Exploring Potential Benefits of Enumerating All Prescribed Medicines as a Tool for Estimating Opioid Use in the Medicare Current Beneficiary Survey (MCBS)

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Opioid use and misuse is a substantial problem among Medicare beneficiaries in the United States.

- Medicare beneficiaries face unique health challenges making them potentially more susceptible to opioid use and misuse, including multiple comorbidities, chronic-pain associated conditions, and mental and behavioral health issues (Niles, et al., 2020; Dean, 2017, Wright, et al., 2014).
- Many of these conditions require complex drug therapy involving multiple prescriptions for long periods of time, which can increase the risk for opioid harm (Dean, 2017; Ramachandran, et al., 2021; Raman, et al., 2019).

Different methodologies yield inconsistent estimates and measurement gaps for segments of the Medicare population.

Administrative Data Sources

Provider sources
Pharmacy data

Claims
Medicare Part D Prescription Drug Claims

Survey-Reported Sources

Direct collection of opioid use and misuse
Items ask respondents about opioid use or misuse, using drug names and/or pictures to spur recall

Enumeration method
Enumeration of all prescription drugs; can be enhanced during data processing by matching to claims data and/or linking to an administrative list of opioids to identify opioid use

Administrative Data Sources	Strengths	Limitations
• IQVIA Total Patient Tracker • Medicare Part D Claims Data	• Important to assessing opioid prescribing practices	• Do not provide data on medication adherence • Do not provide contextual health information, such as health status • Potential for coverage bias since ~30% of beneficiaries are not covered by Medicare Part D
Survey-Reported Data	**Strengths**	**Limitations**
Direct collection of opioid use or misuse: ○ National Health Interview Survey (NHIS) ○ National Survey of Drug Use and Health (NSDUH)	• Provides valuable data on opioid use disorder • Allows for collection of contextual health information	• Recall bias due to self-report and social desirability bias • Do not provide data representative of the Medicare population
Enumeration-based approaches: ○ Medicare Current Beneficiary Survey (MCBS) ○ Medical Expenditure Panel Survey (MEPS)	• Recall bias can be mitigated in data collection and processing • MCBS provides representative data for Medicare population	• Recall bias due to self-report

The Medicare Current Beneficiary Survey (MCBS) is a continuous, multi-purpose longitudinal survey.

- The MCBS represents the population of Medicare beneficiaries aged 65 and over and beneficiaries aged 64 and under with certain disabling conditions living in the United States.
- The MCBS is sponsored by the Office of Enterprise Data and Analytics (OEDA) of the Centers for Medicare & Medicaid Services (CMS) and is conducted through a contract with NORC at the University of Chicago (NORC).
- The MCBS serves as the leading source of information on the Medicare program and its impact on beneficiaries, including health care utilization and costs.

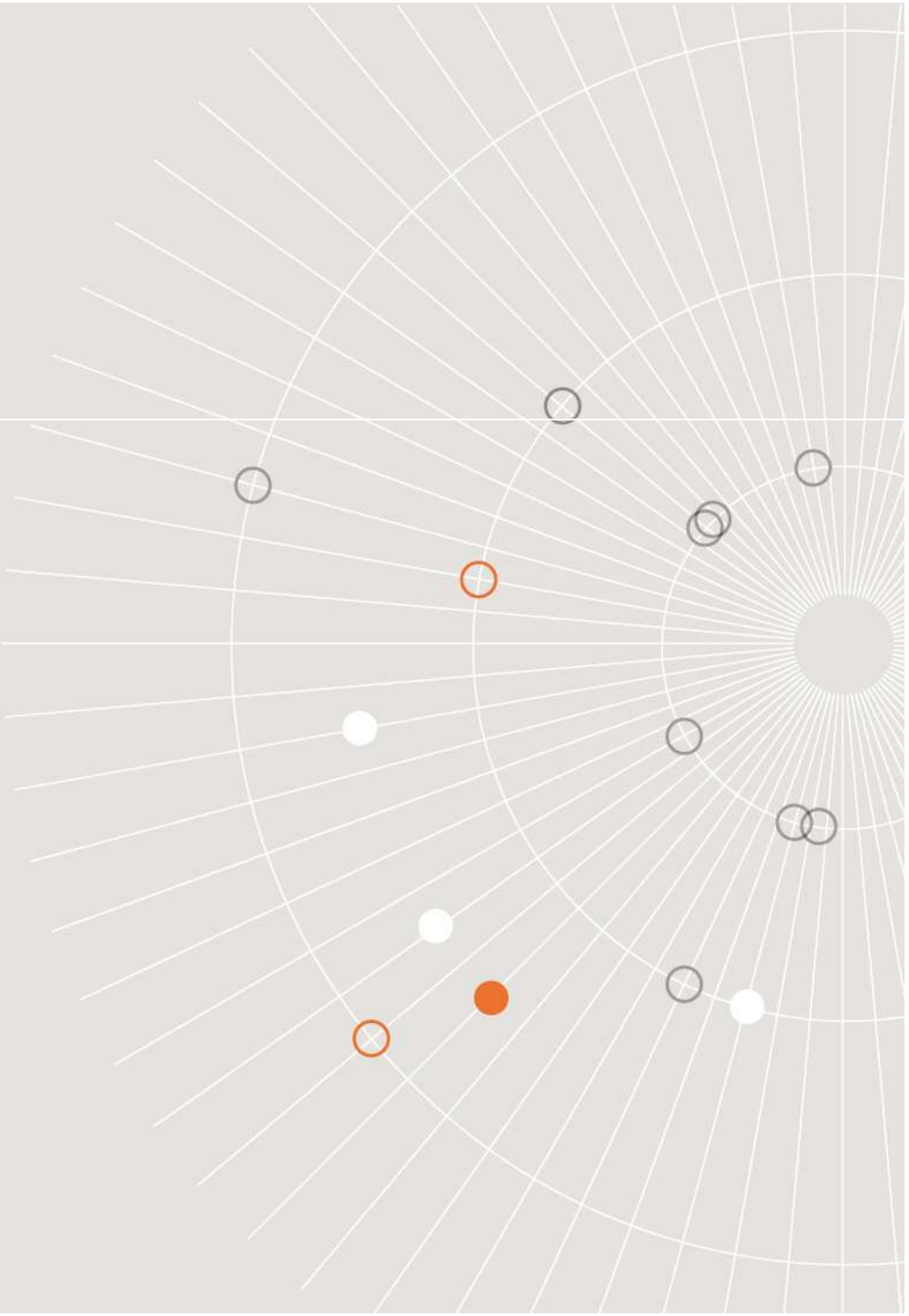
The MCBS employs an enumeration-based approach to collect prescription medication utilization.

- Respondents are asked to report any medications filled in the reference period with the aid of available documentation, such as prescription drug labels.
  - Data entry into the instrument is facilitated by a Prescription Medicine Lookup (PMLU) tool, which is powered by the First Databank (FDB) MedKnowledge™ database of all available prescribed medicines.

