

## Identifying Services Provided in Community Pharmacy Practice Settings

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### Abstract

**Background:** To better address their patients' needs, community pharmacists are expanding from their traditional role of dispensing to managing medications and providing other care.

**Objective:** This study characterized services reported by pharmacists practicing in community pharmacy settings in the 2019 National Pharmacist Workforce Study (NPWS).

**Methods:** The 2019 NPWS was conducted via an online survey. E-mails containing survey links were sent to a systematic random sample of 96,110 U.S. pharmacists. The survey allowed tailoring of questions related to specific practice settings and for respondents in community pharmacies included reporting on delivery of twelve services. Other descriptive characteristic questions included community pharmacy type, staffing, monitoring activities, self-reported workload, and respondent demographics. An index was created by summing the number of yes responses for the service questions. This index served as the dependent variable in an ordinary least squares regression examining the association of work setting characteristics with the index.

**Results:** Usable responses were received from 2,150 community pharmacists. The top four services were: administer vaccines (91.1%), patient medication assistance program (83.7%), naloxone dispensing (72.8%) and medication synchronization (67.2%). The regression model was significant, with supermarket pharmacies having a higher service index than large chains. Elevated service index scores were associated with more technicians on duty, CPESN participation, direct communication with primary care providers, practicing under a CPA and monitoring activities.

**Conclusions:** Pharmacy operational characteristics were important influences on the delivery of services in community pharmacies. These findings can help inform the continuing transformation of community pharmacy practice.

**Key Words:** community pharmacy, pharmacist services, collaborative practice agreement, monitoring

### Background

Community pharmacy services are continuing to evolve from traditional dispensing activities to increasing involvement in managing medication decisions and use.<sup>1</sup> Pharmacists are an important access point for healthcare as on average, patients visit their community pharmacy about ten times more than they see their physician.<sup>2</sup> Pharmacies are providing new services such as point-of-care testing and administering vaccinations and injections.<sup>2</sup> Another service that has become more widely available is medication synchronization by providing convenience for patients and a positive impact on medication adherence.<sup>3,4</sup> Some pharmacists are visiting patients in their community to provide personalized care activities.<sup>2</sup> While there appears to be an increase in service provision in community pharmacy, past research showed variation across practice environments.<sup>5</sup> Previous research suggests these differences relate to pharmacy staffing and other operational characteristics.<sup>5</sup>

There also are challenges that can impede some community pharmacies from providing the highest level of care through their many services. Pharmacy technicians play a vital role in the success of pharmacy services. Some of their pharmacy roles include collecting and entering patient data, compounding (sterile and non-sterile), filling prescriptions, stocking automated dispensing machines and working with patients to monitor their medications.<sup>6</sup> Before the COVID-19 pandemic, and still today, there is a shortage of pharmacy technicians.<sup>7,8</sup> Pharmacy technicians' salaries, level of stress, and opportunity for advancement have been areas of low satisfaction for technicians and could be playing a part in the labor shortage.<sup>9</sup> Additionally, state laws around certification for pharmacy technicians vary and the costs of obtaining a technician certification may cause a burden to some. As pharmacy technician responsibilities continue to evolve, such as the implementation of "tech check tech," the demand for pharmacy technicians is expected to increase.<sup>10</sup>

Over the past two decades, the payments for dispensing have been reduced, primarily through the actions of pharmacy benefit managers (PBMs), including DIR (direct and indirect remuneration) fees.<sup>11,12</sup> Though there are challenges,

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implementing more pharmacy services to patients can create new revenue streams for community pharmacies. Some pharmacies, such as large chains and mass merchandisers, try to make up for low dispensing payments by keeping their costs as low as possible. Other pharmacies, such as progressive independents and small chains, focus on increasing revenue by transforming their practices to deliver new services with the help of organizations such as Community Pharmacy Enhanced Services Networks (CPESNs).<sup>3</sup> Such services include point-of-care testing, vaccinations, and medication management services which can be supported by collaborative practice agreements and medication assistance programs.

