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Challenging the Status Quo: A Global Look at Diversity in Orthopaedics

November 28, 2020 | Article No. 30

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> "The perspective of the next generation of orthopaedic surgeons is this: the workforce needs to be more diverse. Diversity is improving and difficult questions are finally being asked with a challenge to the perceived status quo. However, the next step is the easiest to ask for and the hardest to achieve, a total change in culture." (4)
>
> **The International Orthopaedic Diversity Alliance (2020)**

As countries around the world become increasingly diverse, so do their workforces. As a result, a new generation is becoming acutely aware of the need to advocate for diversity, inclusion and equality, and empowered to challenge more traditional, longstanding ways of doing things. In the surgical field, these new ideologies are painting a distinct picture of the type of culture students and trainees wish to see (1). For example, a 2017 New Yorker cover titled "The Operating Table" by French artist Malika Favre inspired hundreds of surgeons from around the world to recreate the image and post their photograph with the hashtag #ILookLikeASurgeon (2). Another hashtag, #OperateWithRespect, was started by the Royal Australasian College of Surgeons (RACS) to support culture change within the profession. This initiative was motivated by a 2015 survey which showed that half of all surgical fellows, trainees and international graduates had suffered from abuse in the workplace (3).

Medical schools have also been making progress when it comes to fighting the hidden (and not so hidden) biases that plague the medical field. As a result, the diversity of medical graduates has steadily increased in many countries. However, the same rate of change has not been reflected in medical subspecialties such as orthopaedics, leading to the creation of many new organizations, such as the International Orthopaedic Diversity Alliance (IODA). The IODA, which was formed in 2019 by a network of orthopaedic surgeons, aims to advocate for cultural and gender diversity within orthopaedics and promote the sharing of strategies (1).

Exhibit 1. The New Yorker's Health, Medicine and The Body cover from April 3rd, 2017 titled "The Operating Table" by artist Malika Favre (2).

> "Given the fact that we are the least diverse subspecialty across the board, it also seems that orthopaedics as a profession has inherent cultural tendencies compared with other surgical specialties. These "inherent barriers" include a culture of long hours, personal sacrifice, and heavy workload. The lack of flexibility during the training and career years, as well as a lack of role models and mentorship, seem to be pervasive problems in promoting diversity. On a more global scale, the selection process for orthopaedic trainees, and even the culture of the profession that we create, is at risk for unconscious bias." (9)
>
> **The AOA Carousel Presidents (2019)**

Gender Diversity: Where Are We Now and What Is Being Done?

Women have always represented an integral and large portion of the global health workforce, making up an estimated 67% of the midwifery and nursing workforce worldwide (5). However, the number of physicians has historically, mainly been occupied by men. For example, in 1970 in Canada, the number of female physicians was just 7%. Over the last 50 years the number of female physicians has grown to over 40% (6). A similar promising trend has been seen around the world. According to the Organization of Economic Co-Operation and Development (OECD), the number of female physicians in 37 OECD countries (list of countries) (7) has risen by over 13% from 2000 to 2017 (5). The percentage of female and male physicians from various regions around the world can be seen in Exhibit 2 (5).

Region	Percentage Female	Percentage Male
Africa	28	72
Americas	46	53
Eastern Mediterranean	35	65
European	53	47
South-East Asia	39	61
Western Pacific	41	59

Exhibit 2. Percentage of female and male physicians in different world regions (5). Note: Data is from 91 different countries included in the World Health Organization (WHO) National Health Workforce Accounts (NHWA) Physician Data from 2019.

Although male physicians still outnumber female physicians in the America and South-East Asia regions (8), for several countries within these regions, such as Canada, the United States, New Zealand, and Australia, the number of female medical graduates now exceeds the number of male medical graduates (9)(10) (Exhibit 3). In Canada, this trend has been seen over the past decade (10). In other countries, such as the United States, the accomplishment is much more recent, with 2019 being the first year female medical graduates outnumbered male medical graduates (50.5% and 49.5 respectively) (11).

