



Regular Article

Communication during a global pandemic: The utility of a professional society listserv and journal

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A B S T R A C T

The Association of Pathology Chairs listserv was studied in order to determine its utility in facilitating communication among pathology departments during the COVID-19 global pandemic. Between March 2020 and March 2022, there were 116 pandemic-related entries generated by 49 members that stimulated 395 responses from 109 members. Due to overlap between individuals providing listserv entries and those responding, there were 123 unique participants. The majority of entries (64%) as well as responses (64%) occurred during March and April 2020. The most common categorical theme (32% of entries and 39% of responses) related to COVID-19 testing protocols and procedures with the second most common theme being the proactive sharing of individual institutional experiences in coping with the pandemic (16% of entries and 11% of responses). Additional themes included remote pathologist sign-outs, use of alternative specimens for testing, supply chain issues, in-house preparation of viral transport media and swabs, autopsies on COVID-19 decedents, safety of the blood supply, disinfecting masks, Medicare payment for testing, and creation of a biorepository for specimens. Fifty-two (42%) of the 123 unique participants published 277 COVID-related papers during this time, and one third of COVID-19-related articles published during 2020 and 2021 in *Academic Pathology*, the official journal of the Association of Pathology Chairs, involved individuals who had contributed to the listserv either by generating entries or responding to them. These data suggest that professional society listservs and journals are effective vehicles for communication during crises by identifying issues, proposing solutions, and exporting this information into the literature.

Keywords: Communication, COVID-19, Journal, Listserv, Pandemic, Pathology chairs, Themes

Introduction

The SARS-coronavirus –2 (SARS-CoV-2, COVID-19) global pandemic has presented heretofore unimaginable challenges to the field of medicine overall but particularly to the discipline of pathology, which has been thrust onto the front line for development, performance, and reporting of diagnostic and surveillance testing while maintaining support services for nonpandemic patients.^{1–6}

The Association of Pathology Chairs (APC) was established in 1968 as a nonprofit society to act as the voice of academic pathology departments in North America; to provide resources for department chairs, residency program directors, medical student educators, department administrators, and program coordinators; and to provide networking opportunities for these groups.⁷ The APC provides a listserv service for its members and has an official journal, *Academic Pathology*. The goal of this study was to evaluate the effectiveness of the APC listserv and journal publications in enhancing communications among pathology departments during the COVID-19 pandemic.

Materials and methods

The APC department chair listserv was reviewed for all entries whose title suggested that it was related to COVID-19. This listserv is open to 304 APC department chairs, vice chairs, and senior fellows (former department chairs who meet membership criteria and remain active in APC). Those entries were downloaded and abstracted for content by one of us (DNB). The number of individuals generating listserv entries and the number of respondents to each entry were tabulated. Emerging themes of the discussions were determined, and entries and responses were sorted by theme for further analysis.

In attempt to determine the value of listservs during the pandemic, the PubMed database was searched for the paired entries “COVID” and “listserv.” That database was also searched for the paired entries “COVID” and the name of the APC listserv participant in attempt to link listserv participation with the participants' publications on COVID-related issues. When necessary, verification of the author name was made by matching the author's institutional affiliation

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provided in the publication with that listed in the APC membership directory.

Because the APC listserv is open to any APC department chair member and because no survey was conducted as part of this study, it was exempt from requiring University of California San Diego Institutional Review Board approval.

Results

Listserv entries and responses

During the 2-year period of March 10, 2020, to March 9, 2022, there were 116 entries related to COVID-19 provided by 49 unique APC members, 19 of which were provided by APC office staff. The number of entries per individual ranged 1–18 (mean, 2.4; SD 3.1) with one APC office staff member providing 18 entries. There were 395 responses provided by 109 different individuals to the 116 listserv entries. The number of responses per person ranged 1–28 (mean, 3.6; SD 3.7). Thirty-five (35) of the 49 individuals provided both entries and responses, while the remaining 14 provided only entries. Seventy-four (74) of the 109 participants who responded to the listserv did not generate entries. As

Table 1
Listserv entries and responses

Timeline of entries	March 10, 2020–March 9, 2022
Entries	116
Individual contributors to entries	49 ^a
Mean entries/contributor	2.4 (range, 1–18; SD, 3.1)
Responses	395 ^b
Individual contributors to responses	109
Total number of unique contributors	123
Mean responses/contributor	3.6 (range, 1–28; SD, 3.7)

^a Thirty-five (35) provided both entries and responses, while 14 provided only entries.

