

## Abstract

Gender disparities are well established in the surgical field, despite increasing prevalence of women in surgical specialties. This study aims to evaluate gender disparities in otolaryngology residency training with a focus on awards in residency. 122 OHNS training programs were sent emails with a survey link requesting participation. Questions including number of women residents as well as questions pertaining to specific awards were detailed. Primary outcome measures were total number and percentages of award recipients that were women. Further analysis stratification was completed for geographic location and award type. 15% of programs contacted participated in our survey. Data was gathered from 2010-2019. The percentage of women in a given OHNS residency program ranged from 0% to 55%. Awards distributed to women in a program ranged from 6% to 50%. Women were disproportionately awarded in all residency program except one, in which they were over-awarded. Overall, women were found to be 42% less likely to receive a residency award compared to men (OR, 0.58; 95% CI, 0.42 to 0.81;  $P = 0.001$ ). Statistical significance was identified in awards of academic excellence, where women residents were found to be 54% less likely to receive an award, as well as in teaching awards, where women were 51% less likely to receive an award. When addressing whether the responder believed gender bias existed in otolaryngology residency, 58% felt there may be some bias, while 24% responded yes, and 12% responded no. Gender inequalities exist at several stages within an individual's academic career including at the resident trainee level. This study demonstrates that women are disproportionately distributed residency awards when compared to their male colleagues in OHNS. Knowledge of these disparities must be made to prevent a negative long-standing impact on women residents within OHNS programs.

## Introduction

Gender disparities are well established in the surgical field, despite the increasing prevalence of women in surgical specialties. Currently 33% of otolaryngology residents and 28% of otolaryngology faculty in academic programs are female (1). However, women only occupy 13% of full professor positions, 12% of otolaryngology program director positions, and 3.5% of otolaryngology department chair positions (2).

A public method of evaluation is through the distribution of awards. Professional awards are intended to identify and reward those that are considered the best in their field. Externally, awards are beneficial to an individual by adding more value to their resumes or curriculum vitae. Internally, these awards allow for improved self-perception and self-confidence. In otolaryngology-head and neck surgery (OHNS), gender disparities have been identified in the distribution of recognition awards by OHNS societies (3). The parity of these awards carries potential negative implications such as a lower sense of self and slower career advancement into higher leadership positions.

To our knowledge, no such study has been performed to evaluate for potential gender disparities in Otolaryngology-Head and Neck Surgery (OHNS) residency awards.

Awards are important components that influence the trajectory of an individual's career. It is imperative to identify potential disparities present in them in order to make the necessary interventions to eliminate them. We hypothesize that gender disparities will continue to persist within resident award recipients in OHNS programs within the United States.

## Methods and Materials

122 U.S. OHNS programs were sent a recruitment email for participation. Each program coordinator received a description of the study along with the risks and benefits of participation. Located at the end of the email was a link to a secure online survey. Participants were requested to fill in the total number of residents and the gender distribution within their program in each academic year from 2010-2020. Gender categories listed as potential options included: man, woman, or non-binary/third gender. Each residency program entered data on the gender distribution for residents receiving awards in three different categories: teaching awards, research awards, and academic excellence awards. Information was also requested on the way award recipients were chosen in each category. Potential options included attending vote, resident vote, medical student vote, or academic performance. Other data collected included program geographic location, the gender of the program coordinator completing the survey, and their perspective on gender bias in OHNS residency programs.

The primary outcome measures were the total number and percentages of award recipients who were women. This was calculated for all awards. Further analysis was done to stratify gender distribution by geographic location and award category.

