

# **An Analysis of 2014-15 Industry Fellowships and Related Experiences of PharmD Fellows**

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## **Introduction**

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While the number of traditional pharmacy practice positions has been stagnant in recent years, the number of pharmacy schools across the U.S. continues to grow. In 2016 alone, it is expected that between 14,000-15,000 additional PharmDs will enter the workforce, which represents more than double the number of graduates produced in 2001.<sup>1</sup> This has led some to predict a looming employment crisis for the pharmacy profession.<sup>1,2</sup>

Meanwhile, the interest in pursuing a non-traditional professional path has expanded, particularly as such opportunities have increased beyond the realm of community and hospital pharmacies.<sup>3</sup> One such avenue for a pharmacist is a career in the pharmaceutical industry, where knowledge and awareness is increasing for new pharmacy graduates and established pharmacists. This career route allows pharmacists to utilize their clinical knowledge to impact patient health on a broader scale.<sup>3</sup>

As an initial step into the industry career pathway, some PharmDs have the opportunity to pursue postdoctoral industry-focused training. Commonly referred to as a “fellowship” (but sometimes known as residencies and other substantially similar designations), this training is a 1 or 2 year program that provides PharmDs with direct, hands-on work experience in a pharmaceutical, biopharmaceutical, medical device, or pharmaceutical service company.<sup>3</sup> The availability of PharmD industry fellowship programs continues to grow, particularly within recent years.

The objectives of this report are to increase awareness of the dynamics of current 2014-15 fellowship programs, and to describe industry-related experiences of PharmD fellows prior to starting their fellowship.

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# Methods:

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## *IPhO Directory*

The Industry Pharmacists Organization (IPhO) routinely maintains a comprehensive, proprietary “National Fellows Database” of all known PharmD participants in US-based industry-focused postgraduate training programs, including fellows, residents, and visiting scientists (collectively, the “fellows” .) The following data was collected from the IPhO National Fellows Database, which included data from publicly available information sources during 2014-15:

- 1) Fellowship Company
- 2) Fellowship Department
- 3) Fellow Year of Fellowship Completion
- 4) Fellow Alma Mater

Each fellow was grouped into a standardized departmental category after data collection. The categories were assigned based on the authors’ best estimate of the department description.

## *Survey*

To augment the data on file in the IPhO National Fellows Database, an anonymous survey was emailed to all 262 known 2014-15 PharmD industry fellows via SurveyMonkey, allowing collection of primary data. The survey included 7 questions, which focused on fellowship program structure and fellows’ industry-related academic experiences in pharmacy school (e.g., industry internships and/or rotations). An invitation with the survey link was e-mailed twice to all identified fellows in March 2015.

Analytical tools on SurveyMonkey were used to collect and analyze the primary data.

## *Program Duration*

Data regarding fellowship program duration was collected from several sources: program-specific websites, the IPhO Fellowship Catalogue, and online brochures. Additionally, emails were sent to a few fellows regarding program duration in order to fill in data gaps.

Data was collected on fellows participating in programs in the following settings during the period of 7/1/2014 to 6/30/2015: i) pharmaceutical, biopharmaceutical, and medical devices (companies that develop and market pharmaceutical, biopharmaceutical, and medical device products), ii) government (regulatory agencies, such as the Food and Drug Administration), and ii) pharma/biopharma-related service companies (e.g., medical education companies,

consulting companies, contracting organizations, and clinical research organizations that serve industry clients).

