

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.

1 Introduction

2 In the United States, the majority (67.8%) of drug overdoses involved opioids.¹ From 2016 to
3 2017, opioid-related deaths increased across age groups, racial/ethnic groups, county
4 urbanization levels, and in multiple states indicating that naloxone is necessary in diverse
5 communities.¹

6
7 One strategy to prevent opioid-involved deaths is increasing layperson access to the opioid
8 antagonist naloxone. All states have expanded access to naloxone via pharmacies,² which has
9 been associated with a 106% increase from 2017 to 2018 alone.³ Standing orders are one form of
10 expanded access under which a prescriber authorizes the provision of naloxone to a person who
11 meets predetermined criteria.⁴ As of January 2019, twelve states, including North Carolina (NC),
12 implemented statewide standing orders for naloxone allowing all pharmacies licensed in the state
13 to provide naloxone to a person who meets predetermined criteria by the state.² In NC, this
14 consists of individuals who voluntarily request naloxone and are at risk of experiencing an
15 opiate-related overdose or are in the position to assist with an opiate-related overdose.

16
17 The current literature on the implementation and equity of naloxone standing orders is limited.⁵⁻⁸
18 To date, there are no assessments of implementation of statewide standing orders for naloxone. It
19 is important to assess both reach and equity in standing order implementation to maximize
20 population benefit. The objective of this study was to examine the implementation of NC's
21 statewide naloxone standing order and identify community characteristics associated with
22 pharmacies stocked with naloxone and willing to sell without a prescription and out-of-pocket
23 cost for intranasal naloxone.

24

25 Methods

26

27 In April-June 2019, a mystery caller protocol was utilized (available in:

28 <https://dataverse.unc.edu/dataverse/naloxoneinpharmacy>) to assess if retail pharmacies had

29 naloxone available and were willing to dispense it without a prescription. First, a sampling frame

30 of chain (N=1,201), independent (N=760), and health department (N=83) pharmacies was

31 created using a November 2018 list of active pharmacies from the NC Pharmacy Board

32 (N=2,044). Second, the sampling frame was cross-referenced with the NC Department of Health

33 and Human Services' (NCDHHS) list of pharmacies participating in the standing order.⁹ Third,

34 following a power analysis, stratified random sampling was used to select 200 pharmacies. Strata

35 were presence (or not) in the state list of pharmacies participating in the standing order. Of the

36 200, 39 were closed or unreachable after three calls. Odds of being in the analytic sample were

37 higher for pharmacies within counties with higher rates of community member naloxone

38 administration (naloxone provided by community-based organizations) (OR:1.06, CI:0.99, 1.12).

39 Calls were completed with 161 pharmacies, consisting of 83 (54.8%) chain, 69 (40.8%)

40 independent, and 8 (4.4%) health department pharmacies (sample characteristics are in Table 1).

41

42 *Measures and Data Sources*

43

44 The primary outcome was naloxone availability without a prescription. Correlates of out-of-

45 pocket cost for intranasal naloxone was also examined. Pharmacy characteristics included

46 pharmacy type (provided by the NC Pharmacy Board), presence on NCDHHS's standing order

47 list, and how quickly the call was handled. Neighborhood characteristics included basic
48 demographics at the census tract level (American Community Survey 2013-2017 estimates)¹⁰
49 and 2017 county-level opioid data (i.e., rates of opioid overdoses and prescriptions, naloxone
50 administered by community members and Emergency Medical Services, and buprenorphine
51 prescriptions).¹¹

52

53 *Statistical Analysis*

54

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

62

63 Results

64

65 As shown in Table 1, just over three-in-five NC retail pharmacies had naloxone available
66 without a prescription (61.7%, 95% CI:54.3%-68.5%). All pharmacies that had naloxone
67 available without a prescription carried intranasal naloxone spray and 4.1% carried intramuscular
68 naloxone. The weighted mean out-of-pocket cost for these products was \$123.24 (CI:\$117.07-

69 \$129.42) and \$33.82 (CI:\$29.38-\$38.26), respectively. Seventy-five percent of the pharmacies
70 that would sell naloxone stated that naloxone could be covered by Medicaid.