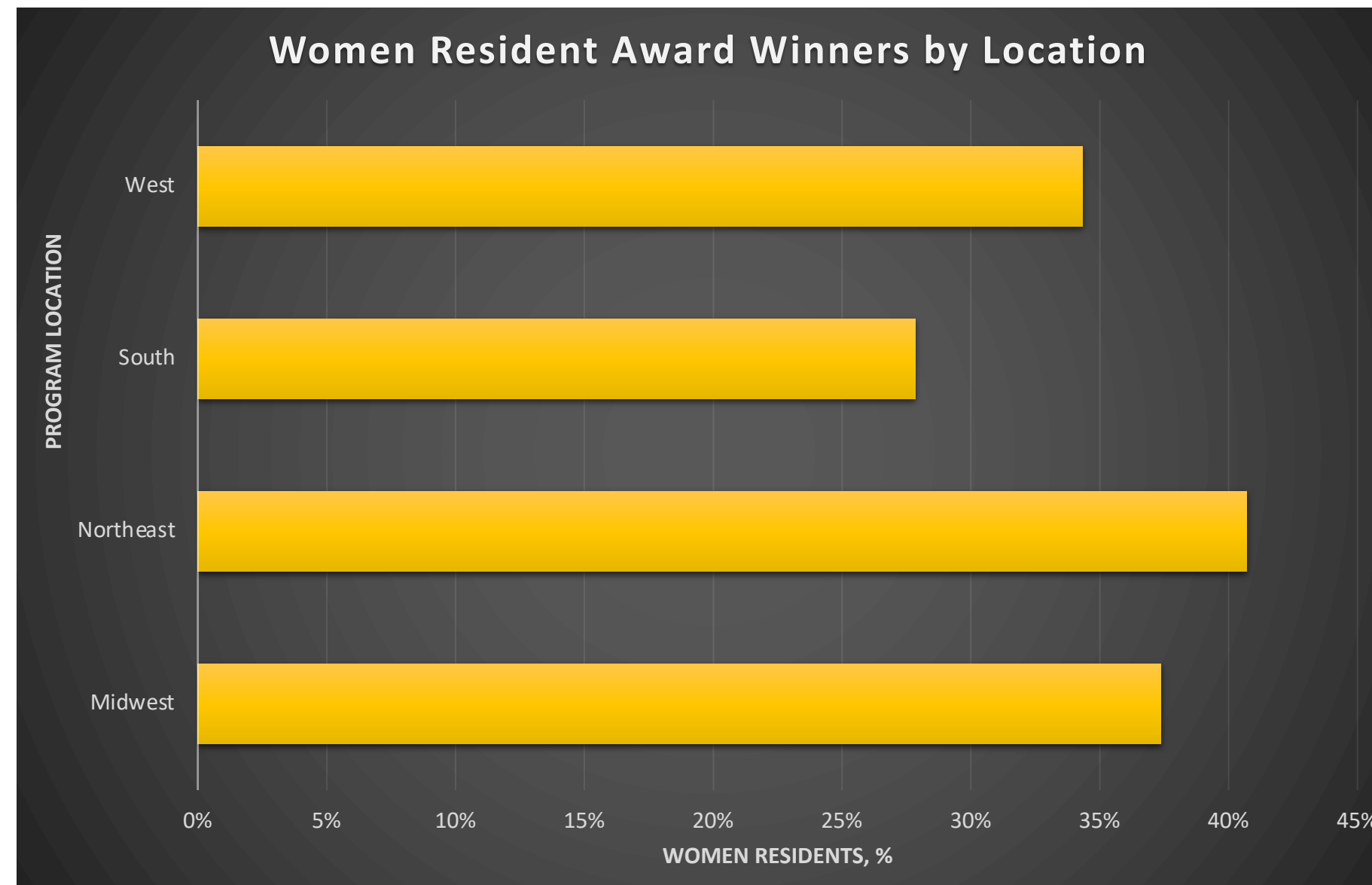


Figure 3. Percentage of Women Resident Award Recipients by Geographic Location