^b Seventy-four (74) provided only responses (no entries).

shown in [Table 1](#), there were a total of 123 different participants (35 + 14 + 74) providing listserv entries, listserv responses, or both.

The largest number of entries (45%) and the largest number of responses (47%) occurred in March 2020 with the majority of entries (64%) and the majority of listserv responses (also 64%) occurring over March and April 2020. [Fig. 1](#) shows the distribution of entries and responses over the period of data collection.

Categorical themes

The most common categorical theme represented by the listserv entries related to COVID-19 testing, which accounted for nearly one third of entries (32%) and more than one third (39%) of responses. The second most common theme was proactive (not prompted) presentation of individual institutional experiences in dealing with the pandemic. This accounted for 16% of entries and 11% of responses. Nine different institutions contributed their experiences with one of the nine sharing its perspective ten times and another sharing its twice. The list of themes and responses is shown in [Tables 2 and 3](#), respectively.

Although it accounted for only 2% of categorical themes, the subject of autopsies on COVID-19 decedents stimulated the most responses per entry item (19:1). However, for items mentioned only one time, the most responses were received for a query about the current status of masking in laboratories (34 responses to this single entry). The ratio of number of responses to number of entries for all themes is shown in [Table 4](#).

Journal publications

A search of the PubMed database for the paired terms “COVID” and “listserv” yielded 71 entries as of April 23, 2022. None of the publications involved the 123 unique individuals who were identified in the APC listserv. All but two of the 71 publications indicated that the professional society listserv had been used merely to distribute surveys, to recruit participants to studies, and to solicit data for studies. One publication⁸

