

# Underrepresentation of Filipino, Laotian, Cambodian, and Indonesians Among US Allopathic Medical Students



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## ABSTRACT

**BACKGROUND:** With increasing efforts to cultivate and foster a diverse physician workforce to improve the delivery of culturally responsive care, the accurate representation of Asian medical students continues to be obscured by aggregation of over 40 ethnic groups that are categorized as Asian race.

**OBJECTIVE:** To describe representation of Asian ethnic groups among applicants and matriculants to US allopathic medical schools.

**DESIGN AND PARTICIPANTS:** Cross-sectional study of applicant and matriculant data from 2020 to 2023, provided by the Association of American Medical Colleges, on self-reported Asian ethnic group and sex of medical school applicants and matriculants, compared with the American Community Survey population estimates of the typical medical school-aged population.

**MAIN MEASURES:** For each academic year, Asian ethnic group, and sex, the representation quotient (RQ), defined as the proportion of an ethnic group in the total

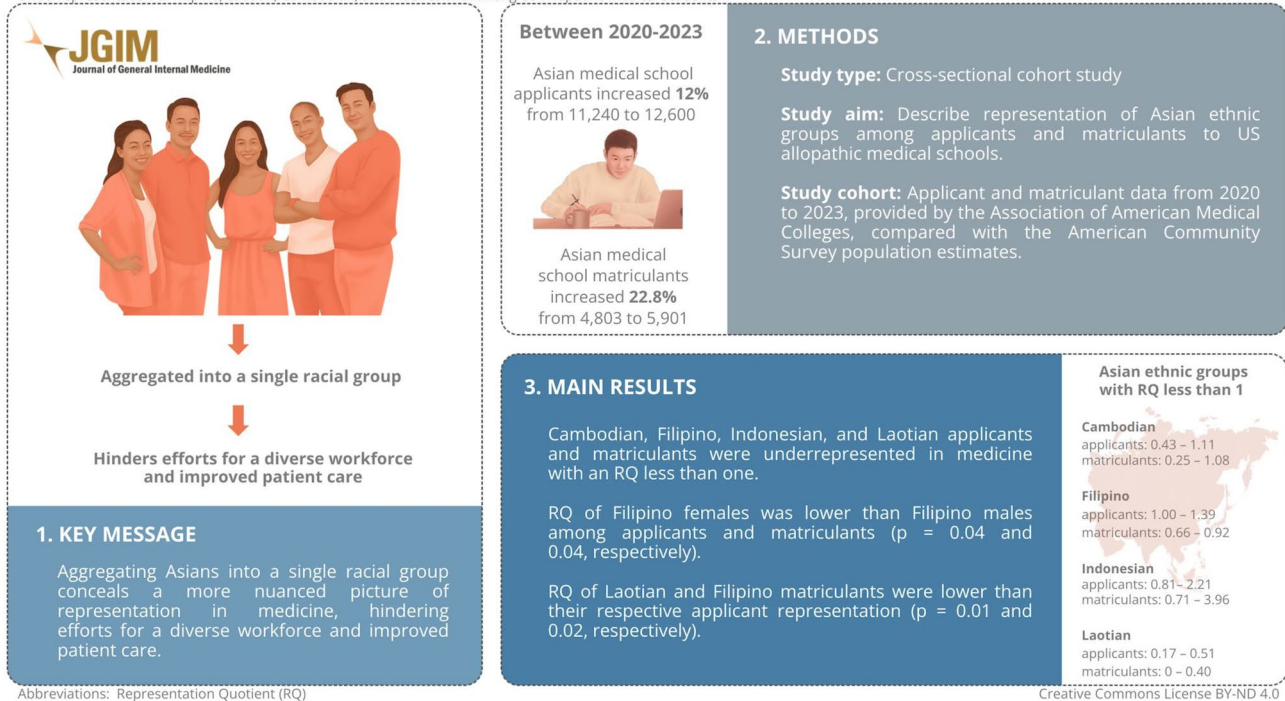
population of medical school applicants or matriculants relative to the corresponding estimated proportion of that ethnic group in the US population, was calculated. We compared differences in applicant and matriculant RQs using t-tests for those with an RQ less than one.

