The Laryngoscope

Contemporary Review

Dissemination of Information During Public Health Crises: Early COVID-19 Data From *The Laryngoscope*

Alexander Chern, MD; Samuel H. Selesnick, MD

Objectives: During a public health crisis, it is important for medical journals to share information in a timely manner while maintaining a robust peer-review process. This review reports and analyzes *The Laryngoscope*'s publication trends and practices during the COVID-19 pandemic, before the COVID-19 pandemic, and during previous pandemics.

Methods: Comprehensive review of two databases (PubMed and *The Laryngoscope*) was performed. COVID-19 manuscripts (published in *The Laryngoscope* during the first 4 months of the pandemic) were identified and compared to manuscripts pertaining to historic pandemics (published in *The Laryngoscope* during the first 2 years of each outbreak). Keywords included "Laryngoscope", "flu", "pandemic", "influenza", "SARS", "severe acute respiratory syndrome", "coronavirus", "COVID-19", and "SARS-CoV-2". Data were obtained from *The Laryngoscope* to characterize publication trends during and before the COVID-19 pandemic.

Results: From March 1, 2020 to June 30, 2020, *The Laryngoscope* had 203 COVID-19 submissions. As of July 8, 2020, 20 (9.9%) were accepted, 117 (57.6%) under review, and 66 (32.5%) rejected. During the first 4 months of the pandemic, 18 COVID-19 manuscripts were published. The mean number of days from submission to online publication was 45, compared to 170 in 2018 and 196 in 2019. A total of 4 manuscripts concerning previous pandemics were published during the initial 2 years of each outbreak.

Conclusions: *The Laryngoscope* rapidly disseminated quality publications during the COVID-19 pandemic by upholding a robust peer-review process while expediting editorial steps, highlighting relevant articles online, and providing open access to make COVID-19-related publications available as quickly as possible.

Key Words: COVID-19, SARS-CoV-2, publication, peer-review, pandemic, research, public health crisis.

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INTRODUCTION

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has rapidly spread across the world since first identified in December 2019 in Wuhan, China.[1] The disease caused by the virus, termed coronavirus disease 2019 (COVID-19), has since been declared a pandemic; as of July 7, 2020, there have been over 11.5 million cases and over 530,000 reported deaths worldwide.[2] Clinical sequelae range from mild upper respiratory infection symptoms to a progressive life-threatening pneumonia, multi-organ failure, and even death.[1] The SARS-CoV-2 virus targets endothelial cells via angiotensin-converting enzyme 2 receptors and causes distinctive vascular changes (i.e., severe endothelial injury and widespread thrombosis with microangiopathy) that are thought to underlie the acute respiratory failure and multi-organ dysfunction associated with the disease.[3,4] As the COVID-19 pandemic poses unprecedented challenges and significant threats to the worldwide population, clinicians have urgently needed answers to questions that can help guide clinical care and decision-making. Consequently, a vast amount of research has emerged on COVID-19; according to one analysis, the scientific community has released over 16,000 COVID-19 related scientific articles within the first 4 months of the initial outbreak,[5] with topics ranging from epidemiology to new detection methods and interventions.

Scientific and clinical progress depends on effective transmission of research findings to members of the scientific and medical communities, who go on to share these discoveries to a broader audience. During a public health crisis such as the COVID-19 pandemic, it is important for medical journals to share information in a timely manner while simultaneously maintaining a robust peer-review process. This ensures the publication of high-quality content and prevents spread of misinformation, which can ultimately have detrimental effects on patient care. This review describes publication trends and practices of *The Laryngoscope* that have enabled the journal

