

University of Kentucky

UKnowledge

---

Rural & Underserved Health Research Center  
Publications

Rural & Underserved Health Research Center

---

5-2021

## Medicare-Paid Naloxone: Trends in Non-Metropolitan and Metropolitan Areas

Chris Delcher

University of Kentucky, [chris.delcher@uky.edu](mailto:chris.delcher@uky.edu)

Yue Cheng

University of Kentucky, [ych342@uky.edu](mailto:ych342@uky.edu)

Minji Sohn

University of Kentucky, [minjisoehn@ferris.edu](mailto:minjisoehn@ferris.edu)

Jeffery C. Talbert

University of Kentucky, [jeff.talbert@uky.edu](mailto:jeff.talbert@uky.edu)

Patricia R. Freeman

University of Kentucky, [trfree1@email.uky.edu](mailto:trfree1@email.uky.edu)

Follow this and additional works at: [https://uknowledge.uky.edu/ruhrc\\_reports](https://uknowledge.uky.edu/ruhrc_reports)



Part of the [Health Services Administration Commons](#), and the [Health Services Research Commons](#)

**Right click to open a feedback form in a new tab to let us know how this document benefits you.**

---

### Repository Citation

Delcher, Chris; Cheng, Yue; Sohn, Minji; Talbert, Jeffery C.; and Freeman, Patricia R., "Medicare-Paid Naloxone: Trends in Non-Metropolitan and Metropolitan Areas" (2021). *Rural & Underserved Health Research Center Publications*. 18.

[https://uknowledge.uky.edu/ruhrc\\_reports/18](https://uknowledge.uky.edu/ruhrc_reports/18)

This Policy Brief is brought to you for free and open access by the Rural & Underserved Health Research Center at UKnowledge. It has been accepted for inclusion in Rural & Underserved Health Research Center Publications by an authorized administrator of UKnowledge. For more information, please contact [UKnowledge@lsv.uky.edu](mailto:UKnowledge@lsv.uky.edu).



## Medicare-paid Naloxone: Trends in Non-metropolitan and Metropolitan Areas

Chris Delcher, PhD; Yue Cheng, MS; Minji Sohn, PhD; Jeffery Talbert, PhD; Patricia R. Freeman, PhD

### Overview of Key Findings

- Medicare pays for the largest share (>30%) of naloxone dispensed from retail pharmacies in non-metropolitan areas.
- Medicare-paid dispensing has grown since 2013, but from 2017-2018 dispensing growth in non-metropolitan areas slowed considerably compared to metropolitan areas (42% v 121%, respectively).
- As of 2018, the rate of naloxone dispensing to Medicare enrollees in metropolitan areas was approximately double that in non-metropolitan areas (4.9 v 2.9 per 1,000 enrollees, respectively).

### Introduction

The U.S. Centers for Disease Control and Prevention (CDC), the U.S. Food and Drug Administration, and other state and federal public health agencies have made increasing access to naloxone, the life-saving opioid overdose reversal medication, a national priority.<sup>1-3</sup> For example, in April 2018, the U.S. Surgeon General specifically encouraged the use of naloxone with an emphasis on groups at higher risk for overdose such as those receiving high-dose prescription opioids.<sup>4</sup> A sizable segment of Medicare enrollees would likely benefit from access to naloxone given that approximately 28% of Medicare Part D beneficiaries with new opioid use were prescribed high doses.<sup>5</sup>

According to the U.S. Centers for Medicare & Medicaid Services (CMS), naloxone dispensing in Medicare has increased markedly in recent years. CMS reported that naloxone prescriptions in Medicare Part D increased 141% from 2016 to 2017 and 148% from 2017 to 2018.<sup>1</sup> Sohn et al. found that Medicare's share of the payer volume of naloxone had also increased from 11% to 29% from 2011 to 2017.<sup>6</sup> The most recent national data available (2018) indicate that Medicare Part D is the payer for more than one-third of all naloxone dispensed from retail pharmacies.<sup>7</sup> This is not surprising given that the prevalence of both chronic pain and high impact chronic pain is higher in persons over age 65.<sup>8</sup> Interestingly, these data also show that prevalence of chronic and high impact chronic pain increases with rurality. However, existing national and state analyses do not provide any insight into naloxone access differences by metropolitan and non-metropolitan areas. Ensuring naloxone access in non-metropolitan areas is an important goal given that these areas have rates of drug overdose deaths on par with those in metropolitan areas and opioid-related mortality grew by 721% in non-metropolitan areas from 1999-2016.<sup>9</sup> Furthermore, 72% of rural counties lack an opioid treatment program (OTP), nearly 65% and 81% of non-metropolitan counties lack a

