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Pharmacist Contributions to the U.S. Health Care System Reported in the 2009 and 2014 National Pharmacist Workforce Surveys

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Abstract

Objectives: Characterize the pharmacist workforce into segments based on the proportion of time they spend in medication providing and patient care services and compare changes in these segments between 2009 and 2014.

Methods: Data from the 2009 and 2014 National Pharmacist Workforce Surveys were analyzed. Random samples of 3,000 and 5,200 pharmacists, respectively, were surveyed via mailed questionnaires with a four-contact approach. Medication providing included preparing, distributing and administering medication products, including associated consultation. Patient care services were professional services designed for patient care and medication management. Cluster analysis was used for identifying pharmacist segments and descriptive statistics were used for describing additional aspects of segments.

Results: The 2009 and 2014 surveys achieved 52% and 48% response rates, respectively. Responses from 1,200 pharmacists in 2009 and 1,382 pharmacists in 2014 were usable for cluster analysis. In both 2009 and 2014, five segments of pharmacists were identified. The proportions of pharmacists in each segment for the two surveys (2009 and 2014) were: (1) Medication Providers (41% and 40%), (2) Medication Providers who also Provide Patient Care (25% and 22%), (3) Other Activity Pharmacists (16% and 18%), (4) Patient Care Providers who also Provide Medication (12% and 13%), and (5) Patient Care Providers (6% and 7%).

Conclusions: The proportion of pharmacists in the five segments did not differ significantly between 2009 and 2014. However, when one considers changes between 2009 and 2014 in the proportion of time devoted to direct patient care, hours worked per week, and expansion of residency training within segments, it is clear that pharmacist capacity for direct patient care increased between 2009 and 2014. However, there remains a need for, and segment of, pharmacists devoted to specialty practices, dispensing, and patient care services which are delivered at the point-of-care. It appears that increases in the number of pharmacy school graduates per year has helped the pharmacy profession meet medication provider needs while, at the same time, expand capacity for new roles in patient care.

Introduction

Findings from the 2009 National Pharmacist Workforce Survey showed that, in 2009, 41% of U.S. pharmacists were devoted primarily to medication providing, 43% of pharmacists contributed significantly to direct patient care service provision, and the remaining 16% contributed most of their time to business/organization management, research,

education, and other health-system improvement activities [1]. The findings also showed that older pharmacists, who are more likely to exit the workforce before younger pharmacists, were most likely to be in the “medication providing” segment of pharmacists. The findings also showed that pharmacists who may be in the “medication providing” segment, but not likely to exit the workforce in the near future, would like to spend less time in medication providing and more time in provision of direct patient care services [1].

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A recent report by the National Governors Association [2] suggested that pharmacists’ roles are evolving to include providing direct patient care as members of integrated health

care provider teams and that this has the potential to improve health outcomes. To help ensure the profession's capacity for its emerging roles in health care, the pharmacy profession has focused more on direct patient care and collaborative practice resulting in reforms for both pharmacy education and practice [3-5].

In light of the expansion of the pharmacist's role in direct patient care and congruent training in such roles, our goal was to repeat a segment analysis conducted in 2009 using data from the 2014 National Pharmacist Workforce Survey. As was done in 2009, the segmentation analysis was based upon pharmacists' time devoted to medication provision (their traditional role) and to patient care services (their emergent role). A segmentation approach identifies key clusters (segments) of the pharmacist workforce and provides a description of their characteristics so that projections can be made regarding future pharmacy profession capacity as cohorts of pharmacists exit the workforce and newly trained pharmacists join the workforce.

Study Objectives

The overall goal for this study was to repeat the segment analysis of the pharmacist workforce conducted in 2009 using data from the 2014 National Pharmacist Workforce Survey. The objectives were to:

1. Identify segments of pharmacists based upon time spent in medication providing and patient care services.
2. Describe segments according to demographic characteristics.
3. Describe segments according to work contributions.
4. Describe segments by work setting.
5. Describe segments according to work activities.
6. Describe year of licensure cohorts to identify trends that may impact future pharmacist capacity for contributing to the U.S. health care system.
7. Compare the findings from the 2014 data with findings from the 2009 data.

Methods

Data for this study were obtained from the 2009 and 2014 National Pharmacist Workforce Surveys. For the 2009 survey, a random sample of 3,000 pharmacists was selected for a national, cross-sectional, descriptive survey [6]. In 2014, a random sample of 5,200 pharmacists was selected in the same manner. Questions comprising each section of the surveys were taken from previous workforce surveys conducted by members of the project team [6-8].

