

Introduction

Industry fellowships available by employers continue to grow due to the following primary factors: first, regulatory approval changes have led to an increase in drug approvals over the last decade; and second, the use of newer technologies positively impacts drug discovery. With the help of technological advancements, experts can predict new drug targets more quickly, improve previous designs, and more. Many of these medications are considered specialty products, including those that treat rare diseases such as immunological or neurological disorders. The complexity of these new products and the disease states they treat has influenced industry employers to more fully appreciate the value that pharmacists' academic and clinical training can offer an organization. An increasing number of drug approvals and use of newer technologies are occurring simultaneously to drive supply and demand for pharmacist opportunities within the pharmaceutical industry. Additionally, the oversupply of traditional pharmacists is resulting in more students exploring industry as a career path. Post-doctoral fellowship programs are available to train and prepare graduates, and the amount of positions available continues to grow as the need for pharmacists in this field rises. Over the last 7 years, the number of fellows increased by 140% from 262 in 2014-2015 to over 600 fellows in 2020-2021.^(1,2)

The top functional areas for fellowship opportunities include Medical Affairs, Clinical Development, Regulatory Affairs, Commercial Strategy, Health Economic Outcomes Research (HEOR), and Medical Information/Communications.⁽²⁾ While there are plenty of resources regarding the importance of prioritizing these *functional areas*, significantly less information has been made available regarding the high prevalence of specific *therapeutic areas*. Understanding and recognizing which therapeutic areas are trending may be highly beneficial for pharmacy graduates, as it can allow them to be a more competitive and stronger fellowship candidate.

Objective

The objective of this research is to increase awareness of the most prevalent therapeutic areas in which fellows are assigned within their functional area and discuss their implications to overall fellowship application strategy.

Methods

Identification of therapeutic areas (TAs) of incoming 1st and 2nd year fellows during the summer of 2020 from the following data sources in sequential order:

- Surveys to obtain the names of fellows and TA involvement
- LinkedIn profiles to search for job titles or job descriptions
- Fellowship program brochures to examine any mentions of fellows' positions

Results

Figure 1: Fellows' Top Therapeutic Area Focus (N=501)

