Figure 1

National Institute on Minority Health and Disparities Research Framework

		Levels of Influence			
		Individual	Interpersonal	Community	Societal
Domains of Influence (Over the Life Course)	Biological	Biological Vulnerability and Mechanisms	Caregiver-Child Interaction, Family Microbiome	Community Illness Exposure, Herd Immunity	Sanitation, Immunization, Pathogen Exposure
	Behavioral	Health Behaviors, Coping Strategies	Family Functioning, School/Work Functioning	Community Functioning	Policies and Laws
	Physical/Built Environment	Personal Environment	Household Environment, School/Work Environment	Community Environment, Community Resources	Societal Structure
	Sociocultural Environment	Sociodemographics, Limited English, Cultural Identity, Response to Discrimination	Social Networks, Family/Peer Norms, Interpersonal Discrimination	Community Norms, Local Structural Discrimination	Social Norms, Societal Structure, Discrimination
	Healthcare System	Insurance Coverage, Health Literacy, Treatment Preferences	Patient-Clinician Relationship, Medical Decision Making	Availability of Services, Safety Net Services	Quality of Care, Health Care Policies
Health Outcomes		Individual Health	Family/ Organizational Health	Community Health	Population Health

Closing the Gap

COVID-19 management: Health equity challenges and planning solutions

By Elizabeth Ruvalcaba, MSPH; Alicia Rooney, MPH, MSW; and Elizabeth L. Ciemins, PhD, MPH, MA

As temperatures decrease and groups move indoors, COVID-19 cases, along with flu and respiratory syncytial virus (RSV), continue to rise.[1] This is an ideal time to consider how healthcare organizations (HCOs) can contribute to equitable management of COVID-19 for all patients, from vaccination and testing to inpatient and outpatient treatment.[2]

In September 2023, AMGA Research launched a study titled "Reducing Health Inequities for Populations Experiencing Disparate Care in the Context of COVID-19," developed in collaboration with and funded by Pfizer, Inc. Four AMGA member organizations—AtlantiCare, Atlantic City, NJ; Sutter Health, Sacramento, CA; Tulane Medical Center, New Orleans, LA; and Prevea Health, Green Bay, WI—are collaborating with AMGA to develop and implement interventions to improve health equity in the management of COVID-19. The ultimate goal of the four HCOs is to apply processes used for developing tools/resources and learnings from this project to other health inequities within their systems.

Health equity, as defined by the Centers for Disease Control and Prevention (CDC), is "the state in which everyone has a fair and just opportunity to attain their highest level of health."[3] Interventions developed to address health disparities and health inequity target priority populations to confront

unique barriers and facilitators within different communities. In this study, the National Institute on Minority Health and Health Disparities (NIMHD) Research Framework guides AMGA's approach by aiding researchers and participating health systems in the development of such interventions. The framework advises using multilevel interventions to improve health equity and reduce disparities, as health outcomes are influenced at multiple levels throughout the life course and in different settings (see Figure 1).[4]

Inequities in COVID-19 cases, disease severity, and vaccination have been well documented in the literature, with Black and Hispanic patients experiencing higher infection rates, hospitalizations, and mortality.[5–16] Disparities also extend into COVID-19 management in the form of treatment delays and inequitable prescription of COVID-19 treatments.[17–25] For example, during the first half of 2022, Black patients were 36% less likely than White patients and Hispanic patients were 30% less likely than non-Hispanic patients to receive oral antiviral treatment, with larger disparities among patients with severe COVID-19 risk.[17] Potential contributors to treatment disparities included more frequent hospital transfers among Black patients and overestimation of oxygen saturation in Black and Hispanic patients.[24–26] Not only did Black and Hispanic patients receive treatment at a lower rate than White and non-Hispanic patients, respectively, but Black patients were also less likely to receive effective COVID-19 treatments, such as oral antivirals, steroids, immunomodulators, monoclonal antibody treatments, and outpatient rehabilitation, and were more likely to receive ineffective treatments.[17–25]

Launch of COVID-19 Health Equity Study

The AMGA study "Reducing Health Inequities for Populations Experiencing Disparate Care in the Context of COVID-19" convened a kickoff meeting in September 2023, during which HCO representatives heard from national advisors on health equity interventions and engaged in shared learning and hands-on exercises to begin initial planning of interventions to address health inequities in COVID-19 management. All participating organizations conducted a preliminary review of their electronic health record (EHR) data and noted that Black and Hispanic patients were provided outpatient COVID-19 treatment about half as often as White patients.