Random samples of licensed pharmacists in the United States were obtained from Redi-Data a company that maintains a list of licensed pharmacists in the United States from every state. In 2009, this list contained 249,381 unduplicated licensed individuals and in 2014 this list contained 250,652 unduplicated licensed individuals. The lists were cleaned and updated by Redi-Data whenever a state board of pharmacy provided an updated file. Redi-Data had no states that refused to give them the information. Randomly selected samples of names and mailing addresses were selected and stored in electronic format. These files were incorporated into a database program to generate mailing labels for the surveys.

A mailed questionnaire with multiple follow-up was designed using principles from Dillman [9] in which a multiple-contact approach was utilized. In both study years (2009 and 2014), surveys were returned to the University of Minnesota, College of Pharmacy and processed for data entry. A database structure was created and responses coded according to the survey code book.

Two continuous variables were the primary focus of this study: (1) percent time spent in medication providing and (2) percent time spent in patient care services at each respondent's primary place of employment. Respondents reported the proportion of time they spent in each of the activities. These were two of the six work activities we included for the 2009 survey which were defined as:

- **Medication Providing:** preparing, distributing, and administering medication products, including associated consultation, interacting with patients about selection and use of over-the-counter products, and interactions with other professionals during the medication **providing** process.
- **Patient Care Services:** assessing and evaluating patient medication-related needs, monitoring and adjusting patients' treatments to attain desired outcomes, and other services designed for patient care management.
- **Business/Organization Management:** managing personnel, finances, and systems.
- **Research:** discovery, development, and evaluation of products, services, and/or ideas.
- **Education:** teaching, precepting, and mentoring of students/trainees.
- **Other Activities:** any activities not described in other categories.

The 2014 survey differed slightly as follows:

- **Patient Care Services Associated with Medication Dispensing:** preparing, distributing, and administering medication products, including associated consultation, interacting with patients about selection and use of over-the-counter products, and interactions with other professionals during the medication **dispensing** process.
- **Patient Care Services Not Associated with Medication Dispensing:** assessing and evaluating patient medication-related needs, monitoring and adjusting patients' treatments to attain desired outcomes, and other services designed for patient care management.
- **Business/Organization Management:** managing personnel, finances, and operations.
- **Research/Scholarship:** discovery, development, and evaluation of products, services, and/or ideas.
- **Education:** teaching, precepting, and mentoring of students/trainees/technicians:
- **Other:** any activities not described in the above categories.

The headings for 'Medication Providing' and 'Patient Care Services' were changed to 'Patient Care Services Associated with Medication Dispensing' and 'Patient Care Services Not Associated with Medication Dispensing', respectively. Also, one word in the definition of 'Medication Providing' was changed from "providing" in 2009 to "dispensing" in 2014. This was done to help respondents answer these questions so that "**medication providing**" primarily uses the medication as the unit of focus for service provision. It is typically focused on prescription order fulfillment but includes an array of professional activities in which pharmacists are responsible to the technical functions of providing a prescription product, assuring that the correct drug product is provided, identifying and resolving drug-drug interactions, conversing with prescribers about dose or directions, and counseling patients about proper use. In contrast, the designation "**patient care services**" uses the patient as the unit of focus and can be provided independent from any medication being provided to the patient. This service typically is a team-based clinical role providing patient-centered medication therapy management, health improvement, and disease prevention services [10].

Data were extracted from the database and analyzed for this report. Two variables (percent time spent in medication providing activities and percent time spent in patient care activities) were utilized for conducting a two-step cluster analysis, with IBM SPSS version 21 statistical software. The two-step cluster analysis uses a scalable cluster algorithm.

The first step of the analysis is to 'pre-cluster' each case (record) into many small sub-clusters through a sequential clustering approach. The second step of the analysis is to 'cluster the sub-clusters' resulting from step one into the final cluster solution using an agglomerative hierarchical clustering method. The log-likelihood distance measure (a probability-based distance) is applied for each step of the analysis so that both continuous and categorical variables can be used if so desired.

Our primary goal was to identify pharmacist segments and describe them using descriptive statistics within the context of the new roles for pharmacists that we mentioned in the introduction of this paper. Thus, after pharmacist segments were identified, they were compared across several demographic variables using Chi-Square and Analysis of Variance statistics.

Results

In 2009, 2,667 surveys were presumed to be delivered to a pharmacist. Of these, 1,395 (52.3%) were returned. In 2014, 5,053 surveys were presumed to be delivered to a pharmacist. Of these, 2,445 (48.4%) were returned.