**KEY RESULTS:** Cambodian, Filipino, Indonesian, and Laotian applicants and matriculants were underrepresented in medicine with an RQ less than one. The RQ of Filipino females was lower than Filipino males among applicants and matriculants ( $p=0.04$  and  $0.04$ , respectively). The RQ of Laotian and Filipino matriculants were lower than their respective applicant representation ( $p=0.01$  and  $0.02$ , respectively).

**CONCLUSIONS:** With disaggregated race and ethnicity data, we found significant variation in representation of Asian ethnic groups among medical school applicants and matriculants relative to the US population. Aggregating Asians into a single racial group conceals a more nuanced picture of representation in medicine, hindering efforts for a diverse workforce and improved patient care.

## Graphical Abstract

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**KEY WORDS:** Asian; Equity; Diversity and inclusion; Health care workforce

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## INTRODUCTION

Recent efforts to make medical education more accessible have aimed to recruit individuals from diverse backgrounds, particularly those who are historically underrepresented in medicine due to their race, ethnicity, socioeconomic status, and/or disability. The premise for these efforts is based on a well-established body of literature describing how cultivating a diverse workforce can improve the delivery and effectiveness of culturally appropriate care and increase access to health care for underserved populations<sup>1,2</sup>. For example, increased representation of Black primary care physicians has been associated with lower mortality rates among Black individuals<sup>3</sup>. While these efforts have appropriately targeted historically underrepresented racial groups including American Indian or Alaska Native, Black, Hispanic, and Native Hawaiian and Pacific Islander people, the historical representation of Asians as an aggregate group has led to their omission from this conversation<sup>4,5</sup>.

Recruitment of Asian individuals in efforts to diversify the healthcare workforce is an essential step to improving

the delivery of and access to healthcare for underserved populations, which includes Asian populations<sup>6-8</sup>. Greater inclusion of Asian trainees within the healthcare workforce will increase advocacy for their communities and awareness of their unique health issues and disparities<sup>9</sup>. Asian communities, not unlike other diverse racial and ethnic communities, hold specific cultural beliefs and values that inform healthcare-decision making. Combined with language access challenges, the underutilization of health and mental health care services, and low health-related knowledge and awareness, the heterogenous Asian community requires more nuanced consideration and responsive action from health providers<sup>10</sup>. Moreover, Asian medical students are a minoritized racial group – on the receiving end of discrimination and microaggressions, requiring mentorship and guidance from racially-concordant senior mentors and peers to thrive and be successful physicians<sup>11</sup>. In addition, Asian female medical students face unique challenges relative to their male counterparts and are more likely to experience microaggressions<sup>12,13</sup>.

Research surrounding diversification efforts has used the Representation Quotient (RQ) as a method of assessing representation by race, drawing from the Association of American Medical Colleges (AAMC) definition of underrepresented minority (URM) as “underrepresented in the medical profession relative to their numbers in the general population.”<sup>14</sup> A recent publication using available

data from 2013 to 2021 found that Cambodian, Filipino and Laotian medical school matriculants and Laotian medical school applicants were underrepresented based on this definition<sup>15,16</sup>. However, previous studies have not reviewed more recent medical school matriculant and applicant data nor examined the differences in representation based on sex. To address this data gap, our analysis aims to examine the current representation of Asian students in US undergraduate medical education programs by presenting data disaggregated into specific ethnic groups and by sex.

## METHODS

### Study Setting and Participants

In this cross-sectional cohort study of public-use data, applicant and matriculant data from the AAMC was collected to examine Asian representation among the medical student population from 2020 to 2023; these self-reported data are publicly available on the AAMC website through the annual AAMC FACTS tables<sup>17</sup>. We define the medical student population to include both applicants and matriculants as described previously<sup>15</sup>. We obtained national data from the US Census Bureau's American Community Survey and Census data from 2020–2023 to ascertain the population estimates of the US Asian population of similar age (18 to 34 years old) to medical school applicants and matriculants. All data were de-identified prior to our use. This study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines for cohort studies<sup>18</sup>. The study was reviewed and deemed exempt from obtaining informed consent by the Yale University Institutional Review Board (IRB).