Key takeaways from this meeting suggest that health equity interventions must be multimodal with an eye toward long-term sustainability and partnerships within and outside of health systems (see Table 1). HCO experiences from the pandemic highlighted the ability of HCOs and community agencies to partner, mobilize, and provide interventions to patients in a variety of settings. Participants in this new study intend to take lessons learned along with new information to be proactive in providing equitable COVID-19 management by engaging in both the health system/healthcare provider and patient/community levels.

Considerations: Health System and Healthcare Provider Level

- **COVID-19 fatigue/need to reinvigorate on treatment**
  Study participants noted that, while there has been a fair amount of COVID-19 fatigue, reinvigoration of clinic staff is needed as additional COVID-19 cases are brought into health

Table 1

Key Takeaways for Health Equity Interventions

These takeaways apply in both the healthcare system/provider and patient/community levels.

Intervention Considerations	▶ COVID-19 fatigue ▶ Sustainability of interventions ▶ Understand where patients are receiving treatment outside of ambulatory clinics (ED, specialists, urgent care) ▶ Take action on what data are already collected ▶ Do community-based organizations (CBOs) have anything to share ▶ Mixed method evaluation ▶ Establish long term partnerships ▶ Feedback loops ▶ Leverage existing infrastructure (e.g., mobile units) ▶ Start small ("going deep" within a narrow population)
Intervention Partners	▶ All departments ▶ CBOs (health and non-health focused) ▶ Churches ▶ Employee Resource Groups ▶ Federally Qualified Health Centers (FQHCs) ▶ Local Health Departments ▶ Other HCOs

systems for treatment in anticipation of COVID-19 surges.

- **Targeted messaging to healthcare professionals**
  When engaging on health equity, language matters. Targeted messaging can facilitate buy-in when there are differing goals among staff. For example, HCOs can present the cost benefit perspective to operations and finance and emphasize patient outcomes to nursing. Intentional language should be used to highlight the focus on gold standard and equitable care to all patients across diseases rather than seeming accusatory toward healthcare professionals.
- **Regular review of data and feedback**
  Participants discussed the importance of reviewing treatment data and providing feedback to providers and clinic staff. Benchmarking across and within practices can help highlight where specific strategies are working and allow others to learn from those best practices. Drilling these data down to the practice and provider level also allows for transparency and accountability. Incorporation of qualitative data as part of the evaluation of health equity interventions is essential to gain a more complete snapshot of the care experience, processes, or encounters and to understand what worked well and where potential opportunities for future interventions remain.
- **Need for engagement across multiple divisions with senior leadership support**
  The effort toward health equity is occasionally relegated solely to diversity, equity, and inclusion officers and their teams. However, it is essential to break down silos and take a collaborative approach to this work as patients interact with the health system across multiple settings. Engaging everyone, from physician champions to students to marketing teams—and holding them accountable—is key to ensuring a unified approach for interventions and participation across the health system. The active involvement of senior leadership is also critical to ensure top-down support for health equity initiatives.
- **Strategizing with other entities supporting patients and communities**
  Community-based organizations (CBOs), local health departments, and federally qualified health centers (FQHCs) were described as eager partners on health equity interventions but are infrequently utilized by HCOs. Engagements with these partners in addition to other local HCOs were viewed as resources for long-term sustainability of health equity interventions. However, consultation with internal legal departments is needed to support the establishment of these partnerships.

Considerations: Patient and Community Level

- **Establishing feedback loops and bidirectional long-term partnerships**
  When engaging with community partners, it is imperative to establish feedback loops and bidirectional partnerships with equal exchange of resources, expertise, and information so the relationships are not viewed as transactional by the community they are intended to support. Through such partnerships, HCOs can leverage patient data collected by CBOs and FQHCs and existing relationships of CBOs and FQHCs with trusted community leaders to support health equity in multiple communities. HCOs' engagement with patients at the community level must be sustained with an eye toward the future rather than being "one and done," as long-term community partnerships can lead to greater health equity by growing in impact over time.[27]
- **Power of patient voice and actions**
  Patients need to be empowered to use their voices and bargaining power to ensure health systems listen to what needs are present in their communities and take action.
- **Combating patient misinformation**
  Preliminary experiences shared by attendees highlighted that patients may be unsure of when and where to seek treatment, how to access testing, and what treatment options are available. Patient uncertainty of conditions putting them at high risk for COVID-19 was another potential opportunity for education. Participants were unclear on the impact that COVID-19 vaccination misinformation may have had on patient perspectives on treatment.
- **"Going deep" within narrow populations and scaling up when possible**
  Among all participants there was an intention of "going deep" within a narrow population and scaling up to other populations when possible.[27] Health equity interventions require a depth and expertise that is developed when going narrow and deep, while a wide and shallow approach risks overpromising and underdelivering.