For inclusion in cluster analysis, respondents needed to report both their percent time devoted to medication providing and to patient care services. Respondents who reported that they were: (1) retired, do not practice pharmacy at all, (2) employed in a career not related to pharmacy, or (3) unemployed were not asked the work activity questions and, thus, not included for analysis. Respondents who were included for analysis were those who reported that they were: (1) practicing as a pharmacist, (2) employed in a pharmacy-related field or position, or (3) retired, but still working in pharmacy or employed part-time as a pharmacist. A total of 1,200 respondents in 2009 and 1,382 respondents in 2014 provided usable responses for cluster analysis.

Cluster analysis identified five segments of pharmacists that we labeled as: (1) Medication Provider, (2) Medication Provider who also provides Patient Care, (3) Other Activity Pharmacist, (4) Patient Care Provider who also Provides Medication, and (5) Patient Care Provider. Figure 1 shows the proportion of pharmacists in each of the five segments and Table 1 provides a description of each segment in terms of time devoted to medication providing and patient care services.

Table 2 provides summary comparisons among the five segments in terms of (1) demographic characteristics, (2)

work contributions, (3) work settings by column %, (4) work settings by row %, and (5) time currently spent in work activities.

Medication Providers

In our study, 41% of pharmacists in 2009 and 40% of pharmacists in 2014 who were employed in pharmacy or in a pharmacy-related field were in the Medication Provider segment. In 2009 / 2014 these pharmacists devoted an average of 88% / 83% of their time to medication providing and only 5% / 6% to patient care services as defined in this study. Table 2 shows that they were the oldest of the five segments, on average. In 2009, 59% of this segment was male, only 17% had a PharmD degree, and only 3% had residency training. In 2014, 48% were male, 43% had a PharmD degree, and 6% had residency training. In both 2009 and 2014, this segment contributed the fewest hours worked per week of any segment. This segment of pharmacists primarily worked in community pharmacy practice settings (78% in 2009 and 68% in 2014). In 2014, 61% of respondents who worked in community practice settings were identified as being in the "Medication Provider" segment of pharmacists which is similar to 60% of respondents in 2009.

Medication Providers Who Provide Patient Care

In our study, 25% of pharmacists in 2009 and 22% of pharmacists in 2014 who were employed in pharmacy or in a pharmacy-related field were in the Medication Provider who also Provides Patient Care segment. In 2009 / 2014 these pharmacists devoted an average of 65% / 60% of their time to medication providing and 19% / 22% to patient care services as defined in this study. Table 2 shows that, in 2009, 52% percent of this segment were male, only 17% had a PharmD degree, and only 4% had residency training. In 2014, 41% were male, 48% had a PharmD degree, and 5% had residency training. In 2009, 67% of this segment of pharmacists worked in community pharmacy practice settings, 25% in hospital settings, and 7% in other pharmacy settings. In 2014, 58% worked in community pharmacy settings, 28% worked in hospital settings, and 14% worked in other pharmacy settings.

Other Activity Pharmacists

In 2009, 16% of pharmacists who were employed in pharmacy or in a pharmacy-related field were in the Other Activity Pharmacists segment. In 2014, the proportion was 18%. In 2009 / 2014 these pharmacists devoted an average of 5% / 6% of their time to medication providing and 3% / 5% to patient care services as defined in this study. Most of their time was devoted to other activities such as business/organization management, research, education, and

other health-system improvement activities. Table 2 shows that, in 2009, 60% were male, 42% had a PharmD degree, and 19% had residency training. In 2014, 46% were male, 58% had a PharmD degree, and 27% had residency training. This segment contributed the most hours worked per week of any segment in both 2009 and 2014. In 2009, 45% of this segment of pharmacists worked in 'other, setting not licensed as a pharmacy,' and 30% worked in a hospital setting. In 2014, 46% of this segment of pharmacists worked in 'other, setting not licensed as a pharmacy,' and 23% worked in a hospital setting.

Patient Care Providers Who Also Provide Medication

This segment (12% of pharmacists in 2009 and 13% of pharmacists in 2014 who were employed in pharmacy or in a pharmacy-related field) devoted an average of 33%/29% of their time to medication providing and 43%/49% in 2009 and 2014, respectively, to patient care services as defined in this study. Table 2 shows that they were the youngest of the five segments, on average, in both 2009 and 2014. In 2009, 64% were female, 40% had a PharmD degree, and 25% had residency training. In 2014, 66% were female, 59% had a PharmD degree, and 30% had residency training. In 2009, the hours worked per week by this segment were below the overall average. In 2014, the hours worked per week were above the overall average. In 2009, 54% of this segment of pharmacists worked in hospital settings, 23% worked in community pharmacy practice settings, and 16% worked in 'other, licensed pharmacy settings.' In 2014, 70% worked in hospital settings, 13% in community settings, and 14% in 'other, licensed pharmacy settings.'

