Naloxone availability in retail pharmacies and neighborhood inequities in access

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Abstract

Introduction: The objective of this study was to examine the implementation of North Carolina’s (NC) statewide naloxone standing order and identify community characteristics associated with pharmacy stocking and willingness to sell naloxone under the standing order.

Methods: In April-June 2019, a mystery caller protocol was completed to assess if (a) NC pharmacies had naloxone available and were willing to dispense it without a prescription, (b) pharmacy characteristics associated with availability, and (c) there were neighborhood differences (e.g., census tract population size, density, racial composition, socioeconomic status, rates of opioid overdoses, and rates of opioid prescriptions dispensed) in availability. Using random sampling stratified by inclusion on NC’s public list of pharmacies participating in the standing order, chain, independent, and health department pharmacies in NC were sampled (n=161 out of 2,044). In June 2019, data was analyzed. Survey weights were utilized to calculate the prevalence of availability and regression models were conducted to examine associations.

Results: An estimated 61.7% (CI:54.3,68.5) of NC retail pharmacies have naloxone available without a prescription. The odds of naloxone availability were lower for independent pharmacies than chains (OR:0.12; 95% CI:0.06,0.25). Inclusion on NC’s public list of pharmacies had greater odds of naloxone availability (OR:2.32; 95% CI:1.22,4.43). Naloxone availability was lower in communities with higher percentages of residents with public health insurance (OR:0.97; 95% CI:0.95,0.999).

Conclusion: While over half of pharmacies in NC participate in the standing order for naloxone, efforts to identify best practices for ensuring widespread implementation of statewide standing orders for naloxone are warranted.
Introduction

In the United States, the majority (67.8%) of drug overdoses involved opioids.\textsuperscript{1} From 2016 to 2017, opioid-related deaths increased across age groups, racial/ethnic groups, county urbanization levels, and in multiple states indicating that naloxone is necessary in diverse communities.\textsuperscript{1}

One strategy to prevent opioid-involved deaths is increasing layperson access to the opioid antagonist naloxone. All states have expanded access to naloxone via pharmacies,\textsuperscript{2} which has been associated with a 106% increase from 2017 to 2018 alone.\textsuperscript{3} Standing orders are one form of expanded access under which a prescriber authorizes the provision of naloxone to a person who meets predetermined criteria.\textsuperscript{4} As of January 2019, twelve states, including North Carolina (NC), implemented statewide standing orders for naloxone allowing all pharmacies licensed in the state to provide naloxone to a person who meets predetermined criteria by the state.\textsuperscript{2} In NC, this consists of individuals who voluntarily request naloxone and are at risk of experiencing an opiate-related overdose or are in the position to assist with an opiate-related overdose.

The current literature on the implementation and equity of naloxone standing orders is limited.\textsuperscript{5-8} To date, there are no assessments of implementation of statewide standing orders for naloxone. It is important to assess both reach and equity in standing order implementation to maximize population benefit. The objective of this study was to examine the implementation of NC’s statewide naloxone standing order and identify community characteristics associated with pharmacies stocked with naloxone and willing to sell without a prescription and out-of-pocket cost for intranasal naloxone.
Methods

In April-June 2019, a mystery caller protocol was utilized (available in: https://dataverse.unc.edu/dataverse/naloxoneinpharmacy) to assess if retail pharmacies had naloxone available and were willing to dispense it without a prescription. First, a sampling frame of chain (N=1,201), independent (N=760), and health department (N=83) pharmacies was created using a November 2018 list of active pharmacies from the NC Pharmacy Board (N=2,044). Second, the sampling frame was cross-referenced with the NC Department of Health and Human Services’ (NCDHHS) list of pharmacies participating in the standing order. Third, following a power analysis, stratified random sampling was used to select 200 pharmacies. Strata were presence (or not) in the state list of pharmacies participating in the standing order. Of the 200, 39 were closed or unreachable after three calls. Odds of being in the analytic sample were higher for pharmacies within counties with higher rates of community member naloxone administration (naloxone provided by community-based organizations) (OR:1.06, CI:0.99, 1.12). Calls were completed with 161 pharmacies, consisting of 83 (54.8%) chain, 69 (40.8%) independent, and 8 (4.4%) health department pharmacies (sample characteristics are in Table 1).