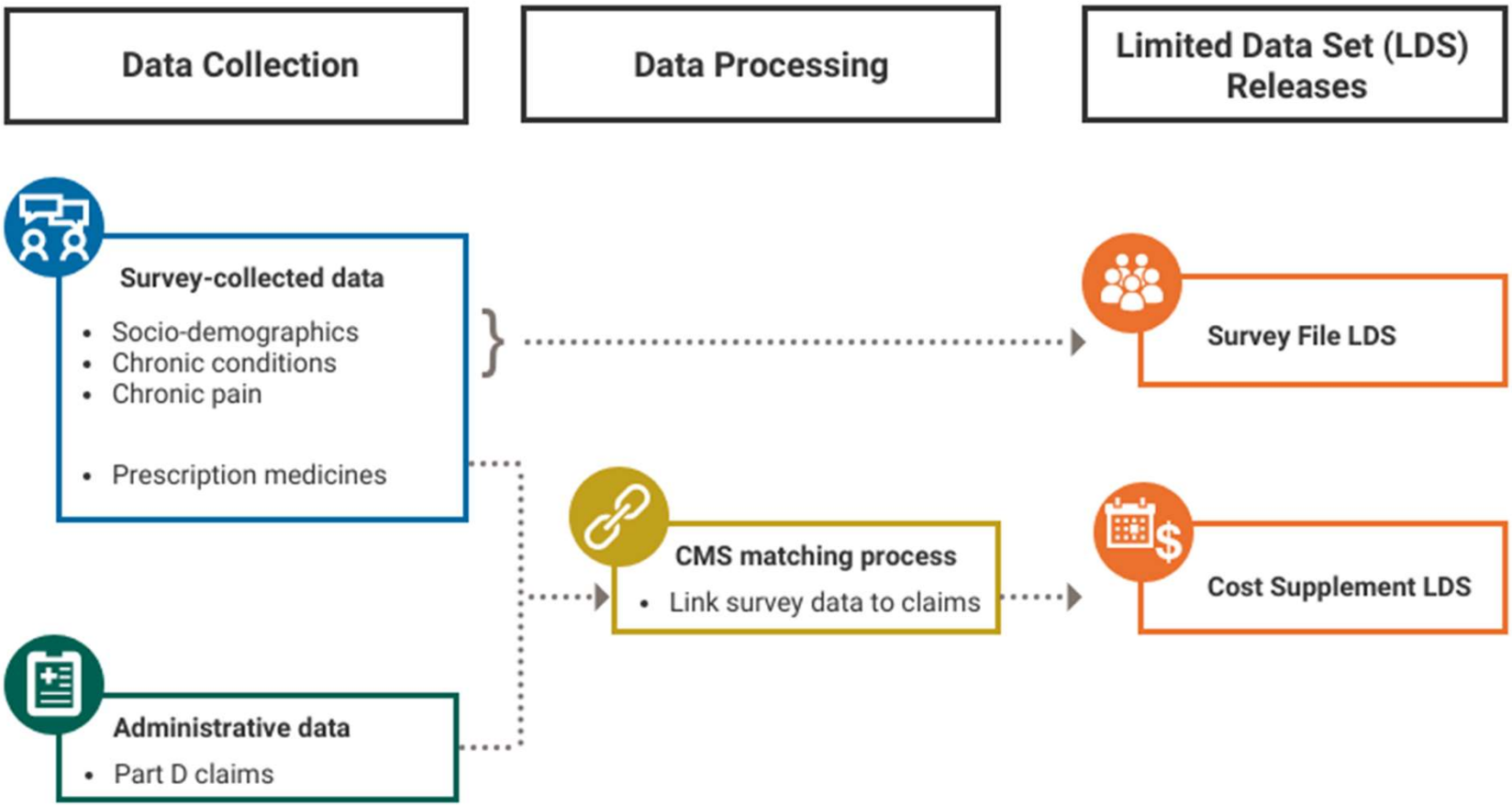
- Medicare Part D claims data are used to enhance self-reported data during data processing.

1. Is it feasible to estimate opioid usage by enumerating all prescribed medicines during data collection and determining which, if any, are opioids in data processing?
2. What proportion of Medicare beneficiaries are estimated to have obtained at least one prescription opioid during a given year using this approach?
3. How do estimates based on this approach compare to those from external benchmarks?
4. How much does this estimate change once survey data are matched to Part D claims data (adding new medicines that were not reported in the survey, but that are present in claims)?
5. How do opioid use estimates vary based on beneficiary characteristics, including demographics and health factors?

