Graboyes Evan (Orcid ID: 0000-0003-3766-468X)
Cognetti David (Orcid ID: 0000-0001-7039-3055)
Nathan Cherie-Ann (Orcid ID: 0000-0001-7386-318X)
Spector Matthew (Orcid ID: 0000-0001-7646-6075)

COVID-19 Pandemic and Healthcare Disparities in Head and Neck Cancer: Scanning the Horizon

Evan Graboyes MD, MPH[1], John Cramer MD[2], Karthik Balakrishnan MD[3], David M. Cognetti MD[4], Daniel López-Cevallos, PhD, MPH[5], John R. de Almeida MD, MSc[6], Uchechukwu C. Megwalu MD, MPH[3], Charles E. Moore MD[7], Cherie-Ann Nathan MD[8], Matthew E. Spector MD[9], Carol M. Lewis MD, MPH[10], Michael J. Brenner MD[9]

Authors Affiliations:

1. Department of Otolaryngology-Head & Neck Surgery, Medical University of South Carolina, Charleston, SC
2. Department of Otolaryngology-Head & Neck Surgery, Wayne State University, Detroit, MI
3. Department of Otolaryngology-Head & Neck Surgery, Stanford University, Stanford, CA
4. Department of Otolaryngology-Head & Neck Surgery, Thomas Jefferson University, Philadelphia, PA
5. School of Language, Culture & Society, Oregon State University, Corvallis, OR

6. University Health Network/ Princess Margaret Cancer Centre, University of Toronto, Toronto, ON
7. Department of Otolaryngology-Head & Neck Surgery Emory University, Atlanta, GA
8. Department of Otolaryngology-Head & Neck Surgery Louisiana State University Health Sciences Center, Shreveport, LA
9. Department of Otolaryngology-Head & Neck Surgery University of Michigan, Ann Arbor, MI
10. Head & Neck Surgery, University of Texas MD Anderson Cancer Center, Houston, TX

Corresponding Author:

Michael J. Brenner, MD

Department of Otolaryngology-Head and Neck Surgery

University of Michigan

1500 East Medical Center Drive, SPC 5312

1904 Taubman Center

Ann Arbor, MI 48109- 5312

Email: mbren@med.umich.edu

Running Head: Disparities HNC COVID-19

Acknowledgements/Funding Support: This work was supported by K08CA237858 from the National Cancer Institute (NCI) and DDCF2015209 from the Doris Duke Charitable Foundation to Dr. Graboyes. The funding organizations had no influence on the design and conduct of the

study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Conflicts of Interest: none

Key words: healthcare delivery, COVID-19, head and neck cancer, racial and ethnic disparities, social determinants of health,

Abstract

The COVID-19 pandemic has profoundly disrupted head and neck cancer (HNC) care delivery in ways that will likely persist long-term. As we scan the horizon, this crisis has the potential to amplify pre-existing racial/ethnic disparities for HNC patients. Potential drivers of disparate HNC survival resulting from the pandemic include 1) differential access to telemedicine, timely diagnosis, and treatment; 2) implicit bias in initiatives to triage, prioritize, and schedule HNC-directed therapy; and 3) the effects of loss of employment, health insurance, and dependent care. We present four strategies to mitigate these disparities: 1) collect detailed data on access to care by race/ethnicity, income, education, and community; 2) raise awareness of HNC disparities; 3) engage stakeholders in developing culturally appropriate solutions; and 4) ensure that surgical prioritization protocols minimize risk of racial/ethnic bias. Collectively, these measures address social determinants of health and the moral imperative to provide equitable, high quality HNC care.

Introduction

The COVID-19 pandemic due to SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) has disrupted and transformed the delivery of healthcare in ways that few would have imagined or thought possible. Clinicians, healthcare administrators, insurance companies, policy makers, researchers, and patients are all grappling with how to deliver and access medical care in the COVID-19 era while planning for an unpredictable future contingent on several unknowns (e.g. viral seasonality, vaccine development). The various stakeholders are charting a course for healthcare delivery during a time of unprecedented resource scarcity, relatively uncertain but potentially significant personal risk (for clinicians and patients), and massive economic upheaval. In response to the COVID-19 pandemic, best practices in healthcare delivery for head and neck cancer (HNC) have been upended amid urgent efforts to protect patients, providers, and communities while stewarding scarce resources.

