

Opioid Utilization Patterns in United States Patients With Sickle Cell Disease

**Samir K. Ballas, MD, FACP, FASCP, DABPM, FAAPM¹; Julie Kanter, MD²; Irene Agodoa, MD³;
Robin Howard³; Sally Wade⁴; Virginia Noxon, PhD⁵; Carlton Dampier, MD⁶**

¹Thomas Jefferson University, Philadelphia, PA

²Lifespan Comprehensive Sickle Cell Center, Medical University of South Carolina, Charleston, SC

³Global Blood Therapeutics, South San Francisco, CA

⁴Wade Outcomes Research and Consulting, Salt Lake City, UT

⁵Truven Health Analytics, an IBM company, King of Prussia, PA

⁶Emory University, Atlanta, GA

Disclosures

- Dr. Ballas has no disclosures to declare
- Editorial support was provided by ApotheCom (San Francisco, CA) and supported by Global Blood Therapeutics
- This study was sponsored by Global Blood Therapeutics

Background

- Individuals with SCD suffer from many symptoms, most notably fatigue and recurrent pain¹
- Acute VOC is a hallmark manifestation of SCD¹
- Opioids are the recommended treatment for VOCs and chronic pain²
- Opioids are underutilized in the management of SCD pain²
- There is limited evidence on current treatment patterns with opioids in patients with SCD and their relation, if any, to the opioid epidemic³

SCD, sickle cell disease; VOC, vaso-occlusive crisis.

¹Piel FB, Steinberg MH, Rees DC. Sickle cell disease. *N Engl J Med*. 2017;376(16):1561-1573.

²Han J, Saraf SL, Zhang X, et al. Patterns of opioid use in sickle cell disease. *Am J Hematol*. 2016;91(11):1102-1106.

³Solomon LR. Treatment and prevention of pain due to vaso-occlusive crisis in adults with sickle cell disease: an educational void. *Blood*. 2008;111(3):997-1003.

Objective

- To describe opioid treatment patterns in a large cohort of patients with SCD in the United States

Methods: Data Sources and Patient Selection

- **Data Sources**

- Deidentified US administrative claims data extracted from the Truven Health MarketScan[®] Commercial & Medicaid Claims Databases
- 5 years of data were extracted: January 1, 2009 through December 31, 2014

- **Patient Selection**

- Either 1 inpatient or 2 outpatient (different days) non-diagnostic claims for SCD¹
- Have continuous enrollment with medical and pharmacy benefits for the year identified and year prior
- Patients could qualify for multiple years if they met the above criteria in each year (ie, a patient could qualify in 2010, 2011, and 2012)

¹ ICD-9 Diagnosis Code 282.41, 282.42 or 282.6x.

Methods: Data Analysis

- Annual opioid treatment patterns were determined from outpatient pharmacy claims:
 - Number of claims, days supplied, and MEDD
- Average annual event rates per patient were reported for the following:
 - VOCs¹
 - ED visits
 - IP admissions
- Averages across all years are reported
- All results were reported by age group (from <6 to ≥45 years) and payer (Commercial, Medicaid)

ED, emergency department; MEDD, morphine equivalent daily dose; IP, inpatient.

¹ICD-9 Diagnosis Code 282.42, 282.62, 282.64, or 282.69.

Results: Annual SCD Cohorts

- Unlike the Commercial cohort, the Medicaid cohort had a marked increase in patients over time¹

	2009	2010	2011	2012	2013	2014
Commercial Cohort	2619	2748	2929	3285	2752	2969
Medicaid Cohort	4807	5055	4963	5189	6649	7007

¹ MarketScan Medicaid Databases had an underlying increase in enrollees compared to Commercial databases during this time; states contributing Medicaid data may vary over time.

