

Supplementary Online Content

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eMethods

This supplementary material has been provided by the authors to give readers additional information about their work.

eMethods

Population denominators

To calculate the rate of buprenorphine initiation per 100,000 Americans, we used estimates of the size of the U.S. resident population based on the 2010 U.S. Census (for data years 2016-2019) and the 2020 U.S. Census (for data years 2020-2021). An analytic challenge is that the 2016-2019 U.S. population estimates based on the 2010 Census may have underestimated the actual population count in those years. For example, on the basis of the 2010 U.S. Census, the Census Bureau estimated that there were 329,877,505 U.S. residents in July 2020. However, on the basis of the 2020 U.S. Census, the Census Bureau estimated that there were 331,501,080 U.S. residents in July 2020, or 1.004921751 times higher compared with the estimate based on the 2010 Census. To account for this discrepancy, we multiplied each of the 2016-2019 population estimates based on the 2010 U.S. Census by 1.004921751. The table below displays the annual population denominators used in analyses.

Year	Annual population denominator	Source
2016	324,530,748	2010 Census estimate (322,941,311) multiplied by 1.004921751
2017	326,585,037	2010 Census estimate (324,985,539) multiplied by 1.004921751
2018	328,295,376	2010 Census estimate (326,687,501) multiplied by 1.004921751
2019	329,855,036	2010 Census estimate (328,239,523) multiplied by 1.004921751
2020	331,501,080	2020 Census estimate
2021	331,893,745	2020 Census estimate
2022	332,838,183	2020 Census estimate

Defining treatment retention

Following a National Quality Forum-endorsed quality measure, we defined retention as the occurrence of ≥ 180 days of continuous buprenorphine treatment following the dispensing date of the initial buprenorphine prescription without any gaps of more than 7 days. To identify dates of buprenorphine treatment, we determined

the “active period” of each buprenorphine prescription dispensed during the 180-day period after the dispensing date of the initial buprenorphine prescription. If the active periods of prescriptions overlapped, we combined them into one period and added the number of days of overlap to the end. For example, if one prescription had an active period of 1/1/2016 through 1/8/2016 and another prescription had an active period of 1/8/2016 through 1/14/2016, we would consider the patient to have buprenorphine treatment from 1/1/2016 through 1/15/2016. Finally, we calculated the length of any gaps between periods of buprenorphine treatment. In the above hypothetical example, if the patient had another dispensed buprenorphine prescription with an active period from 1/18/2016 through 1/25/2016, we would consider the patient to have a 2-day gap, as there was no buprenorphine treatment on either 1/16/2016 or 1/17/2016.

For the small number of dispensed prescriptions for extended-release buprenorphine products, such as Sublocade, we used the value of days supplied directly reported on the pharmacy claim. Overall, 99% of these values were either 28 or 30 days. Setting all values of days supplied to 28 days for extended-release buprenorphine products made almost no difference in estimates of retention rates.

Statistical analysis

We used joinpoint regression to assess for slope changes in the monthly rate of buprenorphine initiation and retention. We fitted models with 1, 2, and 3 joinpoints and used permutation tests to select the model with the best fit.