As the pandemic has unfolded across the world, it has become increasingly clear that COVID-19 is a disease with varying incidence and mortality in racial/ethnic subgroups.[1,2] While the causes for COVID-19-related racial and ethnic differences are still being examined, they seem to stem from 1) long-standing systemic inequities and differences in social determinants of health, access to care, and quality of care; and 2) biologic determinants such as comorbidity burden, genetics, and immune phenotype.[3-5] COVID-19 reminds us that determinants of health are multifactorial. Thought leaders in global public health have recently called for development of polysocial risk scores, adapted from the polygenic risk modeling to quantify social

determinants of health.[6] In that sense, the COVID-19 pandemic has been described as a magnifying glass that has brought attention yet again to stark racial/ethnic disparities in health outcomes in the US.[3]

We have long recognized that HNC is a disease with marked racial/ethnic disparities in outcomes.[7-11] Although the reasons underlying observed racial/ethnic differences in mortality for patients with HNC are multifactorial, disparities in both access to care and timely cancer care are major drivers for poor outcomes.[8,11-15] While the calls to view healthcare delivery as science that informs national improvement priorities are not new,[16] the disruptive forces of the COVID-19 pandemic regarding crisis standards of care are unprecedented. It is imperative that we consider how COVID-19-related changes to healthcare delivery exacerbate existing disparities in access to care and may worsen oncologic outcomes for patients with HNC. Many health care system changes attributable to COVID-19 will likely persist long after the pandemic has waned.[17] We must explore strategies to mitigate disparities in care for HNC patients that have arisen from this "stress test" on our healthcare delivery system.

Impact of COVID-19 on the Equity of Cancer Care Delivery for HNC Patients

First, COVID-19-associated changes in healthcare delivery may widen existing disparities in timely diagnosis and treatment of HNC as a result of reduced access to health care providers. For patients with HNC, access to and receipt of timely treatment across the cancer

care continuum is critical to optimal oncologic outcomes.[18,19] It is therefore not surprising that racial and ethnic differences in timely treatment are strongly associated with racial and ethnic differences in oncologic outcomes.[8,11-15] Care during the COVID-19 pandemic has brought about an abrupt and precipitous reduction in the number of patients accessing HNC-related care.[20] There has also been an associated transformation in the method of care delivery for patients with HNC, with a shift towards telemedicine in lieu of in-person consultation and follow-up.[20,21] However, access to telehealth is a privilege not shared by all.[22] Studies across a variety of disease states have demonstrated that telehealth-based interventions are neither culturally appropriate nor tailored which may result in low uptake among African American and Hispanic/Latino communities, exacerbating disparities in access.[23] The specific financial, structural, and institutional characteristics of health care systems that affect racial and ethnic differences in care also require attention. The hospitals where African Americans, Hispanic/Latino, and other racial/ethnic minorities tend to seek care are often less likely to have the resources and may have less capacity for a comprehensive telehealth program, further creating a divide.[24] Many telehealth platforms require the use of electronic devices with certain software requirements, which may not be readily available to low-income and racial/ethnic minority patients.[25] Furthermore, access to telehealth may also be limited by inadequate health literacy and low English proficiency, which may be more prevalent in these populations.[26]

Second, ongoing initiatives to triage, prioritize, and schedule HNC-directed therapy to accommodate scarce resources during the COVID-19 pandemic may exacerbate pre-existing

racial/ethnic disparities in timely treatment initiation. The considerations mirror national discourse on Crisis Standards of Care (CSC) that modify healthcare operations and preferentially triage lifesaving resources based on likelihood of survival. The latent threat to minorities in CSC is that when comorbidities are used in prioritization schemes a proxy for health, minority patients who, in general, have higher base rates of comorbidities (and increased risk of mortality) may be deprioritized for access, placing them in double jeopardy.[27] Although risk stratification protocols have been developed to maximize objectivity in determining treatment priority,[28] the risk of bias, implicit or explicit, looms large.[29]