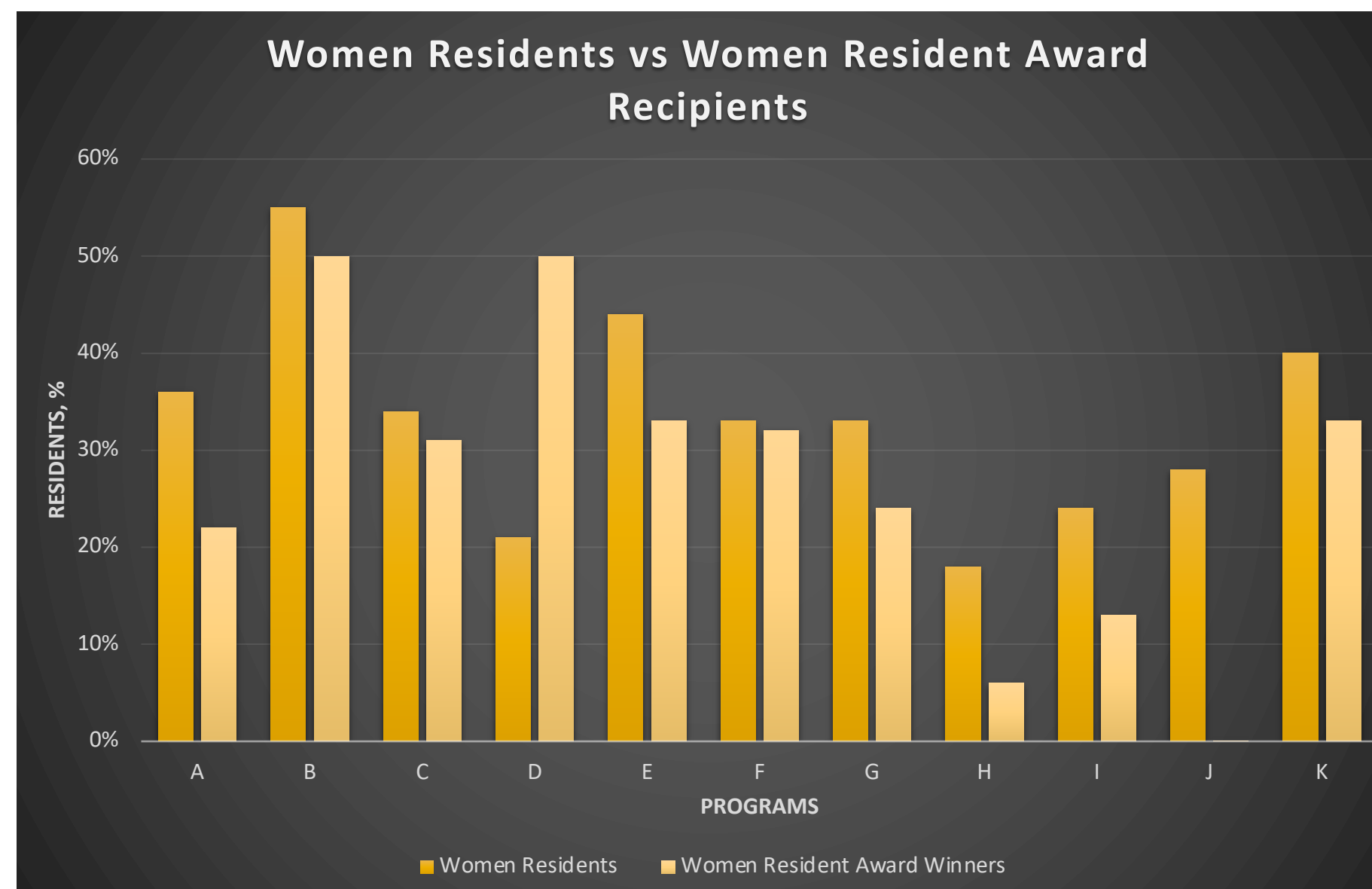


Figure 1. Percentage of Women Residents and Women Resident Award Recipients by Residency Program, 2010-2020

