

# Hat-Wearing Patterns in Spectators Attending Baseball Games: A 10-Year Retrospective Comparison

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## PRACTICE POINTS

- With less than half of attendees wearing hats to Major League Baseball games, there has been limited change in hat-wearing behavior over the last decade, possibly due to a knowledge or behavioral gap.
- Improved availability and access to hats can lead to improved sun-protective behaviors.

*Spectators at baseball games may receive a considerable amount of exposure to solar UV radiation (UVR). The purpose of this study was to evaluate if public education about sun protection over the last 10 years has impacted the use of hats at Major League Baseball (MLB) games. Photographs of seating sections during a 3-game series in New York, New York, were obtained and analyzed to evaluate the percentage of spectators wearing hats. Different seating sections were evaluated (sunny, shaded, bleachers) and assessed as well as compared to similar data reported 10 years prior. Given the limited change in hat use over the last decade, a knowledge and behavioral gap exists that may be exploitable to achieve better skin cancer prevention.*

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Spectators at baseball games may be exposed to excess solar UV radiation (UVR), which has been linked to the development of both melanoma and nonmelanoma skin cancers.<sup>1,2</sup> Although baseball hats traditionally are worn to demonstrate team support, they also may provide some sun protection for the head and face where skin cancers are commonly found.

The importance of protecting the skin from solar UVR has led to sun-protection programs and community education as well as efforts to evaluate the impact of these programs. Major League Baseball (MLB) has partnered with the American Academy of Dermatology since 1999 to promote the importance of sun protection and raise skin cancer awareness through its Play Sun Smart program.<sup>3</sup> A study conducted 10 years ago (N=2030) evaluated hat use in spectators at MLB games and noted that less than half of all spectators in seating sections exposed to direct sunlight wore hats.<sup>4</sup> The purpose of the current study was to evaluate how public education about sun protection has impacted the use of hats by spectators at MLB games in 2015 compared to the prior study in 2006.

## Methods

Data were collected during a 3-game series (2 day games, 1 night game) in August 2015 in New York, New York. During one of the day

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The authors report no conflict of interest.

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games, 18,000 fans received a free wide-brimmed hat. High-resolution digital photographs of seating sections were obtained using a camera with a 300-mm lens. Using the same methodology as the prior study,<sup>4</sup> sunny and shaded seating sections were photographed during all 3 games (Figure). Photographs of each section were analyzed by an independent reviewer using a high-resolution computer screen. Spectators wearing head coverings—baseball hats, visors, or hats with circumferential brims—were defined as using hats. The number of spectators wearing hats versus not wearing hats was recorded for all identical sections of interest. Bleacher seating was analyzed separately, as spectators presumably knew in advance of the continuous direct sun exposure during day games, and a subset of young children in the bleachers (<10 years of age) also was assessed. A continuously sunny section also was evaluated at the second and sixth innings to see if hats were presumably purchased during exposure. Statistical significance was determined using  $\chi^2$  tests with  $P < .05$  indicating statistical significance.

### Results

This analysis consisted of 3539 spectators. In both the sunny and shaded sections of a day game, there were more spectators wearing hats (49% and 37%, respectively) ( $P < .001$ ) than in the same sections at night games (35% and 29%, respectively) (Table 1). During the day game, more spectators wore hats in the sunny section than in the adjacent shaded section (49% vs 37%;  $P < .001$ ). Analysis of the same 2 sections during the night game revealed no significant differences.

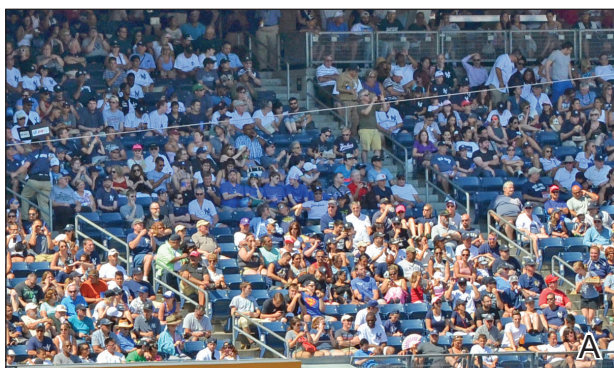
Spectators sitting in the bleachers during a day game who presumably knew to anticipate direct sun exposure showed no significant differences in hat-wearing patterns versus the sunny section (44% vs 49%) but were more likely to wear hats compared to those sitting in the bleachers at the

night game (44% vs 33%) ( $P < .001$ ) (Table 1). There was no significant difference in the number of hats worn by spectators in the sunny section in the second inning (43%) versus the same section after continuous sun exposure at the sixth inning (44%) (Table 2). Significantly more children seated in the bleachers during the day game wore hats compared to adults in the same section (64% vs 42%;  $P < .001$ ) (Table 3). During the hat giveaway day, significantly more spectators wore hats (the majority of which were the free giveaway hats) across all sections studied ( $P < .001$ ) (Table 4).

