



An Analysis of 2023-2024 PharmD Industry Fellowships

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Introduction

The number of Industry Fellowships (defined below) has grown at an unprecedented rate over the past decade, due in part to a substantial number of new drug approvals, averaging nearly 50 each year during that 10-year time frame. In 2023, the FDA Center for Drug Evaluation and Research (CDER) approved 55 new molecular entities and biologics.¹ Many of these novel medicines are a result of pharmaceutical research and development (R&D) innovation, which enhances the identification and evaluation of promising new therapies. The introduction of these new agents has fueled the need among Industry employers for specialized talent, including health care professionals.

Awareness was once low, but PharmD Fellowships have now become well known as a valuable Industry employer talent acquisition/pipeline strategy. Fellowships offer Industry employers an opportunity to attract, train, and often retain new PharmD graduates, usually without the obligation of full-time employment. As clinically trained medication experts, PharmDs are well prepared to make valuable contributions to the drug development and commercialization process.

More than 100 Industry employers currently sponsor Fellowships, including the top pharmaceutical companies in the world. The number of PharmDs participating in Fellowships has grown rapidly over the past decade and has reached a new high of 941 Fellows in 2023-24. From 2014-2023, the average number of PharmD Fellows increased by about 75%.^{2,3} During the same time frame, the average number of Industry employees has increased by less than 3%, so the growth of PharmD Fellowships is far outpacing the growth rate of overall Industry employment.^{2,3} The number of Fellowship Alumni over the past 40 years has now surpassed 4,400.^{4,5,6} As a result, over 20% of the ~20,000 pharmacists currently employed in the industry have completed a Fellowship.^{4,5,6}

Recent publications have described how the scope of traditional pharmacy practice has struggled to expand, resulting in very low job satisfaction, stagnating compensation, and relatively few career growth opportunities.⁷ At the same time, pharmacy school enrollment and the number of degrees conferred have also declined.⁸ Many pharmacists have left their traditional pharmacy jobs in search of improved job satisfaction in other roles including Industry careers.^{7,9} In the pharmaceutical industry environment, pharmacists can utilize their clinical training and experience to impact patient care at a population level, in contrast to the individual patient care delivered through traditional community or hospital settings. Additionally, for those pharmacists who are interested in learning more about the business of healthcare, Industry provides opportunities to integrate clinical training with commercial experiences in a corporate environment.

These driving forces have converged to create an environment where many PharmDs are interested in Industry career opportunities at a time that Industry employers need to increase their pool of talented health care professionals to support new product approvals.

The objectives of this annual report from the Industry Pharmacists Organization (IPhO) are to describe: i) characteristics of current 2023-2024 Fellowship programs, and ii) trends in Fellowships based on 10-year longitudinal data. This valuable report is designed to increase awareness among all Fellowship program stakeholders, including students and recent graduates interested in Industry, current Fellows, Fellowship leaders and preceptors, Industry employers, and Fellowship Sponsors.

Methods

IPhO maintains a comprehensive, proprietary database of all PharmD fellows currently participating in PharmD Industry Fellowship Programs. Data is obtained from a variety of publicly available sources, combined with information proprietary to IPhO. For the 2023-2024 Annual Analysis, database lockdown was December 1, 2023. The following data fields were utilized and evaluated:

1. [Fellowship Functional Area](#)
2. [Fellowship Sponsors](#)
3. [Fellowship Affiliation](#)
4. [Fellowship Program Duration](#)
5. [Fellows' Alma Mater](#)
6. [Fellowship Diversity](#)

Data from the 2023-2024 analysis were also compared with results from similar analyses from 2014-15 through 2022-23⁵ to yield 10-year trends.

1. [10-year Trend in Fellowship Program Size](#)
2. [10-year Trend in Fellowship Positions by Functional Area](#)
3. [10-year Trend in Fellowship Sponsors](#)

For the purposes of this analysis, the following definitions apply:

“Fellowship” is defined as a Post-Doctoral, pharmaceutical industry-focused training program for PharmDs, which may include residencies, fellowships, and other related nomenclature.

“Fellow” is defined as a PharmD participant in a Fellowship.

“Fellowship Sponsor” is defined as an Industry employer/entity primarily responsible for hosting and training a Fellow during their Fellowship, regardless of whether the entity directly or indirectly employs the Fellow during their Fellowship.

“Fellowship Affiliation” is defined as the Academic Institution, Professional Organization, or other entity that collaborates with Fellowship Sponsors to recruit Fellowship candidates and deliver Fellowship training.

“Fellowship Alumni” are defined as PharmDs who previously participated in a Fellowship, including former Fellows who completed all or part of their scheduled training period.

“IPhO 2023-2024 Fellows Database” is a comprehensive, proprietary database of all Fellows currently participating in Fellowships that includes data obtained from a variety of publicly available sources and combined with information proprietary to IPhO, including LinkedIn profile URL, Fellowship Affiliation (if any), Fellowship Sponsor, year of scheduled Fellowship completion, and primary Functional Area.

“Industry” is defined as the group of companies whose primary purpose is to develop and commercialize pharmaceutical products, together with the group of companies whose primary purpose is to provide services to them, including but not limited to:

- Pharmaceutical and Biotechnology companies
- Pharmaceutical advertising agencies or clinical research organizations
- Companies whose primary purpose is to provide a service to pharmaceutical companies (e.g. management consulting, medical information, MSL contracting, HEOR consulting, medical communications agencies)
- Market access or global branding firms

“Functional Area” is a term used in this study to describe the primary department(s) of focus for the Fellow during their Fellowship and/or the primary department of focus. For the purposes of this study, the Functional Areas were categorized at the discretion of the authors. This categorization was implemented to group Functional Areas into analyzable categories based on “best fit” despite the variability in Functional Area nomenclature across companies.