Country	Practicing Female Physicians (%)	Female Medical Graduates (%)
Canada	44.1	55
USA	36.6	50.5
New Zealand	45.7	56.3
Australia	41.8	50.7

Exhibit 3: Percentage of practicing female physicians (2018) (8) and female medical graduates (2016-2019) (9)(10) in Canada, USA, New Zealand and Australia.

The number of female medical graduates may be on the rise, but the increase in female representation within orthopaedics is relatively small in comparison. Exhibit 4 shows the percentage of female orthopaedic surgeons from various countries around the world. This data has been made available by the IODA and has been collected from each nation's orthopaedic association (1). Estonia for example, has shown one of the highest proportions of female orthopaedic surgeons (26%) and has also consistently demonstrated one of the highest proportions of practicing female physicians (64%) (1).; yet even they have a long way to go to achieving a gender balance. Other countries, such as Laos and Cambodia, have yet to begin their journey towards achieving gender diversity in field of orthopaedic surgery (1).

Country	Female Orthopaedic Surgeons (Female Orthopaedic Residents) (%)
Estonia	26.4 (36)
Sweden	16.8 (35)
Brunei	13.3
Canada	12 (26)
Columbia	10.3
Malaysia	10
Hong Kong	8.1 (20)
Tanzania	7.6 (5.3)
France	7.1 (15)
Chile	6.2 (13)
USA	6.1 (15.4)
Indonesia	5.4
New Zealand	5.0 (18)
Japan	4.9
United Kingdom	4.8 (19)
Australia	4.3 (15)
Kosovo	3.8 (0)
Thailand	3.8
Philippines	3.3
Singapore	3.2
Kuwait	2.0
Myanmar	2.0
Sri Lanka	1.1
Taiwan	1.0
Korea	0.8
India	0.5
Nepal	0.5
Bangladesh	0.4
Pakistan	0.3
Cambodia	0.0
Laos	0.0

Exhibit 4. Percentage of female orthopaedic surgeons and residents by country according to each nation's orthopaedic association (1). Note: data is from each nation's orthopaedic association; percentage of female orthopaedic residents is not available for all countries.

Like the number of medical school graduates, there is also a positive trend that exists. For many countries such as Estonia, Sweden, Canada and Hong Kong, the percentage of female orthopaedic residents is increasing (1); an encouraging sign that things are moving in the right direction. However, in countries such as Kosovo and Tanzania, the number of female orthopaedic residents is in decline (1); a reminder that there is still much that needs to be done and why collaboration and consistency in change efforts is so important.

> "Although diversity strategies may vary between nations, the principles they incorporate hold true for all. Diversity attracts the best talent and leads to improved decision-making and innovation in our organisations. Generous parental entitlements and progressive social policies are likely to be drivers for the participation of females in orthopaedic surgery. Leadership in diversity involves engaging female medical students, minimising unconscious bias, mentoring, creating an environment that is inclusive of females and providing support for those with family commitments."
>
> **Green et al. (2020)**

What Is Being Done To Improve Gender Diversity?

There are different measures being implemented in various countries to counteract some of the main deterrents for women.

1. Addressing biases in selection processes. Efforts to increase diversity in orthopaedics have ultimately begun with increasing the gender, age and cultural diversity in medical schools and extend through to orthopaedic trainee candidate selection. Many countries have begun to restructure selection processes and address existing bias in the hope that more female entrants to medical school will contribute to a balanced pool of candidates from which to choose orthopaedics trainees. In the United States, the American Academy of Orthopaedic Surgeons (AAOS) has created a strategic plan that prioritizes transparency in the selection process and provides implicit bias training (1). Results of improvements to these selection processes can be seen in Estonia for example, where no surgical unit now exists without a female orthopaedic surgeon (1).

2. Prioritizing diversity initiatives. Initiatives aimed at increasing diversity are vital to ensuring diversity is prioritized at all levels, biases in the selection process are addressed, and that the right candidates are attracted and retained. Overall, many countries have begun the process of developing and prioritizing diversity initiatives. For example, the Canadian Orthopaedic Association (COA) has developed a Gender Diversity Strategic Plan aimed at reducing bias, increasing females in leadership roles and facilitating mentorship (1).

