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Penobscot Community Health Care

State of Maine | 131st Legislature
Joint Standing Committee on Appropriations and Financial Affairs
Joint Standing Committee on Health and Human Services
Testimony of Paul Morrow Jr, PharmD on behalf of Penobscot Community Health Care
February 12, 2025

Neither for Nor Against:

LD 210, *An Act Making Unified Appropriations and Allocations from the General Fund and Other Funds for the Expenditures of State Government and Changing Certain Provisions of the Law Necessary to the Proper Operations of State Government for the Fiscal Years Ending June 30, 2025, June 30, 2026 and June 30, 2027*

In Opposition to:

Language Part "SS" Establishes a $0.70 cents per pharmacy prescription assessment on pharmacy providers

Dear Senator Rotundo, Representative Gattine and members of the Appropriations and Financial Affairs Committee, and Senator Ingwersen, Representative Meyer and members of the Health and Human Services Committee:

I am Paul Morrow, Jr., PharmD, Pharmacy Manager for Brewer Medical Center Pharmacy at Penobscot Community Health Care (PCHC), one of Maine's 20 community health centers (CHCs), also known as Federally Qualified Health Centers (FQHCs), and part of the largest independent primary care network in the state.

PCHC is Maine's largest Federally Qualified Health Center (FQHC), serving about 60,000 patients with locations in Penobscot, Waldo, and Somerset Counties. We provide high quality integrated primary care – including mental health services, pediatrics, care management and treatment for substance use disorder—at 22 clinical service sites, regardless of a patient's ability to pay. We have four community pharmacies, a robust primary care pharmacy service, and a long-standing pharmacy residency program, with pharmacists working at the top of their licenses as an integral part of the primary care team. Our pharmacists play an important role in management of chronic disease states, providing medication management, med reconciliation, assessment and reduction of poly-pharmacy, Hep B and Hep C treatment, connection to HIV treatment, and more. The pharmacists, in many ways, have become the link between our patients, ongoing chronic disease management, and their use of and access to affordable medications. Our pharmacists have also played a vital role in reducing the prescribing of controlled substances across the State over the past decade, through our Controlled Substance Stewardship program, an innovative program that began at PCHC to address overprescribing of controlled substances and start to tackle the opioid epidemic over 10 years ago, and is now offered to all providers in Maine at no charge to them through a contract with the State. This program alone has been a significant driver in the reduction of opioid prescribing across the State.

We strongly oppose Part "SS" of LD 210 which establishes a $0.70 per pharmacy prescription assessment on pharmacy providers.

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Retail pharmacies are under attack on a variety of fronts, especially in rural states like Maine, making the viability of these pharmacies very challenging. Pharmacies face increased costs for drugs, a reduction in reimbursement from third party payers, and ongoing threats to the 340b program for 340b eligible entities. The $0.70 per prescription assessment on outpatient pharmacies that is currently proposed would cause further damage to already tight margins that in some cases may push pharmacies to the brink of closure or at best consider a reduction in services.

Many Maine residents, including thousands of PCHC's patients, travel 1 hour or more just to receive basic healthcare. If pharmacies, especially in rural areas are forced to close, this would further impose hardships on patients living in these areas, creating even more pharmacy deserts then currently exist. While mail order pharmacies can solve some problems related to predictable mediation needs, they do not solve the problem. Patients experience, at best, inconvenience, communicating over the phone with largely automated systems or, at worst, having to go without in some cases life sustaining medications due to delays in delivery, challenges delivering in rural places, and other barriers to consistent mail delivery.

PCHC and all community health centers are nonprofit safety net providers that already operate on tight financial margins and are facing an increasingly uncertain federal funding landscape. Further financial stress imposed by the State in the form of this tax would make it that much more difficult to stay open and continue to care for our patients. It has been stated that it is the intention to offset the cost of these assessments by increasing the dispensing fees for prescriptions of MaineCare patients, however, there is great uncertainty regarding these claims as these offsetting dispensing fees are not currently tied to the assessment proposal and would have to be approved through separate legislation. Moreover, this assessment would apply to all prescriptions filled at retail pharmacies, not just those covered by MaineCare. Thus, even if the separate legislation to ensure there was offsetting revenue for MaineCare prescriptions, about 62% of the total prescriptions filled at PCHC would be ineligible for the separate reimbursement because those are covered by other insurance plans or by self-pay patients. As an example of the potential financial burden, applying this tax to eligible prescriptions filled across all four PCHC pharmacies in 2024 would result in at least $110,000 of lost revenue. This is far from insignificant.

