Delivery-related Healthcare Utilization among Pregnant Women with Spinal Cord Injury or Paralysis in the United States

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Background

- Women with spinal cord injury (SCI) in their childbearing age represent a growing population, and in the U.S., each year, approximately 2,000 women in their reproductive period suffer from an SCI.[1]
- SCI and paralysis in pregnancies are rarely seen when compared to other conditions.[2]
- Pregnant women with SCI/paralysis have higher chances of associated labor or obstetric complications such as anemia, autonomic dysreflexia, decreased blood pressure, urinary tract infections, preterm labor, and Cesarean section.[3]
- Vital to understand the health services utilization of this population for the healthcare system to be responsive to medical needs and acknowledge the financial implications associated with the necessary healthcare rendered to this population.
- Health services utilization during inpatient hospitalization for non-delivery related reasons by pregnant woman with SCI or paralysis is different than delivery-related hospitalization for the pregnant woman with SCI or paralysis

Aim

- To assess delivery-related healthcare services utilization among pregnant women with SCI or paralysis in the United States

Methods

- Data source
  - National (Nationwide) Inpatient Sample by Healthcare Cost and Utilization Project
- Study period: 2006 to 2019
- Statistical software: STATA SE 17.0 (StataCorp, College Station, TX)
- Outcome variables
  - Length of hospital stay
  - Total hospitalization charges
- Independent variables
  - Population characteristics
    - Predisposing variables (age, race)
    - Enabling variables (location, median household income, primary payer)
    - Need variables (type of admission, modified Elixhauser comorbidity index)
  - Health delivery system characteristics
    - Hospital bed size
    - Hospital location/teaching status
    - Hospital region
- Statistical Analyses
  - Negative binomial regression model
  - Ordinary least squares regression model

Results

Variables	Variability Measure	Negative Binomial Regression Model predicting length of hospital stay		Ordinary least squares regression model predicting log of total hospital charges	
		Count Ratio	95% Confidence Interval	Coefficient	95% Confidence Interval
Age-group					
25 to 29 years (reference)	24.57%				
19 years or less	4.55%	1.135	0.862, 1.495	0.117	-0.082, 0.317
20 to 24 years	19.57%	1.013	0.821, 1.250	0.003	-0.123, 0.129
30 to 34 years	25.81%	1.007	0.845, 1.200	0.015	-0.106, 0.136
35 to 39 years	19.85%	1.014	0.848, 1.212	0.064	-0.063, 0.191
40 years or more	5.65%	1.132	0.900, 1.425	0.125	-0.075, 0.325
Race/Ethnicity					
White (reference)	45.19%				
Black	19.29%	0.924	0.782, 1.092	0.043	-0.089, 0.174
Hispanic	16.60%	0.979	0.799, 1.200	**0.171***	0.037, 0.306
Other	7.64%	1.088	0.907, 1.304	**0.193***	0.026, 0.360
Unknown	11.27%	1.039	0.833, 1.295	-0.050	-0.193, 0.092
Median Household Income					
Quartile 1 (reference)	32.89%				
Quartile 2	25.71%	1.028	0.861, 1.229	0.082	-0.031, 0.195
Quartile 3	22.04%	0.966	0.811, 1.152	0.045	-0.080, 0.170
Quartile 4	19.37%	1.017	0.851, 1.214	0.109	-0.032, 0.251
Residential location					
Metropolitan >= 1 million (reference)	55.81%				
Metropolitan < 1 million	28.23%	1.004	0.857, 1.176	-0.056	-0.166, 0.054
Micropolitan	9.72%	1.026	0.792, 1.329	0.068	-0.101, 0.238
Not metro/micropolitan	6.23%	0.928	0.748, 1.150	-0.047	-0.241, 0.147
Primary Payer					
Private (reference)	38.44%				
Medicare	11.56%	0.956	0.766, 1.192	**-0.257*****	-0.396, -0.118
Medicaid	44.73%	1.003	0.877, 1.146	-0.087	-0.187, -0.014
Self-pay	2.46%	0.953	0.677, 1.343	-0.044	-0.316, 0.228
Other	2.81%	1.209	0.751, 1.945	-0.056	-0.334, 0.223
Type of Admission					
Non-elective (reference)	63.78%				
Elective	36.22%	0.937	0.821, 1.070	**-0.297*****	-0.385, -0.209
Modified Elixhauser Index					
Equals zero (reference)	45.49%				
Equals one	24.97%	**1.407*****	1.205, 1.643	**0.398*****	0.296, 0.500
Equals two	15.79%	**2.150*****	1.754, 2.637	**0.806*****	0.672, 0.940
Equals three or more	13.74%	**2.991*****	2.464, 3.630	**1.434*****	1.281, 1.587
Hospital Bed size					
Small (reference)	9.45%				
Medium	20.19%	**1.321****	1.091, 1.599	**0.245****	0.096, 0.394
Large	70.35%	**1.765*****	1.469, 2.122	**0.478*****	0.351, 0.606
Hospital Location/Teaching					
Rural (reference)	7.20%				
Urban nonteaching	21.78%	1.320	0.992, 1.758	**0.455*****	0.254, 0.655
Urban teaching	71.03%	**1.790*****	1.367, 2.345	**0.627*****	0.443, 0.812
Hospital Region					
Northeast (reference)	12.18%				
Midwest	21.46%	0.972	0.776, 1.216	-0.100	-0.260, 0.060
South	42.20%	1.107	0.936, 1.308	-0.119	-0.267, 0.029
West	24.16%	1.095	0.910, 1.317	0.103	-0.060, 0.265

