

Pandemic stewardship: Reflecting on new roles and contributions of antimicrobial stewardship programs during the coronavirus disease 2019 (COVID-19) pandemic

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To the Editor—In March 2020, we cowrote a letter published in *Infection Control and Hospital Epidemiology* titled “Involving antimicrobial stewardship programs in COVID-19 response efforts: All hands on deck,”¹ in which we noted that antimicrobial stewardship programs (ASPs) have not traditionally been involved in hospital pandemic response endeavors.^{2,3} However, given existing skills and program structures, we postulated that ASPs could take on major roles in this capacity. Since then, myriad examples of successful ASP involvement have been noted throughout the country. Our letter was the first paper published on antimicrobial stewardship and COVID-19, to our knowledge. As of March 23, 2021, a little over a year later, it pleases us to report that a PubMed search for “antimicrobial stewardship and COVID-19” yielded 143 results. Herein, we revisit our original projections about ASP involvement in the pandemic and highlight how programs have been utilized over the past year (Table 1).

- 1) *Case identification and diagnostic stewardship of SARS-CoV-2 testing.* Prior to the widespread availability of testing, several ASPs assumed this role in coordination with infection prevention (IP) programs. After deployment of widespread or universal testing on admission, ASPs continued to assist with identification of potential new hospital-acquired SARS-CoV-2 infections during daily audit activities. Presently, ASPs continue to work with IP partners and the clinical virology laboratory to flag breakthrough cases after COVID-19 vaccination for potential genomic sequencing to detect variants. Continued vigilance is warranted as the pandemic evolves, and future surges are anticipated.
- 2) *COVID-19 treatment guidelines.* In the inpatient setting, many ASPs assumed responsibility for the creation and maintenance of local treatment guidelines as their primary contribution to hospital pandemic response efforts. Often, this effort involved incorporating preauthorization of COVID-19 therapeutics, such as tocilizumab and remdesivir, into existing stewardship paradigms. Anecdotally, one author's ASP has updated the local COVID-19 treatment guidelines >80 times in the last year. Other complementary functions have included stewardship interventions to reduce inappropriate antibiotic use in COVID-19 patients, assisting providers to

navigate the access process for novel therapeutics,^{4,5} and monitoring and reporting drug shortages and adverse events.

- 3) *Outpatient pandemic stewardship.* In the outpatient setting, ASPs across the country have led efforts to rapidly scale up monoclonal antibody infusion programs, folding these functions into ambulatory stewardship activities and partnering with new operational partners such as infusion centers, emergency departments, and nursing staff. Patient eligibility screening and authorization are frequently conducted by antimicrobial stewards or their extenders.³
- 4) *Vaccine planning.* In the last year, ASPs have also immersed themselves in vaccine planning, education, allocation, and postvaccination counseling for hospital systems. Although this role for ASPs began in the H1N1 pandemic, it has also been facilitated by years of trust and relationship building within hospital networks by ASP physicians and pharmacists.⁶

The pandemic has required new mechanisms for communication and collaboration among ASPs, infection prevention programs, and information technology departments. ASPs possess data presentation and dissemination expertise and should leverage new data access structures developed during the pandemic to advance their work in antibiotic use and resistance reporting. Moving forward, a tighter collaboration, if not full integration, of ASPs and infection prevention programs should be prioritized given shared agendas in the area of patient safety and quality.

The value of ASPs has been readily evident during the pandemic. ASPs should leverage their increased visibility and institutional credibility to advocate for resources, increased protection efforts, and enhanced access to leadership. We strongly believe that this should happen on national and international levels and that it should influence policy pertaining to stewardship. Additionally, ASPs should solidify their “place at the table” related to future pandemic and disaster planning at a health-system level. Finally, incentives to enable the recruitment of future antimicrobial stewards should be prioritized, and education within infectious diseases training should emphasize pandemic stewardship.