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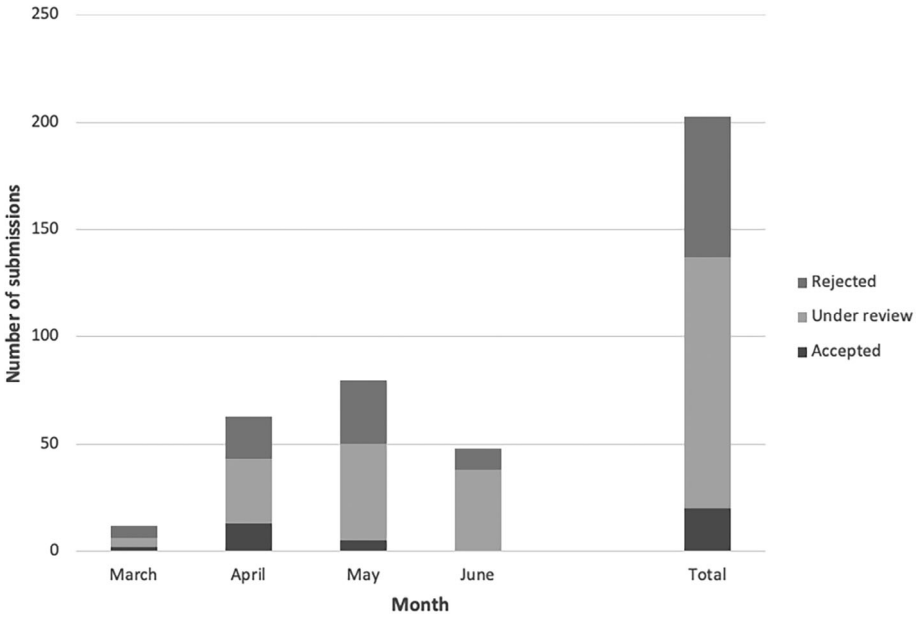

Fig. 1. Number of submissions to *The Laryngoscope* during the first 4 months of the COVID-19 distributed by publication status.

to combine urgency and scientific rigor for rapid dissemination of quality publications.

Our research objectives were to report and analyze publication trends and practices of *The Laryngoscope* during the COVID-19 pandemic, before the COVID-19 pandemic, and during previous pandemics.

METHODS

Literature Search

Comprehensive review of two databases (PubMed and *The Laryngoscope* journal website) was performed on July 8, 2020 to identify *The Laryngoscope* publications pertaining to the COVID-19 pandemic and historic respiratory pandemics of the 20th and 21st century.[6–9]

The Highlighted Content: COVID-19 section of *The Laryngoscope* journal website provides all published COVID-19 manuscripts. *The Laryngoscope* Issue Archive provides historic and present-day issues.[11] Entries from these sections of the website were searched to identify relevant manuscripts published during the first 4 months of the COVID-19 outbreak (3/1/2020–6/30/2020) and first 2 years of each historic outbreak.[6,7] Historic pandemics and relevant dates included the 1918 influenza pandemic (4/5/1918–4/4/1920), 1957–1958 influenza pandemic (5/1/1957–4/30/1959), 1968 influenza pandemic (7/1/1968–6/30/1970), severe acute respiratory syndrome (SARS) outbreak of 2003 (3/1/2003–2/28/2005), 2009 influenza pandemic (4/15/2009–4/14/2011). Publication titles were screened to identify manuscripts related to these pandemics. Publications with ambiguous titles were manually reviewed.

A PubMed literature search was performed using pertinent date ranges for each pandemic to verify the aforementioned review of *The Laryngoscope* website. Search terms "flu", "pandemic", "influenza", "SARS", "severe acute respiratory syndrome", "coronavirus", "COVID-19", and "SARS-CoV-2" were each combined with "Laryngoscope". Publication titles, abstracts, and manuscripts were reviewed to identify those related to historic pandemics.

Relevant publications from both databases were compiled, with duplicates removed, for analysis.

Internal Data from The Laryngoscope

Internal submission and publication data from *The Laryngoscope* during the early COVID-19 pandemic (3/1/2020–6/30/2020) were obtained from *The Laryngoscope* to identify COVID-19 submissions during this time. COVID-19 submissions were categorized by topic, publication type, and publication status (as of 7/8/2020) to characterize submission trends and publication speed. Internal publication metrics (time from submission to acceptance, acceptance to online publication) prior to the COVID-19 pandemic (2018 and 2019) were obtained to anchor the reader to the typical publication speed of *The Laryngoscope*.