### Comment

More than 23 million spectators attended daytime MLB games in 2015, with millions more attending minor league and amateur events.<sup>5</sup> Although sun-protection messages tend to be well understood and received by society, many choose to ignore them.<sup>6</sup>

In partnership with the American Academy of Dermatology, the MLB's Play Sun Smart program has promoted UVR risk awareness at sporting events since 1999.<sup>3</sup> Those affiliated with MLB teams also receive annual skin cancer screenings in conjunction with a public education effort in May of each season. However, despite the years of sun-protection education, our study found that less than half of attendees wore hats for UVR protection. In fact, there were no significant differences noted across all of the hat-wearing parameters studied (day vs night game, sunny vs shaded section, sunny section over course of game) between the current study compared to the results from 10 years prior<sup>4</sup> (Tables 1 and 2). For spectators in the bleacher section, even presumably knowing in advance that seating would be in the sun did not significantly increase hat-wearing behavior. Although skin cancer rates continue to rise, hat-wearing trends remain stable, revealing a concerning trend.



Representative photographs of spectators at a daytime baseball game sitting in adjacent sunny and shaded sections (A) and spectators sitting in the bleachers during a day game with a free hat giveaway (B).

Increased availability of sunscreen has led to improved sun-protective behaviors in many populations.<sup>7</sup> In our study, the free hat giveaway had the greatest impact on hat wearing, which suggests that improved availability and access to hats can lead to an important opportunity for sun-protection

programs to partner with hat manufacturers to augment their use and protective impact.

Sun avoidance during childhood and adolescence has been shown to decrease the risk for melanoma.<sup>1</sup> Young children had the highest rate of hat usage in the current study, possibly due to parental example

Table 1.

**Comparison of Hat Use Data Versus 10 Years Prior**

Hat Use by Section <sup>a</sup>	Hat	No Hat	Total	<i>P</i> Value <sup>b</sup>	Difference Vs 10 Years Prior, <sup>4</sup> %	<i>P</i> Value <sup>b</sup>
Day game, n (%)				<.05 <sup>c</sup>		
Sunny	118 (49)	121 (51)	239 (100)	<.001 <sup>d</sup>	+4	NS
Shaded	207 (37)	357 (63)	564 (100)	<.001 <sup>d</sup>	+4	NS
Bleachers <sup>e</sup>	234 (44)	293 (56)	527 (100)	<.001 <sup>f</sup>	-3	NS
Night game, n (%)				<.05 <sup>c</sup>		
Sunny	101 (35)	188 (65)	289 (100)		+5	NS
Shaded	122 (29)	293 (71)	415 (100)		-4	NS
Bleachers	167 (33)	340 (67)	507 (100)	<.001 <sup>f</sup>	-4	NS

Abbreviation: NS, not statistically significant.  
<sup>a</sup>Sections were classified based on the level of sun exposure during the day.  
<sup>b</sup>*P*<.05 indicates statistical significance.  
<sup>c</sup>Comparison of day vs night game.  
<sup>d</sup>Comparison of sunny vs shaded section.  
<sup>e</sup>It was presumed that spectators sitting in the bleachers during the day knew they would experience direct sun exposure throughout the entire game.  
<sup>f</sup>Comparison of day vs night game in bleachers section.

Table 2.

**Hat Use in Sunny Section by Inning Versus 10 Years Prior<sup>a</sup>**

Hat Use by Inning	Hat	No Hat	Total	<i>P</i> Value <sup>b</sup>	Difference Vs 10 Years Prior, <sup>4</sup> %	<i>P</i> Value <sup>b</sup>
2, n (%)	108 (43)	143 (57)	251 (100)	NS <sup>c</sup>	-1	NS
6, n (%)	96 (44)	124 (56)	220 (100)	NS <sup>c</sup>	+3	NS

Abbreviation: NS, not statistically significant.  
<sup>a</sup>Over a 2-hour period.  
<sup>b</sup>*P*<.05 indicates statistical significance.  
<sup>c</sup>Comparison of second vs sixth innings.

Table 3.

**Hat Use in Children Versus Adults During a Day Game in the Bleachers**

Hat Use by Age Group	Hat	No Hat	Total	P Value <sup>a</sup>
Children, n (%)	36 (64)	20 (36)	56 (100)	<.001
Adults, n (%)	198 (42)	273 (58)	471 (100)	<.001

<sup>a</sup>P<.05 indicates statistical significance.

Table 4.

**Impact of Free Hat Giveaway on Hat Use at Daytime Major League Baseball Games**

Hat Use by Section, %	Normal Game	Free Hat Giveaway	Difference, %	P Value <sup>a</sup>
Sunny	49	70	+21	<.001
Shaded	37	52	+15	<.001
Bleachers	44	60	+16	<.001

<sup>a</sup>P<.05 indicates statistical significance.

or dictates. Research has shown the importance of role models in promoting sun safety to young children,<sup>8,9</sup> so perhaps use of hats by parents or MLB players contributed to the hat-wearing behavior observed in this subpopulation.

Given the limited change observed in hat-wearing behaviors over the last decade, a knowledge and behavioral gap appears to exist that may be able to be exploited to enhance future sun protection. Also, based on our findings, the MLB and other sun-protection education campaigns may wish to augment their UVR protective messages by offering hat giveaways, which appear to have a notable impact.

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