71

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

78

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

86

87 Discussion

88

89 The principal findings were: (1) an estimated three of every five NC retail pharmacies have
90 naloxone in stock and are willing to dispense it under the statewide standing order, (2) an
91 important predictor of availability is being a chain vs. independent pharmacy, (3) almost two-in-

92 five pharmacies on the state list of participating pharmacies were unable or unwilling to
93 dispense, and (4) limited evidence of inequities based on neighborhood characteristics.

94

95 Thus far, this is the highest percentage of pharmacy participation in a statewide naloxone
96 standing order. The finding that 61.7% of pharmacies in NC have naloxone in stock and are
97 willing to dispense it without a prescription is double that of other studies that have assessed
98 naloxone accessibility without a prescription^{6,7} or a statewide standing order.⁵ This study
99 confirms prior studies showing independent pharmacies (compared to chains) are less able or
100 willing to dispense naloxone, consistent with previous studies,^{5,7} suggesting room for
101 improvement.

102

103 NC has created a database of pharmacies that participate in the statewide standing order to
104 enhance naloxone accessibility for the public. The findings suggest that pharmacies who have
105 elected to be listed on this website were more likely to have naloxone available without a
106 prescription. However, 39.1% of pharmacies on the list did not have naloxone available without
107 a prescription which prevents the list from being utilized as intended. These pharmacies may
108 have stocking issues^{5,6} or variation among individual pharmacy staff members' knowledge and
109 comfort in dispensing naloxone may exist.¹²

110

111 These results are generally positive regarding inequities in access to naloxone by neighborhood
112 characteristics. This is in stark contrast to the historical inequities in marketing and access to
113 analgesics in neighborhoods with lower proportions of White residents.¹³ No differences in
114 naloxone availability based on opioid overdose death rates, opioid prescriptions, or other

115 naloxone programs were identified. However, there were differences in access by neighborhood
116 resources as indicated by percent of residents participating in public health insurance. This
117 finding is significant because the presence of a statewide naloxone standing order is associated
118 with an increase of naloxone prescriptions covered by Medicaid.¹⁴

119

120 *Limitations*

121

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

125

126 *Conclusions*

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

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132

133 *Acknowledgements*

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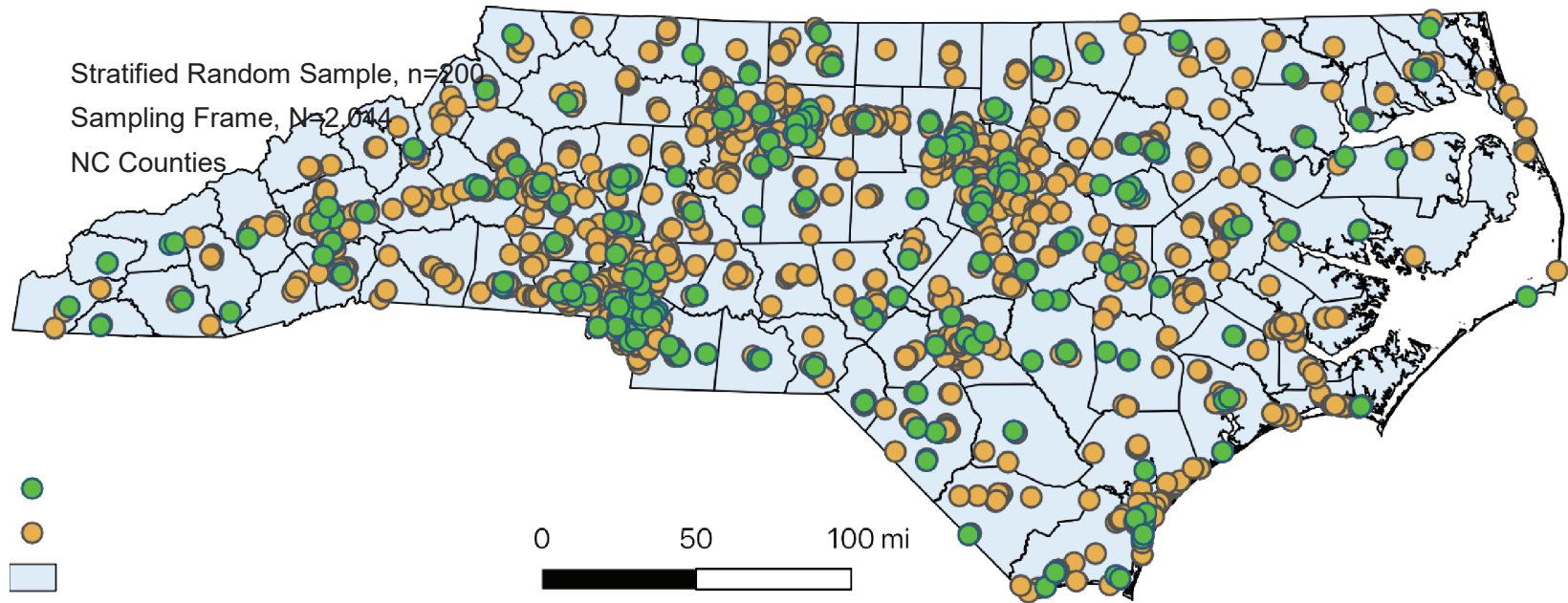
135 No financial disclosures were reported by the authors of this paper.

