## Appendix A. Parameter Values, Treatment Cost Calculations, and Distributions

***Table A.1. Parameters Used in the Model of Two Modes of Sickle Cell Diseases Crises Care***

| **Parameter Description** | **Parameter** | **Source** |
| --- | --- | --- |
| **Population Parameters** | | |
| U.S. adults 18 and older | 255,200,373 | U.S. Census Bureau (2018) |
| Population turning 18 each year | 3,749,040 | National Center for Health Statistics (2019) |
| Adult prevalence of sickle cell disease in U.S. population | 23 per 100,000 | Hassell (2010); Brousseau et al. (2009) |
| Incidence of sickle cell disease among population turning 18 each year | 40 per 100,000 | Hassell (2010); Brousseau et al. (2009) |
| Mortality rate | 15.13 per 100,000 sickle cell disease patients | Paulukonis et al. (2016) |
| **Sickle Cell Disease Crises Care** | | |
| Frequency of acute care visits | 2.67 | Lanzkron et al. (2021) |
| Proportion of VOC events initially treated in an ED among patients with specialty care access | 0.30 | Clinical expert input |
| Proportion of IC visits sent to ED | 0.14 | Lanzkron et al. (2021) |
| Proportion of adult patients who have zero acute care encounters annually | 0.26 | Brousseau et al. (2010) |
| Proportion of ED visits resulting in hospital admission | 0.38 | Lanzkron et al. (2010) |
| Proportion of IC visits resulting in hospital admission | 0.11 | Lanzkron et al. (2021) |
| Model transition probabilities conditioned on receipt of initial care at an IC | | |
| Proportion of IC visits that transition to inpatient care prior to discharge home | 0.06 | Authors’ calculation based on clinical expert input |
| Proportion of IC visits that transition to ED prior to discharge home | 0.09 | Authors’ calculation based on clinical expert input |
| Proportion of IC visits that transition from ED to an inpatient stay prior to being discharged home | 0.05 | Authors’ calculation based on clinical expert input |
| Proportion of IC visits that require no additional care | 0.80 | Authors’ calculation based on clinical expert input |
| Model transition probabilities conditioned on receipt of initial care at an ED: treated state | | |
| Proportion of ED visits that transition from IC visit to home without requiring additional care | 0.01 | Authors’ calculation based on clinical expert input |
| Proportion of ED to home | 0.61 | Authors’ calculation based on clinical expert input |
| Proportion of ED to hospital to home | 0.38 | Authors’ calculation based on clinical expert input |
| Model transition probabilities conditioned on receipt of initial care at an ED: baseline state | | |
| Proportion of ED to IC to home | 0.00 | Authors’ calculation based on clinical expert input |
| Proportion of ED to home | 0.62 | Authors’ calculation based on clinical expert input |
| Proportion of ED to hospital to home | 0.38 | Authors’ calculation based on clinical expert input |
| **Direct Costs** | | |
| Total Medical Costs | | |
| ED costs, per visit | $2,379.82 | Johns Hopkins Hospital, Provided by Dr. Sophie Lanzkron October 25, 2020. |
| Inpatient hospital costs, per stay | $32,125.62 | HCUP (2017) |
| IC visit cost, per visit | $1,004.59 | Johns Hopkins Hospital, Provided by Dr. Sophie Lanzkron October 25, 2020. |
| Patient Out-of-Pocket Costs | | |
| ED costs, per visit | $204.20 | Medical Expenditure Panel Survey; Johns Hopkins Hospital |
| Inpatient hospital costs, per stay | $2,756.55 | Medical Expenditure Panel Survey; HCUP (2017) |
| IC visit cost, per visit | $86.20 | Medical Expenditure Panel Survey; Johns Hopkins Hospital |
| **Indirect Costs** | | |
| Patient Time | | |
| Length of stay in hospital (hours) | 114.84 | HCUP (2017) |
| Length of specialty care IC visit (hours) | 4.32 | HCUP (2017); Lanzkron et al. (2021) |
| Length of ED visit (hours) | 5.40 | HCUP (2017) |
| Value of Time | | |
| Average hourly wage rate | $29.58 | U.S. DOL BLS (2018) |
| Average hourly caregiver wage rate | $15.80 | U.S. DOL BLS (2018) |
| Productivity loss | | |
| Labor force participation rate among SCD population | 0.41 | Lanzkron et al. (2018) |
| Caregiver time | 1.00 | Author assumption |
| Travel costs | | |
| Transportation cost (cost per mile) | .58 | IRS (2019) |
| Average distance from ED to home | 6.80 | Brown et al. (2015) |
| **Probabilities and Fractions** | | |
| Uptake of Specialty Care in Year 1 | 0.15 | Authors’ assumptions; modifiable in accompanying Excel model |
| Year-to-Year Change in Uptake (Percentage) | 0.10 | Authors’ assumptions; modifiable in accompanying Excel model |
| Maximum Level of Specialty Care Uptake | 0.50 | Authors’ assumptions; modifiable in accompanying Excel model |

Note: Dollars are in 2018 values.

DOL BLS = Department of Labor, Bureau of Labor Statistics; ED = emergency department; HCUP = Healthcare Cost and Utilization Project; IC = infusion center; SCD = sickle cell disease