To create new streams of revenue, some community pharmacies have been implementing more pharmacy services, one of which is point-of-care testing (POCT). Point-of-care testing provides benefits to patients, such as easier access to treatments, and is a service that some pharmacists believe should be reimbursed by insurance.<sup>13</sup> Some pharmacies interested in offering POCT report their biggest limitations are availability of their pharmacists and restrictions within their workflow.<sup>13</sup> Both of these can be addressed by practice transformation.<sup>14,15</sup>

Another emerging area is for pharmacists to assess patients' needs for vaccines and then work to address them.<sup>16</sup> These programs increase the odds of patients receiving their vaccinations.<sup>16</sup> Research has shown that patients who receive medications where pharmacy-based vaccinations are present have a two times greater chance of receiving their eligible vaccines.<sup>16</sup>

Another service expansion for community pharmacists has been medication management services. While most of these services relate to Medicare Part D, other payers have recognized the benefits of paying pharmacists to help manage medications.<sup>17</sup> As patients continue to take more medications chronically, the need for regular involvement of community pharmacists in managing medications increases. The growth in medication therapy management (MTM) services also builds on practice transformation that can allow pharmacists the time to deliver such services. Over time, MTM services have switched focus from acute medications to chronic medications and patient education to more consultant-like discussions.<sup>18</sup>

The medication monitoring attitude of pharmacists across settings also as been shown to have variability.<sup>19</sup> These attitudes, which influence core practices of asking about chronic conditions, are important for pharmacists' engagement with the ongoing management of medications. To support service delivery, some community pharmacists have pursued collaborative practice agreements with local prescribers that facilitate drug therapy changes as a member of the patient's health care team.<sup>20</sup> Similarly, statewide protocols can allow pharmacists to deliver new services. Community pharmacists

can help patients connect with medication assistance programs offered by pharmaceutical manufacturers, charities, and health systems to increase patient access by assisting patients with medication costs.<sup>21,22</sup>

Pharmacy practice continues to evolve, so it is helpful to periodically assess the extent to which pharmacist services are accessible across community settings. The 2019 National Pharmacist Workforce Study provides recent national data available to evaluate services provided by pharmacists in community setting. Having pre-pandemic data provides a useful baseline of services delivered by community pharmacies that can help with evaluations of the effects of COVID-19 on community pharmacy practice. There is a need to update our knowledge of the availability of community pharmacy services. The purpose of this study was to examine the community pharmacy services reported in the data gathered in the 2019 National Workforce Study.

### Objectives

The objective of this study was to characterize services reported by pharmacists practicing in community pharmacy settings in the 2019 National Pharmacist Workforce Study. Further, we investigated variables associated with higher levels of service provision.

### Methods

The 2019 National Pharmacist Workforce Study was conducted via an online survey using the Qualtrics electronic survey platform. On behalf of the research team, emails containing survey links were sent out by the National Association of Boards of Pharmacy Foundation to a systematic random sample of 96,110 licensed pharmacists in the U.S. Pharmacists who were licensed in multiple states were listed once in the sample frame. The online survey allowed tailoring of questions based on the pharmacist's practice setting and created the opportunity for the survey to address more pertinent and emergent topics. The survey included a list of twelve services potentially being provided in some community pharmacies and respondents noted whether they occurred in their pharmacy. The list of services was compiled after reviewing the literature and discussions with some key informant pharmacists. Other survey questions asked about community pharmacy type, staffing, monitoring activities, self-reported workload, other pharmacy characteristics and respondent demographics. Self-reported workload was measured with a five-point scale (1=excessively low/5=excessively high)

The survey was cognitively tested and piloted before the main data collection. To optimize response rates, the survey link was sent using three emails sent about two weeks apart. The emails consisted of a brief explanation about the purpose of the study and included a link for subjects to click if they were willing to participate. Though no monetary incentive was used, subjects were offered an opportunity to enter their email into a separate

survey link to receive a summary of the survey results. This study was approved by the University of Iowa Institutional Review Board.

For the analyses, four categories of community pharmacy practice settings were included: 1) independent (3 stores or less under the same ownership) and small chain pharmacy (4-10 stores under the same ownership), 2) large chain pharmacy, 3) mass merchandiser pharmacy and 4) supermarket pharmacy. Descriptive statistics were calculated for all items. Also, to investigate the variation in delivery of the twelve services across community pharmacy types, an index was created that summed the number of yes responses for the questions about the services being offered/available. This index served as the dependent variable in an ordinary least squares regression. Several independent variables, hypothesized to be associated with the service index, included in the regression were community pharmacy type, staffing numbers of pharmacists and technicians, CPESN membership, use of a collaborative practice agreement (CPA), direct communication with a primary care provider and an index of documented monitoring activities. These last four variables were measured using yes or no response formats. The monitoring index was a sum of 6 conditions or medications about which the pharmacist had an in-depth discussion with a patient in the past month: high cholesterol, hypertension, diabetes, warfarin, opioid and antidepressant.

### Results

Usable responses were received from 2,150 pharmacists practicing in a community setting (Table 1). Almost two-thirds (63.2%) of the community pharmacists who responded were female. Respondents usually had one additional pharmacist on duty (67.0%) and typically had 3 pharmacy technicians on duty (56.0%). A heavy self-reported workload generally was found for community pharmacists, with 41.1% reporting excessively high workload. Community Pharmacy Enhanced Services Network (CPSEN) membership (12.7%) and managing patient therapy under a collaborative practice agreement (16.3%) were less frequently reported.