References

1. Scholl L. Drug and Opioid-Involved Overdose Deaths — United States, 2013–2017. *MMWR Morb Mortal Wkly Rep.* 2019;67. doi:10.15585/mmwr.mm6751521e1
2. National Alliance of State Pharmacy Associations. Naloxone Access in Community Pharmacies. NASPA. <https://naspa.us/resource/naloxone-access-community-pharmacies/>. Accessed June 20, 2019.
3. Guy GP. Vital Signs: Pharmacy-Based Naloxone Dispensing — United States, 2012–2018. *MMWR Morb Mortal Wkly Rep.* 2019;68. doi:10.15585/mmwr.mm6831e1
4. Davis C, Carr D. State legal innovations to encourage naloxone dispensing. *J Am Pharm Assoc.* 2017;57(2):S180-S184. doi:10.1016/j.japh.2016.11.007
5. Guadamuz JS, Alexander GC, Chaudhri T, Trotzky-Sirr R, Qato DM. Availability and Cost of Naloxone Nasal Spray at Pharmacies in Philadelphia, Pennsylvania, 2017. *JAMA Netw Open.* 2019;2(6):e195388. doi:10.1001/jamanetworkopen.2019.5388
6. Lozo KW, Nelson LS, Ramdin C, Calello DP. Naloxone Deserts in NJ Cities: Sociodemographic Factors Which May Impact Retail Pharmacy Naloxone Availability. *J Med Toxicol.* 2019;15(2):108-111. doi:10.1007/s13181-019-00700-7
7. Puzantian T, Gasper JJ. Provision of Naloxone Without a Prescription by California Pharmacists 2 Years After Legislation Implementation. *JAMA.* 2018;320(18):1933-1934. doi:10.1001/jama.2018.12291
8. Palombi L, Hawthorne AN, Lunos S, Melgaard K, Dahly A, Blue H. Community Pharmacist Utilization of Legislation That Allows Impact on the Opioid Crisis in the State of Minnesota: A Mixed-Methods Approach. *J Pharm Pract.* April 2019:0897190019841747. doi:10.1177/0897190019841747
9. North Carolina Department of Health and Human Services website. N.C. Pharmacies that Offer Naloxone Under a Standing Order. Naloxone Saves. <https://www.naloxonesaves.org/2019/02/n-c-pharmacies-that-offer-naloxone-under-a-standing-order/>. Accessed September 1, 2018.
10. Social Explorer. *American Community Survey 2013-2017 Estimates.* New York, NY; 2019. <http://www.socialexplorer.com/pub/reportdata/HtmlResults.aspx?reportid=R12198643>.
11. North Carolina Department of Health and Human Services website. NC Opioid Action Plan Data Dashboard. <https://injuryfreenc.shinyapps.io/OpioidActionPlan/>. Accessed September 1, 2018.
12. Rudolph SE, Branham AR, Rhodes LA, Hayes H “HJ,” Moose JS, Marciniak MW. Identifying barriers to dispensing naloxone: A survey of community pharmacists in North Carolina. *J Am Pharm Assoc* 2018;58(4):S55-S58.e3. doi:10.1016/j.japh.2018.04.025