Over the last 15 years, Maine has already been subject to a high percentage of pharmacy closures. An analysis of national pharmacy closures published in *Health Affairs* in December 2024 reveals Maine has the among highest pharmacy desert rates in the nation. Between 2010 and 2021, all but one Maine county experienced pharmacy closure rates of above 20%, and many of our more rural counties saw closure rates approaching 40%. For reference, the national average of closures during this time period was 29.4%. Between 2018 and 2021, this study also found that Maine was among the states that experienced a net loss of pharmacies, meaning more pharmacies closed than opened. Access is declining fast, and a tax like this will only exacerbate the problem and accelerate closures.

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I'm sure many of you have regular experience with using a local community pharmacy for prescriptions for yourself or family members. Pharmacists are often referred to as the most accessible healthcare providers because it does not require an appointment or cost anything to seek the advice and guidance of a community pharmacist. Many patients will go speak to their local pharmacist first when considering the best option for seeking or not seeking medical care for a given circumstance. In addition to forcing patients to find an alternative to filling a prescription, this prescription assessment would put at further risk patients being unable to access the valuable counsel of their trusted local community pharmacist due to pharmacy closures because of an unsustainable business environment.

In consideration of your constituents that often already have limited resources concerning access to local quality health care, as well as locally employed healthcare professionals, I urge you to vote against this proposal to tax prescriptions dispensed at retail pharmacies in the State.

On behalf of Penobscot Community Health Care, thank you for considering our comments. Please do not hesitate to contact me directly at paul.morrow@pchc.com with any follow up questions.

Respectfully,

Paul J Morrow Jr.

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More US Pharmacies Closed Than Opened In 2018–21; Independent Pharmacies, Those In Black, Latinx Communities Most At Risk

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ABSTRACT **In recent years, federal and state policy makers have expressed concern about retail pharmacy closures throughout the US. However, there is a dearth of timely information on the extent of such closures. We linked data from the National Council for Prescription Drug Programs on all US retail pharmacies to county-level data from the National Center for Health Statistics and ZIP Code Tabulation Area data from the American Community Survey to determine the number and percentage of pharmacy closures during the period 2010–21; identify pharmacy, neighborhood, and market characteristics associated with pharmacy closure; and estimate the risk for closure for independent pharmacies relative to chain pharmacies. We found that of the 88,930 retail pharmacies operating during 2010–20, 29.4 percent had closed by 2021. The risk for closure for pharmacies in predominantly Black and Latinx neighborhoods was higher than in White neighborhoods. Independent pharmacies were at greater risk for closure than chain pharmacies across all neighborhood and market characteristics. Policy makers should consider strategies to increase the participation of independent pharmacies in Medicare and Medicaid preferred networks managed by pharmacy benefit managers and to increase public insurance reimbursement rates for pharmacies that are at the highest risk for closure.**

Retail pharmacies are increasingly important providers of emergency and preventive care in the United States,[1–3] yet many are at risk of closing.[4] Such closures have been found to contribute to medication nonadherence, specifically among elderly adults in neighborhoods with few pharmacies.[5] In recent years, federal and state policy officials have expressed concern about retail pharmacy closures.[6–8] However, there is a dearth of timely information on such closures at the national, state, and local levels.

We previously investigated US pharmacy closures during the period 2009–15,[4] finding that one in eight US retail pharmacies closed during this period, with independent pharmacies that served disproportionately low-income, publicly insured, urban populations being at greatest risk for closure. Although this previous research demonstrated that independent pharmacies were at greater risk for closure than chain pharmacies, this association has not been evaluated across neighborhood and market characteristics. Furthermore, our previous study was based on data that now are nearly a decade old, and it quantified closures across county characteristics, rather than across states or neighborhoods.

Updated state-level analyses are needed to inform state Medicaid policy and pharmacy benefit manager (PBM) regulations.[7,9] Low reimbursement rates by state Medicaid programs and

PBMs, as well as PBMs' exclusions of certain pharmacies from their preferred networks, may affect pharmacies' profitability and lead to disparate closure rates. Neighborhood-level analyses are also needed because neighborhood racial and ethnic composition and poverty status have been associated with the prevalence of pharmacy deserts.[1,10,11]

In this study, we calculated the total number and percentage of retail pharmacy closures nationwide during the period 2010–21; identified pharmacy, neighborhood, and market characteristics associated with closure; and estimated the risk for closure among independent pharmacies, relative to chain pharmacies, by neighborhood and market characteristics. We also examined net loss in the number of pharmacies across states, counties, and neighborhoods. We hypothesized that independent pharmacies in predominantly Black and Latinx neighborhoods would be most at risk for closure because they are more likely than chain pharmacies to serve publicly insured populations yet often are excluded from the Medicaid and Medicare Part D preferred pharmacy networks managed by PBMs.[8,12]

