

The Rising Prevalence of Chronic Low Back Pain

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Background: National or state-level estimates on trends in the prevalence of chronic low back pain (LBP) are lacking. The objective of this study was to determine whether the prevalence of chronic LBP and the demographic, health-related, and health care-seeking characteristics of individuals with the condition have changed over the last 14 years.

Methods: A cross-sectional, telephone survey of a representative sample of North Carolina households was conducted in 1992 and repeated in 2006. A total of 4437 households were contacted in 1992 and 5357 households in 2006 to identify noninstitutionalized adults 21 years or older with chronic (>3 months), impairing LBP or neck pain that limits daily activities. These individuals were interviewed in more detail about their health and health care seeking.

Results: The prevalence of chronic, impairing LBP rose significantly over the 14-year interval, from 3.9% (95%

confidence interval [CI], 3.4%-4.4%) in 1992 to 10.2% (95% CI, 9.3%-11.0%) in 2006. Increases were seen for all adult age strata, in men and women, and in white and black races. Symptom severity and general health were similar for both years. The proportion of individuals who sought care from a health care provider in the past year increased from 73.1% (95% CI, 65.2%-79.8%) to 84.0% (95% CI, 80.8%-86.8%), while the mean number of visits to all health care providers were similar (19.5 [1992] vs 19.4 [2006]).

Conclusions: The prevalence of chronic, impairing LBP has risen significantly in North Carolina, with continuing high levels of disability and health care use. A substantial portion of the rise in LBP care costs over the past 2 decades may be related to this rising prevalence.

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LOW BACK PAIN (LBP) IS THE second most common cause of disability in US adults¹ and a common reason for lost work days.^{2,3} An estimated 149 million days of work per year are lost because of LBP.⁴ The condition is also costly, with total costs estimated to be between \$100 and \$200 billion annually, two-thirds of which are due to decreased wages and productivity.⁵

More than 80% of the population will experience an episode of LBP at some time during their lives.⁶ For most, the clinical course is benign, with 95% of those afflicted recovering within a few months of onset.⁷ Some, however, will not recover and will develop chronic LBP (ie, pain that lasts for 3 months or longer). Recurrences of LBP are also common, with the percentage of subsequent LBP episodes ranging from 20% to 44% within 1 year for working populations to lifetime recurrences of up to 85%.⁸

The use of health care services for chronic LBP has increased substantially over the past 2 decades. Multiple studies using national and insurance claims data

have identified greater use of spinal injections,⁹⁻¹¹ surgery,¹²⁻¹⁶ and opioid medications¹⁷—treatments most likely to be used by individuals with chronic LBP. Studies have also documented increases in medication prescription and visits to physicians, physical therapists, and chiropractors.¹⁸⁻²¹ Because individuals with chronic LBP are more likely to seek care²²⁻²⁴ and to use more health care services,²⁵⁻²⁷ relative to individuals with acute LBP, increases in health care use are likely driven more by chronic than acute cases.

Increased health care use for chronic LBP could be a function of (1) increased prevalence of chronic LBP; (2) increased proportion of those with chronic LBP who seek care; (3) increased use by those who seek care, or (4) some combination of these factors.²⁸ The documented increase in use of services is often assumed to be due to increased health care seeking or use by those who seek care. A less investigated contributing factor is increased prevalence of chronic LBP.

National and state estimates on trends in the prevalence of LBP have been hampered by the lack of consistent data over

time.^{29,30} Previous studies have used inconsistent definitions of LBP, preventing cross-study comparisons, or do not use the same definition over time, leading to varying conclusions on trends in prevalence.^{29,31,32} Data from England suggest that the prevalence of LBP has increased substantially over the past several decades,^{31,33} while data from the United States, Finland, and Germany indicate little change over the past 2 decades.^{29,32,34-36} Studies specifically focusing on trends over time in the prevalence of chronic LBP in the United States, using consistent definitions from one time point to the next, are severely lacking. Discerning whether the prevalence of chronic LBP is increasing and contributing to the increase in the use of health services is vital to the development of strategies to contain costs and improve care for this condition.

