

AO Access

Advancing the Opportunity, Diversity and Inclusion Initiative

Survey 2019

FORMAL REPORTS

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Introduction

from AO President Robert McGuire

Diversity: a business-critical imperative to ensure the relevance and sustainability of the AO long into the future.

“Although words are important, actions matter most: our leadership ought to look more like our members and the patients they serve. AO Access is our vehicle to identify, train, and support our community and beyond in order to drive change. One of my goals has been to evolve the culture and governance of the AO’s boards, committees, and volunteer structure to become more innovative and diverse.”

Robert McGuire, MD

President, AO Foundation

AO Access Steering Committee Chairperson

October 2020

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Introduction from the chairperson of the Opportunity, Diversity and Inclusion (ODI) Initiative Working Group

Report on the Opportunity, Diversity and Inclusion Initiative Survey

The Opportunity, Diversity and Inclusion (ODI) initiative was launched in December 2018 with a remit to identify obstacles and opportunities for change in the context of equity and diversity within the AO and its membership. Although the initiative originated from AO VET, underrepresentation of various gender, racial, and socioeconomic identities are broadly visible across all aspects of the AO organization, including the clinical divisions, clinical unit, and the institutes that the AO comprises. With the support of AO President Robert McGuire, MD, the ODI Working Group undertook a systematic review of the current landscape across the clinical divisions, with the expectation that the data from this review would allow identification of bottlenecks created by policies and/or procedures that serve as barriers within the organization, as well as potential intervention points.

In September 2019, the ODI Initiative deployed a questionnaire to almost 15,000 AO faculty members from across all clinical divisions and global AO regions. A summary of the survey's early findings was presented at the AO Davos Courses in December 2019. The report that follows provides a more detailed analysis of the complete survey and identifies several areas where we believe a need exists for urgent action. The ODI Working Group developed a plan for implementing the next stage of data collection and intervention; this plan and the

organizational structure to oversee the work were approved by the AO Foundation Board (AOFB) as AO Access in June 2020.

The AO recognizes that a diverse and inclusive community of surgeons, operating room personnel, health care professionals, and researchers is of paramount importance in its mission of promoting excellence in patient care and outcomes. As a global leader in clinical education and research, the AO needs to better reflect the concerns, perspectives, and aspirations of the young health care professionals that we strive to educate, as well as the patients that we are committed to serve. Enhancing access, removing unreasonable barriers to progression, and creating a culture of inclusivity, mentorship, and support will be critical to the future success of the AO in attracting and retaining the most talented faculty and trainees for its educational offerings. With this in mind, we present the report from the ODI survey and encourage your participation in moving this initiative forward to the benefit of all stakeholders.

Amy Kapatkin, DVM, MS, DACVS
President, AO North America and AO Access Steering Committee Representative for Diversity and Inclusion
Professor of Small Animal Orthopedic Surgery
University of California-Davis, United States
October 2020

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Composition of the ODI Initiative Working Group

The founding members of the ODI Working Group include Drs Amy Kapatkin and Matthew Allen, who have extensive experience in various education, leadership and teaching roles within the AO; Dr Samantha Morello, who has conducted large-scale survey investigation and analysis of the effects of gender and/or race among veterinary surgeons and other specialists; and Dr Clare Allen, who has studied the effect of feminization on the veterinary profession as part of her doctoral program in education. The work of the group is managed by Tatjana Topalovic, Senior Program Manager Diversity, Inclusion and Mentorship, from the AO Education Institute.

It is important to note that while the composition of the working group reflects its origins within AO VET, the group's perspective and remit has been firmly focused on identifying

challenges and opportunities across the full breadth of the AO family, including the clinical divisions, unit, institutes, and the young trainees who look to the AO for training and mentorship. It was always the group's intention to expand its composition to better reflect this much broader perspective, and our proposal for an organizational structure for the new diversity, inclusion and mentorship initiative, AO Access, is outlined in chapter 10 of this report. The new structure is lean and dynamic, makes use of ad-hoc task forces that will be created and dissolved as needed, and will use shared resources within the AO. An open call has already been circulated among the AO membership, and ongoing discussions with the leads of the clinical divisions, clinical unit and institutes leads will serve to identify talent to drive AO Access forward in the coming years.

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Glossary

ARI AO Research Institute
AOFB AO Foundation Board
AO CID AO Clinical Investigation and Documentation; now AO Innovation Technology Center (AO ITC)
CD Clinical division

CU Clinical unit
ODI Opportunity, Diversity and Inclusion
ToR Terms of Reference
URG Underrepresented Groups

5.1 Background

In order to expand and enhance engagement of current and future orthopedic surgeons globally within AO, a need exists to understand how various individuals become, and remain, involved with the organization. Limited data exists on the experiences or participation characteristics of various identity groups (gender, race/ethnicity, age) within AO. The ODI Working Group surveyed AO faculty (those with AO teaching assignments in the last 10 years) across the clinical divisions to better define how faculty with varying backgrounds interact within the existing AO structural and environmental framework.

5.2 Strategic context

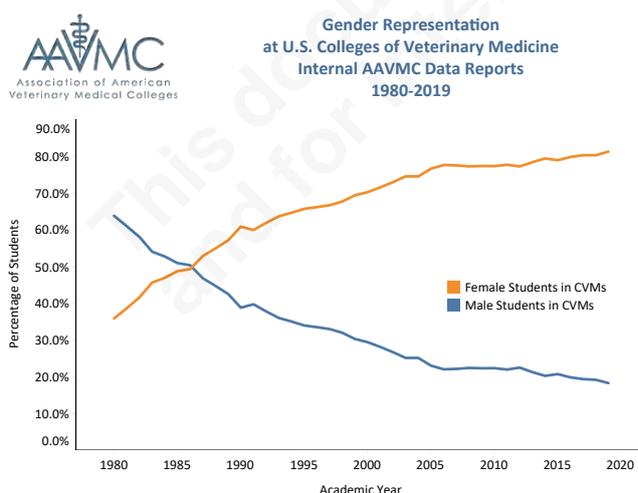
Research shows that diverse groups are more creative and effective in problem-solving, making an organization more resilient and adaptable. This leads to benefits in research and innovation, and increased funding opportunities—all of which lead to improved patient care through the ability of an organization to improve meeting its goals for performance.

The most recent available data from veterinary schools in North America show that matriculants are predominantly female, and this situation is mirrored by medical schools (Figures 1 and 2).

While there has been a concerted effort to improve the representation of underrepresented groups (URG) within veterinary classes, much remains to be done.

Despite these changes in the demographics of the “supply line,” gender and ethnic representation of physicians and veterinarians entering specialty training in orthopedic surgery does not mirror these increases in diversity.

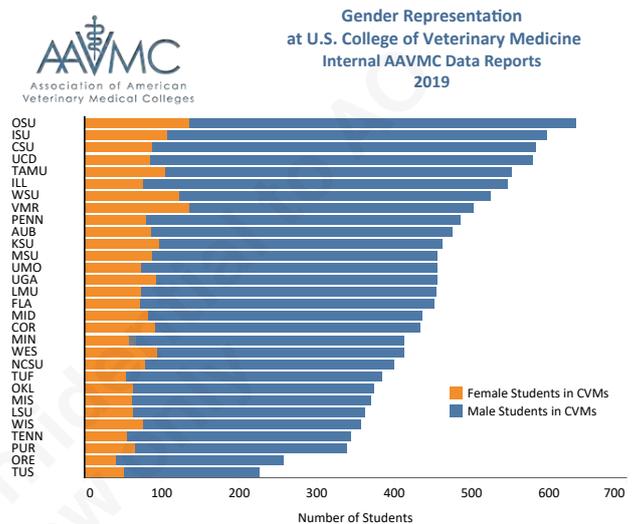
A similar picture of skewed representation exists within the field of orthopaedic surgery in human medicine. As with the veterinary school data, data from US medical schools demonstrates a female majority in applicants, students and graduates (Figure 3).



In 2017, AAVMC began collecting data for individuals identifying as non-binary. For the 2018-2019 academic year, these individuals comprised .12% of the professional DVM student population.

Total DVM student enrollment at the U.S. Colleges of Veterinary Medicine is 13,323.

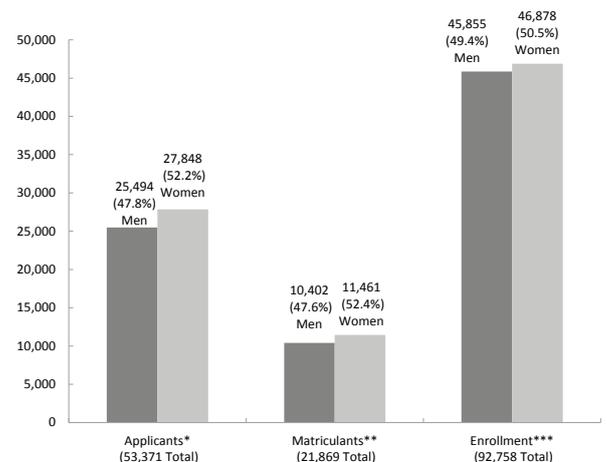
Figure 1 – Source: Annual Data Report 2018-2019. Washington, DC: Association of American Veterinary Medical Colleges (AAVMC); 2019, p.15



Total DVM student enrollment at the U.S. Colleges of Veterinary Medicine is 13,323.

Figure 2 – Source: Association of American Veterinary Medical Colleges (AAVMC)

Applicants, Matriculants, and Enrollment to U.S. Medical Schools by Sex, 2019



*The applicant number includes 29 applicants of unknown sex.

** The matriculant number includes 6 matriculants of unknown sex.

*** The enrollment number includes 25 enrollees of unknown sex.

Figure 3 – Source: Association of American Medical Colleges (AAMC)

Although the numbers of male and female medical school graduates are relatively balanced, the picture changes significantly at the point of surgical sub-specialization. This will be discussed in greater detail in Section 7.2 of this report. In the context of ethnicity, the demographics of the applicant pool for human medicine (Figure 4) are not representative of the demographics of the population at large (Figure 5).

**U.S. Medical School Matriculants, 2012-2019
Race/Ethnicity Self-Identification Percents
With an Matriculant Able to Appear in
More than One Race/Ethnicity Category**

In 2013, the methodology for acquiring race and ethnicity information was updated. Rather than one question asking a matriculant's Hispanic origin and a second question asking the matriculant's race, the Hispanic origin and race categories are now listed together under a single question about how matriculants self-identify. Matriculants could select multiple response options. Due to these changes in methodology, the data for 2013 may not be comparable to the data from previous years.

Change of methodology

Matriculants	Year							
	2012	2013	2014	2015	2016*	2017	2018	2019
American Indian or Alaska Native	0.9%	0.9%	1.0%	1.0%	0.9%	1.0%	1.0%	1.1%
Asian	23.4%	20.8%	21.2%	22.4%	24.4%	24.2%	25.4%	24.8%
Black or African American	7.3%	7.0%	6.9%	7.6%	8.4%	8.3%	8.6%	8.8%
Hispanic, Latino, or of Spanish Origin	8.9%	9.1%	9.1%	9.6%	10.5%	10.8%	10.7%	11.3%
Native Hawaiian or Other Pacific Islander	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.4%
White	65.4%	56.9%	57.9%	57%	58.8%	56.9%	57.7%	55.1%
Other Race/Ethnicity (New in 2013)	-	3.6%	3.7%	3.5%	3.4%	3.3%	3.4%	3.3%
Unknown Race/Ethnicity (New in 2013)	-	6.9%	5.7%	4.5%	1.6%	3.6%	1.8%	4.9%
Non-U.S. Citizen or Non-Permanent Resident	1.4%	1.3%	1.5%	1.6%	1.3%	1.3%	1.3%	1.2%
Total Unduplicated Matriculant Count	19,517	20,055	20,343	20,631	21,030	21,338	21,622	21,869

*During the 2016 application cycle, a technical malfunction in the collection of race/ethnicity data necessitated a request that applicants review and re-submit responses to the race/ethnicity question in their AMCAS applications. No applicants were asked to review this question prior to or after 2016.

Note: Data in each column may sum to more than 100%, as matriculants could select more than one response option.

Source: AAMC Applicant Matriculant Data File as of 11/4/2019

Figure 4 – Source: Association of American Veterinary Medical Colleges (AAVMC)

Minority Group	% Orthoresident Representation in the Survey Cohort	% Orthoresident in ACGME Data Resource '18-'19 ¹⁶	%Orthofaculty Representation in the Survey Cohort	% Representation in US Population	% Resident Under/ Overrepresentation	% Faculty Under/ Overrepresentation
African American/ Black	5.4	2.8	3.4	13.4	-8.0	-10.0
Hispanic/Latino	4.6	3.3	2.6	18.1	-13.5	-15.5
American Indian/ Alaska Native	0.5	0.2	0.2	1.3	-0.8	-1.1
Native Hawaiian/ Pacific Islander	0.6	8.8†	0.4	0.2	0.4	0.2

*ACGME = Accreditation Council for Graduate Medical Education. †Not comparable because the ACGME combines Asians with Native Hawaiians/ Pacific Islanders and our survey did not.

Figure 5 – Source: McDonald TC, Tyler C, Drake LC, Replogle WH, Graves ML, Brooks JT. Barriers to Increasing Diversity in Orthopaedics: The Residency Program Perspective.

Figure 6 demonstrates that the participant ratio of female and male course participants varies between the clinical divisions, ranging from 7 percent to 35 percent between 2016 and 2018. However, the data also shows that the proportion of women represented within the AO's faculty development programs (**Figure 7**), as well as the international and regional boards (**Figure 8**), is lower than in the orthopedic community of North America (**Figure 9 and 10**), and does not reflect the demographics of participants at AO clinical courses (**Figure 6**).

Underrepresentation of women in leadership was seen across all CDs, with the exception of AO CMF. Without female representation in these governance positions, it is impossible to get perspective on the challenges associated with gender in orthopedics, and we are also failing to provide effective role models for younger trainees who would like to develop into leaders through involvement with the AO.

With this as background, the leadership felt that it was mission- and business-critical to explore ways in which the membership and leadership might better reflect the face of the profession that it serves.

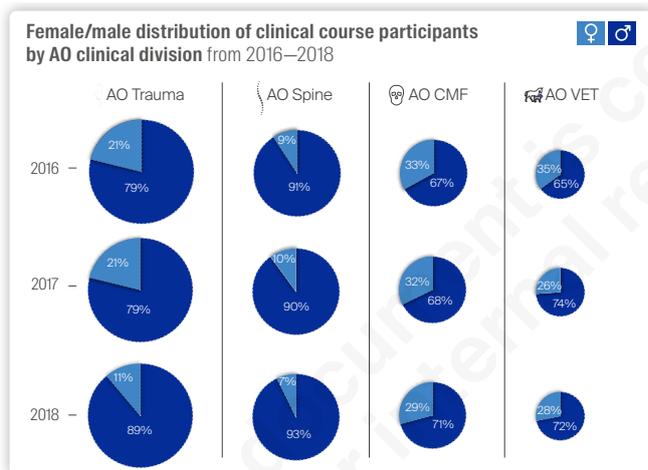


Figure 6 – AO clinical divisions: AO Trauma, AO Spine, AO CMF, AO VET. Source: AO data compiled in 2018

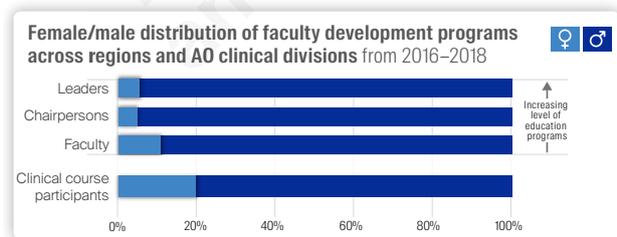


Figure 7 – Female/male distribution of faculty development programs across regions and AO clinical divisions from 2016-2018. Source: AO data compiled in 2018.

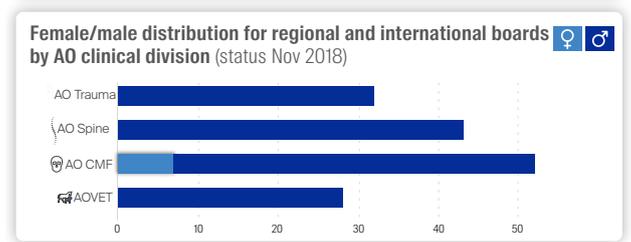


Figure 8 – Female/male distribution for regional and international boards by AO clinical division (status Nov 2018). Source: AO data compiled in 2018

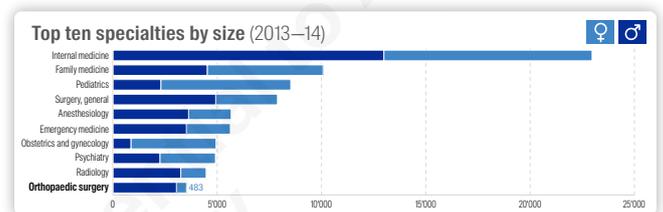


Figure 9 – Top ten specialties by size (2013-2014). Source: Brotherton SE, Etzel SI. Graduate medical education, 2013-2014. JAMA

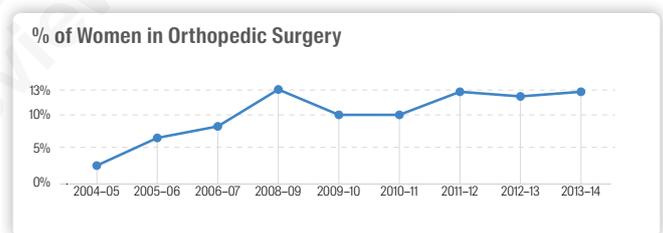


Figure 10 – percent of Women in Orthopedic surgery. Source: Brotherton SE, Etzel SI. Graduate medical education, 2013-2014. JAMA

5.3 Scope of work for the ODI Initiative

The overarching goal of the ODI Initiative was to identify the barriers to entry and progression through membership into faculty and leadership positions within the CDs, and to use this information to develop intervention strategies to improve transparency and enhance opportunities for more diverse representation within the CDs.