Proposed Health Equity Interventions

Several health system and patient-facing intervention components for improving equity in COVID-19 management were discussed within the behavioral, environmental, and healthcare system domains of influence as described by the NIMHD Research Framework (see Table 2).[4] Health system-level interventions were multimodal, considered long-term feasibility, and included both broader high-level interventions and smaller, "biteable chunks."[27]

Behavioral interventions focused on addressing individual behaviors through provider and patient education. Patient education regarding when and where to seek treatment after testing positive was discussed. HCOs noted that patients seek and receive care for COVID-19 in many different locations, so it is important to educate and engage within multiple departments (especially ambulatory care, emergency medicine, urgent care, and telehealth). Provision of continuing education on COVID-19 treatment guidelines and high-risk

Table 2

Health Equity Interventions*

Domain of Influence	Component/Resource	Examples
Behavioral	▶ Provider education ▶ Patient education	▶ Provider bias training ▶ Patient education on symptoms, high-risk conditions, treatment options
Environment (physical and sociocultural)	▶ Culturally/linguistically appropriate materials ▶ Utilize community members as educators ▶ Existing resources within health systems	▶ CBOs and lay health educators ▶ Ambassador program
Health Care System	▶ Existing infrastructure ▶ Utilize staff as champions ▶ Existing health partners in local community ▶ EHR integration	▶ Mobile units ▶ Promotoras (lay Hispanic health educators) ▶ Physician champions or ambassadors ▶ Partnerships with local health departments and community health organizations, and FQHCs ▶ Add COVID-19 to measure dashboard ▶ Treatment protocol-based checklists

*Intervention domains of influence are based on the NIMHD Research Framework. Intervention components or potential resources are elements that your HCO could examine further as part of a needs assessment for health equity interventions. Examples provided are interventions discussed during this study's kickoff meeting.

conditions for patients and providers was also considered important as these evolve over time.

Environmental interventions included both the physical and sociocultural environments. CBOs, local health departments, and FQHCs were considered resources to be mobilized within the local community for education, outreach, or direct intervention implementation (for example, an ambassador program where local trusted community members are engaged with the HCO for patient education). Interventions for the sociocultural environment centered on the interpersonal and individual levels (for example, ensuring all interventions are culturally and linguistically appropriate for minority populations). Interventions for the interpersonal relationships between healthcare professionals and patients could include education on effective strategies to reduce provider bias/discrimination and education/resources to provide linguistically and culturally appropriate care.

Healthcare system-level interventions focused on leveraging existing resources and relationships within HCOs to compliantly improve COVID-19 management. For example, one participant is considering adapting existing mobile units going into communities with complete lack of healthcare access to incorporate COVID-19 vaccination, testing, and treatment. HCOs' EHR systems could be reviewed and revised to add COVID-19 to the quality measure dashboards or create protocol-based checklists for COVID-19 management to ensure all patients are treated the same, thus reducing provider bias. Leveraging existing relationships, HCOs could also establish physician champions within multiple departments to facilitate education among physicians in advance of increased COVID-19 cases.

Conclusion

Overall, this work, as one of our expert advisors expressed, should be "not just a moment, but a movement."[27] In an attempt to impact disparities, with a particular focus on inequity in the management of COVID-19, the study team and HCOs utilized the different levels of the NIMHD Research Framework to guide exploration of intervention considerations, partnerships, and components. Through the course of this study, and by engaging multiple champions both within and outside their HCOs, our participants hope that this work will lead to measurable changes in COVID-19 treatment and outcome disparities and contribute to better engagement with patients. HCOs can leverage preliminary takeaways from the study to consider how to prepare their own organizations to provide more equitable care to patients. GPJ

Acknowledgments
Our thanks to Pfizer, Inc. for funding this study. AMGA Research considers all available treatments (i.e., is not brand specific), disease-state focused, and centers on care process design and implementation science—how medical groups and health systems improve population health. Thanks also to the 11 clinical leaders from AMGA member organizations and our expert advisors who shared their experience and expertise in this meeting.