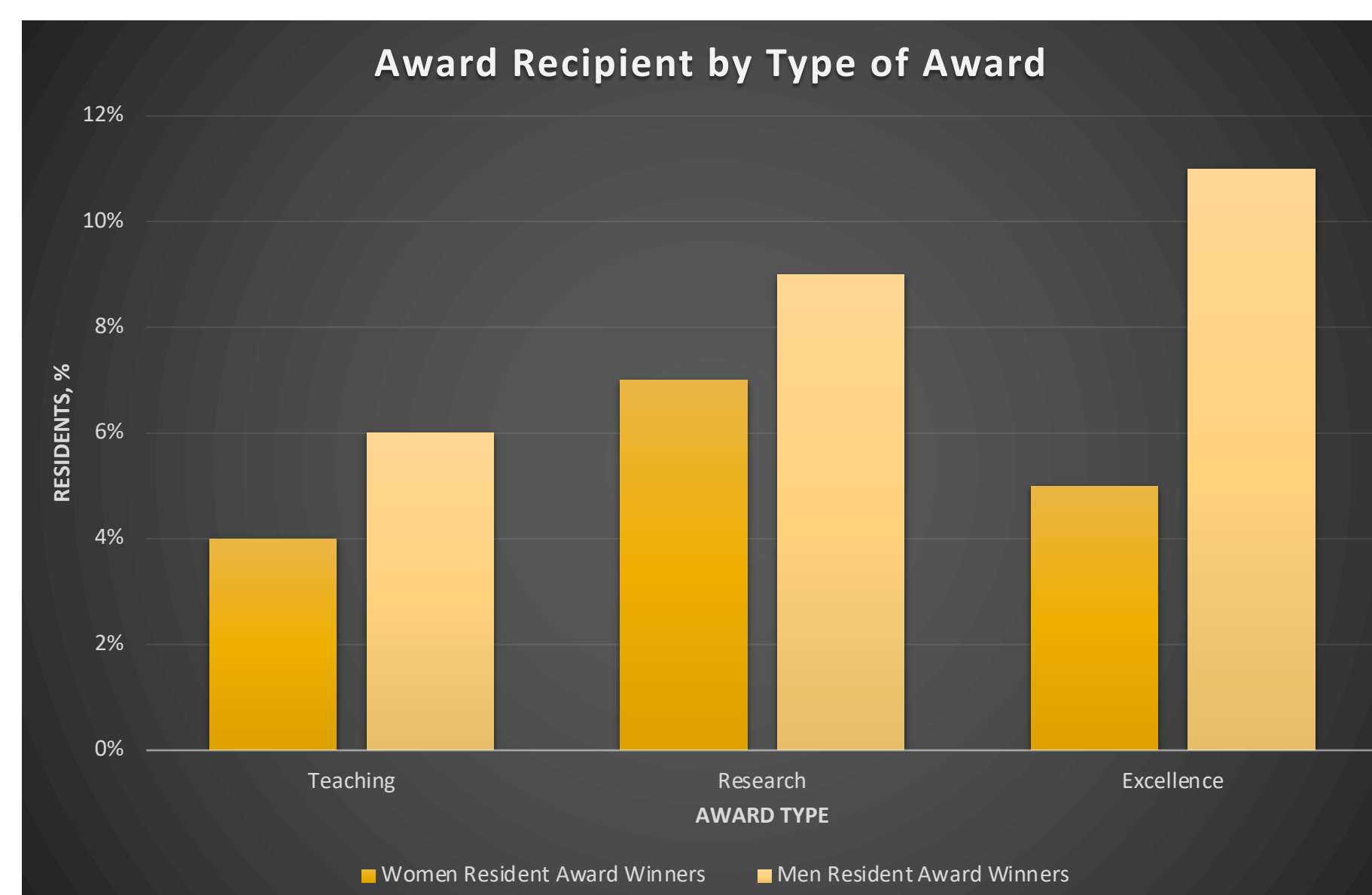


Figure 2. Proportion of Men and Women Receiving Resident Awards by Award Type

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## Results

15 % of U.S. OHNS programs that were contacted responded to the survey. Of the participating programs, 11 programs were able to report data on the gender distribution of their residency awards from 2010 to 2019. Four of the programs are in the Midwest, two are located in the Northeast, three are located in the South, and two are located in the West.

The percentage of women in a given OHNS residency program ranged from 0% to 55%. Awards distributed to women in a program ranged from 6% to 50%. Women were disproportionately awarded in all residency program except one, in which they were over-awarded (Figure 1). There were 2161 residents eligible to receive an award in this study, 66% of which were men and 34% were women. From 2010 to 2019, 207 awards were distributed, 76.3% of which went to men and 23.6% went to women. 9% of eligible resident men were awarded in contrast to 5% of eligible resident women. Overall, women were found to be 42% less likely to receive a residency award compared to men (OR, 0.58; 95% CI, 0.42 to 0.81;  $P = 0.001$ ) from the years 2010 to 2019.

Participants of this study also varied in their geographic location, with responses from programs located in the Midwest, Northeast, South, and West (Figure 2). The highest proportion of women residents were found to be located in the Northeast, composing 41% of all reported residents. However, women within Northeast residency programs were still found to be 61% less likely to receive a residency award compared to men (OR 0.39, 95% CI, 0.17 to 0.89;  $P = 0.03$ ). In the South, women made up the lowest percentage of total residents at 28% and were found to be 55% less likely to receive a residency award compared to men (OR 0.45, 95% CI, 0.25 to 0.80;  $P = 0.007$ ).

Overall, the proportion of women resident award recipients was lower than the proportion of men resident award recipients (Figure 3). This was particularly significant in academic excellence awards, where women residents were found to be 54% less likely to receive an academic excellence award compared to men (OR 0.46, 95% CI, 0.25 to 0.84;  $P = 0.01$ ). Women were also 51% less likely to receive a teaching award (OR 0.50, 95% CI, 0.24 to 1.02;  $P = 0.05$ ).

## Discussion

This study is the first to our knowledge to investigate the influence of gender in residency awards within otolaryngology-head and neck surgery residency programs. Our results demonstrate that women are disproportionately distributed residency awards compared to their male colleagues in OHNS. Our findings are consistent with the those found within general surgery programs.

The Association of Women Surgeons #HeForShe Taskforce released recommendations to eradicate unconscious bias within the profession surgical community. These steps involved a combination of education, introspection, and dedicated efforts over time (4).

**Study Limitations:** Since responses were voluntary, the programs who chose to respond to the survey may be more likely to be interested in gender equity than those who did not answer. In addition, many residency programs were only able to provide data on award distribution in more recent years rather than the entire study period. This study also fails to delineate whether these gender disparities impact those who identify as non-binary or third gender. Due to the smaller sample size in this study, investigation of the impact of residency awards in these populations was not investigated. However, to ensure equality within OHNS residency programs, further effort should be made to identify disparities impacting individuals who do not fit the binary categorization of gender.

## Conclusions

In this study, we determined the presence of gender inequality in the distribution of residency awards in OHNS residency programs within the United States. While representation of women in OHNS residency programs continues to improve, disparities still lie in other aspects of residency training that influence an individual's career. Knowledge of these disparities be made to prevent bias and negative long-standing impact on women residents within OHNS programs.