psychiatrist or psychiatric nurse practitioner, respectively, and providers in rural areas are less likely to receive promotional material for opioid use disorder medications. In addition, a larger proportion of the rural population is 65 and older.<sup>10–14</sup> We are aware of only one study (2019) showing that non-metropolitan counties were less likely to be high-naloxone dispensing areas compared to metropolitan counties.<sup>7</sup>

Given these gaps, the purpose of this policy brief is to examine trends in Medicare-paid naloxone dispensing rates in non-metropolitan versus metropolitan areas from 2014 to 2018.

## Methods

The IQVIA National Prescription Audit (NPA) provided national estimated counts of naloxone dispensed. The NPA covers nearly 90% of all-payer, naloxone-dispensed transactions and is weighted to represent 100% of naloxone prescriptions from retail pharmacies in the U.S. The NPA provided information on product, month, payer type, state, 3-digit ZIP Code of the pharmacy, and dispensing count for all 50 states and the District of Columbia. Payer types included cash, commercial insurance, Medicare Part D, Medicaid Fee for Service (FFS), and Medicaid managed care.

The data were aggregated to the 3-digit ZIP Code (929 areas comprising approximately 42,000 5-digit ZIP Codes), a geographic unit used by data providers to avoid the risk of inadvertent statistical disclosure.<sup>15</sup> Therefore, to examine dispensing by metropolitan and non-metropolitan areas, we estimated county-level naloxone dispensing by 1) acquiring the population in ZIP Code tabulation areas (ZCTA),<sup>16</sup> which approximate 5-digit ZIP Codes located in 3-digit ZIP Codes; 2) linked ZCTAs to counties; and 3) weighted 3-digit counts based on county populations. ZCTAs and the crosswalk file are both available from the U.S. Census Bureau.<sup>17</sup> The method and analytic code was provided by Sullivan et al (2020).<sup>16</sup> Metropolitan and non-metropolitan areas were defined using the Rural-Urban Continuum Codes (2013) where county designations 1-3 were metropolitan and 4-9 were non-metropolitan.<sup>18</sup>

To calculate calendar year annual dispensing rates per Medicare enrollees in Part D prescription plans, we divided the annual count of naloxone paid for by Medicare by the annual number of enrollees in Medicare Part D stratified by metropolitan and non-metropolitan areas. Medicare enrollment data were available from 2015 to 2018.<sup>19</sup>

Because implementation of state laws mandating the co-prescribing of naloxone to persons at risk for opioid overdose can abruptly and significantly increase the rate of naloxone dispensed in states passing them,<sup>20</sup> we performed a sensitivity analysis to see if the 2018 rate difference could be attributable to the inclusion of states with mandatory versions of these laws in either 2017 (delayed effects) or 2018. These states were Arizona, Florida, New Mexico, Rhode Island, Virginia, Vermont, and Washington.<sup>21</sup>

## Findings

Nationally, naloxone prescriptions paid for by Medicare increased by 216% between 2016 and 2017 and 120% between 2017 and 2018 (Table 1). The growth rate in the most recent period (120%) was considerably higher than for the other payer types (Medicaid FFS: 54%, Medicaid MCO: 82%, Commercial: 42%). Cash payments declined by 43%.