Third, the marked changes in employment status, health insurance coverage, and dependent care responsibilities may further aggravate racial/ethnic disparities in access to care and treatment for patients with HNC, particularly because workers of color are more likely to have lost employment during the pandemic.[30] According to the US Census, over 36 million Americans have already filed unemployment claims as of May 14, 2020. Prior to the COVID-19 pandemic, insurance coverage was strongly linked to stage at diagnosis, timely treatment initiation, and oncologic outcomes.[31,32] The abrupt loss of insurance coverage for vulnerable patients, compounded by the financial shock of having to absorb the out-of-pocket costs of care, will certainly worsen racial disparities in access to multidisciplinary HNC care. In addition, the increased need for childcare due to school closings during the COVID-19 pandemic may introduce another barrier to seeking care that disproportionately burdens racial and ethnic minorities.

Strategies to Address Worsening HNC Care Disparities During the COVID-19 Pandemic

While the COVID-19 crisis has shone a light on already-marked disparities, it has also provided an impetus for structural changes that can mitigate inequities in access and outcomes both in times of pandemic and beyond. We offer the following suggestions:

1. **Collect detailed data on access to care by race/ethnicity, income, education, and community.**

It is imperative that we collect data about HNC care delivery and access to care in a manner that allows us to more comprehensively examine racial and ethnic disparities as well as the underlying social determinants of health. Otolaryngology-head and neck surgery groups analyzing the impact of COVID-19 on access to care did not report or analyze data by race/ethnicity, income, education, or community.[20] A similar problem with data collection in part delayed the recognition that COVID-19 was disproportionately harming African-Americans and Hispanic/Latinos.[5] In-depth exploration of the social determinants of health that are the underlying drivers of disparate outcomes are needed[6], and such data need to be publicly available to allow clinicians, policy makers, public health professionals, and policy makers to make informed decisions to better care for these marginalized groups within the broader HNC

population. These steps will indeed require investment of time and resources; but the absence of data does not imply the absence of a problem.

2. **Raise awareness that racial and ethnic disparities exist.**

We should be proactive in recognizing the potential for exacerbating disparities in access and outcomes during this massive upheaval of clinical care. Raising awareness at individual, team, and hospital administrative levels will be key to ensuring that a broad range of stakeholders can be brought together and can combine their collective areas of expertise to proactively seek out, identify, and address areas of concern. As clinicians and team leaders, we share responsibility for drawing attention to this problem and addressing it.

3. **Engage communities and stakeholders to understand their challenges and develop culturally-appropriate solutions.**

We also need to reach out to the African American, Hispanic/Latino, and other at-risk communities to better understand the specific challenges they are facing during this crisis. Although publications from reputable institutions describing their experiences altering HNC care delivery during times of crisis may also inform current solutions,[33] it would be presumptuous and ineffective for clinicians or administrators to pre-suppose that they already know how to address the problem. Building a strong coalition of involved stakeholders will help ensure that whatever

healthcare delivery interventions arise will be delivered in a manner that is culturally appropriate, community competent, and relevant to the needs of the more vulnerable populations. Furthermore, such a coalition will enable us to also look beyond health care services into improving community support systems and policy-level solutions, which can have significant influences on individual health outcomes.[34,35]

4. **Ensure that surgical care prioritization protocols proactively address the potential for racial/ethnic bias.**