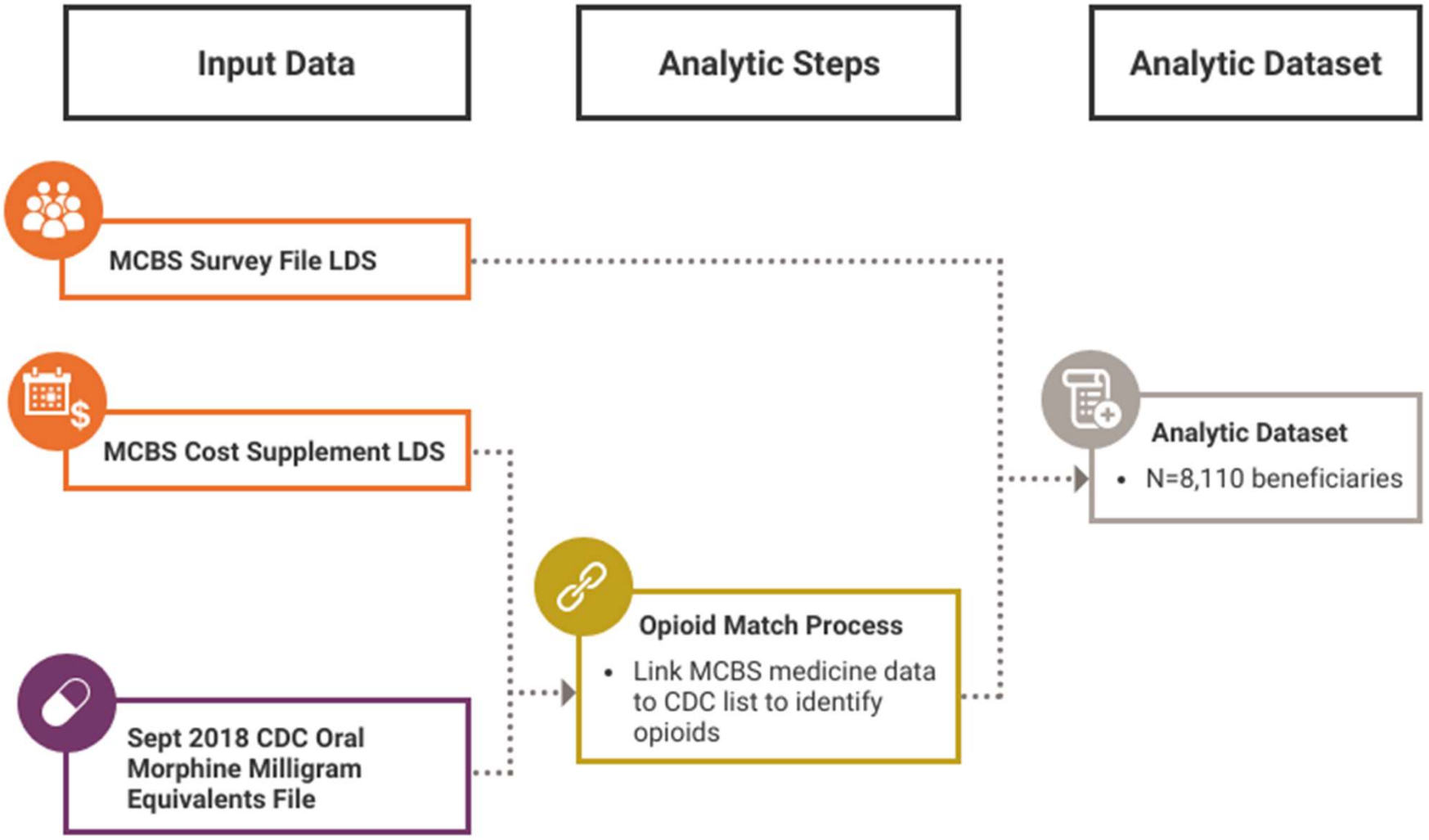
Methods



MCBS Prescription Medicine Data Life Cycle



Building an Analytic Dataset



Metrics:

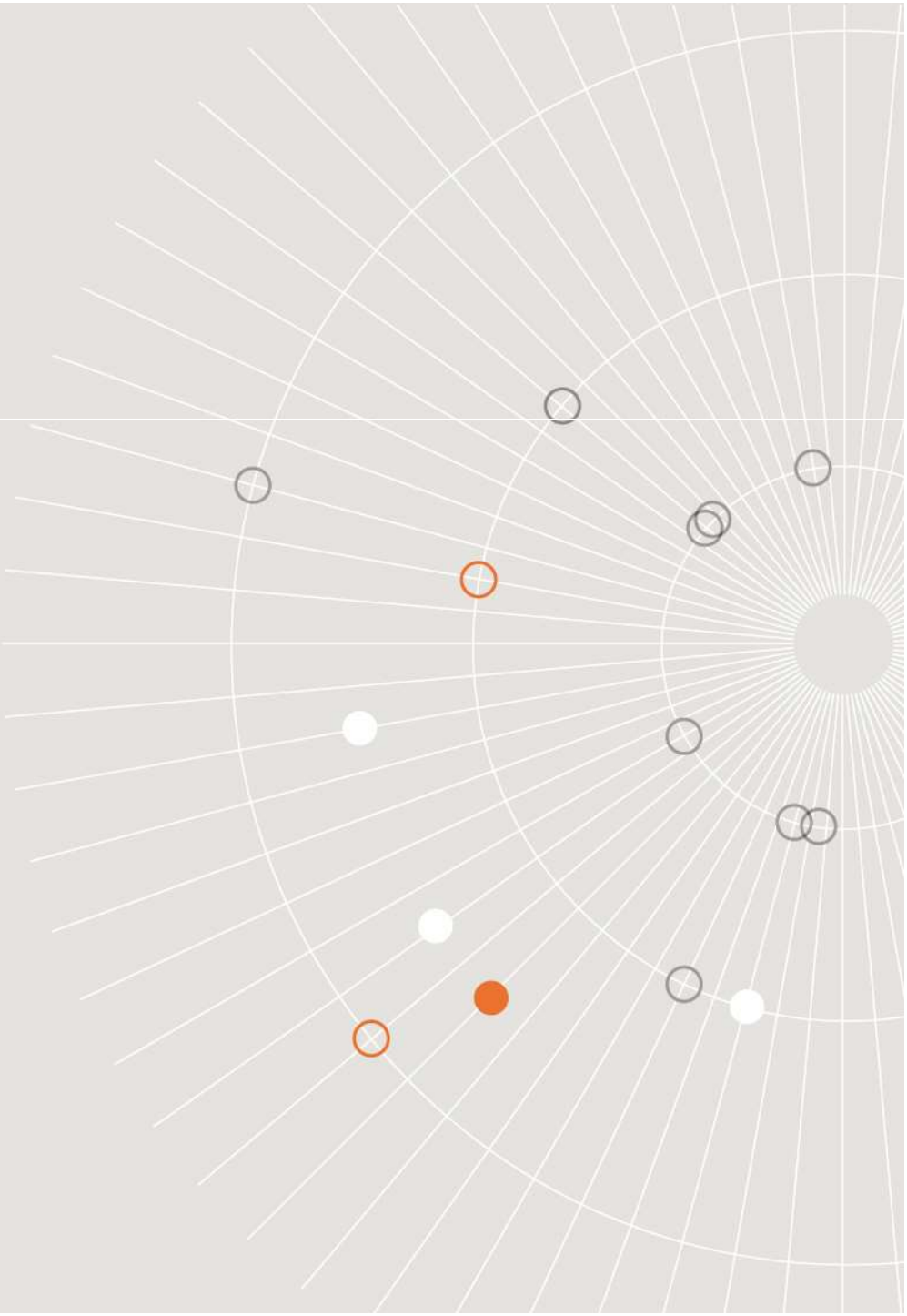
- Beneficiary level:
  - "Any opioid use": at least one opioid reported in 2018
  - "Consistent opioid use": at least one opioid reported in each 2018 interview

- Total opioid counts:
  - Survey-reported opioid count
  - Survey-reported and claims-only opioid count

