

# Examining the Impact of Opioid Monotherapy vs. Opioid-Antidepressant Combination on Self-Reported Health Outcomes in Black Adults (45-64) with Low Back Pain and Depression: A Secondary Analysis of the *All of Us* Database

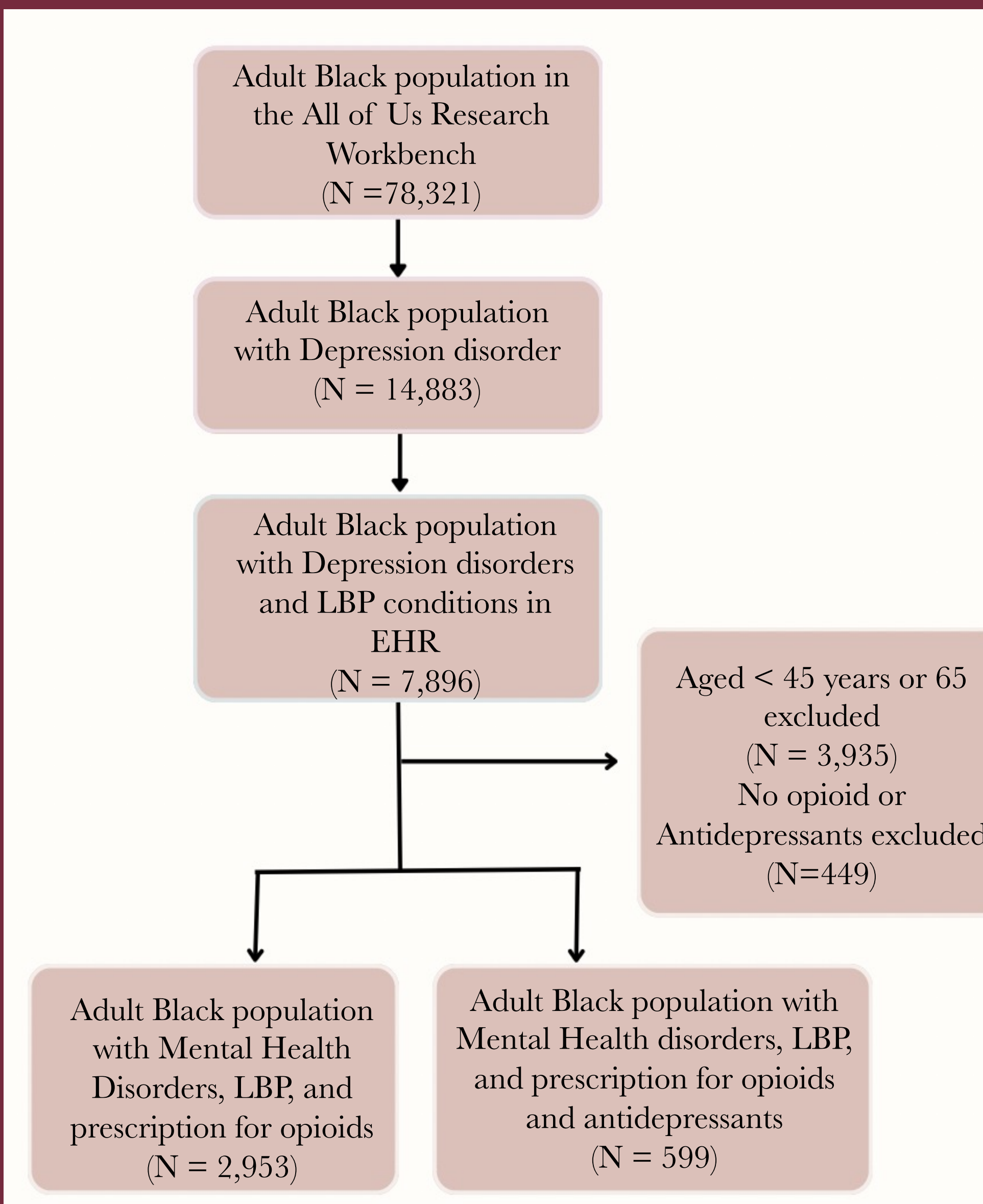
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## Introduction

- Chronic low back pain (CLBP) is a growing health concern among Black adults aged 45–65, significantly affecting daily function and quality of life.
- Managing CLBP is complex, as physical, social, and psychological factors—especially comorbid depression—can worsen symptoms and complicate treatment.
- Clinical guidelines recommend holistic, patient-centered care (e.g., physical therapy, exercise, psychological support) and strongly discourage opioid use.<sup>1</sup> However, opioid prescriptions remain high in this population.
- Among Black adults with CLBP and depression, opioids are often co-prescribed with antidepressants, yet little is known about how this combination affects self-reported health outcomes.
- Black adults are underrepresented in research, often due to historical exclusion, systemic barriers, and limited study recruitment efforts.<sup>2</sup> As a result, there is a critical need for diverse, representative health data.
- The *All of Us* database provides a unique opportunity to study this population by addressing these gaps in research.<sup>3</sup>
- This study investigates whether opioid monotherapy or opioid-antidepressant combination therapy leads to better self-reported health outcomes in Black adults aged 45–65 using data from the *All of Us* database.