5.4 Deliverables

The primary deliverable for the initiative was intended to be a cross-divisional report of the key results from the survey, including the identification of key challenges and recommendations for potential strategic initiatives. At defined intervals, oral reports are also to be delivered at key stakeholder events such as the AO Davos Courses, AOFB meetings, and the annual meeting of the AO Trustees.

6.1 Survey recipients

Invitations to participate in the survey were delivered by e-mail to the AO clinical divisions' faculty members who had been identified as having held a teaching assignment within the last ten years.

All of the information used to subclassify respondents (eg, age, gender, ethnicity, regional representation) were based on data self-reported through the survey.

6.2 Definitions

Ethnicity

The ODI Working Group recognizes that there is no consensus regarding descriptors of ethnicity. Given the global nature of the AO, there are also regional differences in how ethnicity is referenced. The survey offered response options of White/Caucasian, Black/African American, Native American/American Indian, Hispanic/Latino/Latina, Asian, and Pacific Islander. We relied on these as self-reported descriptors when subclassifying data but recognize the limitations in defining ethnic identity that these options may have posed.

Role in education or governance

Survey data generated demographic information of AO faculty members in educational and leadership positions or activities through self-reporting of positions held. During the reporting of this data, the ODI Working Group referenced internal data on governance and board compositions (eg, international boards, commissions) and faculty development program participation. Due to the anonymous nature of the survey, it was not possible to cross-check data.

With regard to specific **activities in governance roles**, survey respondents were asked to select from the following options:

- International board or committee
- Regional board or committee
- Education commission
- Research commission
- Community development commission
- Spine centers and fellowships
- Knowledge Forum
- AO Technical Commission
- Country council
- Expert group member
- Education task force
- Working group
- Contributor to clinical research at the AO
- Contributor to an AO educational resource (book, Surgery Reference, video, webinar, etc)
- AO fellow

With regard to specific **attendance in faculty development programs**, survey respondents were asked to select from the following options:

- Tips for Trainers (T4T)
- Faculty Education Program (FEP)
- Chairperson Education Program (CEP) or Chairperson Training Program (CTP)
- Education Leader Program (ELP)
- Educational Advisor Training (EA) *AO Spine only
- Regional Education Team Training (RETT)
- Coaching Program (CP) *AO Trauma only
- Leader Education Program (LEP)

With regard to specific **teaching assignments**, survey respondents were asked to select from the following options:

- Table instructor
- Discussion group leader and facilitator
- Lecturer
- Practical director
- Session moderator
- Faculty
- Coach
- Regional Education Team (RET)
- Course evaluator
- Educational Advisor
- Educator
- Chairperson
- Cochairperson

6.3 Format and content of the survey

The survey was designed by Dr Samantha Morello, who has conducted large-scale survey investigation and analysis of the effects of gender and/or race among veterinary surgeons and other specialists.

The survey was set up under Research Electronic Data Capture (REDCap), which was developed by an informatics core at Vanderbilt University (Nashville, United States) in 2004, with ongoing support from United States National Center for Research Resources (NCRR) and United States National Institute of Health (NIH) grants. A total of 75 questions were posed, of which the majority were in multiple-choice format. A couple of the questions also encouraged answers in free text format. Logic flow was utilized to facilitate certain lines of questioning. The survey was designed to be completed in around 15 minutes.

Thematically, the questions were broken down into five categories, addressing:

- Professional demographics and experience
- Experience as AO faculty
- Mentorship within the AO
- Habits as AO faculty educators/subjective observations
- Personal characteristics

7.1 Summary demographic data

A survey was sent out to 14,396 members of the AO community. In a pilot run, the average time taken to complete the survey was 12 minutes.

The overall response rate was 33.5 percent, which is good for a survey of this type (Baruch and Holtom, 2008). The overall demographics of the responders are summarized in **Figure 13**, with additional subclassification by age, clinical division, and geographical region, based on self-reported data.

As a reference point, **Figure 11** shows the demographics of the AO community in 2018.

Figure 12 and **Figure 13** show that the gender demographics of respondents were in line with those of the AO faculty demographics, suggesting appropriate representation of our survey population and/or minimal response bias.

Comment: Although participation by women was consistent with their representation in the AO clinical divisions, overall representation of women within the CDs lags behind that of the residents and course participants that the AO is educating, and far below that of the pool of potential talent currently in veterinary or medical education training programs.



Figure 11 – Source: AO Annual Report 2018

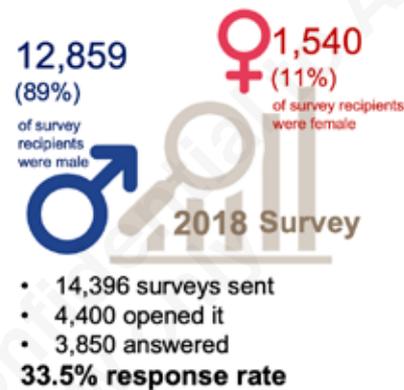


Figure 13 – Source: ODI survey data 2019

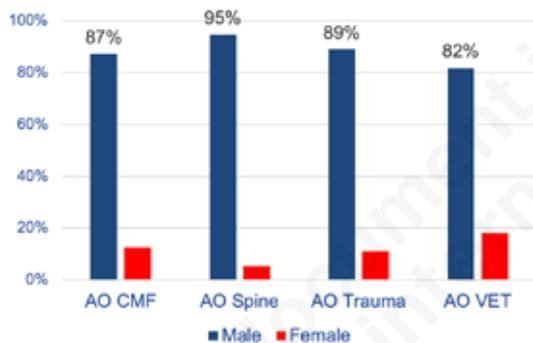


Figure 12 – Source: Salesforce 2018; manual data compilation

7.2 Gender

Respondent gender, by region and CD

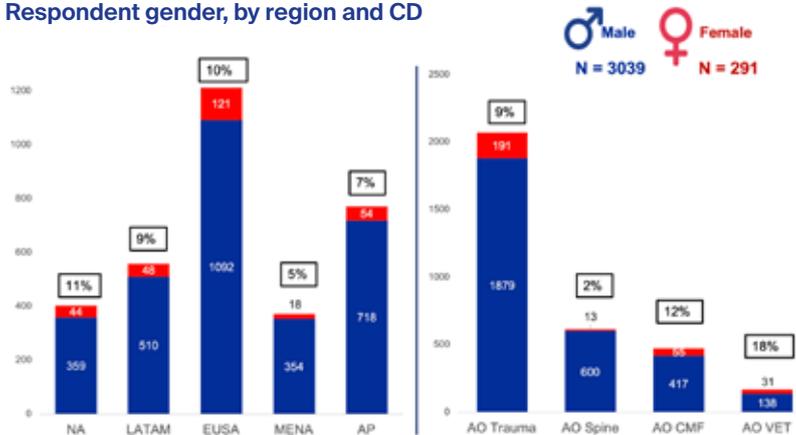


Figure 14 – Source: ODI survey data
Gender distribution of the survey respondents split by regional representation (left panel) and clinical division (right panel).

Survey data were initially sub-classified by region and clinical division, then by gender in order to provide a perspective on gender representation across the survey sample. As depicted in **Figure 14**, females accounted for 11 percent of the total survey respondents. Across regions, female representation ranged from 5 percent in Middle East-North Africa to 10 percent in Europe-South Africa and 11 percent in North America. Across the clinical divisions, female representation in the survey ranged from 2 percent in AO Spine to 18 percent in AO VET.

Comment: While the data collected from the survey reflects the most current snapshot of AO faculty, it is helpful to frame these data in the broader context of the profession and specialties from which AO faculty are recruited. Through that lens, the possibility of barriers in the pipeline for AO faculty recruitment or selection can be evaluated. It is important to consider whether the current demographics of the AO faculty reflect that of the trainees that the AO educates, and will one day recruit into its membership.

With regard to the effectiveness and integrity of the faculty selection process, the most relevant comparison is between AO survey data against those from trainees in orthopedic surgery programs. In the context of gender, there is clear disparity between the number of men and women in orthopedic residency programs; in the United States, just under one-third of the residency programs surveyed in 2014 had no female trainees, and only one in ten had more than 20 percent women enrolled over a five-year period (Van Heest et al, 2016). Over the period 2009–2014, the mean percentage of female trainees in orthopedic surgery residency programs was 12.6 percent, up slightly from 11.6 percent in 2004–2009 (Van Heest et al, 2016).

In our survey of AO faculty, 11 percent of respondents self-reported as women. Our data suggest that AO faculty recruitment is broadly in line with gender representation within the orthopedic residency pool at large but it is important to note that these data do not reflect the patterns within AO VET and AO CMF, since these do not pull from the orthopedic residency programs. If recruitment of AO faculty is to be considered equitable, the proportions of women in AO Trauma and AO Spine (whose membership comes directly from the orthopedic resident pool) should reflect the demographics of the residency programs—this rings true for AO Trauma, with 11 percent female faculty, but not for AO Spine, with only 5 percent female faculty. AO VET has the highest percentage of female faculty (18 percent) but it should be noted that residency programs in veterinary surgery (which combines training in both general surgery and orthopedic surgery) have much closer to equal number of female and male trainees. AO CMF also has a relatively high proportion of female faculty (13 percent), a figure that matches that of female representation within US training programs in Oral and Maxillofacial Surgery (Marti et al, J Dental Education 81: 75-86, 2017). It should also be noted that US dental training programs are currently training almost equal numbers of male and female students (Saadi, 2008).

7.3 Age

	Total	Mean	StDev	Percentile		
				0.25	0.5 (median)	0.75
Men	3015	49.81	9.49	42	49	57
Women	289	45.36	7.67	39	45	50

Figure 15 – Source: ODI survey data

Gender and age, by clinical division

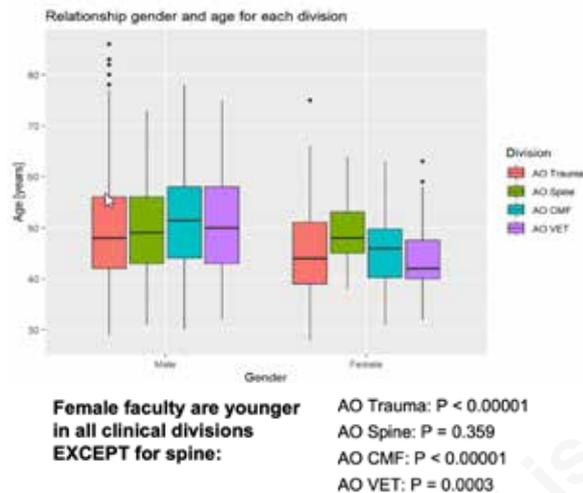


Figure 16 – Source: ODI survey data

Overall, the median age of survey respondents was 48 years of age. When split by gender, women were younger than men (45 years versus 49 years, respectively). For three of the four clinical divisions, the differences in age between male and female respondents were statistically significant (**Figure 16**).

Comment: Female faculty are younger than men in all clinical divisions, except for AO Spine. For women, the mean age of the respondents was 45.3 years whereas for men it was 50 years. Very few of the respondents were under the age of 40, the age threshold below which would typically reflect early career, post-residency/fellowship surgeons.

7.4 Ethnicity and underrepresented groups (URG)

Black faculty

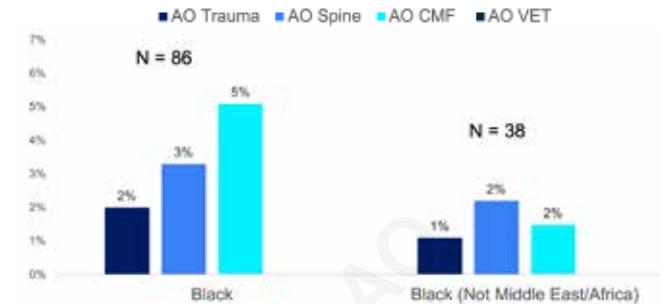


Figure 17 – Source: ODI survey data

Only 86 survey respondents self-identified as Black, with the majority (48) coming from the Middle East/North Africa. Across all divisions and all regions, between 2 percent and 9 percent of those surveyed within a division self-reported as being Black, but these data were significantly affected by the much higher representation of Black faculty in MENA - this was especially true for AO Trauma. None of the respondents from AO VET self-identified as Black (**Figure 17**).

Comment: It is widely recognized and documented that orthopedic surgery is one of the least racially diverse specialties within medicine. In the United States (US), 2.8 percent of residents-in-training identified as Black/African American compared with 13.4 percent of the US population at large. Of US orthopaedic residents, 3.3 percent self-identified as Hispanic/Latinx, compared with 18.1 percent of the population (McDonald et al, 2020).

There have been several studies looking into potential obstacles to more balanced recruitment of various racial identities into residency training programs. Overall, the ethnic and racial composition of AO faculty is broadly in line with that of the orthopedic residency pool, but does not reflect the pool of applicants or matriculants into medical training programs, and is far from representative of the population that surgeons serve. Much will need to be done in terms of outreach activities to ensure that younger students and trainees are encouraged to consider orthopedic surgery and veterinary surgery as career choices much earlier in their lives, though the lead time for effect of such grass-roots programs will be long. In the meantime, it may be better for the AO to focus on ensuring that the URM faculty currently participating in our programs are being supported so that they have equal chances to progress to leadership positions, which may more readily influence others who are waiting at the gate.

Disaggregated reporting of where black faculty are represented demonstrates one example of the regional variation in ethnicity.

The Middle East/Africa region of the AO accounted for 56 percent of all black faculty responding to the survey, despite it being the smallest region, proportionally, within the global organization. Considering the prevailing ethnicities within different regions is critical to understanding where certain groups are underrepresented, and how different interventions will need to be applied to achieve diversity.

7.5 Culture within the AO

Questions under this section of the survey focused on subjective experiences which, when considered together, allow us to explore the effects of personal identity characteristics and intersectionality, or how those characteristics (age, gender, ethnicity) may combine and affect the respondent’s experience within the AO organization.

Please rate your level of agreement with the following statement: I feel that I really belong as a member of the AO faculty group.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

Comments: Figure 18 demonstrate that women felt a lower sense of belongingness as members of AO, as compared with men (P=0.03). A similar effect was seen with age, with younger members disagreeing more often that they “belonged” than older members (P<0.00001) (Figure 19). Some of the age-related differences will likely relate to the comfort level that comes with many years of service; younger members will likely always feel a little more uneasy about their place in an organization as compared with more senior members, for whom time has served to reinforce their sense of belonging.

Note: Pacific Islanders numbers are likely of limited value due to the very small sample size.

Climate of the AO: “I feel that I really belong as a member of AO”

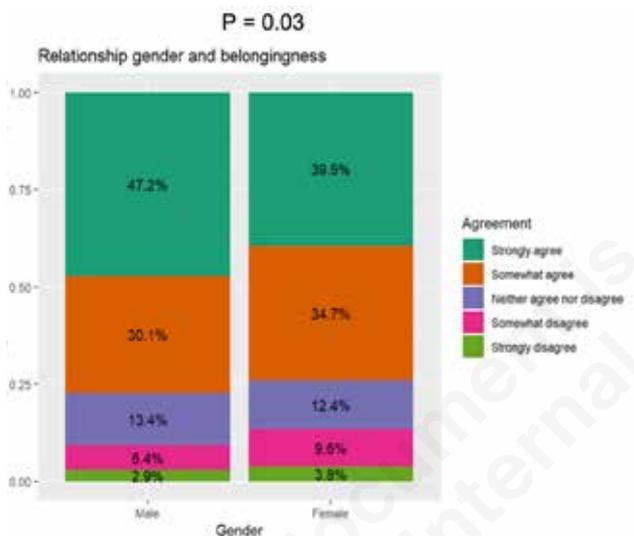


Figure 18 – Source: ODI survey data

Climate of the AO: “I feel that I really belong as a member of AO”

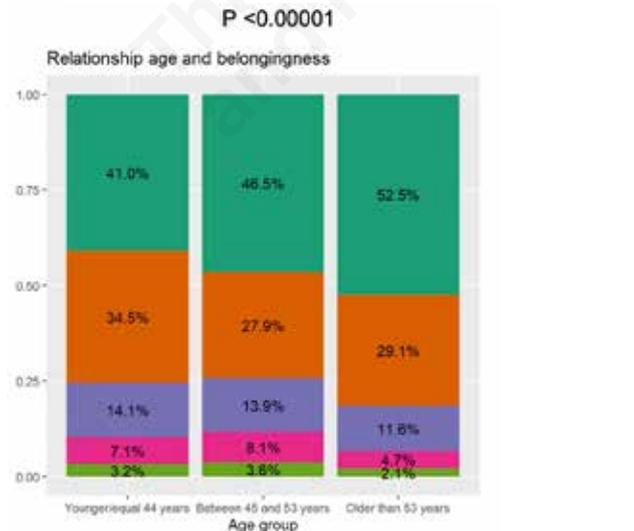


Figure 19 – Source: ODI survey data

Intersectionality: How have your personal characteristics affected your experiences in the AO?