We repeated a population-based telephone survey, originally conducted in 1992 in North Carolina, to determine whether the prevalence of chronic LBP and the demographic, health-related, and health care-seeking characteristics of those so afflicted have changed in the state. For both surveys, we used identical definitions of chronic LBP.

METHODS

The present study builds on a computer-assisted telephone survey of LBP prevalence and health care use conducted in 1992.^{25,26} The 1992 survey addressed acute and chronic LBP. The current survey, fielded in 2006, addressed chronic LBP and chronic neck pain. Low back pain was defined as pain at the level of the waist or below, with or without buttock and/or leg pain.²⁵ An individual was considered to have chronic LBP if she or he reported (1) pain and activity limitations nearly every day for the past 3 months or (2) more than 24 episodes of pain that limited activity for 1 day or more in the past year.²⁵ This study was approved by the institutional review board of the University of North Carolina at Chapel Hill.

2006 SURVEY INSTRUMENT

The 2006 survey instrument was an expansion of the 1992 instrument. Questions were added to identify individuals with neck pain and to gather more detailed information about the health and health care use of individuals with chronic pain. We also created a Spanish version, since the Hispanic population of North Carolina had increased substantially in the interval. Prior to data collection, the University of North Carolina at Chapel Hill Survey Research Unit (UNC-SRU) piloted the instrument, using computer-assisted telephone interviewing, on a random sample of North Carolina residents or known cases of chronic LBP ($n=84$). Instrument revisions were made based on the results of the pilot study.

The final instrument had 4 sections: household roster, acute/chronic screener, back pain module, and neck pain module. The household roster, to be completed by an adult member of the household, included questions on the demographic characteristics of each household member 21 years or older and a screener for LBP and neck pain (ie, "As far as you know, did [adult 1] have any kind of back or neck problem in the past few years?"). The acute/chronic screener, to be completed by a household member with a history of back or neck pain, included questions on pain severity and duration in the past year. The back pain module, to be completed by individuals with

chronic LBP, included a series of questions on symptoms (eg, pain intensity, presence of leg pain), general health status (Medical Outcomes Study Short Form 12, presence of comorbidities), functional status (Roland-Morris Disability Questionnaire), and use of health care providers and treatments in the past year. The neck pain module had a similar design.

Both the back and neck pain modules ended with more detailed questions on employment and demographic characteristics. Two questions were used for individuals to self-identify their race/ethnicity. These were (1) "How would you describe your race/ethnicity?" and (2) "Do you consider yourself Hispanic or Latino?"

SAMPLE SELECTION

At each contacted household, an adult gave verbal consent and completed the household roster. If 1 or more adults in the household had a history of back problems (1992 survey) or back or neck problems (2006 survey) in the past few years, one individual was randomly selected to be interviewed in more detail. The selected individual gave verbal consent and completed the survey. Individuals who reported both chronic back and neck pain in the 2006 survey completed the questions on back pain in order to emulate the 1992 survey procedures.

2006 SAMPLE

A stratified probability sample of North Carolina telephone numbers was obtained from GENESYS Sampling Systems (Marketing Systems Group, Fort Washington, Pennsylvania).³⁷ Numbers were chosen from 6 sampling strata, defined by the cross-classification of region of the state (mountains, piedmont, coastal) and concentration of African Americans (high, $\geq 15.5\%$ of population; low, $<15.5\%$ of population). The latter variable was chosen to ensure adequate representation of African Americans so we could more accurately determine whether the prevalence of chronic LBP varied by race/ethnicity.

The **Figure** details the sample selection strategy. A total of 5357 households with 1 or more adults 21 years or older were contacted and 9924 adults were rostered. The household response rate was 66%, computed as the sum of households interviewed divided by the sum of eligible households plus an estimate of the proportion of households with unknown eligibility.³⁸

Of the 5357 households contacted, 3276 households (61%) had 1 or more adults with a history of back and/or neck pain in the past few years. Of the adults randomly selected from these households ($n=3276$), 2723 were interviewed for an individual response rate of 86% and an overall response rate (household response rate \times individual response rates) of 57%. Adults randomly selected to be interviewed were similar in age, sex, and race to those not selected. Adults who refused to be interviewed or who could not be reached were similar in age and race to responders but were more likely to be male (χ^2 test, $P < .001$).