## **Results and Discussion:**

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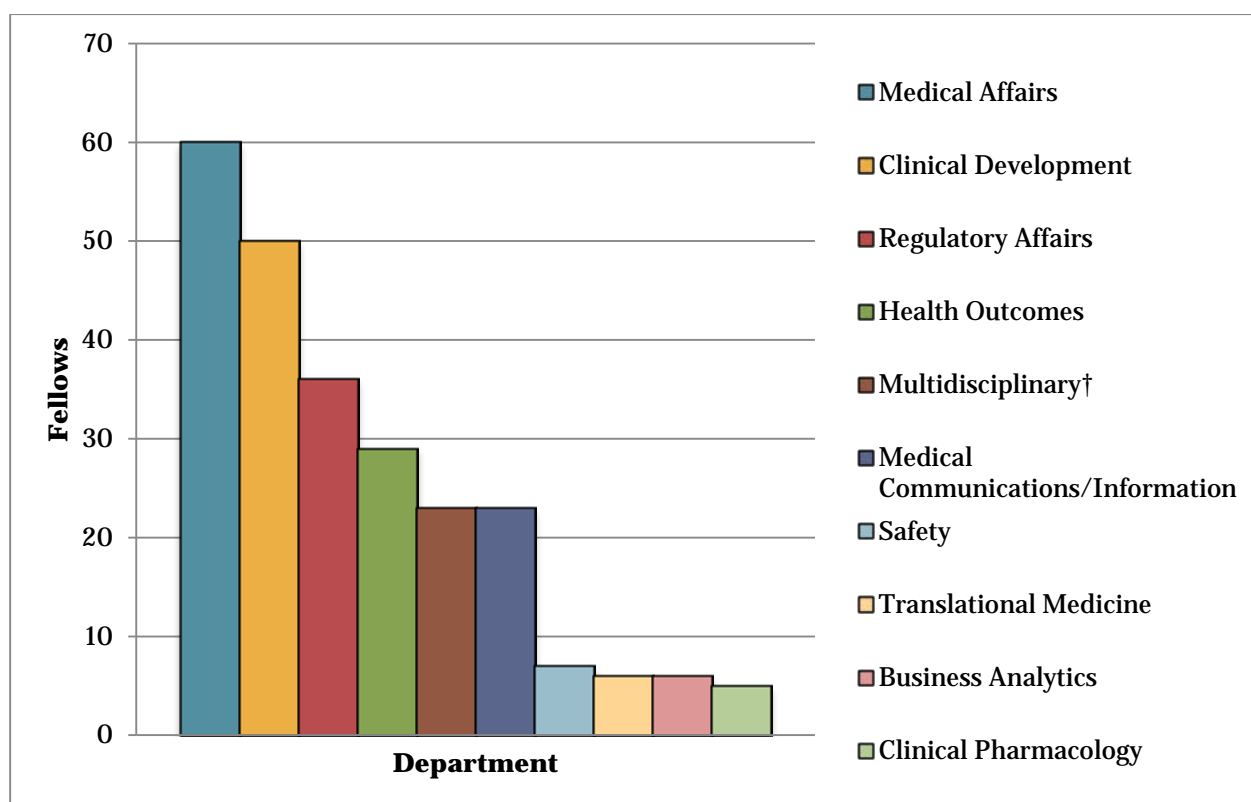
Results are described in the following 3 sections:

- A) Characterization of Industry Fellows**
- B) Academic-Focused Opportunities**
- C) Industry-Related Undergraduate Experiences**

## Section A: Characterization of PharmD Fellows in 2014-15 Industry Fellowship Programs

Data was collected to analyze the current features of PharmD industry fellowship programs, encompassing a broad range of fellowships partner companies with or without academic affiliates.

### Primary Fellowship Department



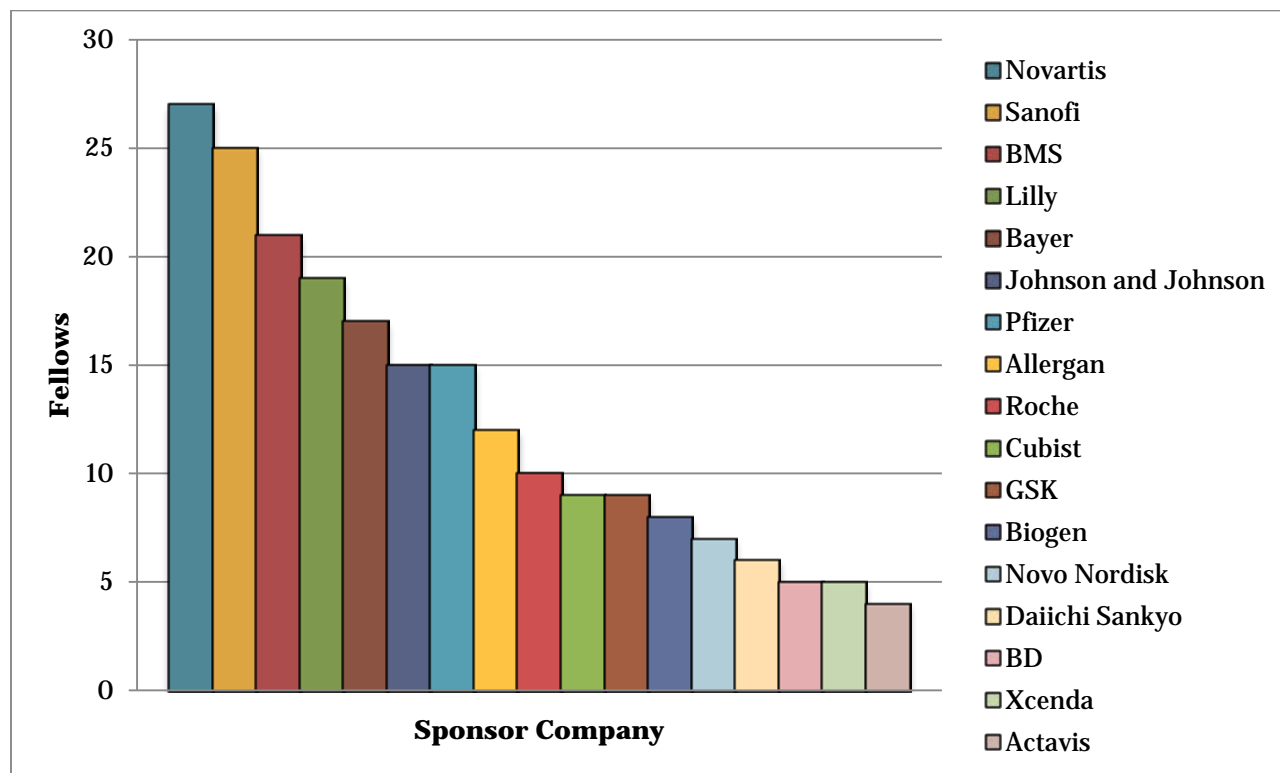
**Figure 1: Most Common Fellowship Departments (n=262 Fellows)\***

†“Multidisciplinary” includes fellows who gain experience in more than one department during their fellowship.