## Methods

- Study Design:** A retrospective cohort study using data from 3,512 Black adults aged 45–64 diagnosed with CLBP and depression in the All of Us Research Program (as of January 2025).
- Diagnosis Confirmation:** CLBP and depression were identified using ICD-9/10 codes.
- Study Groups:** Participants were categorized into two groups of Opioid-only group (n=2,953) and Opioid-Antidepressant therapy group (n=559)
- Outcome Measures:** Self-reported general health, mental health, physical health, quality of life, and social well-being were analyzed. demographic factors and social determinants of health (education, employment, income) were also considered.
- Statistical Analysis:** Descriptive statistics and Chi-squared tests were conducted using Python-based Jupyter Notebook with a significant level set at 0.05



## Demographics

	Opioid Cohort	Opioid+Antidepressants Cohort
<b>Ages 45-64</b>	2953: 84.08%	559: 15.92%
<b>Female</b>	2088: 70.71%	379: 67.8%
<b>Male</b>	827: 28.01%	167: 29.87%
<b>Transgender/ Prefer not to answer</b>	38: 1.29%	13: 2.33%

## Results

- General Health:** The opioid-only group reported good/very good/excellent health (48.49%) compared to 40.25% in the combination therapy group ( $\chi^2 = 12.81$ ,  $p = 0.0003$ ).
- Mental Health:** The opioid-only group reported good/very good/excellent mental health (57.87%) compared to 51.88% in the combination therapy group ( $\chi^2 = 6.889$ ,  $p = 0.0087$ ).
- Physical Health:** The opioid-only group reported good/very good/excellent physical health (44.56%) compared to 39.53% in the combination therapy group ( $\chi^2 = 4.83$ ,  $p = 0.027$ ).
- Quality of Life & Social Well-Being:** The opioid-only group reported good/very good/excellent quality of life (61.19%) compared to 59.93% in the combination therapy group, and social well-being (63.05% vs. 61.72%) ( $\chi^2 = 0.360$ ,  $p = 0.5486$ ).
- Social Determinants of Health:** Education, employment, and income influenced self-reported health perceptions in both groups.

## Discussion

- Key Findings:** Black adults (45–64) with CLBP and depression who received opioid-antidepressant combination therapy reported poorer general, mental, and physical health compared to those on opioid monotherapy.
- Potential Explanations:**
  - Opioid use may reduce antidepressant effectiveness, potentially leading to worse pain and depression outcomes, which could explain the lower health ratings in the combination therapy group.<sup>4</sup>
  - Depressive symptoms are linked to worse CLBP outcomes, as depression can exacerbate pain perception and interfere with treatment response, contributing to poorer health ratings.<sup>5</sup>
  - Differences in social determinants of health (education, employment, income) may also play a role in self-reported health perceptions between the two groups.
- Clinical Implications:** Findings highlight the need for careful medication management in this population, as polypharmacy may not always lead to better outcomes.
- Future Directions:** Further research should explore the mechanisms behind these interactions to guide more effective treatment strategies. These results reinforce guideline-based caution when considering opioid-antidepressant co-prescription.

