Influence of Age on Resistance in Community-acquired Lower Respiratory Tract Isolates of *S. pneumoniae* from the UK and Ireland

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Methods. A total of 27 centres in the UK and Ireland contributed 3584 lower respiratory tract isolates of *Streptococcus pneumoniae* to the BSAC Respiratory Resistance Surveillance Programme[1] over five winters (1999-2000 to 2003-04), excluding duplicates within 2 weeks, and isolates from samples collected >48hours after hospitalisation, or from patients with cystic fibrosis. MICs were determined centrally using the BSAC agar dilution method and interpreted by BSAC criteria. Logistic regression models for penicillin-non-susceptibility and tetracycline-, erythromycin- and ciprofloxacin-resistance (PEN-NS, TET-R, ERY-R & CIP-R) were fitted by a stepwise method.

Results. See tables, graphs and captions.
Age was unknown for 4 patients; median age was 62. Age varied slightly between countries, but not across years. However, year was included in models to investigate trends (see poster P1453).
Sex, care setting (hospital / community / nursing home) and isolate source (sputum / other) did not contribute significantly and were not included in any final models. Final models included centre, age and year of study.

Model for	Including	p
PEN-NS	centre[i]	0.000
>0.06 mg/L	age[i]	0.006
N = 3544	year	0.044
TET-R	centre[i]	0.000
>1 mg/L	age[i]	0.036
N = 3522	year	0.045
ERY-R	centre[i]	0.000
>0.5 mg/L	age[i]	0.018
N = 3571	year	0.289
CIP-R	centre[i]	0.000
>2 mg/L	age	0.000
N = 3544	year[i]	1.000

[i] Included as a categorical variable. Number of observations differ because centres were dropped unless they included both resistant and susceptible isolates.

Acknowledgements

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[1]Reynolds, R., Shackcloth, J., Felmingham, D. *et al.* (2003). *JAC* **52,** 931-943.

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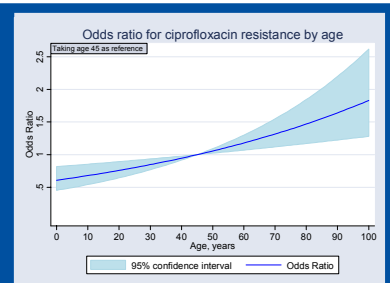
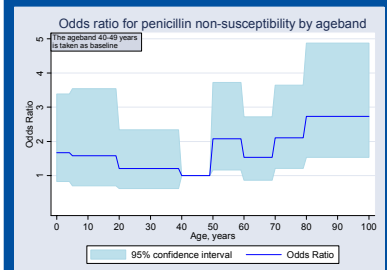
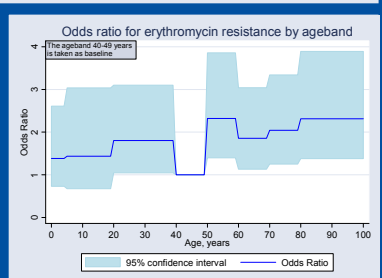
Ageband, years	Median age in band	N	Observed Resistance, %, by Ageband			
			PEN-NS >0.06 mg/L	TET-R >1 mg/L	ERY-R >0.5 mg/L	CIP-R >2 mg/L
0 - 4	0	233	10.3	7.7	11.2	2.1
5 - 19	11	130	9.2	6.2	9.2	2.3
20 - 39	33	402	5.5	6.0	10.7	6.0
40 - 49	45	352	5.1	3.7	6.3	6.3
50 - 59	55	527	9.1	8.9	12.9	9.7
60 - 69	65	759	6.9	5.7	10.8	6.6
70 - 79	74	746	10.6	8.8	12.6	8.4
≥ 80	84	431	13.2	7.4	13.9	8.1
total	**62**	**3580**	**8.7**	**7.0**	**11.4**	**7.1**

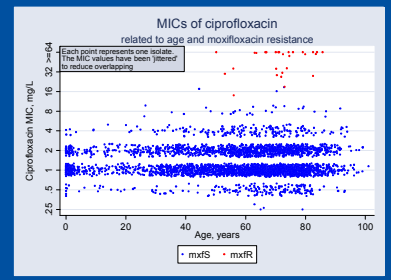


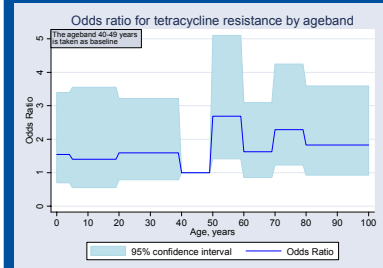
CIP resistance was best modelled with a linear function of age, indicating that the probability of resistance increased steadily with age.

Moxifloxacin-resistance (MXF-R, MIC >1 mg/L) was not geographically localised but was too rare to model (0.8% overall). It was also strongly associated with age. Of 29 MXF-R isolates, 25 were from patients aged ≥60 and none from a patient aged ≤50. (Fisher's exact p < 0.001).

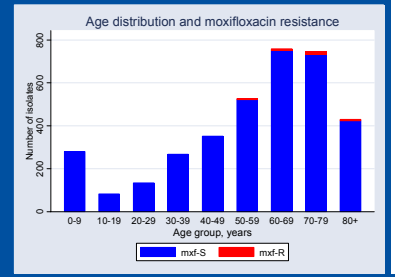


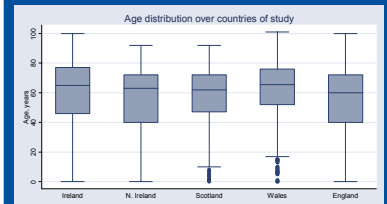


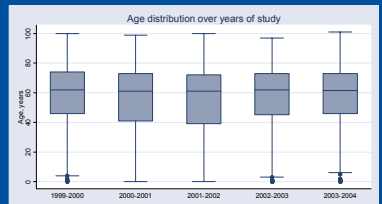




Non-susceptibility to PEN and resistance to TET and ERY were best modelled using categorical agebands. The probability of resistance was lowest in the 40-49 ageband and, particularly for penicillin non-susceptibility, higher in both older and younger patients.







Conclusion. Patient age is a significant predictor of resistance in *S. pneumoniae*. Isolates from both young and elderly patients had increased risk of resistance to PEN, TET and ERY, but CIP resistance increased steadily with age. Resistance to MXF was rare in the UK and Ireland, and was seen only in isolates from patients aged over 50.

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