Study Inclusion Criteria:

- Current Fellows listed in the proprietary IPhO 2023-2024 Fellows Database.⁴

Study Exclusion Criteria:

- Anyone not listed in the proprietary IPhO 2023-2024 Fellows Database.

Data collection methods included:

- LinkedIn (Basic) was utilized to search for current Fellows. Publicly available, self-reported data was subsequently collected for their Fellowship Sponsor, Functional Area, and Fellowship Affiliation.
- The IPhO Fellowship Catalog was utilized to source missing data.
- No surveys were utilized.

Results and Discussion

A total of 941 Fellows were identified in the database, consisting of 539 1st-Year Fellows and 402 2nd-Year Fellows. Results are reported in the following sections:

A) Characterization of PharmD Fellows in 2023-2024 Industry Fellowship Programs

1. [Fellows by Functional Area](#)
2. [Fellowship Sponsors](#)
3. [Fellowship Affiliations](#)
4. [Fellowship Program Duration](#)
5. [Fellows' Alma Mater](#)
6. [Fellowship Diversity](#)

B) Ten-Year Trends in Fellowship Positions

1. [10-year Trends in Number of Fellowship Positions](#)
2. [10-year Trends in Functional Area](#)
3. [10-year Trends in Fellowship Sponsors](#)

Characterization of PharmD Fellows in 2023-2024 Industry Fellowship Programs

Fellowship Functional Area

The top five individual Functional Areas in 2023-24 included Medical Affairs (n=295), Clinical Research/Development (n=146), Regulatory Affairs (n=126), Commercial (n=95), and Health Outcomes (n=62). Thirty-three (n=33) Fellowships were multidisciplinary in nature, which allows the fellow to rotate through two or more distinct Functional Areas. Functional Areas defined as “Other” (n=48) included areas that did not fall into the predefined categories, such as policy/patient advocacy, quality assurance and knowledge management. According to these data, PharmDs remain well equipped to fulfill Fellowship roles in multiple Functional Areas.

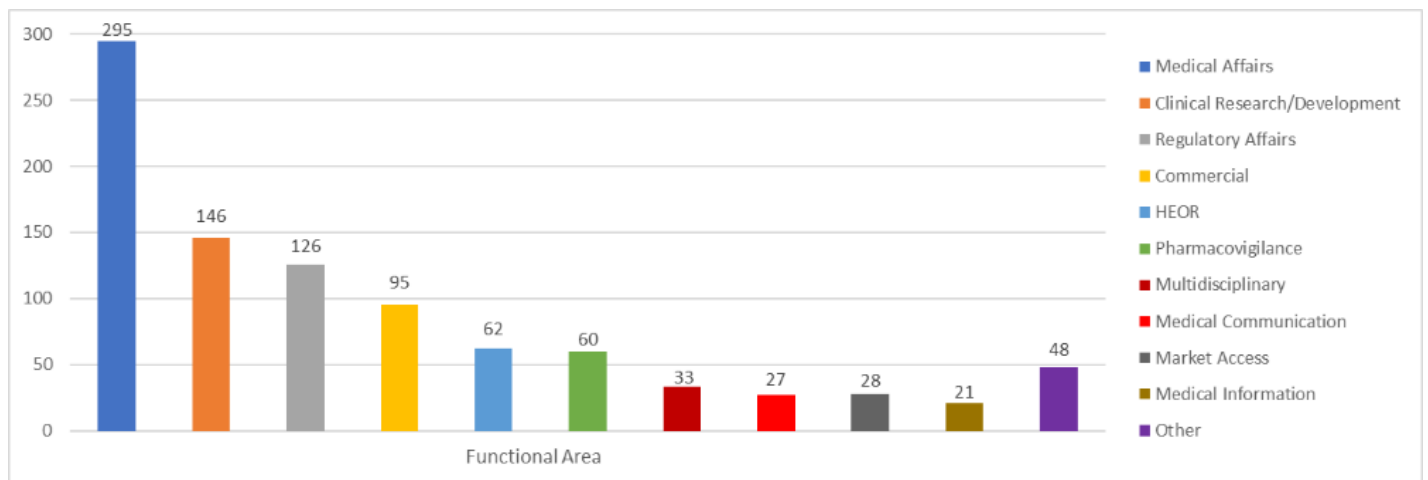
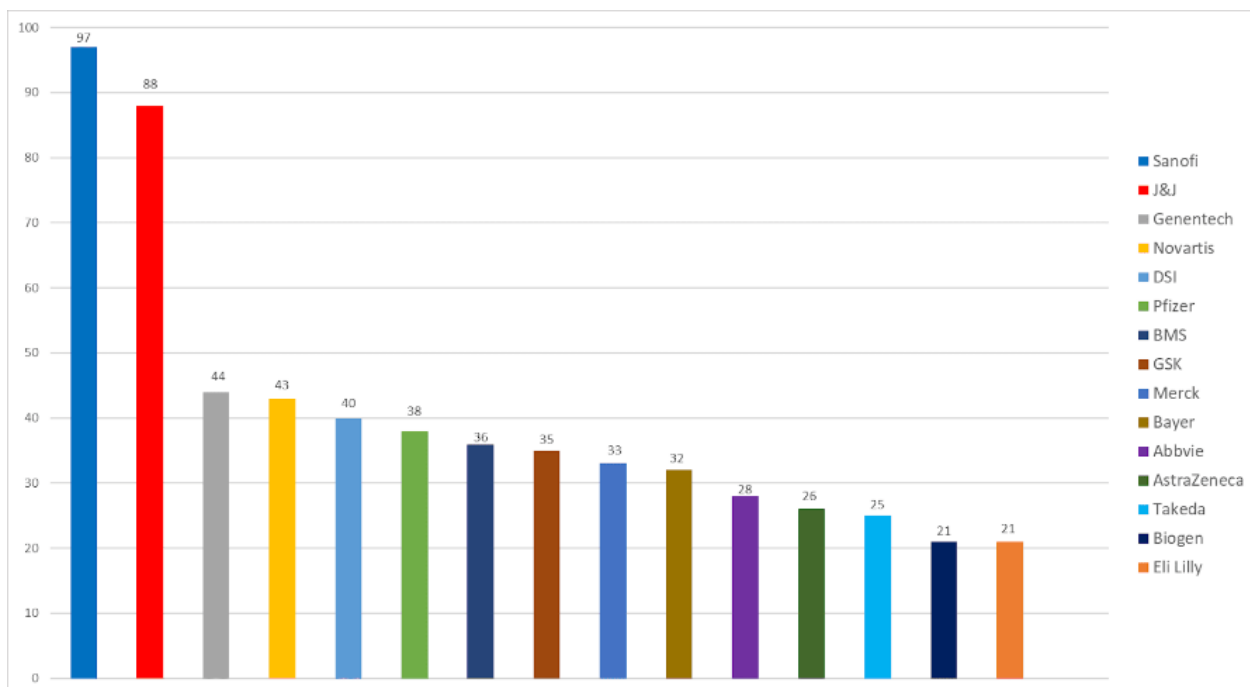