### Asian Ethnicity

Participants self-identified their race and ethnicity on the American Medical College Application Service. Asian ethnic groups that were presented as options including Bangladeshi, Cambodian, Chinese, Filipino, Indian, Indonesian, Japanese, Korean, Laotian, Pakistani, Taiwanese, Vietnamese, or Asian Other. "Asian Other" likely includes Bhutanese, Burmese, Hmong, Malaysian, Mongolian, Nepalese, Okinawan, Sri Lankan, and Thai as these are Asian ethnic groups collected by the US Census but not collected by the AAMC. As we do not differentiate between foreign-born and US-born students, we use Asian to refer to this population over Asian American. To calculate the total number of Asians, we added all those who identified as any of the 12 Asian ethnic groups listed above as well as "Asian Other" or selected multiple Asian ethnic groups (i.e., multiethnic). Individuals who identified as any race other than Asian (i.e. Black, Hispanic, Latino/a, or of Spanish Origin, American Indian or Alaskan Native, or White) were excluded from this study. We also excluded participants who identified as Asian

and one of the other races listed above (i.e., multiracial). Although we include "Asian Other" and multiethnic Asian in the total number of Asians, we did not report them as a separate subgroup in our analysis.

## Outcomes

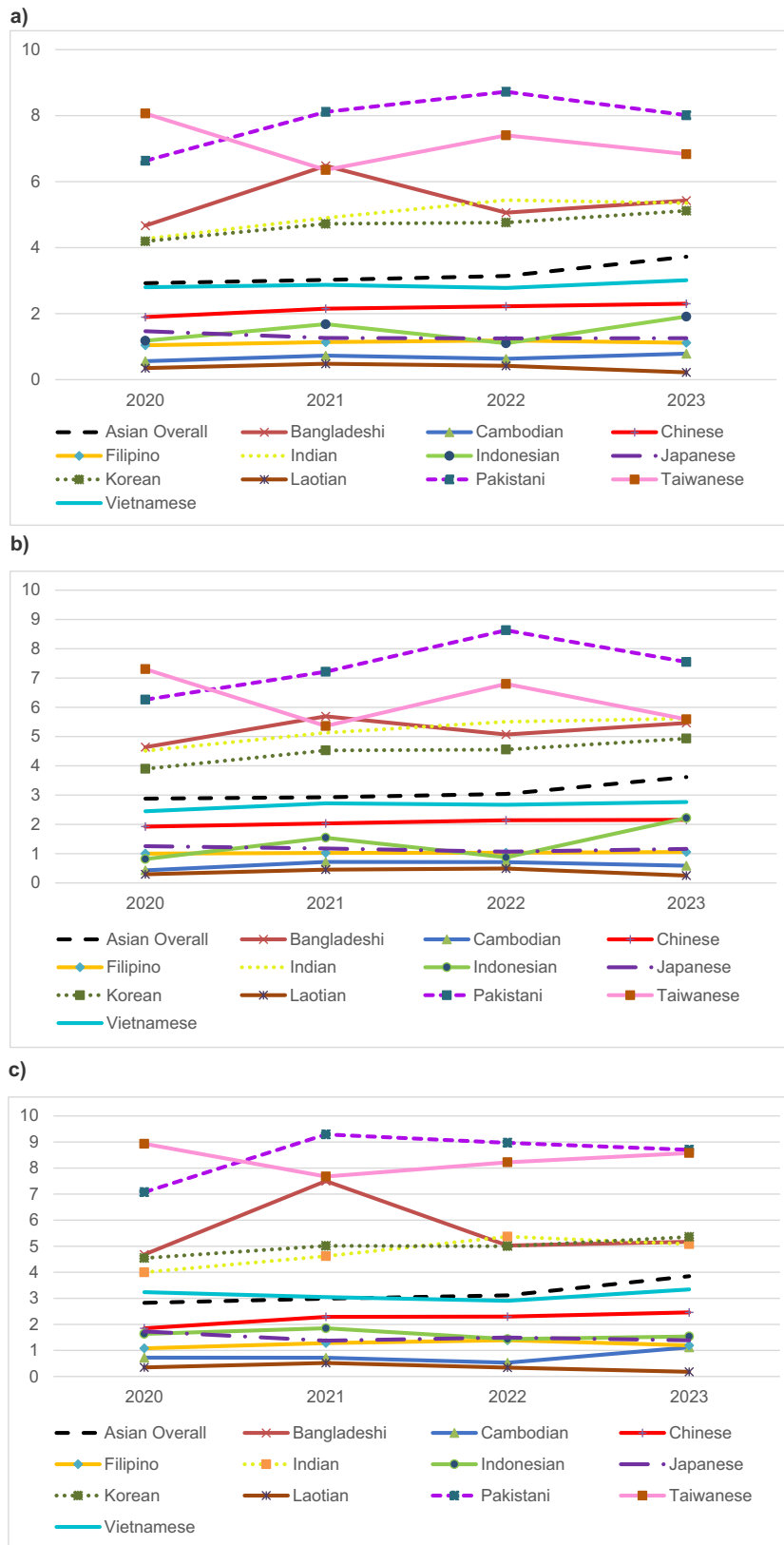
We used the representative quotient (RQ) as our primary outcome. The RQ was calculated as the ratio of the proportion of an ethnic group in the total population of medical school applicants or matriculants over the corresponding estimated proportion of that ethnic group in the US population<sup>19</sup>. An RQ less than 1 suggests underrepresentation, while a RQ greater than 1 suggests overrepresentation and RQ equal to 1 indicates proportional representation. This outcome ( $RQ < 1$ ) is consistent with the AAMC definition of underrepresentation: "those racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population."<sup>14</sup>

