# Factors Associated With Colon and Rectal Surgery Fellowship Program Ranking Before and After the COVID-19 Pandemic

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Fellowship represents the last of many steps in the education of a surgical trainee. The additional 1-year training period required to pursue a career as a board-certified colon and rectal surgeon represents both a learning and networking opportunity, but also a burden on finances, family, and personal life.[1] Therefore, it is imperative for colon and rectal surgery (CRS) fellowship applicants to make informed decisions regarding their application process, and for programs to attract applicants that will fit in and thrive at their institutions. Nonetheless, to date, there is a scarcity of data on the priority of the factors associated with program ranking for CRS fellowship match.[2]

In response to the coronavirus disease 2019 (COVID-19) pandemic, the Accreditation Council for Graduate Medical Education recommended that fellowship programs commit to online interviews and virtual visits for all applicants for the entire cycle.[3] This created uncertainties in the national match process given the lack of traditional metrics.[4] We hypothesized that the most recent class of applicants (2020) would attribute more importance to electronically available information such as program website and social media presence, than those who interviewed in person (2019).

Our aims were thus 1) to identify factors associated with CRS fellowship program ranking across the United States; 2) to compare preferences between applicants who experienced in-person versus online interviews; and 3) to evaluate differences between applicants and faculty regarding factors considered to be important for selecting a fellowship program.

## METHODS

A multiple-choice Survey-Monkey survey was developed by a focus group of 10 faculty and 5 fellows in the Division of Colon and Rectal Surgery at the University of Minnesota. The survey consisted of 16 items evaluating how important each was in selecting a CRS fellowship program. Items were scored from 1 (not at all) to 5 (very much). The list of items included program reputation, faculty reputation, operative volume, variety of operative cases, program didactics, endoscopy volume, geographic location, interview-day experience, research support, program and faculty presence on social media, program website and web-based comments and ratings, number of fellows, hospitals to cover and on-call days, postfellowship destination of alumni, and the influence of mentors, senior residents, and surgery colleagues. At the end of the survey, all participants (matched fellows and program faculty) were asked to rank the top 3 of the 16 items in order of preference.

In early December 2020, the Association of Program Directors in Colon and Rectal Surgery graciously distributed the anonymous survey on our behalf to all US

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fellowship programs. This study was granted an exemption and approved by the institutional review board at the University of Minnesota.

## RESULTS

### Demographics of Applicants and Faculty

A total of 72 of 205 applicants (35%) responded to the survey (Supplemental Table 1 http://links.lww.com/DCR/B644). Most respondents (67%) were White and between 30 of 35 years of age (85%). Thirty-eight percent were women. There were no statistically significant differences between respondents who interviewed in-person (n = 34) or on a web-based format (n = 38).

The response rate for faculty was 20% (91/454). Thirty-three percent were women, a proportion similar to the applicant cohort (Supplemental Table 2 http://links.lww.com/DCR/B644). The majority of faculty respondents were White (68%), held MD degrees (93%), and had no other advanced degrees (71%).

### In-Person vs Web-Based Interview Process

Thirty-four applicants interviewed in person and 38 interviewed via a web-based platform. Both groups selected the same top first and second items: operative volume and variety of cases (Supplemental Figure 1 http://links.lww.com/DCR/B643). There were differences between the groups in the next 3 rankings. Geographic location, influence of mentors, and reputation ranked third to fifth for the in-person group. For the online applicants, reputation, influence of mentors, and interview-day experience were given those priorities. Geographic location was number 3 for the in-person group compared with number 7 for the web-based cohort.

Although the overall ranking was similar between the 2 groups ($p = 0.796$), there were a few differences in ranking of each single item (Table 1). The fellowship program website was significantly less important for those who interviewed in person vs online, with the lowest possible rank in 59% vs 32% ($p = 0.036$). Conversely, geographic location was ranked most important for 50% for web-based interviewees vs 19% of the in-person applicants ($p = 0.030$). Social media presence carried very little importance in both groups, with the majority ranking it as having no influence (62% and 55%).

### Applicants vs Faculty

When comparing the combined applicant groups with faculty, the overall ranking showed a difference that approached but did not meet statistical difference ($p = 0.071$). The top choice differed between the 2 groups; operative volume ranked first with the applicants, whereas program reputation was the top choice of the faculty. However, both of those factors plus the variety of cases were ranked in the top 3 for both groups (Fig. 1).