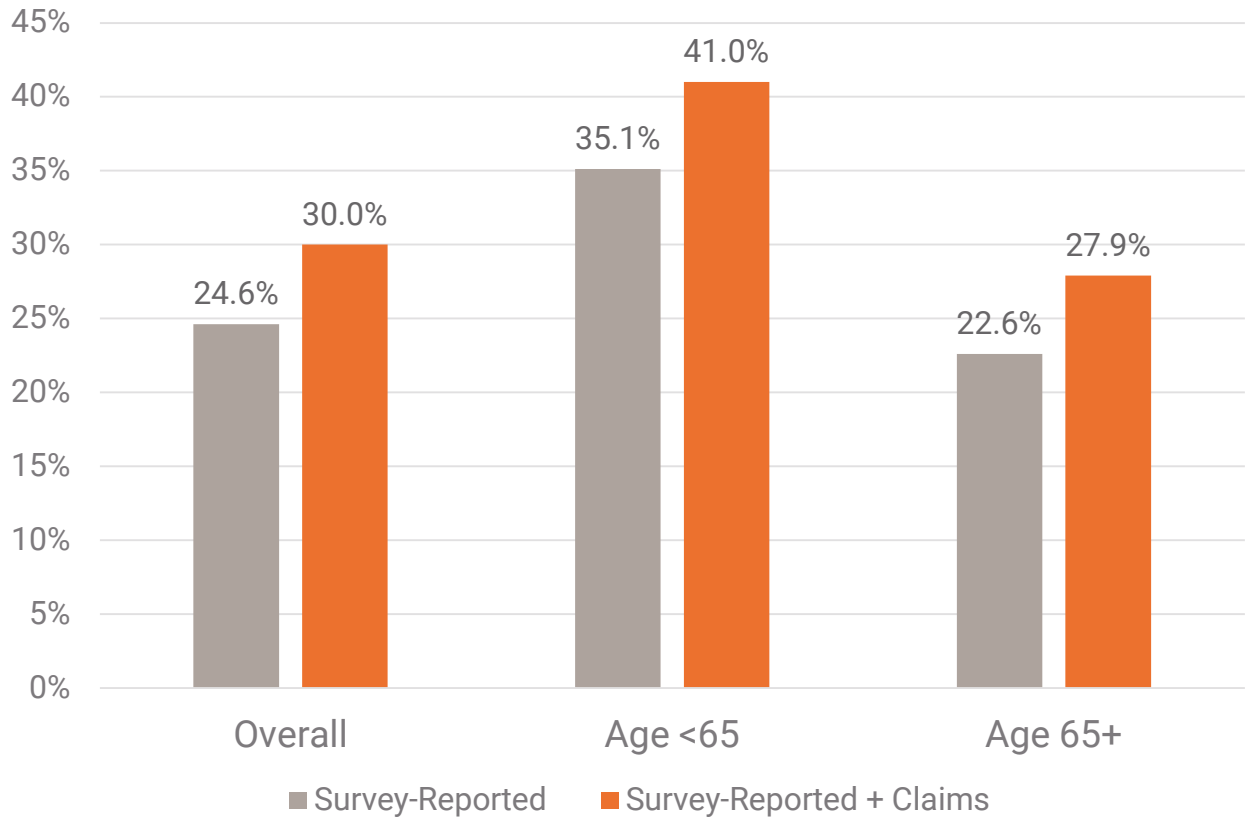
All analyses are unweighted, because:

- This is a methodological investigation.
- The MCBS does not create weights for the specific subset of beneficiaries included in this analysis (age 65+, completing >= 2 interviews in 2018).

Results



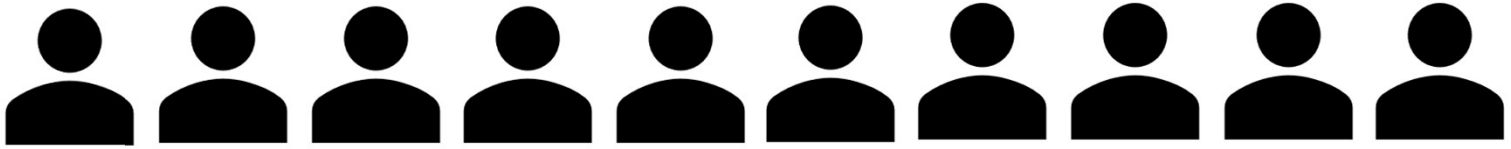
Estimates of Any Opioid Use Based on Beneficiary Age



SOURCE: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey 2018

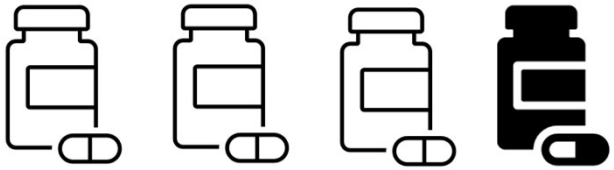
Overall Opioid Counts

- For every 10 Medicare beneficiaries in this analysis:



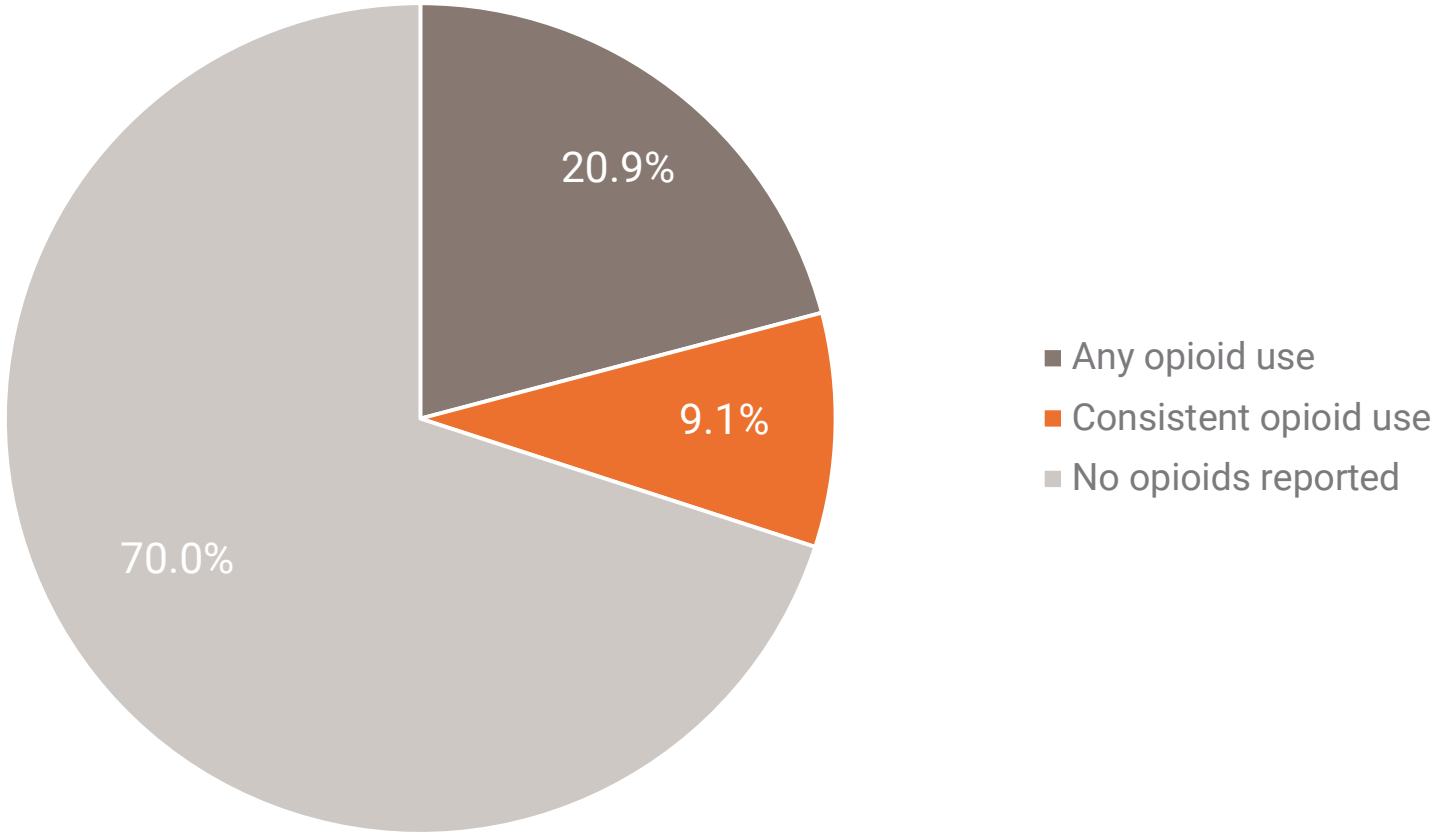
- Three opioid medicines were reported in the survey:

- …and a fourth opioid was identified in claims matching:



SOURCE: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey 2018

Proportion of Beneficiaries with Any Opioid Use and Consistent Opioid Use



SOURCE: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey 2018

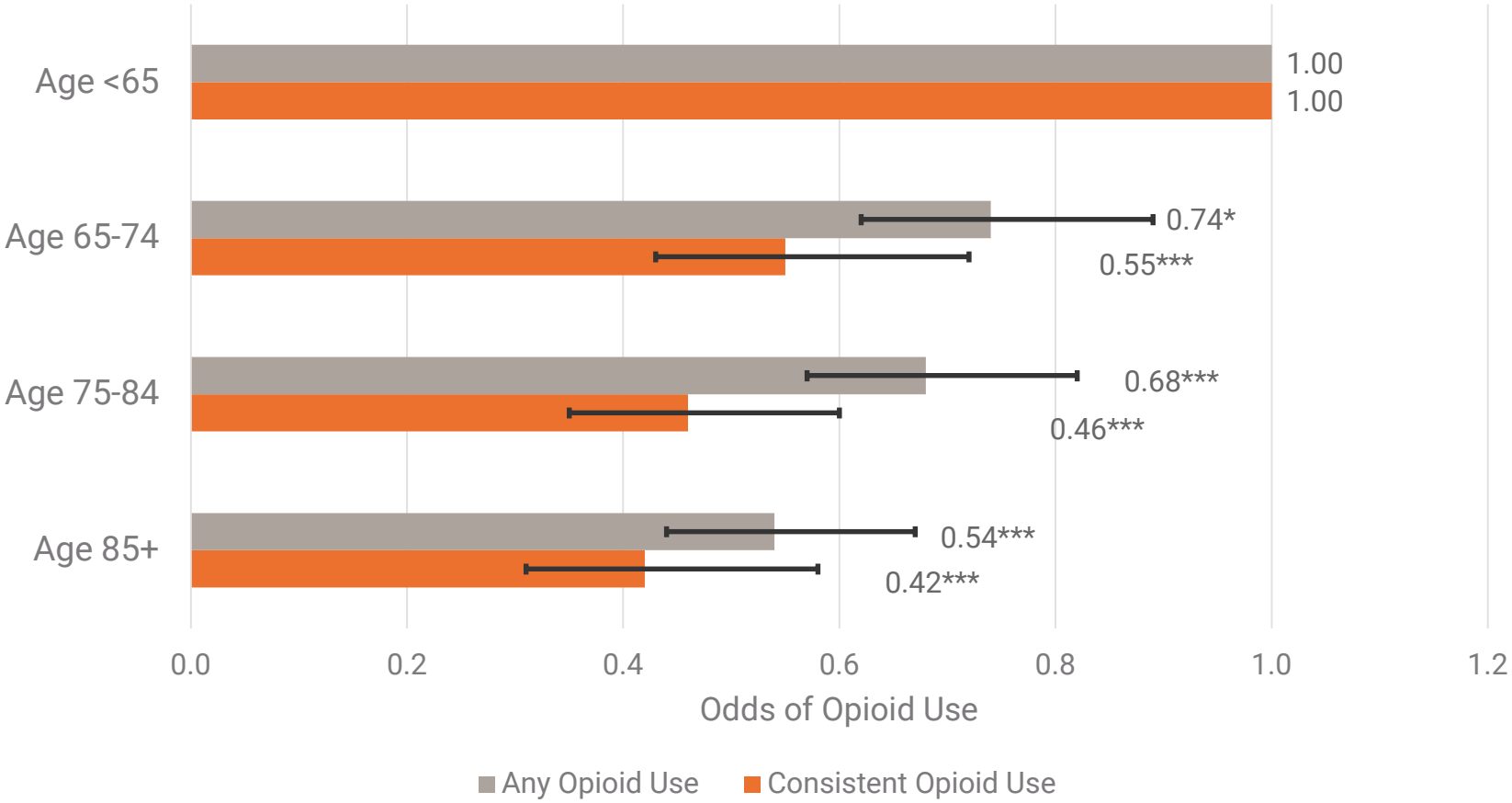
Benchmark Comparison

This study estimates that 27.9% of beneficiaries age 65+ had any opioid use during the calendar year, which is comparable to external benchmarks.

Year(s)	Data Source	Methodology	Findings	Citation
2018	MCBS	Survey-reported medicines + claims	27.9%	N/A – present study
2018	IQVIA Total Patient Tracker	Retail pharmacy data	25%	CDC, 2019
2015-2016	MEPS	Survey-reported medicines, with additional data collection from pharmacies (pending respondent consent)	19.3%	Moriya and Miller, 2018

