

## Pharmacist Workforce and Education in California

### INTRODUCTION

Pharmacists are healthcare professionals who work with patients, physicians and other healthcare providers to ensure that patients receive the safest, most effective and least costly medications. They communicate knowledge about drugs, dispense drugs and manage patients whose chronic conditions require drug therapy. This report presents an overview of California's pharmacist workforce and the pipeline of pharmacy (PharmD) students.

### SUMMARY

- California pharmacists make up a larger share of the nation's pharmacists than those of any other state.
- While the majority of the overall pharmacist workforce in the United States is White, Asians account for the largest percentage of pharmacists in California.
- Women make up close to two-thirds of pharmacists, both in California and nationwide.
- From 2012 to 2018, the number of California PharmD graduates increased by 32%. This increase was largely due to the opening of five new schools of pharmacy.
- Although new pharmacists can begin practicing general pharmacy following graduation and licensure, new graduates are increasingly choosing to complete residencies after graduation.
- The Health Resources and Services Administration predicts a national surplus of full-time or equivalently employed pharmacists of between 4.8% and 14.1% by 2030.
- Future demand for pharmacists will depend, in part, on whether pharmacists achieve national recognition as health care providers who can bill insurers for their services.

### CURRENT SUPPLY

In July 2019, there were an estimated 47,085 licensed pharmacists in California.<sup>1</sup> California has more pharmacists employed in the profession than any other state in the United States, accounting for approximately 10% of the nation's 311,200 working pharmacists.<sup>2</sup>

### Practice Settings

Pharmacists work in a variety of industry settings. As shown in **Table 1**, the most common industry settings for California pharmacists are health and personal care stores/retail pharmacies (38.2%), general medical and surgical hospitals (25.1%), physicians' offices (6.6%), grocery stores (5.5%) and outpatient care centers (2.6%).<sup>3</sup>

**Table 1. Top Industries Employing California Pharmacists**

Industry	Share of pharmacists employed
Health and personal care stores	38.2%
General medical and surgical hospitals	25.1%
Physicians' offices	6.6%
Grocery stores	5.5%
Outpatient care centers	2.6%
Insurance carriers	1.7%
Employment services	1.0%
Other industries	19.3%

Source: California Employment Development Department. Occupation Profile: Pharmacists.

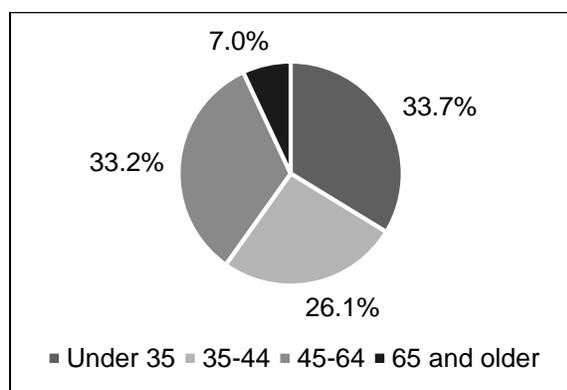
### Demographic Characteristics

Nationally, nearly two-thirds of pharmacists are White (64.5%), 22% Asian, 10.5% Black, and 2.7% Hispanic/Latino.<sup>4</sup> During the period from 2013 to 2017, 35.5% of California pharmacists were White, 48.4% Asian, 2.5% Black, 5.1% Hispanic, 0.03% American Indian/Alaska Native, 5.1% Filipino, 0.3% Native Hawaiian/Pacific

Islander, 2.7% multiracial, and 0.3% of other racial or ethnic background.<sup>5</sup> Nationally, women make up 63.4% of pharmacists.<sup>6</sup> Forecasts suggest that by 2025, two out of three pharmacists in the United States will be women.<sup>7</sup> During the period from 2013 to 2017, 61.6% of pharmacists in California were women.<sup>8</sup>

The average age of California pharmacists was 42.9 years old during the period from 2013 to 2017. As seen in **Figure 1**, over half of pharmacists were under the age of 45.

**Figure 1. Age Distribution of California Pharmacists**



Source: U.S. Census Bureau, 2013-2017 American Communities Survey 5-Year Estimates

## EDUCATION

### Pharmacy Schools

In the United States, the Doctor of Pharmacy (PharmD) degree is the professional degree needed for licensure. Pharmacists are trained at colleges and schools of pharmacy accredited by the Accreditation Council for Pharmacy Education (ACPE). Generally, these programs require four years of graduate study, though some schools offer accelerated three-year programs. Some schools offer baccalaureate, master's and Doctor of Philosophy (PhD) programs in pharmacy in addition to PharmD degrees. This report focuses only on PharmD programs, because all new entrants to the profession are required to obtain a PharmD degree in order to obtain a license to practice.