**Table 1. Percentage change in volume of Medicare-paid naloxone prescriptions dispensed by retail pharmacy in the U.S., 2016 to 2017 and 2017 to 2018.**

<b>Medicare*</b>	216%	120%
<b>Medicaid managed care organization</b>	231%	82%
<b>Cash</b>	72%	-43%

*\*Although consistent, the percentage change in this study is different from that reported by CMS and may be due to methodological differences.*

Since 2014, Medicare-paid naloxone dispensing has been higher in non-metropolitan areas (~19% in 2014, ~38% in 2018) compared to metropolitan areas (~16% in 2014, ~36% in 2018). As of 2018, Medicare surpassed commercial payers as the largest payer of naloxone in both non-metropolitan and metropolitan areas of the United States (see Table 2).

**Table 2. The percentages of naloxone prescriptions dispensed from retail pharmacies by payer types in metropolitan and non-metropolitan areas by year.**

	2013		2014		2015		2016		2017		2018	
Payer type	Non-Metro	Metro	Non-Metro	Metro	Non-Metro	Metro	Non-Metro	Metro	Non-Metro	Metro	Non-Metro	Metro
<b>Cash</b>	73.6%	51.4%	43.8%	31.5%	24.4%	19.8%	12.6%	9.4%	6.5%	6.7%	3.4%	2.2%
<b>Commercial Insurance</b>	17.7%	23.8%	27.6%	33.6%	30.2%	36.6%	34.4%	44.9%	34.0%	39.2%	30.2%	33.2%
<b>Fee-for-service Medicaid</b>	2.8%	8.3%	7.8%	12.0%	15.5%	14.6%	13.2%	13.1%	12.7%	11.7%	12.9%	10.8%
<b>Managed Care Medicaid</b>	0.2%	4.8%	2.2%	7.4%	7.8%	11.6%	10.5%	11.9%	14.2%	15.9%	15.2%	17.9%
<b>Medicare Part D</b>	5.7%	11.8%	18.6%	15.6%	22.2%	17.5 %	29.3%	20.6%	32.6%	26.4%	38.3%	36.0%

Also, since 2013, Medicare-paid naloxone dispensing has essentially increased by triple-digit percentages in both metropolitan and non-metropolitan areas (Table 3). In 2018, Medicare-paid naloxone dispensing showed positive growth rates of 42% and 137% in non-metropolitan and metropolitan areas, respectively, but this was substantially slower growth than in all prior years. Examining these rates as year-over-year ratios in metropolitan/non-metropolitan areas, ratios remained consistently on par from 2014 to 2017 (i.e., close to 1.0). However, in 2018, Medicare-paid naloxone dispensing growth in metropolitan areas outpaced that in non-metropolitan areas by more than 3 times (3.26).

**Table 3. Number of Medicare-paid naloxone prescriptions from retail pharmacies, percentage change and change ratio in non-metropolitan and metropolitan areas in the U.S., 2013 to 2018.**

<b>2014</b>	119	573%	911	519%	1031	525%	0.91
<b>2016</b>	4,558	578%	23,976	502%	28,534	513%	0.87
<b>2018</b>	21,793	42%	176,989	137%	198,783	121%	3.26

The Medicare-paid naloxone dispensing rate (Table 4) increased nationally from 0.12 per 1,000 beneficiaries in 2015 to 4.56 per 1,000 in 2018. Dispensing rates in metropolitan and non-metropolitan areas (Figure 1, Table 5) were largely on par until 2018 when rates in metropolitan areas approximately doubled (1.72) those in non-metropolitan areas (4.92 compared to 2.85 per 1,000 Medicare enrollees, respectively). This result is consistent when examining the rate per 1,000 using the number of county residents older than 65 as the denominator.