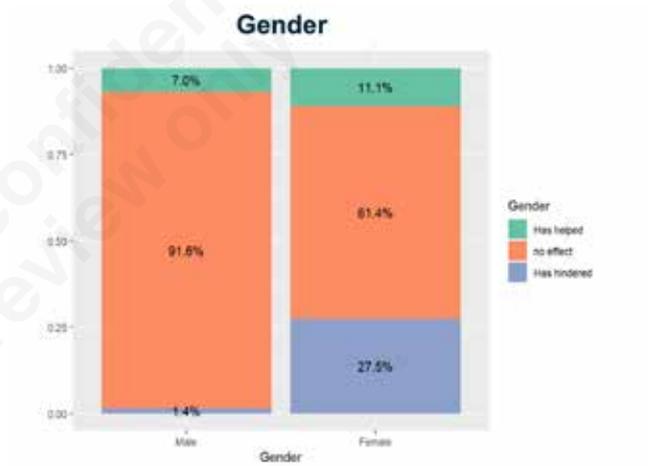


Figure 20 – Source: ODI survey data

Intersectionality: How have your personal characteristics affected your experiences in the AO?

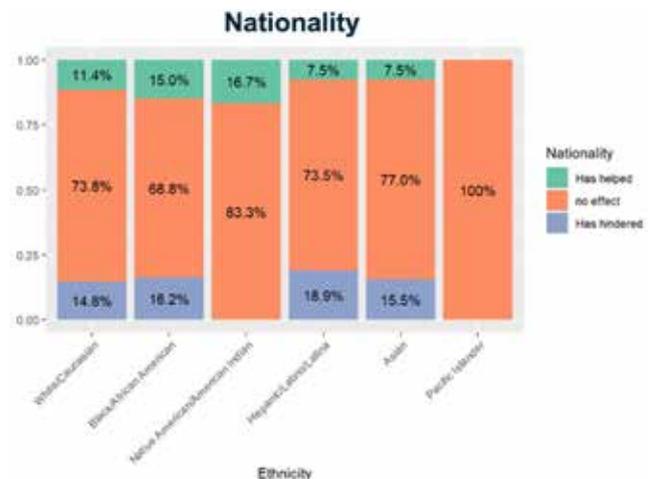


Figure 21 – Source: ODI survey data

The survey was also designed to explore interactions, or intersectionality, between variables that might influence membership of, and progression within, AO. There were important differences in the perception of how gender affected the experience as AO faculty (**Figure 20**), with more females reporting that they felt that their gender had been a hindrance, while the vast majority of male respondents reported that they felt that their gender had not been a determinant of their experience within AO.

When data were analyzed for the influence of nationality on the AO experience, there was consistent reporting of a perceived negative effect. This effect was not reported by faculty from the Pacific Islands, but the number of respondents in this group is so small as to make it hard to interpret these data. (**Figure 21**)

Comment: When observed together, members who identify with more than one of the characteristics above that appeared associated with a decreased feeling of belonging, or a hindrance to experiences within the organization, may be at greater risk of feeling alienated, failing to succeed, or remaining engaged within the AO. Examples would include women of color and young men of underrepresented ethnicities. As in the earlier section about URM representation, it will be critically important to recognize, understand and account for these differences in perception amongst the AO faculty.

8.1 Summary demographics

Professional workload and responsibilities

How many hours per week do you spend working for your main employer, both at the workplace and remotely?

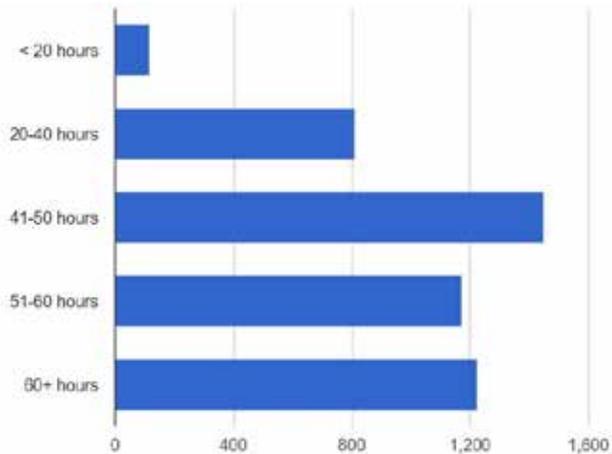


Figure 22 – Source: ODI survey data

In your current professional setting, what do your educational responsibilities include? (please select all that apply)

- None
- Training medical/veterinary students
- Training interns
- Training surgical residents
- Training surgical fellows

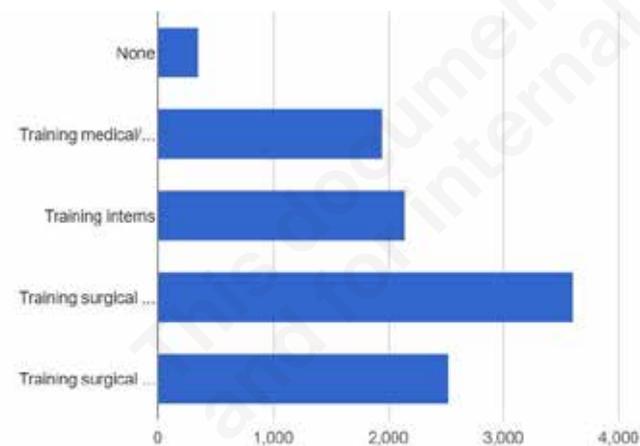


Figure 23 – Source: ODI survey data

Comment: Surgeons are very experienced across a variety of surgical disciplines, with most surgeons working more than a standard 40-hour week. There was no evidence for any difference between genders in this regard. Over 90 percent of faculty have some sort of educational responsibility in their own practice setting and most (75 percent) play an active role in resident education (Figures 22 and 23).

Faculty selection and recruitment

Which of the following statements most accurately describes your pathway to applying to become an AO faculty member?

- I applied after being invited or encouraged to do so by an AO faculty member.
- I applied after being encouraged to do so by a work colleague (non-AO faculty).
- I applied on my own initiative due to my desire to become an AO faculty member.
- After participating in a course, I decided to apply to become an AO faculty member.
- I was discouraged from applying but applied anyway.
- I don't remember.

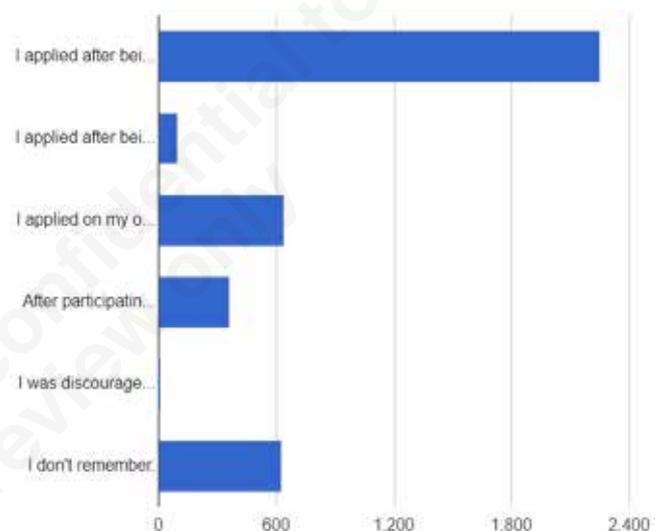


Figure 24 – Source: ODI survey data

Comment: Over 50 percent of AO faculty who responded to the survey became faculty without needing to formally apply for the position. Fifty-five percent had taught at a course within the last 12 months; 86 percent had taught within the last 5 years (data not shown). Overall, 80 percent of faculty had held teaching roles in educational programs, with a median of four courses per faculty member. Forty percent had served as chairpersons of educational events, with a median of two times per person. No differences were identified by gender for these experiences (Figure 24).

8.2 Gender and leadership

Do you currently hold, or have you ever held, a governance/leadership position in the AO?

- Yes
- No

This mosaic plot (**Figure 25**) is scaled to show how few women are in leadership. It represents the proportion of men and women (in relation to each other and in relation to leadership positions). The difference observed is statistically significant, even after controlling for age and experience level, measured by the number of years in the AO. However, gender, age, and experience were all influential in the overall model relating to leadership. Odds for being in leadership were 32 percent smaller for women than men, and increased by 1 percent for every year of age, and by 13 percent for every year of experience participating as a faculty member in AO.

Few women faculty advance into leadership roles



Figure 25 – Source: ODI survey data

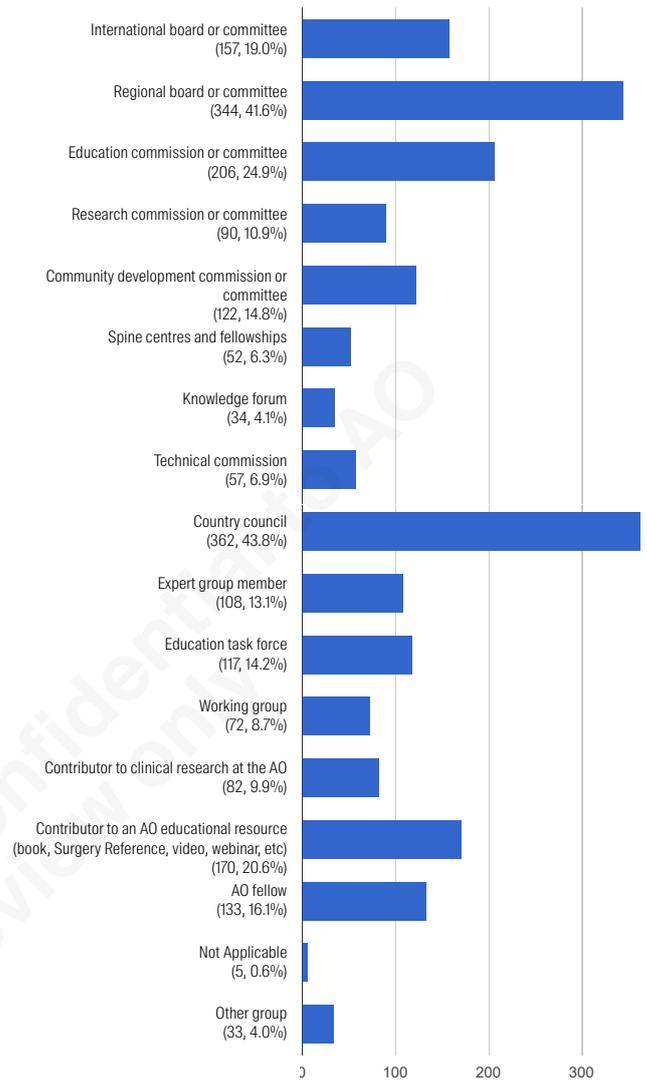


Figure 27 – Source: ODI survey data

Specific leadership positions

	International board	Regional board	Country council	Expert group	Education commission	Education task force	Research commission	Working group
Men N=641	131	269	296	91	164	96	71	59
Women N=38	2	12	10	1	11	4	3	4
Black N=19 (7)	5 (3)	11 (5)	6 (0)	0	3 (1)	2 (1)	1 (1)	1 (0)

Figure 26 – Source: ODI survey data

Comments: With regard to ethnicity, individuals who self-identify as black are not well represented in governance positions, with the possible exception of regional and international boards (**Figures 26 and 27**); in the latter, the relatively higher rates of representation may reflect the demographic makeup of a particular region (eg, Middle East and Northern Africa).

Data for other URM were not analyzed due to there being an insufficient sample size for meaningful statistical interpretation.

Note: **Figure 26** within the category of black faculty, the first numbers represent all respondents, and the second numbers in parentheses represent respondents excluding Middle East/Africa.

8.3 Pathways to faculty recruitment

Given that over half of the faculty represented in this survey did not enter their position through a formal application process (Figure 24), the avenue through which new members gain entry was considered as a possible bottleneck and/or intervention point for diversity efforts. Developing an understanding for how individuals already in the organization recruited individuals from outside the organization might help provide insight as to how the demographics of AO are created and perpetuated.

The mosaic plot in Figure 28, scaled to represent the relative gender distribution of respondents, demonstrates that recruitment practices of male and female members of the AO faculty are significantly different ($P < 0.00001$).

Comments: There was a significant gender dependency of recruitment practices evident across all CDs. Women are more likely to recruit women, or equal proportions of men and women, as compared with men. It is highly likely that informal recruitment was the method by which a very large portion of faculty members entered into the organization. Even through formal channels, recruitment often facilitates the application process.

The survey explored how people recruited others, by clinical division. Fifty-seven percent of faculty members responding were recruited by an older male surgeon with whom they had previously trained or currently practice, while 28.5 percent were recruited by a male member of their peer group. Four percent of respondents had been recruited by a female with whom they had trained, worked, or who were in their personal network. Of respondents who have gone on to recruit members themselves, 53 percent have pursued younger trainees, and 20 percent and 28 percent, respectively, have recruited from their peer group, or both groups equally. These data illustrate the importance of personal and close professional networks in recruitment, and the tremendous influence recruitment by male surgeons has had in building the faculty membership (Figure 29).

Have you successfully recruited surgeons to the AO faculty?

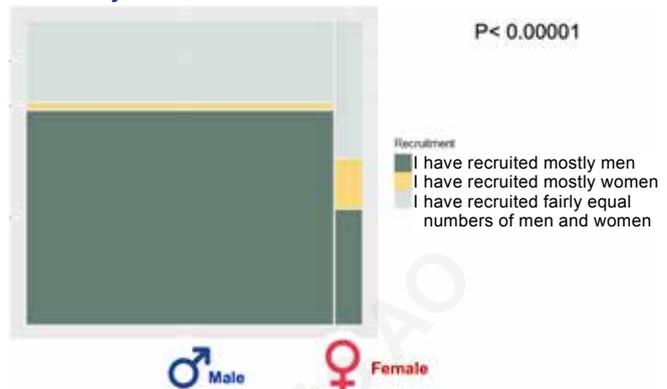


Figure 28 – Source: ODI survey data

Clinical division and recruitment

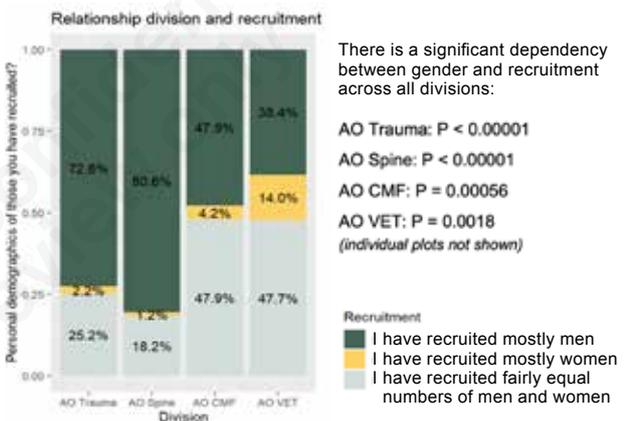


Figure 29 – Source: ODI survey data

8.4 Mentorship of young surgeons

Although informal mentorship has always been evident within the AO network, the Working Group wanted to understand more about how and to whom mentorship is being delivered. Specific questions addressing these issues were deployed.

Figure 30 reports the results broken down by gender and expressed proportionally. The difference in the pattern of mentoring practice is evident and is statistically significant ($P < 0.00001$). Women tend to be more equitable in their selection of mentees, while men are much more likely to mentor male trainees. In **Figure 31**, the data are scaled according to number of respondents.

Comment: As was the case for faculty recruitment, significant gender dependencies existed regarding mentorship, with men being less likely to mentor women, and women being more likely to mentor equal numbers of men and women. Some of these dependencies may be related to engrained behaviors and implicit bias, but some of the effect may be related to discomfort among faculty in establishing a mentoring relationship with a younger individual, or any individual, of the opposite gender. Given the often-simultaneous role of a mentor as a sponsor, and the discrepancies between men and women in leadership roles, it may place women at a disadvantage for advancement when mentorship occurs along these gendered lines.