The RQ was calculated for each Asian ethnic group as well as by sex within each subgroup among applicants and matriculants. For the purposes of this paper, we defined any group that had an applicant or matriculant RQ less than one for any of the four academic years as underrepresented. For these underrepresented populations, we compared differences in male and female applicant and matriculant RQs using t-tests. We also compared differences in applicant or matriculant RQs using t-tests. Analyses were conducted between July 1, 2023, and December 1, 2024. We performed analyses using Microsoft Excel and STATA MP version 18.0 (StataCorp, College Station, TX).

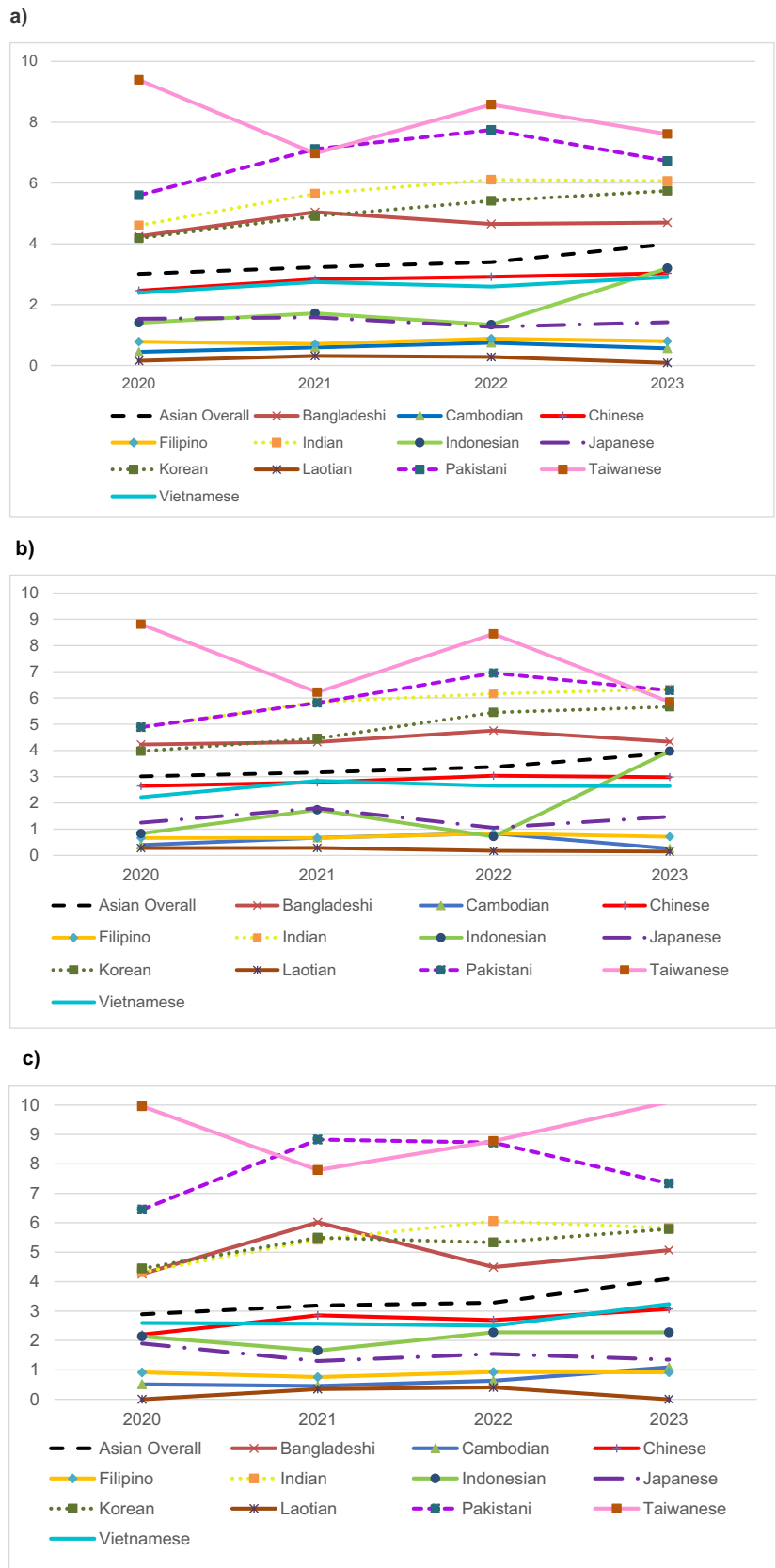
## RESULTS

Between 2020 and 2023, the absolute number of Asian medical school applicants increased 12% from 11,240 to 12,600 and the absolute number of matriculants increased 22.8% from 4,803 to 5,901 (eTables 1 and 2)<sup>17</sup>. This was largely driven