Odds of Opioid Use, Based on Age Group

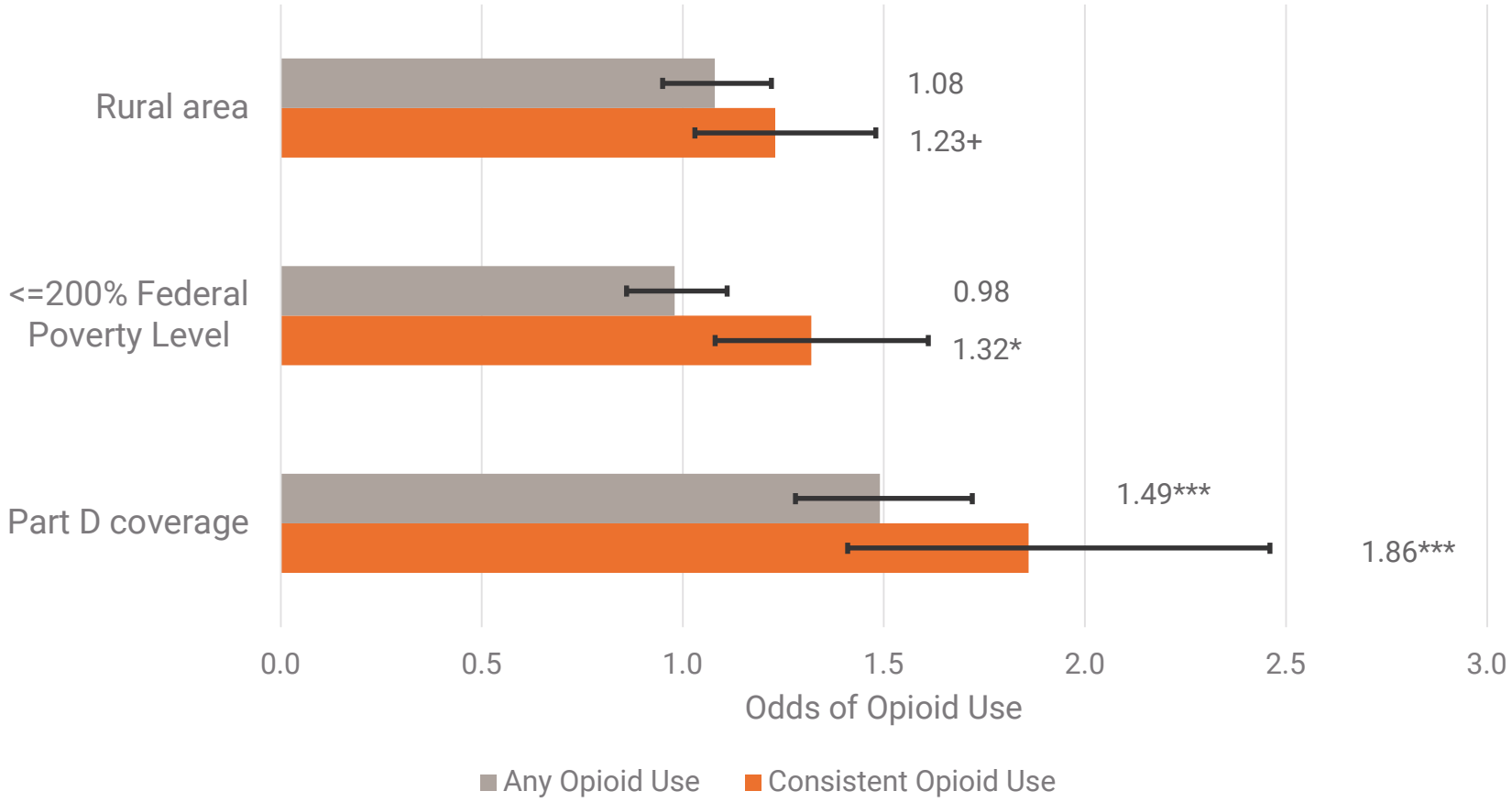
Models predicting any/consistent opioid included socio-demographic, health status, chronic condition, and chronic pain predictors.



+ p<0.5 * p<0.01 ** p<0.001 *** p<0.0001

SOURCE: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey 2018

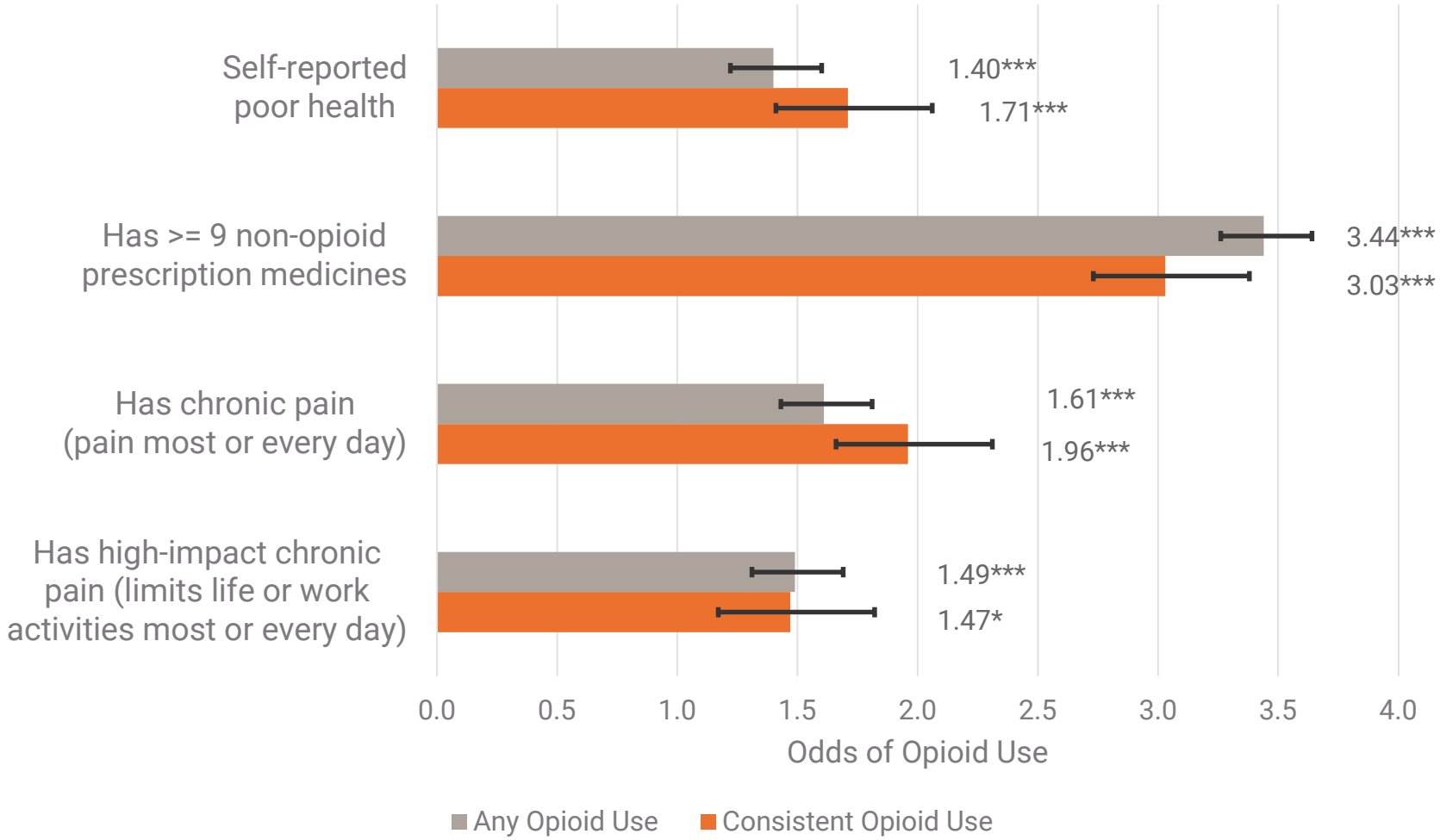
Odds of Opioid Use, Based on Socio-Demographics