3. The creation of supporting organizations. These organizations are vital to improving gender diversity in orthopaedics as they continue to provide support and mentorship, work to prevent discrimination and advocate for equality in the selection process. For example, the Women in Surgery Africa (WiSA) organization provides mentorship and support for women entering or currently working in the surgical field (1). The Association of Female Orthopaedic Surgeons of Chile, the Ruth Jackson Orthopaedic Society in the United States, and the Australian Orthopaedic Association's (AOA) Champions of Change working group are other great examples of organizations working towards gender diversity by advocating for women in orthopaedics (1).

4. The culture and perception of orthopaedics. This perception stems from longstanding systematic biases and persists in the culture of orthopaedics worldwide. This cultural perception is seen as a large deterrent for many women. For example, in Kuwait, women are seen as less likely to match to orthopaedic residency programs compared to men (1). Results of Australian and American surveys found that many women were more likely to not consider orthopaedics due to the perceived lack of flexibility in training and lack of time for family, friends and children. The Australian Orthopaedic Association (AOA) and the Ladies in Orthopaedics New Zealand (LIONZ) now work to set up workshops and social media initiatives aimed at changing these common perceptions surrounding a career in orthopaedics and generating more female interest (1).

5. Societal factors and socio-economic supports. Another deterrent is a lack of social support for women, especially if maternity and parental benefits and supports for breastfeeding and childcare are lacking. Even in countries such as Chile, where a six-month protected parental leave is offered, only 1% of fathers will choose to take parental leave (1). Many women may not consider this specialization due to societal factors, such as the feeling of responsibility to take on the role of primary caregiver when raising a family. In many northern European countries, parental leave is quite extensive. In Estonia for example, parents are provided with 435 days of parental benefits with previous income guaranteed (1). In Sweden, a similarly extensive parental leave is taken by a large number of fathers, providing women with more options and less pressure to become the main caregiver (1). Estonia and Sweden, amongst other northern European countries, currently show the greatest gender diversity in orthopaedics (1).

6. Role models in leadership positions. A lack of women in the field, especially the lack of female faculty members and board members, has meant an overall lack of role models for current and future medical students. As a result, less women feel inspired or encouraged to pursue a career in orthopaedics. In Kuwait, women only made up 10% of faculty members in the department of surgery at Kuwait University (1). In Malaysia, the Philippines, Australia, New Zealand, and the United States there are active efforts to increase the representation of women in faculties and orthopaedic organization boards (1). In Estonia, the president of the Estonian Orthopaedic Society (EOS) has been a female since 2015 (1).

Cultural Diversity: Where Are We Now and What is Being Done?

> "The steady gains in the medical school enrollment of women are a very positive trend, and we are delighted to see this progress. However, the modest increases in enrollment among underrepresented groups are simply not enough. We cannot accept this as the status quo and must do more to educate and train a more diverse physician workforce." (11)
>
> **David J. Skorton, MD**
> **AAMC president and CEO**

Where Are We Now?

Despite progress in increasing gender diversity in medicine and in orthopaedics, there is still a lot that needs to be done when it comes to improving cultural diversity. In many cases, there is also a lack of data. Exhibit 5 outlines the cultural demographics of the general population, medical school graduates and orthopaedic surgeons for the United Kingdom, South Africa, Canada, Australia, the United States and New Zealand. Overall, the representation of various ethnic groups in medical school graduates is not reflective of the cultural composition of the country and this representation becomes drastically less when considering the diversity of orthopaedic surgeons. However, similar to trends for gender, cultural diversity in orthopaedic trainees seems to be improving in some places. This trend can be seen in Australia where the number of indigenous orthopaedic trainees is greater than the current number of practicing orthopaedic surgeons.