Figure 1: Fellowships by Functional Area (N=941 Fellows)

Fellowship Sponsors

Of the 112 Fellowship Sponsors in 2023-24, the top five companies sponsoring the greatest number of fellows were: Sanofi (n=97), Johnson & Johnson (n=88), Genentech (n=44), Novartis (n=43), and Daiichi-Sankyo (n=40). The top 15 Fellowship Sponsors offer about two-thirds of all Fellowship positions and are represented in the figure below. Several of these Fellowship Sponsors have maintained a leading position over several years, suggesting that PharmDs are particularly highly valued within these companies (see [10-Year Trend in Fellowship Positions Offered Through Various Sponsor Companies](#)).

Figure 2: Number of Fellows by Fellowship Sponsor (N=607 Fellows in Top 15 Companies)*



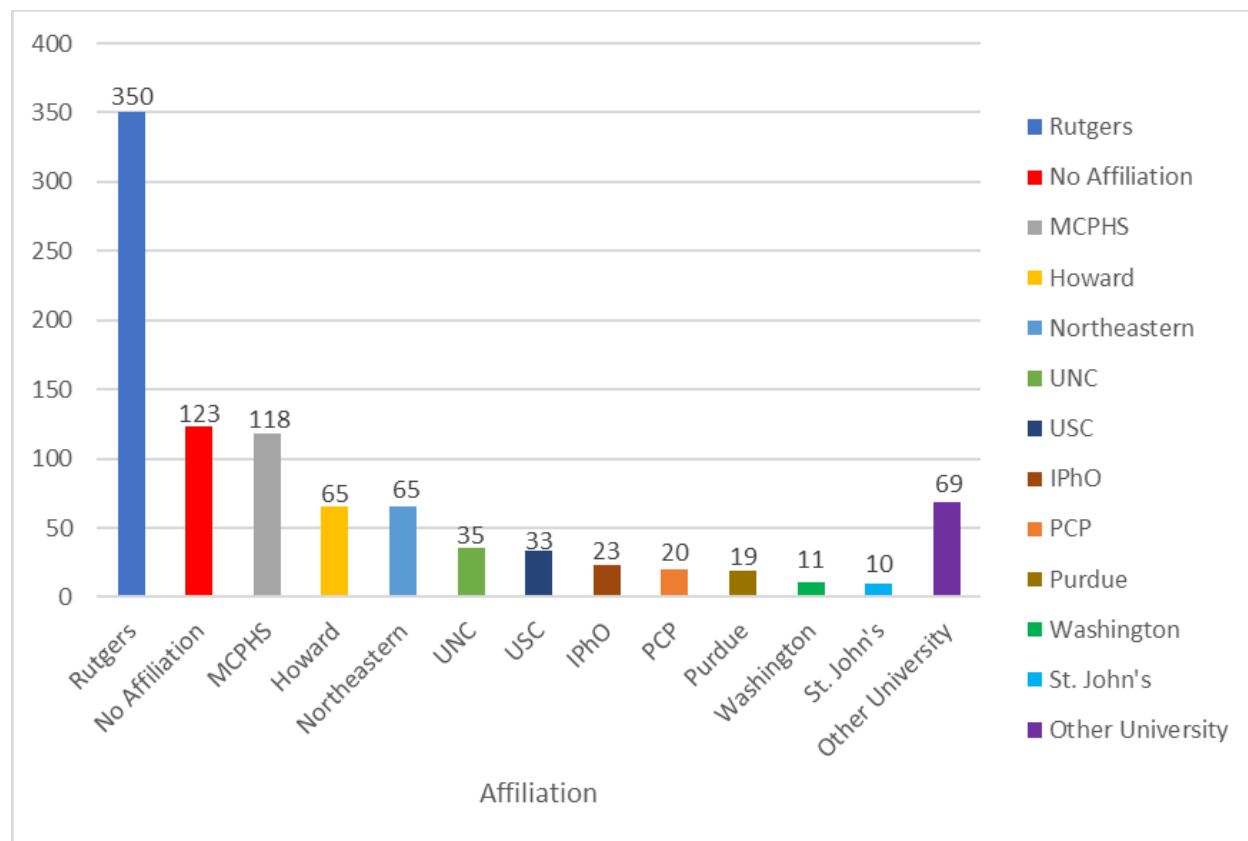
*Abbreviations: The following sponsor companies were combined under: “Johnson & Johnson” – Johnson & Johnson Consumer Inc, Janssen, and Actelion; “Novartis” – Novartis and Sandoz; “Genentech” – Roche and Genentech; “Sanofi” – Sanofi, Sanofi Genzyme and Sanofi Vaccines; “AbbVie” - AbbVie, Allergan, and PCYC; “Merck” - Merck and Organon; “AstraZeneca” - AstraZeneca and Alexion.