The reliance on personal networks as a pathway for mentorship presents a limitation for people to access the wider resources that AO has to offer, and for individuals who do not come from programs or institutions where there are other well-established faculty within the organization. This demonstrates a real concern for optimizing opportunities and promoting diversity for certain groups.

Of those receiving mentorship within the AO, 55 percent were mentored by an older male with whom they had trained or practiced, and 30.5 percent were mentored by a male member of their peer group. Four percent of respondents indicated receiving mentorship within the AO from a woman (either an educator, an older colleague, or a peer).

Mentorship is an avenue for individuals to learn directly from their role models, though the process is most effective when there is a diverse set of mentors that will “look like” the larger group of mentees that are being mentored to advance, or to enter a field and increase diversity even further. Entry into an organization may be influenced by mentorship; however there are other strategies for promoting diversity initiatives at that level. Mentorship is a great way to support those initiatives, to make sure that they are maintained through all levels of an organization, and to increase diversity throughout an organization, specifically in areas of leadership. It can also help improve climate and inclusivity for individuals who belong to underrepresented groups within an organization by providing support, networking opportunities, and other forms of access.

Encouragingly, over 70 percent of respondents who have participated in mentorship reported receiving feedback on their performance. The importance of educating both mentors and mentees as to best practices cannot be overstated. Structured teaching, perhaps through a dedicated program equivalent to

Which of the following best describes the individuals whom you have mentored?

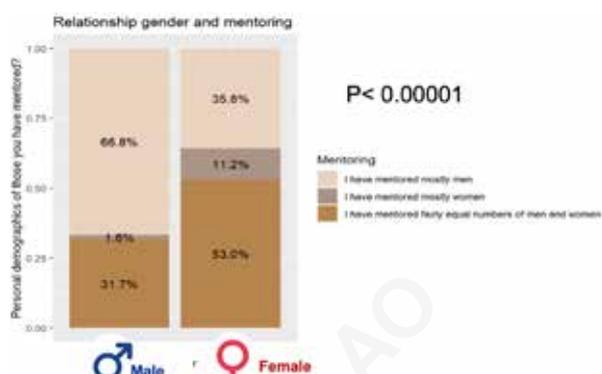


Figure 30 – Source: ODI survey data

There are fewer women to mentor, but women are doing more of that gender-specific mentoring

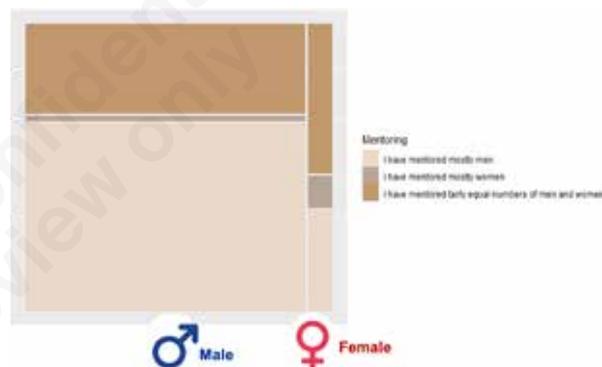


Figure 31 – Source: ODI survey data

Mentoring by clinical division

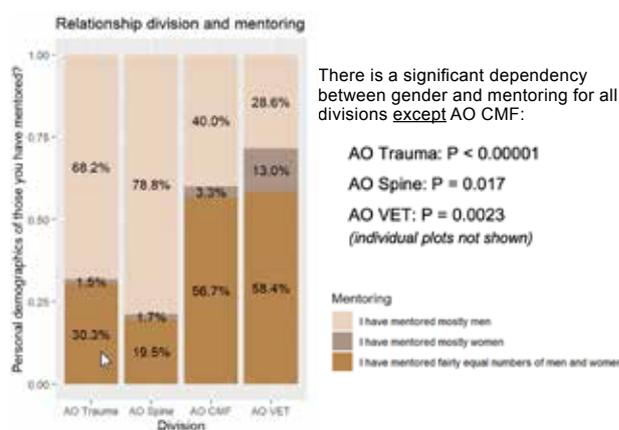


Figure 32 – Source: ODI survey data

Faculty Education Program (FEP), Chairperson Education Program (CEP) and Leader Education Program (LEP), would ideally be combined with mandatory 360-degree feedback for evaluation and quality assurance.

Comment: Similar to recruitment, mentorship patterns follow gendered trends in each of these clinical divisions, with the exception of AO CMF. Men and women in AO CMF are mentoring men and women at a statistically equivalent rate. Men and women in AO CMF are mentoring in the same way. AO CMF is the most ethnically diverse group and has some of the greatest proportional representation by women (**Figure 32**).

8.5 The importance of personal networks and clinical experience

For each of the following personal characteristics, please indicate whether you believe the characteristic has helped, hindered, or had no effect on your position as a member of the AO teaching faculty.

- Age
- Race
- Gender
- Nationality
- Level of clinical experience
- Status of institution of employment
- Personal network within AO
- Research program

Personal networks and clinical experience are universally influential

Influence of personal networks within the AO in the intersection with the AO

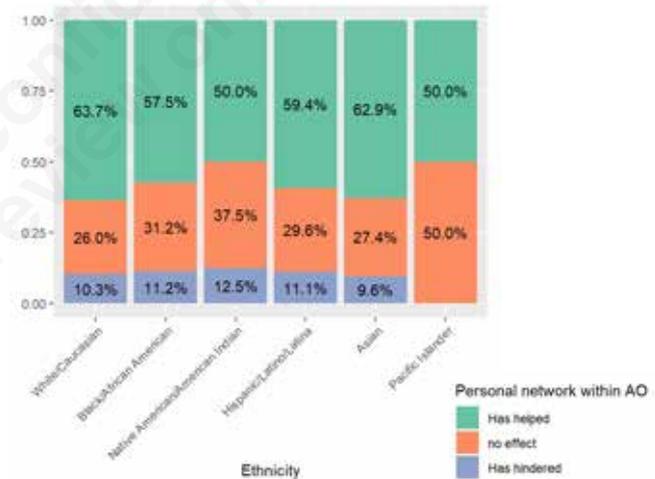


Figure 33 – Source: ODI survey data

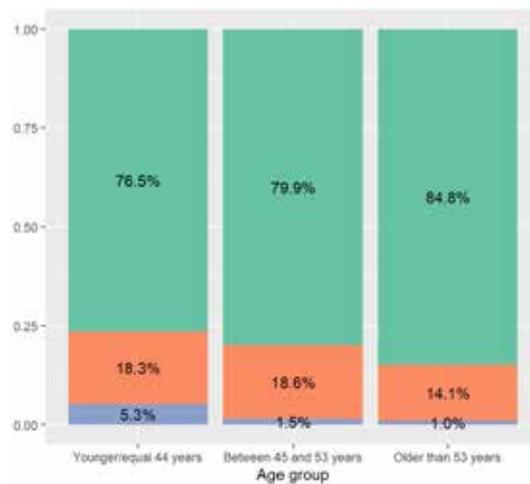


Figure 34 – Source: ODI survey data

One of the strengths of the AO teaching model has always been the small-group format that allows close and extended interactions between faculty and trainees. Similar relationships exist within the residency training programs. Irrespective of their location, these personal networks are known to have an impact on the likelihood that an individual decides to seek a role as faculty within AO. The Working Group wanted to know whether the anecdotal evidence (of a perceived benefit) was confirmed by survey data.

There was a consistent pattern across all clinical divisions (**Figure 33**) that personal relationships are an important determinant of whether an individual is successful in applying for a faculty position within AO.

In view of the age data presented in Section 7.3, the Working Group was also interested in determining whether faculty felt that their clinical experience impacted the likelihood of being invited to join the AO faculty. **Figure 34** shows that all elements of the faculty felt that the extent of a candidate's clinical experience is an important determinant of success when applying for faculty positions in AO.

Comment: The common threads, across various personal identities, and irrespective of clinical division or geographical location, were the influences that personal networks and clinical capability had on the faculty experience within AO. Personal networks, and clinical experience, were overwhelmingly recognized as helpful influences on one's experience within the organization. While it is intuitive that clinical knowledge would be of great benefit to an individual involved in a cutting-edge clinically focused educational organization, the collective agreement on the positive impact of personal networks demonstrates the large role these relationships have likely played, and continue to play, in the professional worlds of AO faculty. Efforts aimed at expanding these networks, yet simultaneously restructuring pathways so that they are not as singularly reliant or dependent upon these networks, will be crucial aspects of a diversity initiative, and improving overall membership engagement in the organization.

9.1 Key findings

Professional demographics and experience

- Women and URM are proportionally underrepresented within the AO faculty. This trend will accelerate given current demographics of residency programs.
- Although participation by women was generally consistent with their representation in the AO clinical divisions, overall representation of women within the CDs lags behind that of the trainees we are educating, and far below that of the pool of potential talent currently in veterinary or medical education training programs.
- Female faculty are younger than male faculty in all CDs apart from AO Spine. Very few of the respondents were under the age of 40, the age threshold below which would typically reflect early career, post residency/fellowship surgeons. This “age engagement” gap excludes young surgeons.
- Even when successful in joining the AO faculty, female faculty do not experience the same sense of “belonging” as male faculty. This is likely having a negative effect on both retention of these faculty and on their willingness to recruit new female faculty.
- Aside from gender, similar concerns exist for other underrepresented groups, who are also at risk of feeling alienated by current recruitment and promotion practices within AO.

Recommendations:

- The AO should track at least gender and age of course attendees and faculty in order to provide objective data on both the current status and, more importantly, the impact of future interventions.
- The age engagement gap must be addressed. This is a prime age to target to create bridge programs for engagement of promising, energetic surgeons who will commit as lifelong members and contributors to the AO and reinforce a sense of belonging.
- The current practices for faculty recruitment and promotion need to be re-evaluated and changes made in order to improve the sense of belonging among all faculty, but with a particular emphasis on female and under-represented faculty. These changes can only be impactful when based on a sound understanding of the challenges that these groups face within the AO organisation.
- The ODI survey has provided a high-level view of the issues that exist but a more granular approach will be needed.

Experience as AO faculty and habits as AO faculty educators

- AO surgeons are very experienced and work more than a standard 40-hour week, irrespective of gender.
- Over 90 percent of faculty have some sort of educational responsibility and most (75 percent) play an active role in resident education.
- 55 percent have taught courses within the last 5 years and 55 percent have taught within the last 12 months.
- 80 percent of faculty have taught in educational programs and 40 percent have served as chairpersons of educational events.
- Over 50 percent of the faculty respondents became faculty without needing to apply for the position.
- Even when controlling for age and years of experience, women are less likely to be in leadership positions within the AO.
- Individuals who self-identify as Black are not well-represented in governance positions, with the possible exception of regional and international boards.
- Recruitment is an informal process, following personal/professional networks.

Recommendations:

- Time committed to AO activities is volunteered and the organisation needs to ensure that the time is valued.
- Retention of talented faculty will be facilitated by creating a community that is open and equitable, with transparent and aligned practices in faculty recruitment, leadership selection and governance.
- Faculty play a central role in the identification of the next generation of orthopaedic talent but clear guidelines need to be developed to ensure that opportunities for recruitment are offered to equally accessible to all potential candidates, not just existing personal networks.
- Faculty and leadership positions within AO should be appointed (or re-appointed) on the basis of open and transparent processes for nomination, evaluation and approval.

Mentorship within the AO

- As is the case for initial recruitment, significant dependencies exist between gender and mentorship.
- Men are less likely to mentor women, while women are more likely to mentor equal numbers of men and women.
- Some of these dependencies may be related to engrained behaviours and implicit biases, but some of the effect may be related to discomfort among faculty in establishing a mentoring relationship with a younger individual of the opposite gender.
- Given the link between mentorship and sponsorship, the inequalities in gender and ethnicity seen in leadership positions risk being propagated as inequalities in the opportunity for mentorship, further reinforcing the disadvantages for these underrepresented groups.
- The current reliance on personal networks as a pathway for mentorship is a real concern as it will simply reinforce these inequalities.

Recommendations:

- AO should evaluate the training available to potential mentors and mentees within its current educational offerings (eg, FEP, CEP, LEP, AO PEER).
- In addition to providing training on how to mentor, there needs to be a focus on why mentoring is important for the development of a sustainable, diverse faculty.
- Not every faculty member will prove to be an effective or committed mentor. Ongoing review will be needed to assure the quality of the mentoring within AO.
- Personal networks are still valuable but should be expanded with the specific intent to foster diversity of opportunity. Some degree of central facilitation ("mentoring program") may be needed to address this requirement.
- If designed and implemented effectively, a robust mentoring plan forms a central component of the AO experience and one that will facilitate recruitment and retention of a more diverse and progressive faculty.

9.2 Conclusions

- The AO faculty is experienced both inside and outside of the organization.
- The current structures for entry and advancement do not promote distribution of opportunity across underrepresented groups.
- Diversity is lacking, and it affects climate for underrepresented groups.
- Age, gender, ethnicity are not being recorded proactively as part of AO registration and data collection processes; this needs to change if we are to develop and track the effectiveness of interventions.
- Personal networks are influential for everyone, regardless of identity. There likely is a relationship to recruitment and mentoring practices.
- There is evidence that current practices for mentorship and recruitment will continue to potentiate present norms.
- Mentorship is an avenue for providing role models, but it first requires a diverse set of mentors to provide the role models that will "look like" the larger group of mentees that are being mentored to potentially enter a field, in order to even further increase diversity.



Figure 35 – Source: AO Access

10.1 AO Access task forces; recruited through open calls and elections based on self-nominations

10.2 Organizational structure of AO Access

The organizational structure of AO Access facilitates establishing outcome measures and achievable goals, based on qualitative and quantitative methods and is governed by its terms of references (ToR).

AO Access acts as a strategy and implementation body to create, change, and/or implement current policies to meet the changing needs of the AO community. AO Access consists of a team of health care professionals (HCPs) including surgeons, researchers, educators and staff across the AO's regions and CDs, and the clinical unit. AO Access is organized as follows:

- AO Access Steering Committee (SteCo) (four members, including a direct link to the AO Foundation Board (AOFB), and the AO Executive Committee (AO EC), plus two members, one responsible for diversity and inclusion, and one for mentorship)
- AO Access manager (manager)
- One task force lead per focus area
- Three to four task force members per focus area
- Invited guests and/or consultants, based on need/topic

AO Access ensures linkages with existing programs such as faculty development programs, the AO Program for Excellence and Education in Research (AO PEER), and fellowship programs that are relevant and applicable to all regions, the clinical divisions and unit, as well as the AO institutes.

AO Access Steering Committee

The SteCo provides strategic advice and guidance to AO Access, represents AO Access, and handles additional funding requests and ensures the efficient deployment of the program's strategic goals.

The SteCo monitors and evaluates the output and acts as both a sounding board and collaboration partner for the strategic oversight of AO Access. One of its members forms a direct link to the AOFB, ensuring alignment and buy-in across the board (regions, CDs/unit, institutes and other AO bodies, as well as key stakeholders).

First suggested focus areas for taskforces



Figure 36 – Source: AO Access

Task force lead and member

Task force leads and members of AO Access develop, implement, evaluate, and continually improve and monitor the program’s scope, ensuring its implementation, monitoring of, and evaluation for the scope of each focus area.

For further details, please refer to the Terms of Reference (ToR) available by contacting us at: diversity.inclusion@aofoundation.org.



Figure 37 – Source: AO Access

AO Access web page



https://www.aofoundation.org/who-we-are/about-ao/access-diversity-inclusion-and-mentorship#the_right_mentoring_connection=null&o=News%20Date%20Facet,Descending

11.1 Acknowledgment

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11.2 Intellectual property

This project is the intellectual property of the AO Foundation.

The content is solely the responsibility of the AO's ODI

Working Group.

11.3 Contact

If you have any questions, comments, or concerns, please

feel free to contact us at:

diversity.inclusion@aofoundation.org.

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Appendix 1: Survey questions (to be included following journal publications)

Appendix 2: Summary of data for AO Trauma

Appendix 3: Summary of data for AO Spine

Appendix 4: Summary of data for AO CMF

Appendix 5: Summary of data for AO VET

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AO Spine

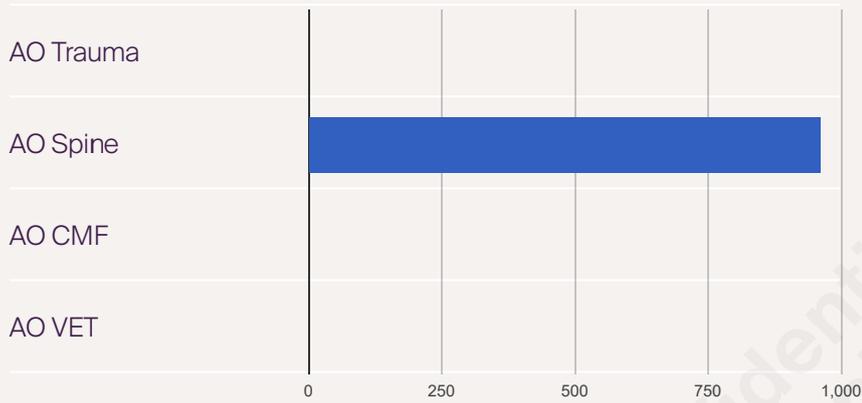
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1

To which **AO clinical division** do you belong?