Patient Care Providers

In 2009, 6% of pharmacists who were employed in pharmacy or in a pharmacy-related field were in the Patient Care Provider segment. In 2014, the proportion was 7%. In 2009 / 2014 these pharmacists devoted an average of 5% / 5% of their time to medication providing and 82% / 84% to patient care services as defined in this study. Table 2 shows that they were the second youngest of the five segments, on average, in both 2009 and 2014. In 2009, 59% were female, 53% had a PharmD degree, and 26% had residency training. In 2014, 68% were female, 61% had a PharmD degree, and 34% had residency training. This segment contributed the second highest number of hours worked per week of any segment in both 2009 and 2014. In 2009, 64% worked in hospital pharmacy practice settings and 27% worked in 'other, pharmacy settings.' In 2014, 49% worked in hospital settings and 36% worked in 'other, pharmacy settings.'

Year of Licensure Cohorts

Table 3 summarizes comparisons for U.S. pharmacist by year of licensure cohorts and provides insight regarding future pharmacy profession capacity as cohorts of pharmacists exit the workforce and newly trained pharmacists join the workforce. For example, Table 3 shows that pharmacists who were licensed before 1980 are typically male, not likely to hold a PharmD degree, and not likely to have residency training. In comparison, pharmacists were licensed after 1995 are much more likely to be female, hold a PharmD degree, and have residency training. The findings in Table 3 also show that year of licensure cohort was significantly associated with pharmacist segment type in 2009 ($p < 0.001$). However, this association was not significant in 2014 ($p = 0.12$) since the sample sizes for year of licensure cohorts became relatively small for the years 1974 and earlier.

Discussion

Five pharmacist segments were identified using data from a survey of pharmacists conducted in 2009 and replicated using data collected in 2014. The findings showed that, in 2009, 41% of U.S. pharmacists were devoted primarily to medication providing (Medication Providers) with a relatively negligible proportion of their time (five percent or less) devoted to patient care service provision. Forty-three percent of pharmacists contributed a significant portion of their time (19% or more) to patient care service provision (Medication Providers who also Provide Patient Care, The Patient Care Providers who also Provide Medication, and The Patient Care Providers). The remaining 16% (Other Activity Pharmacists) contributed most of their time to business/organization management, research, education, and other health-system improvement activities. The findings from 2014 showed a similar pattern with 40% of U.S. pharmacists devoted primarily to medication providing, 42% contributing a significant portion of their time (20% or more) to patient care service provision, and the remaining 18% contributing most of their time to business/organization management, research, education, and other health-system improvement activities.

Findings from the 2009 and 2014 studies (Table 2) did show some statistically significant differences between the survey years, however. For example:

- The proportion of time that 'Medication Providers' devoted to medication dispensing decreased from 88% in 2009 to 83% in 2014.
- The proportion of 'Medication Providers' who had a PharmD increased from 17% in 2009 to 43% in 2014.
- The proportion of 'Medication Providers who also Provide Patient Care' who had a PharmD increased from 17% in 2009 to 48% in 2014.

- The proportion of time that 'Patient Care Providers who also Provide Medication' devoted to patient care increased from 43% in 2009 to 49% in 2014.
- The proportion of 'Patient Care Providers who also Provide Medication' who had a PharmD increased from 40% in 2009 to 59% in 2014.
- The proportion of 'Patient Care Providers' who had residency training increased from 26% in 2009 to 34% in 2014.
- The proportion of 'Patient Care Providers' who worked in 'other, pharmacy settings' increased from 27% in 2009 to 36% in 2014.

These findings show that patient care provision by pharmacists is increasing. However, the relatively stable proportions of Medication Providers in 2009 and 2014, suggests that there is a continued need for pharmacists to be engaged in medication provision as well. Increases in the number of pharmacists graduating per year (See Figure 2) [11], pharmacy technicians (there are over 350,000 certified technicians in the United States), use of advanced logistics (e.g. centralized fill), and technology (e.g. bar code scanning, e-prescribing, robotics) have helped the profession meet medication provision needs while expanding capacity for new roles in patient care.