by an increase in Chinese, Indian, and Pakistani applicants and matriculants. In that same period, similar to the US population, proportional representation of every male and female Asian ethnic group aged 18 to 34 years decreased except for Indonesian females and Vietnamese males.

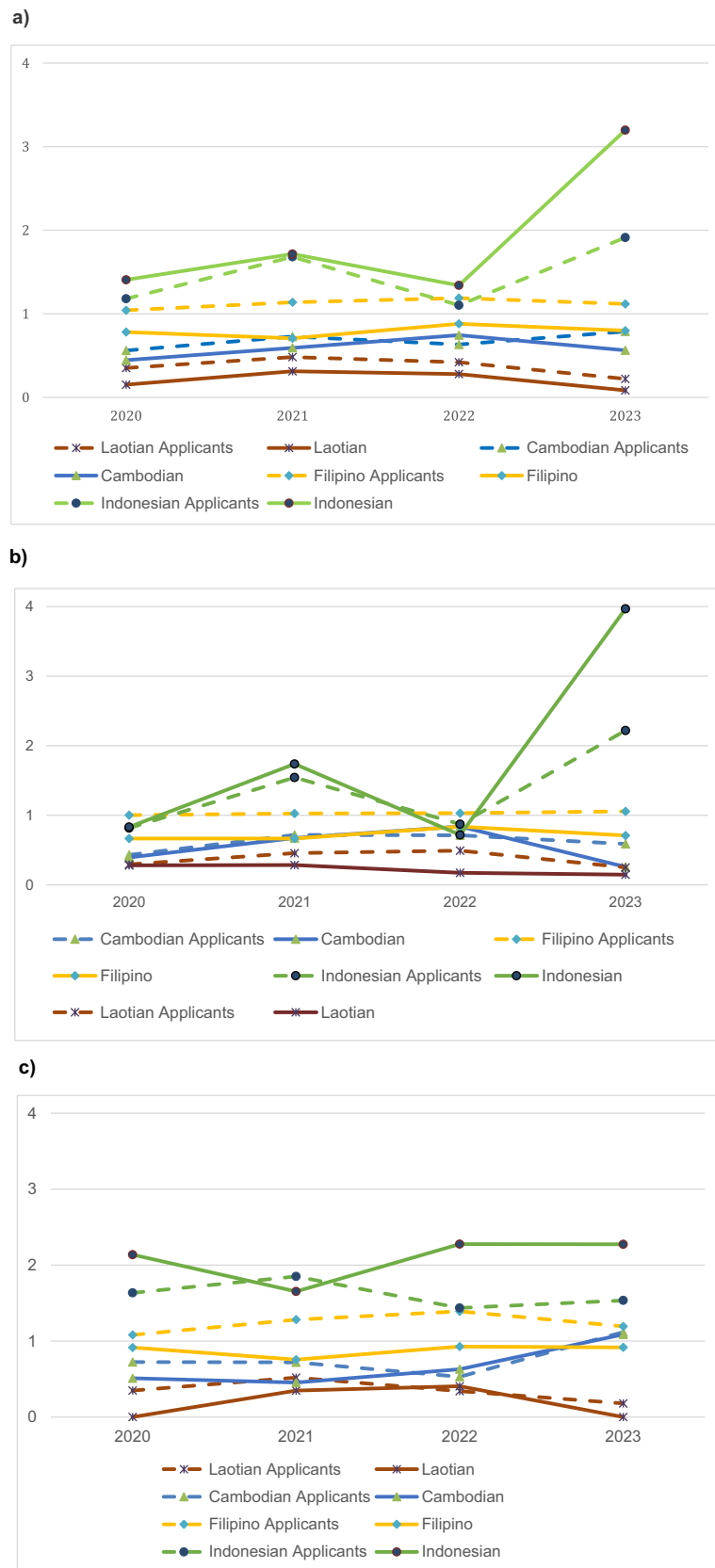
The RQ for Asian applicants is shown in Figure 1a and eTable 3, stratified by sex (Fig. 1b female, Fig. 1c male). The RQ for Asian matriculants is shown in Figure 2a and eTable 4. The RQ among applicants varied from 0.17 for Laotian male applicants to 9.29 for Pakistani male applicants, and the RQ among matriculants ranged from 0 for Laotian male matriculants to 10.10 for Taiwanese male matriculants. Four Asian ethnic groups had an RQ less than 1 during the study period and are, by definition, underrepresented populations: Cambodian (applicants: 0.43–1.11; matriculants: 0.25–1.08), Filipino (applicants: 1.00–1.39; matriculants:



**Figure 1 Representation of Medical School Applicants by Asian race and ethnicity, 2020 to 2023. Asian ethnic group representation among medical school applicants relative to their representation in the US population among (a) all applicants, b female applicants, and (c) male applications. RQ indicates representation quotient where  $RQ < 1$  suggests underrepresentation.**



**Figure 2 Representation of Medical School Matriculants by Asian race and ethnicity, 2020 to 2023. Asian ethnic group representation among medical school matriculants relative to their representation in the US population among (a) all matriculants, b female matriculants, and (c) male matriculants. RQ indicates representation quotient.**



**Figure 3 Comparison of Applicant and Matriculant Representation for Select Asian Ethnic Groups, 2020 to 2023. Selected ethnic groups represented here are those that had RQs less than one, suggesting underrepresentation within the medical school admissions processes. RQ over time for applicants and matriculants among (a) all underrepresented ethnic groups, b females within the ethnic groups, and (c) males within the ethnic groups.**

0.66–0.92), Indonesian (applicants: 0.81–2.21; matriculants: 0.71–3.96), and Laotian (applicants: 0.17–0.51; matriculants: 0–0.40). There was a large increase in the RQ for Indonesians between 2022 to 2023, largely driven by an increase in female matriculants, from 3 to 13 individuals.

Next, we observed differences between male and female representation within each underrepresented Asian ethnic group to better understand if there were sex differences in the medical school application process. Among the four underrepresented Asian ethnic groups, we observed that Cambodians and Laotians had RQs lower than 1 among applicants and matriculants for both females and males (Fig. 3). Female, but not male, Indonesian applicants and matriculants had RQs lower than 1 in 2020 and 2022. Among Filipinos, we observed that the RQs for males were significantly higher than the RQs for females among applicants and matriculants ( $p=0.04$  and  $0.04$ , respectively).

We compared the representation between applicants and matriculants to understand how individuals in each ethnic subgroup progressed through the admissions process and focused on the underrepresented groups as identified above (Fig. 3). We observed differences in RQs for Laotian and Filipino applicants compared to matriculants ( $p=0.01$  and  $0.02$ , respectively), with matriculant RQs being significantly lower than applicant RQs in both cohorts. Conversely, Cambodians and Indonesians had similar RQ for applicants and matriculants.