Outcomes of Interest

Outcomes of interest extracted from the database search and internal data from *The Laryngoscope* included 1) number of COVID-19 publications during the first 4 months of the COVID-19 pandemic, 2) number of publications pertaining to historic respiratory pandemics of the 20th and 21st century during the first 2 years of each pandemic, 3) COVID-19 submission trends (i.e., number of submissions, topic, publication type, and status of publication) during the first 4 months of the COVID-19 pandemic, and 4) publication speed before and during the COVID-19 pandemic.

RESULTS

Publication Trends during Previous Pandemics

Since *The Laryngoscope* was founded in 1896,[12] there have been several notable pandemics worldwide, including the 1918 influenza pandemic (H1N1 virus), 1957–1958 influenza pandemic (H2N2 virus), 1968 influenza pandemic

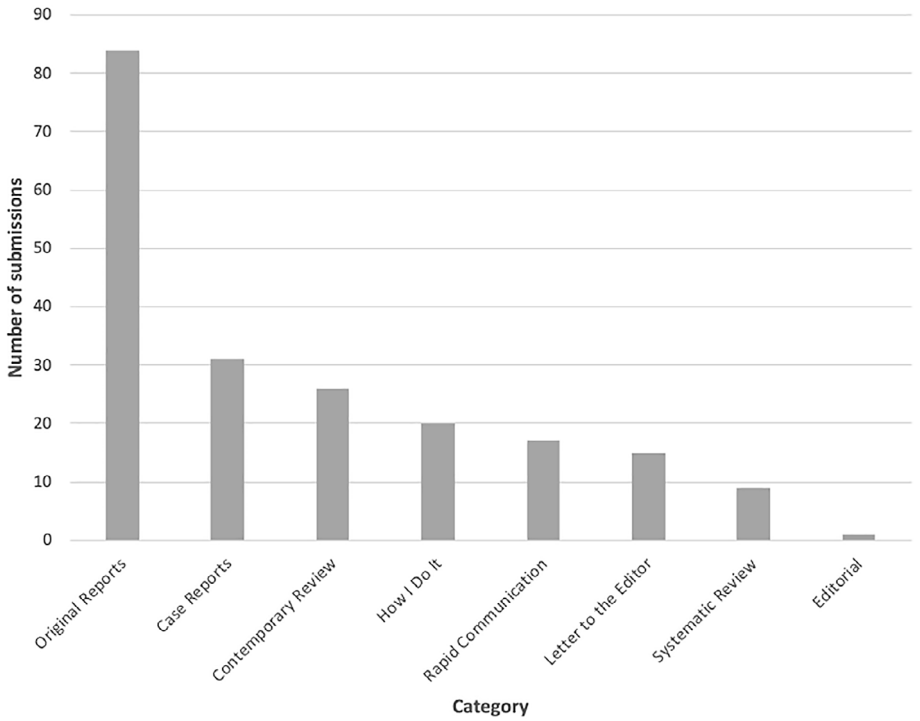

Fig. 2. Number of submissions to *The Laryngoscope* during the first 4 months of the COVID-19 distributed by manuscript category.

(H3N2 virus), SARS outbreak of 2003 (SARS-CoV virus), and 2009 influenza pandemic (H1N1 virus).[6,8] These pandemics were all caused by viruses with similar respiratory disease presentations and transmission modalities (i.e., aerosols or respiratory droplets) as SARS-CoV2.[13] The most severe of these pandemics was the so-called "Spanish Flu" (1918 influenza pandemic), which caused 20–50 million deaths from 1918–1919. Milder influenza pandemics occurred subsequently; the 1957–1958 and 1968 pandemics were estimated to have