The proportionate sizes of the five pharmacist segments were similar between 2009 and 2014. However, when one considers changes that occurred from 2009 to 2014 in the proportion of time devoted to patient care, hours worked per week, expansion of residency training, and increases in the number of graduates per year (Table 2 and Figure 2) [11], it is clear that pharmacist capacity for direct patient care increased between 2009 and 2014.

Limitations

The results and our interpretation of them should be tempered with the limitations of the study. The results are based on respondents' self-reports, raising questions regarding the extent to which respondents gave socially desirable responses. Non-response bias is another limitation. It is possible that responders were more interested in the topic we studied or had stronger opinions about the questions we asked than those who chose not to respond. For our analysis, usable data from respondents working in pharmacy or a pharmacy related field were used. While our findings are representative of pharmacists working in pharmacy or a pharmacy related field, it should be noted that our analysis did not include licensed pharmacists who were outside of these domains (retired, unemployed, or working outside of a pharmacy related field). The headings we used

for medication providing and patient care services were slightly different between the 2009 and 2014 surveys. However, the definitions of these variables were exactly the same, except for one word change (providing / dispensing). None-the-less, these changes could have affected the results, especially the risk for socially desirable responses. Finally, patient care services may vary widely among responders in terms of specific activities and various roles served. This variable should be viewed as a broadly defined one when interpreting the findings.

Conclusions

Findings from the 2009 and 2004 National Pharmacist Workforce Surveys revealed five segments of pharmacists: (1) Medication Providers, (2) Medication Providers who also Provide Patient Care, (3) Other Activity Pharmacists, (4) Patient Care Providers who also Provide Medication, and (5) Patient Care Providers. The proportion of pharmacists in these segments did not differ significantly between 2009 and 2014. However, when one considers changes between 2009 and 2014 in the proportion of time devoted to patient care, hours worked per week, and expansion of residency training within segments, it is clear that pharmacist capacity for direct patient care increased between 2009 and 2014. However, the findings also suggest that there remains a need for, and segment of, pharmacists devoted to specialty practices, dispensing, and patient care services which are delivered at the point-of-care. It appears that increases in the number of pharmacy graduates per year has helped the pharmacy profession meet medication provision needs while, at the same time, expand capacity for new roles in patient care.

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Figure 1: Proportion of U.S. Pharmacists by Segment in Descending Size (2009 data in lighter tone on left and 2014 data in darker tone on right)