1992 SAMPLE SELECTION

Details of the sample selection in 1992 are described elsewhere.²⁵ Briefly, a 2-stage proportionate stratified sample (based on region of state and urban/rural status) of residential North Carolina telephone numbers was generated using a modified version of the Waksberg random digit dialing sampling design.³⁹ A total of 4437 households with 1 or more adults 21 years or older were contacted. The household response rate, computed as the number of completed interviews divided by a prorated estimate of the number of eligible households,⁴⁰ was 79%. Of the 4437 households contacted, 2053 households had 1 or

more adults with a history of back pain. One adult with back pain was randomly selected from each of these households and interviewed.

INTERVIEWING PROCEDURES

Both surveys were conducted by trained personnel in the UNC-SRU. Interviews for the 2006 survey were conducted from April to November. A call scheduling system was used to ensure that repeated calls were conducted at different times of the day and week. Telephone numbers were withdrawn after a minimum of 10 unsuccessful call attempts with at least 1 day, 1 weekend, and 1 evening call. The 1992 methods were identical with the exception of using more current software in 2006.

WEIGHTING OF THE DATA

Sample weights and prevalence weights were created for both the 2006 and 1992 data.

2006 Data

The sample weights provided by GENESYS Sampling Systems were first adjusted to account for the differential probability of selection into our sample due to the use of only a proportion of the vendor-provided numbers, the number of household landlines, and stratum-specific household nonresponse. To reduce bias resulting from differences in response rates among demographic subgroups, a poststratification adjustment was made by calibrating the weighted sample to the distribution of the North Carolina population with respect to age, race/ethnicity, and sex. Data from the 2005 American Community Survey (conducted by the US Census Bureau to gather demographic, economic, social, and housing information) were used for the calibration.⁴¹ Weights used for prevalence estimation also took into account the number of nominated back and neck pain cases in the respondent's household as well as nonresponse among nominated back and neck pain cases.

1992 Data

Sample weights were created for the 1992 data to account for the differential probability of selection, telephone coverage, and survey nonresponse. A poststratification adjustment was then made to ensure the survey data were representative in terms of age, race, and sex, using data from the 1990 census. Prevalence weights were calculated using a method identical to that used for the 2006 data.

DATA ANALYSIS

All analyses were conducted using the survey commands in Stata statistical software (version 9.2; StataCorp, College Station, Texas). Prevalence estimates, 95% confidence intervals (CIs), and descriptive statistics on the chronic LBP respondents were generated for the 1992 and 2006 data. Two-sample *t* tests and χ^2 tests of proportions were conducted to determine differences in the demographic, health-related, and health care-seeking characteristics of the 2 groups. Missing data ranged from 0% to 9% for the variables examined in this study and were treated as such (ie, no imputation or use of dummy variables).

RESULTS

The prevalence of chronic LBP more than doubled in the 14-year interval from 3.9% to 10.2%. This marked in-