## References

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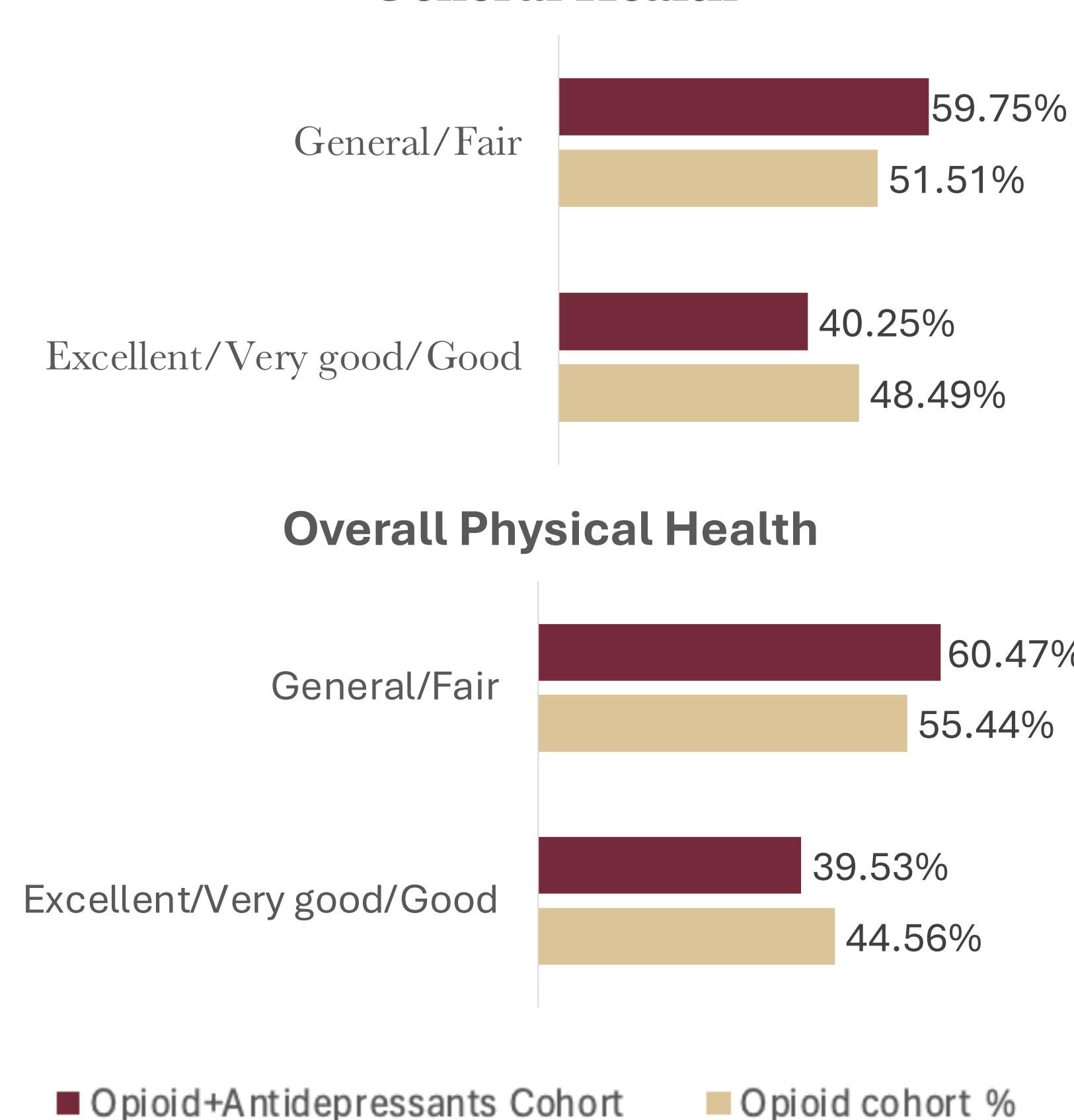
## Results

General Health Status	Opioid cohort : %	Opioid+Antidepressants Cohort : %
Excellent/Very good/Good	1432 (48.49%)	225 (40.25%)
General/Fair	1521 (51.51%)	334 (59.75%)
General Mental Health	Opioid cohort : %	Opioid+Antidepressants Cohort : %
Excellent/Very good/Good	1709 (57.87%)	290 (51.88%)
General/Fair/Poor	1244 (42.13%)	269 (48.12%)
Overall Physical Health	Opioid cohort : %	Opioid+Antidepressants Cohort : %
Excellent/Very good/Good	1316 (44.56%)	221 (39.53%)
General/Fair/Poor	1637 (55.44%)	338 (60.47%)
Overall Health: General Quality	Opioid cohort : %	Opioid+Antidepressants Cohort : %
Excellent/Very good/Good	1807 (61.19%)	335 (59.93%)
General/Fair/Poor	1146 (38.81%)	224 (40.07%)
Overall Health: General Social	Opioid cohort : %	Opioid+Antidepressants Cohort : %
Excellent/Very good/Good	1862 (63.05%)	345 (61.72%)
General/Fair/Poor	1091 (36.95%)	214 (38.28%)

## Social Determinants of Health

Variables	Opioid cohort: %	Opioid+Antidepressants Cohort: %
<b>Less than high school</b>	473: 16.02%	84: 15.03%
<b>Twelve or GED</b>	980:33.19%	221: 39.53%
<b>College Degree or higher</b>	1358: 45.99%	218: 39%
<b>Employed/Self-employed</b>	825: 27.94%	99: 17.71%
<b>Not currently employed</b>	1990: 67.39%	440: 78.71%
<b>Annual Income 1-50,000</b>	2022: 68.47%	416: 74.42%
<b>Annual Income 50,001-100,000</b>	221: 7.48%	20: 3.58%
<b>Annual Income &gt; 100,000</b>	70: 2.37%	6: 1.07%
<b>Never Married</b>	1196: 40.5%	228: 40.79%
<b>Married/Living with Partner</b>	692: 23.43%	128: 22.9%
<b>Divorced/Widowed/Separated</b>	918: 31.09%	180: 32.2%

## General Health



## Overall Physical Health