Fellowship Affiliation

Of the 941 Fellows, 87% (n=818) of all Fellowship positions were offered through collaboration between two or more entities. The vast majority of Fellowship positions are offered through academic partners, including Rutgers University (n=350), MCPHS University (n=118), Howard University (n=65), and Northeastern University (n=65). Together, the four programs employ nearly 2/3 (64%) of all current Fellows. Howard University continued its growth trend by doubling the size of its program from 32 positions in 2022-23 to 65 positions in 2023-24.

Currently, 123 Fellowship positions (13%) are offered through Fellowship Sponsors who do not have an affiliation with an academic institution. Possible reasons for this may include monetary cost of affiliation, distance from affiliating institution, significant time spent at academic institution away from the Fellowship Sponsor company, or a lack of Fellowship Sponsor interest in engaging an academic affiliation.

Figure 3: Fellowships with an Academic or Non-Academic Affiliation (N=941 Fellows)

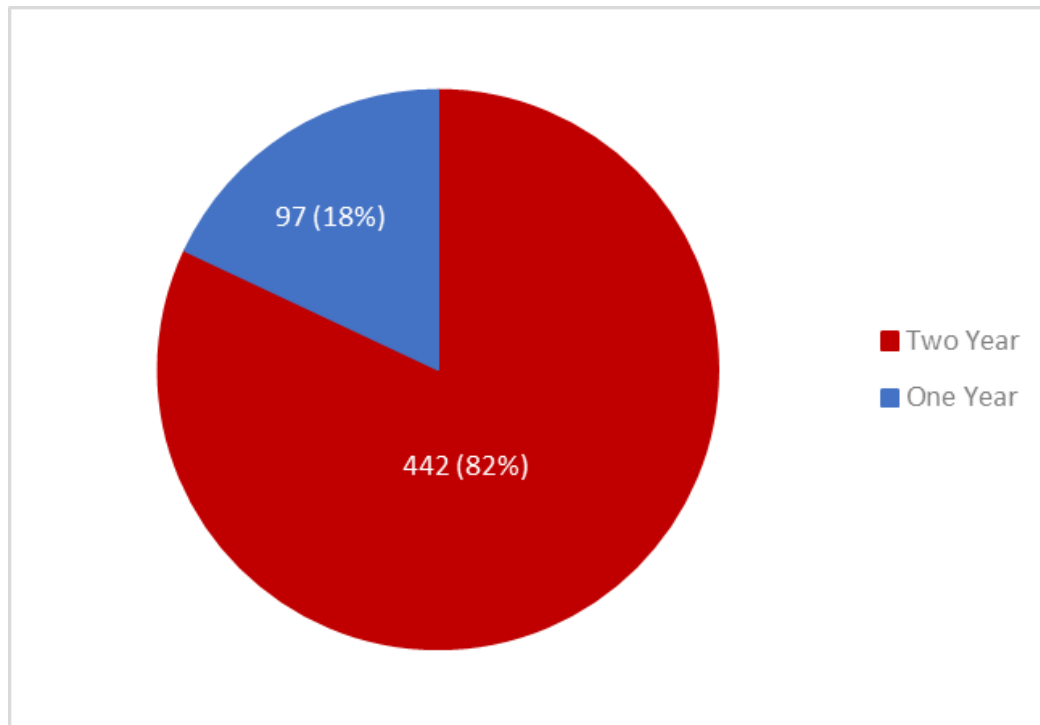


*Abbreviations: MCPHS – Massachusetts College of Pharmacy and Health Sciences; UNC – University of North Carolina; USC – University of Southern California; IPhO – Industry Pharmacists Organization; PCP – Philadelphia College of Pharmacy

Fellowship Duration

Of the 539 first-year Fellows included in this study, 442 (82%) were participating in two-year programs versus 97 (18%) in one-year programs. Among all 941 Fellows who began a Fellowship in either 2022 or 2023, 12% were participating in a one-year program. The number of one-year Fellows declined (-13%) when compared with last year, while the number of 2-year Fellows increased (+13%).

Figure 4: First-Year Fellows by Program Duration (N=539 First-Year Fellows)



