



4CPS-082 ATC code: 3. Literature reviews ENVIRONMENTAL POLLUTION WITH QUINOLONES IN SPAIN



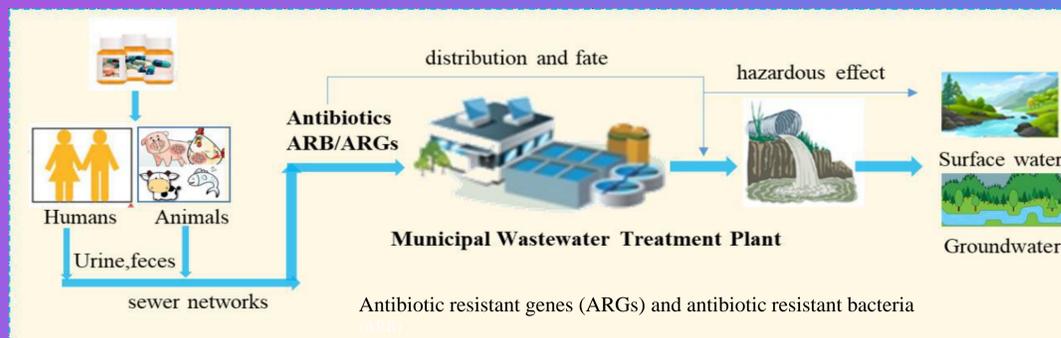
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Background and importance

Concern about emerging pollutants, including pharmaceuticals, has been growing in the last decades. Antibiotics receive particular attention because of the problem of antibiotic resistance. **Hospital pharmacists play an important role in the antibiotic stewardship program, aiming to reduce antibiotic resistance.**

Wastewater treatment plants (WWTP) were not designed to eliminate pharmaceuticals. In fact, the effluent of these WWTPs frequently show the presence of several antibiotics. The presence of human pathogens and a wide diversity of environmental bacteria provide the opportunity for transferring resistance factors between bacteria.



The Predicted No Effect Concentration (PNEC) is the concentration of a chemical which marks the limit at which below no adverse effects are expected. The PNEC for ciprofloxacin is 0,064 µg/l and 0,5 µg/l for norfloxacin. When concentrations exceed the PNEC, the water is denoted as being 'at risk' for resistance selection.

Spain is the fourth European country in consumption of quinolones.

Aim and objectives

In this study, we aimed to review the presence of quinolones in WWTPs effluent (treated) in Spain.

Material and methods

We used the pharmaceutical database published by the German Environment Agency-Umweltbundesamt, which collects all published information about the presence of pharmaceuticals in different environmental matrices.

The database was downloaded on September 28, 2021. We selected data regarding quinolones in WWTP effluent (treated) samples from Spain. **We looked if measured concentrations were above the PNECs.**

Results

Quinolones in WWTP effluent (treated)	PNEC (mcg/l)	Highest concentration (mcg/l) in samples	Nº samples	Nº samples >PNEC
Ciprofloxacin	0,064	5,69	47	31
Norfloxacin	0,5	0,98	25	2

There were no data for levofloxacin or other quinolones.



Conclusion and relevance

In Spain, **65% of ciprofloxacin and 8% of norfloxacin samples leaving WWTP show a concentration > PNEC**, and thus may be contributing to the development of quinolone resistant bacteria. More data are needed to describe the effects and fate on the environment. **It is necessary to increase awareness of quinolone pollution among hospital pharmacists to help reduce its consumption.**