***Elizabeth Ruvalcaba, MSPH**, is senior research project lead; **Alicia Rooney, MPH, MSW**, is population health research analyst; and **Elizabeth L. Ciemins, PhD, MPH, MA**, is senior vice president, research and analytics at AMGA.*

References

1. Centers for Disease Control and Prevention. 2023. CDC COVID-19 Data Tracker. Centers for Disease Control and Prevention. Available at covid.cdc.gov/covid-data-tracker/#datatracker-home.
2. Centers for Disease Control and Prevention. 2023. COVID-19 Treatments and Medications. Centers for Disease Control and Prevention. Available at cdc.gov/coronavirus/2019-ncov/your-health/treatments-for-severe-illness.html.
3. Centers for Disease Control and Prevention. 2022. What Is Health Equity? Centers for Disease Control and Prevention, 1 July 2022, cdc.gov/healthequity/whatis/index.html.
4. National Institute of Minority Health and Health Disparities. 2022. NIMHD Research Framework. U.S. Department of Health and Human Services. Available at nimhd.nih.gov/about/overview/research-framework/nimhd-framework.html.
5. K. Mackey, C.K. Ayers, K.K. Kondo, et al. 2021. Racial and Ethnic Disparities in COVID-19-Related Infections, Hospitalizations, and Deaths: A Systematic Review. *Ann Intern Med* 2021; 174: 362. Available at acpjournals.org/doi/10.7326/M20-6306.
6. A. Khanijahani, S. Iezadi, K. Gholipour, et al. A systematic review of racial/ethnic and socioeconomic disparities in COVID-19. *Int J Equity Health* 2021; 20: 248. Available at equityhealthj.biomedcentral.com/articles/10.1186/s12939-021-01582-4.
7. S. Magesh, D. John, W.T. Li, et al. 2021. Disparities in COVID-19 Outcomes by Race, Ethnicity, and Socioeconomic Status: A Systematic-Review and Meta-analysis. *JAMA Netw Open* 2021; 4: e2134147. doi: 10.1001/jamanetworkopen.2021.34147. Available at jamanetwork.com/journals/jamanetworkopen/fullarticle/2785980.
8. H. Green, R. Fernandez, and C. MacPhail. 2021. The social determinants of health and health outcomes among adults during the COVID-19 pandemic: A systematic review. *Public Health Nurs* 2021; 38: 942. Available at onlinelibrary.wiley.com/doi/10.1111/phn.12959.
9. W. Mude, V.M. Oguoma, T. Nyanhanda, et al. 2021. Racial disparities in COVID-19 pandemic cases, hospitalisations, and deaths: A systematic review and meta-analysis. *J Glob Health* 2021; 11: 05015. Available at jogh.org/documents/2021/jogh-11-05015.pdf.
10. S. Fallah-Aliabadi, F. Fatemi, A. Heydari, et al. 2022. Social vulnerability indicators in pandemics focusing on COVID-19: A systematic literature review. *Public Health Nurs* 2022; 39: 1142. doi: 10.1111/phn.13075. Epub 2022 Apr 7. Available at onlinelibrary.wiley.com/doi/10.1111/phn.13075.
11. C. Agyemang, A. Richters, S. Jolani, et al. 2021. Ethnic minority status as social determinant for COVID-19 infection, hospitalisation, severity, ICU admission and deaths in the early phase of the pandemic: a meta-analysis. *BMJ Glob Health* 2021; 6: e007433. Available at gh.bmj.com/content/6/11/e007433.
12. J.M. Cénat, P.G. Noorishad, S.M. Bakombo, et al. 2022. A Systematic Review on Vaccine Hesitancy in Black Communities in Canada: Critical Issues and Research Failures. *Vaccines (Basel)* 2022; 10: 1937. Available at mdpi.com/2076-393X/10/11/1937.
13. A. Kamal, A. Hodson, and J.M. Pearce. 2021. A Rapid Systematic Review of Factors Influencing COVID-19 Vaccination Uptake in Minority Ethnic Groups in the UK. *Vaccines (Basel)* 2021; 9: 1121. Available at mdpi.com/2076-393X/9/10/1121.
14. B. Hussain, A. Latif, S. Timmons, et al. 2022. Overcoming COVID-19 vaccine hesitancy among ethnic minorities: A systematic review of UK studies. *Vaccine* 2022; 40: 3413. doi: 10.1016/j.vaccine.2022.04.030. Epub 2022 Apr 28. Available at sciencedirect.com/science/article/pii/S0264410X22004467?via%3Dihub.