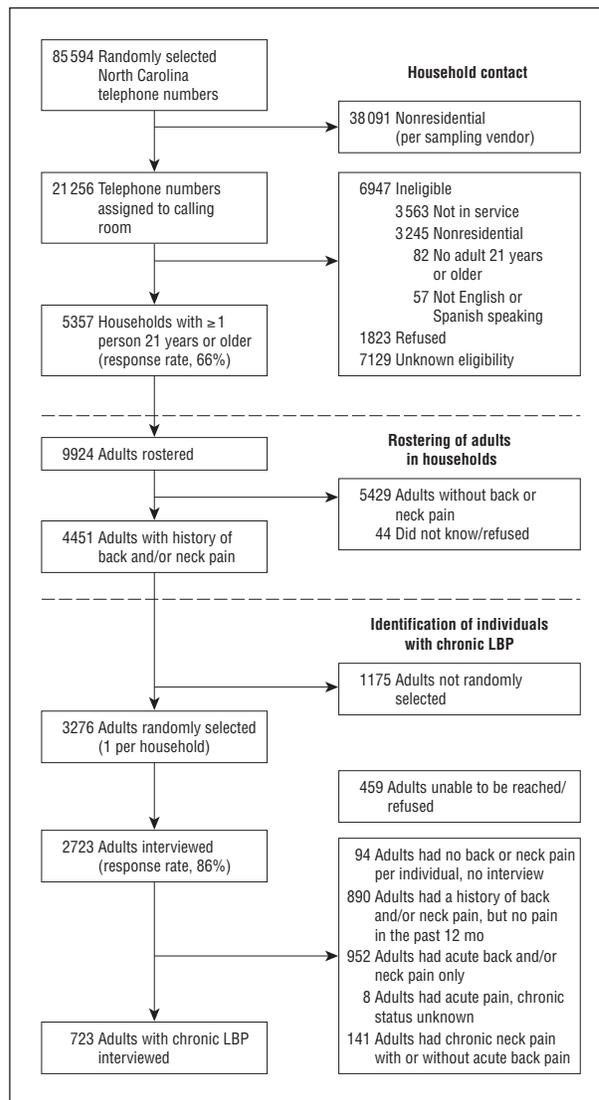


Figure. 2006 Sample selection. LBP indicates low back pain.

crease occurred among all sex, age, and race/ethnic subgroups (**Tables 1, 2, and 3**). In both years, the prevalence of chronic LBP was greater in women.

Table 4 presents demographic, health-related, and health care-seeking characteristics of the 1992 and 2006 chronic back pain respondents. The groups were similar in regard to demographic characteristics, with the exception of the 2006 respondents being more educated, with a greater percentage of individuals who were 45 to 54 years old, and Hispanic. North Carolina has undergone a marked increase in its Hispanic population, particularly in the 0- to 44-year age group, over the past decade.⁴² In the 1992 survey, few respondents claimed Hispanic ethnicity. There were also some differences in the insurance and employment status of the 1992 and 2006 groups. Most notably, the proportion of individuals receiving Medicare who were younger than 62 years (ie, receiving Social Security Disability Insurance) more than doubled from 1992 to 2006 and parallels the increase in chronic LBP prevalence. A considerable proportion of individuals in both groups had a low house-

Table 1. Prevalence of Chronic Low Back Pain in North Carolina, 1992 and 2006

Characteristic	Prevalence, % (95% CI)		Increase, %	PRR (2.5%-97.5% CI) ^a
	1992 (n=8067)	2006 (n=9924)		
Total	3.9 (3.4-4.4)	10.2 (9.3-11.0)	162	2.62 (2.21-3.13)
Sex				
Male	2.9 (2.2-3.6)	8.0 (6.8-9.2)	176	2.76 (2.11-3.75)
Female	4.8 (4.0-5.6)	12.2 (10.9-13.5)	154	2.54 (2.13-3.08)
Age, y				
21-34	1.4 (0.8-2.0)	4.3 (3.0-5.6)	201	3.01 (1.95-5.17)
35-44	4.8 (3.3-6.3)	9.2 (7.2-11.2)	92	1.92 (1.35-2.86)
45-54	4.2 (3.0-5.5)	13.5 (11.4-15.7)	219	3.19 (2.29-4.59)
55-64	6.3 (4.2-8.3)	15.4 (12.8-17.9)	146	2.46 (1.73-3.50)
≥65	5.9 (4.5-7.3)	12.3 (10.2-14.4)	109	2.09 (1.62-2.84)
Race/ethnicity				
Non-Hispanic white	4.1 (3.5-4.7)	10.5 (9.4-11.5)	155	2.55 (2.13-3.05)
Non-Hispanic black	3.0 (2.0-4.0)	9.8 (8.2-11.4)	226	3.26 (2.32-4.96)
Hispanic	.. ^b	6.3 (3.8-8.9)		
Other	4.1 (1.4-6.8)	9.1 (6.0-12.0)	120	2.20 (1.16-6.99)

Abbreviations: CI, confidence interval; PRR, prevalence rate ratio.