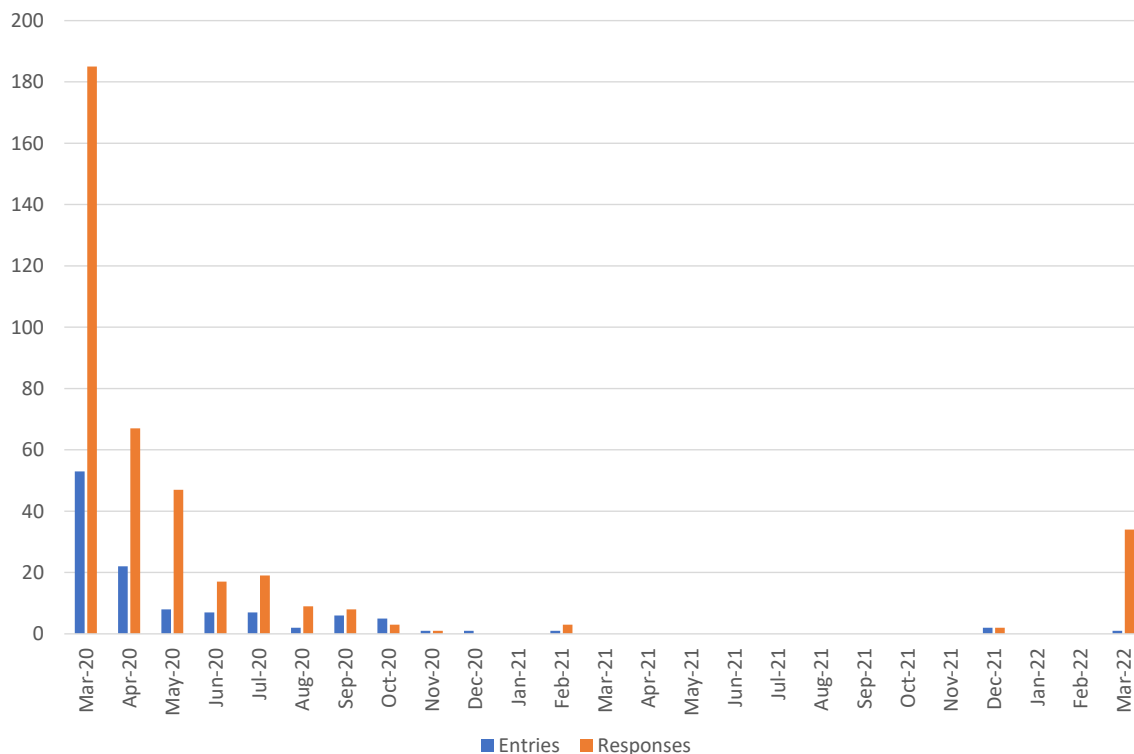


Fig. 1. Distribution of listserv entries and responses by timeline

Table 2

Listserv categorical themes (Descending order of frequency, number, %)

COVID-19 testing (37 entries, 32% of total)
Serology testing (10)
Pooling samples for COVID-19 testing (6)
COVID-19 nucleic acid testing on different platforms (5)
Testing healthcare workers and prioritization of testing (3)
Rapid antigen testing (2)
Retesting patients who test negative but are clinically suspicious (2)
Testing students in nonlicensed laboratories (2)
Commercial laboratory testing and marketing (1)
Testing asymptomatic patients (1)
Use of diagnostic tests for screening (1)
Validation of combined COVID/influenza testing (1)
Detection of vaccine S mRNA in COVID nucleic acid testing (1)
Cycle threshold values in COVID-19 nucleic acid testing (1)
False positive rates in COVID-19 nucleic acid testing (1)
Individual institutional experiences (19 entries, 16% of total)
Announcements (12 entries, 10% of total)
Association of Pathology Chairs (6)
American Board of Pathology (2)
Academic Pathology Journal (2)
Coronavirus Standards Working Group (1)
Omicron Variant Video (1)
Remote pathology sign-outs policy and regulations (6 entries, 5% of total)
Use of alternative (nonswab) specimens for COVID-19 testing (saliva, bronchoalveolar lavage, nasopharyngeal wash, sputum, formalin-fixed tissue) (5 entries, 5% of total)
Universal precautions in specimen handling (4 entries, 3% of total)
Supply chain issues (4 entries, 3% of total)
Viral transport media and swab alternatives (4 entries, 3% of total)
Safety of blood supply (2 entries, 2% of total)
Medicare payment for high-throughput COVID-19 testing (2 entries, 2% of total)
Reopening colleges and universities (testing algorithms, approaches) (2 entries, 2% of total)
Autopsies on COVID-19 decedents (2 entries, 2% of total)
Biorepository for COVID-19 specimens (2 entries, 2% of total)
Disinfecting N95 masks (2 entries, 2% of total)
Single mentions only (13 entries, 11% of total)
Convalescent plasma protocol
COVID infections and death in faculty, staff, and trainees
Use of pathologists to provide direct patient clinical care during pandemic
Software for morgue management
Reporting COVID-19 test results to Federal Government
Handling glass slides during sign-out
Setting up service center for COVID-19 patients
Reopening research laboratories
Change in emergency use authorization policy for laboratory-developed tests
Expiration of CMS 1135 waivers
Current status of masking in labs
Social distancing policies
Death rates from COVID-19

reported use of a professional listserv to discuss care, to organize webinars, to provide updates on local and national data, and to plan next steps in pediatric care during the pandemic. Another publication,⁹ a letter to the editor, reported creation of an informal listserv to share opinions, practices, and procedures about autopsies on COVID decedents.