There are 145 programs in the United States offering the PharmD degree.<sup>9</sup> From Fall 2012 to Fall 2018, the number of students enrolled in PharmD programs as their first professional degree increased by two percent, from 61,221 to 62,468. From Spring 2012 to Spring 2018, the number of graduates from such programs increased by 17.2%, from 12,692 to 14,876.<sup>10</sup>

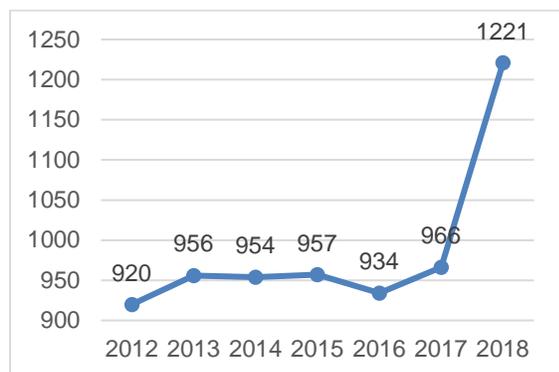
In the last five years, California has nearly doubled its number of PharmD programs, from 8 to 14 programs. In Fall 2014, California Health Sciences University College of Pharmacy (Clovis), Keck Graduate Institute School of Pharmacy and Health Sciences (Claremont) and West Coast University School of Pharmacy (Los Angeles) enrolled their first classes. Chapman University School of Pharmacy (Irvine) enrolled its first class in Fall 2015, Marshall B. Ketchum University College of Pharmacy (Fullerton) enrolled its first class in Fall 2016, and American University of Health Sciences School of Pharmacy (Signal Hill) enrolled its first class in Fall 2019. UC Irvine has also expressed interest in opening a new pharmacy school; however, this proposal is currently under review and has not yet been formally approved.<sup>11</sup>

Except for the two programs offered by the University of California (UC) at its San Francisco and San Diego campuses, all pharmacy programs in California are private.<sup>12</sup> While eight of the state's private PharmD programs are offered by traditional, not-for-profit universities, four programs are offered by for-profit universities (American University of Health Sciences, California Northstate University, California Health Sciences University and West Coast University).

From Fall 2012 to Fall 2018, the total number of students enrolled in California PharmD programs increased by approximately 33%, from 3,718 to 4,947. From Spring 2012 to Spring 2018, the number of California PharmD graduates increased by 32.7%, from 920 to 1,221 (**Figure 2**). The spike in the number of graduates between 2017 and 2018 was likely driven by the opening of four new schools that graduated their first classes in Spring 2018.

Graduates of California pharmacy schools in Spring 2018 were 67.9% Asian, 23.3% White, 5.8% Hispanic, 2.8% Black, 0.2% Hawaiian/Pacific Islander and 0.1% American Indian/Alaska Native.<sup>13</sup> The majority (92.6%) of PharmD students enrolled at California schools in 2018 were California residents, consistent with prior years' trends.<sup>14</sup>

**Figure 2. Number of Graduates of California PharmD programs, Spring 2012 to Spring 2018**



Source: American Association of Colleges of Pharmacy Profile of Pharmacy Students (Fall 2018).

### Postgraduate Education and Training

Following graduation and licensure, new PharmDs may enter practice as licensed pharmacists. However, new PharmDs are increasingly choosing to pursue postgraduate education through research fellowships or residency training. From 2014 to 2018, the number of new U.S. PharmD graduates matched to residency programs accredited by the American Society of Health-System Pharmacists (ASHP) grew 44.8%, from 2,640 to 3,822. During this time, the share of new U.S. graduates matched to residencies grew from 19.1% to 24.4% of graduates.<sup>15</sup>

Most general practice residencies (PGY1) require one year for completion. These PGY1 residencies enhance pharmacists' knowledge of treatment for a broad range of diseases. Following the PGY1 year, residents can elect to complete specialized training in postgraduate year 2 (PGY2). These include specialty areas such as ambulatory care, cardiology, infectious diseases, oncology and specialty pharmacy.<sup>16</sup>

Additionally, there are specialized one- to two-year residency tracks in community pharmacy, managed care, community and health administration, drug information, health system administration, investigational drug services, medication systems and operations, pharmacotherapy and pharmacy informatics. In the 2019 match cycle, the most common programs were general pharmacy PGY1 (87.6%), community pharmacy (7.2%), and managed care (2%).<sup>17</sup>