Measures and Data Sources

The primary outcome was naloxone availability without a prescription. Correlates of out-of-pocket cost for intranasal naloxone was also examined. Pharmacy characteristics included pharmacy type (provided by the NC Pharmacy Board), presence on NCDHHS’s standing order
list, and how quickly the call was handled. Neighborhood characteristics included basic demographics at the census tract level (American Community Survey 2013-2017 estimates)\textsuperscript{10} and 2017 county-level opioid data (i.e., rates of opioid overdoses and prescriptions, naloxone administered by community members and Emergency Medical Services, and buprenorphine prescriptions).\textsuperscript{11}

Statistical Analysis

Pharmacies were the unit of analysis. All analyses utilize survey weights to generalize to NC retail pharmacies. First, descriptive statistics were computed to describe characteristics of the overall sample and naloxone availability. Then, unadjusted logistic regression models were used to examine correlates of naloxone availability and linear regression models to examine correlates with the out-of-pocket cost of intranasal naloxone spray. All analyses were completed using SPSS 25 and its Complex Samples feature. The protocol was deemed exempt from human subject research by the East Carolina University Institutional Review Board (#19-000372).

Results

As shown in Table 1, just over three-in-five NC retail pharmacies had naloxone available without a prescription (61.7%, 95% CI:54.3%-68.5%). All pharmacies that had naloxone available without a prescription carried intranasal naloxone spray and 4.1% carried intramuscular naloxone. The weighted mean out-of-pocket cost for these products was $123.24 (CI:$117.07-
$129.42) and $33.82 (CI:$29.38-$38.26), respectively. Seventy-five percent of the pharmacies that would sell naloxone stated that naloxone could be covered by Medicaid.

Among the pharmacies that did not have naloxone in stock or would not sell without a prescription (n=64), 40.6% pharmacies explicitly stated that naloxone was not available without a prescription and 39.1% provided recommendations for other places to access naloxone. Of those, 64% recommended calling a chain, 9.9% a health department, or 2.5% an independent pharmacy. About 20% requested personal information (e.g., name, identification, date of birth, why or for whom is naloxone needed, record of prescription for narcotics).

Regarding predictors of availability (Table 1) and cost, the odds of naloxone availability were lower for independent pharmacies (OR:0.13, CI:0.06, 0.26) than chains and greater for pharmacies on the NCDHHS list (OR:2.32, CI:1.25, 4.32). Only one neighborhood characteristics predicted naloxone availability: the percentage of residents with public health insurance (OR:0.97, CI:0.95, 0.999). Linear regression models indicated no statistically significant relationships between out-of-pocket costs of intranasal naloxone and pharmacy type or neighborhood characteristics (results not shown).

Discussion

The principal findings were: (1) an estimated three of every five NC retail pharmacies have naloxone in stock and are willing to dispense it under the statewide standing order, (2) an important predictor of availability is being a chain vs. independent pharmacy, (3) almost two-in-
five pharmacies on the state list of participating pharmacies were unable or unwilling to
dispense, and (4) limited evidence of inequities based on neighborhood characteristics.

Thus far, this is the highest percentage of pharmacy participation in a statewide naloxone
standing order. The finding that 61.7% of pharmacies in NC have naloxone in stock and are
willing to dispense it without a prescription is double that of other studies that have assessed
naloxone accessibility without a prescription or a statewide standing order. This study
confirms prior studies showing independent pharmacies (compared to chains) are less able or
willing to dispense naloxone, consistent with previous studies, suggesting room for
improvement.

NC has created a database of pharmacies that participate in the statewide standing order to
enhance naloxone accessibility for the public. The findings suggest that pharmacies who have
elected to be listed on this website were more likely to have naloxone available without a
prescription. However, 39.1% of pharmacies on the list did not have naloxone available without
a prescription which prevents the list from being utilized as intended. These pharmacies may
have stocking issues or variation among individual pharmacy staff members’ knowledge and
comfort in dispensing naloxone may exist.

These results are generally positive regarding inequities in access to naloxone by neighborhood
caracteristics. This is in stark contrast to the historical inequities in marketing and access to
analgesics in neighborhoods with lower proportions of White residents. No differences in
naloxone availability based on opioid overdose death rates, opioid prescriptions, or other
naloxone programs were identified. However, there were differences in access by neighborhood resources as indicated by percent of residents participating in public health insurance. This finding is significant because the presence of a statewide naloxone standing order is associated with an increase of naloxone prescriptions covered by Medicaid.\textsuperscript{14}

\textit{Limitations}

Limitations include possible inclusion of non-pharmacist respondents, lack of information pertaining to why pharmacies were not furnishing naloxone, absence of data on pharmacist naloxone training, and restriction to NC.