A query of the PubMed database for the paired terms “covid” and the APC listserv participant name for each of the 123 unique participants yielded 277 COVID-related publications either authored or coauthored by 52 (42%) of the 123 participants as of April 24, 2022. Table 5 shows the range of papers per participant, the mean, and standard deviation for these individuals arranged by their listserv participation status (entry only, responder only, or both). Table 6 provides a breakdown of the general topics covered in these publications with the majority (22%) being clinical studies and cases reports, followed by testing policies (18%), basic science studies (13%), descriptions of institutional and population experiences (11%), serology (8%), digital pathology and artificial intelligence (7%), autopsy (5%), and treatment (5%) with other topics accounting for less than 5% each. Figs. 2–4 show the number of publications per month for each of the three groups by year (2020, 2021, 2022). It should be noted that PubMed indicated that some publications were beyond the date of the search (e.g., in May and June 2022) due to the issue publishing practices of journals.

Table 3

Listserv entry responses to categorical themes (descending order of frequency, number, %)

COVID-19 testing (154 responses, 39% of total)
Pooling samples for COVID-19 testing (57)
Serology testing (39)
Testing healthcare workers and prioritization of testing (12)
Rapid antigen testing (11)
COVID-19 nucleic acid testing on different platforms (8)
Testing asymptomatic patients (8)
Testing students in non-licensed laboratories (7)
Commercial laboratory testing and marketing (4)
False positive rates in COVID-19 nucleic acid testing (3)
Retesting patients who test negative but are clinically suspicious (3)
Validation of combined COVID/influenza testing (1)
Use of diagnostic tests for screening (1)
Detection of vaccine spike protein mRNA in COVID nucleic acid testing (0)
Cycle threshold values in COVID-19 nucleic acid testing (0)
Individual institutional experiences (42 responses, 11% of total)
Current status of masking in labs (34 responses, 9% of total)
Remote pathology sign-outs policy and regulations (32 responses, 8% of total)
Viral transport media and swab alternatives (29 responses, 7% of total)
Testing healthcare workers and prioritization of testing (12 responses, 3% of total)
Use of alternative (nonswab) specimens for COVID-19 testing (saliva, bronchoalveolar lavage, nasopharyngeal wash, sputum, formalin-fixed tissue) (12 responses, 3% of total)
Use of pathologists to provide direct patient clinical care during pandemic (11 responses, 3% of total)
Universal precautions in specimen handling (10 responses, 2% of total)
Announcements (9 responses, 2% of total)
Association of Pathology Chairs (6)
American Board of Pathology (2)
Omicron Variant Video (1)
Academic Pathology Journal (0)
Coronavirus Standards Working Group (0)
Supply chain issues (7 responses, 2% of total)
COVID infections and death in faculty, staff, and trainees (6 responses, 1% of total)
Death rates from COVID-19 (6 responses, 1% of total)
Handling glass slides during sign-out (6 responses, 1% of total)
Reporting COVID-19 test results to Federal Government (5 responses, 1% of total)
Less than five responses each
Disinfecting N95 masks
Medicare payment for high-throughput COVID-19 testing
Social distancing policies
Safety of blood supply
Change in emergency use authorization policy for laboratory-developed tests
Expiration of CMS 1135 waivers
Convalescent plasma protocol
Software for morgue management
Reopening colleges and universities (testing algorithms, approaches)
Reopening research laboratories
Biorepository for COVID-19 specimens
Setting up service center for COVID-19 patients

In 2020 and 2021, *Academic Pathology* published 32 original articles related to the COVID-19 pandemic. Ten of these involved authors who had contributed to the APC COVID-19 listserv dialogs.^{1,2,4-6,10-14}

Discussion

Communication is essential to resolution of and coping with crisis. It is even more so with crises that are global in nature with the SARS-Coronavirus-2 (SARS-CoV-2) pandemic (“COVID-19”) being a prime example of this fact.