Some states, including California, have designated pharmacists as reimbursable health providers. In 2013, California passed Senate Bill (SB) 493, which expanded pharmacists' scope of practice and authorized reimbursement for services that supplement their traditional role in dispensing medications. The expanded scope of practice included the creation of the "advanced practice pharmacist" (APh) license. APhs work in collaborative practice agreements with physicians. They can perform patient assessments, refer patients to other healthcare providers and collaborate with other providers to evaluate and manage diseases and health conditions.<sup>18</sup> To become an APh, a pharmacist must be licensed and meet two of the following three criteria: (1) certification in a relevant area of practice (e.g., ambulatory care, oncology pharmacy, psychiatric pharmacy, etc.), (2) completion of a postgraduate residency program, and (3) provision of clinical services to patients for at least one year and no fewer than 1,500 hours under a collaborative practice agreement or protocol with a physician, APh, pharmacist practicing collaborative drug therapy management or health system; this experience must have been earned within 10 years of the time of application for APh licensure.<sup>19 20</sup> As of July 2019, there are 550 APhs in California (1.2% of all pharmacists in the state).<sup>21</sup>

### FUTURE SUPPLY AND DEMAND

The U.S. Bureau of Labor Statistics (BLS) estimates that there will be little or no change in employment of pharmacists through 2028. While job opportunities in health and personal stores are expected to decrease due to increasing sales via mail order and online pharmacies, the BLS projects that demand will increase for

pharmacists in healthcare settings such as hospitals and clinics.<sup>22</sup> By contrast, a 2018 report by the Health Resources and Services Administration (HRSA) predicts a national surplus of full-time or equivalently employed (FTE) pharmacists of 4.8% to 14.1% by 2030. HRSA's analysis also projects that the number of new pharmacists entering the profession from 2016 to 2030 will exceed the number leaving the profession.<sup>23</sup>

According to the California Employment Development Department (EDD), the number of pharmacist jobs in the state is expected to grow 8.2% between 2016 and 2026 (by approximately 2,400 jobs).<sup>24</sup> Although the number of California PharmD program enrollments and graduates has increased during the last decade, the lack of available data on the age distribution and interstate mobility of California's pharmacists makes it difficult to conclude whether there will be enough new pharmacists to replace retiring pharmacists or those leaving the state. At the time of this writing, there are no publicly available analyses about whether California's pharmacist supply will be sufficient to meet future demand.

Given that California's population is aging, and that older patients are on average sicker and more reliant on prescription drugs than those from younger age groups, demand for prescription drugs will likely increase and could increase demand for pharmacists. The move towards greater integration of care could also increase demand for pharmacists in care management.

However, new pharmacy workforce models could mitigate or reduce demand for pharmacists. For instance, pharmacy technicians, whose job growth is expected to outpace that projected for pharmacists (14.4%, or approximately 5,100 jobs), may be able to take on additional lower-skill tasks in pharmacies.<sup>25</sup> Additionally, automated dispensing and refill systems and mail order filling of prescriptions may reduce demand in the community pharmacy setting. Moreover, if HRSA's projection of a national surplus by 2030 is correct, California may be able to recruit pharmacists trained in other states if pharmacy

schools in California do not produce a sufficient number of graduates to replace retiring pharmacists.

Although the overall national supply of pharmacists appears adequate, the skills mix of pharmacists in the western United States does not appear to be aligned with demand. The most recent Pharmacist Demand Indicator (PDI) published by the American Association of Colleges of Pharmacy's Pharmacy Workforce Center reports that in 2018, employers in the Western region of the United States, which includes California, perceived a shortage of specialized pharmacists (for instance, pharmacists with qualifications in medication therapy management, anticoagulation, oncology, informatics, etc.).<sup>26</sup>

The perceived shortage of specialized or skilled pharmacists coincides with the growing recognition that pharmacists can play crucial roles as members of interprofessional care teams and in settings that focus on public health issues. The aforementioned SB 493 explicitly declares pharmacists as health care providers who have the authority to provide health care services beyond their traditional role in dispensing prescription medications. SB 493 further authorizes pharmacists to furnish self-administered hormonal contraceptives and nicotine replacement products, order and interpret tests for monitoring and managing the efficacy and toxicity of drug therapies, and independently initiate and administer routine vaccinations.<sup>27</sup>

In 2017, the state passed SB 401, which authorizes the creation of remote dispensing site pharmacies in medically underserved areas, operated and overseen by a supervising pharmacy through telepharmacy technology.<sup>28</sup> In 2019, the state also passed SB 159, which authorizes pharmacists to furnish pre- and post-exposure prophylactic drugs for HIV/AIDS after completing a training program.<sup>29</sup> The extent to which pharmacists provide these additional services will likely depend on the availability of reimbursement.