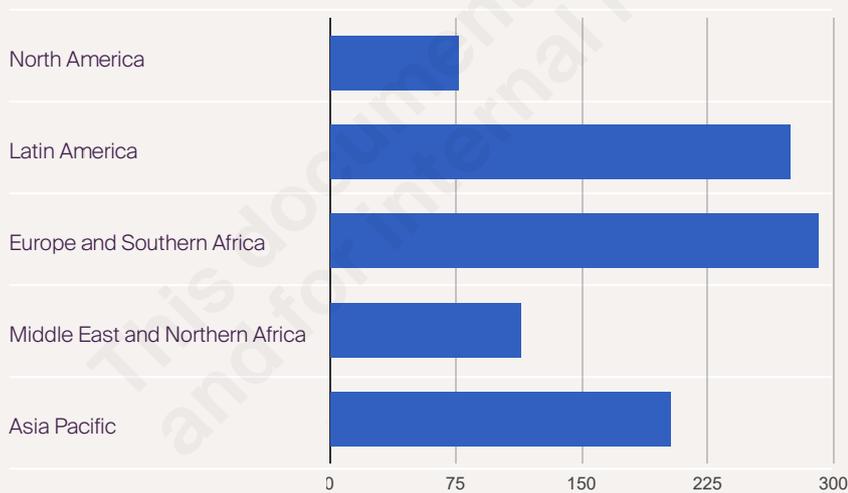
N=961



2

In which **geographical region** do you reside?

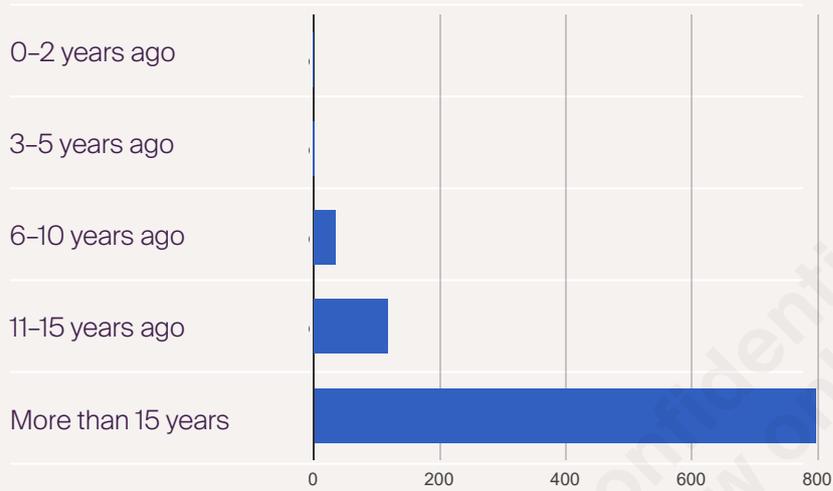
N=959



2.1

When did you **graduate** from medical school?

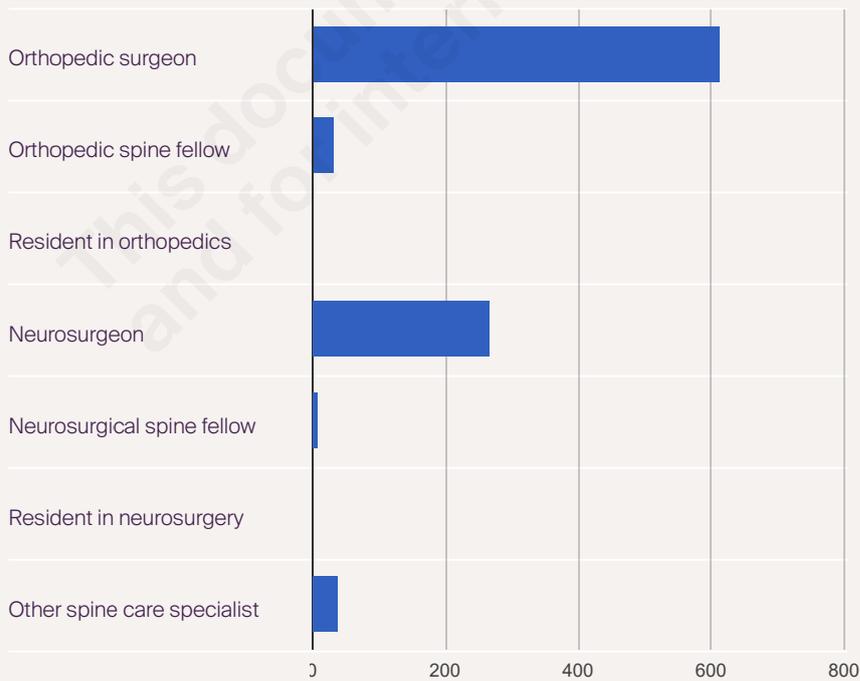
N=956



2.2

What is your **current position**?

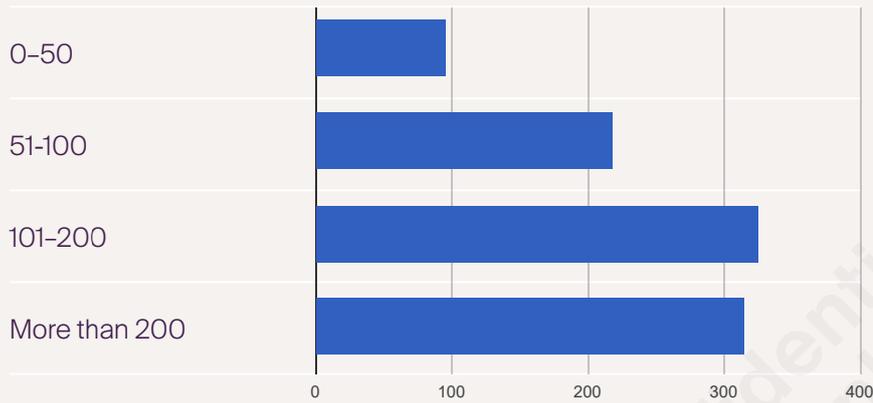
N=958



2.3

How many spinal operations did you perform in the last year?

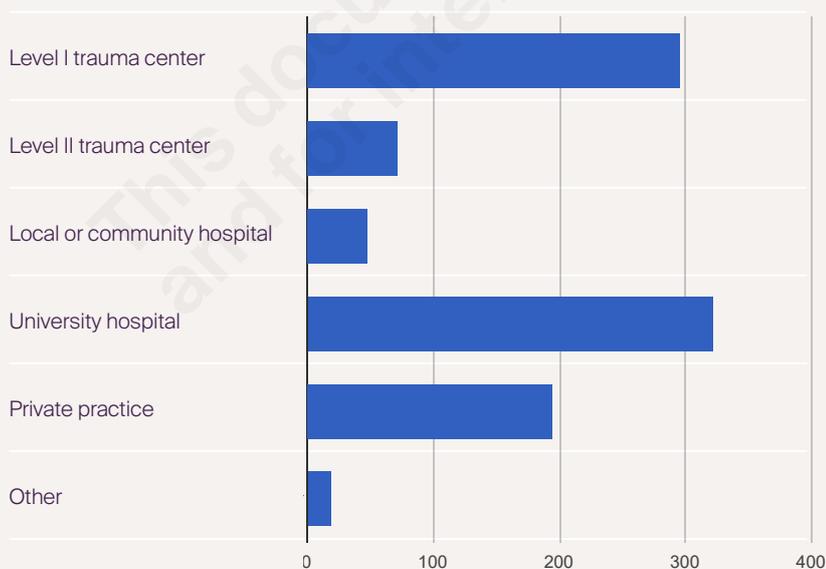
N=955



2.5

What is your main practice location?

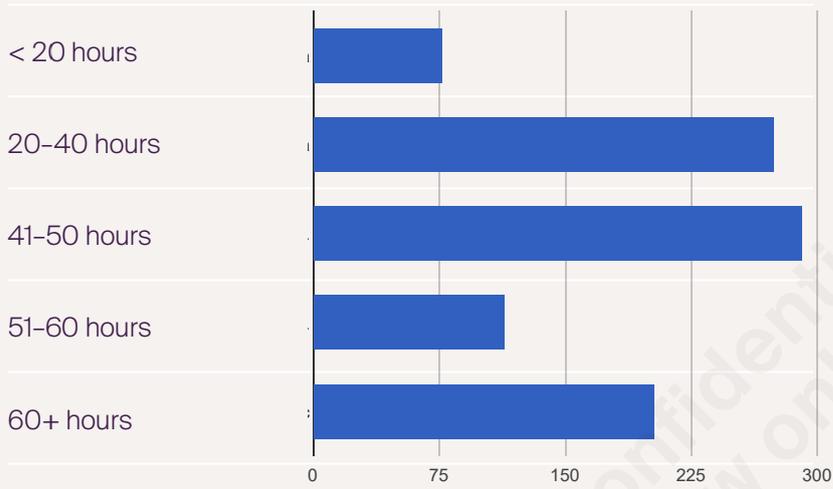
N=953



3

How many **hours per week** do you spend working for your main employer, both at the workplace and remotely?

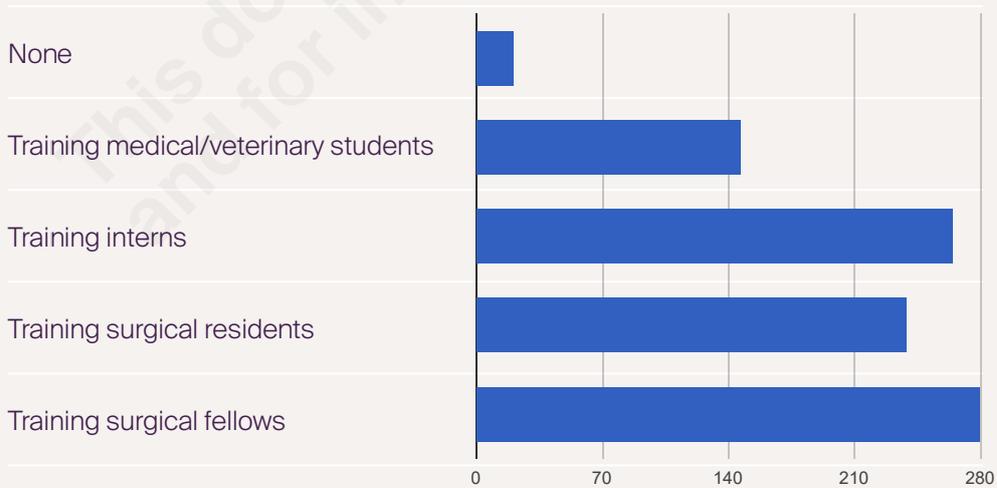
N=952



4

In your current professional setting, what do your **educational responsibilities** include? (please select all that apply)

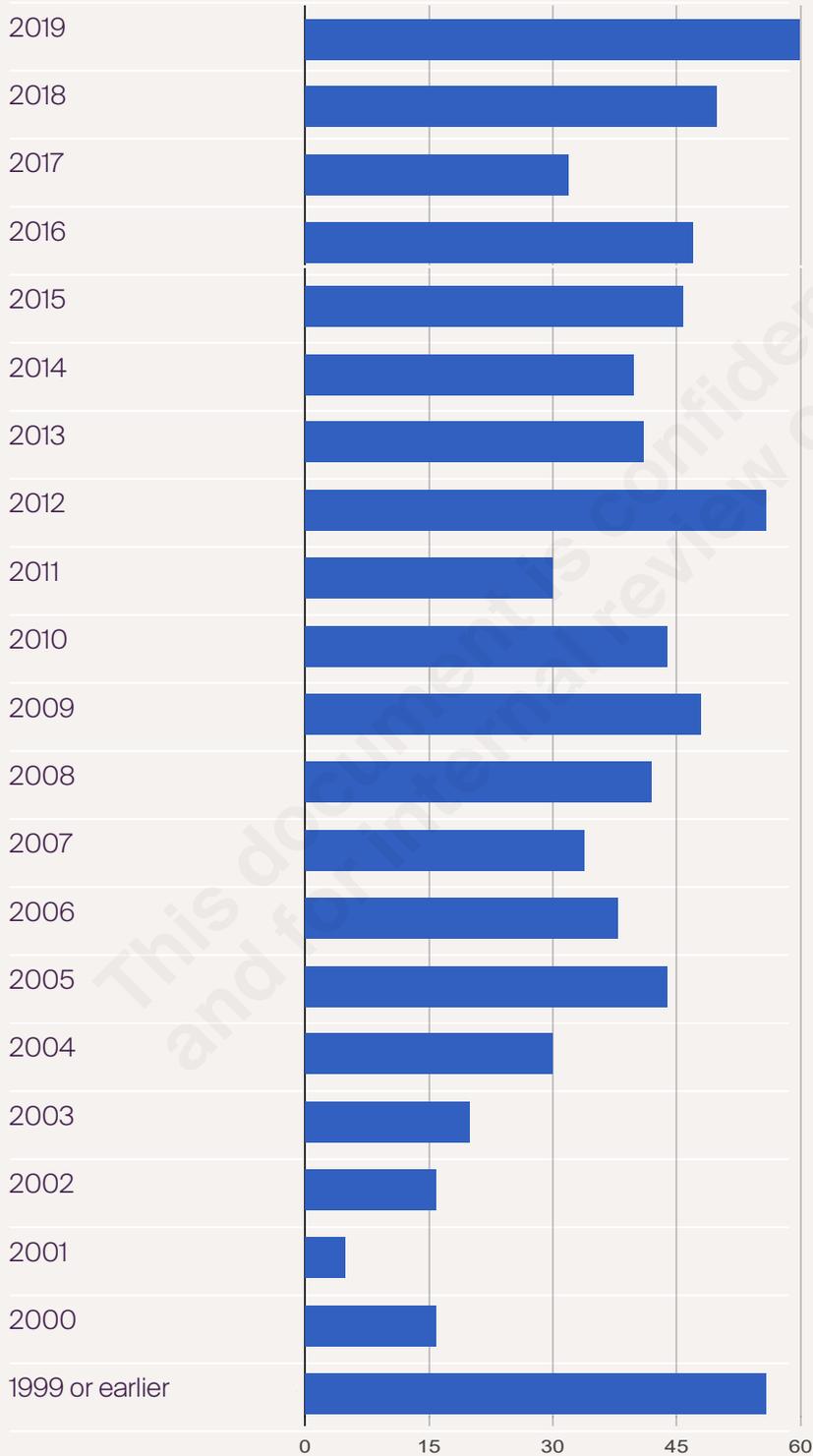
N=950



5

In which year did you officially become an **AO faculty member**?

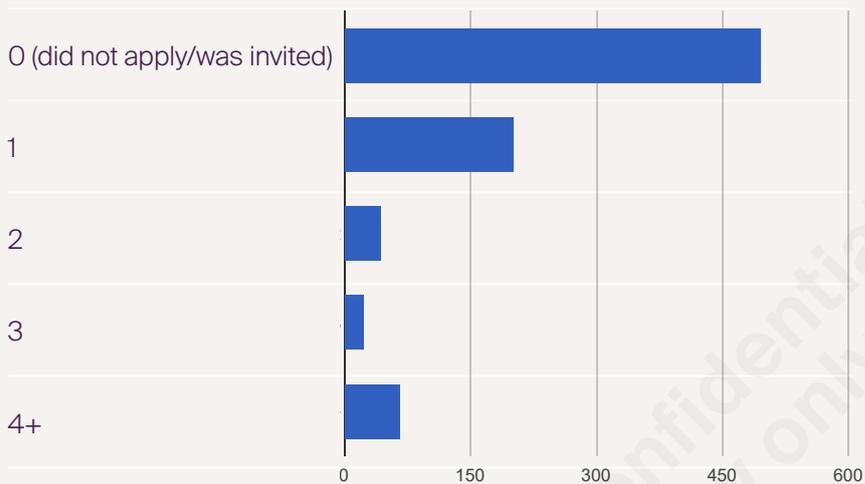
N=795



6

How many times did you apply to become an AO faculty member?