**Table 4. Naloxone dispensing from retail pharmacies to Medicare Part D enrollees in the U.S., 2015 to 2018.**

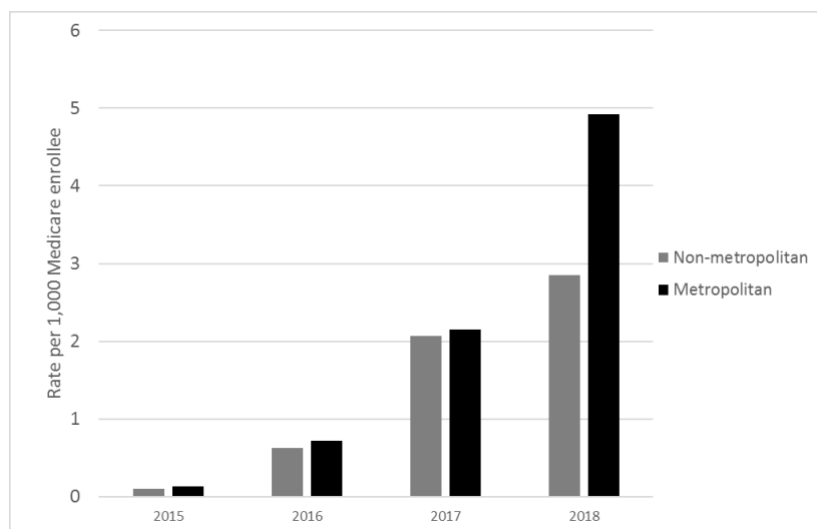
Year	Naloxone dispensed (No.)	Medicare enrollees (No.)	Rate (per 1000)
<b>2015</b>	4,654	38,019,814	0.12
<b>2016</b>	28,534	40,597,528	0.70
<b>2017</b>	89,981	42,125,229	2.14
<b>2018</b>	198,783	43,634,677	4.56

**Table 5. Naloxone dispensing from retail pharmacies to Medicare Part D enrollees in non-metropolitan and metropolitan areas in the U.S., 2015 to 2018.**

Non-metropolitan				Metropolitan		
No.	Medicare enrollees (No.)	Rate (per 1000)	No.	Medicare enrollees (No.)	Rate ((per 1000))	
<b>2015</b>	672	6,448,389	0.10	3,982	31,571,425	0.13
<b>2016</b>	4,558	7,229,972	0.63	23,976	33,367,556	0.72
<b>2017</b>	15,337	7,431,717	2.06	74,643	34,693,512	2.15
<b>2018</b>	21,793	7,645,066	2.85	176,989	35,989,611	4.92

*Note: The rate per 1,000 using number of residents > 65 years old in non-metropolitan areas was 0.12, 0.55, 1.86, and 2.48; for metropolitan areas it was 0.12, 0.64, 2.02, and 4.22 from 2015 to 2018, respectively.*

**Figure 1. Medicare-paid naloxone dispensing rate per 1,000 enrollees in Medicare Part D in non-metropolitan and metropolitan areas in the U.S., 2015 to 2018.**



In the sensitivity analysis, after excluding states with co-prescribing laws, the rate ratio was somewhat attenuated (1.63) but could not completely account for the difference between non-metropolitan and metropolitan areas.

## Discussion

As of 2018, Medicare Part D was the largest single payer (by volume percentage) of naloxone prescriptions in both non-metropolitan and metropolitan areas of the United States. Our findings suggest that Medicare-paid dispensing rates in metropolitan areas have begun to outpace those in non-metropolitan areas. To a certain degree, this trend may appropriately reflect the recognition that urban areas of the United States have experienced higher overdose death rates involving synthetic opioids other than methadone compared to rural areas since 2015.<sup>22</sup> Even so, as naloxone prescriptions are dispensed to patients from community pharmacies, changes in the number of pharmacies in non-metropolitan areas could lead to disparities in dispensing. Previous research has shown that the number of independently owned rural pharmacies declined by 16.1% from 2003-2018, raising concerns that areas dependent on a sole pharmacy are at risk of losing access to many essential clinical services should that pharmacy close.<sup>23</sup> Further research is needed to understand the relationship between dispensing disparities and pharmacy closures.

Our findings are largely consistent with the CDC's analysis of all-payer naloxone, but their analysis suggests that the disparity is driven by increasing rates in micropolitan areas versus rural areas (1.4 times higher) in 2018.<sup>7</sup> Ongoing efforts are needed to monitor these dispensing trends with improved urban/rural specification to avoid preventable health care access barriers.