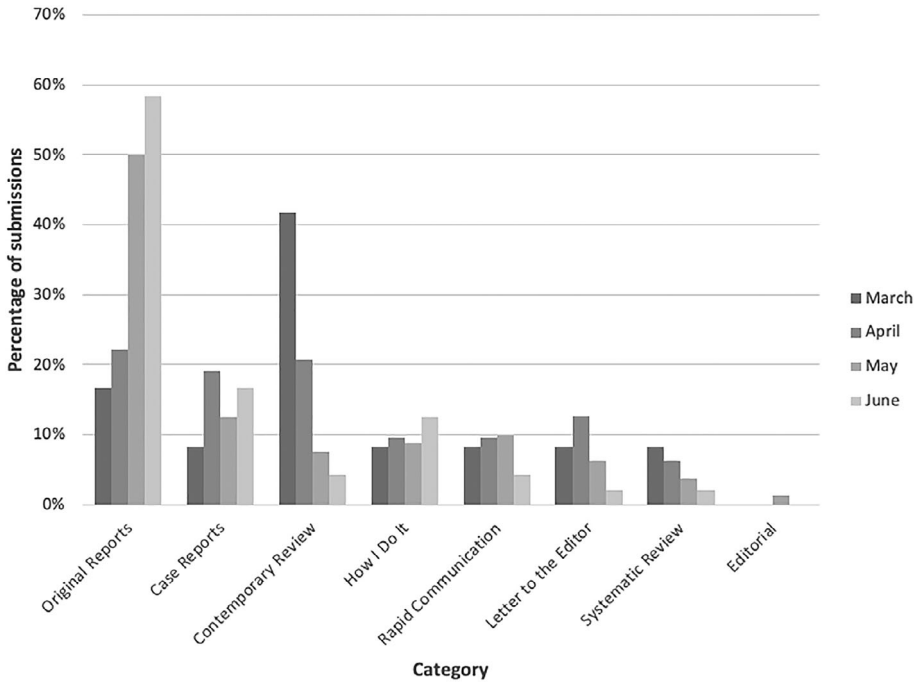

Fig. 3. Proportion of submissions to *The Laryngoscope* per month during the first 4 months of the COVID-19 pandemic distributed by manuscript category.

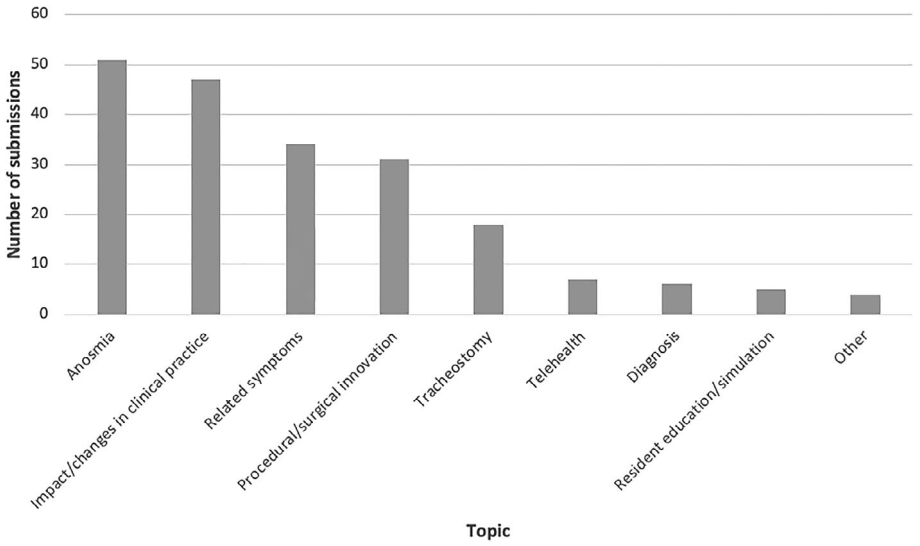

Fig. 4. Number of submissions to *The Laryngoscope* during the first 4 months of the COVID-19 pandemic distributed by topic.

caused 1–4 million deaths each, while the 2009 influenza pandemic was estimated to have caused 100,000–400,000 deaths globally in the first year.[7]

Our comprehensive search of two databases, PubMed (use of relevant keywords and date ranges) and *The Laryngoscope* journal website (review of 2833 publication entries in prior issues published during relevant date ranges), yielded a total of 4 articles pertaining to historic pandemics published by *The Laryngoscope* within the first 2 years of each pandemic. These included two case series on otolaryngologic manifestations of the disease during the 1918 influenza pandemic,[14,15] as well as reports pertaining to safe tracheostomy for patients[16] and the impact of the pandemic on otolaryngologists during the SARS outbreak of 2003.[17]

In summary, remarkably little was published regarding prior pandemics by *The Laryngoscope*.

