

Antimicrobial resistance in pathogenic and non-pathogenic *Escherichia coli* from pigs in Belgium: a retrospective study from 1998 to 2008

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INTRODUCTION

The level and profile of antimicrobial resistance in food producing animals is evaluated both through the monitoring of non-pathogenic and pathogenic *E. coli*. In order to estimate the value of non-pathogenic *E. coli* to predict resistance in pathogenic strains, we compared both populations. Moreover, since resistance prevalence may change over time, we analysed the evolution of resistance both in pathogenic and non-pathogenic strains.

MATERIALS AND METHODS

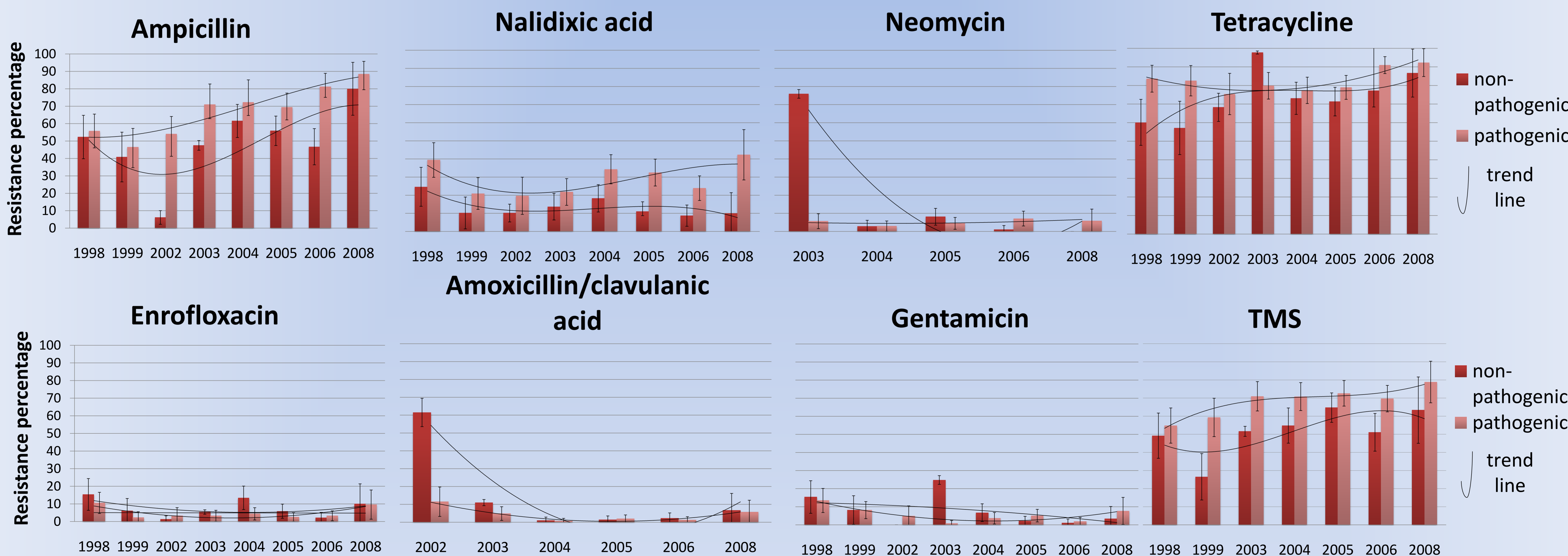
Data were retrospectively collected from several Belgian studies between 1998 and 2008. Pigs with different ages were included in this study. A total of 1047 *E. coli* isolates were collected from pigs showing symptoms of an *E. coli* infection. Multiplex PCR was done to determine the pathotype of the strain. In the same period 1862 *E. coli* isolates were collected from non-diseased animals and regarded as non-pathogenic. Agar disk diffusion was performed in accordance to the standards of the CLSI and the "Société Française de Microbiologie" (isolates collected in 2002). A multivariable logistic regression analysis was performed to explore the effect of time and pathogenicity on the occurrence of antimicrobial resistance.

RESULTS & DISCUSSION

For 5 of the 8 tested antimicrobials (ampicillin, nalidixic acid, neomycin, tetracycline, trimethoprim/sulfonamide) the prevalence of resistance was significantly ($P < 0.05$) higher in pathogenic isolates compared to non-pathogenic isolates. Yet the resistance evolution of pathogenic and non-pathogenic *E. coli* followed a similar trend in time.

A significant increase ($P < 0.05$) of antimicrobial resistance between 1998 and 2008 was seen for ampicillin, tetracycline and trimethoprim/sulfonamide in both pathogenic and non-pathogenic strains, whereas for amoxicillin/clavulanic acid, enrofloxacin and neomycin no time effect was observed. Gentamicin and nalidixic acid showed decreasing resistance percentages over time in the non-pathogenic strains (figures 1 to 8).

Figures 1 to 8: Antimicrobial resistance prevalences in pathogenic and non-pathogenic *E. coli* and their 95% CI.



CONCLUSION

For 5 of the 8 tested antimicrobials a significantly higher antimicrobial resistance prevalence was observed in pathogenic *E. coli* compared to non-pathogenic *E. coli*. Yet comparable trends in the antimicrobial resistance evolution of pathogenic and non-pathogenic *E. coli* were observed over time.

ACKNOWLEDGEMENTS

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