Results: Average Patient Characteristics (All Years)

	Commercial	Medicaid
Average Age, Mean (SD)	27.4 (17.2)	17.2 (13.1)
Age Groups, y, n (%)		
<6	235 (8)	1026 (18)
6-11	383 (13)	1252 (22)
12-17	451 (16)	1115 (20)
18-30	634 (22)	1372 (25)
31-44	579 (20)	550 (9)
≥45	603 (21)	298 (5)
Females, n (%)	1658 (58)	2965 (53)
SCD Genotype, n (%)		
HbSS	1031 (36)	2480 (44)
HbSC	259 (9)	445 (8)
Sickle Cell Thalassemia	194 (7)	194 (4)
Other	53 (2)	73 (1)
Unspecified/Unknown	1348 (47)	2421 (43)

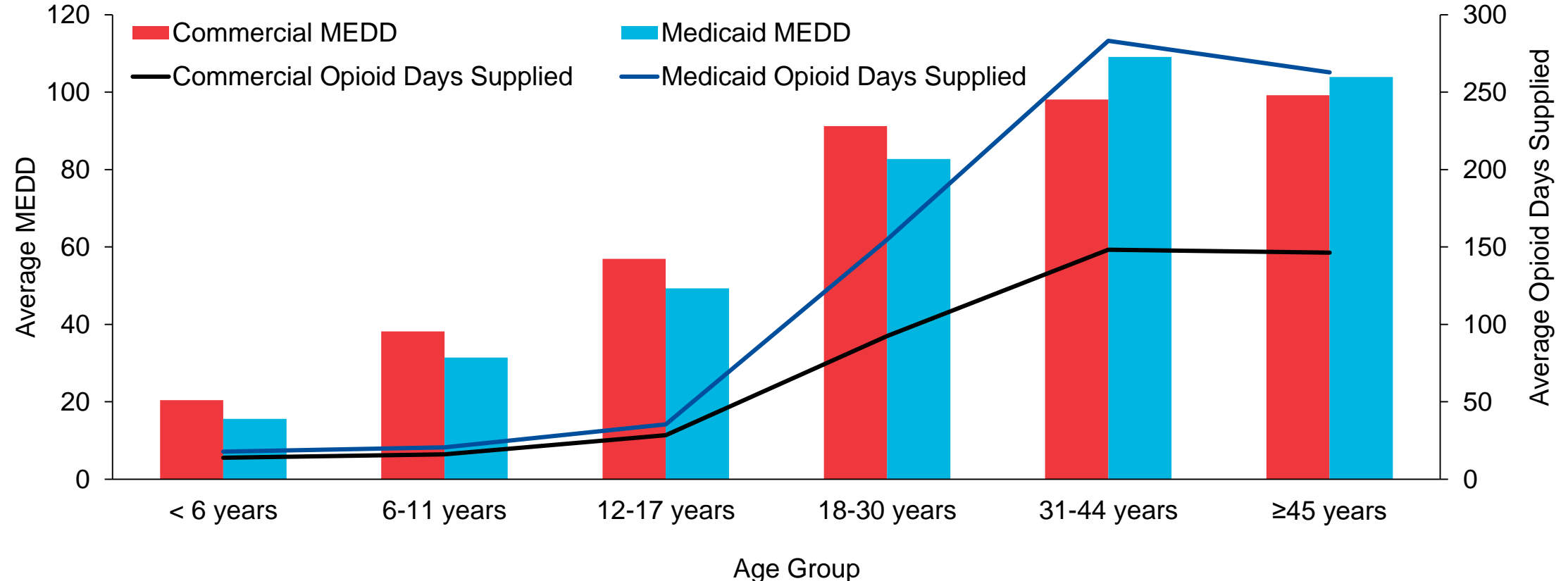
Results: Opioid Use Increased Over Time as SCD Patients Aged

- As patients age, in both payers, opioid use increased from 30% to 60% (Commercial) and from 39% to 77% (Medicaid)

	All patients	<6 y	6-11 y	12-17 y	18-30 y	31-44 y	≥45 y
Commercial cohort							
Patients with opioid analgesics, n (%)	1596 (55)	70 (30)	185 (48)	230 (51)	383 (60)	366 (63)	362 (60)
Average number of claims, mean (SD)	6.3 (9.3)	1.9 (1.6)	2.3 (2.3)	3.6 (4.6)	7.0 (10.5)	8.7 (10.8)	8.0 (10.3)
Average days supplied, mean (SD)	96 (185)	14 (14)	16 (25)	28 (60)	92 (178)	148 (226)	146 (222)
Average MEDD, mean (SD)	87 (63)	20 (13)	38 (31)	57 (35)	91 (60)	98 (66)	99 (67)
Medicaid cohort							
Patients with opioid analgesics, n (%)	3604 (64)	396 (39)	731 (58)	730 (66)	1071 (78)	446 (81)	230 (77)
Average number of claims, mean (SD)	9.0 (13.4)	2.4 (2.3)	3.0 (3.3)	4.7 (5.8)	13.0 (16.0)	19.2 (18.4)	15.8 (15.8)
Average days supplied, mean (SD)	111 (195)	18 (20)	21 (30)	35 (63)	154.8 (214)	283.2 (275)	263 (270)
Average MEDD, mean (SD)	75 (59)	16 (10)	31 (18)	49 (23)	83 (53)	109 (73)	104 (77)