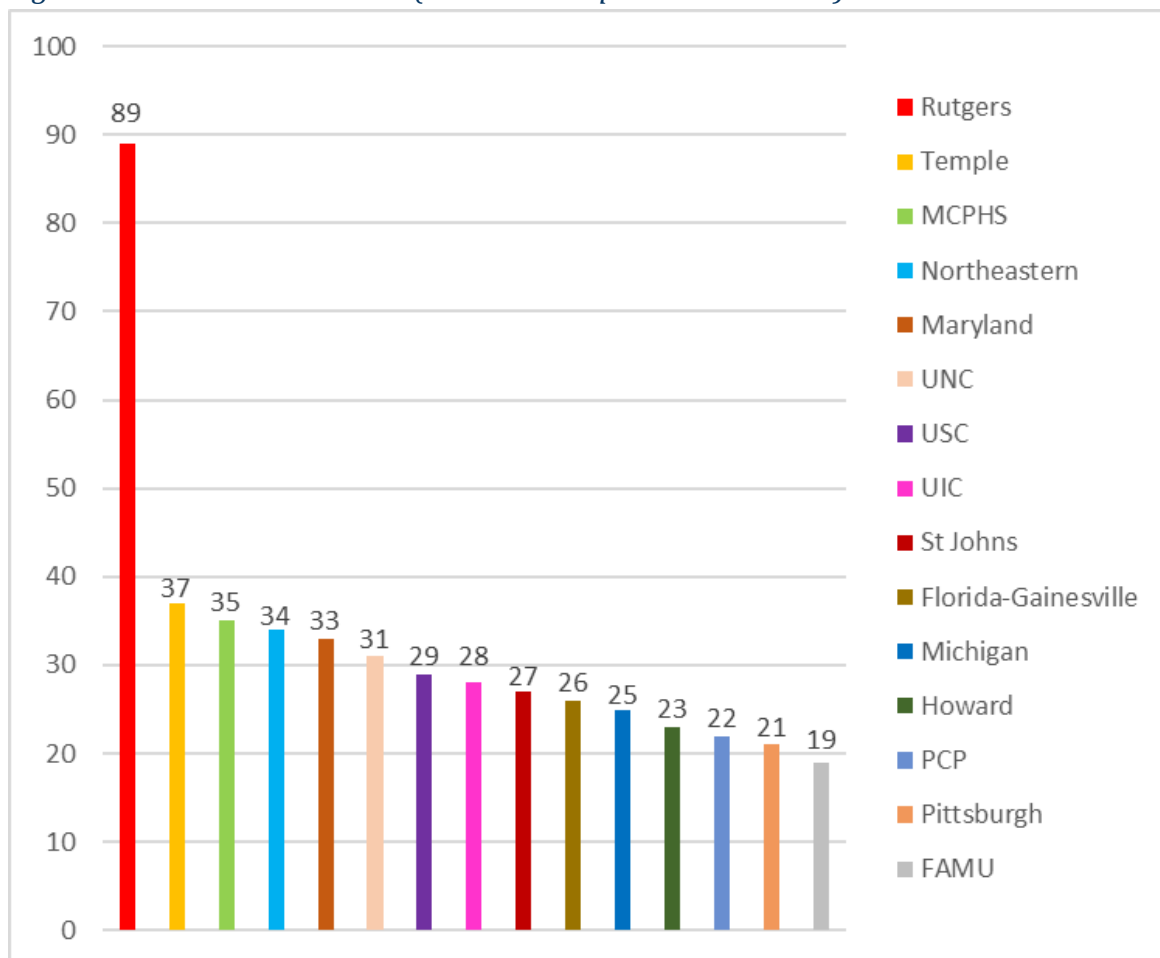
Fellows' Alma Mater

In 2023-2024, 108 unique pharmacy school alma maters were represented among the cohort of 941 Fellows.

The top 5 most common Fellow alma maters in 2023-24 were Rutgers (n=89), followed by Temple (n=37), MCPHS (n=35), Northeastern (n=34), and Maryland (n=33). By a wide margin, Rutgers is perennially the most common alma mater among current Fellows. The other top alma maters have evolved somewhat over the past 5 years. The top 5 alma maters in 2018-2019 were Rutgers (n=58), MCPHS (n=29), St. John's University (n=25), Philadelphia College of Pharmacy (n=25), and UNC (n=24).

The top 15 most common alma maters among 2023-24 Fellows are depicted in the figure below.

Figure 5: Fellow's Alma Mater (Fellows in Top 15 Alma Maters)



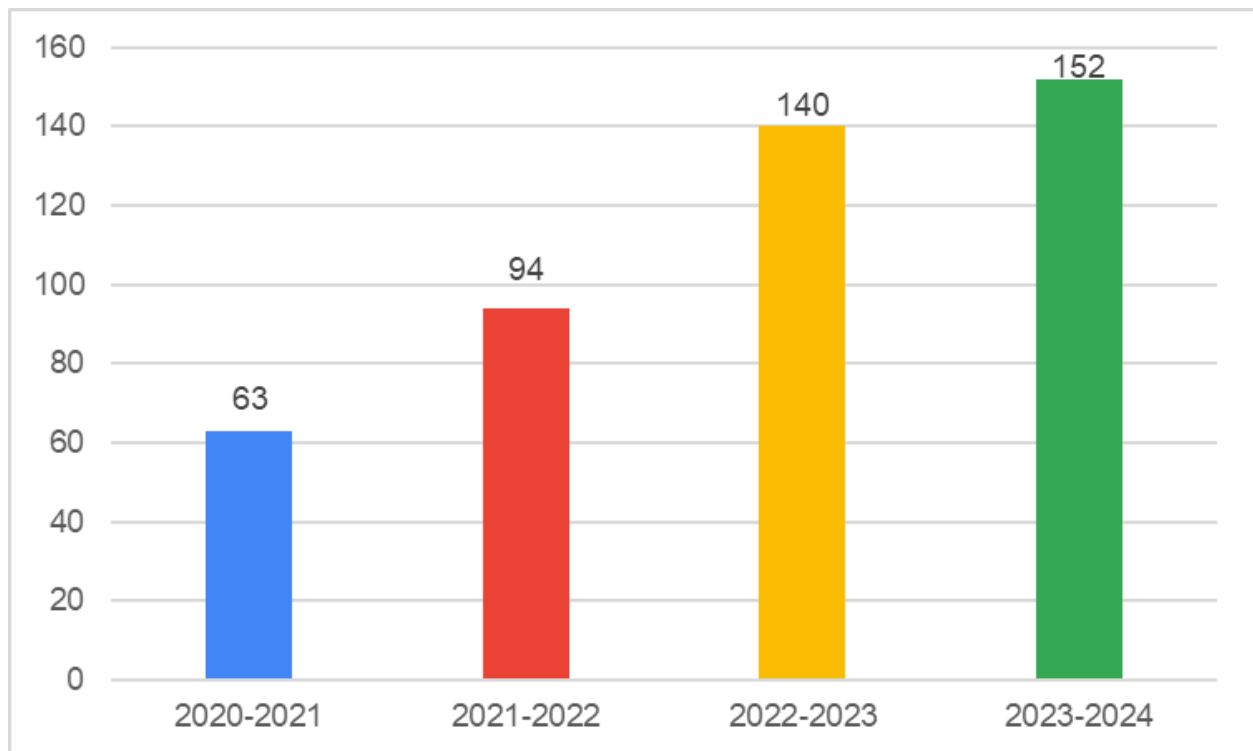
*Abbreviations: UIC - University of Illinois at Chicago, UNC - University of North Carolina, MCPHS - Massachusetts College of Pharmacy, UCSF - University of California San Francisco, USC - University of Southern California

Fellowship Diversity

Fellowship Sponsors and Affiliates have implemented diversity enhancement programs to address an increasing need for black pharmacist Fellow representation that is more reflective of the general US population. In recent years, Fellowships have experienced a large increase in i) black student pharmacist applicants and ii) black pharmacists who were offered and accepted positions.