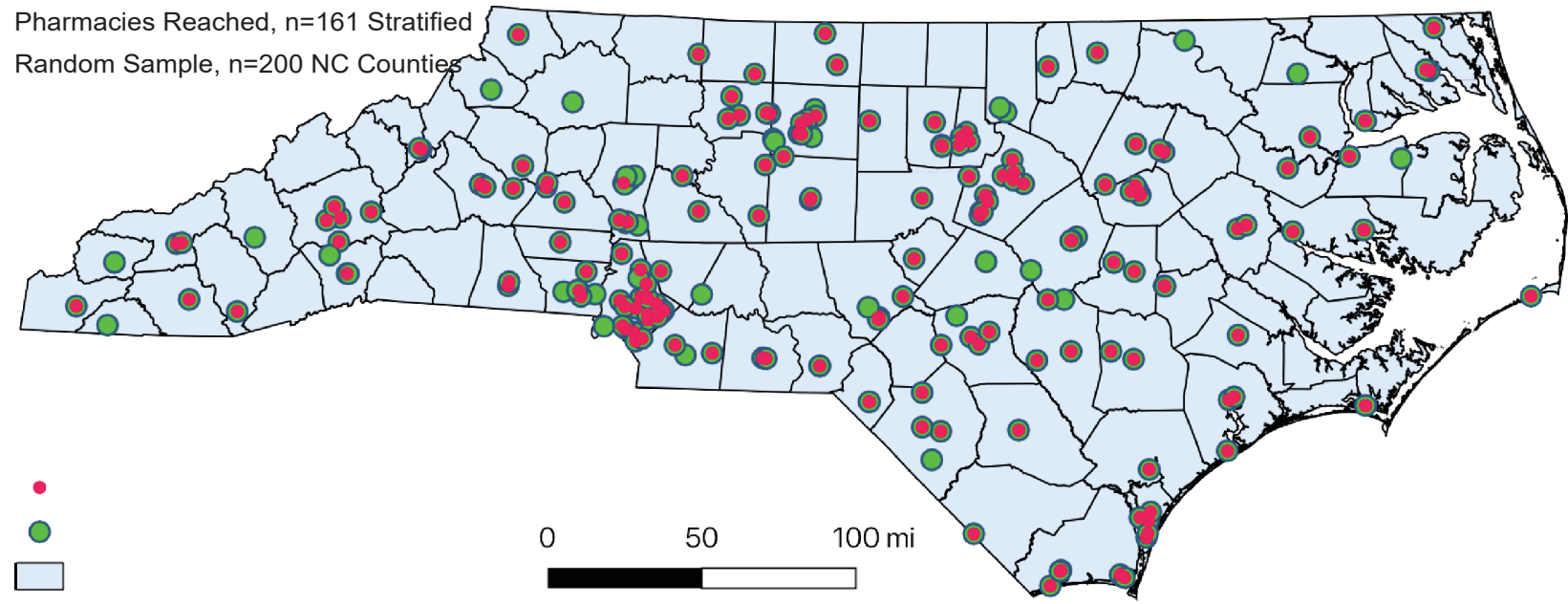
13. Hansen H, Netherland J. Is the Prescription Opioid Epidemic a White Problem? *Am J Public Health*. 2016;106(12):2127-2129. doi:10.2105/AJPH.2016.303483
14. Gertner AK, Domino ME, Davis CS. Do naloxone access laws increase outpatient naloxone prescriptions? Evidence from Medicaid. *Drug Alcohol Depend*. 2018;190:37-41. doi:10.1016/j.drugalcdep.2018.05.014

Map of sampling frame and stratified random sample, NC pharmacies



Created in QGIS 3.4 on October 10, 2019. Projection NC State Plane (EPSG102719).