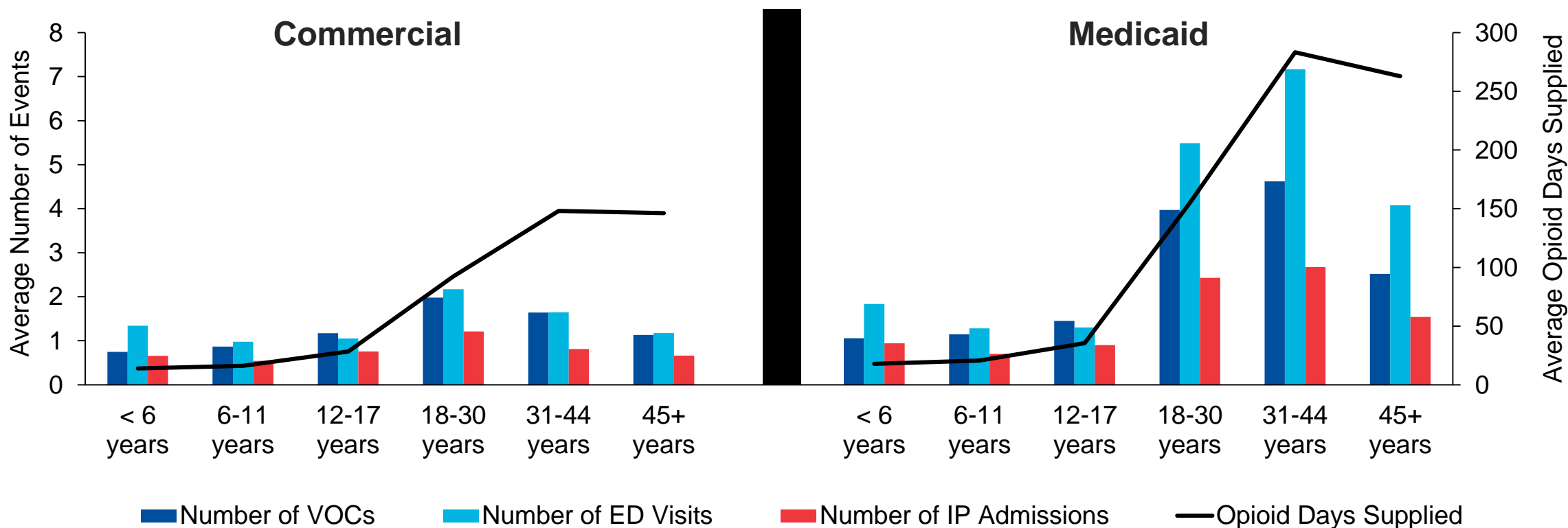
Results: Medicaid Patients Had More Opioid Days Supplied Post-Transition; MEDDD Remained Similar

- MEDDD and opioid days supplied both have a marked increase in patients ≥ 18 years old (transition and post-transition to adult SCD care)