N=833

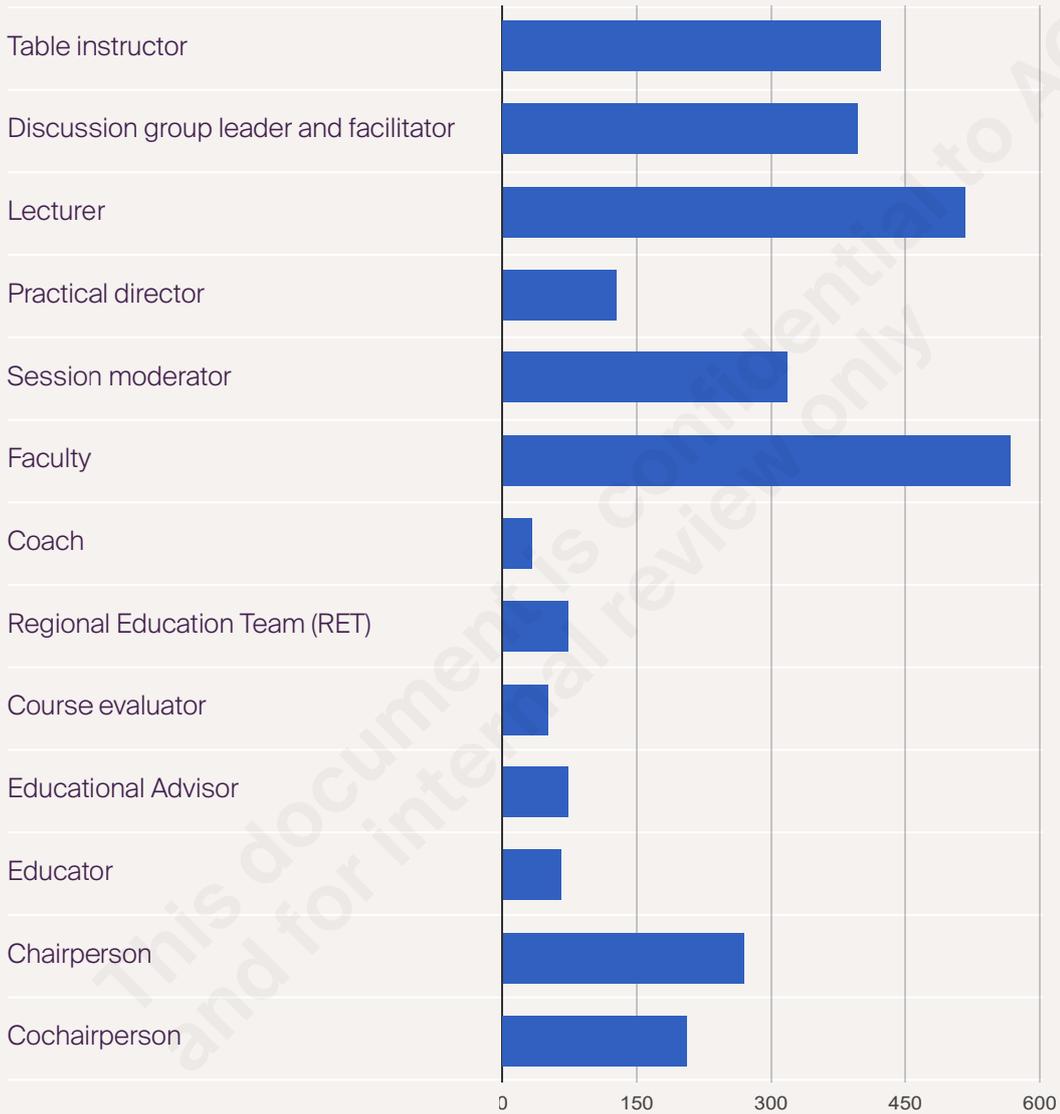


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9

Which of the following **(teaching) assignments** have you performed at an AO educational event? (please select all that apply)

N=723



14

Do you currently hold, or have you ever held a **governance/ leadership position** in the AO?

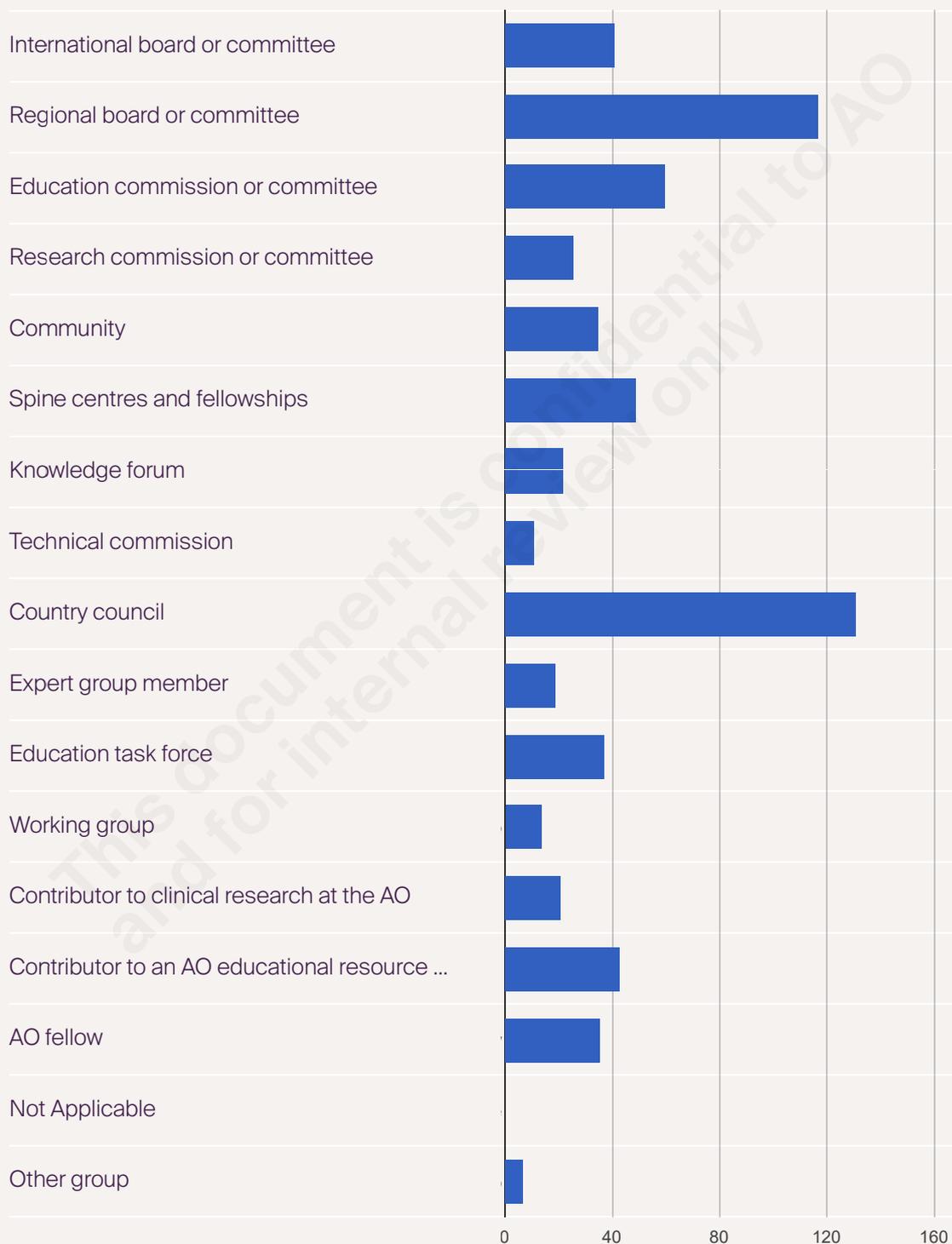
N=823



15

In **what governance body?** (please select all that apply)

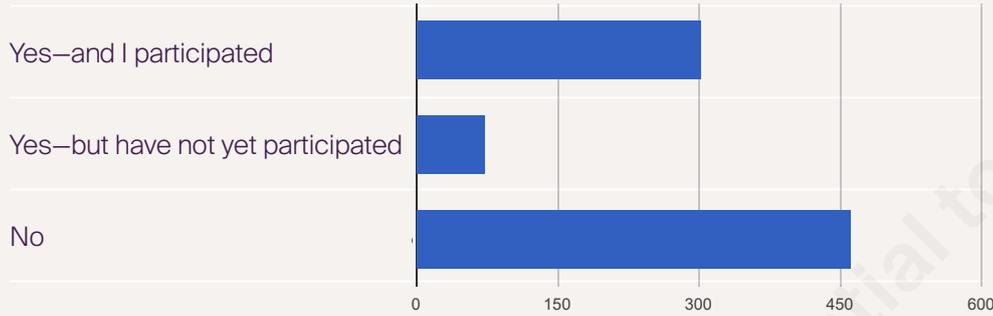
N=241



16

Have you been **invited to participate** in a faculty development program?

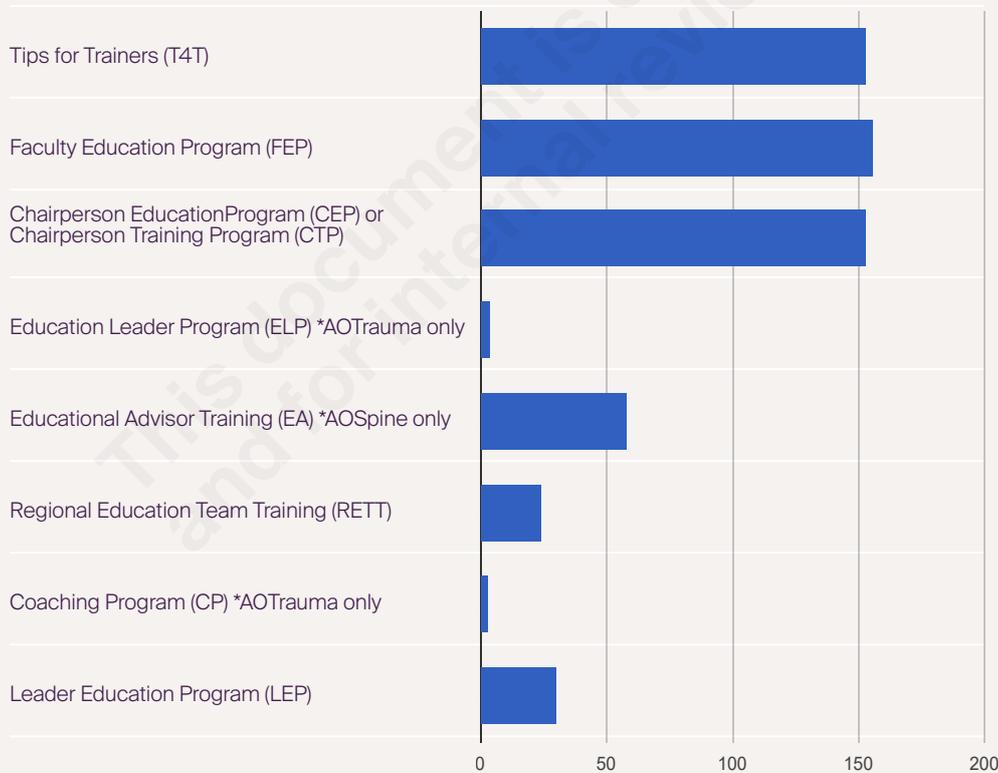
N=838



17

Which **faculty development program(s)** did you participate in? (please select all that apply)

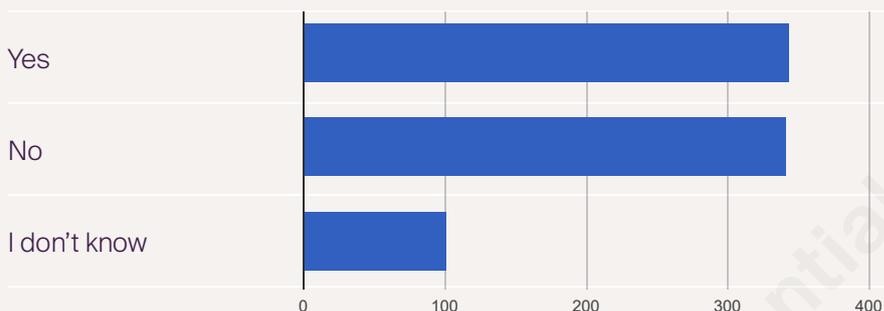
N=301



22

Since becoming an AO faculty member, do you feel you have **received mentorship** from another AO faculty member, either formally or informally?

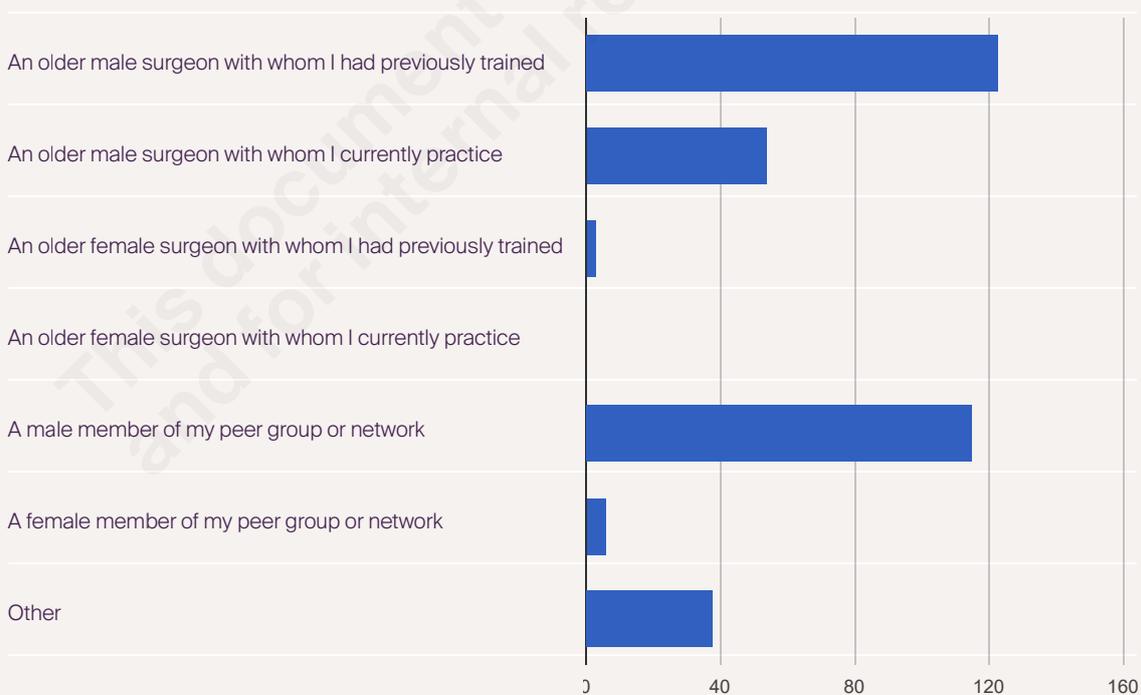
N=785



22.1

Which of the following best describes the AO faculty member(s) from whom you have **received the most**, or the most consistent, **mentorship**?

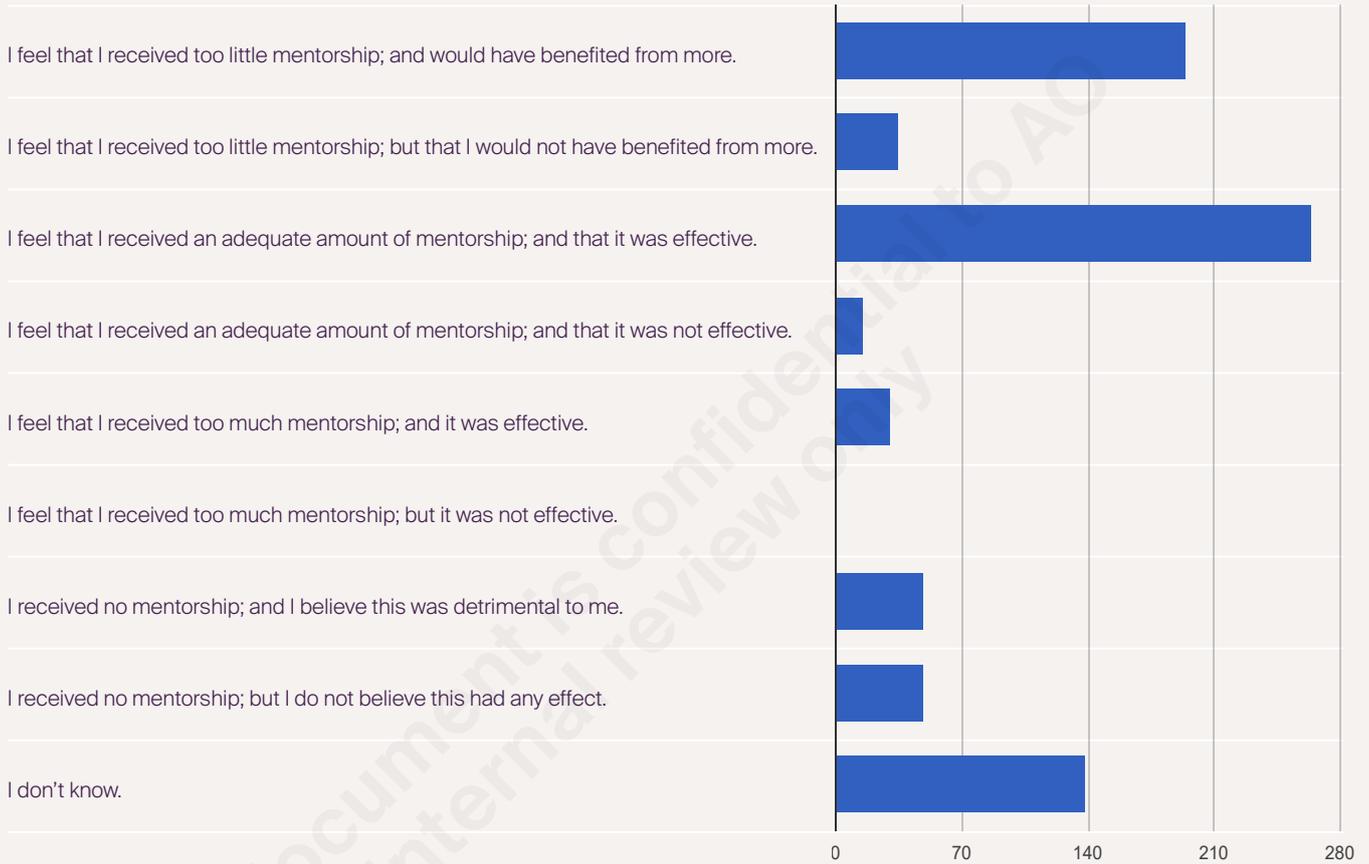
N=339



22.2

Which of the following statements best describes your experience with mentorship as a member of the AO faculty?