In 2020-21, 63 of 628 Fellows (10%) were black. In 2023-24, 152 of 941 current Fellows (16%) are black. In the past three years, the percentage of Fellows who are black has risen from 10% to over 16%, marking encouraging progress toward addressing underrepresentation.

Figure 6: Fellowship Diversity Trends among Black/African American Fellows

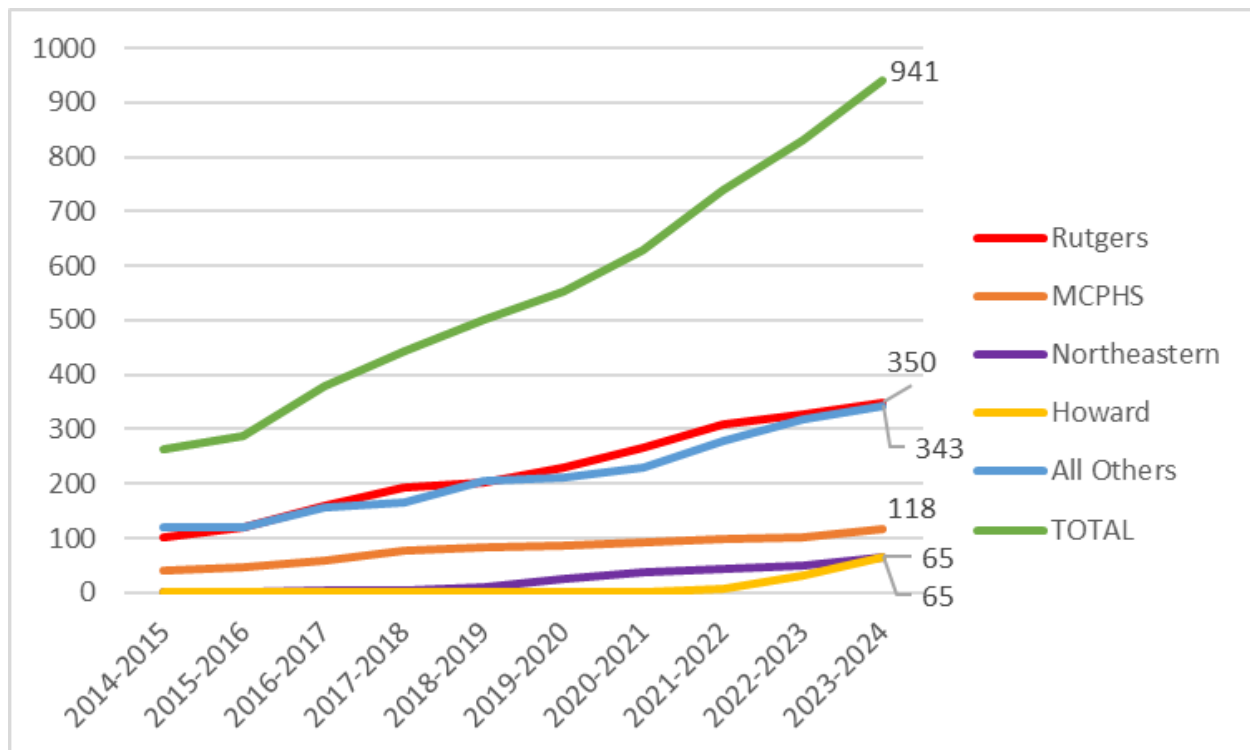


Ten-Year Fellowship Trends

10-year Trend in Fellowship Program Size

Overall, there has been a 259% increase in the number of Fellows over the last 10 years, increasing from 262 Fellows in 2014-15 to 941 Fellows in 2022-23. Notably, there was substantial growth in the number of Fellowships (+111) from 2022-23 to 2023-24. The total number of Fellowships has more than tripled since 2014-15. Fellowships offered through Rutgers University have grown from 103 to 350 (+240%) positions during that time, MCPHS Fellowships have increased from 39 to 118 (+203%) positions, while Northeastern and Howard Fellowships have increased from 0 to 65 positions.