Publication Trends During the COVID-19 Pandemic

From March 1, 2020 to June 30, 2020, a total of 203 manuscripts concerning COVID-19 were submitted to *The Laryngoscope*.[18] There were 12 submissions in March, 63 in April, 80 in May, and 48 in June. As of July

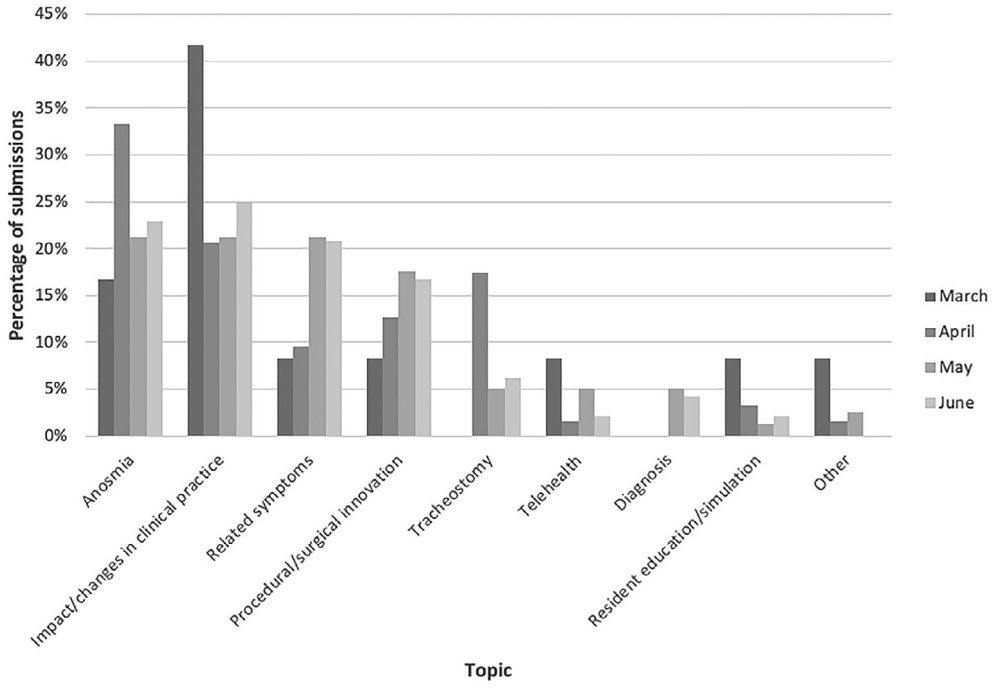

Fig. 5. Proportion of submissions to *The Laryngoscope* per month during the first 4 months of the COVID-19 distributed by topic.