Five services were reported by about two-thirds or more of the community pharmacist respondents (Table 2): administering vaccines (91.1%), patient medication assistance programs (83.7%), naloxone dispensing (72.8%), MTM services (67.2%) and medication synchronization (67.2%). The mean number of services reported by community pharmacies was 5.75 and the range was 0-12. Supermarket pharmacies reported delivering eight of the twelve services at a rate higher than the overall mean for each service, while small chain and independents reported above average on six services. Large chains reported an above average percentage on the fewest number of services with four.

The service index regression model was significant ( $P < 0.001$ ;  $R^2 = 0.173$ ) and is summarized in Table 3. The supermarket pharmacies had a significantly higher service index than large chain pharmacies. Interestingly, there was not a significant association between level of service index and having an additional pharmacist on duty. In contrast, pharmacies having three or more technicians on duty had a significantly higher service index than having 0-1 technicians on duty. Community Pharmacy Enhanced Services Network (CPESN) participation, direct communication with primary care provider and practicing through a collaborative practice agreement all resulted in significantly increased service indexes. Also, the monitoring index was significantly positively associated with the number of community pharmacy services delivered.

### Discussion

Regression results show pharmacy type was significantly associated with pharmacy services provided. Supermarkets offered the most pharmacy services and had statistical significance in offering more services compared to large chains. This is consistent with the findings from the 2014 National Pharmacist Workforce Study, where supermarkets had significantly higher service index compared to mass merchandisers.<sup>5</sup> Many supermarkets are regional, while large chains are national. This difference in size and geography may impact the number of services provided by each pharmacy type. It could be easier to implement initiatives for providing new services if a company has fewer stores all in the same region compared to national chains. Supermarkets may be offering more pharmacy services to promote healthier lifestyles to assist their customers and patients when managing chronic conditions.<sup>23</sup>

Medication assistance programs were offered by 83.7% of the surveyed pharmacies across all community pharmacy respondents. These programs reduce the burden placed on patients and providers in obtaining medications by helping reduce the price of medications through manufacturer or community programs, with a goal of increasing patient medication access and adherence.<sup>21</sup> Some patients, especially those who are not insured, often have trouble paying for their medications. Community pharmacies can support these patients and their physicians by directing patients to available medication assistance programs.<sup>21</sup> Medication assistance programs can decrease patients' out of pocket costs, and copay assistance programs help completely cover majority of claims.<sup>24</sup> One study that examined 789 patients reported an average \$3,493 reduction in patients' annual out of pocket costs when the patient used copay assistance for specialty drugs.<sup>24</sup>

The third most provided service across the pharmacy types was naloxone dispensing (72.8%). In addition, about one-quarter of the respondents reported performing opioid deprescribing, with over 40% of mass merchandiser respondents reporting it. The United States opioid epidemic is a nationwide public health

crisis partially due to more overdoses from heroin and fentanyl.<sup>25</sup> However, prescription opioid medications can play a role in opioid use disorder and have received attention for restricted access.<sup>26</sup> Naloxone, also now available over-the-counter, is a crucial agent in reversing the effects of opioid overdose, thus it is a key tool in addressing the opioid epidemic. Pharmacists have been playing more of a central role in naloxone dispensing through standing orders or statewide protocols.<sup>27</sup> Now with OTC naloxone also available, community pharmacies have the opportunity to help address the opioid epidemic through naloxone dispensing and sales, along with opioid deprescribing since patients visit their pharmacists, on average, about 10 times more often than their physician.<sup>28</sup> This increased accessibility places pharmacists in a unique position to interact more often with their patients who are at risk of opioid abuse. Pharmacists can take advantage of this position to assure proper use of opioids and assure availability of naloxone.<sup>29</sup>

Medication synchronization services were delivered by 67.2% of surveyed pharmacies. This shows rapid growth from 10% of independent pharmacies and 6 to 11% of large retail chain types reported in 2016.<sup>30</sup> Medication synchronization programs, where the patient's medications are all filled at one time, are associated with increased patient adherence.<sup>31</sup> Medication nonadherence is a common issue; about 50% of the time, patients are nonadherent to their medication regimen.<sup>32</sup> Medication nonadherence is harmful to all patients, but especially to those with chronic diseases or those taking multiple medications for various conditions. When performing medication synchronization that includes regular interactions with patients, community pharmacy staff can talk with patients about their medication regimens, which can support medication adherence. Additionally, by coordinating when (time of the month) multiple medications need to be dispensed, this service increases efficiency of the pharmacy's workflow and decreases the burden on the patient from obtaining their medications.

