

Influence of Insurance Type on Rate and Type of Initial Concussion-Related Medical Visits Among Youth



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OBJECTIVE AND BACKGROUND

Objective: To evaluate the influence of insurance type on rate and type of concussion visits and the time from injury to initial visit in youth.

- Concussion, a form of mild traumatic brain injury, affects 2 million youth annually¹ and impairs physical, cognitive, emotional, and sleep health.^{2,3}
- Concussion-related healthcare utilization increased in recent years for both publicly and privately insured youth, due in part to enactment of concussion laws in sport.⁴
- Publicly insured youth are more likely to use the emergency department (ED) as an initial point of entry for concussion treatment compared to privately insured youth; however, the influence of insurance type on concussion-related care utilization including where and when care is sought remains unclear.
- Using the electronic health record system in a large pediatric healthcare network, we aimed to describe the influence of insurance type on the rate of the initial concussion visit, the type of initial visit sought, and the time from injury to the initial concussion visit.

PATIENT DEMOGRAPHICS BY INSURANCE TYPE

	Private Insurance (n=3,442)	Public Insurance (n=742)	Other ^a (n=771)
Sex, No. (%)[*]			
Male	2,004 (58.2)	514 (69.3)	462 (59.9)
Female	1,438 (41.8)	228 (30.7)	309 (40.1)
Age, No. (%)^y			
10-13	1365 (39.7)	310 (41.8)	309 (40.1)
14-17	2077 (60.3)	432 (58.2)	462 (59.9)
Race, No. (%)[*]			
White	3,003 (87.3)	434 (58.5)	550 (71.3)
Black	217 (6.3)	203 (27.4)	133 (17.3)
All Others	212 (6.2)	105 (14.1)	88 (11.4)
Study Year, No. (%)^{b, *}			
2012 ^c	367 (10.7)	70 (9.4)	88 (11.4)
2013	659 (19.1)	118 (15.9)	164 (21.3)
2014	610 (17.7)	146 (19.7)	163 (21.1)
2015	643 (18.7)	132 (17.8)	152 (19.7)
2016	641 (18.6)	153 (20.6)	127 (16.5)
2017	522 (15.2)	123 (16.6)	77 (10.0)

a. Includes self-pay or mixed public and private across visits
 b. P-value was based on counts at the quarter level
 c. Quarter 3 and 4 only
 * = p<0.05 based on chi-square tests of the distribution between insurance types

TYPE OF CONCUSSION VISIT ODDS RATIOS

Insurance Type	ED and Urgent Care		Sports Medicine Clinic	
	Adjusted OR ^a	(95% CI)	Adjusted OR ^a	(95% CI)
Private	0.74	(0.60, 0.90)*	1.45	(1.20, 1.76)*
Public	Ref		Ref	
Sex				
Male	Ref		Ref	
Female	0.97	(0.82, 1.14)	1.00	(0.86, 1.18)
Age, y				
10-13	Ref		Ref	
14-17	0.30	(0.25, 0.34)*	3.26	(2.81, 3.78)*
Race				
White	Ref		Ref	
Black	1.33	(1.03, 1.71)*	0.74	(0.58, 0.95)*
All others	1.15	(0.87, 1.52)	0.88	(0.67, 1.16)

Note. OR=Odds Ratio; CI=Confidence Interval
 a. Odds ratio was based on logistic regression adjusted for all the variables listed in the table.
 b. 2012 included data from Quarter 3 and 4 only
 * = p-value <0.05