We should develop and utilize measures that acknowledge the role that racial/ethnic implicit or explicit bias can play in prioritizing surgical cases. While the content and underlying ethical principles of these prioritization decision-aids could vary, the role of race and ethnicity will have to be carefully considered. While omitting race/ethnicity data in prioritization may give the sense of a "color-blind" approach, clinical stage and severity of comorbidity would likely be part of a prioritization scheme,[28] particularly if one of the guiding ethical principles is maximizing benefit (e.g. life-years).[36] However, African American and Hispanic patients are significantly more likely to present with advanced-stage disease and have more severe comorbidities. Therefore, a "color-blind" prioritization system based on maximizing benefit that includes comorbidity and stage may systematically de-prioritize care for African American and Hispanic/Latino HNC patients. While it might be inappropriate to eliminate use of stage or comorbidity, one could consider incorporating race/ethnicity into prioritization schemes with an

evidence-based, data-driven weight, determined by relative patient populations and local or regional prevalence of HNC so as to avoid building implicit racial bias into prioritization schemes.[27] Alternatively, developing a prioritization framework based on different ethical principles (e.g. giving priority to the worst off)[36] might actually prioritize racial/ethnic minorities. Although the details of the optimal solution are not known, there is a critical need to establish objective measures and metric-based interventions to diminish current disparities in the receipt of HNC care. Such a solution would likely be consistent with the recommendation from the World Health Organization that the process of surgical prioritization adhere to principles of inclusiveness, transparency, accountability, and consistency.[37]

Conclusion

While COVID-19 pandemic may eventually dissipate, health care disparities will likely persist. The COVID-19 pandemic has provided us with a lens, opportunity, and rationale for renewed dedication to investigating the causes of and solutions for racial/ethnic disparities in access and outcomes for patients with HNC. Although many factors contribute to racial/ethnic disparities in morbidity and mortality in patients with HNC, healthcare delivery should not be one of them.

References

1. Wadhera RK, Wadhera P, Gaba Pet al. Variation in COVID-19 Hospitalizations and Deaths Across New York City Boroughs. JAMA 2020.
2. Owen WF, Jr., Carmona R, Pomeroy C. Failing Another National Stress Test on Health Disparities. JAMA 2020.
3. Williams DR, Cooper LA. COVID-19 and Health Equity-A New Kind of "Herd Immunity". JAMA 2020.
4. Webb Hooper M, Napoles AM, Perez-Stable EJ. COVID-19 and Racial/Ethnic Disparities. JAMA 2020.
5. Cleveland Manchanda E, Couillard C, Sivashanker K. Inequity in Crisis Standards of Care. N Engl J Med 2020.
6. Figueroa JF, Frakt AB, Jha AK. Addressing Social Determinants of Health: Time for a Polysocial Risk Score. JAMA 2020.
7. Molina MA, Cheung MC, Perez EAet al. African American and poor patients have a dramatically worse prognosis for head and neck cancer: an examination of 20,915 patients. Cancer 2008; 113:2797-2806.
8. Gourin CG, Podolsky RH. Racial disparities in patients with head and neck squamous cell carcinoma. Laryngoscope 2006; 116:1093-1106.
9. Goodwin WJ, Thomas GR, Parker DFet al. Unequal burden of head and neck cancer in the United States. Head Neck 2008; 30:358-371.

10. Mahal BA, Inverso G, Aizer AA, Bruce Donoff R, Chuang SK. Impact of African-American race on presentation, treatment, and survival of head and neck cancer. Oral Oncol 2014; 50:1177-1181.

11. Naghavi AO, Echevarria MI, Strom TJet al. Treatment delays, race, and outcomes in head and neck cancer. Cancer Epidemiol 2016; 45:18-25.

12. Liao DZ, Schlecht NF, Rosenblatt Get al. Association of Delayed Time to Treatment Initiation With Overall Survival and Recurrence Among Patients With Head and Neck Squamous Cell Carcinoma in an Underserved Urban Population. JAMA Otolaryngol Head Neck Surg 2019.

13. Graboyes EM, Garrett-Mayer E, Ellis MAet al. Effect of time to initiation of postoperative radiation therapy on survival in surgically managed head and neck cancer. Cancer 2017; 123:4841-4850.

14. Guttmann DM, Kobie J, Grover Set al. National disparities in treatment package time for resected locally advanced head and neck cancer and impact on overall survival. Head Neck 2018; 40:1147-1155.

15. Naghavi AO, Echevarria MI, Grass GDet al. Having Medicaid insurance negatively impacts outcomes in patients with head and neck malignancies. Cancer 2016.