CMS initiatives implemented during and after our study period will warrant future examination. Three policy changes may provide insight for future research. First, more recent data may allow us to examine whether the U.S. Surgeon General's effort to increase naloxone use in 2018 may have contributed to uptake differences in metropolitan versus non-metropolitan areas.<sup>24</sup> Second, in 2019, CMS launched a series of initiatives to address opioid misuse, including encouraging Medicare Part D plan sponsors to lower cost-sharing for naloxone as out-of-pocket costs for naloxone were still relatively high for this period.<sup>25,26</sup> Third,

research is needed into whether the dispensing disparities that we found are driven by differences in the risk profile of Medicare populations living in these areas. The CDC found that naloxone prescriptions among Medicare Part D patients had increased for some high-risk enrollees as recommended. However, only a small proportion of Medicare enrollees at the highest risk of overdose were being co-prescribed naloxone.<sup>7,27</sup> Further, the CDC found that as the percentage of the population with Medicare increased, so too did the likelihood of a county being a low naloxone dispensing area after controlling for rural status.<sup>7</sup> Focusing on Medicare-paid naloxone is important partly because a recent report indicated that opioid prescriptions in Medicare increased by 2% from 2011 to 2019, whereas other payers saw double-digit decreases.<sup>28</sup>

**Limitations.** Medicare Part D is only a subset of Medicare patients and does not include all patients in fee-for-service or Medicare Advantage plans. Naloxone prescription counts in metropolitan and non-metropolitan areas are based on estimates derived from statistical methods that extrapolate the volume of naloxone dispensed in pharmacies to the county level. Although patients are expected to live relatively close to their pharmacy, pharmacy availability in non-metropolitan areas is dynamic and our findings may not reflect residential context.<sup>29</sup> Furthermore, the county population data available cover only 2010, and metropolitan/non-metropolitan designations are from 2013. More research is planned to understand the variability in naloxone dispensing introduced by this method. Even so, metropolitan and non-metropolitan areas are still relatively large aggregations of counties that may mitigate some of this error, and our results are comparable to the CDC's in 2018 which had access to county-level data. Race/ethnicity data are not available for our naloxone dispensing data. Our data may not be comparable to more recent analyses due to a methodology change from IQVIA.<sup>30</sup>

## Conclusion

We expect Medicare to remain a critical payer for naloxone in the United States. Medicare beneficiaries visit retail pharmacies more frequently than their primary care physicians,<sup>31</sup> especially in non-metropolitan areas. Continued emphasis on retail pharmacy distribution of naloxone in these areas is warranted, especially as opioid prescriptions continue to increase for the Medicare population in parallel to concerning increases in opioid use disorder prevalence in this population.<sup>32</sup>

## References

1. HHS OIG Data Brief. *Opioid Use Decreased in Medicare Part D, While Medication-Assisted Treatment Increased*. U.S. Department of Health and Human Services, Office of Inspector General; 2019. Accessed September 14, 2020. <https://oig.hhs.gov/oei/reports/OEI-02-19-00390.pdf>
2. Center for Drug Evaluation and Research. New Recommendations for Naloxone. *US Food Drug Adm*. Published online August 12, 2020. Accessed January 5, 2021. <https://www.fda.gov/drugs/drug-safety-and-availability/new-recommendations-naloxone>
3. CDC. Naloxone saves lives. Centers for Disease Control and Prevention. Published August 6, 2019. Accessed January 30, 2021. <https://www.cdc.gov/vitalsigns/naloxone/index.html>
4. Office of the Surgeon General. U.S. Surgeon General's Advisory on Naloxone and Opioid Overdose. HHS.gov. Published April 3, 2018. Accessed October 24, 2020. <https://www.hhs.gov/surgeongeneral/priorities/opioids-and-addiction/naloxone-advisory/index.html>