\*Departments containing  $\leq 3$  fellows include: Marketing, Policy, Managed Markets, Epidemiology, Quality, Project Management, Pricing Reimbursement and Access, Pharmacokinetics/Pharmacodynamics, Medication Adherence, and Others

The three most common departments that fellows train in are Medical Affairs (n=60), Clinical Development (n=50), and Regulatory Affairs (n=36). This is not surprising, given that these industry functions are traditionally well populated with health care professionals. For the multidisciplinary category (n=23), fellows reported gaining experience in two or more of the following departments: Regulatory Affairs, Safety, Medical Affairs, Medical Communications/ Medical Information, Marketing, and Clinical Development.

## Sponsor Company

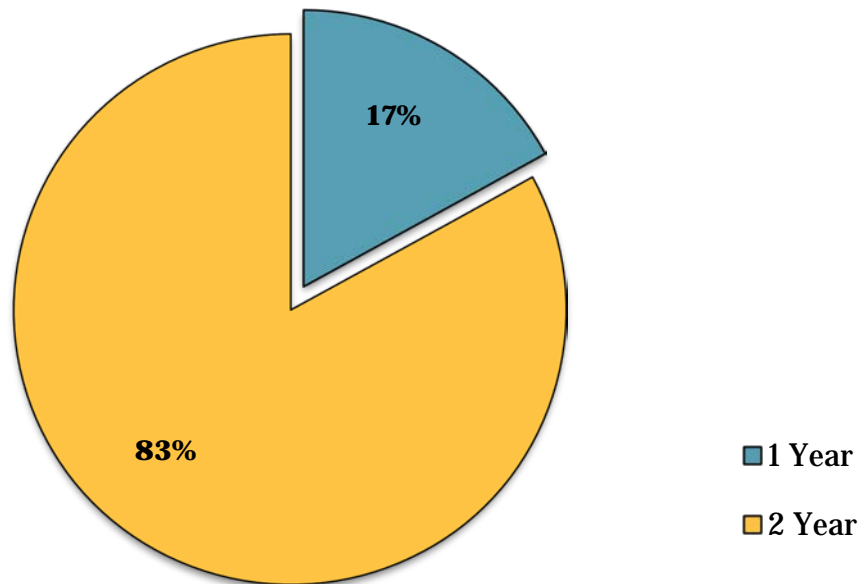


**Figure 2: Most Common Fellowship Sponsor Companies (n= 17)\***

\* The following sponsor companies were combined: Sanofi and Genzyme; Johnson and Johnson, McNeil and Janssen; Roche and Genentech; Actavis and Forest; Lilly, FDA, and Purdue.  
(BMS= Bristol Myers Squibb; GSK= GlaxoSmithKline; BD= Becton Dickinson)

Based on results, 49 companies (and their subsidiaries) hosted post-PharmD industry fellowship programs from 2014-15. While this evaluation encompasses essentially all fellowship programs in the US, it is possible that a few may have been missed. The five companies with the most fellows include Novartis (27), Sanofi (25), BMS (21), Lilly (19), and Bayer (17). Several of these companies have offered fellowships, residencies, and visiting scientist programs for many years. Together with strong internal advocates and substantial academic affiliates, their participation longevity has fueled the growth of many fellowship offerings and training of industry pharmacists.