Study Data And Methods

DATA SOURCES We used data from the National Council for Prescription Drug Programs' dataQ database[13] to determine the number and types of retail pharmacies in operation in the US from January 2010 through July 2021. We defined *retail pharmacies* as pharmacies that are open to the general public and dispense prescription medications for local patient populations (in this article, we use *retail pharmacies* and *pharmacies* interchangeably). The National Council for Prescription Drug Programs provides detailed and internally validated information on an annual basis on all US pharmacies.[13,14] To validate our approach for identifying pharmacies in operation, we randomly sampled 100 pharmacies listed as operational by the National Council for Prescription Drug Programs, and we confirmed via telephone in 2017 that 98 percent were open for business.[4,11,14] Because dataQ is considered a census of pharmacies,[13] we classified pharmacies for which identifiers or national provider numbers were missing from the council's subsequent yearly data sets as permanently closed.[4] Conversely, pharmacies newly appearing in the data in a given year were considered newly opened in that year.[4]

We geocoded pharmacies using Texas A&M GeoServices,[15] and we linked these data to county-level data from the National Center for Health Statistics (NCHS)[16] and to ZIP Code Tabulation Area data from the Census Bureau's American Community Survey (2015–19).[17] Consistent with previous research,[18,19] we defined neighborhoods as ZIP Code Tabulation Areas. Based on the linked data, we categorized pharmacies by neighborhood and market characteristics. We also linked pharmacies to annual population estimates from the Census Bureau (2010–21)[17] to derive the number of pharmacies per 10,000 people at the state and county levels.

OUTCOME MEASURES Our primary outcome was pharmacy closure, defined as the permanent closure of a pharmacy in operation at any point during the study period. We defined the year of pharmacy closure as one year after the year the pharmacy was last considered in operation by the National Council for Prescription Drug Programs.[4] The closure rate was defined as the total number of pharmacies that closed during 2011–21, divided by the total number of pharmacies in operation at any time during 2010–20.

We calculated the total number of pharmacies operating each year and identified the states, counties, and neighborhoods that experienced net losses of pharmacies, which we defined as a decline in the total number of pharmacies operating during 2010–21. Given the wave of chain pharmacy closures announced starting in 2018,[20–22] we conducted an additional analysis to identify the states that experienced net losses during 2018–21.

COVARIATES We categorized pharmacy types by ownership status, as chain (defined as having four or more pharmacies under common ownership), independent (having one to three pharmacies under common ownership), or other (government-owned pharmacies or alternative dispensing sites such as clinic-based pharmacies).[13] Neighborhood characteristics included urbanicity (county-level information applied to neighborhoods), predominant race and ethnicity, percentage of adults older than age sixty-five, and percentage of the population with income below the federal poverty level. To ensure sufficient sample sizes to observe differences across urbanicity, we condensed the six categories that the NCHS uses to classify the urban-rural spectrum of US counties into three categories (consistent with previous research).[4,23] Counties containing a principal city and located in Metropolitan Statistical Areas with populations of one million or more were classified as urban. Counties located in Metropolitan Statistical Areas with populations of 250,000 or more that do not qualify as urban were considered suburban. All other counties were considered rural. Market characteristics, also measured at the neighborhood level, included percentage uninsured, private-to-public insurance ratio, and number of pharmacies per 10,000 people.

STATISTICAL ANALYSIS To assess geographic patterns in pharmacy closures, we estimated closure rates at the national, state, and county levels. We then estimated the percentage of states, counties, and neighborhoods that experienced a net loss in pharmacies. We used chi-square tests to compare the prevalence of net loss across neighborhoods.

To assess factors associated with closure among pharmacies, we estimated closure rates across pharmacy types and across neighborhood and market characteristics. We then used Cox proportional hazard models adjusted for pharmacy type and neighborhood and market characteristics to identify characteristics associated with risk for closure. Pharmacies that had opened before 2010 were entered into the models for 2010; pharmacies that newly opened during 2010–20 were entered into the models for their respective years of opening. Our analysis included eleven one-year intervals for pharmacy closure. To account for the potential influence of state-level differences, we also examined the associations of pharmacy type and neighborhood and market characteristics on the risk for closure after adjusting for a state-level indicator (a categorical variable indicating the state in which each pharmacy was located). Finally, we compared the closure risk of independent pharmacies relative to chain pharmacies across neighborhood and market characteristics.

We used a significance level of 5 percent in all statistical testing; p values reported are two-sided. Statistical analyses were conducted with Stata, version 17.0, and R, version 4.3.3. The Institutional Review Board at the University of Southern California determined that this study was not considered human subjects research.

LIMITATIONS Our study had several limitations. First, because of limitations in the National Council for Prescription Drug Programs data, we were unable to capture all of the market dynamics, such as the volume of prescriptions filled at individual pharmacies and pharmacies' participation in PBMs' preferred pharmacy networks, that may have contributed to pharmacy closure. Participation in PBM networks is an important unobserved factor that may have been associated with closure because exclusion from these networks may be associated with low patient volume and profitability.[24] Second, our neighborhood-level measure of public insurance did not differentiate between Medicaid and Medicare. Because average pharmacy reimbursement rates in state Medicaid programs are lower than in Medicare,[25] our public insurance measure may have masked the potentially adverse effect of Medicaid and the potentially positive effect of Medicare on pharmacies' total profit at the neighborhood level.