Delivery of medication therapy management (MTM) services by surveyed community pharmacies stayed about the same (~67%) when compared to the results from the 2014 National Pharmacist Workforce Study.<sup>5</sup> MTM services may include patient counseling, disease management, and comprehensive medication reviews (CMR).<sup>33</sup> MTM services can provide pharmacists with professionally rewarding experiences, provide patients with more information regarding their medication regimen, and are supported by most physicians.<sup>34</sup> The 2003 Medicare Modernization Act required Medicare Part D to provide MTM services to their patients, to hopefully optimize medication safety and effectiveness.<sup>35</sup> However, a common barrier to increasing medication therapy management services offered to patients is insufficient compensation.<sup>36</sup>

The most delivered service among all the pharmacy types was administering vaccines (91.1%). Vaccine administration slightly increased in delivery since the 2014 National Pharmacist Workforce Study, going from 88.6% to 91.1%.<sup>5</sup> Some common vaccines offered by community pharmacies include influenza, shingles, pneumonia, and tetanus (Tdap).<sup>37</sup> This increase in vaccination services could be a result of legislature being passed in various states allowing pharmacists more readily administer vaccines under collaborative practice agreements or statewide protocols. Additionally, since the 2014 NPWS, some states have passed legislation allowing pharmacy technicians to administer vaccines. The first state to allow pharmacy technicians to administer vaccines under the supervision of a pharmacist was Idaho in 2017.<sup>38</sup> In the past, pharmacy technicians were able to assist pharmacists with vaccine workflow to make vaccination services more efficient.<sup>39</sup> However, now with more pharmacy staff certified and legally able to administer vaccines, pharmacies should be able to provide this service to more patients. This high level of vaccination capacity was a valuable resource when the nation needed many COVID vaccines administered in a short period of time.

Medication reconciliation services nearly doubled from the 2014 NPWS, going from 20% to 38.8%. This service is a key component in increasing patient safety during transitions of care.<sup>40</sup> Medication errors or discrepancies are common when a patient is discharged from the hospital and sent to the community pharmacy to obtain their medications.<sup>41</sup> Also, some vulnerable patients often are less aware of which changes in therapy are to be continued after discharge to the community. Due concern for patient safety, more attention and resources are being put towards making transitions of care safer. As shown by these findings, one approach being used is conducting medication reconciliations by community pharmacists.

The prevalence of point of care testing services in community pharmacies increased from 12.6% to 19.9% since 2014. This increase could be due to new legislation passed in various states allowing pharmacists to prescribe treatments for specific test results of common illnesses, such as the influenza and group A streptococcus. Barriers to point of care testing in community pharmacies include pharmacy workflow, pharmacist scope of practice, time of staff to complete service and reimbursement.<sup>42</sup> Since 2014, community pharmacies and the pharmacy profession have worked to reduce these barriers, thus increasing delivery of this service to many patients and communities.

The regression results showed no significant association from having an additional pharmacist on duty. However, 3 or more technicians on duty was positively associated with delivering these services when compared to having 0-1 technicians working. This result differs from the results of the 2014 National

Workforce Pharmacy Study, which showed a lower service index for 3 or more technicians on duty compared to 0-1 technicians working. This difference could relate to differences in the services included in the indexes in the 2014 data and this 2019 data. Although five services were the same, the rest were not (three in the 2014 index and seven in the 2019 index). Another explanation could relate to the growth of medication synchronization and greater roles for technicians in that process. Technicians have become more prominent in dispensing by overseeing distribution of medications and managing medication synchronization processes.<sup>43</sup> These changes could support pharmacists' availability to perform more clinical tasks for service delivery.

Membership in a Community Pharmacy Enhanced Services Network (CPESN) may be an indicator that a pharmacy is working to transform its practice and to implement more of these services.<sup>3</sup> CPESN provides support and resources to pharmacists to assist them in developing staffing and workflows for sustaining the delivery of these services. Additionally, to deliver these services, the pharmacy staff likely would work closer with the primary care provider (PCP). For example, MTM services and disease state management medication adjustments often require interactions between pharmacists and primary care providers, so having better communication would support the delivery of these services. This conclusion is consistent with that from the 2014 NPWS, which found that greater service delivery was associated with involvement in an interprofessional care team.<sup>5</sup> Working closer with the PCP can form collaborative working relationships with providers, which could support delivery of services to manage medications and chronic conditions.<sup>44</sup> Similarly, providing care under a collaborative practice agreement (CPA) likely would allow a community pharmacist to deliver more services to their patients directly.