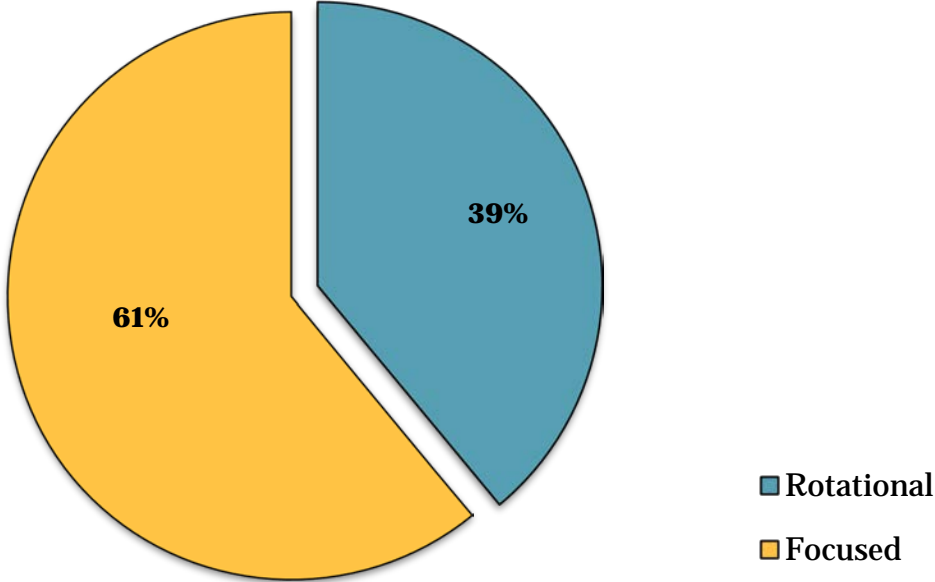
*Program Duration*



**Figure 3: Duration of Fellowship (n=244 Fellows)**

83% of 2014-15 fellows are participating in a 2-year program. This is a reflection of the amount of training fellows most frequently need to develop sufficient expertise and skill sets to become independently functioning professionals in most industry-related functional roles. Traditionally, fellowships with a rotational component have frequently been 2 years in duration, allowing for adequate time to incorporate different departments. While 1 year provides sufficient time and extent of training for certain departmental functions, results show that most fellows generally gain two years of experience prior to pursuing a full time role in industry.

Structure



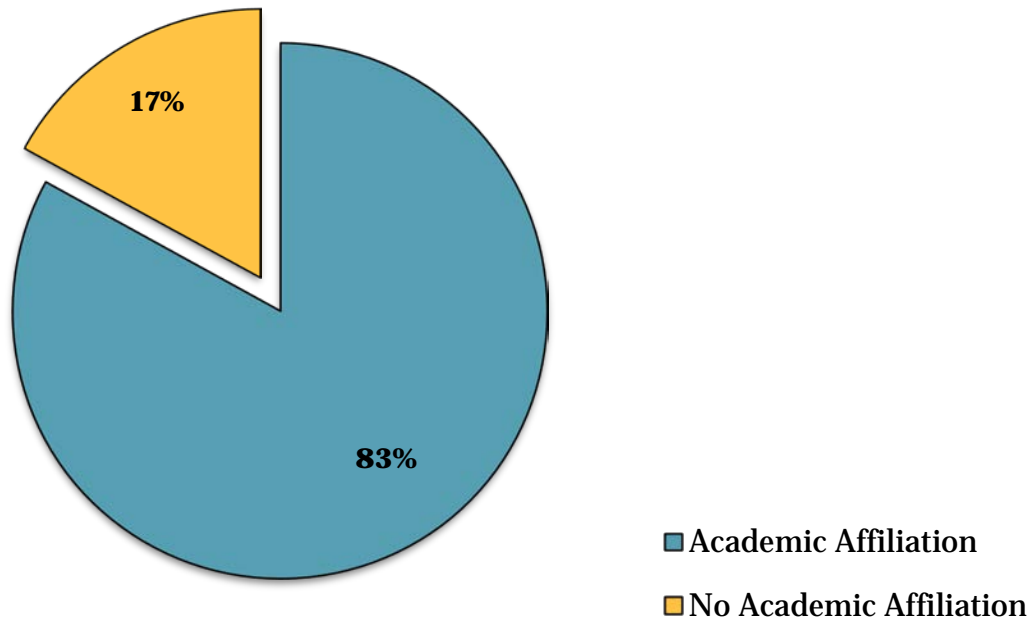
**Figure 4: Rotational Versus Focused Program Structure (n=133)**

In the fellows' survey, more than 60% of respondents reported to have a focused program structure, rather than a rotational one. While rotational programs allow flexibility and the opportunity to gain experience in multiple departments, focused programs provide a greater depth of experience within one specific company department. Traditionally, the degree to which a fellowship is focused versus rotational varies according to the preferences of the company, preceptor, and/or fellow.

## Section B: Academic-Focused Opportunities for Fellows

PharmD industry-fellowships typically allow opportunities for the fellow beyond the usual responsibilities of the sponsor company, helping to build the fellow's professional portfolio and further enhancing overall training. The following data delves into scholarly opportunities.