^aThe PRRs and CIs were estimated via bootstrapping; 97.5% CIs were reported rather than to assume normality.

^bUnable to estimate owing to small cell count (n < 5).

Table 2. Prevalence of Chronic Low Back Pain by Age and Sex

Age Group, y, and Sex	Prevalence, % (95% CI)		Increase, %	PRR (2.5%-97.5% CI) ^a
	1992	2006		
21-34				
Male	1.6 (0.8-2.5)	3.5 (1.8-5.2)	115	2.15 (0.96-5.16)
Female	1.2 (0.5-1.9)	5.1 (3.2-7.0)	320	4.20 (2.19-9.19)
35-44				
Male	3.4 (1.2-5.6)	6.5 (3.9-9.2)	92	1.92 (0.93-5.28)
Female	6.1 (4.0-8.2)	11.9 (8.8-15.0)	96	1.96 (1.28-3.02)
45-54				
Male	2.6 (1.2-4.0)	10.3 (7.6-13.1)	293	3.93 (2.25-7.89)
Female	5.8 (3.7-7.8)	16.5 (13.1-19.9)	187	2.87 (1.99-4.62)
55-64				
Male	5.7 (3.1-8.4)	13.7 (9.9-17.5)	139	2.39 (1.45-4.66)
Female	6.7 (3.9-9.5)	16.9 (13.2-20.5)	152	2.52 (1.68-4.44)
≥65				
Male	3.7 (1.9-5.5)	9.7 (6.6-12.7)	159	2.59 (1.48-5.55)
Female	7.3 (5.3-9.4)	14.3 (11.2-17.4)	95	1.95 (1.37-2.87)

Abbreviations: CI, confidence interval; PRR, prevalence rate ratio.

^aThe PRRs and CIs were estimated via bootstrapping; 97.5% CIs were reported rather than to assume normality.

hold income. In 2006, 40% of the subjects reported a household income of \$20 000 or less. In 1992, 55% reported a household income of \$20 000 (\$29 000 in 2006 dollars) or less.

Health-related characteristics of the 2 groups were also similar in regard to onset of LBP, pain intensity, and health status. For individuals who reported continuous chronic pain, those in the 2006 group reported a longer duration of pain. Condition-specific functional data were only collected in 2006 using the Roland-Morris Disability Questionnaire, which measures degree of functional limitation on a scale from 0 to 23. The mean Roland score for the 2006 group was 14.9 (95% CI, 14.3-15.5), indicating substantial functional impairment, similar to scores for patients considering surgery for their LBP.^{43,44} Health

care seeking had significantly increased for the 2006 group, from 73.1% to 84.0%; the percentage seeking care from a physician increased from 66.5% to 78.1%. Among those who sought care, there was little change in the number who had surgery or in the number of provider visits.

COMMENT

To our knowledge, this is the first population-based study in the United States that has examined trends in the prevalence of chronic LBP using similar survey methods and identical definitions of chronic LBP. We found an alarming increase in the prevalence of chronic LBP from 1992 to 2006 in North Carolina, which occurred across all

Table 3. Prevalence of Chronic Low Back Pain by Race and Sex

Race/Ethnicity and Sex	Prevalence, % (95% CI)		Increase, %	PRR (2.5%-97.5% CI) ^a
	1992	2006		
White				
Male	3.0 (2.1-3.8)	8.3 (6.9-9.8)	177	2.80 (2.05-3.94)
Female	5.1 (4.2-6.1)	12.4 (10.8-14.0)	143	2.42 (1.96-3.00)
Black				
Male	2.5 (1.2-3.8)	7.3 (5.1-9.4)	192	2.89 (1.65-6.37)
Female	3.5 (2.0-5.0)	11.7 (9.3-14.0)	234	3.37 (2.14-5.67)
Other				
Male	3.3 (0.0-6.9)	7.0 (3.1-10.9)	112	2.12 (0.70-16.35)
Female	5.0 (0.5-9.5)	11.8 (7.0-16.5)	136	2.34 (1.02-14.21)
Hispanic				
Male	... ^b	2.7 (0.6-4.7)		
Female	... ^b	11.7 (6.2-17.1)		

Abbreviations: CI, confidence interval; PRR, prevalence rate ratio.