In March 2020 (about 3 months after the first cluster of symptomatic patients was identified in Wuhan, Hubei Providence, China on December 17, 2019, and about two months after the first reported case of COVID-19 in the United States on January 17, 2020)¹⁵, the APC chair listserv began to acquire entries related to the impact of COVID-19 on academic departments of pathology. This listserv currently has 304 subscribers. Over a 2-year period (March 2020 to March 2022), 49 unique subscribers provided entries on the listserv, and 109 unique subscribers provided responses to the listserv entries. Due to overlap in the composition of these two groups, there were a total of 123 different

Table 4

Ratio of listserv responses to listserv entries for categorical themes (descending order)

Autopsies on COVID-19 decedents (19.00)
Viral transport media and swab alternatives (7.25)
Remote pathology sign-out policy and regulations (5.33)
Single mentions as a category (13 items) (4.31) ^a
Convalescent plasma protocol (1.00)
COVID infections and death in faculty, staff, and trainees (21.00)
Use of pathologists to provide direct patient clinical care during pandemic (1.00)
Software for morgue management (1.00)
Reporting COVID-19 results to Federal Government (5.00)
Handling glass slides during sign-out (6.00)
Setting up service center for COVID-19 patients (0)
Reopening research laboratories (0)
Change in emergency use authorization policy for laboratory-developed tests (1.00)
Expiration of CMS 1135 waivers (1.00)
Current status of masking in labs (34.00)
Social distancing policies (2.00)
Death rates from COVID-19 (6.00)
COVID-19 testing (4.16)
Universal precautions in specimen handling (2.50)
Use of alternative (nonswab) specimens for COVID-19 testing (bronchoalveolar lavage, nasopharyngeal wash, saliva, sputum, formalin-fixed tissue) (2.40)
Individual institutional experiences (2.21)
Supply chain issues (1.75)
Disinfecting N95 masks (1.50)
Medicare payment for high-throughput COVID-19 testing (1.00)
Announcements (0.75)
Safety of blood supply (0.50)
Biorepository for COVID-19 specimens (0)
Reopening colleges and university (testing algorithms, approaches) (0)

^a The ratio is for this whole category; individual components may be higher due to the fact that they were mentioned once but had many responses.

participants in the COVID-19 dialogs, representing 40% of all listserv subscribers.

There are several qualifications in interpreting the data from this study. Because individuals responding to the listserv entries may have responded directly to the sender instead of to the listserv itself, the number of responses may be underestimated. Furthermore, some categorical themes may be underrepresented because such information may have been included in presentation of individual institutional experiences as a categorical theme and not counted separately. In addition, because this study did not include the separate APC listserv dedicated to the APC Program Directors section (PRODS), which focuses on educational issues, discussion of educational issues may have been underestimated on the APC chair listserv. However, the goal of the study was to “mine” the listserv of the pathology department chairs, vice chairs, and

Table 5

COVID-related publications produced by APC listserv participants

Participants who only provided listserv entries (n = 14)
15 papers (6% of papers)
2 authors (4% of authors) (one published 5 papers; one published 10 papers)
Participants who only responded to listserv entries (n = 74)
142 papers (51% of papers)
36 authors (69% of authors)
Mean papers/participant = 3.9 (SD 4.0)
Range = 1–17 papers/participant
Participants who both provided listserv entries and who responded to listserv entries (n = 35)
120 papers (43% of papers)
14 authors (27% of authors)
Mean papers/participant = 7.0 (SD 7.8)
Range = 1–32 papers/participant
All 123 participants (14 + 74 + 35)
277 papers (15 + 142 + 120)
52 authors (42% of Listserv Participants)
Mean papers/participant = 4.9 (SD 5.4)
Range = 1–32 papers/participant

Table 6

General topic of the 277 COVID-related publications (decreasing order of frequency)

Clinical studies and case reports (22%)
Testing policies (18%)
Basic science studies (13%)
Reports of institutional and population experiences (11%)
Serology (8%)
Digital pathology and artificial intelligence (7%)
Autopsy (5%)
Treatment (5%)
Other (swab and viral transport media production mask decontamination, vaccine, effects on job market, effects on education, use of laboratory data to predict trends) (11%) (each <5%)

former chairs because leadership at the department chair level is tasked with addressing all missions (service, education, research), and study of that listserv was deemed to be more representative of the relative importance of issues than a listserv focused primarily on one mission.