### *Academic Affiliation*

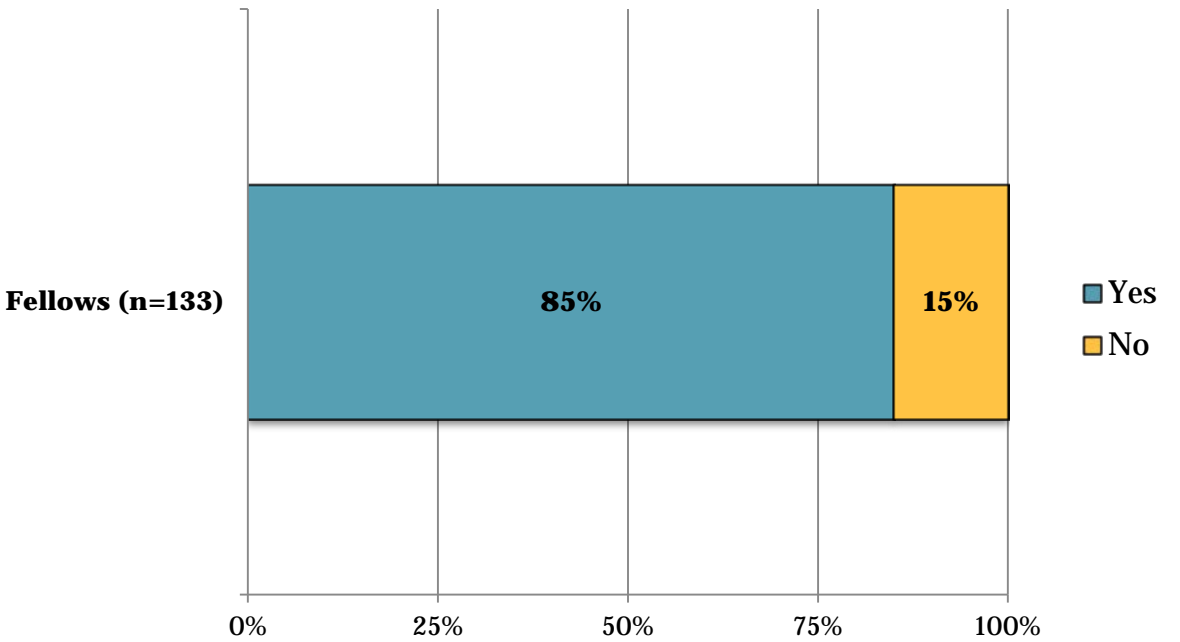


**Figure 5: Fellowship Programs with an Academic Affiliation (n=262 Fellows)**

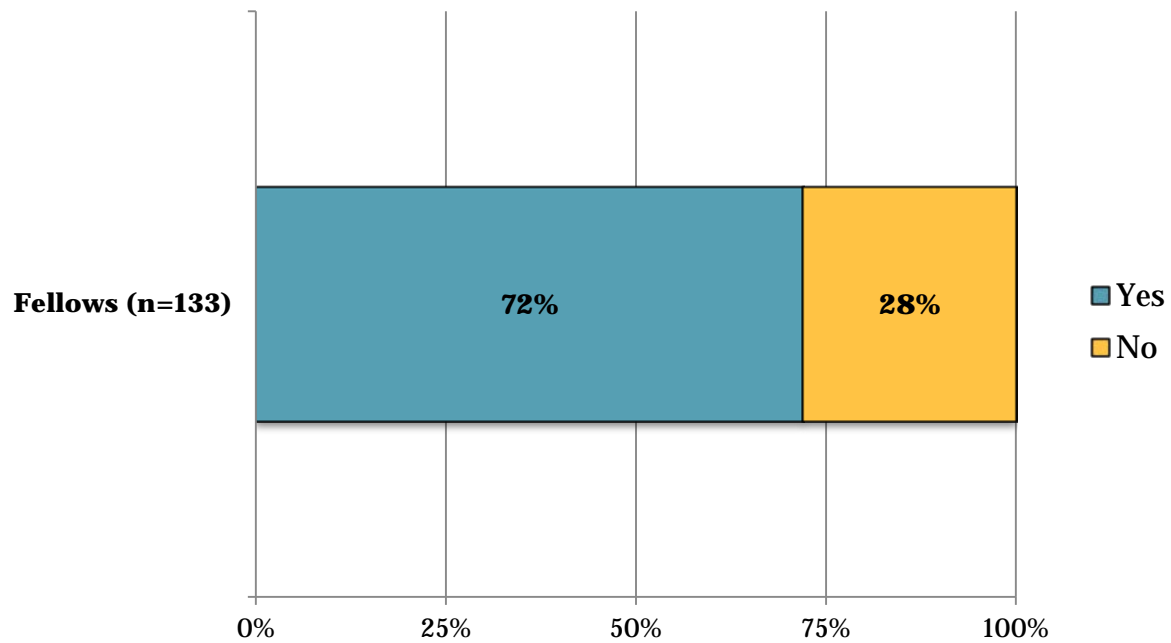
Almost 85% of fellows are in programs that are affiliated with an academic institution. 101 of those fellows are affiliated with Rutgers University Ernest Mario School of Pharmacy and 38 are affiliated with MCPHS University. Fellows participating in programs affiliated with an academic institution typically have responsibilities at both the fellowship host company and the academic institution. The number of fellowships offered through Rutgers and MCPHS University has been expanding significantly. Although a smaller portion of fellows are currently participating in non-academic affiliated programs, it will be important to monitor future trends as more industry service companies and manufacturers realize the value of industry fellowship programs.



