WORKSHOP IN SHORT	
Title of workshop	Strengthening the Policy Relevance of Wastewater-based Surveillance for Antimicrobial Resistance
Organizers of workshop (2-3) **For each organizer:** - Name - Affiliation - URL - Short bio - Identify two contacts with an Asterix	Sheena Conforti*, Ph.D. Student, Eawag, Swiss Federal Institute of Aquatic Science and Technology (https://www.eawag.ch/en/aboutus/portrait/organisation/staff/profile/sheena-conforti/show/) is a Ph.D. student affiliated with the Department of Environmental Microbiology at Eawag and the Department of Biosystems Science and Engineering at ETH Zurich since November 2020. Her academic background includes a B.S. in Biological Sciences from the University of Zurich and an International Master of Science in Marine Biological Resources from the University of Ghent. Her research interests involve inferring carriage of antimicrobial resistance in the population using rates of resistance estimated in wastewater. Additionally, she focuses on utilizing genomic data from wastewater and other sources to infer the transmission of antibiotic-resistant bacteria within the One Health framework. Amy Pruden*, Professor, Virginia Tech (https://cee.vt.edu/people/faculty/pruden.html) is a University Distinguished Professor in the Department of Civil and Environmental Engineering at Virginia Tech. She earned her B.S. in Biological Sciences and her PhD in Environmental Science, both at the University of Cincinnati. Her research focuses on bringing a microbial ecological perspective to advancing control of pathogens and antibiotic resistance in the design and management of water, wastewater, and recycled water systems. Currently she is leading a US National Science Foundation PhD training grant focused on wastewater-based surveillance of AMR and policy.
Proposed speakers **For each speaker:** - Status (pending invitation, confirmed) - Name - Affiliation - URL	Frank Møller Aarestrup (Confirmed), DTU National Food Institute, https://www.dtu.dk/english/person/frank-moelleraarestrup?id=39147&entity=profile Andrew C. Singer (Confirmed), UK Centre for Ecology & Hydrology, https://www.ceh.ac.uk/staff/andrew-singer Heike Schmitt (Confirmed), RIVM National Institute for Public Health and the Environment, https://www.rivm.nl/en/news/heike-schmitt-appointed-asprofessor-of-antibiotic-resistance-in-water-cycle Sheena Conforti (Confirmed), EAWAG, https://www.eawag.ch/en/aboutus/portrait/organisation/staff/profile/sheena-conforti/show/ Amy Pruden (Confirmed), Virginia Tech, https://cee.vt.edu/people/faculty/pruden.html

	Chand Mangat (Confirmed), Public Health Agency of Canada, https://www.linkedin.com/in/chand-mangat-09b82914/?originalSubdomain=ca Dominic Frigon (Confirmed), McGill University, https://www.mcgill.ca/civil/dominic-frigon
Summary (150 words max)	The major objective of the workshop is to inform and advance policy relevance of antimicrobial resistance (AMR) measurements generated by wastewater-based surveillance (WBS) programs. Wastewater offers substantial promises to complement and bolster current AMR surveillance programs, which overwhelmingly rely on data collected within clinical settings. However, the extent to which wastewater data provides actionable or policy relevant insights remains unclear. The goal of this workshop is to bridge the gap between data collection strategies and actionable policy. The workshop will integrate discussion with breakout groups to address: 1) What current public health relevant indicators are used to drive antimicrobial stewardship policy at local/global/national scales? 2) What public health relevant indicators can be derived from wastewater through monitoring programs? 3) What information, resources, and contextualization is/are needed to align public health indicators derived from wastewater with other public health indicators to better inform epidemiological understanding of AMR? 4) How can the information derived from WBS and wastewater-based epidemiology (WBE) contribute to the formulation of effective public health policies or interventions?
Importance for the EDAR community (100 words max)	Antimicrobial resistance detection in wastewater has and will remain a key component of research within the EDAR community given that wastewater is inevitably contaminated with AMR and can be a source of spread and exposure in the environment. AMR in untreated wastewater holds substantial untapped promise to provide novel, clinically-relevant insights on the burden of AMR in communities and in hospitals, as well as on changes over time. A key outcome from this workshop will be to provide insights into how best to tap this potential in order to improve epidemiological understanding of AMR and derive public health-relevant information from wastewater. This outcome is of particular interest and importance to members of the EDAR community, particularly those studying AMR in wastewater.
AUDIENCE	
Target audience	The target audience is scientists and other stakeholders working on the detection of AMR in wastewater and others with expertise in AMR surveillance, epidemiology, risk communication, and policy. We welcome perspectives from different disciplines: engineers, public health scientists, medical doctors, and others. This audience includes people developing or applying diverse methods and who are interested in discussing how these data can be used to best inform and evaluate public health interventions aimed at stemming the spread of AMR.