Even with potential underestimations, useful information can be derived from these findings. The fact that almost two thirds of both listserv entries and responses occurred over just 2 months (March and April 2020) of the 2-year survey period conveys a sense of severe concern, if not angst, about the effect of the pandemic upon pathology services as well as upon education and research. The vivid descriptions of experience by nine different institutions particularly captured this feeling as they relayed advice “from the front lines” as one contributor termed it and from “a figure from the flank” as another contributor put it. In fact, after the topic of COVID-19 testing itself (which accounted for about one third of listserv entries and more than one third of responses), presentation of individual experiences was the next most common (about one sixth of entries and one tenth of responses). These often poignant and graphic personal presentations were among the most useful suggestions for coping with the crisis. One institution (Northwell Health) provided ten landmark updates, which routinely included elegant PowerPoint presentations showing the COVID-19 positivity curve in that institution's catchment area as well as throughout the rest of the United States.¹⁶

Institutional experience and personal advice included information on bringing up laboratory-developed tests; coping with extraordinary test volumes; in-house production of hand sanitizers, viral transport media, and nasopharyngeal swabs; coping with the supply-chain problems; social distancing practices in the institution; demographical information on the pandemic in the institution's area of outreach; problems with handling the morgue; developing priorities for testing of patients and healthcare workers; managing the molecular virology workforce; implementation of specimen triage centers; the training of residents and fellows during the pandemic; the necessity of having daily conference calls on availability of testing and changing clinical priorities; integration of respiratory virus panels into COVID-19 testing; critiques of individual testing platforms; and dealing with autopsies during the pandemic.

As stated previously, the most popular theme addressed in the listserv was COVID-19 testing itself (Tables 2 and 3). Interestingly, in this categorical theme, rapid antigen and serology testing were the most discussed topics, perhaps reflecting the fact that such tests were just being developed in response to the public health needs for quick diagnosis of infection with and evaluation of immunity to COVID-19.

The listserv activity decreased substantially after October 2020 with only one entry several months later (March 2022) that provoked multiple responses about the current status of masking in laboratories (Fig. 1). That said, during this relatively quiescent period, forty percent (40%) of the 123 unique listserv participants authored or co-authored COVID-related manuscripts in the literature, producing a remarkable 277 publications. During 2020 and 2021, one third of articles relating to COVID-19 and published in the APC open-access, rapid-publication journal *Academic Pathology* involved authors that had contributed to the APC