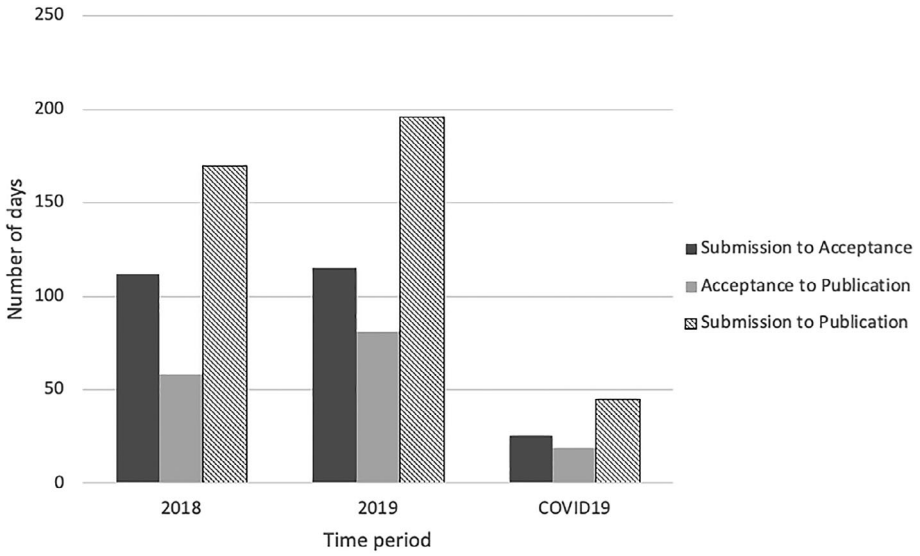

Fig. 6. Mean publication speed of articles published in *The Laryngoscope* during the COVID-19 pandemic (March 1, 2020 to June 30, 2020) compared to the previous 2 years (2018 and 2019).

8, 2020, 20 (9.9%) of all manuscripts were accepted, 117 (57.6%) were still under review, and 66 (32.5%) were rejected (Fig. 1).

COVID-19 manuscript submissions to *The Laryngoscope* were classified per the author guidelines[19] and consisted of the following categories (number of submissions, percentage of total submissions): Original Report (84, 41.4%), Case Report (31, 15.3%), Contemporary Review (26, 12.8%), How I Do It (20, 9.9%), Rapid Communication (17, 8.4%), Letter to the Editor (15, 7.4%), Systematic and Evidence-Based Review (9, 4.4%), and Editorial (1, 0.5%) (Figs. 2 and 3).

COVID-19 manuscript submissions to *The Laryngoscope* were also classified by topic (Supplementary Material 1) and consisted of the following topics (number of submissions, percentage of total submissions): anosmia (51, 25.1%), impact and changes in clinical practice (47, 23.2%), related symptoms (34, 16.7%), procedural/surgical innovation (31, 15.3%), tracheostomy (18, 8.9%), telehealth (7, 3.4%), diagnosis (6, 3%), resident education/simulation (5, 2.5%), other (4, 2.0%) (Figs. 4 and 5). See Supplementary Material 1 for explanations of the specific COVID-19 topics.

Publication Speed: Before and During the COVID-19 Pandemic

A total of 18 COVID-19 publications have been published during the first 4 months of the pandemic (3/1/2020–6/30/2020). Mean number of days from submission to acceptance was 26, acceptance to online publication 19, and submission to online publication 45. Prior to the COVID-19 pandemic in 2018, mean numbers of days from submission to acceptance was 112, acceptance to publication 58, and submission to online publication 170. In 2019, mean number of days from submission to acceptance was 115, acceptance to publication 81, and submission to online publication 196 (Fig. 6).[18]

DISCUSSION

Otolaryngologists have been uniquely impacted by the COVID-19 pandemic and are often closely involved in the management of patients suffering from the disease. COVID-19 often presents with otolaryngologic symptoms, including cough, sore throat, dyspnea, dysgeusia, and most notably, anosmia.[20,21] Otolaryngologists have been frequently called upon for their expertise in airway management (e.g., performing and managing tracheostomies for patients with COVID-19 that require chronic invasive mechanical ventilation).[22] The high rates of community and nosocomial spread have also led to a wide variety of innovations (e.g., novel personal protective equipment) centered around reducing risk of SARS-CoV-2 virus transmission during surgery.[23,24] These innovations have been valuable for those involved in patient care during the pandemic; healthcare personnel, specifically those who routinely participate in aerosol-generating procedures (e.g., endotracheal intubation, nasal endoscopy) such as otolaryngologists and anesthesiologists, reportedly suffered a high rate of infection and death during the initial outbreak in Wuhan, China.[25,26] The large impact that COVID-19 has had on otolaryngology practice has led to a notable influx of submissions to *The Laryngoscope* during the first 4 months of the pandemic. Overall, the publication trends and practices of *The Laryngoscope* have enabled the journal to transparently bring its audience the best possible information available in an expedited manner.