Map of stratified random sample and pharmacies reached, NC pharmacies



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), 2019^a

Characteristics	Naloxone Availability at Time of Call without Prescription			
	Overall (n=161) %/mean (CI)	Available (n=97) %/mean (CI)	Not Available (n=64) %/mean (CI)	Odds Ratio ^b (CI) p-value
Total	-	61.7 (54.3-68.5)	38.3 (31.5-45.7)	-
Pharmacy Characteristics				
Pharmacy Type				
Chain	54.8 (47.8-61.6)	71.1 (62.0-78.8)	28.1 (18.6-40.1)	referent
Independent	40.8 (34.0-48.0)	22.6 (15.7-31.5)	70.5 (58.5-80.2)	0.13 (0.06, 0.26) ***
Health Department	4.4 (2.3-8.3)	6.3 (3.1-12.2)	1.4 (0.2-8.5)	1.78 (0.22, 14.12)
North Carolina Standing Order List	58.8 (56.4-61.2)	66.6 (60.4-72.4)	46.3 (36.7-56.1)	2.32 (1.25, 4.32) *
Call Disposition				
Immediately handled naloxone inquiry	42.9 (35.5-50.6)	38.9 (29.9-48.6)	50.3 (37.7-62.8)	referent
Put on hold or transferred to other staff	57.1 (49.4-64.5)	61.1 (51.4-70.1)	49.7 (37.2-62.3)	1.59 (0.83, 3.06)
Neighborhood Characteristics				
Tract Population size	5,088.5 (4,784.0-5,392.9)	5,233.0 (4,802.3-5,663.8)	4,855.6 (4,474.1-5,237.0)	1.00 (1.00, 1.00)
Tract Population density	1,356.4 (1,146.6-1,566.2)	1,439.1 (1,184.1-1,694.1)	1,223.3 (860.8-1,585.8)	1.00 (1.00, 1.00)
Tract % White	65.1 (61.6-68.6)	63.9 (59.3-68.5)	66.9 (61.6-72.2)	0.99 (0.98, 1.01)
Tract % Black	25.1 (21.9-28.3)	25.6 (21.4-29.9)	24.2 (19.4-29.1)	1.00 (0.99, 1.02)
Tract % American Indian	1.4 (0.3-2.4)	1.2 (0.0-2.4)	1.5 (-0.5-3.6)	1.00 (0.96, 1.03)
Tract % Asian	2.8 (2.1-3.5)	3.3 (2.3-4.4)	2.0 (1.3-2.7)	1.09 (0.99, 1.20)
Tract % Other	3.1 (2.5-3.8)	3.3 (2.5-4.2)	2.9 (1.7-4.0)	1.03 (0.94, 1.11)

Tract % Mixed	2.5 (2.2-2.8)	2.5 (2.1-2.9)	2.4 (1.9-2.8)	1.05 (0.89, 1.23)
Tract % Hispanic	9.6 (8.3-10.9)	10.7 (8.8-12.5)	7.9 (6.2-9.7)	1.04 (1.00, 1.09)
Tract % Bachelor's degree+	29.1 (26.3-32.0)	29.8 (25.9-33.6)	28.1 (23.8-32.3)	1.00 (0.99, 1.02)
Tract % Unemployment	7.9 (7.2-8.6)	7.9 (7.0-8.9)	7.8 (6.7-8.9)	1.01 (0.95, 1.07)
Tract Median household income	\$62,679.8 (58,426.1-66,933.0)	\$63,975.6 (58,262.2-69,689.0)	\$60,592.7 (54,371.5-66,813.9)	1.00 (1.00, 1.00)
Tract % with public health insurance	37.5 (35.6-39.4)	35.7 (33.3-38.1)	40.4 (37.5-43.2)	0.97 (0.95, 0.999) *
Tract % no health insurance	12.9 (12.0-13.9)	12.9 (11.6-14.1)	13.1 (11.7-14.4)	1.00 (0.95, 1.05)
Tract % vacant housing	14.6 (13.0-16.3)	13.9 (12.1-15.7)	15.8 (12.6-19.1)	0.98 (0.96, 1.01)
County opioid overdose death rate per 100,000	18.6 (17.2-20.0)	17.9 (16.2-19.7)	19.7 (12.6-19.1)	0.98 (0.95, 1.01)
County opioid pills dispensed rate per 100,000	5,454,720.7 (5,117,943.5-5,791,497.8)	5,215,964.9 (4,773,624.7-5,658,305.0)	5,839,258.6 (5,337,893.1-6,340,624.0)	1.00 (1.00, 1.00)
County Emergency Medical Services naloxone use rate per 100,000	154.9 (142.7-167.1)	158.4 (141.1-175.7)	149.2 (133.9-164.5)	1.00 (1.00, 1.01)
County community member naloxone ^c use rate per 100,000	48.6 (33.2-63.9)	47.4 (26.4-68.5)	50.4 (29.0-71.8)	1.00 (1.00, 1.00)
County buprenorphine prescription rate per 100,000	6,301.6 (5,503.7-7,099.4)	5,929.3 (4,860.0-6,998.6)	6,901.1 (5,744.0-8,058.1)	1.00 (1.00, 1.00)

^aweighted; ^bunadjusted; ^cnaloxone provided by a community-based organization
 Boldface indicates statistical significance (*p<0.05; **p<0.01; ***p<0.001)