N=772

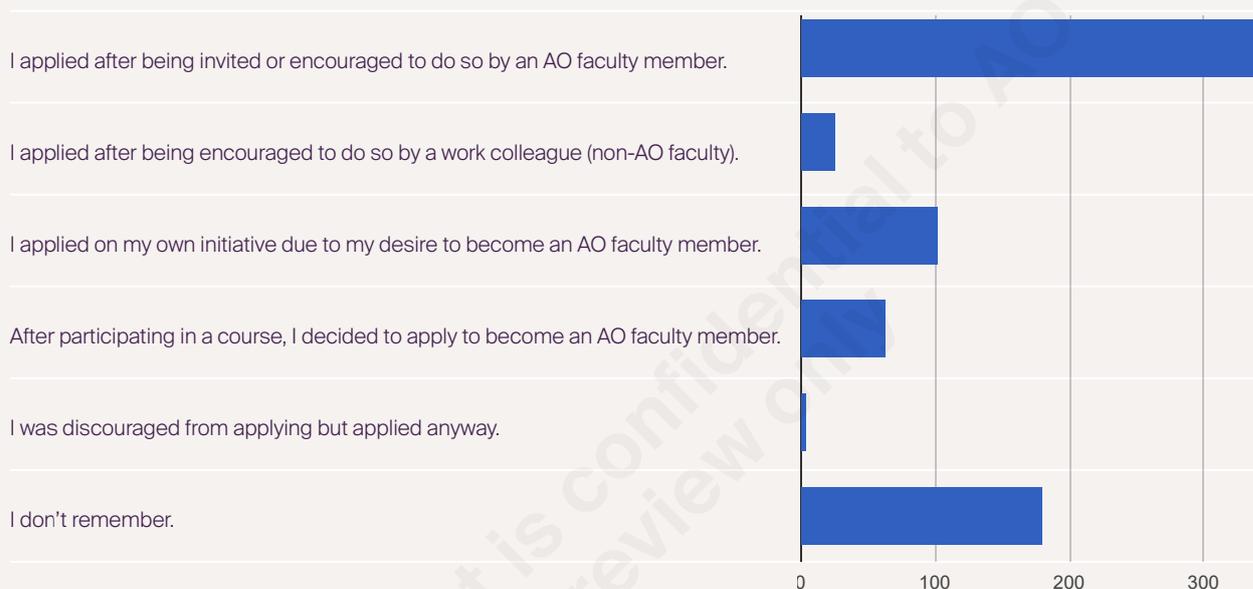


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24

Which of the following statements most accurately describes your **pathway to applying** to become an AO faculty member?

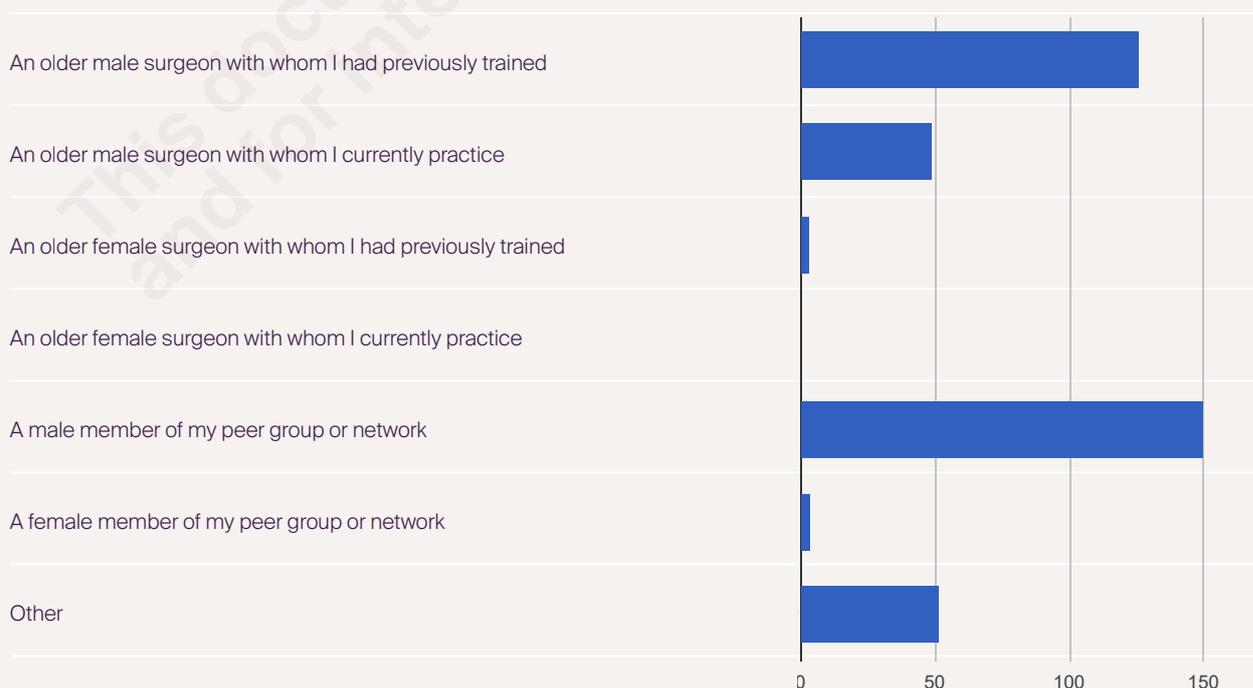
N=764



25

Which of the following most closely describes the **individual who recruited you** to the AO faculty body?

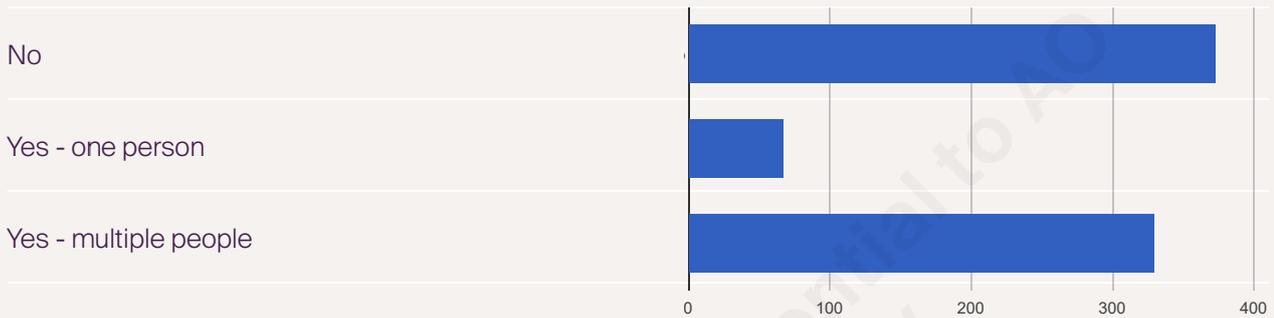
N=384



26

Have you **successfully recruited** other surgeons, health care professionals or researchers into the AO faculty body since you started as an AO faculty member?

N=770



27

Which of the following best describes your **professional relationship** to those you have recruited?

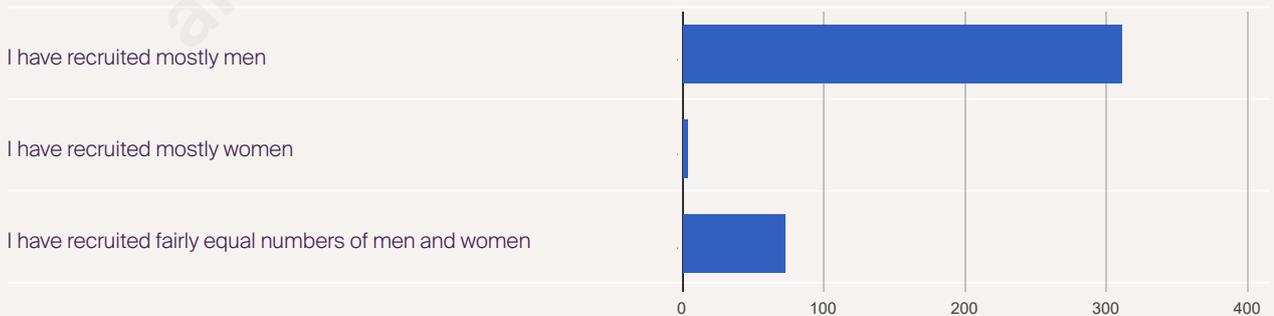
N=390



28

Which of the following best describes the **personal demographics** of those you have recruited?

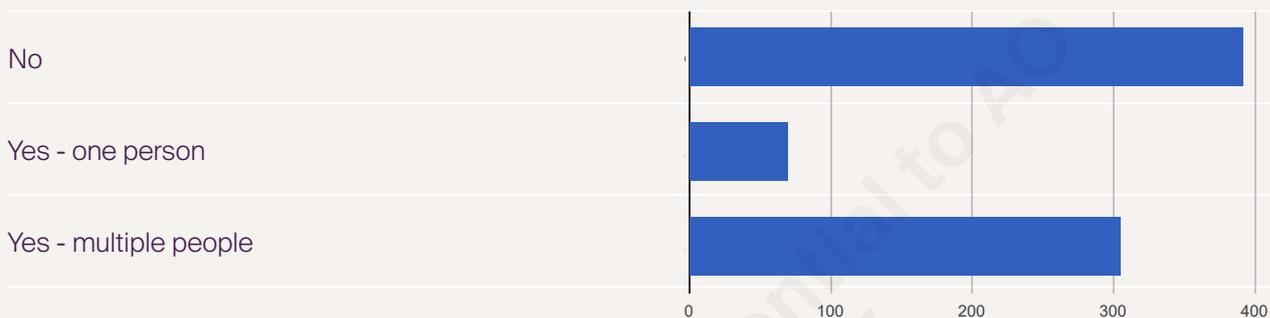
N=389



29

Have you formally or informally **mentored other younger members** of the AO faculty since you started as an AO faculty member?

N=768



30

Which of the following best describes your **professional relationship** to those you have mentored?

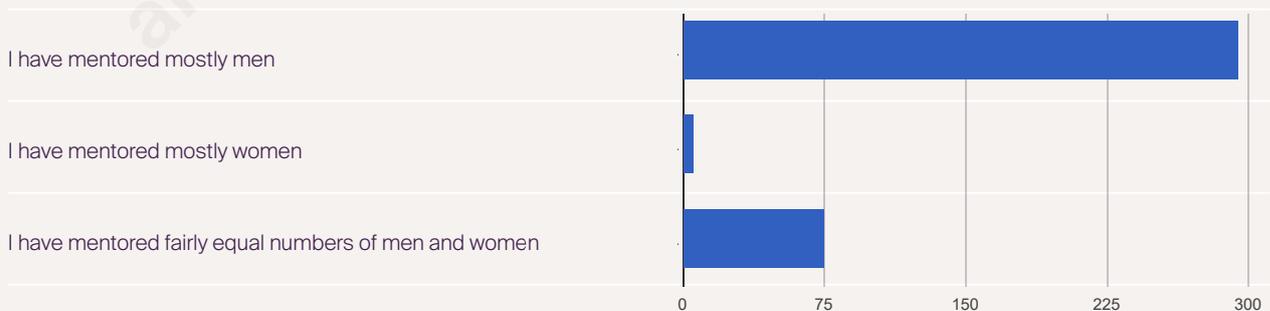
N=374



31

Which of the following best describes the **individuals** whom you have mentored?

N=376



33

Which of the following statements best represents **your initial beliefs** regarding opportunities to become an AO faculty member (ie, prior to when you joined the faculty, or specifically sought out information on joining the faculty)?

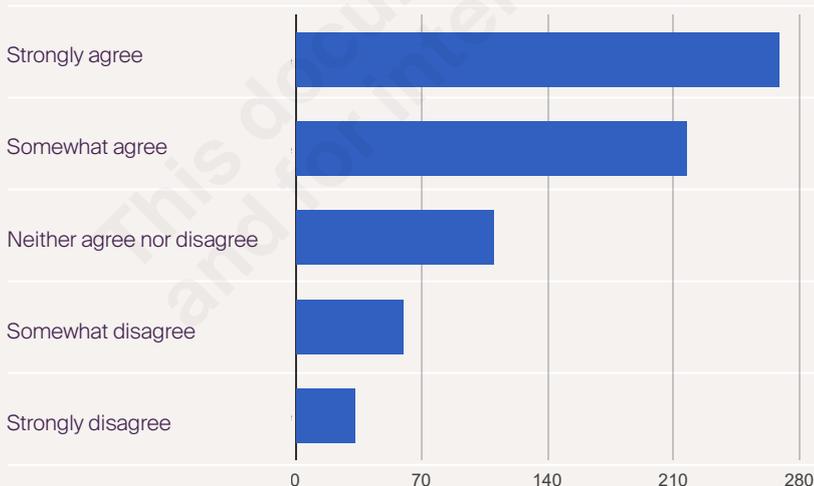
N=685



34

Please rate your level of agreement with the following statement: **I feel that I really belong** as a member of the AO faculty group.

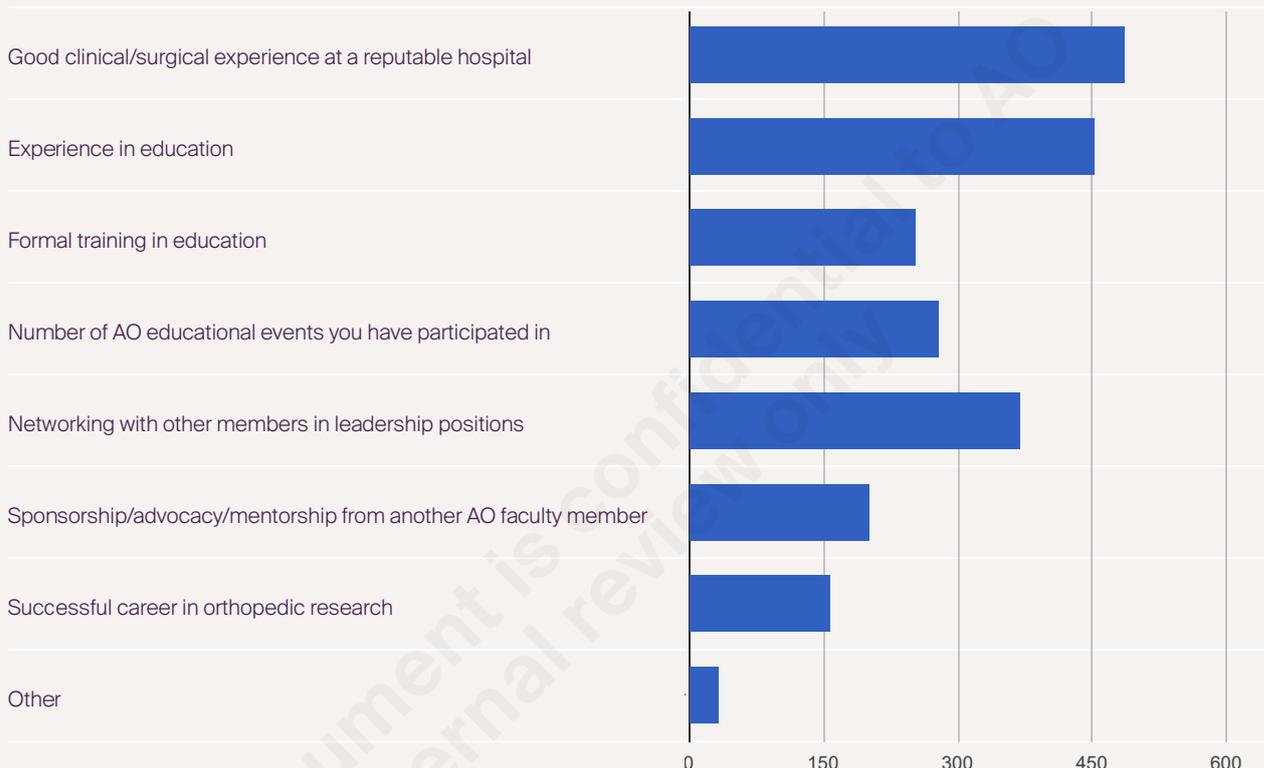
N=689



41

Which of the following factors do you believe are necessary for a successful application to a **leadership position** within the AO? (please select all that apply)?