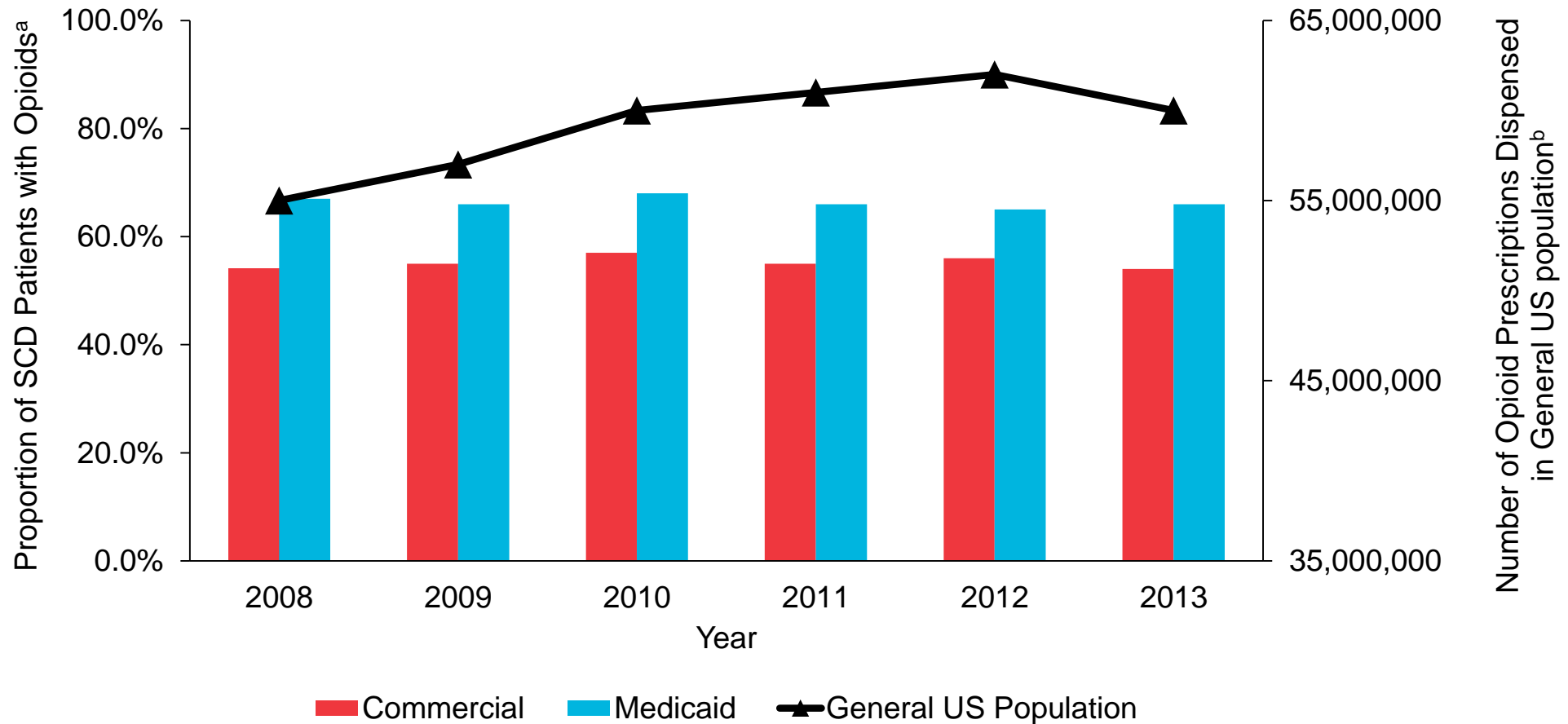


Results: Similar Trends Were Seen Between Opioid Days Supplied and Health Care Resource Utilization

- Medicaid patients had higher number of VOCs, health care utilization, and opioid days supplied compared with Commercial patients
- VOCs and health care utilization had a marked increase in the transition to adult care (ages 18 to 30)



Results: Opioid Use in SCD Patients Has Been Constant Over Time



^aReflects opioid use in the observed year (ie, prior use for 2009 patients is presented for year 2008).

^bReflects dispensed opioid prescriptions for the 4th quarter in each year (Dart et al. Trends in opioid analgesic abuse and mortality in the United States. *N Engl J Med* 2015; 372:241-248).