## DISCUSSION

After disaggregating data regarding Asian medical school applicants and matriculants, we found that there is large variation in representation by Asian ethnic groups within US allopathic medical schools. Additionally, we found that there are differences in representation by sex and between applicants and matriculants by Asian ethnicity. This is the first published study to examine representation of Asian medical school applicants and matriculants in a disaggregated manner by both ethnicity and sex. Our findings reaffirm recently reported variation in representation among Asian ethnic groups, identify differential representation within the Filipino community by sex, and suggest the presence of barriers within the admissions process for Laotian and Filipino applicants<sup>15</sup>.

This study expands upon the body of literature focused on representation of underrepresented populations among US medical students<sup>19,20</sup>. While we acknowledge that underrepresentation among other minoritized groups is significant<sup>19</sup>, providing space for Asians is equally important as they face unique health challenges and have specific cultural considerations related to their health that are particularly challenging to address. One of the distinctive challenges within Asians is that they represent over 40 different ethnic groups, each with their individual cultural preferences and languages, and

have the highest limitation of English proficiency among all racial groups<sup>21</sup>. As a result, most Asians prefer patient-provider concordance at the ethnicity level rather than the racial level, a preference that is strengthened if they have had communication problems in the healthcare setting such as language and cultural barriers between patients and their providers<sup>22</sup>. Therefore, efforts to increase Asian representation is complicated by the need to more deeply understand the immense diversity within this group.

Since patient-provider concordance improves patient satisfaction and outcomes and because Asians prefer ethnic concordance, evidence-based interventions to improve representation of currently underrepresented Asian ethnic subgroups within healthcare are needed<sup>1,2,23–25</sup>. Within the Asian healthcare workforce, data disaggregation is an essential first step to address the healthcare needs of the heterogenous Asian population. We recognize that data disaggregation among the general Asian population has been instrumental in elucidating health disparities. For example, applying basic descriptive statistics like mortality (e.g., heart disease is the leading cause of death amongst South Asians, cancer is the leading cause of death amongst East Asians<sup>26</sup>) have allowed us to more effectively tailor our approaches, both in research and funding, to develop solutions addressing the most pressing health needs within specific Asian ethnic communities. In another example, while Asians have lower overall cancer rates compared to non-Hispanic White (NHW) people, the rates of liver cancer among Laotians and Filipinos are seven and two times, respectively, higher than NHW<sup>27</sup>. Improving representation of currently underrepresented Asian ethnicities in medical schools could improve ethnic concordance and lead to improved patient care and outcomes<sup>28–32</sup>.

Prior work by Lett and colleagues used RQs to describe the representation of different racialized groups in medical schools<sup>19</sup>. Here, the inclusion of disaggregated Asians allows us to further understand the nuances of representation in medical schools. We do not advocate for the use of specific proportional targets by group because policies enforcing target proportions would not be responsive to the needs of the ever-changing US population<sup>19</sup>. Rather, we recommend using the RQ to understand barriers to representation for different minority groups. For example, since the RQ for matriculants is lower than the RQ for applicants in our study for Laotians and Filipinos, they likely face systemic barriers in the admissions process. Furthermore, the RQ for Filipino female applicants and matriculants was significantly lower than the RQ for Filipino male applicants and matriculants. This suggests that Filipino females face barriers in the admissions process that differ from their male counterparts. Future work should be conducted to identify potential systemic barriers faced by these individuals, including investigating the experiences of the admissions process for diverse individuals, availability of equitable resources, and the utilization of such resources. There is currently little to

no qualitative data describing possible discriminatory experiences within applicant interviews or other aspect of the admission process<sup>4,5</sup>. Understanding diverse learners' experiences earlier along the pipeline is an additional area to identify potential systemic barriers, especially given the lower household incomes and college education completion rates for Laotians compared to other Asian ethnic groups that could lead to their relatively lower representation in post-graduate programs<sup>33</sup>. Additionally, previous literature have identified that Filipino females have lower educational attainment compared to their male counterparts, and this finding correlates with our results on Filipino females versus male representation<sup>34</sup>. The findings in our paper and others that quantify representation can subsequently target future research endeavors to focus on subpopulations and their experiences along the medicine pipeline. While preexisting pipeline programs have been effective at bolstering representation for other racial groups, no pipeline programs exist to the authors' knowledge that focus on specific Asian ethnic groups<sup>35,36</sup>. Existing pipeline programs can consider broadening their definition of URM to be inclusive of identified underrepresented Asian ethnic groups. Identifying barriers specific to Asian ethnic groups and sex differences within each ethnic group will be critical towards reaching ethnic parity in the healthcare workforce. Lastly, we also do not advocate for the use of RQ to reduce the number of applicants in other Asian ethnic groups as in a zero-sum equation.