*Teaching and Precepting Opportunities for 2014-15 Fellows*



**Figure 6: Opportunity to Teach Student Pharmacists at Pharmacy Schools**



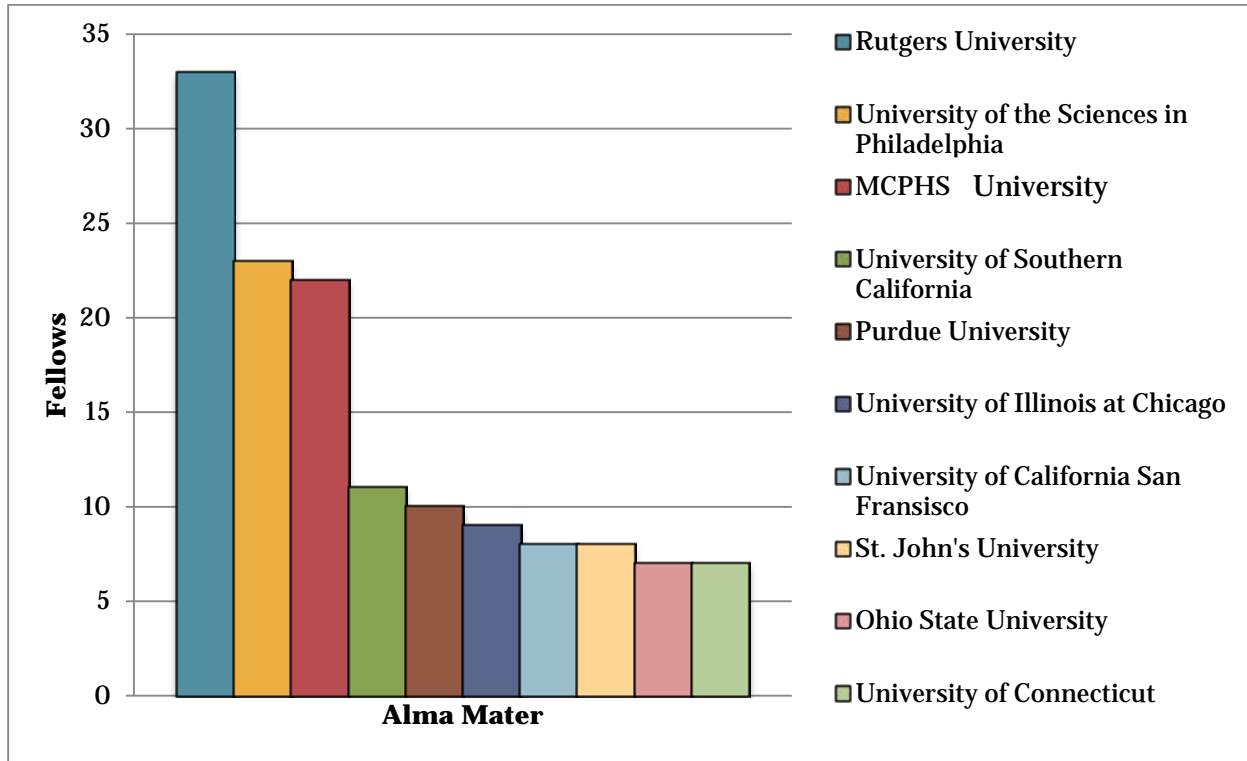
**Figure 7: Opportunity to Precept Student Pharmacists at Sponsor Company**

Of fellows responding to the survey, 85% reported that they have an opportunity to teach at a pharmacy school and 72% reported that they have an opportunity to precept student pharmacists on rotation. This is likely a reflection of the fact that most fellows (see Figure 5) are in an academic-affiliated program that offer an adjunct faculty role.

## Section C: Industry-Related Undergraduate Experiences of 2014-15 PharmD Fellows

Fellows' experiences during pharmacy school are characterized below.

