Environmental Impact of COVID-19 and Effects of Changing Behaviours

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Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria (PACCARB)
1:20pm, September 10, 2020
A moderate to severe influenza pandemic will increase antibiotic use (13 to 252%), risking:

- Reduction in sewage treatment
- Reduced pathogen removal
- Untreated sewage discharge
- AMR selection in STP & environment

https://ehp.niehs.nih.gov/doi/10.1289/ehp.1002757
Secondary Bacterial Infections from COVID-19

Patients with suspected community-acquired pneumonia are to be treated with:

- Doxycycline
- Co-amoxiclav
- Clarithromycin
- Cefuroxime
- Levofoxacin
Evidence of Antibiotic Use

- 8% of COVID-19 patients reported bacterial/fungal coinfection during hospital admission.
- 72% of COVID-19 patients reported received antimicrobial therapy.
1. Reduced ‘Face to Face’ visits to the doctor might have resulted in reduced antibiotic prescribing.

2. Is a similar trend seen in countries where access to antibiotics is typically provided without a prescription (LMICs).

Impact of COVID-19 on Access to Healthcare

Evidence for Increased Antibiotic Use by NHS

Early pandemic (<May): increased antibiotic use

Lockdown led to lower antibiotic use (at a national level).

https://openprescribing.net/
Behaviour Change: Environmental Surveillance

Lockdown reduced environmental surveillance compromising incident identification, mitigation, enforcement.

More ‘stay-cations’ means increased use of local sewage-impacted rivers with implications on AMR carriage/infection.
Many within the AMR research community have adapted to the needs for COVID-19 research.

- leaves us unaware of the unique impact of COVID-19 on AMR the environment.
- Reduced availability of molecular reagents for AMR research.
- On-going AMR work has been put on hold or stopped.
- Some international AMR research has been cut or suspended.

Social distancing requirements limited lab capacity systematically reducing scientific output.

Lockdown and new restrictions led to suspended fieldwork with a dramatic reduction in environmental sampling.
**Positive:** Widespread use of alcohol-based hand sanitizers will have reduced infections.

**Positive:** Rigorous PPE use in community & hospitals might have impacted our “culture” with long-term implications for AMR.

**Negative:** Continued sale of non-alcoholic hand sanitizers containing biocides will maintain/increase some AMR.

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**Behavioural Change: PPE**

**Positive:** Widespread use of alcohol-based hand sanitizers will have reduced infections.

**Positive:** Rigorous PPE use in community & hospitals might have impacted our “culture” with long-term implications for AMR.

**Negative:** Continued sale of non-alcoholic hand sanitizers containing biocides will maintain/increase some AMR.

**CDC recommends at least 60% ethyl alcohol (ethanol) or 70% isopropyl alcohol (isopropanol) Poly(hexamethylenebiguanide) hydrochloride 0.1%, Didecyldimethylammonium chloride 0.15%. (QAC)**

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<th>100ml, 250ml</th>
<th>100ml</th>
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<td>Alcohol Content (%v/v)</td>
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UK Centre for Ecology & Hydrology
The early increase in antibiotic prescribing by the NHS during COVID-19 pandemic has unlikely lead to increased environmental AMR.

Lasting impact on AMR could come from reduced AMR research, diverted funds, changing agendas.

Culture change from embedding PPE might be a positive legacy with huge implications on AMR.