

# Wheelchair Users at Home: Few Home Modifications and Many Injurious Falls

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In 1994, 1.6 million community-dwelling Americans reported using a wheelchair for mobility, double the number reported in 1980.<sup>1</sup> Earlier studies in the United States suggested that only 10% of adults with a disability were living in home environments properly suited to their functional limitations.<sup>2</sup>

The objectives of this study were 2-fold: to describe the prevalence of specific structural modifications in the homes of wheelchair users in the community and to examine the relationship between home modifications and the occurrence of injurious falls.

All individuals in the study completed the 1994–1995 National Health Interview Survey Disability Supplement and, 6 to 18 months later, the Disability Follow-Back Survey.<sup>3</sup> In total, 525 respondents met the study selection criteria of being 18 years and older and noninstitutionalized and having reported wheelchair use in both surveys. Fall status and injury status were based on self-report of incidents occurring within the 12 months preceding the second survey. Overall, 37.9% of wheelchair users fell at least once in the past

12 months, and 17.7% suffered a fall-related injury (46.7% of fallers).

The prevalence of 5 structural modifications was relatively low (Table 1). Only 4% had all 5 accessibility features and 36.4% had none. A higher percentage of the injured fallers (47.7% vs 34.0%) reported having none of the modifications examined here.

A logistic regression was used to model the observed relationship between fall injury status and home modifications, in the presence of other risk factors. The presence of any indoor home modification was associated with a lower prevalence of falls involving injury (adjusted odds ratio [OR]=0.56; 95% confidence interval [CI]=0.35, 0.90). Factors associated with increased odds of having a fall-related injury included the use of other mobility aids (adjusted OR=2.28; 95% CI=1.37, 3.78), a reliance on multiple helpers (adjusted OR=1.83; 95% CI=1.10, 3.06), and getting outside on a daily basis (adjusted OR=2.25; 95% CI=1.31, 3.85).

The survey data offered no way of determining the adequacy of the reported home modifications. The temporal sequence of the fall and the modifications was also not ascertainable. Each of these limitations may lead to underestimation of the observed relationship between injurious falls and home modifications.

The study is an important step in highlighting access and safety problems in the homes of wheelchair users. Home environments that facilitate independence and that make it easier to move around should be considered a basic need for disabled persons. Health pro-

viders can play a valuable role in educating patients, but first they must identify modifiable problems with specific questions, such as whether the wheelchair fits through the bathroom door, how the patients transfer to and from bed and move about the home, how they access the toilet, and whether they avoid any rooms or areas in the home. Similarly, surveys designed to monitor the needs of persons with disability should ask specific questions about the width of doors and spatial dimensions within the home.

From a public health perspective, both safety and access would be greatly facilitated if home modifications became a reimbursable expense under Medicare, Medicaid, and other health insurers. From a societal perspective, there should be greater movement toward barrier-free universal design environments. ■

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## Contributors

K. Berg conceptualized and designed the study, assisted in data analysis, and led the writing of the manuscript. M. Hines assisted in developing the analysis plan, performed the analyses, and participated in writing the manuscript. S. Allen assisted in the conceptualization of the study and with writing and revising the manuscript.

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**TABLE 1—Prevalence of Home Features as Self-Reported by Wheelchair Users, by Age and Injurious Fall Status**

Feature Present in House	Aged 18–64 y (n = 219)		Aged >64 y (n = 306)		All, % (n = 525)
	Injurious Fall, %		Injurious Fall, %		
	No (n = 174)	Yes (n = 45)	No (n = 258)	Yes (n = 48)	
Bathroom modifications	45.4	35.6	47.7	52.1	46.3
Widened doorways/hallways	43.1	28.9	25.2	18.8	30.9
Kitchen modifications	17.8	13.3	5.4	8.3	10.5
Railings	39.7	26.7	38.8	35.4	37.7
Easy-open doors	19.0	11.1	13.6	12.5	15.0
Has all 5 features	6.9	0.0	2.7	4.2	4.0
Has none of the 5 features	33.3	53.3	34.5	41.7	36.4

Note. Percentages represent respondents who reported that their homes had the indicated features.  
Source. National Center for Health Statistics.<sup>3</sup>