Stop AMR Global Media Monitor

29 February – 06 March 2020

Antimicrobial resistance in the EU: infections with foodborne bacteria becoming harder to treat

The new report on Anti-Microbial Resistance in zoonotic and indicator bacteria from humans, animals and food in 2017/2018 has been published. Regarding the data, it appears that *Salmonella* and *Campylobacter* are a growing threat as they are becoming increasingly resistant to ciprofloxacin, one of the most used antibiotics against those families of bacteria. The resistance to high concentration of ciprofloxacin increased overall from 1.7% to 4.6% between 2016 and 2018 in *Salmonella.* Regarding *Campylobacter*, 16 out of 19 countries at least pointed at very high percentages of bacteria with a ciprofloxacin resistance. The efficiency of combined treatment is not endangered as multi-drug resistance to the most efficient antibiotics toward those bacteria remains low.
From a more alarming point of view, occasional and unrelated cases of human *Salmonella* infection with resistance to carbapenems, a last-resort antimicrobial, have been signalled in the report.
Mike Catchpole, ECDC's chief scientist, said: "Finding carbapenem resistance in foodborne bacteria in the EU is a concern. The most effective way to prevent the spread of carbapenem-resistant strains is to continue screening and respond promptly to positive detections. ECDC is working with EU Member States and with EFSA in a One Health approach to enhance the early detection and monitoring, in an effort to fight the persisting threat of antimicrobial-resistant zoonotic infections."
Marta Hugas, EFSA's chief scientist, also expressed her concerns as AMR is for her a serious threat to global public and animal health.
A positive note emphasises the decline in resistance to ampicillin and to tetracyclines in *Salmonella Typhimurium.*
In the animal sector, results are encouraging regarding the period of 2014-2018. In 6 Member States, the susceptibility of *E-Coli* towards antibiotics increased while in the same timeframe, a decreasing number of *E-Coli* bacteria resistant to cephalosporin infections has been observed. Those bacteria being responsible for serious infections in human, such a reduction is always welcome.

For last-line anti-microbials, resistance to colistin was not common and carbapenem-resistant *E-Coli* have not been recorded in the poultry industry.

Source: EFSA, 03 March 2020

Anti-evolution drug could stop antibiotic resistance

Bacteria acquired during the evolutionary process an adaptative mechanism called "competence". This mechanism has a unique objective, to catch resistance genes in the surrounding environment. Indeed, as bacteria are killed by multiple substances, some of them, with a randomly acquired mutations are resistant to the substance and can generate a new resistant strain. More dangerously, resistant bacteria can spread the resistance gene inside the treated population because of this "competence" mechanism.
As antibiotics enhance the activity of this mechanism, scientists tried to find a way to supress it. They managed to isolate 46 already approved drugs able to block the induction of "competence". They discovered that all of them were acting by preventing the proton-motive force, a source of energy for various cellular processes. Laboratory tests shows that those drugs efficiently prevent the transmission of bacterial genes in susceptible strains of *Streptococcus pneumoniae.* However, as human cells also use this mechanism, the "risk-free" application is still not guaranteed. However, this discovery could help as an adjuvant, to increase in time the efficiency of antibiotics.

Source: Phys.org, 03 March 2020

Bacteria killed by new light-activated coating

A newly developed bactericidal coating made with chemically modified gold and crystal violet (a dye with antibacterial and antifungal properties) has efficiently killed *S. aureus* and *E. Coli* at ambient light levels. While exposed to light, it produces reactive oxygen species, a powerful killer inducing cellular damages. This opens the possibility of a promising use in multiple healthcare environments.

Source: EurekAlert!, 05 March 2020

Novel compound sparks new malaria treatment hope

A team of US and Australian researchers developed a novel class of antimalarial compound that effectively kills malaria parasites. The compounds are efficient against multiple species of malaria parasites and remained efficient in the different life stages of the parasites. This prevent a transmission back to the mosquito and could help to restrain the spread of the malaria's parasites. This compound could help to deal with the increasing problem of parasite drug resistances. Indeed, in some areas, the parasite is already resistant to all malaria treatments.

Source : EurekAlert!, 04 March 2020

UK study links frequent antibiotic use to higher risk of hospitalization

A published study indicates that repeated prescribing of antibiotics, despite the lack of clinical benefit, could lead to an increased risk of health issues in the following years. Within a cohort of 2 million patients that were prescribed antibiotics between 2000 and 2017 for common infections, they selected the ones with at least 3 years of history in the databases to perform statistical analysis.
They separated the selected patients in 5 categories depending on their antibiotic consumption. It appears that infection-related hospitalization was higher in the high antibiotic consumers group than in the lowest. The highest category of consumers was also more inclined to a higher hospitalization risk than the other categories over time.

Researchers propose multiple explanations.

- There is a possible bias by immunocompromised peoples, resulting in a higher antibiotic use and chance of hospitalisation due to infection.
- Increased resistance to antibiotic, resulting in harder to treat infections and so requiring hospitalisation.
- A disrupt in the intestinal microbiota, enabling the colonization in guts by pathogens.

Source: CIDRAP, 02 March 2020

Plastic Pollution May Be Spreading Antibiotic Resistance

For a new study, scientists collected multiple larger than 5 mm in diameter plastic food packaging along the Irish coast. The bacteria were then harvested from the plastic packaging and were treated with 10 common antibiotics.
98 % of the plastic pieces were carrying resistant bacteria against ampicillin. The more efficient antibiotic was the minocycline, with only 16% of the plastic pieces holding bacteria resistant strains. The other antibiotics had an efficiency between those two extremes.
Some of the detected bacteria are known to be harmful for humans, plants or animal.

Plastic debris are an incredible source of new habitats to colonize for bacteria and, if terrestrial bacteria may not efficiently survive in the water, they could transfer the resistance gene to marine bacteria. This could help to spread AMR at an international scale. As those plastics can be eaten by fishes, bacteria could potentially reinter the food chain.

Hakai magazine, 04 March 2020