STUDY DESIGN

Inclusion

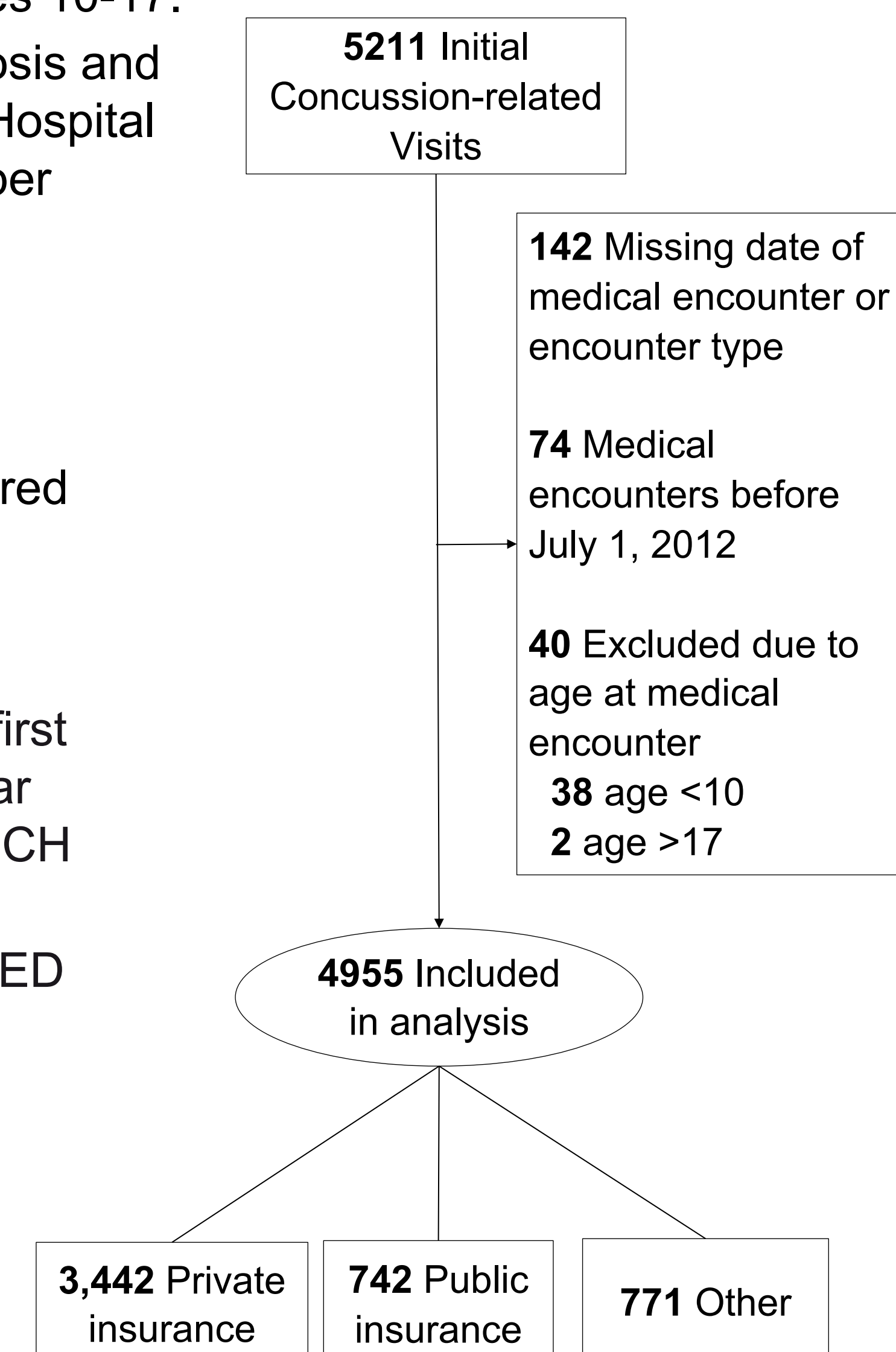
- Initial concussion-related medical visits for youth ages 10-17.
- Patients had a confirmed isolated concussion diagnosis and visited a concussion clinic at Nationwide Children's Hospital (NCH) at least once between July 2012 and December 2017.

Exclusion

- Patients diagnosed with a more severe TBI.
- Patient's first concussion-related medical visit occurred before July 1, 2012.