Several significant differences were observed in how the 2 cohorts ranked each single item (Supplemental Table 3 http://links.lww.com/DCR/B644). Reputation was ranked as most influential by 44% of applicants vs 59% of faculty ($p = 0.033$). Conversely, 31% of applicants ranked endoscopy volume as very important compared to 19% of the faculty ($p = 0.016$). Compared with faculty, applicants had a low interest in social media presence and the fellowship program website, assigning the lowest influence in 58% and 44% vs 22% and 15% (both $p < 0.001$). Interview-day experience and number of cofellows were very influential in 43% and 20% of applicants vs 21% and 6% of faculty ($p < 0.001$ and $p = 0.022$).

## DISCUSSION

This national survey of CRS program applicants before and after the COVID-19 pandemic and the faculty confirmed that all participants equally attributed the highest influence on ranking to operative volume, variety of operative cases, and program reputation, and revealed that social media presence and the program website had minimal if any impact on program selection. Fellowship program website was less important to those who interviewed in person vs those who interviewed online, whereas geographic location was significantly more influential for the in-person group. Faculty respondents perceived reputation of the program as more influential than applicants did, whereas the faculty felt that endoscopy volume, interview-day experience, and number of cofellows were less important. In an era of emphasis on workplace diversity, we confirmed a low representation of minorities among CRS trainees and faculty, with no change over time among respondents.

As expected, the 2 cohorts of applicants had the same top selections: operative volume and variety of cases. These data are in line with a survey published by Kelley et al[2] of colon and rectal surgery fellowship applicants at the Mayo Clinic between 2016 and 2017. Although the top choices were shared between our 2 groups of applicants, 2 main differences were observed. Those who interviewed online attributed more importance to the fellowship program website and alumni job placement, whereas the in-person applicants ranked geographic location higher. These findings might be explained by the nature of the interview process, forcing those who could not travel to focus more on data retrievable online, while allowing the exploration and appreciation of the program and surroundings to have a more important weight for those who could visit the institution.

Surprisingly, in this digital era, social media and program website were ranked very low by both faculty and applicants.

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**TABLE 1.** Ranking of factors by interview process (1= not at all; 5 = very much)

| | *Ranking score (%)* | | | | | | |
|---|---|---|---|---|---|---|---|
| | *1-2* | | *3* | | *4-5* | | |
| *Variable* | *In-person* | *Web* | *In-person* | *Web* | *In-person* | *Web* | *p value* |
| Reputation | 9 | 3 | 9 | 16 | 81 | 81 | 0.567 |
| Diversity | 33 | 21 | 39 | 32 | 17 | 48 | 0.128 |
| Operative volume | – | – | 3 | 0 | 98 | 100 | 0.551 |
| Endoscopy volume | 9 | 3 | 24 | 21 | 67 | 77 | 0.495 |
| Variety of operative cases | – | – | 15 | 3 | 86 | 97 | 0.995 |
| Didactics | 24 | 11 | 38 | 40 | 39 | 51 | 0.243 |
| Research | 42 | 45 | 35 | 29 | 24 | 27 | 0.926 |
| Social media | 83 | 87 | 9 | 11 | 9 | 3 | 0.799 |
| Website | 83 | 72 | 12 | 21 | 6 | 8 | 0.036 |
| Mentors | 15 | 11 | 9 | 16 | 77 | 74 | 0.196 |
| Interview | 6 | 3 | 6 | 11 | 88 | 87 | 0.586 |
| Number of fellows | 18 | 18 | 27 | 34 | 56 | 47 | 0.774 |
| Number of hospitals | 12 | 16 | 27 | 32 | 60 | 53 | 0.432 |
| Number of calls | 24 | 18 | 35 | 32 | 42 | 50 | 0.546 |
| Geography | 18 | 27 | 18 | 22 | 65 | 51 | 0.030 |
| Postfellowship destination of alumni | 15 | 8 | 29 | 24 | 56 | 69 | 0.088 |

Percentages have been rounded and may not add up to 100%.

Other specialties have previously published data suggesting only modest interest of applicants in program engagement in social media.[5] An anonymous survey of Harvard applicants for plastic and reconstructive surgery by Irwin et al[6] showed that only 20% of respondents thought that a social media platform "influenced their perception of a program or intended rank position of a program." Therefore, even though social media may offer opportunities for networking, education, and potentially enhancing professional growth, its role in fellowship selection remains minor in comparison with the other factors discussed above.[7]

Compared with the applicants' ranking, faculty perception was significantly different in attributing a higher level of importance to the reputation of the program and lower importance to endoscopy volume, interview-day experience, and number of cofellows. These data suggest a possible change in values of the millennial generation with the stature of an institution having less relevance than endoscopy experience or the culture of a program. Alternatively, applicants may not fully appreciate the importance and the power of networking associated with more established programs. In a recent study by Daneshgaran et al[8] analyzing 79 university programs in plastic and reconstructive surgery, program reputation was associated with academic faculty selection and production. Because 60% of the faculty responding to our survey were from academic institutions, it is possible that this background influenced their ranking.

