



Geographic Variation in Sun Protection Behaviors by Region and Population Density: Findings from the National Health Interview Survey

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BACKGROUND

Skin cancer is the most common cancer in the United States, yet recommended sun protection behaviors remain underutilized.^{1,2} Sun protection is an important component of skin cancer prevention, but these behaviors may vary across geographic and community settings. Geographic and urban-rural differences in preventive health behaviors may contribute to disparities in skin cancer prevention³

OBJECTIVE

To examine differences in sun protection behaviors across U.S. geographic regions and levels of population density using data from the 2020 National Health Interview Survey (NHIS).

METHODS

This retrospective observational study analyzed five sun protection behavior questions from the 2020 National Health Interview Survey (NHIS): hat use, sunscreen use, shade seeking, long-sleeved shirt use, and intentional tanning. Behaviors were compared across U.S. Census regions (Northeast, Midwest, South, and West) and NCHS urban-rural categories (urban, suburban, medium, and rural.) Frequencies and percentages were used to summarize participant characteristics and behaviors. Pearson χ^2 tests were used to examine associations between geographic region, urbanicity, and each categorical sun protection behavior. Statistical significance was defined as $P < .05$. Bivariate analyses were utilized for this exploratory analysis.

Table 1. Regional Sun Protective Behaviors, Always, N(%)

	Northeast	Midwest	South	West
Sunscreen Use (X=20.2)	1348(22.5)	1346(19.1)	2129(18.2)	1997(23.5)
Sun Tanning (X=2.5)	172(3.2)	229(3.3)	223(2.1)	136(1.8)

Table 2. Urbanicity Sun Protective Behaviors, Always, N(%)

	Urban	Suburban	Medium	Rural
Sunscreen Use (X=22.2)	2098(23.2)	1770(24.6)	2148(21.9)	804(17.3)
Sun Tanning (X=2.5)	198(2.2)	194(2.7)	244(2.5)	1128(2.8)

Figure 1. Sun-Protective Behaviors by Region

U.S. regions with the highest rates of reported 'Always' and 'Never' sun-protective behaviors



Region indicates the U.S. region with the highest reported rate for each response category.

RESULTS

- Sun protection behaviors differed significantly by geographic region and urbanicity (all $P < .001$).
- The West reported the highest use of long-sleeved shirts and sunscreen, the Northeast most frequently wore hats.
- Midwest respondents reported the lowest engagement in protective behaviors and the highest rates of intentional tanning (Table 1).
- Southern respondents were most likely to seek shade and reported the lowest rate of using sunscreen.
- By urbanicity, suburban residents reported greater sunscreen use and shade seeking (Table 2).
- Rural residents demonstrated lower use of protective measures and higher rates of blistering after sun exposure.

CONCLUSIONS

- Respondents in the West and in suburban or large urban communities reported greater use of sunscreen, protective clothing, and shade.
- Rural, Midwest, and South residents reported lower engagement in recommended protective behaviors despite higher UV exposure in some regions.
- These findings align with prior research showing rural disparities in preventive health, likely reflecting reduced healthcare access, greater occupational sun exposure, and limited sunscreen availability.^{3,4,5} Interventions through primary care and community-based programs may improve sun protection tailored to where people live.
- A limitation is that race and ethnicity were not evaluated but likely influence sun protection behaviors and should be examined in future studies.

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