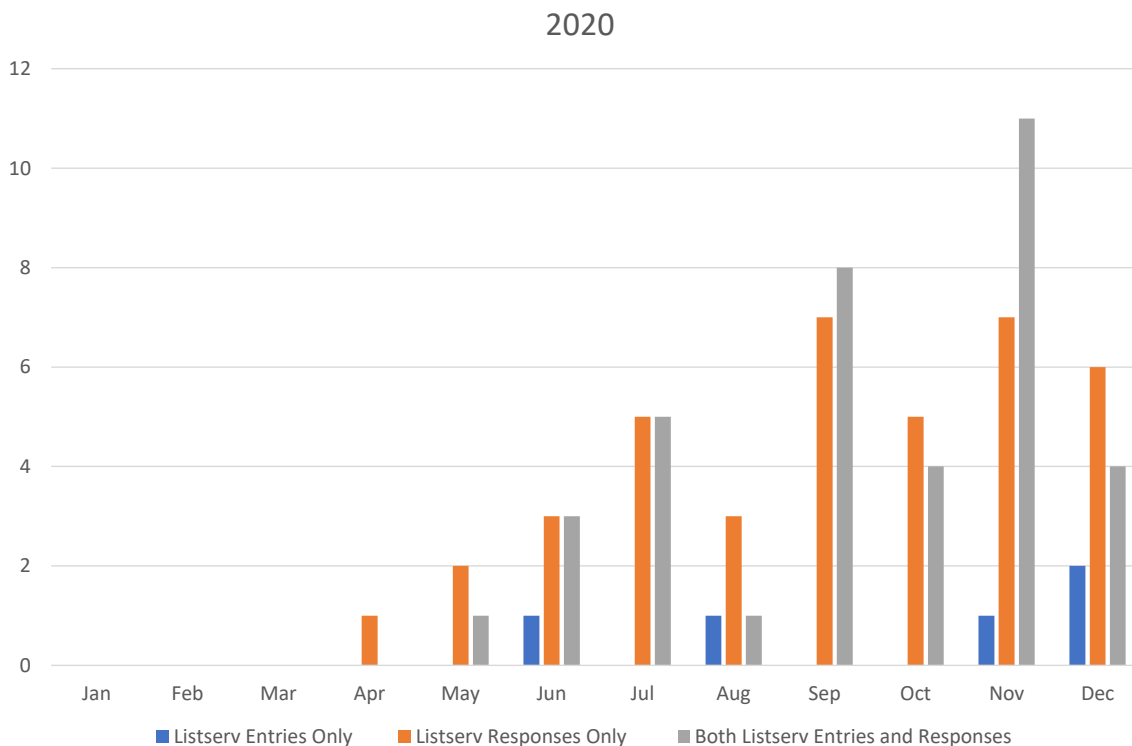


Fig. 2. Frequency of literature publication by APC listserv participants: 2020

listserv COVID-19 entries, and these articles were included among the 277 total publications. It should be noted that occasionally several of the 123 APC listserv participants published papers together. Because each publication was attributed to only one author, this somewhat inflated the frequency of publications shown in Figs. 2–4.

In conclusion, these observations suggest that professional society listservs are effective in bringing questions to the fore, resolving them, and subsequently quickly disseminating information in the literature, particularly during a crisis like a global pandemic. The additional value of a professional society journal also should not be underestimated.