There are several limitations to this study. One is that the delivery of services was self-reported in a survey and was not observed. Such reporting could include some error due to recall difficulties by respondents. However, measurement for such services often has been done using self-report in surveys, which allows comparisons across studies. Additionally, provision of services was measured in a yes or no format. The intensity of services, such as service volume or time spent in service activities, could be another informative measure of service delivery. Another limitation is the low response rate, which could result in non-response bias. Though we have evaluated the likelihood of nonresponse bias for this survey<sup>45</sup>, the findings should be interpreted conservatively. Finally, the regression model had a relatively low  $R^2$ , which means it did not explain a lot of the variation in the service index levels across the community pharmacies. Additional conceptual work should be conducted to try to more fully explain community pharmacy service delivery.

## Conclusion

In conclusion, relatively common services in community pharmacy were found to include administering vaccines, connecting patients with medication assistance programs, dispensing naloxone, delivering medication therapy management (MTM) services and synchronizing medications. Community pharmacy services were positively associated with supermarket pharmacy type, having at least three technicians working, membership in Community Pharmacy Enhanced Services Networks (CPESNs), using a collaborative practice agreement (CPA), having in-depth communications with a primary care provider (PCP) and performing monitoring activities. These findings help inform the continuing transformation of community pharmacy practice.

**Conflicts of Interest:** None

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## References

1. Urick BY, Meggs EV. Towards a Greater Professional Standing: Evolution of Pharmacy Practice and Education, 1920-2020. *Pharmacy (Basel)*. Jul 20 2019;7(3)doi:10.3390/pharmacy7030098
2. Goode JV, Owen J, Page A, Gatewood S. Community-Based Pharmacy Practice Innovation and the Role of the Community-Based Pharmacist Practitioner in the United States. *Pharmacy (Basel)*. Aug 4 2019;7(3)doi:10.3390/pharmacy7030106
3. Renfro CP, Turner K, Seeto J, Ferreri SP. Medication synchronization adoption and pharmacy performance. *Research in Social and Administrative Pharmacy*. 2021/08/01/ 2021;17(8):1496-1500. doi:<https://doi.org/10.1016/j.sapharm.2020.11.009>
4. Holdford DA, Inocencio TJ. Adherence and persistence associated with an appointment-based medication synchronization program. *Journal of the American Pharmacists Association*. 2013/11/01/ 2013;53(6):576-583. doi:<https://doi.org/10.1331/JAPhA.2013.13082>
5. Doucette WR, Rippe JJ, Gaither CA, Kreling DH, Mott DA, Schommer JC. Influences on the frequency and type of community pharmacy services. *Journal of the American*