Third, we used area-level neighborhood and market characteristics as proxies for the populations that each pharmacy served. However, pharmacies may serve populations that reside in neighborhoods other than those in which they are located. Finally, we were not able to assess underlying mechanisms that may have contributed to pharmacy closures, such as COVID-19 pandemic–related factors or trends in the use of mail-order pharmacies.[26]

Study Results

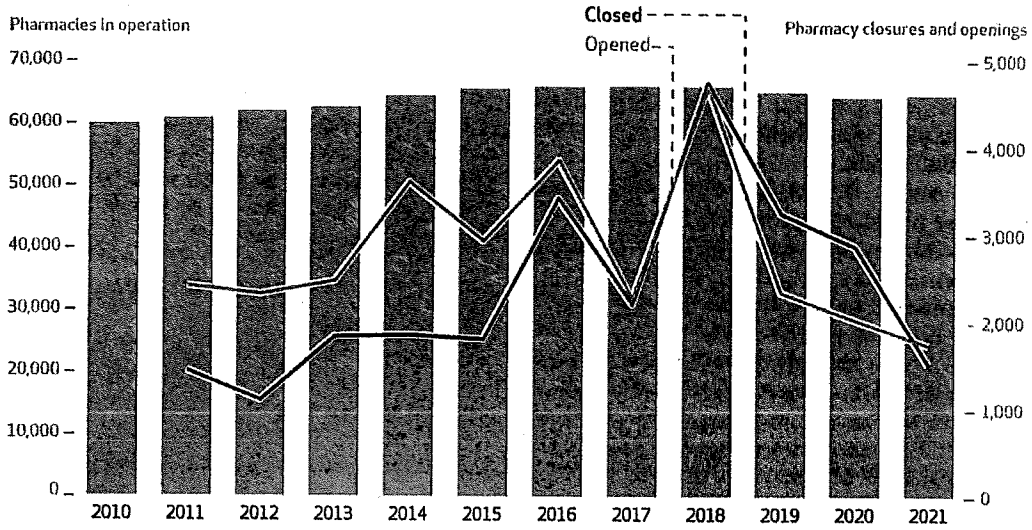
NATIONAL TRENDS IN NUMBER OF PHARMACIES As shown in exhibit 1, the number of pharmacies in the US increased by 7.7 percent during the study period, from 59,902 in 2010 to 64,530 in 2021. During this period, 26,145 pharmacies closed, and 30,773 opened. However, during 2018–21, the number of pharmacy closures exceeded pharmacy openings, resulting in a net 2.1 percent loss of pharmacies over the course of the three-year period. This decline was primarily due to chain pharmacy closures, as the number of chain pharmacies declined 5.0 percent from 2018 to 2021, whereas the number of independent pharmacies grew 2.3 percent in that period (online appendix exhibit A2).[27] Of all neighborhood race and ethnicity categories, predominantly Black neighborhoods experienced the steepest decline in pharmacies during 2018–21, with 4.8 percent fewer pharmacies of any type and 12.6 percent fewer chain pharmacies.

PHARMACY CLOSURES NATIONALLY AND BY STATE The national pharmacy closure rate was 29.4 percent during 2010–21, and state-level closure rates ranged from 17.7 percent to 40.7 percent (appendix exhibit A3).[27] Closure rates in North Dakota and Arizona were less than 20 percent, whereas New York, West Virginia, Vermont, Rhode Island, and Mississippi had closure rates greater than 35 percent. During 2010–21, eight states (Illinois, Indiana, Iowa, Minnesota, Mississippi, Rhode Island, Tennessee, and Wisconsin) had a net loss of pharmacies (appendix exhibit A4).[27] During 2018–21, forty-one states experienced a net loss of pharmacies (all states except Arizona, Colorado, Florida, Idaho, Kansas, Montana, North Dakota, Texas, Washington State, and Washington, D.C.).