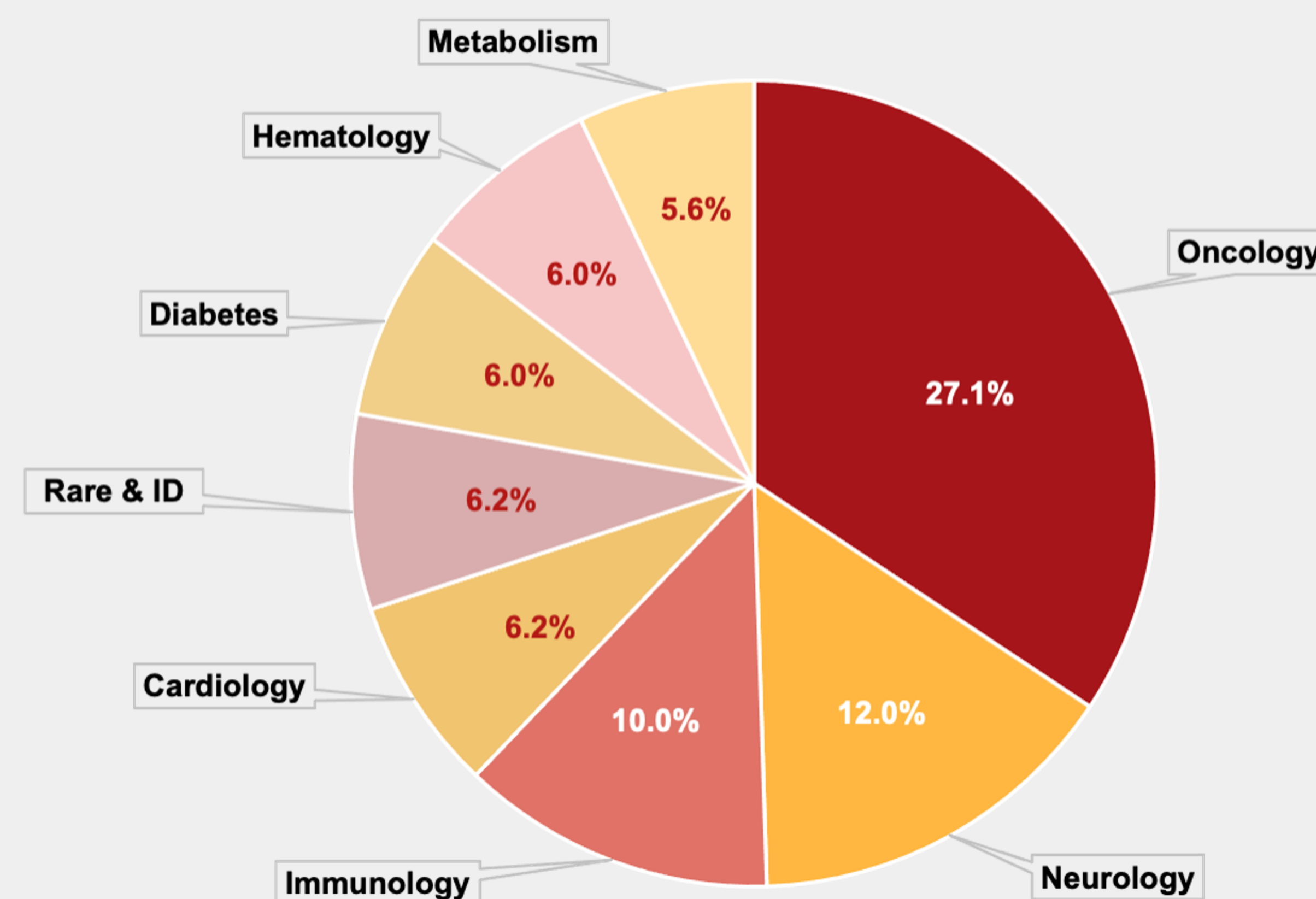
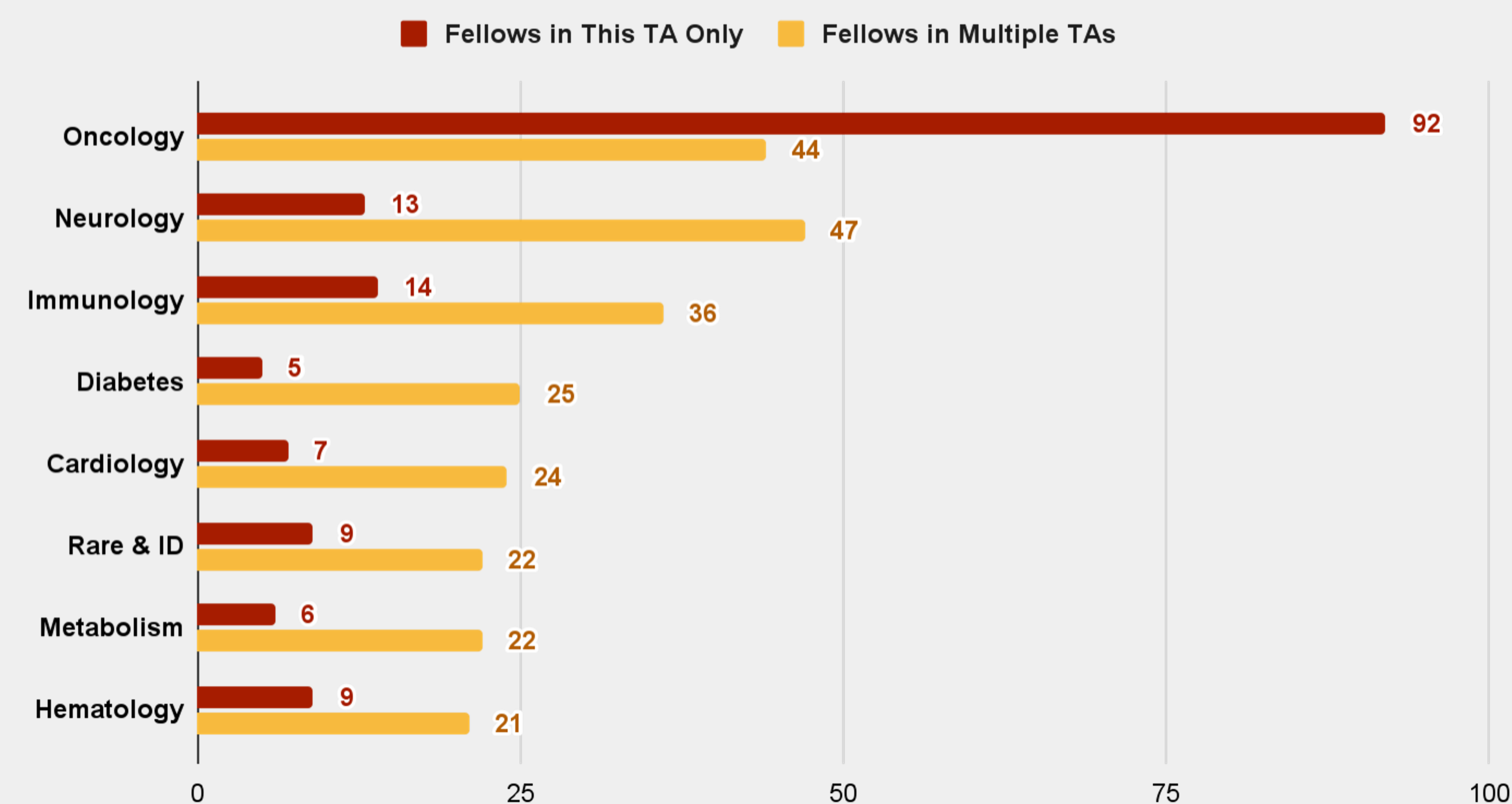