- Pharmacists Association. 2017/01/01/ 2017;57(1):72-76.e1. doi:<https://doi.org/10.1016/j.japh.2016.08.008>
6. White CL, Hohmeier KC. Pharmacy Informatics: Current and Future Roles for the Pharmacy Technician. *J Pharm Technol*. Dec 2015;31(6):247-252. doi:10.1177/8755122515605517
7. Carrasquillo M, Petrovskis M, Roberts PA, Taylor RA. Bridging the gap: Technician shortage and education standards. *American Journal of Health-System Pharmacy*. 2022;79(10):720-722. doi:10.1093/ajhp/zxac006
8. Schneider PJ, Pedersen CA, Ganio MC, Scheckelhoff DJ. ASHP national survey of pharmacy practice in hospital settings: Workforce-2018. *Am J Health Syst Pharm*. Jul 18 2019;76(15):1127-1141. doi:10.1093/ajhp/zxz102
9. Desselle SP, Holmes ER. Results of the 2015 National Certified Pharmacy Technician Workforce Survey. *American Journal of Health-System Pharmacy*. 2017;74(13):981-991. doi:10.2146/ajhp160666
10. Andreski M, Myers M, Gainer K, Pudlo A. The Iowa new practice model: Advancing technician roles to increase pharmacists' time to provide patient care services. *J Am Pharm Assoc* (2003). May-Jun 2018;58(3):268-274.e1. doi:10.1016/j.japh.2018.02.005
11. Motheral BR, Fairman KA. Changes in PBM Business Practices in 2019: True Innovation or More of the Same? *J Manag Care Spec Pharm*. Oct 2020;26(10):1325-1333. doi:10.18553/jmcp.2020.20213
12. Gabay M. Direct and Indirect Remuneration Fees: The Controversy Continues. *Hosp Pharm*. Dec 2017;52(11):740-741. doi:10.1177/0018578717739633
13. Gallimore CE, Porter AL, Barnett SG, Portillo E, Zorek JA. A state-level needs analysis of community pharmacy point-of-care testing. *J Am Pharm Assoc* (2003). May-Jun 2021;61(3):e93-e98. doi:10.1016/j.japh.2020.12.013
14. Bacci JL, Ferreri SP, Coley KC, et al. Qualitative analysis of a community pharmacy practice transformation initiative. <https://doi.org/10.1002/jac5.1728>. *JACCP: JOURNAL OF THE AMERICAN COLLEGE OF CLINICAL PHARMACY*. 2022/12/01 2022;5(12):1236-1252. doi:<https://doi.org/10.1002/jac5.1728>
15. Elrod S, Snyder ME, Hall D, McGivney MAS, Smith RB. Practice Change in Community Pharmacy: A Case Study of Multiple Stakeholders' Perspectives. 3. University of Minnesota, College of Pharmacy; 2012;3. October 2012. <https://hdl.handle.net/11299/137097>
16. Sheer RL, Nau DP, Dorich N, et al. Medicare Advantage-pharmacy partnership improves influenza and pneumococcal vaccination rates. *Am J Manag Care*. Oct 2021;27(10):425-431. doi:10.37765/ajmc.2021.88760
17. Doucette WR, DeVolder R, Heggen T. Evaluation of financial outcomes under a value-based payment program for community pharmacies. *J Manag Care Spec Pharm*. Sep 2021;27(9):1198-1208. doi:10.18553/jmcp.2021.27.9.1198
18. Barnett MJ, Frank J, Wehring H, et al. Analysis of pharmacist-provided medication therapy management (MTM) services in community pharmacies over 7 years. *J Manag Care Pharm*. Jan-Feb 2009;15(1):18-31.
19. Witry MJ, Doucette WR. Factors influencing community pharmacists' likelihood to ask medication monitoring questions: A factorial survey. *Res Social Adm Pharm*. Sep-Oct 2015;11(5):639-50. doi:10.1016/j.sapharm.2014.11.007
20. Bacci JL, Coley KC, McGrath K, Abraham O, Adams AJ, McGivney MS. Strategies to facilitate the implementation of collaborative practice agreements in chain community pharmacies. *Journal of the American Pharmacists Association*. 2016/05/01/ 2016;56(3):257-265.e2. doi:<https://doi.org/10.1016/j.japh.2016.02.014>
21. Mounts VL, Ringenberg DG, Rhees K, Partridge C. Implementation of a Patient Medication Assistance Program in a Community Pharmacy Setting. *Journal of the American Pharmacists Association*. 2005/01/01/ 2005;45(1):76-81. doi:<https://doi.org/10.1331/1544345052843039>
22. Kang S-Y, Sen A, Bai G, Anderson GF. Financial Eligibility Criteria and Medication Coverage for Independent Charity Patient Assistance Programs. *JAMA*. 2019;322(5):422-429. doi:10.1001/jama.2019.9943
23. Sax B. Supermarkets Offer Patients Accessible Pharmacy Services. *MJH Life Sciences*. October 21, 2010. <https://www.pharmacytimes.com/view/supermarkets-fall2010>
24. Brouwer E, Yeung K, Barthold D, Hansen R. Characterizing patient assistance program use and patient responsiveness to specialty drug price for multiple sclerosis in a mid-size integrated health system. *J Manag Care Spec Pharm*. Jun 2021;27(6):732-742. doi:10.18553/jmcp.2021.27.6.732
25. Lyden J, Binswanger IA. The United States opioid epidemic. *Semin Perinatol*. Apr 2019;43(3):123-131. doi:10.1053/j.semperi.2019.01.001
26. Underwood N, Cremer L, Cance JD, Williams J, Guy GP, Jr., Zule W. The impact of community-level prevention strategies