	Cultural Demographics		
Country	**General Population**	**Medical School Graduates**	**Orthopaedic Surgeons**
United Kingdom	White: 85.5% Mixed or multiple ethnic groups: 2.3% Asian/Asian British: 7.8% Black/African/Caribbean / Black British: 3.5% Other ethnic groups: 1% (12)	White: 70.5% Black/African/Caribbean/ Black British: 3.1% Asian: 19.1% Mixed or multiple ethnic groups: 3.6% Other ethnic groups: 1.7% (16)	No data available. The National Health Service reported ethnic demographic data for the entire workforce. As of 2019, 13% of the workforce were Black, Asian, and Minority Ethnic Groups (BAME). (13)
South Africa	Black: 79.4% White: 9.2% Coloured: 8.8% Indian/Asian: 2.6% (14)	Black: 38.7% Coloured: 13.4% Indian/Asian: 13.6% White: 33% (4)	No data available. 193 orthopaedic surgeon trainees (registrars). Black: 45% White: 33% Coloured:13%) Indian: 9% (9)
Canada	Not a visible minority: 77.7% Visible minority: 22.3% (15)	No data available. Recognized that there are less aboriginal or lower socioeconomic graduates. (9)	No data available.
Australia	Indigenous (Aboriginal and Torres Strait Islander): 3% (4)	Indigenous: 1.4% (17)	Indigenous: 0% Currently 5 trainees (0.36%) (4)
United States	White: 76.3%; Black/African American: 13.4% Hispanic/ Latino: 18.5% Asian: 5.9% (9) Multiple race/ethnicity: 2.8% American Indian/Alaskan Native: 1.3% Native Hawaiian/Pacific Islander: 0.2% (19)	White: 54.6% Asian: 21.6% Black/African American: 6.2% Hispanic: 5.3% Multiple race/ethnicity: 8% American Indian/ Alaskan Native: 0.2% Other/Unknown: 2.5% (18)	White: 73.2% Asian:13.3% Black: 4.0% Hispanic: 5.6% Other: 3.9% (9)
New Zealand	Indigenous (Maori): 16.5% (4)	Indigenous (Maori): 15% (9)	No data available. Currently 15.5% of trainees are Maori) (4)

Exhibit 5. Cultural demographics of the general population, medical school graduates and orthopaedic surgeons in the United Kingdom, South Africa, Canada, Australia, the United States and New Zealand (4)(9)(12-19).

What Is Being Done To Improve Cultural Diversity?

There are now active initiatives to ensure students from diverse backgrounds are represented in the medical schools, while ensuring the admission is still based on traditional achievement benchmarks.

United Kingdom: The British Orthopaedic Association (BOA) has initiatives dedicated to showcase orthopaedics and trauma in the medical societies of secondary schools. (9)

South Africa: Selection criteria for orthopaedic trainees have been modified to better reflect the demographics of South Africa's population (4).

Canada: Certain medical schools have awarded 10-15% of their medical school admissions to applicants from certain cultural or socioeconomic backgrounds. The goal is for the cultural composition of medical schools to reflect the composition of their immediate community. There are currently no special considerations made in residency or fellowship training programs. (9)

Australia: The Australian Orthopaedic Association (AOA) participated in the Australian Indigenous Doctors Association (AIDA) Conference in 2019 and continues to host workshops to generate interest in orthopaedic surgery. There are also several scholarships, mentoring prizes and a special Indigenous Surgical Trainee Selection Initiative geared towards encouraging Indigenous Australians in their orthopaedic career. (4)

United States: The American Orthopaedic Association (AOA) has facilitated many symposia focused on diversity. The American Academy of Orthopaedic Surgeons (AAOS) has also established a special Diversity Advisory Board and elected presidents from many different ethnic backgrounds. (9)

New Zealand: The Royal Australasian College of Surgeons (RACS) and the New Zealand Orthopaedic Association (NZOA) have included special Maori cultural advisors on selection committees and are working to create a mentorship and support program for Maori and Pacific Islander physicians (9).

> "We have a diversity gap in the global orthopaedic profession. Cultural, structural, and unconscious bias barriers exist that make change difficult. Expanding the conversation with our international colleagues can provide ideas, commitment, and leadership, with the hope of effecting positive change."
>
> **The AOA Carousel Presidents (2019)**

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