



Original Article

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## IMGs Matching into Plastic Surgery in the United States: The Domino Effect

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### Introduction

“The Black Swan”, the title of *The New York Times* Bestseller written by Nassim Nicholas Taleb in 2007, was recently attributed to international medical graduates (IMGs) in the field of plastic surgery, for that is what they have been described as: “wild cards; the black swans of plastic surgery”. [1] Since the results of the 2021 National Resident Matching Program were out, there has been an increasing talk about the exceedingly competitive nature of plastic surgery and the onerous requirements for landing a residency spot, growing more stringent, year after year, cycle after cycle, and rendering plastic surgery residency extremely difficult to get into.

### Discussion

The 2021 Match cycle, also known as the COVID-19 Match, has been unprecedented, just like the prodigious virus itself. This match has been the largest in history including the greatest number of residency positions ever offered (38,106), participating programs (5,915), and applicants (48,700). [2]

However, there has been a discordant fall in match rates of US MD Seniors, US Osteopathic (DO) Seniors, US IMGs, and non-US IMGs (Table 1).

Moving towards an increasingly competitive match, IMGs have been affected more than others. While 92.9% of US MD Seniors and 89.1% of US DO Seniors successfully matched, only 59.5% of US IMGs and 54.8% of non-US IMGs did (Table 1). Although the 2021 match rates have fallen across the board, it has affected IMGs to a greater extent: the 2021 match rate of non-US IMGs has fallen by 6.3% from 2020, compared to only 0.9% for US MD Seniors and 1.6% for US DO seniors (Table 1).

Match Year	US MD Seniors	US DO Seniors	US IMG	Non-US IMG
2010	93.3	75	47.3	39.8
2011	94.1	75.4	50	40.9
2012	95.1	78.8	49.1	40.6
2013	93.7	78.5	52.8	47
2014	94.4	82.1	53	49.5
2015	93.9	82.7	53.1	49.4
2016	93.8	83.8	53.9	50.5
2017	94.3	85	54.8	52.4
2018	94.3	81.7	57.1	56.1
2019	93.9	88.1	59	58.6
2020	93.7	90.7	61	61.1
2021	92.8	89.1	59.5	54.8

**Table 1** showing match rates of US MD Seniors, US DO Seniors, US IMGs, and Non-US IMGs 2010-2021. [2]

Abbreviations: United States (US), Medical Doctor (MD), Doctor of Osteopathic Medicine (DO), International Medical Graduate (IMG).

One might argue that according to NRMP statistics, the absolute number of accepted applicants (including IMGs) has in fact risen from 2020 to 2021, thus attributing the fall of 2021 match rates to

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MAR Plastic and Reconstructive Surgery 1.2

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the increase in the absolute number of applicants. [2] Therefore, we instead look at the increase in number of matches compared to the increase in number of applicants across groups. For example, 535 more US MDs matched while 753 more US MDs applied in 2021 compared to 2020 (71% if we divide the two values). Applying the same comparison to US IMGs, we find out that 17 more US IMGs matched with respect to 144 more US IMGs who applied in 2021 compared to 2020 (11.8%). Similarly, the ratio for non-US IMGs is 17.4%. Hence, although the total number of matched and unmatched applicants increased among all categories, the proportion of newly matched students compared to all new applicants is disproportionate among groups: least for IMGs.

Furthermore, Integrated Plastic Surgery is still one of the hardest specialties for IMGs (and US students) to match into, with less than 10% of matching applicants being non-US MDs in 2021. [2] Among US applicants who ranked plastic surgery as their only choice in 2021, 80% of US MD Seniors and 100% of US DO Seniors matched! [2] On the other hand, only 16.7% of US IMGs and 33.3% of non-US IMGs matched in the 2021 cycle. [2] If we trace this back in time, we can note a downward trend in the percentage of accepted IMGs in plastic surgery residency with succeeding years. In 2020, more US IMGs and the same percentage of non-US IMGs matched (Table 2). [3] In 2016, 60% (43.3% more) of US IMGs and 33.3% of non-US IMGs matched (Table 2). [3] Therefore, although overall match rates of IMGs are going up across the years, especially before 2020 (Table 1), the acceptance rate of IMGs in plastic surgery is either remaining the same or going down (Table 2).

Match Year	US MD Seniors	US DO Seniors	US IMG	Non-US IMG
2016	90		60	33.33
2018	89.7		NR	18.75
2020	79.65	0	25	33.33
2021	79.87	100%	16.67	33.33

**Table 2** showing match rates of US MD Seniors, US DO Seniors, US IMGs, and Non-US IMGs in plastic surgery. [3]

Abbreviations: United States (US), Medical Doctor (MD), Doctor of Osteopathic Medicine (DO), International Medical Graduate (IMG).

Similar to our previous analysis, it is necessary to look at absolute numbers of IMG applicants to rule out that the above decrease in match rates of IMGs is due to an increasing total number of IMGs applying. While the match rates of US IMGs decrease from 65, to 25, to 16.67% from 2016, to 2020, to

2021 respectively, the absolute number of US IMG applicants fluctuates around the same value (5,4,6 respectively). [3] Similarly, the match rates of non-US IMGs remain at 33.33% in 2016, 2020, and 2021, while the absolute number of non-US IMG applicants are 9,9,6 respectively. [3] Therefore, what is the reason that the overall total number/match rates of accepted IMGs are increasing throughout the years while that of IMGs in plastic surgery are decreasing or remaining the same?

We hypothesize that one possible reason for this is the increasing preparedness of IMGs in plastic surgery throughout the years. The decreasing rate of acceptances, going in parallel with increasing USMLE scores, abstracts, presentations, and publications, is far from coincidence. Non-US IMGs matching in plastic surgery in 2018 had a mean USMLE Step 1 score of 228, mean USMLE Step 2 score of 242, and 28 abstracts, presentations, and publications on average.<sup>3</sup> The same numbers in 2020 were 245 for Step 1, 244 for Step 2, and up to 59.8 abstracts, presentations, and publications on average (vs 19.1 for matching US MDs)! [3] This outstanding preparedness of IMGs applying to plastic surgery has been progressively skyrocketing throughout the years, setting the bar higher for each future cycle, making it even harder for ensuing IMG applicants to get accepted into plastic surgery. We describe this as the *Domino Effect* of IMGs in Plastic Surgery, backfiring at them and exacerbating the competitiveness across cycles.

### **Conclusion**

We argue that absent any considerate plans and steps, this might lead to a never-ending vicious cycle of competitiveness rendering many competent medical students (US MDs, US IMGs, and non-US IMGs) unable to apply or get accepted. Possible actions to cut-off this vicious cycle include designing less stringent and more IMG-friendly programs. US residency programs should provide greater support, equity, and inclusion to innovators and passionate students from all over the world, regardless of their country of origin or education.

### **Contribution Statement:**

BH is the first author of the manuscript who developed the idea and wrote the manuscript. RH prepared the tables and helped in writing the manuscript.

### **Conflict of Interest Statement:**

The authors have no conflicts of interest to declare.

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