Estimated number of participants	We anticipate between 50-70 participants, based on expectations of interests amongst previous attendees of the EDAR conferences.
WORKSHOP CONTENT	
Rationale, objectives and outputs of workshop (300 words max)	The Covid-19 pandemic offered an unprecedented opportunity to demonstrate that wastewater-derived data aligns with, and provides complementary data to, clinical surveillance. Simultaneously, multiple research programs have looked to wastewater for information on circulating AMR, both within communities and within hospitals. Insights have revealed the extent to which wastewater informs circulation of AMR in communities, aligns with clinically-relevant AMR transmission, and can monitor emergence of novel resistance mechanisms. The recent successes of WBS have also motivated a wave of funding for WBS. This funding is often leveraged to extend WBS beyond the respiratory pathogens to include AMR surveillance, both within communities and within hospitals. The indicators that arise from WBS, however, are distinct from the indicators derived from clinical surveillance. Given the historic reliance on clinical surveillance to inform AMR burden and transmission, there is often uncertainty in how WBS-based indicators can be used to inform public health. Similarly, it is unclear what actionable outcomes or policy-relevant information follows on findings from WBS programs. Making the links between data derived from WBS and data derived from clinics/livestock/wildlife will help to build a framework for WBE and strengthen the application of AMR monitoring. Furthermore, linking WBS-derived data directly with policy relevance will help to motivate continued use of WBS for AMR surveillance. As such, the major objective of the workshop is to inform and advance policy relevance of public health data generated within WBS programs. This will be accomplished by focusing on four priority research questions listed in the summary. Any and all who are interested in contributing will be welcome to attend and can choose to engage in contributing to post-workshop deliverables, if desired.

Tentative Schedule	13:45-13:50 – Welcome, Agenda 13:50-14:00 - Overview on WWBE, its practical value and challenges, how is it currently used and how can we move it forward? (Speaker 1) 14:00-14:10 - First Plenary Discussion Input: Example Case Study (Speaker 2) 14:10-14:20 - Second Plenary Discussion Input: Example Case Study (Speaker 3) 14:20-14:30 - Third Plenary Discussion Input: Example Case Study (Speaker 4) 14:30-15:15: First Break Out Group. 4-8 groups are created of between 8 and 10 people each. Each group is assigned to discuss one of the focus questions highlighted in the previous three Example Case Study presentations. 15:15-15:20: Reconvene. 15:20–15:30: Fourth Plenary Discussion Input: Example Case Study (Speaker 5) 15:30–15:40: Fifth Plenary Discussion Input: Example Case Study (Speaker 6) 15:40–15:50: Sixth Plenary Discussion Input: Example Case Study (Speaker 7) 15:50–16:45: Second Break Out Group. Same groups as before are assigned to discuss one of the focus questions highlighted in the previous three Example Case Study presentations. 16:45–17:30: Reconvene and Reporting. Each group from the breakout will report back to the general assembly on their updates. Experts will discuss pro/contra in a plenary session. Open discussion. 17:30–17:45: Closing Overview and Summary of the Perspective Paper by the Organizers
What outcome do you expect to result from the workshop (impact) (200 words max)	We expect two outcomes from the workshop. The primary outcome from the workshop will be a written perspective paper from leading researchers in the field of WBS for antimicrobial resistance. The goal of the perspective paper will be to define: 1) the state-of-the-science in the use of wastewater-derived data on antimicrobial resistance to inform public health, including a review of successful case studies; 2) delineate how clinically-derived data on AMR is used to inform public health; and 3) describe a potential strategic trajectory for research that motivates and better aligns the collection of data within WBS programs with data that is useful for clinicians and public health practitioners.

	The second outcome will be to strengthen the connections between researchers working in the field of WBS for antimicrobial resistance. WBS programs are often responsive to the needs of their local context. Yet, many of the issues faced by researchers in the field are universal, including challenges that arise in creating reliable, sensitive, and specific quantification assays; or in deriving public health relevant indications of AMR. This workshop will provide substantial opportunities for collaboration and engagement amongst interested researchers, providing a foundation for the expansion of a global network. .