PHARMACY CLOSURES BY COUNTY Exhibit 2 depicts county-level closure rates, which ranged from 0 percent in 524 counties to more than 40 percent in 611 counties. Twenty-seven counties experienced a total loss of pharmacies (100 percent net loss). Approximately one-third ($n = 1,010$) of counties experienced a net loss

EXHIBIT 1

Net number of pharmacies in operation in the US, and trends in pharmacy closures and openings, 2010–21



SOURCE Authors' analysis of pharmacy data from the National Council for Prescription Drug Programs' dataQ database, 2010–21.

during the study period, affecting 91.6 million people (appendix exhibit A5).[27] (To explore data on pharmacy closures by US county, see the interactive map that accompanies this article online.)[28] More than half of all counties in Illinois, Maine, Mississippi, New York, Pennsylvania, Rhode Island, and Vermont experienced net losses in pharmacies (appendix exhibit A6).[27] Fewer urban counties (23.5 percent) experienced a net loss than suburban (33.6 percent) or rural (31.9 percent) counties. Among the ten urban counties with the highest pharmacy closure rates, Miami-Dade (Florida) had the highest rate (57.8 percent), experiencing a 5.1 percent net loss of pharmacies (from 665 to 631; appendix exhibit A7).[27] Among the ten rural counties with the highest pharmacy closure rates, all had closure rates of 100 percent and thus experienced a total loss of pharmacies.

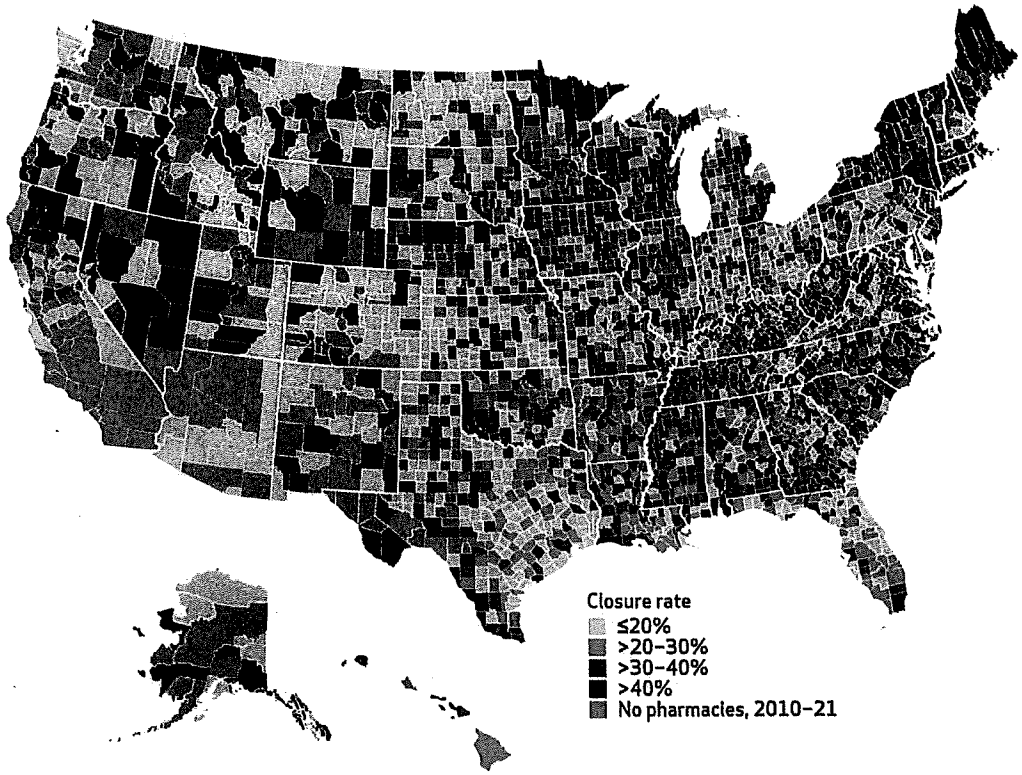
NEIGHBORHOOD NET LOSS OF PHARMACIES Among the 15,402 neighborhoods in the US with at least one pharmacy in operation throughout the study period, 25.7 percent experienced a net loss of pharmacies (appendix exhibit A8).[27] Across neighborhood race and ethnicity categories, predominantly Black neighborhoods experienced the highest net loss (32.7 percent). Among the 9,954 neighborhoods affected by at least one pharmacy closure, 38.7 percent experienced a net loss. Neighborhoods were more likely to experience pharmacy net losses when at least one chain pharmacy closed than when at least one independent pharmacy closed (43.0 percent versus 38.7 percent; $p < 0.001$).

PHARMACY, NEIGHBORHOOD, AND MARKET CHARACTERISTICS ASSOCIATED WITH CLOSURE The analytic cohort included 88,930 pharmacies, including 49,247 (55.4 percent) chain and 38,804 (43.6 percent) independent pharmacies (exhibits 3 and 4). Our adjusted analyses found that the risk for closure was significantly greater for independent pharmacies than for chain pharmacies (38.9 percent versus 21.9 percent; adjusted hazard ratio: 2.33; $p < 0.001$) (exhibit 3). Pharmacies in rural neighborhoods were at lower risk for closure than pharmacies in urban neighborhoods (29.9 percent versus 31.3 percent; aHR: 0.94; $p < 0.01$). Pharmacies in predominantly Black and predominantly Latinx neighborhoods had closure rates (37.5 percent [aHR: 1.33; $p < 0.001$] and 35.6 percent [aHR: 1.21; $p < 0.001$], respectively) that were higher than those in predominantly White neighborhoods (27.7 percent). Pharmacies in neighborhoods where 20 percent of residents or more had incomes below the federal poverty level had a modestly higher risk for closure than those in neighborhoods with lower poverty rates (34.3 percent versus 28.0 percent; aHR: 1.05; $p < 0.05$).