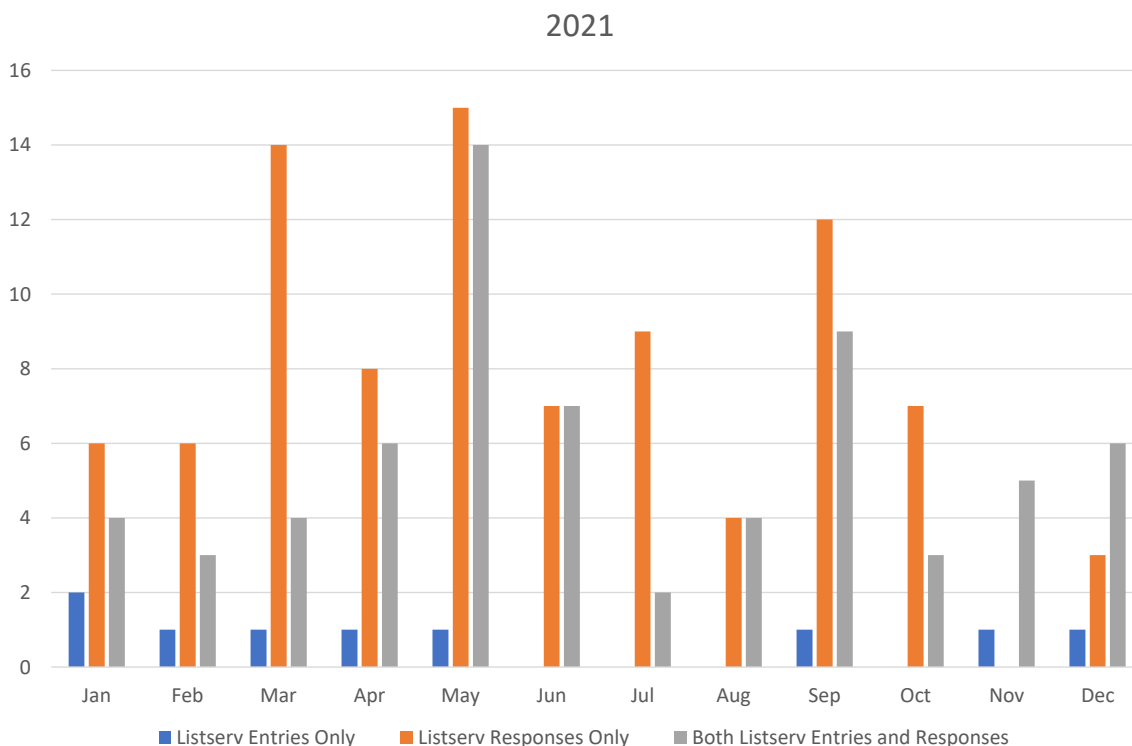


Fig. 3. Frequency of literature publication by APC listserv participants: 2021

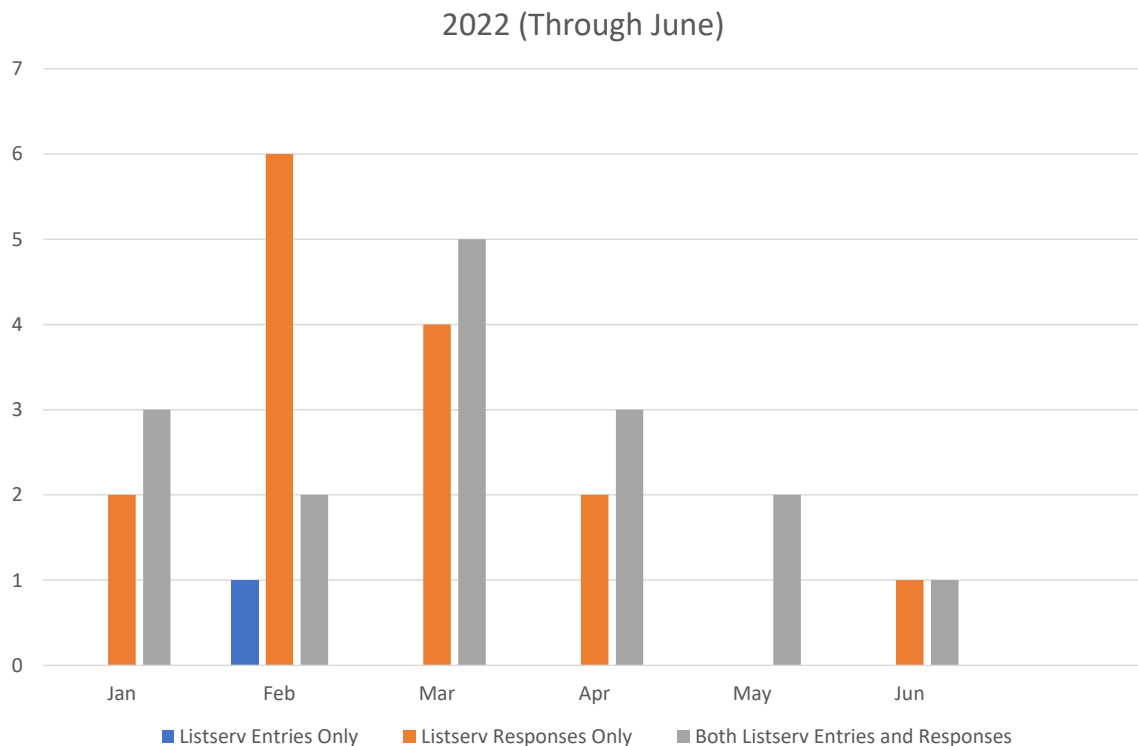


Fig. 4. Frequency of literature publication by APC listserv participants: 2022

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Declaration of competing interest

The authors declare no potential competing interests with respect to the research, authorship, and/or publication of this article.

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