\textit{Conclusions}

This study suggests that, while over half of pharmacies in NC participate in the standing order for naloxone, efforts to further implementation are needed. Further research is should identify best practices for ensuring widespread implementation of statewide standing orders for naloxone.

\textit{Acknowledgements}

No financial disclosures were reported by the authors of this paper.
References


Map of sampling frame and stratified random sample, NC pharmacies

Stratified Random Sample, n=200
Sampling Frame, N=2,044
NC Counties

Created in QGIS 3.4 on October 10, 2019. Projection NC State Plane (EPSG102719).
Map of stratified random sample and pharmacies reached, NC pharmacies

Pharmacies Reached, n=161 Stratified Random Sample, n=200 NC Counties

Created in QGIS 3.4 on October 10, 2019. Projection NC State Plane (EPSG102719).
Table 1. Naloxone availability at time of call without prescription in North Carolina pharmacies (n=161), 2019a

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Overall (n=161) %/mean (CI)</th>
<th>Available (n=97) %/mean (CI)</th>
<th>Not Available (n=64) %/mean (CI)</th>
<th>Odds Ratiob (CI) p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>-</td>
<td>61.7 (54.3-68.5)</td>
<td>38.3 (31.5-45.7)</td>
<td>-</td>
</tr>
<tr>
<td>Pharmacy Characteristics</td>
<td></td>
<td></td>
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<tr>
<td>Pharmacy Type</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Chain</td>
<td>54.8 (47.8-61.6)</td>
<td>71.1 (62.0-78.8)</td>
<td>28.1 (18.6-40.1)</td>
<td>referent</td>
</tr>
<tr>
<td>Independent</td>
<td>40.8 (34.0-48.0)</td>
<td>22.6 (15.7-31.5)</td>
<td>70.5 (58.5-80.2)</td>
<td>0.13 (0.06, 0.26) ***</td>
</tr>
<tr>
<td>Health Department</td>
<td>4.4 (2.3-8.3)</td>
<td>6.3 (3.1-12.2)</td>
<td>1.4 (0.2-8.5)</td>
<td>1.78 (0.22, 14.12)</td>
</tr>
<tr>
<td>North Carolina Standing Order List</td>
<td>58.8 (56.4-61.2)</td>
<td>66.6 (60.4-72.4)</td>
<td>46.3 (36.7-56.1)</td>
<td>2.32 (1.25, 4.32) *</td>
</tr>
<tr>
<td>Call Disposition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediately handled naloxone inquiry</td>
<td>42.9 (35.5-50.6)</td>
<td>38.9 (29.9-48.6)</td>
<td>50.3 (37.7-62.8)</td>
<td>referent</td>
</tr>
<tr>
<td>Put on hold or transferred to other staff</td>
<td>57.1 (49.4-64.5)</td>
<td>61.1 (51.4-70.1)</td>
<td>49.7 (37.2-62.3)</td>
<td>1.59 (0.83, 3.06)</td>
</tr>
<tr>
<td>Neighborhood Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tract Population size</td>
<td>5,088.5 (4,784.0-5,392.9)</td>
<td>5,233.0 (4,802.3-5,663.8)</td>
<td>4,855.6 (4,474.1-5,237.0)</td>
<td>1.00 (1.00, 1.00)</td>
</tr>
<tr>
<td>Tract Population density</td>
<td>1,356.4 (1,146.6-1,566.2)</td>
<td>1,439.1 (1,184.1-1,694.1)</td>
<td>1,223.3 (860.8-1,585.8)</td>
<td>1.00 (1.00, 1.00)</td>
</tr>
<tr>
<td>Tract % White</td>
<td>65.1 (61.6-68.6)</td>
<td>63.9 (59.3-68.5)</td>
<td>66.9 (61.6-72.2)</td>
<td>0.99 (0.98, 1.01)</td>
</tr>
<tr>
<td>Tract % Black</td>
