70.3 (12.5)	69.2 (11.9)
Female, <i>n</i> (%)	11 (32.4)	29 (16.6)	10 (37.0)	11 (52.4)	42 (40.8)	103 (38.0)
Fever, <i>n</i> (%)	13 (38.2)	25 (29.1)	13 (48.1)	4 (19.0)	22 (21.4)	77 (28.4)
Cough, <i>n</i> (%)	34 (100.0)	69 (80.2)	23 (85.2)	20 (95.2)	94 (91.3)	240 (88.6)
Purulent sputum, <i>n</i> (%)	25 (73.5)	45 (52.3)	15 (55.6)	14 (66.7)	76 (73.8)	175 (64.6)
Poor general condition, <i>n</i> (%)	5 (14.7)	22 (25.6)	12 (44.4)	4 (19.0)	16 (15.5)	59 (21.8)
Antibiotics given, <i>n</i> (%)	27 (79.4)	58 (67.4)	18 (66.7)	16 (76.2)	85 (82.5)	204 (75.3)
<i>Total of patients with lower respiratory tract infections</i>						
<i>n</i> (%)	216 (100.0)	379 (100.0)	658 (100.0)	439 (100.0)	523 (100.0)	2,215 (100.0)
Age, in years, mean (SD)	44.1 (32.5)	56.3 (21.2)	47.8 (30.5)	32.2 (29.0)	58.6 (21.1)	48.3 (28.6)
Female, <i>n</i> (%)	114 (52.8)	175 (46.2)	346 (52.6)	217 (49.4)	312 (59.7)	1,164 (52.6)
Fever, <i>n</i> (%)	91 (42.1)	180 (47.5)	392 (59.6)	198 (45.1)	178 (34.0)	1,039 (46.9)
Cough, <i>n</i> (%)	205 (94.9)	330 (87.1)	567 (86.2)	422 (96.1)	490 (93.7)	2,014 (90.9)
Purulent sputum, <i>n</i> (%)	60 (27.8)	188 (49.6)	112 (17.0)	127 (28.9)	237 (45.3)	724 (32.7)
Poor general condition, <i>n</i> (%)	38 (17.6)	89 (23.5)	220 (33.4)	39 (8.9)	82 (15.7)	468 (21.1)
Antibiotics given, <i>n</i> (%)	105 (48.6)	292 (77.0)	377 (57.3)	340 (77.4)	243 (46.5)	1,357 (61.3)

SD: standard deviation.

* Doctors had the option to tick off referral to the hospital on the template, explaining why some instances of pneumonia did not receive antibiotic treatment.

from 46.5% in Spain to 77.4% in Poland. The variation was even greater for acute bronchitis, from 20% in France to 80.4% in Greece. France and Spain, which labelled fewer LRTIs as pneumonia, had the lowest rates of antibiotic prescribing overall.

The study suggests that the diagnosis of various LRTIs is often overestimated in certain locations, potentially leading to overdiagnosis and excessive antibiotic use. We observed that the prevalence of pneumonia can vary significantly, with rates nearly three times higher in one country compared to another. There is no reason to believe that pneumonias account for a higher proportion of LRTIs in one country over another, and according to international literature, the prevalence of pneumonia in patients with LRTIs should not exceed 20% of the LRTIs in primary care.⁴ Howie already

stated in 1972 that, at times, diagnostic labels rationalize management decisions rather than determining them, with doctors often prescribing antibiotics before finalizing a diagnosis.⁵ This was confirmed by the current study. Christensen et al.⁶ found that 47% of patients with LRTI were diagnosed with pneumonia in Denmark compared to 11% in Spain. Similar to our findings, fever was also more prevalent among patients with pneumonia in Spain.

Cross-country differences in diagnosing LRTI symptoms, driven by diagnostic uncertainty and varying medical practices, contribute to overprescription of antibiotics. There is no single symptom or sign that definitively indicates pneumonia, making it difficult to distinguish from acute bronchitis in primary care.⁷ While point-of-care tests and chest X-rays could aid diagnosis, use of C-reactive protein

rapid testing in these countries is not widespread and routine X-rays for every cough and fever is not recommended due to high costs and radiation risks. It is only recommended when the diagnosis of pneumonia is highly likely; in addition, a normal chest X-ray does not necessarily rule out pneumonia.⁸ Valid diagnostic tools are essential to mitigate overdiagnosis and unnecessary antibiotic use.

Ethical aspects

In Spain, the coordinating country, the study was approved by the Ethics Committee of IDIAP Jordi Gol, Institute of Research in Primary Health Care. Trial Registration Number: 21-121-P.

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Conflicts of interest

The authors declare no conflicts of interest.

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