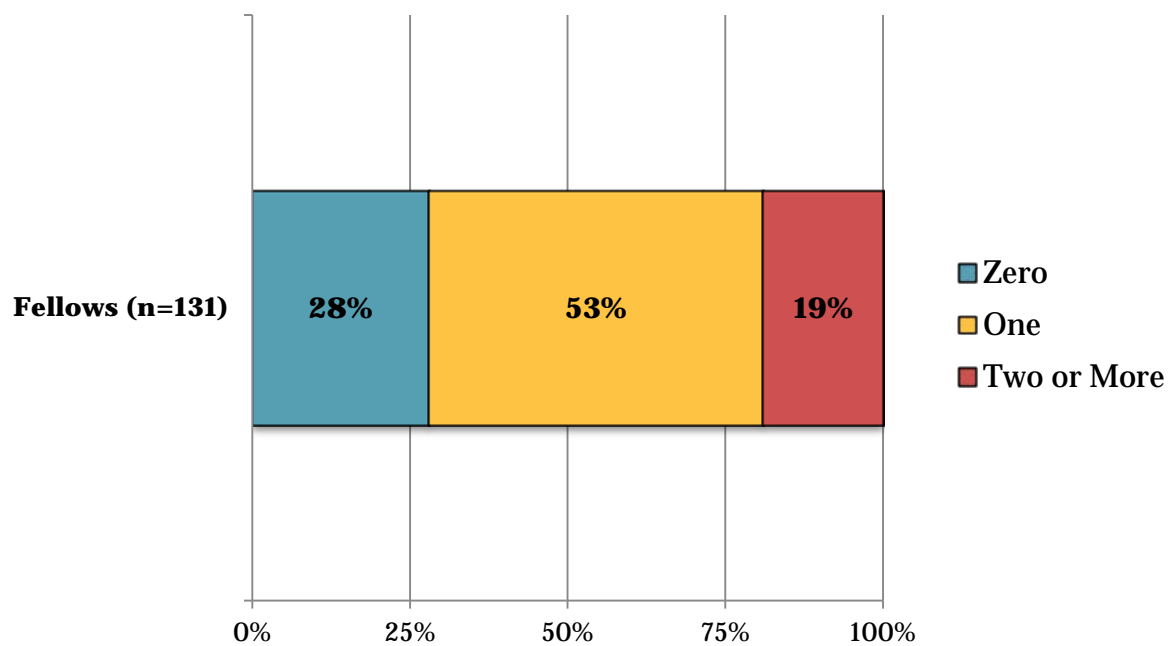
### *Alma Mater*



**Figure 8: Fellow Alma Maters (n= 262 Fellows)**

In 2014-15, 64 different pharmacy school alma maters were represented among 262 fellows, representing roughly half of all 130 U.S.-based pharmacy schools. The most common alma mater was Rutgers University (n=33), followed by the University of the Sciences (n=23) and Massachusetts College of Pharmacy and Health Sciences University (MCPHS University) (n=22). These findings are not surprising, considering that these institutions participate as academic affiliates in well-established fellowship programs. Several of the top ten most common alma maters are located in geographic regions where pharmaceutical companies are also located.

## Advanced Pharmacy Practice Experiential (APPE) Rotations

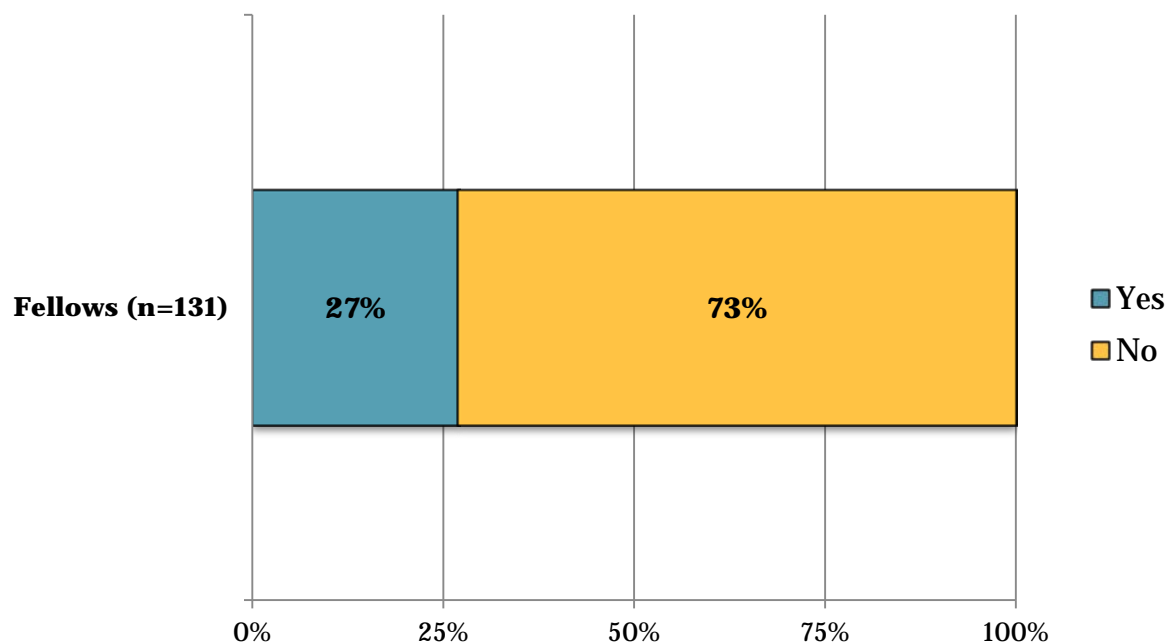


**Figure 9: Number of Industry-Related\* APPEs**

\* Includes pharmaceutical manufacturer or pharmaceutical industry-related service company (medical agency, contract research organization, consulting companies, etc)

The majority of fellow respondents (72%) had at least one industry-related APPE. These results support prior research<sup>4</sup>; in particular, one analysis showed that in 2008 and 2009, 71% and 81%, respectively, of accepted applicants (n=330) to the Rutgers Pharmaceutical Industry Fellowship Program had a prior industry rotation.<sup>4</sup> APPEs provide students with exposure to the responsibilities of industry pharmacists and a limited degree of experience within an industry setting. While industry APPEs may be a factor that decision makers consider in selecting incoming fellows, there are a substantial percentage (28%) of current fellows who did not complete industry-related APPEs. This indicates that other qualifications, skills, and experiences are also important factors in the selection process.