Pharmacies in neighborhoods with uninsurance rates of 20 percent or more were at higher risk for closure than those in neighborhoods with lower uninsurance rates (36.4 percent versus 29.0 percent; aHR: 1.10; $p < 0.01$). Pharmacies in neighborhoods with private-to-public insurance ratios less than 1.0 (which we defined as disproportionately publicly insured) had higher

EXHIBIT 2

Pharmacy closure rates in the US, by county, 2010–21



SOURCE Authors' analysis of pharmacy data from the National Council for Prescription Drug Programs' dataQ database, 2010–22. **NOTES** The pharmacy closure rate was defined as the total number of pharmacies that closed during the period 2011–21, divided by the total number of pharmacies in operation at any time during 2010–20. County closure rates were categorized as follows: ≤20% ($n = 909$), >20–30% ($n = 750$), >30–40% ($n = 761$), and >40% ($n = 611$). An additional 112 counties had no pharmacies in operation throughout the study period.

closure rates than pharmacies in neighborhoods with a ratio of at least 2.0 (34.7 percent versus 27.4 percent). Although this difference was substantial in univariate analysis (HR: 1.38; $p < 0.001$), it was largely attenuated after adjustment for pharmacy type (aHR: 1.13; $p < 0.001$) and was not significant in fully adjusted models (aHR: 0.97; $p = 0.27$) (exhibit 3, appendix exhibit A9).[27]

After we adjusted for which state the pharmacy was located in, the associations of pharmacy, neighborhood, and market characteristics on the risk for closure remained largely unchanged (appendix exhibit A10).[27]

CLOSURE RISK AMONG INDEPENDENT VERSUS CHAIN PHARMACIES As shown in exhibit 4, independent pharmacies were much more likely than chains to be in predominantly Black (7.5 percent versus 4.9 percent) and predominantly Latinx (12.8 percent versus 6.4 percent) neighborhoods, as well as in neighborhoods with poverty rates of 20 percent or more (28.3 percent versus 17.5 percent). Independent pharmacies were nearly two times more likely than chain pharmacies to be in neighborhoods with uninsurance rates of 20 percent or more (7.3 percent versus 3.7 percent) and more than two times more likely than chain pharmacies to be critical access pharmacies (that is, the sole pharmacy in the neighborhood) (10.0 percent versus 3.7 percent).

Overall, the risk for closure among independent pharmacies was more than twice that of chain pharmacies (aHR: 2.33; $p < 0.001$). A heightened risk for closure among independent pharmacies was evident across all neighborhood and market characteristics and was more than three times higher than the closure risk for chain pharmacies in predominantly Latinx neighborhoods (47.8 percent versus 16.7 percent; aHR: 3.90; $p < 0.001$) and neighborhoods with uninsurance rates of 20 percent or more (47.5 percent versus 19.5 percent; aHR: 3.37; $p < 0.001$).

EXHIBIT 3

Pharmacy, neighborhood, and market characteristics associated with pharmacy closure in the US, 2010–21

	Total[a] (%)	Closure status (%)		Closure rate[b] (%)	Adjusted hazard ratio[c]
		Open	Closed		
Overall (N = 88,930)	100.0	70.6	29.4	29.4	
PHARMACY TYPE					
Chain	55.4	61.2	41.3	21.9	Ref
Independent	43.6	37.8	57.7	38.9	2.33****
Other[d]	1.0	1.0	1.0	29.5	2.03****
NEIGHBORHOOD CHARACTERISTICS					
Urbanicity[e]					
Urban	32.2	31.3	34.3	31.3	Ref
Suburban	42.4	43.4	39.8	27.6	0.98
Rural	25.5	25.3	25.9	29.9	0.94***
Predominant race and ethnicity[f]					
White	68.5	70.1	64.7	27.7	Ref
Black	6.1	5.4	7.7	37.5	1.33****
Latinx	9.2	8.4	11.2	35.6	1.21****
Diverse	16.2	16.1	16.4	29.8	1.06***
Adults older than 65					
<20%	80.0	80.1	79.9	29.3	Ref
≥20%	20.0	19.9	20.1	29.6	1.02
Income below federal poverty level					
<20%	77.6	79.2	73.8	28.0	Ref
≥20%	22.4	20.8	26.2	34.3	1.05**
MARKET CHARACTERISTICS					
Uninsurance rate					
<20%	94.7	95.2	93.4	29.0	Ref
≥20%	5.3	4.8	6.6	36.4	1.10***
Private-to-public insurance ratio[g]					
≥2.0	53.9	55.5	50.2	27.4	Ref
1.0–1.9	33.9	33.3	35.5	30.7	0.96**
<1.0	12.1	11.2	14.3	34.7	0.97
No. of pharmacies per 10,000 people					
≥2.0	67.4	65.4	72.1	31.5	Ref
<2.0	26.1	27.9	21.8	24.6	0.80****
Critical access pharmacy[h]	6.5	6.7	6.1	27.6	0.70****