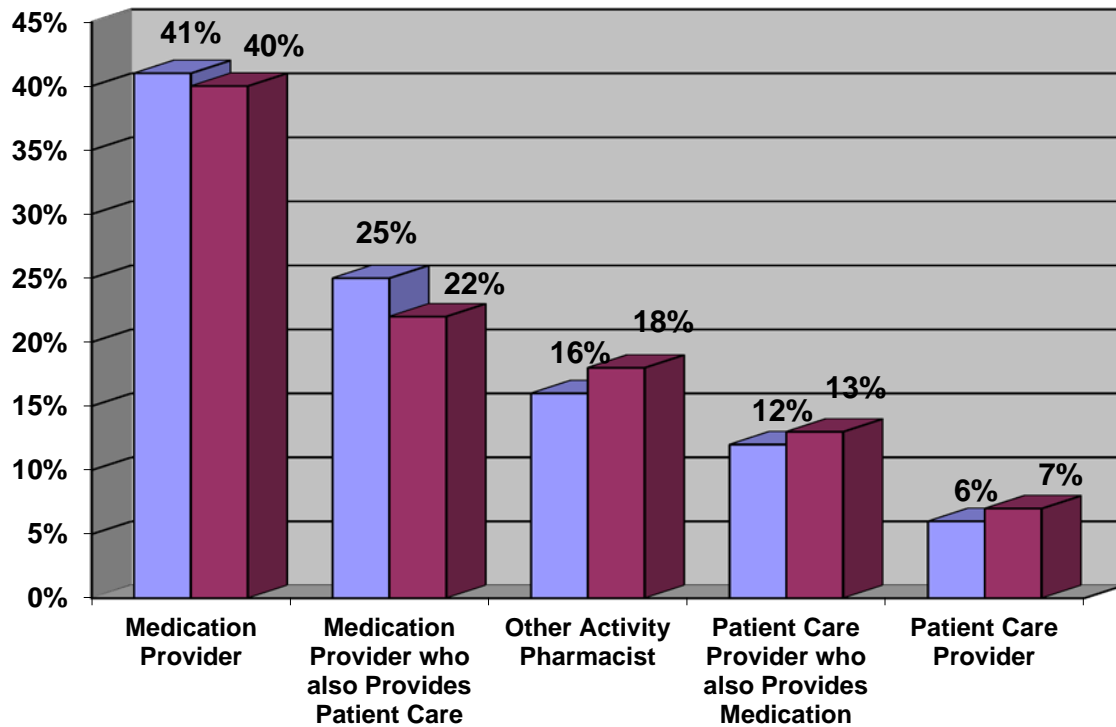
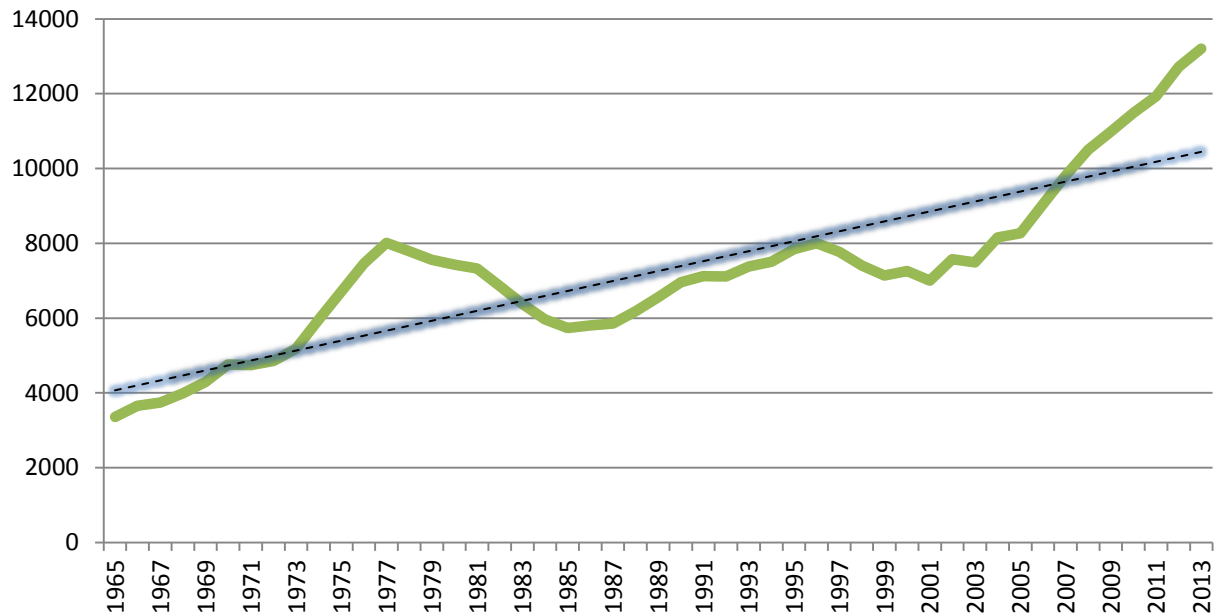


Figure 2: Number of Pharmacist First Professional Degrees by Year of Graduation (1965-2013) with Trend Line



Source: 2012-13 Profile of Pharmacy Students – AACP

Table 1
Description of Pharmacist Segments

Pharmacist Segment	Segment Size (% of total)		Mean Time Devoted to Medication Providing		Mean Time Devoted to Patient Care	
	2009	2014	2009	2014	2009	2014
1: Medication Provider	n = 496 (41%)	n = 555 (40%)	88%	83%	5%	6%
2: Medication Provider who also Provides Patient Care	n = 303 (25%)	n = 301 (22%)	65%	60%	19%	22%
3: Other Activity Pharmacist	n = 193 (16%)	n = 247 (18%)	5%	6%	3%	5%
4: Patient Care Provider who also Provides Medication	n = 142 (12%)	n = 184 (13%)	33%	29%	43%	49%
5: Patient Care Provider	n = 66 (6%)	n = 99 (7%)	5%	5%	82%	84%
Total	N = 1,200	N = 1,382	58%	52%	17%	20%