+ p<0.5 * p<0.01 ** p<0.001 *** p<0.0001

SOURCE: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey 2018

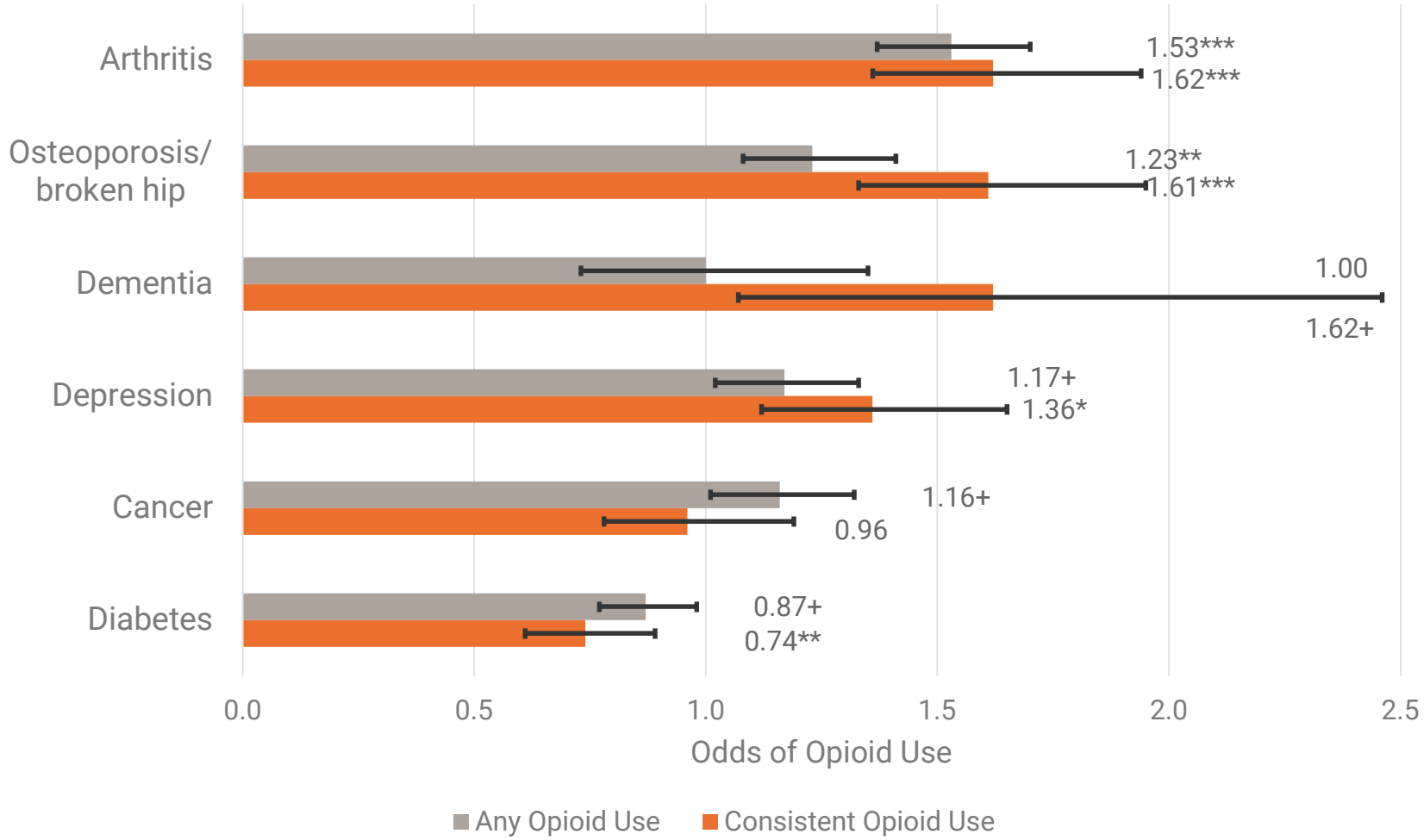
Odds of Opioid Use, Based on Health Characteristics



+ p<0.5 * p<0.01 ** p<0.001 *** p<0.0001

SOURCE: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey 2018

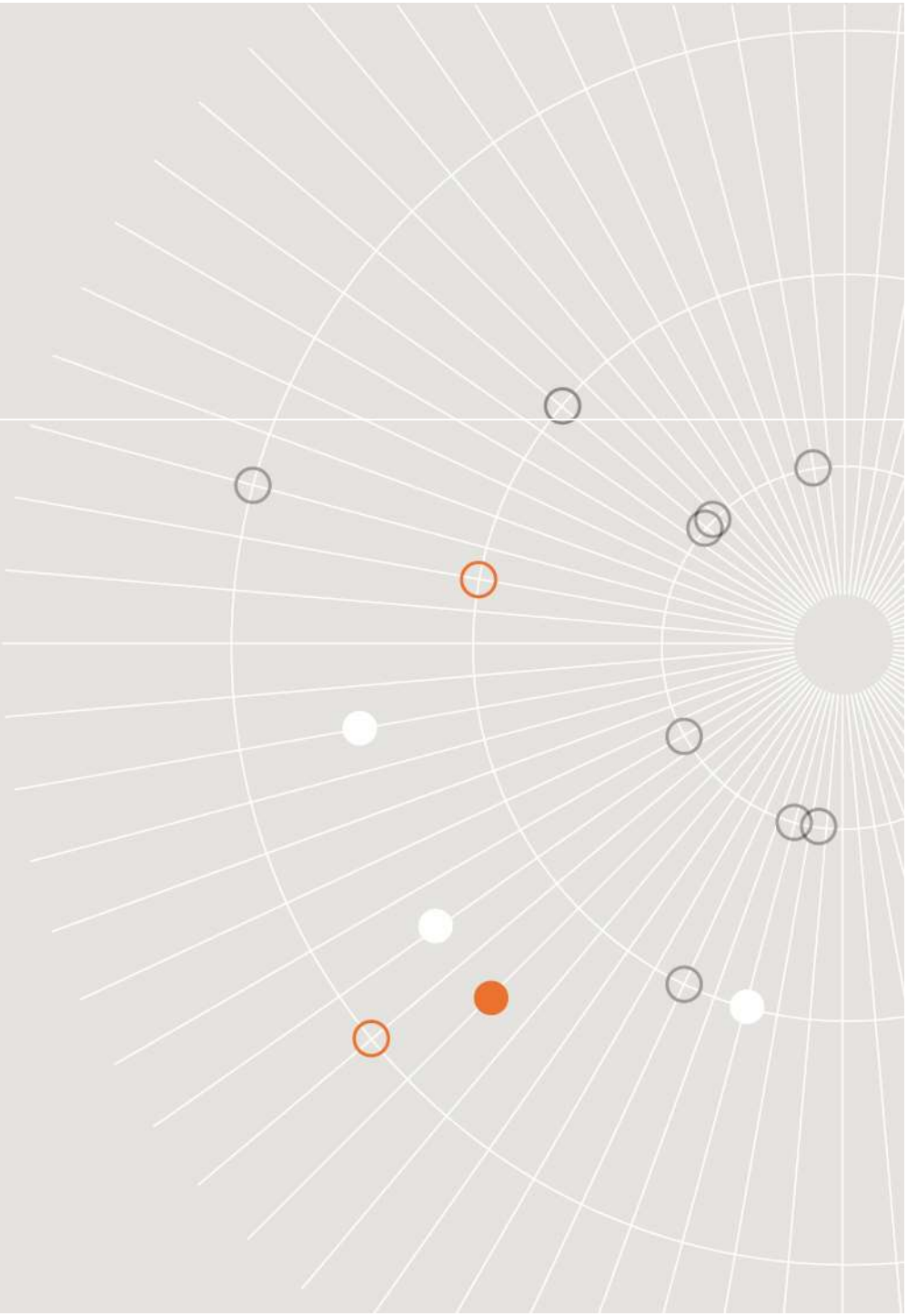
Odds of Opioid Use, Based on Chronic Conditions



+ p<0.5 * p<0.01 ** p<0.001 *** p<0.0001

SOURCE: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey 2018

Discussion



Enumeration of all prescribed medicines is a feasible approach for estimating opioid use among Medicare beneficiaries.