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Table 1. Projections and Key Examples of ASP Involvement in COVID-19 Relief Efforts

ASP Activity	Ways We Projected ASPs Might Be Utilized	Examples of ASP Utilization From March 2020 to March 2021	Comments and Implications for the Future
Collaboration with epidemiology and infection prevention specialists	<ul style="list-style-type: none"> Assisting in case identification Assisting with provider and patient communication 	<ul style="list-style-type: none"> As part of prospective audit and feedback efforts, ASPs played a role in early case identification. 	<ul style="list-style-type: none"> New mechanisms for real-time data access and distribution have been developed during the pandemic. ASPs and infection prevention programs can collaborate with IT departments to coordinate reporting.
Diagnostic Stewardship	<ul style="list-style-type: none"> Assisting with SARS-CoV-2 test stewardship 	<ul style="list-style-type: none"> Identifying breakthrough cases after vaccination to send for sequencing 	<ul style="list-style-type: none"> Stewardship of limited resources extends beyond antimicrobials.
Treatment	<ul style="list-style-type: none"> Creating and monitoring compliance to treatment guidelines Anticipating and managing drug shortages Assisting in drug access for novel therapeutics 	<ul style="list-style-type: none"> ASPs have played a major role in guideline creation, preauthorization of novel therapeutics as well as helping providers navigate therapeutic access. Inpatient and outpatient ASP infrastructure harnessed to optimize treatment of COVID-19 patients 	<ul style="list-style-type: none"> ASPs should have longitudinal, enhanced access to leadership and should be involved in all future pandemic planning and response efforts. Outpatient relationships built out of necessity during the pandemic can be harnessed to augment ambulatory stewardship efforts.

References

- Stevens MP, Patel PK, Nori P. Involving antimicrobial stewardship programs in COVID-19 response efforts: all hands on deck. *Infect Control Hosp Epidemiol* 2020;41:744–745.
- Banach DB, Johntson LB, Al Zubeidi, *et al*. Outbreak response and incident management: SHEA guidance and resources for healthcare epidemiologists in United States acute-care hospitals. *Infect Control Hosp Epidemiol* 2017;38:1393–1419.
- Mazdeyasna H, Nori P, Patel PK, *et al*. Antimicrobial stewardship at the core of COVID-19 response efforts: implications for sustaining and building programs. *Curr Infect Dis Rep* 2020;22:23.
- Patel PK, Nori P, Stevens MP. Antimicrobial stewardship and bamlanivimab: opportunities for outpatient preauthorization? *Infect Control Hosp Epidemiol* 2020;41:744–745.
- Stevens MP, Patel PK, Nori P. Antimicrobial stewardship programs and convalescent plasma for COVID-19: a new paradigm for preauthorization? *Infect Control Hosp Epidemiol* 2020. doi: [10.1017/ice.2020.459](https://doi.org/10.1017/ice.2020.459).
- Nori P, Patel, PK, Stevens MP. Rational allocation of COVID-19 vaccines to healthcare personnel and patients: a role for antimicrobial stewardship programs? *Infect Control Hosp Epidemiol* 2020. doi: [10.1017/ice.2020.1393](https://doi.org/10.1017/ice.2020.1393).

Utility of viral whole-genome sequencing for institutional infection surveillance during the coronavirus disease 2019 (COVID-19) pandemic

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To the Editor—Whole-genome sequencing (WGS) analysis of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has led to important findings related to the origin and evolution of the virus.^{1–3} The high potential for infectivity of SARS-CoV-2 raises legitimate concerns for person-to-person transmission, particularly in the hospital setting. Evaluation of the viral genome during a pandemic can aid in identifying outbreaks.⁴

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Methods

Viral WGS was performed as previously described⁵ on all positive SARS-CoV-2 isolates at Children's Hospital Los Angeles, a quaternary-care, free-standing, pediatric medical center.

To analyze local propagation of the virus, we relied upon direct comparisons of mutations found in viral genomes. We defined the dissimilarity between viral isolates as the size of the symmetric difference between the sets of mutations present relative to the reference genome. The analysis was restricted to the consensus level mutations and SARS-CoV-2 mutations with allele frequency of $\geq 50\%$. Only high-quality SARS-CoV-2 genomes, defined as at least