^aThe PRRs and CIs were estimated via bootstrapping; 97.5% CIs are reported rather than to assume normality.

^bUnable to estimate owing to small cell count ($n < 5$).

demographic subgroups. We also found that episodes of acute LBP (defined as pain that limited usual activities for at least 1 day but less than 3 months; or less than 25 episodes of LBP that limited activities) in the past year increased from 7.3% (95% CI, 6.6%-8.1%) to 10.5% (95% CI, 9.5%-11.4%). Although the cross-sectional nature of our data prevents any firm conclusions, the smaller increase in prevalence of acute vs chronic LBP is consistent with a greater percentage of acute cases transitioning to chronic cases.

Reasons for the increase in chronic LBP are unclear. Changes in the age composition of the state do not explain the increase since the rise in prevalence was similar across all age strata. Ethnic differences also do not explain the increase. As our data indicate, the Hispanic population has a lower prevalence of chronic LBP, which is likely because of their younger age. More than 50% of the Hispanic individuals surveyed in our study were 21 to 34 years old. Individuals in this age group, relative to older groups, have a lower prevalence of LBP. An increase in the rate of smoking, a potential risk factor for LBP,^{45,46} is also not a likely explanation for the increase in chronic LBP because rates of smoking in North Carolina adults have decreased slightly over the past decade (26% in 1995 to 22% in 2006).⁴⁷

One potential reason for the increase may be increasing rates of obesity. North Carolinians have grown considerably more obese (body mass index ≥ 30 [calculated as weight in kilograms divided by height in meters squared]) over the period we examined (13.4% in 1992 to 26.6% in 2006).⁴⁷ Whether obesity is a risk factor for LBP, however, is still unclear.⁴⁸⁻⁵⁰ Changes in psychosocial and physical work demands, risk factors for LBP,⁵¹ may have also contributed to the increase in prevalence. The workforce in North Carolina has changed over the past 15 years, with decreases in the percentage of manufacturing jobs and increases in the percentage of construction and service industry jobs.⁵²

Increases in back pain prevalence may also be due to increases in depression prevalence. Rates of major depression in the United States more than doubled from

3.33% in 1991-1992 to 7.06% in 2001-2002⁵³; and longitudinal studies suggest that major depression increases the risk of developing future chronic pain.⁵⁴⁻⁵⁶ Individuals with major depression are almost 3 times more likely to develop incident chronic back pain within 2 years relative to nondepressed individuals.⁵⁶

Others have speculated that increases in back pain prevalence may be due to increased symptom awareness and reporting.^{33,57} Increasing public knowledge of LBP via medicalization, the media, and the Internet have likely made back pain a more prominent part of life over the past 2 decades. Current care for chronic LBP often includes the use of multiple health care professionals which, some argue, encourages the further medicalization and persistence of chronic LBP.^{57,58} Recent analyses of data from several German health surveys indicate that immediately after reunification, rates of back pain prevalence were roughly 10 percentage points less in East Germany relative to West Germany, but they were essentially the same 10 years later.⁵⁹ While selective migration and differences in rates of unemployment may have contributed to rising prevalence rates in East Germany, the authors hypothesized that much of the increase in prevalence was due to dissemination of back-related attitudes and beliefs from the more "medicalized" West Germany to East Germany. When we tried to assess whether our respondents were simply labeling ongoing back symptoms as functionally impairing, we found that those with back pain in 2006 were functioning either similarly or worse than in 1992, with decreased employment, greater use of disability insurance, and continued high pain scores.