Table 2
Comparison of U.S. Pharmacist Segments

	Medication Provider	Medication Provider who also provides Patient Care	Other Activity Pharmacist	Patient Care Provider who also Provides Medication	Patient Care Provider	Overall
Demographic Characteristics						
2009 Mean Age (years) ANOVA p< 0.001	52.0	50.2	49.2	45.6	47.4	50.1
2014 Mean Age (years) ANOVA p< 0.001	49.5	47.3	49.5	44.5	45.8	48.1
2009 Female Gender (%) X^2 p < 0.001	41%	48%	40%	64%	59%	47%
2014 Female Gender (%) X^2 p < 0.002	52%	59%	54%	66%	68%	57%
2009 Mean Year of First Licensure ANOVA p< 0.001	1982	1983	1984	1988	1988	1983
2014 Mean Year of First Licensure ANOVA p< 0.001	1989	1992	1989	1994	1993	1991
2009 Hold PharmD (%) X^2 p < 0.001	17%	17%	42%	40%	53%	26%
2014 Hold PharmD (%) X^2 p < 0.001	43%	48%	58%	59%	61%	50%
2009 Residency Training (%) X^2 p < 0.001	3%	4%	19%	25%	26%	9%
2014 Residency Training (%) X^2 p < 0.001	6%	5%	27%	30%	34%	15%
2009 Both PharmD + Residency (%) X^2 p < 0.001	2%	3%	17%	21%	24%	8%
2014 Both PharmD + Residency (%) X^2 p < 0.001	4%	3%	22%	26%	33%	12%
Work Contributions						
2009 Mean Hrs Worked /Wk ANOVA p< 0.001	35.6	38.0	44.7	37.2	39.8	38.1
2014 Mean Hrs Worked /Wk ANOVA p< 0.001	37.2	39.5	46.4	40.3	40.8	40.0
2009 Practicing as a Pharmacist (%) X^2 p < 0.001	89%	93%	45%	94%	97%	84%
2014 Practicing as a Pharmacist (%) X^2 p < 0.001	90%	95%	59%	94%	93%	86%

Current Work Setting (Column %) 2009, $X^2 p < 0.001$ 2014, $X^2 p < 0.001$						
2009 Community Pharmacy ^a	78%	67%	10%	23%	1%	-
2014 Community Pharmacy ^a	68%	58%	15%	13%	1%	
2009 Hospital Setting	15%	25%	30%	54%	64%	-
2014 Hospital Setting	17%	28%	23%	70%	49%	
2009 Other, Pharmacy Setting ^b	7%	7%	15%	16%	27%	-
2014 Other Pharmacy Setting ^b	14%	14%	16%	14%	36%	
2009 Other, Setting Non-Pharmacy ^c	<1%	1%	45%	7%	8%	-
2014 Other, Setting Non-Pharmacy ^c	1%	<1%	46%	3%	14%	
Current Work Setting (Row %) 2009, $X^2 p < 0.001$ 2014, $X^2 p < 0.001$						
2009 Community Pharmacy ^a	60%	32%	3%	5%	<1%	-
2014 Community Pharmacy ^a	61%	29%	6%	4%	<1%	
2009 Hospital Setting	23%	24%	17%	23%	13%	-
2014 Hospital Setting	23%	20%	14%	31%	12%	
2009 Other Pharmacy Setting ^b	29%	16%	23%	18%	14%	-
2014 Other, Pharmacy Setting ^b	36%	18%	18%	12%	16%	
2009 Other, Setting Non-Pharmacy ^c	1%	2%	83%	10%	5%	-
2014 Other, Setting Non-Pharmacy ^c	4%	1%	81%	4%	10%	
Mean % of Time Currently Spent in Work Activities						
2009 Medication Providing ANOVA $p < 0.001$	88%	65%	5%	33%	5%	58%
2014 Medication Providing ANOVA $p < 0.001$	83%	60%	6%	29%	5%	52%
2009 Patient Care Services ANOVA $p < 0.001$	5%	19%	3%	43%	82%	17%
2014 Patient Care Services ANOVA $p < 0.001$	6%	22%	5%	49%	84%	20%
2009 Business/Org. Management ANOVA $p < 0.001$	5%	10%	41%	9%	3%	12%
2014 Business/Org. Management ANOVA $p < 0.001$	5%	8%	39%	7%	2%	12%
2009 Research ANOVA $p < 0.001$	<1%	1%	18%	4%	3%	4%
2014 Research ANOVA $p < 0.001$	<1%	1%	15%	3%	2%	4%

2009 Education ANOVA p< 0.001	2%	4%	8%	8%	6%	4%
2014 Education ANOVA p< 0.001	4%	7%	10%	9%	6%	7%
2009 Other ^d ANOVA p< 0.001	1%	1%	25%	5%	2%	5%
2014 Other ^d ANOVA p< 0.001	1%	2%	24%	3%	2%	6%

^a “Community Pharmacy Practice” included: independent, chain, mass merchandiser and supermarket pharmacies.

