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Medicine

Covid-19 pandemic linked to antibiotic resistance in pneumonia bacterium

Carissa Wong

THE covid-19 pandemic may have led to a rise in antibiotic-resistant bacteria. While a modelling study suggests that Europe's various lockdowns resulted in a decline in cases of a pneumonia-causing bacterium between 2019 and 2020, the proportion of those that were resistant to antibiotics increased.

People with covid-19 may be at a greater risk of bacterial infections because fighting off viruses limits the immune system's ability to tackle invading bacteria. Confirmed or suspected bacterial co-infections may be treated with antibiotics, which can contribute to the bacteria becoming resistant to the drugs.

Aleksandra Kovacevic at the Pasteur Institute in France and her colleagues modelled how people interacted in and out of Europe's covid-19 lockdowns, alongside changes to the prescription of antibiotics



KIYOSHI TAKAHASE/SEGUNDOALAMY

Streptococcus pneumoniae bacteria can cause pneumonia

between 2019 and 2020, and how these affected the bacterium *Streptococcus pneumoniae's* ability to evolve antibiotic resistance and its transmission in non-hospital settings.

The team also used data on the transmission of the original SARS-CoV-2 coronavirus and the extent to which it affects *S. pneumoniae's* ability to go from being carried asymptotically to resulting in illness – the bacterium lives harmlessly in many people's throats, but can cause pneumonia and serious blood infections.

Within the model, the team

simulated the planting of two coronavirus cases in a population of 100,000 people. On day 120 of the simulated outbreak, a 90-day wave of infections began. The model, which tracked changing levels of antibiotic-resistant and antibiotic-sensitive *S. pneumoniae* cases, spanned one year.

The team ran six scenarios through the model. Three included population-wide lockdowns, which reduced the spread of *S. pneumoniae*.

But in all six scenarios, the coronavirus wave was associated with a rise in the proportion of *S. pneumoniae* that was antibiotic-resistant (bioRxiv, doi.org/jw4k).

This could lead to more medical complications and hospitalisations, says team member Lulla Opatowski. But we don't know if higher-than-expected morbidities linked with antibiotic-resistant *S. pneumoniae*

have occurred in the pandemic, says Scott Olesen at the US Centers for Disease Control and Prevention.

The situation could even be worse than the modelling suggests, as it only simulated *S. pneumoniae* in non-hospital settings, says Olesen.

It is also unclear whether similar results apply to bacteria

“We don't know if higher morbidities have occurred during the pandemic due to antibiotic resistance”

other than *S. pneumoniae*.

This model indicates there were changing levels of antibiotic resistance among a bacterium that causes respiratory infections, but you would need different models to gauge resistance in a bacterium such as *Escherichia coli*, which mainly spreads via contaminated food, says Kovacevic. ■

Ecology

Urban beekeeping boom may be bad for native bee species

EFFORTS to “save the bees” by encouraging urban beekeeping over the past decade may have been good for honeybees, but wild, native bees appear to be paying the price.

Researchers in Montreal, Canada, surveyed wild bee populations across the city in 2020 and found that the diversity of species of wild bees was lower in areas with higher concentrations of honeybee hives.

The overall bee diversity in the city also dropped since the survey was last done in 2013, before an influx of around 3000 new honeybee hives. A survey of the same sites found 177 different



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wild bee species in 2013, but just 120 species were spotted in 2020 (PeerJ, doi.org/grqqm6).

“The sites that saw the largest increase in honeybees over the years had the fewest wild species,” says Gail MacInnis, now at the National Bee Diagnostic Centre

at Northwestern Polytechnic in Beaverlodge, Canada.

The honeybees seem to be crowding out wild bees by competing with them for food. MacInnis and her colleagues also sampled white clover at every study site and found that the amount of

Colonies of domesticated honeybees may crowd out wild bee species

available clover pollen declined as honeybee numbers went up.

While the study doesn't prove that the honeybees are directly causing the drop in wild bee diversity, research in other cities has pointed to a similar trend.

Phil Stevenson at the Royal Botanic Gardens, Kew, in London says the drop in wild bee diversity is concerning. Although honeybees are vital for pollination in many agricultural settings, wild bees are better pollinators for native plants, and even some crops, such as apples. “Many wild bees actually provide the services that we attribute to honeybees,” he says. ■ Brian Owens