- on high-dose opioid dispensing rates: 2014-2019. *Drug Alcohol Depend.* Oct 1 2021;227:108988. doi:10.1016/j.drugalcdep.2021.108988
27. Thakur T, Frey M, Chewing B. Pharmacist roles, training, and perceived barriers in naloxone dispensing: A systematic review. *J Am Pharm Assoc* (2003). Jan-Feb 2020;60(1):178-194. doi:10.1016/j.japh.2019.06.016
28. Tsuyuki RT, Beahm NP, Okada H, Al Hamarneh YN. Pharmacists as accessible primary health care providers: Review of the evidence. *Can Pharm J (Ott)*. 2018;4-5. vol. 1.
29. Contreras J, Baus C, Brandt C, Witry M, Peters J, Evoy KE. Pharmacist counseling when dispensing naloxone by standing order: A secret shopper study of 4 chain pharmacies. *J Am Pharm Assoc* (2003). Mar-Apr 2021;61(2):e94-e99. doi:10.1016/j.japh.2020.10.010
30. Krumme AA, Isaman DL, Stolpe SF, Dougherty S, Choudhry NK. Prevalence, effectiveness, and characteristics of pharmacy-based medication synchronization programs. *Am J Manag Care.* Mar 2016;22(3):179-86.
31. Nsiah I, Imeri H, Jones AC, Bentley JP, Barnard M, Kang M. The impact of medication synchronization programs on medication adherence: A meta-analysis. *Journal of the American Pharmacists Association.* 2021/07/01/2021;61(4):e202-e211. doi:<https://doi.org/10.1016/j.japh.2021.02.005>
32. Brown MT, Bussell J, Dutta S, Davis K, Strong S, Mathew S. Medication Adherence: Truth and Consequences. *Am J Med Sci.* Apr 2016;351(4):387-99. doi:10.1016/j.amjms.2016.01.010
33. McGivney MS, Meyer SM, Duncan-Hewitt W, Hall DL, Goode JV, Smith RB. Medication therapy management: its relationship to patient counseling, disease management, and pharmaceutical care. *J Am Pharm Assoc* (2003). Sep-Oct 2007;47(5):620-8. doi:10.1331/JAPhA.2007.06129
34. Oladapo AO, Rascati KL. Review of Survey Articles Regarding Medication Therapy Management (MTM) Services/Programs in the United States. *Journal of Pharmacy Practice.* 2012/08/01 2012;25(4):457-470. doi:10.1177/0897190012442715
35. Pellegrino AN, Martin MT, Tilton JJ, Touchette DR. Medication therapy management services: definitions and outcomes. *Drugs.* 2009;69(4):393-406. doi:10.2165/00003495-200969040-00001
36. Wang J, Hong SH, Meng S, Brown LM. Pharmacists' acceptable levels of compensation for MTM services: A conjoint analysis. *Research in Social and Administrative Pharmacy.* 2011/12/01/ 2011;7(4):383-395. doi:<https://doi.org/10.1016/j.sapharm.2010.09.003>
37. Immunizations. National Community Pharmacists Association. 2023. <https://ncpa.org/immunizations>
38. Bright D, Adams AJ. Pharmacy technician-administered vaccines in Idaho. *American Journal of Health-System Pharmacy.* 2017;74(24):2033-2034. doi:10.2146/ajhp170158
39. Powers MF, Hohmeier KC. Pharmacy Technicians and Immunizations. *Journal of Pharmacy Technology.* 2011/05/01 2011;27(3):111-116. doi:10.1177/875512251102700303
40. Almanasreh E, Moles R, Chen TF. The medication reconciliation process and classification of discrepancies: a systematic review. *Br J Clin Pharmacol.* Sep 2016;82(3):645-58. doi:10.1111/bcp.13017
41. Ensing HT, Koster ES, van Berkel PI, van Dooren AA, Bouvy ML. Problems with continuity of care identified by community pharmacists post-discharge. *J Clin Pharm Ther.* Apr 2017;42(2):170-177. doi:10.1111/jcpt.12488
42. Klepser M, Koski RR. Molecular point-of-care testing in the community pharmacy setting: current status and future prospects. *Expert Review of Molecular Diagnostics.* 2022/10/03 2022;22(10):923-936. doi:10.1080/14737159.2022.2139178
43. Doucette WR, Schommer JC. Pharmacy Technicians' Willingness to Perform Emerging Tasks in Community Practice. *Pharmacy (Basel).* Oct 12 2018;6(4) doi:10.3390/pharmacy6040113
44. Snyder ME, Zillich AJ, Primack BA, et al. Exploring successful community pharmacist-physician collaborative working relationships using mixed methods. *Res Social Adm Pharm.* Dec 2010;6(4):307-23. doi:10.1016/j.sapharm.2009.11.008
45. Witry MJ, Arya V, Bakken BK, et al. National Pharmacist Workforce Study (NPWS): Description of 2019 Survey Methods and Assessment of Nonresponse Bias. *Pharmacy (Basel).* Jan 13 2021;9(1)doi:10.3390/pharmacy9010020