Ultimately, California's ability to meet its future demand for pharmacists will depend on the

demographic composition of the workforce, evolving pharmacy delivery and workforce models (including changing roles for pharmacy technicians), national designation of pharmacists

as providers and the extent to which the healthcare system utilizes pharmacists beyond their traditional roles.

<sup>1</sup> California State Board of Pharmacy. (2019, July 2). License Type Totals. Retrieved from [https://www.pharmacy.ca.gov/about/license\\_totals.shtml](https://www.pharmacy.ca.gov/about/license_totals.shtml)

<sup>2</sup> U.S. Bureau of Labor Statistics. (2019). Occupational Employment and Wages, May 2019. Retrieved from <https://www.bls.gov/oes/current/oes291051.htm>

<sup>3</sup> California Employment Development Department. Occupation Profile: Pharmacists. Retrieved October 3, 2019 from [https://www.labormarketinfo.edd.ca.gov/cgi/data\\_browsing/occExplorerQSDetails.asp?soccode=291051](https://www.labormarketinfo.edd.ca.gov/cgi/data_browsing/occExplorerQSDetails.asp?soccode=291051)

<sup>4</sup> U.S. Bureau of Labor Statistics. (2020, January 22). Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity. Retrieved March 12, 2020, from <https://www.bls.gov/cps/cpsaat11.htm>

<sup>5</sup> U.S. Census Bureau. (2018). Public Use Microdata Sample, 2013-2017 American Community Survey 5-year estimates.

<sup>6</sup> U.S. Bureau of Labor Statistics. (2019, January 18). Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity. Retrieved October 3, 2019, from <https://www.bls.gov/cps/cpsaat11.htm>

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<sup>8</sup> U.S. Census Bureau (2018). Public Use Microdata Sample, 2013-2017 American Community Survey 5-year estimates.

<sup>9</sup> Accreditation Council for Pharmacy Education. (2018, July 11). Programs By State. Retrieved October 4, 2019, from <https://www.acpe-accredit.org/accredited-programs-by-state/>

<sup>10</sup> American Association of Colleges of Pharmacy. (n.d.). *Profile of Pharmacy Students.* Retrieved from

<https://www.aacp.org/research/institutional-research/student-applications-enrollments-and-degrees-conferred>

<sup>11</sup> UCI News. (2018, October 30). Jan Hirsch named founding dean of planned School of Pharmacy & Pharmaceutical Sciences. Retrieved from <https://news.uci.edu/2018/10/30/jan-hirsch-named-founding-dean-of-planned-school-of-pharmacy-pharmaceutical-sciences/>

<sup>12</sup> Accreditation Council for Pharmacy Education. (2018, July 11). Programs By State. Retrieved October 4, 2019, from <https://www.acpe-accredit.org/accredited-programs-by-state/>

<sup>13</sup> American Association of Colleges of Pharmacy. (n.d.). Fall 2018 Degrees Conferred - Profile of Pharmacy Students. American Association of Colleges of Pharmacy. Retrieved from <https://www.aacp.org/sites/default/files/2019-05/fall-2018-profile-of-pharmacy-students-degrees-conferred.pdf>

<sup>14</sup> American Association of Colleges of Pharmacy. (n.d.). *Profile of Pharmacy Students.* Retrieved from

<https://www.aacp.org/research/institutional-research/student-applications-enrollments-and-degrees-conferred>

<sup>15</sup> American Society of Health-System Pharmacists. (2019, September 17). ASHP Match Statistics. Retrieved from <https://natmatch.com/ashprmp/stats.html>

<sup>16</sup> American Society of Health-system Pharmacists. (n.d.). Glossary of Terms. Retrieved from <https://www.ashp.org/Professional-Development/Residency-Information/Student-Residency-Guide/Glossary-of-Terms>

<sup>17</sup> American Society of Health-system Pharmacists. (2019). *Summary of Programs and Positions Offered and Filled in the 2019 Match – Combined Phase I and Phase II.* Retrieved from <https://natmatch.com/ashprmp/stats/2019summpos.pdf>

<sup>18</sup> SB 493. Sess. 2013-2014. (Cal 2013). Retrieved from [https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill\\_id=201320140SB493](https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201320140SB493)

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