16. Pronovost PJ, Goeschel CA. Viewing health care delivery as science: challenges, benefits, and policy implications. Health Serv Res 2010; 45:1508-1522.

17. Khariwala SS, Weinreich HM, McCoul EDet al. Leveraging COVID-19-Inspired Changes to Advance Otolaryngology-Here to Stay. JAMA Otolaryngol Head Neck Surg 2020.

18. Graboyes E, Kompelli A, Neskey Det al. Association of Treatment Delays with Survival for Patients with Head and Neck Cancer. JAMA Otolaryngol Head Neck Surg 2019; 145:166-177.

19. Ho AS, Kim S, Tighiouart Met al. Quantitative survival impact of composite treatment delays in head and neck cancer. Cancer 2018; 124:3154-3162.

20. Kasle DA, Torabi SJ, Savoca EL, Judson BL, Manes RP. Outpatient Otolaryngology in the Era of COVID-19: A Data-Driven Analysis of Practice Patterns. Otolaryngol Head Neck Surg 2020:194599820928987.

21. Prasad A, Carey RM, Rajasekaran K. Head and neck virtual medicine in a pandemic era: Lessons from COVID-19. Head Neck 2020.

22. Yancy CW. COVID-19 and African Americans. JAMA 2020.

23. Latulippe K, Hamel C, Giroux D. Social Health Inequalities and eHealth: A Literature Review With Qualitative Synthesis of Theoretical and Empirical Studies. J Med Internet Res 2017; 19:e136.

24. Smedley BD, Stith AY, AR N. Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care. In: Care IoMCoUaERaEDiH, ed. Washington, DC: National Academies Press, 2003.

25. Abel EA, Shimada SL, Wang Ket al. Dual Use of a Patient Portal and Clinical Video Telehealth by Veterans with Mental Health Diagnoses: Retrospective, Cross-Sectional Analysis. J Med Internet Res 2018; 20:e11350.

26. Megwalu UC, Lee JY. Health Literacy Assessment in an Otolaryngology Clinic Population. Otolaryngol Head Neck Surg 2016; 155:969-973.

27. Tartak JC, H. K. *U.S. Must Avoid Building Racial Bias Into COVID-19 Emergency Guidance*: National Public Radio, 2020.

28. Prachand VN, Milner R, Angelos Pet al. Medically Necessary, Time-Sensitive Procedures: Scoring System to Ethically and Efficiently Manage Resource Scarcity and Provider Risk During the COVID-19 Pandemic. J Am Coll Surg 2020.

29. Balakrishnan K, Arjmand EM. The Impact of Cognitive and Implicit Bias on Patient Safety and Quality. Otolaryngol Clin North Am 2019; 52:35-46.

30. Jan T, Clement S. Hispanics are almost twice as likely as whites to have lost their jobs amid pandemic, poll finds *The Washington Post*, 2020.

31. Sineshaw HM, Ellis MA, Yabroff KRet al. Association of Medicaid Expansion Under the Affordable Care Act With Stage at Diagnosis and Time to Treatment Initiation for Patients With Head and Neck Squamous Cell Carcinoma. JAMA Otolaryngol Head Neck Surg 2020.

32. Cannon RB, Shepherd HM, McCrary Het al. Association of the Patient Protection and Affordable Care Act With Insurance Coverage for Head and Neck Cancer in the SEER Database. JAMA Otolaryngol Head Neck Surg 2018; 144:1052-1057.

33. Wu V, Noel CW, Forner Det al. Considerations for head and neck oncology practices during the coronavirus disease 2019 (COVID-19) pandemic: Wuhan and Toronto experience. Head Neck 2020.

34. Metzl JM, Hansen H. Structural competency: theorizing a new medical engagement with stigma and inequality. Soc Sci Med 2014; 103:126-133.

35. Marmot M. Social determinants of health inequalities. Lancet 2005; 365:1099-1104.

36. Emanuel EJ, Persad G, Upshur Ret al. Fair Allocation of Scarce Medical Resources in the Time of Covid-19. N Engl J Med 2020; 382:2049-2055.

37. Clinical management of COVID-19: Interim Guidance. Accessed May 21 2020.