SOURCE Authors' analysis of pharmacy data from the National Council for Prescription Drug Programs' dataQ database (2010–21), county-level data on urbanicity from the National Center for Health Statistics (NCHS), and ZIP Code Tabulation Area data on neighborhood and market characteristics from the American Community Survey (2015–19). **NOTES** Neighborhood and market characteristics refer to the geographic areas in which pharmacies were located. We defined neighborhoods at the ZIP Code Tabulation Area level. [a]Total number of pharmacies in operation at any point during 2010–20. [b]Closure rate is defined in the exhibit 2 notes. [c]Hazard ratios denote the risk for closure for each pharmacy type and category of neighborhood and market characteristics, relative to the reference category. Results are from Cox proportional hazard models adjusted for pharmacy type and neighborhood and market characteristics. [d]Defined as government-owned pharmacies or alternative dispensing sites such as clinic-based pharmacies. [e]Based on the NCHS urban-rural county classification scheme. To ensure sufficient sample sizes to observe differences across urbanicity, we condensed the six NCHS categories into three (consistent with prior research, as indicated in the text). [f]Predominant race and ethnicity in a neighborhood was categorized as White (50% or more of the population was non-Latinx White), Black (50% or more of the population was non-Latinx Black), Latinx (50% or more of the population was Latinx), or diverse (no single racial or ethnic group accounted for at least 50% of the population). [g]Defined as the number of people with private health insurance divided by the number of people with health insurance provided through public programs such as Medicare and Medicaid. [h]Defined as the sole pharmacy in a neighborhood. **$p < 0.05$ ***$p < 0.01$ ****$p < 0.001$

Discussion

Using national data on US pharmacies in operation at any point during the period 2010–21, we found that nearly one-third of pharmacies had closed by 2021, and closure rates varied substantially across states, counties, and neighborhoods. Pharmacies located in predominantly Black and Latinx neighborhoods were most at risk for closure, even after differences in other neighborhood and market characteristics were accounted for. These findings suggest that closures could worsen existing racial and ethnic disparities in access to pharmacies, medications, and essential health care services such as vaccinations, naloxone dispensing, and contraception prescribing.[1–3]

EXHIBIT 4

Closure rates and closure risk of independent versus chain pharmacies in the US, overall and by neighborhood and market characteristics, 2010–21

	Chain pharmacies (n = 49,247)		Independent pharmacies (n = 38,804)		Independent versus chain (ref), adjusted hazard ratio[c]
	Total,[a] %	Closure rate,[b] %	Total,[a] %	Closure rate,[b] %	
Overall	100.0	21.9	100.0	38.9	2.33****
NEIGHBORHOOD CHARACTERISTICS					
Urbanicity[d]					
Urban	28.9	20.7	36.4	42.0	2.78****
Suburban	48.2	20.9	35.0	39.3	2.57****
Rural	22.9	25.6	28.6	34.3	1.63****
Predominant race and ethnicity[e]					
White	73.5	21.6	62.4	36.9	2.26****
Black	4.9	33.6	7.5	41.0	1.62****
Latinx	6.4	16.7	12.8	47.8	3.90****
Diverse	15.3	22.0	17.3	38.5	2.45****
Adults older than 65					
<20%	81.0	22.0	78.8	38.8	2.32****
≥20%	19.0	21.3	21.2	39.2	2.35****
Income below federal poverty level					
<20%	82.5	20.7	71.7	38.5	2.54****
≥20%	17.5	27.5	28.3	39.9	1.78****
MARKET CHARACTERISTICS					
Uninsurance rate					
<20%	96.3	22.0	92.7	38.2	2.29****
≥20%	3.7	19.5	7.3	47.5	3.37****
Private-to-public insurance ratio[f]					
≥2.0	60.5	20.2	45.7	39.4	2.70****
1.0–1.9	30.7	23.8	38.0	37.9	2.03****
<1.0	8.8	27.5	16.3	39.7	1.84****
No. of pharmacies per 10,000 people					
≥2.0	64.5	24.0	70.9	40.1	2.20****
<2.0	31.8	17.6	19.2	39.2	3.05****
Critical access pharmacy[g]	3.7	22.5	10.0	29.9	1.56****