## Pharmaceutical Industry Internships



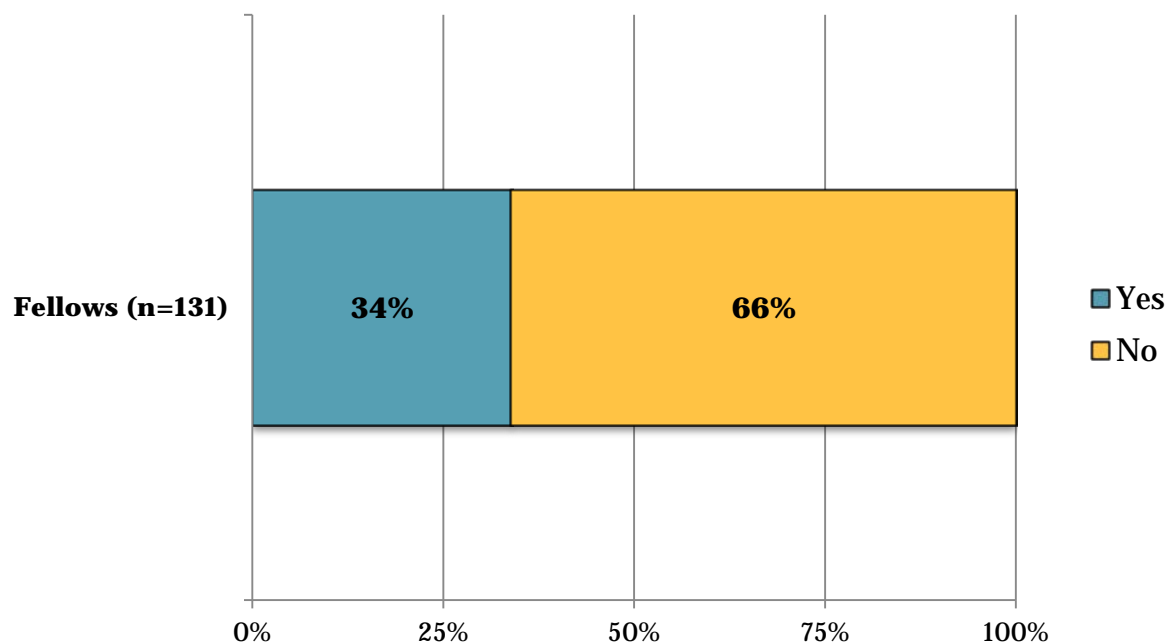
**Figure 10: Fellows With Industry-Related Internships\***

\*IPPE, APPE, or Co-op externships were not included

Close to 75% of survey respondents reported no industry-related internships during pharmacy school. These results are both surprising and disappointing, as this may reflect a low supply of industry internship opportunities compared with student pharmacist demand. Given rigorous academic curricular requirements such as IPPEs and APPEs, there is also limited time for student pharmacists to participate in extracurricular internships.

In addition to APPEs, internships are widely considered to be one of the few ways that students gain exposure/experience in the industry. Based on results seen in Figure 9, more current fellows received industry exposure through an industry-focused APPE than an internship. It will be important to monitor the number of available industry-focused APPEs and internships in the future, as prior industry experience is known to be a significant factor to obtain a fellowship.<sup>4</sup>

## Industry-Related Electives



**Figure 11: Completion of a Pharmaceutical Industry-Related Elective Course**

The higher than expected percentage of fellows who reported that they participated in an industry elective during pharmacy school is likely due to the high percentage of fellows who graduated from universities in industry centric geographic locations (i.e. East and West coasts), as illustrated in Figure 8. The number of pharmacy schools that actually offer industry electives is only estimated at between 15-20 schools, out of a total of more than 130 pharmacy schools.<sup>5</sup> More pharmacy schools may need to add industry-related electives, by either design or student demand, if student pharmacist interest in industry careers continues to grow.

## Limitations

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Data was collected from multiple sources. It is difficult to draw direct comparisons between data collected from the fellow survey and the IPhO National Fellows Database. Some data was self-reported, and some errors and missing data were also found during the analysis.

Other specific limitations that study authors noted included the following:

- Departmental data (Figure 1) was grouped by the authors according to best fit, since departmental nomenclature varies widely among companies.
- Data for program duration (Figure 3) was collected from multiple sources.
- In Figure 6, the survey question about teaching could have been more specific about teaching lectures vs. earning a teaching certificate.

## Conclusion

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As a surplus of PharmDs are expected to enter the workforce in the upcoming years<sup>1,2</sup>, pharmacy schools are starting to place more emphasis on post-doctoral training, such as clinical residencies and industry fellowships. Because student pharmacists and recent graduates are becoming more aware of and interested in pursuing opportunities in the industry, it is important to identify and describe the characteristics of fellowship programs, as well as undergraduate experiences of pharmacy graduates who have obtained fellowships.

The data in this report describing current industry fellows and fellowship programs can provide student pharmacists interested in pursuing an industry fellowship with a better understanding of the entire fellowship landscape. Student pharmacists can also review undergraduate experiences of fellows, and evaluate the potential relevance of these experiences in pursuing a fellowship.

This report may also help fellowship programs compare and contrast their own offerings with the characteristics of other programs to maintain and enhance overall program quality. The importance of monitoring and reporting upon characteristics and stakeholder trends among various fellowship programs is critical to the continued growth of the professional practice of industry pharmacy and should be undertaken with continued diligence on a consistent basis.

## Author Information

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5. Data on file, Industry Pharmacists Organization