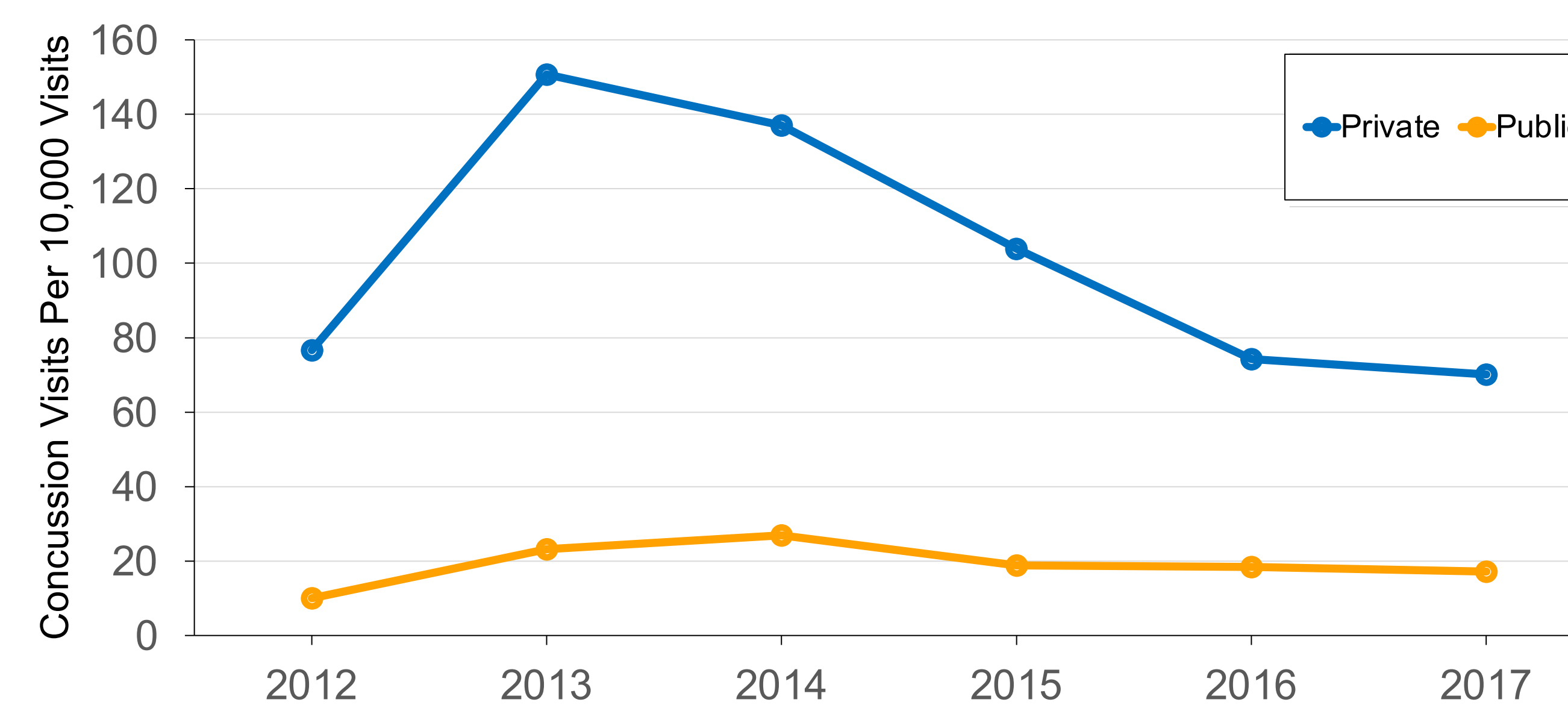
Study Variables and Measures

- Rates of initial concussion visits** – the number of first medical visits among youth with concussions in a year divided by the total number of first medical visits of NCH patients in the same year, then multiplied by 10,000
- Type of initial concussion visit** – sports medicine, ED (including urgent care), or other
- Days from injury to initial concussion visit**
- Insurance type** – public vs. private
- Patient demographics**
- Season (quarter 1 to 4) and calendar year of medical visit (2012 to 2017)**