Although we attempted to apply identical methods for the 2 surveys, it remains possible that minor sampling or measurement issues may have accounted for some of the difference in prevalence between the 2 years. Differences in survey methods, however, would likely not explain all of the increase in prevalence. While direct comparisons are not possible, our estimates and trends are similar to data from the National Health Interview Survey. In 2006, 8.3% (95% CI, 7.8%-8.7%) of adults 21 years or older reported difficulty with 1 or more of 12 func-

Table 4. Demographic and Clinical Characteristics of 1992 and 2006 Chronic Low Back Pain (LBP) Samples

Characteristic	Estimate (95% CI)		Difference P Value
	1992 (n = 269)	2006 (n = 732)	
Age, mean, y	52.3 (50.2-54.5)	53.1 (51.9-54.3)	.55
Age category, y			
21-34	11.9 (8.2-17.2)	10.6 (8.1-13.8)	.007
35-44	26.9 (20.3-34.6)	18.3 (15.3-21.8)	
45-54	15.2 (11.2-20.4)	26.7 (23.2-30.4)	
55-64	19.5 (13.6-27.1)	22.7 (19.5-26.2)	
≥65	26.5 (20.6-33.4)	21.7 (18.6-25.2)	
Sex			
Female	65.9 (58.3-72.8)	62.2 (58.1-66.2)	.39
Race/ethnicity			
Non-Hispanic white	81.1 (74.6-86.3)	70.5 (67.0-73.8)	.14
Non-Hispanic black	16.4 (11.4-22.9)	18.7 (16.3-21.4)	
Other	2.6 (1.2-5.3)	5.5 (3.7-8.0)	
Hispanic	... ^a	4.7 (3.2-6.9)	
Missing	0.6 (0.1-2.4)	0.7 (0.2-1.9)	
Education			
<High school	34.0 (27.3-41.4)	20.2 (16.9-24.0)	<.001
High school/GED	36.0 (29.1-43.6)	31.6 (27.7-35.7)	
>High school	30.0 (23.1-37.9)	48.3 (44.0-52.6)	
Insurance ^b			
Medicare	28.2 (22.1-35.1)	37.9 (33.8-42.1)	.02
Age <62 y ^c	12.8 (7.2-21.6)	33.2 (27.7-39.2)	<.001
Medicaid	8.7 (5.1-14.2)	16.4 (13.5-19.7)	.02
Worker's compensation for LBP	12.6 (8.8-17.5)	6.9 (5.0-9.3)	.01
Private/other	65.8 (58.5-72.5)	56.1 (51.7-60.3)	.02
No health insurance	14.9 (10.5-20.7)	14.5 (11.5-18.2)	.92
Employment			
Currently employed	41.5 (34.2-49.2)	31.8 (27.9-35.9)	.02
Employed in the past year	48.9 (41.1-56.7)	42.1 (37.8-46.4)	.13
Missed work days during the past year ^d	20.6 (12.5-28.6)	17.7 (11.5-23.9)	.58
Pain duration and intensity			
Years since LBP began, mean	14.4 (12.6-16.2)	14.7 (13.6-15.8)	.78
Years with chronic pain, mean	5.9 (4.8-7.0)	9.8 (8.9-10.7)	<.001
Pain severity past 3 months, mean ^e	7.2 (6.8-7.5)	6.8 (6.6-7.0)	.06
Pain in one or both legs, %	76.1 (67.6-83.0)	68.4 (64.5-72.1)	.10
Self-reported health status, %			
Excellent	8.4 (5.3-12.9)	5.5 (3.9-7.8)	.06
Very good	12.0 (8.4-17.0)	18.2 (15.1-21.7)	
Good	26.7 (20.2-34.3)	32.3 (28.4-36.4)	
Fair	30.8 (24.0-38.5)	27.0 (23.4-30.8)	
Poor	22.2 (16.8-28.6)	17.1 (14.2-20.4)	
Health care seeking			
Ever hospitalized for LBP	40.8 (33.3-48.7)	32.0 (28.3-35.9)	.04
Ever had surgery for LBP	22.3 (16.8-28.9)	24.8 (21.5-28.5)	.48
Had surgery in the past year	10.4 (6.1-17.2)	6.8 (5.0-9.2)	.17
Sought care in the past year	73.1 (65.2-79.8)	84.0 (80.8-86.8)	.003
Saw a physician in the past year	66.5 (58.5-73.6)	78.1 (74.4-81.3)	.003
Saw a physical therapist in the past year	21.2 (15.9-27.6)	25.0 (21.6-28.7)	.28
Saw a chiropractor in the past year	18.0 (13.5-23.6)	22.6 (19.2-26.3)	.16
Visits to an MD, PT, DC in the past year	19.5 (14.5-24.5)	19.4 (17.0-21.7)	.97