Figure 2: Comparison of Fellows' Top Primary and Secondary TAs (N=501)



References

1. IPhO. About Us. Advocacy. *Industry Pharmacists Organization*. <https://www.industrypharmacist.org/about.php>. Published 2021. Accessed July 9, 2021.
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5. PhRMA. Medicines in Development: Immuno-Oncology 2017 Report. *The Pharmaceutical Research and Manufacturers of America*. <https://www.phrma.org/Report/Medicines-in-Development-for-Immuno-Oncology-2017-Report>. Published June 1, 2017. Accessed July 26, 2021.

Discussion

We identified the therapeutic areas of 501 first- and second-year fellows out of the total number of 635 fellows during the summer of 2020. The results were divided into 2 groups: those that obtained or were assigned to fellowships in a *single specific TA* and those that obtained or were assigned fellowships in *multiple TAs*. Out of the total number of fellows, regardless of working in either a single or multiple TAs, the top three therapeutic areas of responsibility were oncology (27.1%), neurology (12.0%), and immunology (10.0%). Of the total number of fellows where TAs were identified, 174 worked in a single therapeutic area (35%). Approximately 65% (n=327) of fellows were identified as working in multiple therapeutic areas.

Figure 2 describes that *in addition* to the 92 fellows who had single TA responsibility in oncology, 44 fellows were identified as having oncology as part of their overall TA responsibilities. It also appears that neurology and immunology had numerous fellows that worked in multiple related therapeutic areas.

Areas such as oncology have been continuously expanding due to the increase in prevalence and earlier use of increased sophisticated diagnostic procedures. The American Cancer Society estimates that more than 1.8 million new cancer cases will be diagnosed in the U.S. in 2021.⁽³⁾ On a positive note, personalized medicine based on identification of selected biomarkers has led to improvements in drug research and development. The Pharmaceutical Research and Manufacturers of America (PhRMA) reports that there are 1,361 medications and vaccines for various cancers currently in the pipeline by pharmaceutical/biotech companies.⁽⁴⁾ Although this number may seem immense, there is still so much more to learn about this remarkably complex spectrum of conditions. The rise of fellows obtaining immunology as their TA could also be due to the overlap with oncology research. Studies of the body's immune system in fighting cancer resulted in a new wave of immunotherapies that specifically target cancers. More than 240 immuno-oncology treatments are being developed or awaiting review.⁽⁵⁾

Conclusion

The results from this research illustrate that the top therapeutic areas of responsibility for fellows—and, as an extension, the top areas offering fellowship opportunities—lie currently in oncology, immunology, and neurology. What are the implications of this data for fellowship applicants? Are applicants aware of this data to the extent that they are consciously prioritizing these therapeutic areas during their academic and clinical training? How important is an applicant's specific therapeutic experience to a fellowship employer? While the importance of applicant *functional area* prioritization is well established, there has been little information available about *therapeutic area* prioritization. We hope that this research supports additional discussion among fellowship stakeholders and applicants to improve fellowship applicant preparation.

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