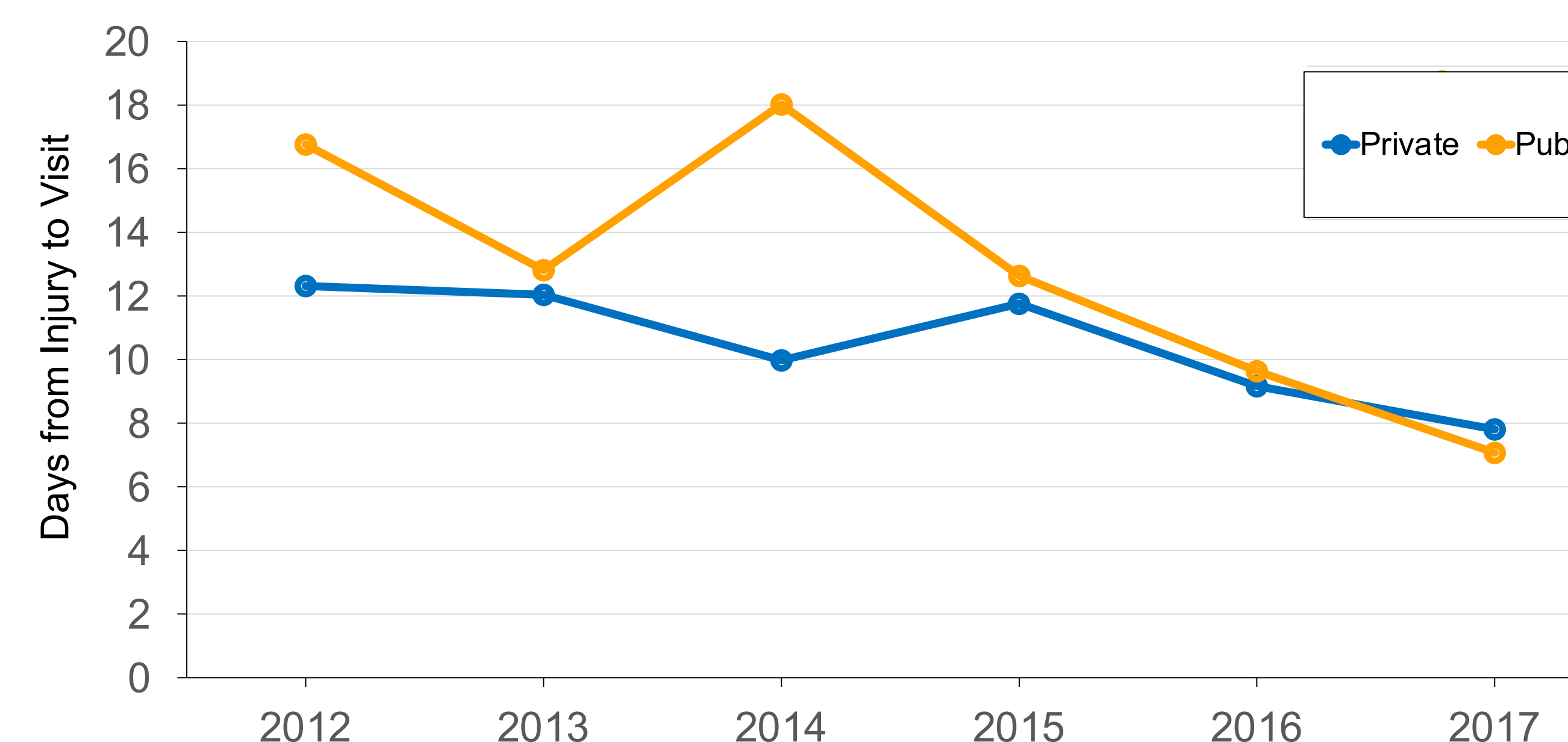


FIGURES

Rate of Initial Concussion-Related Visit by Insurance Type



Days from Injury to Initial Concussion Visit



CONCLUSIONS

- A consistently higher ($P < .0001$) and a greater decrease ($P < .0001$) in rate of the initial concussion visits per 10,000 NCH visits throughout the study period was observed in privately insured compared to publicly insured youth.
- Privately insured youth had higher odds of initial concussion visits to sports medicine clinics (AOR = 1.45, 95%CI = 1.20, 1.76) and a lower odds of initial concussion visits to ED and urgent care (AOR = 0.74, 95%CI = 0.60, 0.90) than publicly insured youth.
- A greater decrease in time from injury to initial visit was observed among publicly insured than privately insured youth ($P = .0106$).
- The differences observed between insurance types and the general trends for both insurance types require further exploration. Awareness of these findings may help improve the care of youth following concussion injury.

REFERENCES

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