Figure 7: 10-Year Trend in Fellowship Program Size

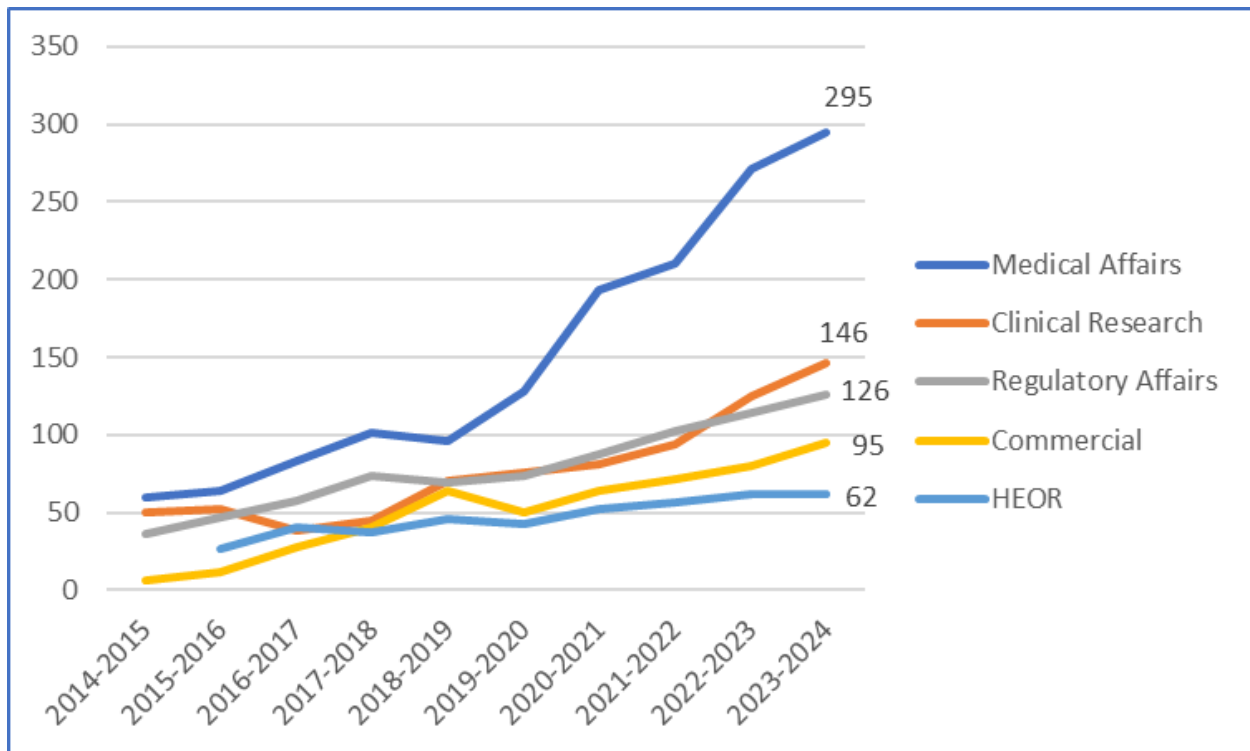


*Abbreviations: MCPHS - Massachusetts College of Pharmacy and Health Sciences

10-Year Trend in Fellowships by Functional Area

All major Functional Areas experienced growth in 2023-24. Over the past 10 years, the number of Fellows in Medical Affairs has increased the most with 235 (+392%) more positions in 2023-24 than in 2014-15. During this 10-year timeframe Regulatory Affairs opportunities have grown by 250% and Clinical Research Fellowships have increased by 192%. Fellowships in Commercial and HEOR have also steadily increased.

Figure 8: 10-year Trend in Fellowships by Functional Area



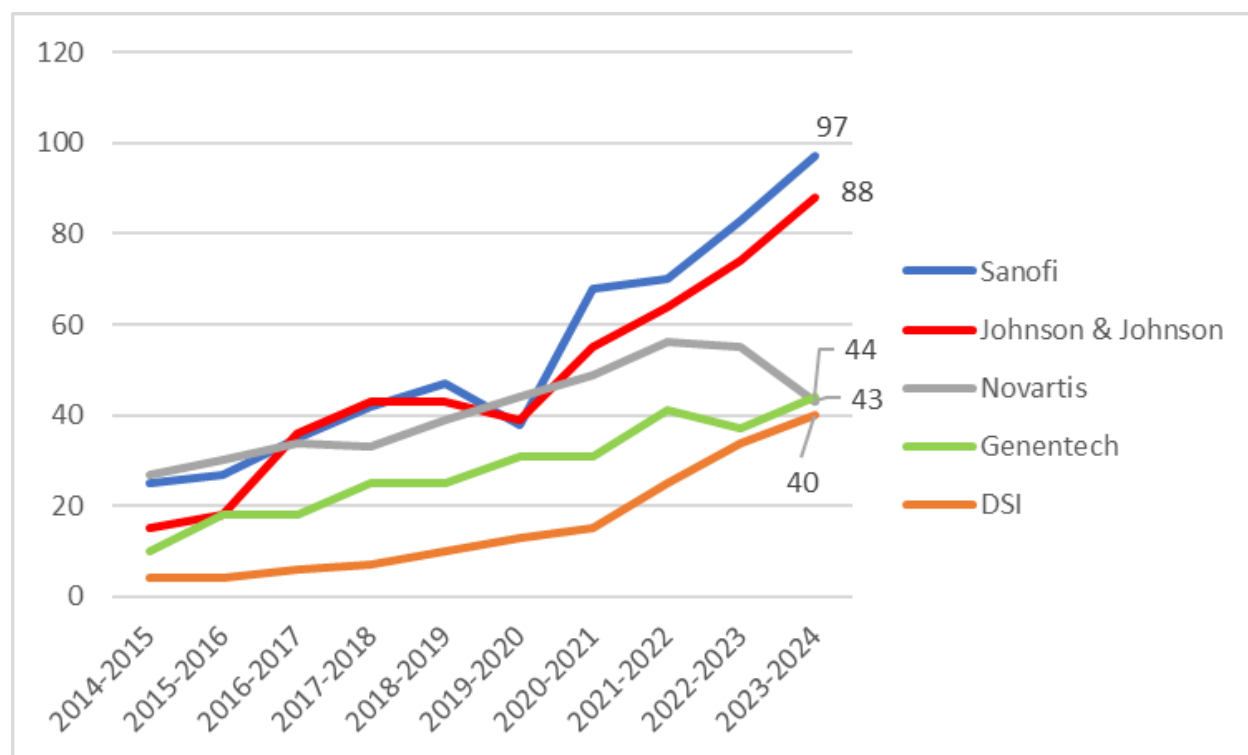
*Abbreviations: HEOR – Health Economics and Outcomes Research

NOTE: No data was collected for HEOR fellowships in 2014-15.

