

Post-webinar Q&A - Implementing wastewater and environmental surveillance in an archipelagic rural setting in the Philippines

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1. Have you looked at passive or trap sampling methods? There are other options apart from grab and composite. Perhaps that could be a subject of a future webinar sharing.
 - Currently, we are only using grab sampling for our routine surveillance purposes. Given the current cost of autosamplers in the Philippines, it is not feasible to use it since we have wide coverage, more than 60 sites and still expanding. Though we recognized the added value of using autosamplers and so, we will be utilizing a passive or trap sampling method using a device called autosampler for a research collaboration on determining microbial and viral populations in wastewater including AMR pathogens (antimicrobial resistant). I welcome the suggestion that this could be a good topic for discussion for future Asia-PGI webinar series.
2. Do you notice any difference in detection result between composite and water part?
 - The Philippines, as an archipelagic country, hasn't tried the composite sampling due to logistic limitations. In a resource-limited setting, grab sampling is the best option especially for surveillance purposes. So, I don't have any data if both methods have different detection results.

But, in the case of grab sampling, differences in detection results can still be observed. As a perspective, even in one (1) liter of grab sample, after concentration and when we inoculate the concentrates in six flasks of cell lines for polio/enterovirus detection), some flasks do not show any sign of positivity at all, sometimes only one (1) out of six (6) flasks is positive.

But it may be good to try both and see the difference. Having said that, I encourage also those who are doing WES to do so to gather more information on how best to standardize our protocols.
3. Are the field workers government officials or researchers?
 - For wastewater surveillance, we have private and public/government stakeholders. Prior to including a WES site, a Memorandum of Understanding or Agreement is made and the roles and responsibilities of identified stakeholders of WES in the area are outlined. While we partner with private agencies, the ones assisting us in the field are government workers who have jurisdiction in the area. And the government workers who are assisting us also come from various departments/ministries; in some areas, the field workers are coming from the Department of Environment and Natural Resources, some are government officials

of the local government units but majority of the field workers for WES in the Philippines are from the Department of Health.

4. Have these activities been covered by Government Budget or funded by a specific funder/donor?

- When the Philippines started the WES, the primary goal was to serve as a complementary or supplemental surveillance to the human Acute Flaccid Paralysis surveillance, which targets polio. There was hesitancy at the time, even at the national level-Department of Health and so, the initial seed funding came from the World Health Organization (WHO). For two years, since WES started in 2017, funding has been exclusively coming from the WHO.

However, there was a paradigm shift in terms of funding in September 2019 when a polio outbreak was declared in the Philippines. The fact that polioviruses were initially detected in the environment before its detection in humans was the real trigger to have all the national officials of the Department of Health fully aware of the added value of WES in routine surveillance programs such as polio – that WES can be an early warning system of an impending disease outbreak. Since 2019, all WES activities have been funded by the government, with supplemental support from research collaborators and with other developmental partners.

5. How can we incorporate this WE surveillance in more resource limited settings than the Philippines? Any recommendation?

- Based on the Philippine experience, a resource-limited and an archipelagic country, we started WES targeting a pathogen with global and national support and implication, that is why we started with polio. Polio is a disease for global eradication and all member states are doing the polio surveillance in human population. This made it easier for us in the Philippines to implement WES because it is explicitly outlined in the Global Polio Eradication Program that WES can be a supplemental surveillance to the existing human Acute Flaccid Paralysis surveillance. The governance, basis and guidance for establishing WES are already outlined in this program.

First, I recommend that for a resource-limited setting, you start WES anchoring at a global or national program as a supplemental surveillance to a public health significant pathogen with global or national impact.

The same is true during the COVID-19 pandemic. WES has become one innovative tool for detecting community transmission of SARS-CoV2. Another great example that we can leverage on is the Tricycle project for AMR using One Health or the Planetary Health approach. It is in these contexts that we, in a resource-limited setting, can also secure support for WES implementation from developmental partners and the national government.

We've done SARS-CoV2 and testing is now routine; the AMR and other pathogens (respiratory, gastrointestinal) are ongoing through research collaborations and this year, with WES-Avian Influenza using a One-Health approach. Second

recommendation is to do feasibility research for WES of other pathogens as this will serve as evidence to lobby future funding and its eventual integration into existing surveillance programs using One Health approach.

Additionally, I want to share that after securing support to implement WES, the process we have undergone includes:

- 1) Identifying a point person who will oversee the WES operations, one who is knowledgeable or trained on both laboratory and field works.
 - 2) Formulating a national plan for WES and inform key agencies and developmental partners.
 - 3) Conducting consultative meetings with KEY stakeholders first. Private stakeholders are added during the expansion stage. A signed MOA or MOU is also a big factor in securing commitment from all identified stakeholders before starting WES.
 - 4) Pilot testing in at least 3 URBAN sites with a target pathogen and a monthly collection would be a good start. In the case of the Philippines, the fact that we are resource-limited, 3 sites at that time was the most feasible. We target a pathogen that we know we can request initial support and has a global implication once detected – in our case, it is polio. The frequency of collection should also be factored-in in the initial implementation as resource is limited. Lesson learned is to start small but make the output impactful.
 - 5) Ensuring that a feedback report is given regularly to all stakeholders on a monthly basis. And once a significant pathogen is detected, inform the top management for a programmatic response. This reporting mechanism should be included in the national plan.
 - 6) Lastly, conducting Annual Stakeholders' Meeting. In the Philippines, we always convene and ensure that in every annual meeting, we inform them of the achievements of the past year, as well as the future plans and directions. Ensure that they own the program and make them the champions for WES.
6. Do you have plans to assess value add of WES - whether case studies or more formal cost-benefit or cost-effectiveness evaluation?
- We have that in mind to do cost-benefit or cost-effective analysis. We have the data and we welcome those with expertise to do such studies to collaborate with us.
7. Wastewater surveillance for Avian Influenza - better collected regularly or is targeted sampling more appropriate after outbreaks are detected in poultry or humans?
- In the Philippines, starting WES for Avian Influenza is targeted based on geographical locations of the bird species. Our goal is to integrate this WES Avian Influenza in the existing human and animal surveillance programs so the approach is like any other surveillance, conduct monthly or regular collections and monitor together with the human and animal data. We wanted to provide evidence that it can serve as an early warning system of an impending epidemic/outbreak or pandemic.

Targeted sampling with **more frequent** collections can be done once an outbreak or pandemic is declared as a programmatic response.