<td>25.1 (21.9-28.3)</td>
<td>25.6 (21.4-29.9)</td>
<td>24.2 (19.4-29.1)</td>
<td>1.00 (0.99, 1.02)</td>
</tr>
<tr>
<td>Tract % American Indian</td>
<td>1.4 (0.3-2.4)</td>
<td>1.2 (0.0-2.4)</td>
<td>1.5 (-0.5-3.6)</td>
<td>1.00 (0.96, 1.03)</td>
</tr>
<tr>
<td>Tract % Asian</td>
<td>2.8 (2.1-3.5)</td>
<td>3.3 (2.3-4.4)</td>
<td>2.0 (1.3-2.7)</td>
<td>1.09 (0.99, 1.20)</td>
</tr>
<tr>
<td>Tract % Other</td>
<td>3.1 (2.5-3.8)</td>
<td>3.3 (2.5-4.2)</td>
<td>2.9 (1.7-4.0)</td>
<td>1.03 (0.94, 1.11)</td>
</tr>
<tr>
<td>Tract % Mixed</td>
<td>2.5 (2.2-2.8)</td>
<td>2.5 (2.1-2.9)</td>
<td>2.4 (1.9-2.8)</td>
<td>1.05 (0.89, 1.23)</td>
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<td>----------------------</td>
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<tr>
<td>Tract % Hispanic</td>
<td>9.6 (8.3-10.9)</td>
<td>10.7 (8.8-12.5)</td>
<td>7.9 (6.2-9.7)</td>
<td>1.04 (1.00, 1.09)</td>
</tr>
<tr>
<td>Tract % Bachelor’s degree+</td>
<td>29.1 (26.3-32.0)</td>
<td>29.8 (25.9-33.6)</td>
<td>28.1 (23.8-32.3)</td>
<td>1.00 (0.99, 1.02)</td>
</tr>
<tr>
<td>Tract % Unemployment</td>
<td>7.9 (7.2-8.6)</td>
<td>7.9 (7.0-8.9)</td>
<td>7.8 (6.7-8.9)</td>
<td>1.01 (0.95, 1.07)</td>
</tr>
<tr>
<td>Median household income</td>
<td>$62,679.8 (58,426.1-66,933.0)</td>
<td>$63,975.6 (58,262.2-69,689.0)</td>
<td>$60,592.7 (54,371.5-66,813.9)</td>
<td>1.00 (1.00, 1.00)</td>
</tr>
<tr>
<td>Tract % with public health insurance</td>
<td>37.5 (35.6-39.4)</td>
<td>35.7 (33.3-38.1)</td>
<td>40.4 (37.5-43.2)</td>
<td>0.97 (0.95, 0.999) *</td>
</tr>
<tr>
<td>Tract % no health insurance</td>
<td>12.9 (12.0-13.9)</td>
<td>12.9 (11.6-14.1)</td>
<td>13.1 (11.7-14.4)</td>
<td>1.00 (0.95, 1.05)</td>
</tr>
<tr>
<td>Tract % vacant housing</td>
<td>14.6 (13.0-16.3)</td>
<td>13.9 (12.1-15.7)</td>
<td>15.8 (12.6-19.1)</td>
<td>0.98 (0.96, 1.01)</td>
</tr>
<tr>
<td>County opioid overdose death rate per 100,000</td>
<td>18.6 (17.2-20.0)</td>
<td>17.9 (16.2-19.7)</td>
<td>19.7 (12.6-19.1)</td>
<td>0.98 (0.95, 1.01)</td>
</tr>
<tr>
<td>County opioid pills dispensed rate per 100,000</td>
<td>5,454,720.7 (5,117,943.5-5,791,497.8)</td>
<td>5,215,964.9 (4,773,624.7-5,658,305.0)</td>
<td>5,839,258.6 (5,337,893.1-6,340,624.0)</td>
<td>1.00 (1.00, 1.00)</td>
</tr>
<tr>
<td>County Emergency Medical Services naloxone use rate per 100,000</td>
<td>154.9 (142.7-167.1)</td>
<td>158.4 (141.1-175.7)</td>
<td>149.2 (133.9-164.5)</td>
<td>1.00 (1.00, 1.01)</td>
</tr>
<tr>
<td>County community member naloxone Distribution use rate per 100,000</td>
<td>48.6 (33.2-63.9)</td>
<td>47.4 (26.4-68.5)</td>
<td>50.4 (29.0-71.8)</td>
<td>1.00 (1.00, 1.00)</td>
</tr>
<tr>
<td>County buprenorphine prescription rate per 100,000</td>
<td>6,301.6 (5,503.7-7,099.4)</td>
<td>5,929.3 (4,860.0-6,998.6)</td>
<td>6,901.1 (5,744.0-8,058.1)</td>
<td>1.00 (1.00, 1.00)</td>
</tr>
</tbody>
</table>

*weighted; †unadjusted; ‡naloxone provided by a community-based organization
Boldface indicates statistical significance (*p<0.05; **p<0.01; ***p<0.001)