[1] Based on *n* = 2,241 visits (weighted sample=10954); due to sampling design a weighting variable (TRENDWT for 2006 to 2011 and DISCWT for 2012 to 2019) was used for the calculation of all statistics; total charges ln-transformed to correct for skewness (changed from right skewed to approximately normal distribution)

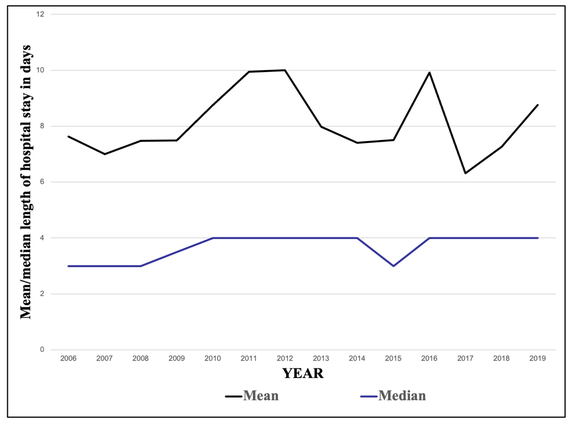

Figure 1: Trends in the mean/median length of hospital stay among inpatient encounters of delivery-related pregnant women with SCI or paralysis

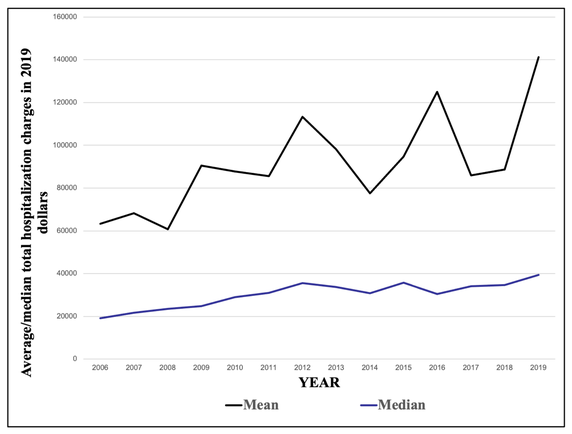

Figure 2: Trends in the mean/median total hospitalization charges among inpatient encounters of non-delivery related pregnant women with SCI or paralysis

Conclusion

- Average length of hospital stay: 8.11 days (median: 4 days, IQR: 2 - 8 days) and average total hospitalization charges: $79027.84 (median: $30043.4, IQR: $16164.16 - $78386.09, in 2019 dollars)
- ***Equips healthcare providers with healthcare services utilization estimates for delivery and labor related inpatient hospitalization of pregnant women with disabilities that can be leveraged when determining the number and frequency of prenatal care visits for this population***
- Provides a ***rationale for designing targeted interventions and healthcare policies to improve the healthcare services utilization*** for this vulnerable population while also considering its financial implications

References

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