5. Raman SR, Bush C, Karmali RN, Greenblatt LH, Roberts AW, Skinner AC. Characteristics of New Opioid Use Among Medicare Beneficiaries: Identifying High-Risk Patterns. *J Manag CARE Spec Pharm*. 2019;25(9):966-972. doi:10.18553/jmcp.2019.25.9.966
6. Sohn M, Talbert JC, Delcher C, Hankosky ER, Lofwall MR, Freeman PR. Association between state Medicaid expansion status and naloxone prescription dispensing. *Health Serv Res*. Published online February 7, 2020:1475-6773.13266. doi:10.1111/1475-6773.13266
7. Guy GP, Haegerich TM, Evans ME, Losby JL, Young R, Jones CM. Vital Signs: Pharmacy-Based Naloxone Dispensing — United States, 2012–2018. *MMWR Morb Mortal Wkly Rep*. 2019;68(31):679-686. doi:10.15585/mmwr.mm6831e1
8. Zelaya CE, Dahlhamer JM, Lucas JW, Connor EM. Chronic Pain and High-impact Chronic Pain Among U.S. Adults, 2019. *NCHS Data Brief*. 2020;(390):1-8.
9. Hedegaard H, Miniño AM, Warner M. Urban-rural Differences in Drug Overdose Death Rates, by Sex, Age, and Type of Drugs Involved, 2017. *NCHS Data Brief*. 2019;(345):1-8.
10. Haffajee RL, Lin LA, Bohnert ASB, Goldstick JE. Characteristics of US Counties With High Opioid Overdose Mortality and Low Capacity to Deliver Medications for Opioid Use Disorder. *JAMA Netw OPEN*. 2019;2(6). doi:10.1001/jamanetworkopen.2019.6373
11. Rigg KK, Monnat SM, Chavez MN. Opioid-related mortality in rural America: Geographic heterogeneity and intervention strategies. *Int J Drug Policy*. 2018;57:119-129. doi:10.1016/j.drugpo.2018.04.011
12. Nguyen T, Andraka-Christou B, Simon K, Bradford WD. Comparison of Rural vs Urban Direct-to-Physician Commercial Promotion of Medications for Treating Opioid Use Disorder. *JAMA Netw Open*. 2019;2(12):e1916520. doi:10.1001/jamanetworkopen.2019.16520
13. US Census Bureau. The Older Population in Rural America: 2012-2016. The United States Census Bureau. Accessed January 28, 2021. <https://www.census.gov/library/publications/2019/acs/acs-41.html>
14. Andrilla CHA, Patterson DG, Garberson LA, Coulthard C, Larson EH. Geographic Variation in the Supply of Selected Behavioral Health Providers. *Am J Prev Med*. 2018;54(6):S199-S207. doi:10.1016/j.amepre.2018.01.004
15. Office for Civil Rights (OCR). Methods for De-identification of PHI. HHS.gov. Published September 7, 2012. Accessed January 28, 2021. <https://www.hhs.gov/hipaa/for-professionals/privacy/special-topics/de-identification/index.html>
16. Sullivan PS, Mouhanna F, Mera R, et al. Methods for county-level estimation of pre-exposure prophylaxis coverage and application to the U.S. Ending the HIV Epidemic jurisdictions. *Ann Epidemiol*. 2020;44:16-30. doi:10.1016/j.annepidem.2020.01.004
17. US Census Bureau. ZIP Code Tabulation Areas (ZCTAs). The United States Census Bureau. Accessed January 28, 2021. <https://www.census.gov/programs-surveys/geography/guidance/geo-areas/zctas.html>
18. United States Department of Agriculture Economic Research Service. 2013 Rural-Urban Continuum Codes. Published October 25, 2019. Accessed September 1, 2020. <https://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx>
19. Medicare Enrollment Dashboard | CMS. Accessed January 7, 2021. <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/CMSProgramStatistics/Dashboard>
20. Sohn M, Talbert JC, Huang Z, Lofwall MR, Freeman PR. Association of Naloxone Coprescription Laws With Naloxone Prescription Dispensing in the United States. *JAMA Netw Open*. 2019;2(6):e196215. doi:10.1001/jamanetworkopen.2019.6215
21. Haffajee RL, Cherney S, Smart R. Legal requirements and recommendations to prescribe naloxone. *Drug Alcohol Depend*. 2020;209:107896. doi:10.1016/j.drugalcdep.2020.107896