Table 1 Description of Respondents

Variable	*Frequency (%) N=2,150
Gender	
Female	1,310 (63.2)
Male	759 (36.6)
Non-binary	4 (0.2)
Ethnicity	
White/Caucasian	1,573 (76.5)
Asian	251 (12.2)
Black/African American	113 (5.5)
Latino/Latina	61 (3.0)
American Indian/Other	58 (2.8)
Year of 1 <sup>st</sup> pharmacy license	
1980 or earlier	195 (9.5)
1981-1990	315 (15.3)
1991-2000	391 (19.0)
2001-2010	329 (16.0)
2011-2019	832 (40.3)
First pharmacy degree	
PharmD	1,185 (57.1)
BS Pharmacy	892 (42.9)
PGY1 Residency (yes)	39 (1.8)
Workload rating	
Low or excessively low	72 (3.5)
About right	371 (17.7)
High	792 (37.8)
Excessively high	863 (41.1)
Number of additional pharmacists on duty	
0	690 (32.1)
≥ 1	1399 (67.0)
Number of pharmacy technicians on duty	
0-1	369 (17.2)
2	551 (25.6)
≥ 3	1172 (56.0)
Community Pharmacy Enhanced Services Network Participation (yes)	272 (12.7)
Direct communication with primary care provider (yes)	1518 (70.6)
Collaborative Practice Agreement (yes)	351 (16.3)
	<b>Mean (SD)</b>
	<b>Range</b>
Age	43.9 (12.9) 20-85
Pharmacy monitoring index <sup>1</sup>	1.56 (1.99) 0-6
Pharmacy service index <sup>2</sup>	5.75 (2.39) 0-12

\*Total frequencies vary due to missing data

1. A sum of 6 conditions or medications about which the pharmacist had an in-depth discussion with a patient in the past month: high cholesterol, hypertension, diabetes, warfarin, opioid and antidepressant.
2. A sum of 12 community pharmacy services being delivered (administered vaccines, patient medication assistance program, naloxone dispensing, MTM services, medication synchronization, comprehensive medication management, medication reconciliation, adherence packaging, opioid deprescribing, disease management, point of care testing, administer injections).

Table 2. Community Pharmacy Services (N=2,150)

Service <sup>2</sup>	Independent and Small Chain <sup>1</sup> N=471	Large Chain N=962	Mass Merchandiser N=395	Supermarket N=322	Total Frequency (%)
Administer vaccines	306 (65.0)	944 (98.1)	390 (98.7)	319 (99.1)	1,959 (91.1)
Patient medication assistance program <sup>3</sup>	349 (74.1)	844 (87.7)	318 (80.5)	289 (89.8)	1,800 (83.7)
Naloxone dispensing	252 (53.5)	734 (76.3)	342 (86.6)	237 (73.6)	1,565 (72.8)
Medication synchronization	309 (65.6)	710 (73.8)	169 (42.8)	257 (79.8)	1,445 (67.2)
MTM service	327 (69.4)	545 (56.7)	276 (69.9)	296 (91.9)	1,444 (67.2)
Comprehensive medication management	231 (49.0)	357 (37.1)	154 (39.0)	204 (63.4)	946 (44.0)
Medication reconciliation	232 (49.3)	354 (36.8)	128 (32.4)	120 (37.3)	834 (38.8)
Adherence packaging	261 (55.4)	183 (19.0)	76 (19.2)	57 (17.7)	577 (26.8)
Opioid deprescribing	98 (20.8)	213 (22.1)	169 (42.8)	56 (17.4)	536 (24.9)
Disease management	114 (24.2)	212 (22.0)	91 (23.0)	98 (30.4)	515 (24.0)
Point of care testing	50 (10.6)	93 (9.7)	166 (42.0)	119 (37.0)	428 (19.9)
Administer injections	132 (28.0)	150 (15.6)	44 (11.1)	78 (24.2)	404 (18.8)

1. Small chain = 4-10 stores under the same ownership
2. Services were measured using yes or no response formats.
3. Medication assistance programs include those offered through pharmaceutical manufacturers and state or local programs to increase access to medications.

Table 3. Regression results for Number of Services Offered

Practice Characteristics	Standardized beta coefficient
Pharmacy Type <sup>A</sup>	
Mass Merchandiser	0.024
Supermarket	0.141*
Independent and Small Chain	-0.028
Number of Additional Pharmacists on Duty <sup>B</sup>	
≥ 1	-0.040
Number of Pharmacy Technicians on Duty <sup>C</sup>	
2	0.040
≥ 3	0.075*
Community Pharmacy Enhanced Services Network (CPESN) Participation	0.137*
Direct communication with primary care provider	0.254*
Collaborative Practice Agreement	0.119*
Pharmacy monitoring index <sup>1</sup>	0.126*
Model: R <sup>2</sup> = 0.173; F = 44.659; P < 0.001	

- A. Comparator is large pharmacy chain.
  - B. Comparator is 0 additional pharmacists on duty.
  - C. Comparator is 0-1 pharmacy technicians on duty.
1. A sum of 6 conditions or medications about which the pharmacist had an in-depth discussion with a patient in the past month: high cholesterol, hypertension, diabetes, warfarin, opioid and antidepressant.

\*p ≤ 0.05