SOURCE Authors' analysis of pharmacy data from the National Council for Prescription Drug Programs' dataQ database (2010–21), county-level data on urbanicity from the National Center for Health Statistics (NCHS), and ZIP Code Tabulation Area data on neighborhood and market characteristics from the American Community Survey (2015–19). **NOTES** Neighborhood and market characteristics refer to the geographic areas in which pharmacies were located. We defined neighborhoods at the ZIP Code Tabulation Area level. [a]Total number of pharmacies in operation at any point during 2010–20. [b]Closure rate is defined in the exhibit 2 notes. [c]Hazard ratios denote the risk for closure for independent pharmacies relative to chain pharmacies within each neighborhood and market category. Results are from Cox proportional hazard models, adjusted for neighborhood and market characteristics. [d]Based on the NCHS urban-rural county classification scheme. To ensure sufficient sample sizes to observe differences across urbanicity, we condensed the six NCHS categories into three (consistent with prior research, as indicated in the text). [e]Predominant race and ethnicity in a neighborhood was categorized as White (50% or more of the population was non-Latinx White), Black (50% or more of the population was non-Latinx Black), Latinx (50% or more of the population was Latinx), or diverse (no single racial or ethnic group accounted for at least 50% of the population). [f]Defined as the number of people with private health insurance divided by the number of people with health insurance provided through public programs such as Medicare and Medicaid. [g]Defined as the sole pharmacy in a neighborhood. ****$p < 0.001$

Although the number of US pharmacies increased from 2010 to 2017, our findings indicate unprecedented declines starting in 2018. These recent declines were primarily due to closures of chain pharmacies and are consistent with reported increases in planned chain pharmacy closures, mergers and acquisitions, and the integration of PBMs with large pharmacy chains.[20,29–31] The vertical integration of PBMs with pharmacy chains may contribute to low pharmacy reimbursement rates (for both independent and chain pharmacies that are not part of PBMs) and the disproportionate exclusion of independent pharmacies from pharmacy networks,[24,32,33] and thus ultimately may lead to more pharmacy closures.

Independent pharmacies, which were much more likely than chain pharmacies to be located in Black, Latinx, low-income, and disproportionately publicly insured neighborhoods during the

study period, were at a higher risk for closure than chain pharmacies. Therefore, the increased risk for closure among independent pharmacies may have worsened racial and ethnic disparities in access to pharmacies and medications, especially as Black and Latinx neighborhoods are more likely to be pharmacy deserts[1,10,11] and have lower adherence rates for some medications than White neighborhoods.[5,34]

Policy Implications

Commercial health insurers and public payers such as Medicare and Medicaid incentivize patients to use preferred pharmacy networks managed by PBMs by offering reduced cost sharing for in-network pharmacies.[35] Because preferred networks often exclude independent pharmacies, widespread use of these networks often has the effect of limiting the patient volumes and profits of independent (nonpreferred) pharmacies operating in the same markets, thus potentially increasing their risk for closure.[24] Federal and state policies to ensure that independent pharmacies are included in preferred pharmacy networks could help reduce their risk for closure and thus could help maintain access to pharmacy services in historically marginalized neighborhoods.

The Centers for Medicare and Medicaid Services should consider regulations to increase the participation of independent pharmacies in preferred pharmacy networks for Medicare Part D and Medicaid plans and should establish specific provisions that mandate preferred status for pharmacies at a heightened risk for closure, such as those in Black, Latinx, and low-income neighborhoods or those serving pharmacy deserts. Federal and state regulators should also consider mandating that PBMs implementing preferred pharmacy networks for commercial plans not disproportionately exclude independent pharmacies in favor of chain pharmacies, including chain pharmacies affiliated with their parent companies.[24]

State officials should also consider policies that increase Medicaid reimbursement for pharmacies most at risk for closure. Such policies could include tiered dispensing fees, which provide differential reimbursement rates based on pharmacy locations and prescription volume. For example, in an effort to reduce pharmacy closures in their states, thirteen state fee-for-service Medicaid programs provide higher reimbursement rates to pharmacies in rural areas.[9] Such policies could be expanded to urban pharmacies at high risk for closure, including those located in historically marginalized or low-income neighborhoods or pharmacies serving existing pharmacy deserts.[10]

Given expected increases in pharmacy closures over the next several years,[20–22] federal, state, and local policy makers should consider targeted strategies to protect pharmacies most at risk for closing. Such efforts could include reforms that increase Medicare Part D and Medicaid reimbursement rates for pharmacies most at risk for closure and that expand PBMs' managed preferred pharmacy networks to include independent pharmacies, especially those in neighborhoods that are or are at risk of becoming pharmacy deserts. ■

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