- After matching survey data to Part D claims data, the proportion of beneficiaries using any opioids rose from 24.6% to 30.0%
- Based on this analysis, 9.1% of beneficiaries were classified as consistent opioid users
- This study's estimate for any opioid use among adults age 65+ (27.9%) was comparable to external benchmarks
- Multivariate models to predict opioid use correctly classified the majority of beneficiaries (73.2% for any use and 91.0% for consistent use)
  - Both models had higher specificity than sensitivity, meaning they were better able to predict beneficiaries without opioid use outcomes

Some socio-demographic and health characteristics associated with any opioid use differ from those associated with consistent opioid use.

- **Predictors of both any opioid use and consistent use**
  - Age <65
  - White non-Hispanic (compared to Hispanic)
  - less than high school degree or some college (compared to high school degree)
  - Part D coverage
  - >=9 prescriptions
  - poor health
  - chronic pain
  - high-impact chronic pain
  - having arthritis, osteoporosis, or depression,
  - not having diabetes
- **Predictors of any opioid use (but not consistent use)**
  - Having cancer
  - not having hypertension
- **Predictors of consistent opioid use (but not any use)**
  - Black non-Hispanic (compared to White non-Hispanic)
  - residence in rural area
  - <= 200% of Federal Poverty Level
  - having dementia
  - not having high cholesterol, mental condition, or stroke

Limitations:

- Recall bias due to self-report of opioid prescriptions
- Inability to match to claims data for beneficiaries not enrolled in Part D (~30% of beneficiaries*)
- Only collects data on prescribed opioid use and does not capture possible misuse
- Use of unweighted data limits generalizability of results

Looking ahead, we will continue to investigate:

- Are there cross-sectional trends in beneficiaries' opioid use over time?
- Among beneficiaries who use opioids, can we estimate the quantities they obtain and their frequency of use?

*https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Information-on-Prescription-Drugs/MedicarePartD

The Medicare population faces unique and complex challenges that may require a different approach to addressing opioid misuse.

- **Painkillers are the most commonly misused prescription among elderly (Dean, 2021)**
- **Misuse may be treated as uncommon or may be undiagnosed or misdiagnosed as other comorbidities**
- **Study contributions include:**
  - Estimating opioid use among beneficiaries without Part D coverage to mitigate potential for underestimation via other methodologies
  - Distinguishing between “any opioid use” versus “consistent opioid use” in an effort to better identify the potential for misuse
  - Identifying diverse list of socio-demographics and health conditions associated with increased risk of opioid misuse among the Medicare population

Data Sources:

- MCBS Cost Supplement and Survey File LDS files
- Data available to the public as a free download here: https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/MCBS-Public-Use-File/index

Thank you.

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Multivariate Model Results: Any/Consistent Opioid Use

	Any Opioid Use		Consistent Opioid Use	
	(N=8,093) Pseudo R^2 = 0.20 Correct Classification = 73.2 Sensitivity = 31.1, Specificity = 91.2		(N=8,093) Pseudo R^2 = 0.22 Correct Classification = 91.0 Sensitivity = 7.7, Specificity = 99.3	
Socio-demographic Variables	**OR**	**95% CI**	**OR**	**95% CI**
Age: (reference: <65 years)				
65-74 years	0.74*	(0.62, 0.89)	0.55***	(0.43, 0.72)
75-84 years	0.68***	(0.57, 0.82)	0.46***	(0.35, 0.60)
85+ years	0.54***	(0.44, 0.67)	0.42***	(0.31, 0.58)
Sex: Female	0.96	(0.86, 1.08)	0.04	(0.23, 0.63)
Race/ethnicity (reference: White)				
Hispanic	0.78+	(0.64, 0.95)	0.57*	(0.41, 0.80)
Non-Hispanic Black	1.19	(0.99, 1.42)	1.49*	(1.16, 1.90)
Other race	0.91	(0.71, 1.15)	1.31	(0.93, 1.84)
Educational attainment (reference: high school degree)				
Less than high school degree	1.23+	(1.05, 1.45)	1.34+	(1.05, 1.70)
Some college/vocational school	1.17+	(1.02, 1.35)	1.39*	(1.12, 1.72)
Bachelor's degree or higher	1.01	(0.87, 1.19)	1.05	(0.80, 1.39)
Residence in rural area	1.08	(0.95, 1.22)	1.23+	(1.03, 1.48)
<=200% of the Federal Poverty Level	0.98	(0.86, 1.11)	1.32*	(1.08, 1.61)
Part D coverage	1.49***	(1.28, 1.72)	1.86***	(1.41, 2.46)

+ p<0.5 * p<0.01 ** p<0.001 *** p<0.0001

SOURCE: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey 2018

Multivariate Model Results: Any/Consistent Opioid Use

	Any Opioid Use		Consistent Opioid Use	
Health Variables	**OR**	**95% CI**	**OR**	**95% CI**
Has >=9 prescription medicines	3.44***	(3.06, 3.87)	3.03***	(2.48, 3.71)
Self-reported poor health status	1.40***	(1.22, 1.60)	1.71***	(1.41, 2.06)
Chronic conditions				
Arthritis	1.53***	(1.37, 1.70)	1.62***	(1.36, 1.94)
Heart disease	0.93	(0.82, 1.04)	0.93	(0.77, 1.11)
Osteoporosis/broken hip	1.23*	(1.08, 1.41)	1.61***	(1.33, 1.95)
Parkinson's disease	1.12	(0.74, 1.69)	0.89	(0.47, 1.71)
Cancer	1.16+	(1.01, 1.32)	0.96	(0.78, 1.19)
Hypertension	0.87+	(0.77, 0.99)	1.04	(0.85, 1.28)
Diabetes	0.87+	(0.77, 0.98)	0.74**	(0.61, 0.89)
High cholesterol	0.94	(0.84, 1.07)	0.79+	(0.66, 0.94)
Alzheimer's disease	1.13	(0.81, 1.59)	1.09	(0.64, 1.86)
Dementia, other than Alzheimer's	1.00	(0.73, 1.35)	1.62+	(1.07, 2.46)
Depression	1.17+	(1.02, 1.33)	1.36*	(1.12, 1.65)
Mental condition	0.89	(0.73, 1.08)	0.70+	(0.53, 0.92)
Stroke	0.91	(0.77, 1.07)	0.70*	(0.54, 0.91)
Pulmonary disease	1.11	(0.98, 1.27)	1.10	(0.91, 1.33)
Chronic pain	1.61***	(1.40, 1.85)	1.96***	(1.58, 2.42)
High-impact chronic pain	1.49***	(1.22, 1.82)	1.47*	(1.14, 1.91)

+ p<0.5 * p<0.01 ** p<0.001 *** p<0.0001

SOURCE: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey 2018

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