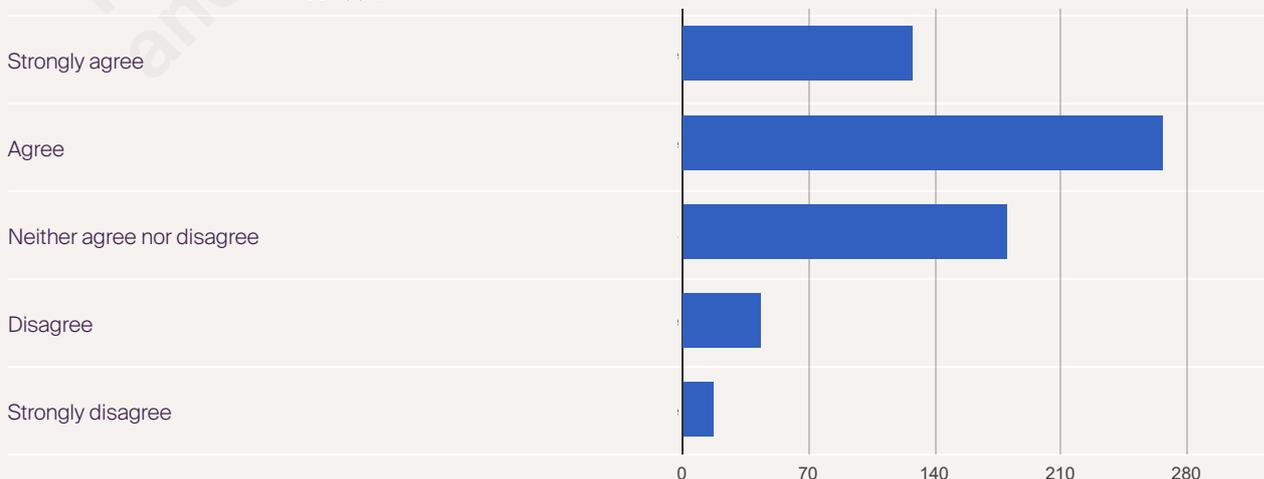
N=651



43

Please select your level of agreement with the following statement: As an AO faculty member, **I feel that I have advanced** to a level commensurate with my experience, abilities, and time invested in the organization.

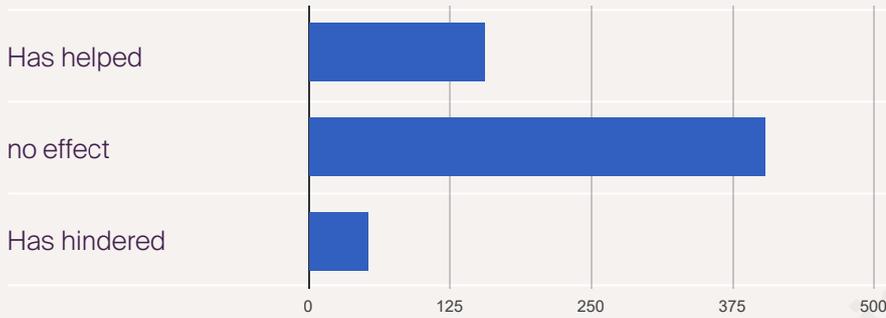
N=634



Habits as AO faculty educators/subjective observations

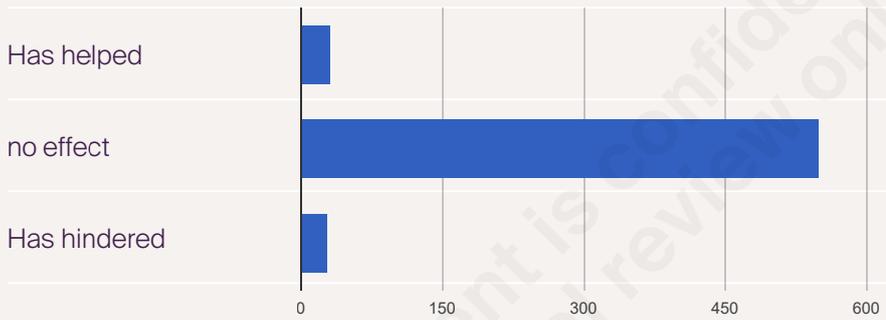
Age

N=613



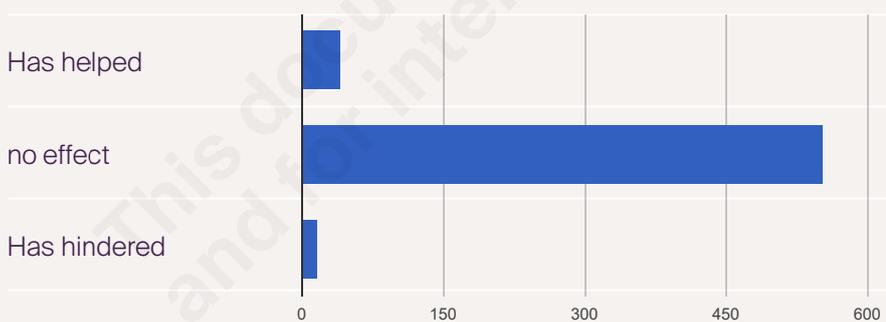
Race

N=608



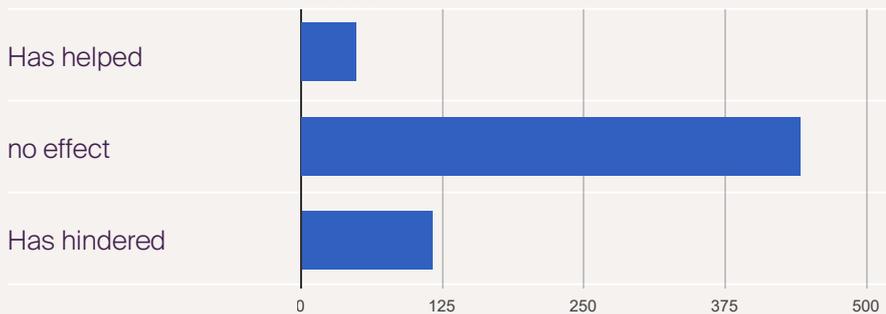
Gender

N=610



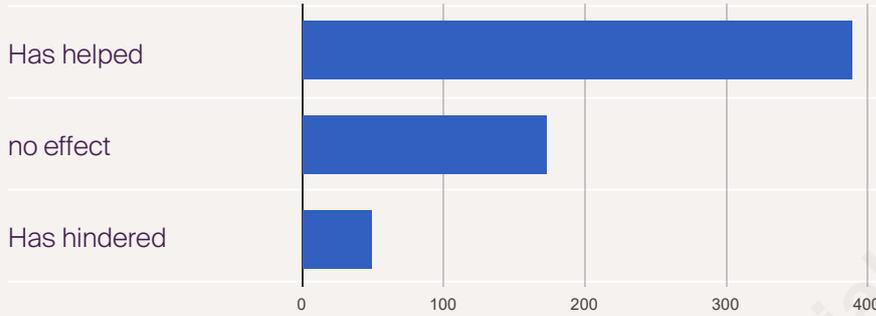
Nationality

N=607



Personal network within AO

N=612



49

Which of the following **obstacles** do you believe you have experienced during your time as an AO faculty member? (please select all that apply)

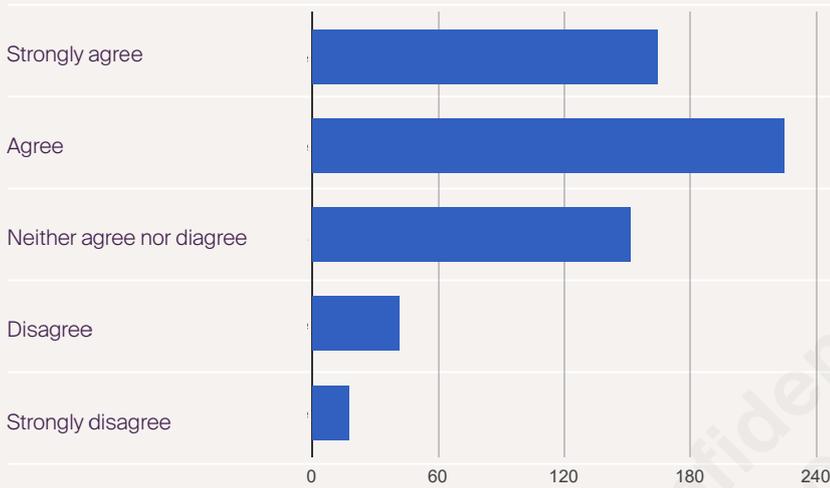
N=626



51

I feel valued within the AO as an AO faculty member.

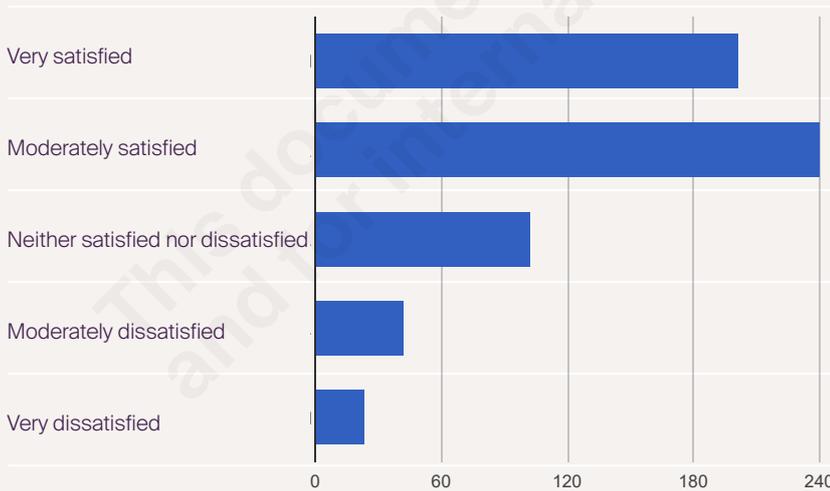
N=602



55

Overall, what is your level of satisfaction with your position as an AO faculty member?

N=608

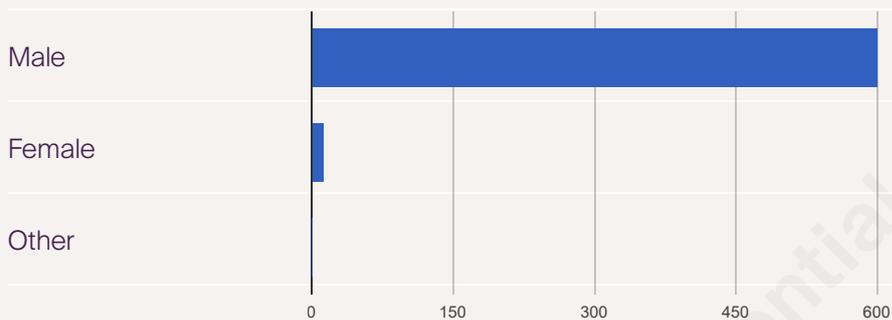


Personal characteristics

56

With which **gender** do you identify?

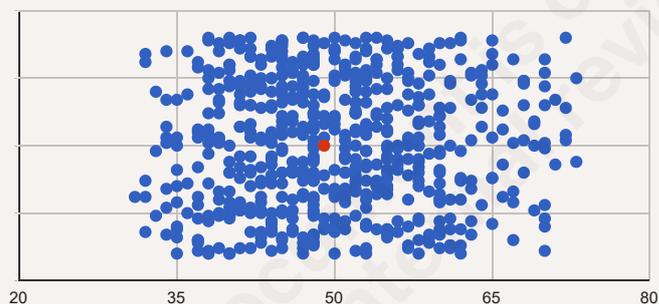
N=614



57

How old are you?

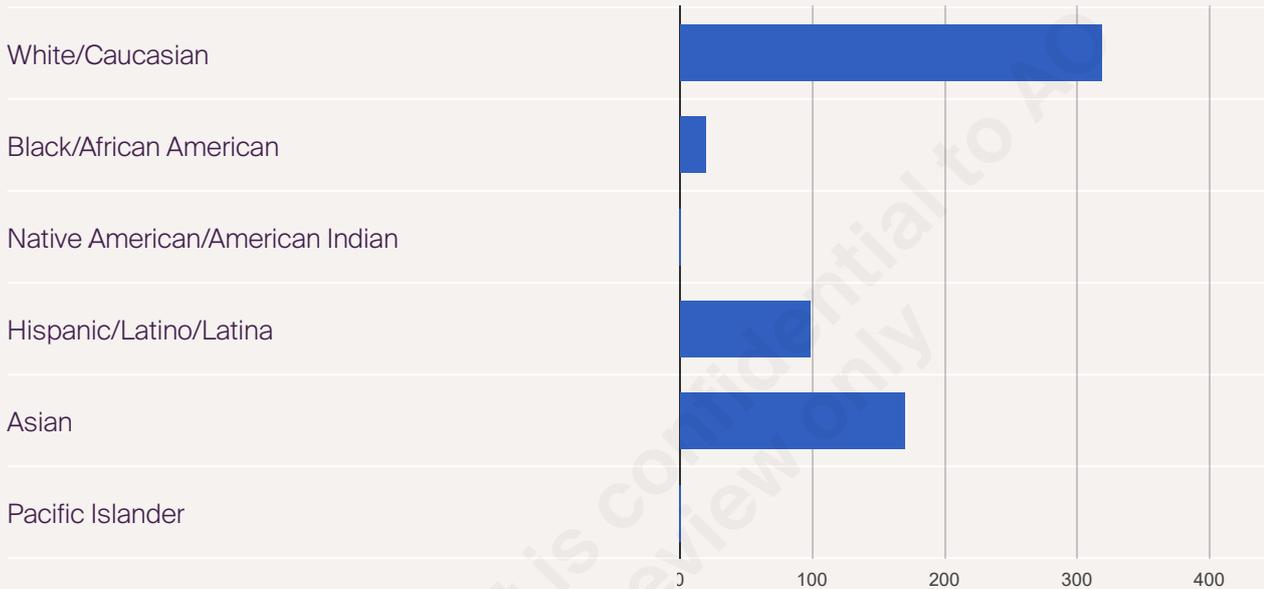
N=612



58

How do you define your **ethnicity**?

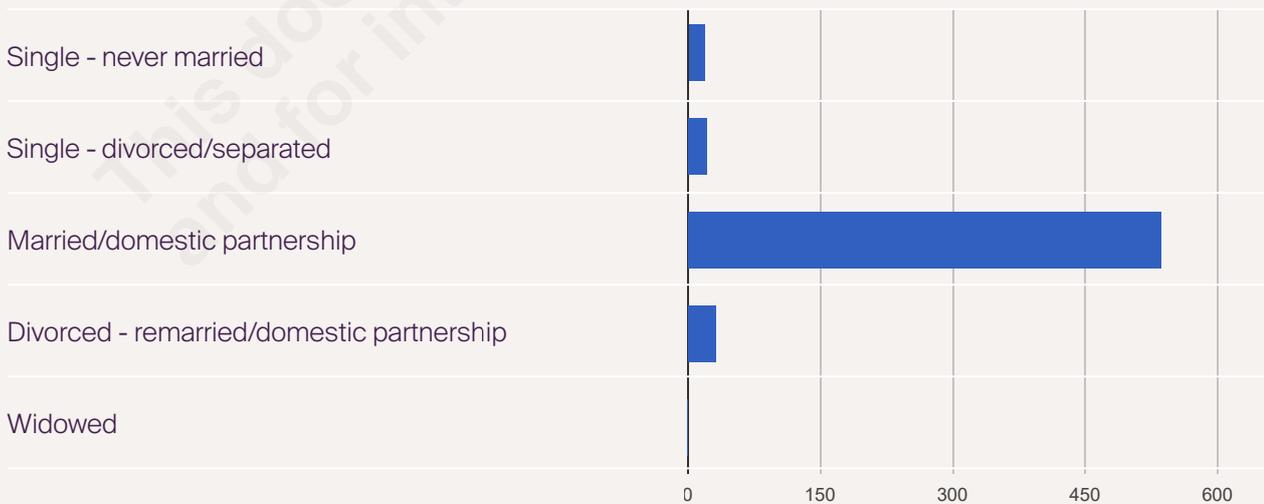
N=610



59

Please describe your current **relationship status**:

N=614



60

Do you currently have **children**?

N=613