Abbreviations: CI, confidence interval; DC, doctor of chiropractic; GED, General Educational Development; MD, doctor of medicine; PT, physical therapist.

^aUnable to estimate owing to small cell count (n < 5).

^bCategories not mutually exclusive.

^cConditional on receiving Medicare.

^dConditional on being employed in the past year.

^eOn a 0 to 10 scale.

tional activities (ie, walking a one-quarter mile [400 meters]; climbing 10 steps; standing for 2 hours; sitting for 2 hours; stooping, bending, kneeling; reaching overhead; grasping small objects; lifting/carrying 4.5 kg; pushing/pulling large objects; going out to events, participat-

ing in social activities; relaxing at home) because of chronic back or neck problems. In 1997, 3.2% of adults reported difficulty with these activities because of chronic back or neck problems.⁶⁰ National data indicate that the proportion of Social Security Disability Income award-

ees claiming “musculoskeletal disease” as their cause of disability has also increased markedly, from 15.2% in 1992 to 28.2% in 2006.⁶¹ In 1983 musculoskeletal disorders were the fourth leading diagnostic group in disability awards; in 2003, they were the leading diagnostic group.⁶² While the musculoskeletal disease classification includes conditions other than back pain, this national trend is consistent with our data on Medicare recipients with chronic LBP younger than 62 years.

Some authors have hypothesized that the increases in the use of health care services for chronic LBP are due to increased health care seeking by those with the condition.^{11,12,29,63} Our data, however, suggest that increased prevalence may be the primary factor contributing to this phenomenon. In fact, as we illustrated, there was only a moderate increase in health care seeking from 1992 to 2006, with little change in the total number of visits to physicians, physical therapists, and chiropractors, conditional on 1 visit. The proportion of individuals who had surgery was also similar across the 2 years.

To further explore the relationship between prevalence and use of surgery, we conducted an age-adjusted analysis of change in lumbar spine surgery rates in North Carolina, using state inpatient and ambulatory surgery data housed at our center. From 1997 to 2005, surgical procedures per person among the North Carolina population increased 157%. This increase parallels the increase we saw in prevalence. Others have also reported increasing surgery rates using state and national data.^{12,14,63,64} The rates of surgery among our survey respondents—individuals with chronic LBP—were similar in 1992 and 2006. These findings suggest that increasing prevalence of chronic LBP may be the contributing factor to increased surgery rates rather than increased use of surgery by those with chronic LBP, at least in the state of North Carolina.

This study has limitations. The cross-sectional nature of the analysis prevents us from making firm conclusions regarding causality. In addition, because we did not collect data on risk factors, our hypotheses regarding the causes for the increase in prevalence are speculative. It is also possible that there was some underreporting of pain in the surveys, since a household member was asked to identify all household members with a history of back or neck problems. Finally, the study was conducted in only 1 state.

The major strength of this study is that we used similar methods and identical definitions of chronic LBP to examine trends in prevalence over time. Although our data come from only 1 state, the lack of comparable national or other state data on trends in the prevalence of chronic LBP elevate their significance. This study provides valuable and timely information on a common, disabling, and increasingly costly condition.

We found an alarming increase in the prevalence of chronic LBP in North Carolina, with moderate increases in already high use of health care. These findings suggest that increases in health care costs on a population basis may be due to the increased prevalence of this condition, more so than increased use by those afflicted. Efforts to improve function and constrain costs of back pain will need to address issues of causality and

self-management if we are to adequately address this health and health care challenge.

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