

Evaluating Trends and Disparities in NIH Funding to the Orthopedic Subspecialties Over the Last 20 Years

Jacob Laperche^{1,2}, Patrick Barhouse³, Mohnish Nadella³, Janine Molino³, Mouhanad El-Othmani MD^{1,3}

¹University Orthopedics, East Providence, RI, ²Quinnipiac University, Frank H. Netter School of Medicine, North Haven, CT, ³Brown University, Warren Alpert Medical School, Providence, RI

Presenting Author: Jacob Laperche, jacoblaperche@gmail.com

INTRODUCTION

Funding provided by the National Institutes of Health (NIH) facilitates biomedical research and the advancement of clinical medicine. The field of orthopedics has gained many advancements through NIH-funded research, but there is a paucity of literature describing trends in NIH-funding across different orthopedic subspecialties. The purpose of this study is to determine if there are significant differences in NIH funding between orthopedic subspecialties and to analyze the trends in NIH funding over the past 20 years. We hypothesize that there are significant differences between orthopedic subspecialties in the amount of NIH funding they receive. Shedding light on the deficiencies in funding in certain subspecialties may provide an avenue to advocate for improvements in funding to orthopedic departments.

METHODS

In the present study, NIH grants awarded to orthopedic departments were analyzed from 2002-2022 utilizing the NIH RePORTER database. All grants awarded from 2002-2022 under the department type "orthopedics" were included. Data of interest included the principal investigator (PI) of the grant, grant year, and grant amount in US dollars. Using the SCOPUS database as well as web searches, individual PIs were investigated and recorded for each grant with gender, degrees, fellowship training, and orthopedic subspecialty. This subspecialty was used in the analysis as the subspecialty that the grant was awarded to. Data was compiled for orthopedics in total, general orthopedics, PhD-run orthopedic lab research, and the following subspecialties: adult reconstruction, foot and ankle, hand, orthopedic oncology, shoulder and elbow, pediatrics, sports medicine, trauma, and spine. All dollar amounts were adjusted to the 2022 dollar using the Consumer Price Index (Bureau of Labor Statistics). Average funding over this period, as well as the total funding per year and total number of grants in each subspecialty were analyzed with generalized linear regression modeling as was the correlation between PI gender, degrees, and research metrics. A total of 4410 grants were reported, 917 female PIs (20.80%) and 3492 male PIs (79.20%) with 583 unique PIs, 417 male (71.5%) and 166 female (28.5%).

RESULTS

Over 20 years there was a significant increase in the total dollars funded and number of grants awarded to orthopedic departments ($t=7.21$, $p<0.0001$ and $t=9.35$, $p<0.0001$). There was increase in total dollars funded to orthopedics PhDs ($p<0.0001$), and significant decreases in total dollars to spine ($p=0.009$), hand ($p<0.0001$), and general orthopedics ($p=0.01$) subspecialties. Total number of grants increased significantly over 20 years in adult reconstruction ($p=0.01$), orthopedics PhDs ($p<0.0001$), and trauma ($p=0.001$) subspecialties as well as a significant decrease in number of grants awarded to spine surgery ($p=0.002$). The average funding per grant did not differ significantly over the 20 years, however, hand and orthopedic oncology reported the highest funding per grant while foot and ankle reported the lowest. The mean funding per grant did not differ by PI gender or by PI degree(s).

DISCUSSION

Of all the analyses, orthopedic PhD lab research was the only group that showed a positive trend in dollars of funding from 2002 to 2022. This is a major contributor to orthopedic research, as seen in the high dollar amounts in funding and the contribution to the overall increase in orthopedic funding despite the decreasing and unchanging dollar amounts in each of the subspecialties. This may give some indication as to how the field has developed, reflecting an increase in advances stemming from the basic science and translational level, as well as the trajectory that orthopedic research is following for future work. PI gender and degrees obtained had no impact on funding or grants awarded despite a significantly larger proportion of male PIs. Further investigation may be warranted to investigate the details of these relationships within the subspecialties.

SIGNIFICANCE

This information may be beneficial to established orthopedic surgeons, who may wish to know which subset of research is most likely to be funded by the NIH and which may require different, outside sources of funding. Additionally, orthopedic residents may use this information to help guide them into a particular field depending on their interest in a research-oriented career.