^b “Other, Pharmacy Setting” included: nursing home, long term care, health maintenance organization, nuclear, clinic-based, mail service, central fill, and home health/infusion pharmacies.

^c “Other, Setting Non-Pharmacy” included: pharmacy benefit administration, academic, government administration, pharmaceutical industry, consulting companies, professional associations, and other organizations that were not licensed as a pharmacy.

^d Other includes activities such as: computer analysis, audit control, continuing education, grants, committee work, communications, consultation, data analysis, drug information services, formulary management, systems implementation, inspections, investigations, information technology work, manufacturing, marketing, medication safety, meetings, policy work, problem resolution, quality assurance, regulatory issues, and writing.

Table 3
Comparison of U.S. Pharmacist Year of Licensure Cohorts in 2009 and 2014

Year of Licensure Cohort (year of first licensure)	Female Gender	Age (years)	Hold PharmD Degree	Residency Training	Have Both PharmD and Residency	% (Medication Provider)	% (Medication Provider who also provides Patient Care)	% (Other Activity Pharmacist)	% (Patient Care Provider who also Provides Medication)	% (Patient Care Provider)
2009 Survey Data										
2005 to 2006 (n = 23)	70%	30.9	96%	30%	30%	52%	4%	9%	13%	22%
2000 to 2004 (n = 101)	66%	33.7	75%	22%	21%	33%	23%	18%	20%	7%
1995 to 1999 (n = 136)	67%	38.2	46%	13%	13%	31%	27%	18%	19%	5%
1990 to 1994 (n = 142)	66%	42.0	30%	14%	14%	44%	23%	12%	11%	10%
1985 to 1989 (n = 141)	58%	47.0	17%	6%	6%	38%	26%	17%	15%	4%
1980 to 1984 (n = 164)	50%	51.2	20%	7%	6%	35%	29%	21%	9%	6%
1975 to 197 (n = 188)	39%	55.6	12%	6%	3%	47%	23%	16%	9%	5%
1970 to 1974 (n = 133)	22%	60.7	7%	3%	0%	39%	30%	17%	8%	6%
1965 to 1969 (n = 74)	10%	65.4	5%	7%	3%	47%	24%	18%	10%	1%
1960 to 1964 (n = 41)	10%	70.0	8%	3%	3%	71%	20%	7%	2%	0%
Before 1960 (n = 33)	6%	77.1	9%	0%	0%	73%	21%	6%	0%	0%
OVERALL (N = 1,176)	47%	51.6	26%	9%	8%	41%	25%	16%	12%	6%
	X ² p < 0.001	ANOVA p < 0.001	X ² p < 0.001	X ² p < 0.001	X ² p < 0.001	Chi-Square, p < 0.001				
2014 Survey Data										
2010 to 2013 (n = 111)	63%	30.5	96%	28%	28%	37%	23%	8%	21%	11%
2005 to 2009 (n = 174)	71%	33.9	95%	22%	22%	35%	24%	15%	17%	9%
2000 to 2004 (n = 153)	71%	38.3	85%	27%	26%	34%	24%	17%	16%	9%
1995 to 1999 (n = 137)	72%	43.7	52%	16%	14%	39%	23%	21%	12%	5%
1990 to 1994 (n = 157)	66%	47.5	31%	13%	11%	41%	19%	20%	15%	5%
1985 to 1989 (n = 147)	61%	52.1	28%	8%	6%	40%	21%	22%	11%	7%
1980 to 1984 (n = 165)	51%	55.9	18%	8%	4%	38%	23%	19%	12%	9%

1975 to 1979 (n = 162)	36%	60.9	18%	10%	2%	48%	19%	20%	9%	6%
1970 to 1974 (n = 73)	21%	65.3	18%	5%	2%	41%	22%	19%	8%	10%
1965 to 1969 (n = 39)	18%	69.7	9%	16%	3%	49%	18%	21%	10%	3%
1960 to 1964 (n = 15)	13%	74.5	0%	0%	0%	80%	13%	7%	0%	0%
Before 1960 (n = 5)	20%	78.0	0%	0%	0%	40%	0%	40%	0%	20%
OVERALL (N = 1,338)	60%	48.1	50%	15%	13%	40%	22%	18%	13%	7%
	$X^2 p < 0.001$	ANOVA $p < 0.001$	$X^2 p < 0.001$	$X^2 p < 0.001$	$X^2 p < 0.001$	Chi-Square, $p = 0.12$				

2009 Survey: N does not total 1,200 due to missing data.

2014 Survey: N does not total 1,382 due to missing data.