15. N. Restrepo and H.J. Krouse. 2022. COVID-19 Disparities and Vaccine Hesitancy in Black Americans: What Ethical Lessons Can Be Learned? *Otolaryngol Head Neck Surg* 2022; 166: 1147. Available at aao-hnsfjournals.onlinelibrary.wiley.com/doi/10.1177/01945998211065410.
16. J.H. Rogers, S.N. Cox, J.P. Hughes, et al. 2022. Trends in COVID-19 vaccination intent and factors associated with deliberation and reluctance among adult homeless shelter residents and staff, 1 November 2020 to 28 February 2021 - King County, Washington. *Vaccine* 2022; 40: 122. Available at sciencedirect.com/science/article/pii/S0264410X21014717?via%3Dihub.
17. T.K. Boehmer, E.H. Koumans, E.L. Skillen EL, et al. 2022. Racial and Ethnic Disparities in Outpatient Treatment of COVID-19 — United States, January–July 2022. *MMWR Morb Mortal Wkly Rep* 2022; 71: 1359. Available at dx.doi.org/10.15585/mmwr.mm7143a2.
18. A.D. Castro, F.B. Mayr, V.B. Talisa, et al. 2022. Variation in Clinical Treatment and Outcomes by Race Among US Veterans Hospitalized With COVID-19. *JAMA Netw Open* 2022; 5: e2238507. doi: 10.1001/jamanetworkopen.2022.38507. Available at jamanetwork.com/journals/jamanetworkopen/fullarticle/2797623.
19. B.M. Althouse, C. Baker, P.D. Smits, et al. 2023. Racial inequality in COVID-treatment and in-hospital length of stay in the US over time. *Front Public Health* 2023; 10: 1074775. doi: 10.3389/fpubh.2022.1074775. Available at frontiersin.org/articles/10.3389/fpubh.2022.1074775/full.
20. T.U. Azam, H. Berlin, E. Anderson, et al. 2022. Differences in Inflammation, Treatment, and Outcomes Between Black and Non-Black Patients Hospitalized for COVID-19: A Prospective Cohort Study. *Am J Med* 2022; 135: 360. Available at amjmed.com/article/S0002-9343(21)00736-1/fulltext.
21. S.E. Vititoe, I.J. Easthausen, T. Lasky, et al. 2022. Describing characteristics and treatment patterns of patients hospitalized with COVID-19 by race and ethnicity in a national RWD during the early months of the pandemic. *PLoS One* 2022; 17: e0267815. Available at journals.plos.org/plosone/article?id=10.1371/journal.pone.0267815.
22. C.B. Hentschel, B.A. Abramoff, T.R. Dillingham, et al. 2022. Race, ethnicity, and utilization of outpatient rehabilitation for treatment of post COVID-19 condition. *PM R* 2022; 14: 1315. doi: 10.1002/pmrj.12869. Available at onlinelibrary.wiley.com/doi/10.1002/pmrj.12869.
23. J.L. Wiltz, A.K. Feehan, N.M. Molinari, et al. 2022. Racial and Ethnic Disparities in Receipt of Medications for Treatment of COVID-19 - United States, March 2020-August 2021. *MMWR Morb Mortal Wkly Rep* 2022; 71: 96. Available at cdc.gov/mmwr/volumes/71/wr/mm7103e1.htm?s_cid=mm7103e1_w.
24. N.R. Sutton, S.G. Robinson-Lane, R.Y. Yeow, et al. 2022. Racial and ethnic variation in COVID-19 care, treatment, and outcomes: A retrospective cohort study from the MiCOVID-19 registry. *PLoS One* 2022; 17: e0276806. Available at journals.plos.org/plosone/article?id=10.1371/journal.pone.0276806.
25. S.E.K. Sudat, P. Wesson, K.F. Rhoads, et al. 2023. Racial Disparities in Pulse Oximeter Device Inaccuracy and Estimated Clinical Impact on COVID-19 Treatment Course. *Am J Epidemiol* 2023; 192: 703. doi: 10.1093/aje/kwac164. Available at academic.oup.com/aje/article/192/5/703/6730981.
26. A. Fawzy, T.D. Wu, K. Wang, et al. 2022. Racial and Ethnic Discrepancy in Pulse Oximetry and Delayed Identification of Treatment Eligibility Among Patients With COVID-19. *JAMA Intern Med* 2022; 182: 730. Available at jamanetwork.com/journals/jamainternalmedicine/fullarticle/2792653.
27. Advisors. 2023. COVID-19 Health Equity Kickoff Meeting. American Medical Group Association, September 2023, Minneapolis.