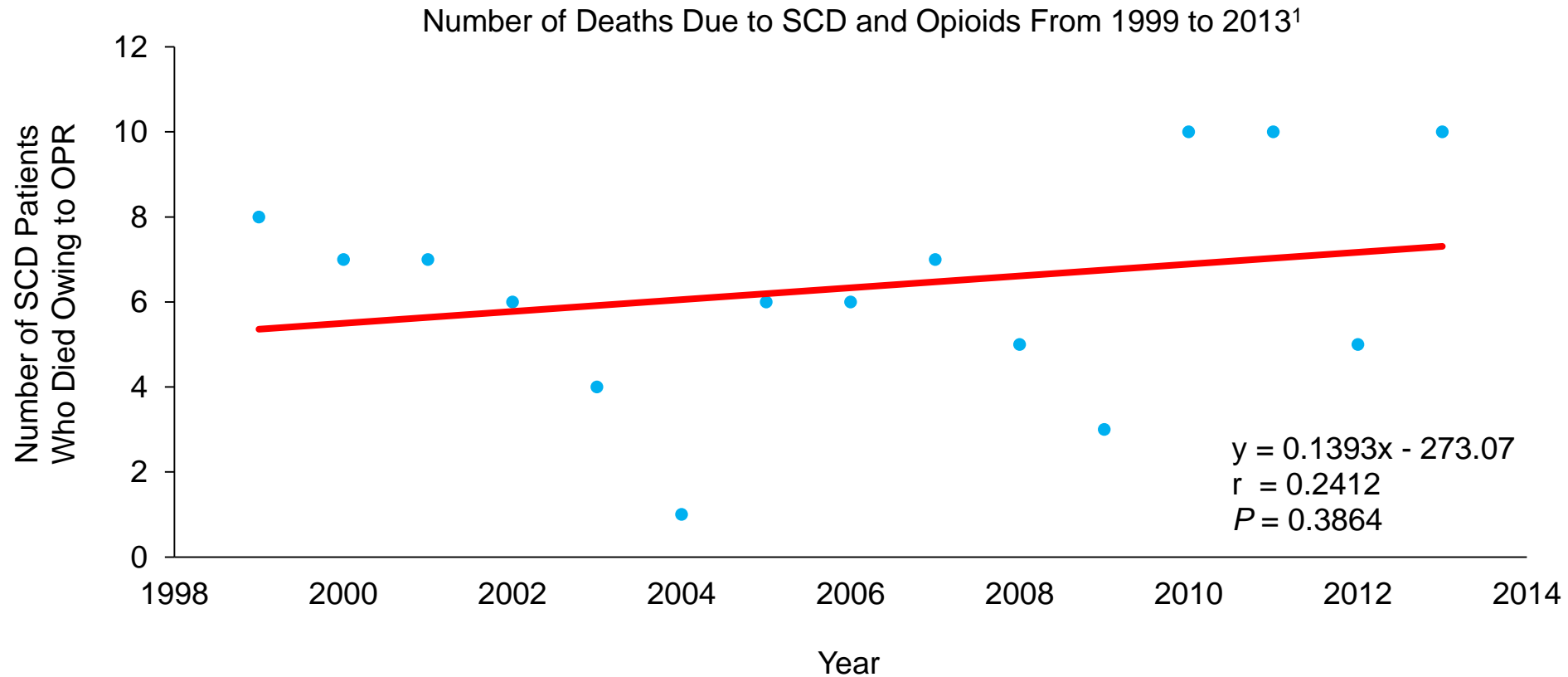
Opioid-Related Death Rate in SCD Is Substantially Lower Than Other Disease Areas

Deaths Due to Opioid Pain Relievers in the United States From 1999 to 2013 in Noncancer Disorders ¹			
Cause of death	Due to all causes	Due to OPR	Percentage
Heart disease	20,595,492	21,656	0.11
Fibromyalgia	3282	144	4.4
Low back pain	3758	80	2.1
Migraine	2286	103	4.5
Sickle cell disease¹	12,261	95	0.77

OPR, opioid pain reliever.

¹Ruta NS, Ballas SK. The opioid drug epidemic and sickle cell disease: guilt by association. *Pain Med.* 2016, 17:1793-1798.

Number of Deaths Due to SCD and Opioids Has Remained Unchanged Over Time



¹Ruta NS, Ballas SK. The opioid drug epidemic and sickle cell disease: guilt by association. *Pain Med.* 2016, 17:1793-1798.

Limitations

- Opioid-related deaths were not measured in this study and may not reflect published literature
- Findings from this study may not be generalizable to populations with other forms of insurance or the uninsured
- Data are limited to those captured in claims and identification of a diagnosis based on ICD-9-CM codes
- Potential for misclassification of SCD and genotypes
- Medication data indicate drugs administered in a physician's office or filled through an outpatient pharmacy but do not indicate whether the patient used the medication as prescribed
- Over-the-counter medications and medications administered in the IP setting are not captured

Summary and Conclusions

- Opioid utilization in the SCD population increases with age but overall has remained steady despite rising concerns of epidemic opioid use in the US general population
- Transition into adult care (ages 18 to 30 years) was associated with a marked increase in opioid utilization, IP admissions, and VOCs
- Opioid utilization protocols should account for the unique needs of patients with SCD
- New disease-modifying medications that decrease pain and SCD complications may be a path to decrease opioid use

Thank You for Your Attention
Samir.Ballas@Jefferson.edu