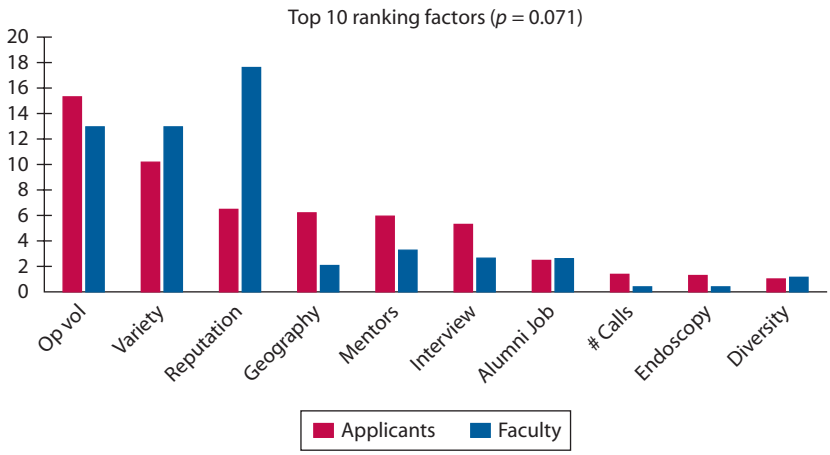


**FIGURE 1.** Top 10 ranking factors among applicants and faculty. *y* axis = weighted values; 1 = operative volume (Op vol); 2 = variety of cases; 3 = reputation of the program; 4 = geographic location; 5 = influence of mentors/senior colleagues; 6 = interview-day experience; 7 = postfellowship destination of alumni; 8 = number of calls; 9 = endoscopy volume;10 = diversity. Data not shown: 11 = didactics; 12 = number of hospitals; 13 = number of fellows; 14 = website; 15 = research support/opportunity; 16 = social media.

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An important and interesting yet unrelated finding of this study demonstrates a low percentage of underrepresented minorities (URMs), particularly Black and Latino surgeons, in colon and rectal surgery, as gauged by the respondents to this survey. Accurate data about the true percentage of URMs in colon and rectal surgery is not available to date. Underrepresentation of minorities in general surgery is an ongoing issue leading the Accreditation Council for Graduate Medical Education board of directors to form a planning committee on diversity and inclusion in 2018.[9] In that year, a cross-sectional study was then conducted by Nieblas-Bedolla et al[10] examining trends in self-reported URM identity among applicants to US residency programs to evaluate changes between 2010 and 2018. In a pool of 21,369 applicants, 16% self-identified as underrepresented in medicine. Noticeably, there was no statistically significant difference in the proportion of URM applicants for all surgical specialties combined in 2010 vs 2018. Our results show a prevalence of 32% and 29% of URMs between CRS applicant and faculty respondents, with particularly low numbers for Black and Latino surgeons. If our respondent data accurately reflect the population prevalence of URMs, this suggests that little progress has been made over time in advancing diversity in the field of colon and rectal surgery. When combining the these figures with the low ranking of importance attributed to diversity in a program by both faculty and applicants, it appears necessary to develop novel strategies aimed at increasing racial and ethnic representation to help recruit a more diverse workforce in our specialty.

The limitations of this study include but are not limited to responders' self-selection bias in the setting of a relatively small sample size and the lack of a validated survey instrument to identify influential factors in selecting a CRS fellowship.

## CONCLUSIONS

This national survey of 2 consecutive classes of CRS program applicants before and after the COVID-19 pandemic and CRS faculty universally identified the top factors associated with highest ranking to be operative volume, variety of operative cases, and program reputation, whereas the lowest were social media presence and program website. Despite many similarities, each group prioritized different specific elements, suggesting that both experience in the CRS field and type of interview process impact fellowship selection. Despite a change from an in-person to a virtual platform interview process, applicants did not attribute more importance to electronically available information to prepare for their interviews.

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**KEY WORDS:** Colon & Rectal Surgery Fellow; Colorectal faculty; Surgery fellowship; Survey.

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