10-year Trend in Fellowships Offered Through Various Fellowship Sponsors

Among the top 5 companies that sponsor Fellowships (Sanofi, Johnson & Johnson, Novartis, Genentech, and Daiichi Sankyo), there has been a sharp increase in the number of positions since 2014-15. Collectively, these 5 Fellowship Sponsors offer roughly one-third of all available Fellowships (33.2%, n=312). In particular, Sanofi and Johnson & Johnson have experienced marked program growth. Sanofi has grown from 25 Fellows in 2014-15 to 97 Fellows in 2023-24, while Johnson & Johnson has grown from 18 to 88 Fellows during that same period. These results show that multiple large pharmaceutical companies continue to support and invest in the training of PharmD graduates for careers in the Industry. Fellowships continue to rise in number, and it will be interesting to observe the trends within individual Fellowship Sponsors in the future as career opportunities for pharmacists in Industry continue to expand.

Figure 9: 10-year Trend in Fellowships Offered Through Fellowship Sponsors



*Abbreviations: DSI – Daiichi Sankyo Inc.

NOTE: Sanofi includes Sanofi Genzyme and other business units.

Limitations

Functional Areas were categorized at the discretion of the authors. This categorization was implemented to stratify Functional Areas into analyzable categories, due to the variability in nomenclature across companies, but may have led to differences in distribution based on the stratification methodology. This includes, but may not be limited to, challenges in accurately and consistently characterizing Functional Areas such as Medical Affairs, Medical Information, Medical Communications, and Multidisciplinary Fellowships.

The accuracy of self-reported data collected from a LinkedIn profile cannot be fully verified. Individuals might have changed their LinkedIn profile data at any time following data collection.

Conclusions

As more and increasingly complex pharmaceutical agents receive FDA approval, the employment opportunities for pharmacists within Industry continue to grow. Fellowships provide employers with an excellent method of cultivating talent to meet this growing need.

Each year, Fellows enter new pharmaceutical, biotechnology, agency, and service provider companies, and Sponsors continue to recognize the value of pharmacists in Industry. Student pharmacists and recent graduates now have more opportunities than ever to pursue careers in non-traditional fields, and it is important to continue to characterize the ever-changing career landscape.

One hundred seventy-two (172) Class of 2023 PharmD graduates secured an Industry position after graduation without a Fellowship.¹⁰ Combined with the 539 current Fellows from the Class of 2023, a total of 711 PharmDs from the Class of 2023 entered the pharmaceutical industry after graduation. This represents more than 5% of all graduating pharmacists.

The key findings in the 2023-24 Fellowship Analysis included:

- Record number of 941 total Fellows
- 13% growth in Fellows versus 2022-23 (+111 more positions)
- Record number of 539 1st-year Fellows
- Record number of 112 Fellowship Sponsors
- Record number of 152 black pharmacist Fellows, a +241% increase since 2020-21

The key 10-year trends from 2014-15 to 2023-24 include:

- The total number of Fellowships has more than tripled in 10 years, with a 259% increase in the number of Fellows to n=941 in 2023-24 compared with n=262 in 2014-15.
- Opportunities in all major Functional Areas have expanded, with Medical Affairs being a key driver of that growth with 235 more Fellowship positions in 2023-24 than in 2014-15 (+392%).
- Multiple large Fellowship Sponsors have grown their programs in the last 10 years, and some have expanded them substantially, including Sanofi (from 23 to 97 positions) and Johnson & Johnson (from 18 to 88 positions).
- Over the last 10 years, Rutgers University Fellowships have grown from 103 to 350 (+240%), MCPHS Fellowships have increased from 39 to 118 (+203%), while Northeastern and Howard Fellowships have increased from 0 to 65 positions.

The results presented here are of interest not only to prospective Fellowship candidates, but to Fellowship program stakeholders as well. This annual analysis continues to support IPhO's position that pharmaceutical industry employers recognize the significant value and contribution of PharmDs within Industry.

References

1. Advancing Health Through Innovation: New Drug Therapy Innovation: New Drug Therapy Approvals 2023. [Novel Drug Approvals for 2023 | FDA](#). January 2024.
2. Pharmaceutical & Medicine Manufacturing. [Data USA](#). February 2023.
3. Employment and Output by Industry. [U.S. Bureau of Labor Statistics](#). September 2023.
4. Data on file, Industry Pharmacists Organization (IPhO).
5. Alexander J, Tran C, Skersick P, Tran M, Dill D, Arana-Madriz B. Analysis of 2022-23 PharmD Industry Fellowships. www.industrypharmacist.org/publications.php. February 2023. Publication.
6. Lam AW, Brady PK, Chow W, et al. Emerging Trends within Industry-Based Post-Graduate Training Programs for Pharmacists. Presented at the American Society of Health-Systems Pharmacy 38th Annual Midyear Clinical Meeting, New Orleans, LA, Dec 7-11, 2003. Poster.
7. Tellez A. A pharmacist shortage has caused CVS, Walgreens and walmart to cut pharmacy hours-here's what we know. Forbes. forbes.com/sites/anthonytellez/2023/01/30/a-pharmacist-shortage-has-caused-cvs-walgreens-and-walmart-to-cut-pharmacy-hours-heres-what-we-know/. Published January 31, 2023.
8. American Association of Colleges of Pharmacy. Fall 2022 Enrollments - Profile of Pharmacy Students. aacc.org/research/institutional-research/student-applications-enrollments-and-degrees-conferred. 2022. Report.
9. Chadna A, Gayam S, Silverman J. Industry Pharmacist Job Satisfaction Analysis. Presented at the American Society of Health-Systems Pharmacists Annual Midyear Clinical Meeting, 2022. Poster.
10. Alexander J, Chamen T, Lee J, Van Sertima C. Analysis of Direct-To-Industry Jobs Among 2023 PharmD Graduates. www.industrypharmacist.org/publications.php. February 2024. Publication.