It is also important to recognize that diversifying the workforce by itself will not resolve health disparities within a community. For instance, while Chinese individuals are well-represented within the physician workforce<sup>37</sup>, Chinese communities continue to face significant disparities during the COVID-19 global pandemic, including being less likely to be tested for COVID-19 and more likely to have COVID-19-related mortality<sup>38-42</sup>. Additionally, there is wide variation in socioeconomic status and language proficiency among Chinese physicians, representation does not necessarily address the needs of patients who speak a different Chinese dialect or recognize the needs of those in lower socioeconomic situations despite racial concordance. Therefore, while representation is important, future efforts should also consider how different groups of Asians are included in healthcare, both at the training level and in the workforce. Recent research has described the invisibility of Asians in medicine: in their day-to-day experience, within the curriculum, and in academic leadership positions<sup>4,5,43,44</sup>. Thus, efforts to diversify the workforce through improving medical school representation should be done in parallel with other efforts to improve the inclusion and sense of belonging for Asians in healthcare.

## Limitations

This study is limited in several ways. First, we only present 12 Asian ethnic groups in this study because AAMC only collects data on these ethnic groups. This excludes other Asian ethnic

groups that are reported on in the American Community Survey. These missing populations have distinct experiences, including language and immigration experience and many of these groups have been shown to be underrepresented in the physician workforce<sup>37</sup>. Second, this study focuses on quantitative representation of specific Asian ethnic groups but does not account for the complex narratives and unique, individual perspectives within these ethnic groups. Future research should include factors such as socioeconomic status, geography, language proficiency and generational status among these groups to understand detailed profiles of experiences and intersectional identities. Third, data from the AAMC does not capture data on osteopathic medical schools, which may or may not have different application and matriculation rates by Asian ethnicity. Lastly, population sizes obtained from the American Community Survey are population estimates and there is potential for inaccuracies.

## CONCLUSIONS

In this quantitative study, we found significant variation in representation for Asian ethnic groups in US medical schools. Our findings highlight the importance of data disaggregation in the Asian population to achieve a diverse workforce. Additionally, our findings suggest that Asian ethnic groups encounter distinctive barriers to medical school admission, there are sex differences within Asian ethnic groups and that attention to barriers within each ethnic group could contribute to diversifying the healthcare workforce.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s11606-025-09880-1>.

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**Author Contribution:** DHY had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Conceptualization: DHY, DB.

Methodology: DHY, LZ, BL, JP, JRH, DB.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: DHY, LZ, DB.

Critical revision of the manuscript for important intellectual content: All authors.

Formal analysis: DHY.

Data curation: DHY.

Administrative, technical, or material support: AMH, SIC, DB.

Supervision: AMH, SIC, DB.

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**Data Availability** Data is publicly available through the AAMC and the US Census Bureau's American Community Survey and Census data.

**Declarations:**

**Human Ethics and Consent to Participate:** N/A

**Conflict of Interest:** David H. Yang has nothing to disclose. Lindy Zhang has nothing to disclose. B U.K. Li has nothing to disclose. Joyce Pang has nothing to disclose. Jiun-Ruey Hu has nothing to disclose. Alexandra M. Hajduk reports a grant from National Institutes of Health during the conduct of the study. Sarwat I. Chaudhry has nothing to disclose. Stella S. Yi has nothing to disclose. Lan N. Doan has nothing to disclose. Simona C. Kwon has nothing to disclose. Dowin Boatright has nothing to disclose.

**Contributors:** N/A

**Prior Presentations:** N/A

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- Table A-12: Applicants, First-Time Applicants, Acceptees, and Matriculants to U.S. MD-Granting Medical Schools by Race/Ethnicity (Alone) and Gender, 2020-2021 through 2023-2024: Association of American Medical Colleges; 2023. Available from: <https://www.aamc.org/media/6046/download?attachment>. Accessed 1 Jul 2024.
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