Several trends in the data are noted. The proportion of Original Reports per month has dramatically increased over the first 4 months of the COVID-19 pandemic, consisting of 16.7% of all submissions in March, to 58.3% of all submissions in June; this can be attributed to the time required to collect adequate data for a high-quality research study. For comparison, Original Reports typically represent approximately 70% of all articles published in non-pandemic time.[18] On the other hand, the

proportion of Contemporary Reviews per month has significantly decreased over time, from 41.7% of all submissions in March to 4.2% of all submissions in June. Contemporary Reviews are typically submissions that address rapidly evolving topics, such as novel diagnostic or therapeutic advances for a public health crisis. In the early stages of a public health crisis, there are less data to collect for a meaningful research study suitable for an Original Report.

The low acceptance rate (9.9%) of COVID-19 manuscripts can be attributed to several factors. As mentioned previously, there is typically a paucity of rigorous data during initial stages of a pandemic, which facilitates the submission of level 4 studies (e.g., case series without an internal control). As time passes and more rigorous studies can be performed, those types of descriptive studies published early on are no longer novel and will no longer be published. Moreover, with time, there are duplications of ideas and findings; these can vary geographically because the COVID-19 pandemic affected different regions at different times. Physicians from communities that were affected at a later time point may wish to publish their experience, which may simply echo the experience of earlier researchers. These submissions would not be accepted by *The Laryngoscope*. It is also important to note that a large number of current submissions (i.e., from May and June) are still under review. The overall acceptance rate of the journal during the first 4 months of the pandemic can be assessed more accurately once most manuscripts have undergone peer-review.

Given the high prevalence of anosmia in patients with COVID-19, manuscripts pertaining to anosmia comprised a large proportion of all submissions (25.1%). The large impact that COVID-19 has had on otolaryngology practice worldwide has resulted in a considerable proportion of all submissions relating to impact and changes in clinical practice (23.2%). Many of these submissions attempted to describe various challenges that otolaryngologists have faced, as well as guidelines and recommendations to address them. The high transmission rates sparked more manuscript submissions over time that addressed procedural and surgical innovations; these were often centered around reducing viral spread during surgery. These submissions reflect the remarkable ingenuity of otolaryngologists when facing this contagion threat to their patients, co-workers, and themselves. Moreover, as otolaryngologists became more familiar with the COVID-19 disease process and how it may affect their patients, the proportion of submissions addressing other otolaryngologic symptoms and manifestations of COVID-19 also increased over time.

There were substantially more publications by *The Laryngoscope* during the early stages of the COVID-19 pandemic (18 during the first 4 months) compared to the other major pandemics of the 20th and 21st century (total of 4 during the first 2 years of each outbreak). This phenomenon cannot be attributed to lack of otolaryngologic symptoms during prior pandemics—influenza is a contagious respiratory illness that certainly manifests with otolaryngologic symptoms, including cough, shortness of breath, sore throat, nasal congestion, and rhinorrhea.[28] We would also not expect that curiosity and zeal for clinical research were diminished in the physicians of earlier pandemics. Although *The Laryngoscope* was a well-known journal during prior pandemics, it is possible that authors sent their pandemic-related research to other otolaryngology journals.

Publishing speed during the COVID-19 pandemic by *The Laryngoscope* has also been considerably faster when compared to the non-pandemic times (2018 and 2019). We report the publishing speed in 2018 and 2019 to anchor the reader in the usual publication rate prior to the COVID-19 pandemic. The time from submission to online publication for non-COVID-19 article in 2018 (170 days) or 2019 (196 days) is approximately 3-4 times the time from submission to online publication for a COVID-19 manuscript (45 days) during the first 4 months of the outbreak. Of note, the peer-review process for COVID-19 submissions is not accelerated and is treated the same as any other submission; reviewers are not instructed to complete their peer-review more quickly.

The speed of publication can be attributed to specific editorial steps are taken by *The Laryngoscope* to ensure rapid dissemination of novel information during the COVID-19 pandemic. All submissions pertaining to COVID-19 are flagged to ensure eventual prompt distribution to reviewers. The time from acceptance to publication online is accelerated to enable the effective spread of new information by working closely with the post-production team of the journal publisher. Relevant manuscripts leapfrog other accepted, non-COVID-19 papers in queue for publication.