22. Hedegaard H, Spencer MR. Urban-Rural Differences in Drug Overdose Death Rates, 1999-2019. *NCHS Data Brief*. 2021;(403):1-8.
23. Salako A, Ullrich F, Mueller KJ. *Update: Independently Owned Pharmacy Closures in Rural America, 2003-2018. Brief No. 2018-2*. Iowa City, IA: RUPRI Center for Rural Health Policy Analysis, University of Iowa College of Public Health; July 2018. <https://rupri.public-health.uiowa.edu/publications/policybriefs/2018/2018%20Pharmacy%20Closures.pdf>
24. Adams JM. Increasing Naloxone Awareness and Use: The Role of Health Care Practitioners. *JAMA*. 2018;319(20):2073-2074. doi:10.1001/jama.2018.4867
25. US Centers for Disease Control and Prevention. Life-Saving Naloxone from Pharmacies: More dispensing needed despite progress. Published online August 2019. Accessed January 28, 2021. <https://www.cdc.gov/vitalsigns/naloxone/pdf/vs-0806-naloxone-H.pdf>
26. Centers for Medicare & Medicaid Services. Resources to reduce opioid misuse [webpage]. Accessed January 30, 2021. <https://www.cms.gov/About-CMS/Story-Page/opioid-misuse-resources>
27. Jones CM, Compton W, Vythilingam M, Giroir B. Naloxone Co-prescribing to Patients Receiving Prescription Opioids in the Medicare Part D Program, United States, 2016-2017. *JAMA*. 2019;322(5):462-464. doi:10.1001/jama.2019.7988
28. Prescription Opioid Trends in the United States. Measuring and Understanding Progress in the Opioid Crisis. Published online December 2020. Accessed January 22, 2021. <https://www.iqvia.com/insights/the-iqvia-institute/reports/prescription-opioid-trends-in-the-united-states#:~:text=In%202019%2C%20opioid%20MME%20per,the%20highest%20per%20capita%20use>.
29. Rural Health Information Hub. Rural Pharmacy and Prescription Drugs [webpage]. Accessed February 1, 2021. <https://www.ruralhealthinfo.org/topics/pharmacy-and-prescription-drugs>
30. IQVIA Institute for Human Data Science. Medicine Use and Spending in the U.S.: A Review of 2018 and Outlook to 2023. Published online May 2019. Accessed February 1, 2021. [https://www.iqvia.com/-/media/iqvia/pdfs/institute-reports/medicine-use-and-spending-in-the-us---a-review-of-2018-outlook-to-2023.pdf?\\_=1612015362752](https://www.iqvia.com/-/media/iqvia/pdfs/institute-reports/medicine-use-and-spending-in-the-us---a-review-of-2018-outlook-to-2023.pdf?_=1612015362752)
31. Berenbrok LA, Gabriel N, Coley KC, Hernandez I. Evaluation of Frequency of Encounters With Primary Care Physicians vs Visits to Community Pharmacies Among Medicare Beneficiaries. *JAMA Netw Open*. 2020;3(7):e209132. doi:10.1001/jamanetworkopen.2020.9132
32. Shoff C, Yang T-C, Shaw BA. Trends in Opioid Use Disorder Among Older Adults: Analyzing Medicare Data, 2013–2018. *Am J Prev Med*. Published online March 2021: S0749379721000921. doi:10.1016/j.amepre.2021.01.010

## Contact Information

Chris Delcher, PhD

Principal Investigator, Rural and Underserved Health Research Center

email: [chris.delcher@uky.edu](mailto:chris.delcher@uky.edu)

website: <http://ruhrc.uky.edu>

## Suggested Citation

Delcher C, Cheng Y, Sohn M, Talbert J, Freeman PR. *Medicare-paid Naloxone: Trends in Non-metropolitan and Metropolitan Areas*. Lexington, KY: Rural and Underserved Health Research Center; 2021.