Once published, COVID-19 articles are highlighted in a section prominently located on the journal webpage. Furthermore, *The Laryngoscope* has made these articles accessible to all without an institutional subscription, personal subscription or fees.

Role of Journals During a Public Health Crisis

The COVID-19 pandemic highlights the need for rapid scientific communication of essential information on the disease to facilitate optimal patient care. Historically, medical journals have played a key role in dissemination of peer-reviewed science; however, the conventional peer-review process and post-production process can take a significant and prohibitive amount of time, delaying time from submission to publication for months—and sometimes for a year or more. Clinicians and public health authorities require actionable information as soon as possible to slow down, contain, and eventually stop the disease. For example, a number of recent publications address methods and outcomes for tracheostomy in patients with COVID-19.[29,30] Novel methods for performing tracheostomy to mitigate aerosolization, as well as patient and healthcare worker outcomes (i.e., transmission amongst patients and healthcare workers) can realistically benefit clinicians worldwide, especially those who may be less experienced or practice in an area where a severe worsening of the pandemic is imminent.

The urgency of a public health crisis may also prompt inadvertent spread of misinformation. Recently, two world-renowned medical journals, *The New England Journal of Medicine* and *The Lancet* retracted two high-profile papers on treatments in patients with COVID-19.[31,32] One of the studies reported the results of clinical trials of two antimalarial drugs used for treatment of COVID-19 (chloroquine and hydroxychloroquine).[32] This retracted study claimed that these drugs were not associated with improved outcomes and were, in fact, associated with higher mortality in patients. Although no strong evidence exists supporting the use of such antimalarial medications for treatment of COVID-19, the study wase based on faulty data and had a global impact, halting trials of the drugs by the World Health Organization and other entities. One of the co-authors of the studies admitted he was rushed to publish research during the COVID-19 pandemic, which prevented him from verifying the source of the data.[33]

There were several limitations to our historical comparison. The dissemination of information by journals during the mid-late 20th century (i.e., the pre-digital age, when manuscripts were submitted with multiple hard copies) took place more slowly compared to today, where digital transmission of information occurs almost instantaneously through the internet. A more generous window for publication during earlier pandemics was provided in our analysis for a fairer comparison to publication during the COVID-19 pandemic (2 years vs. 4 months after initial outbreak). During the early-mid 20th century, *The Laryngoscope* also did not have the global reach that it does today. This is particularly important when considering previous pandemics that predominantly affected other parts of the world and did not have as large of an impact on the United States. Authors may have chosen to publish their work in other more familiar, well-known journals of that time, which may partially explain the paucity of historic pandemic publications in *The Laryngoscope*. Publication data (e.g., number of submissions and acceptances, time from manuscript receipt to acceptance) of *The Laryngoscope* during historic pandemic years were not available for comparison to current COVID-19 publication data.

Future directions include post-pandemic bibliometric studies conducted to inform the scientific community on effective strategies for mobilization of scholarly efforts during a public health crisis. Characterizing how the scientific community responds to emergencies may be beneficial in creating and adjusting anti-epidemic or anti-pandemic strategies.

The Laryngoscope was initially founded by Max Goldstein of St. Louis "in an effort to speed the dissemination of the rapidly expanding body of knowledge in otolaryngology".[34] *The Laryngoscope* continues to hold to this core tenet to this day by publishing exceptional quality and timely manuscripts during what is arguably the most severe public health crisis of the past century—the COVID-19 pandemic.

CONCLUSION

During a public health crisis such as the COVID-19 pandemic, it is important for medical journals to share essential information in a timely manner while maintaining a robust peer-review process. Compared to pre-pandemic times, *The Laryngoscope* has combined urgency and scientific rigor to rapidly spread quality publications by upholding a strict peer-review process while expediting all editorial steps, highlighting relevant articles in a prominent section online, and providing open access capabilities to make publications available as quickly as possible.

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