Special Article

USE AND COST EFFECTIVENESS OF SMOKING-CESSATION SERVICES UNDER FOUR INSURANCE PLANS IN A HEALTH MAINTENANCE ORGANIZATION

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ABSTRACT

Background Lack of information about the effect of insurance coverage on the demand for and use of smoking-cessation services has prevented widescale adoption of coverage for such services.

Methods In a longitudinal, natural experiment, we compared the use and cost effectiveness of three forms of coverage with those of a standard form of coverage for smoking-cessation services that included a behavioral program and nicotine-replacement therapy. The study involved seven employers and a total of 90,005 adult enrollees. The standard plan offered 50 percent coverage of the behavioral program and full coverage of nicotine-replacement therapy. The other plans offered 50 percent coverage of both the behavioral program and nicotine-replacement therapy (reduced coverage), full coverage of the behavioral program and 50 percent coverage of nicotine-replacement therapy (flipped coverage), or full coverage of both the behavioral program and nicotine-replacement therapy.

Results Estimated annual rates of use of smoking-cessation services ranged from 2.4 percent (among smokers with reduced coverage) to 10 percent (among those with full coverage). Smoking-cessation rates ranged from 28 percent (among users with full coverage) to 38 percent (among those with standard coverage). The estimated percentage of all smokers who would quit smoking per year as a result of using the services ranged from 0.7 percent (with reduced coverage) to 2.8 percent (with full coverage). The average cost to the health plan per user who quit smoking ranged from $797 (with standard coverage) to $1,171 (with full coverage). The annual cost per smoker ranged from $6 (with reduced coverage) to $33 (with full coverage). The annual cost per enrollee ranged from $0.89 (with reduced coverage) to $4.92 (with full coverage).

Conclusions Use of smoking-cessation services varies according to the extent of coverage, with the highest rates of use among smokers with full coverage. Although the rate of smoking cessation among the benefit users with full coverage was lower than the rates among users with plans requiring copayments, the effect on the overall prevalence of smoking was greater with full coverage than with the cost-sharing plans. (N Engl J Med 1998;339:673-9.)

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ALTHOUGH cigarette smoking is a leading cause of premature morbidity and mortality in the United States, insurance coverage for smoking-cessation services is uncommon.[1] Lack of information about the effect of insurance coverage on the demand for and use of effective smoking-cessation services has prevented widescale adoption of coverage for such services.[2] The cost effectiveness of smoking-cessation interventions as compared with other medical services is well documented.[3-5] The few studies of the effects of out-of-pocket cost on the use of nicotine-replacement therapy have focused on nicotine gum, and the results suggest that offering it at a reduced cost or at no cost increases the number of prescriptions for the gum that are filled, the amount of gum that is used, and the rate of smoking cessation.[6-8] To our knowledge, no studies have examined the effects of various cost-sharing plans for coverage of behavioral modification and nicotine-replacement therapy combined.

There is a substantial literature on the effects of cost sharing on the use of health care services in general. A number of studies have shown that the use of medical services is reduced when copayments are required.[9-11] Understanding the reductions in use that are associated with cost sharing is an important consideration in making decisions about coverage of smoking-cessation services. Although the provision of free services to all smokers may be attractive, it is possible that they attract less motivated smokers than services for which copayments are required, thus diluting their effectiveness. We studied the use and cost effectiveness of various forms of coverage for smoking-cessation services.

METHODS

The study was conducted at Group Health Cooperative of Puget Sound (GHC), a consumer-owned health maintenance organization that provides health care to over 450,000 residents of western Washington.

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Study Design

We used a natural experiment to compare the use and cost effectiveness of three forms of insurance coverage with those of a standard form of coverage. The plans were provided to specific groups of employees. The employees did not select their coverage.

The smoking-cessation services for all the plans included a behavioral program and nicotine-replacement therapy. GHC's behavioral program, called Free and Clear, was developed and evaluated in a randomized trial funded by the National Cancer Institute.[12] The program is administered by GHC's Center for Health Promotion. Coverage for nicotine-replacement therapy was contingent on enrollment in the behavioral program. The four plans differed according to the user's out-of-pocket costs. The standard plan required a 50 percent copayment for the behavioral program, with no additional charge for nicotine-replacement therapy other than the usual copayment of $5 per prescription. The three other plans offered alternative benefits: one plan provided reduced coverage (a 50 percent copayment for both the behavioral program and nicotine-replacement therapy), another plan required no copayment for the behavioral program but required a 50 percent copayment for nicotine-replacement therapy (flipped coverage), and the third provided full coverage for both the behavioral program and nicotine-replacement therapy. Copayments for the behavioral program were made at the time of registration; copayments for nicotine-replacement therapy were made at the pharmacy when the prescription was filled.

The natural experiment dictated that we use two different study designs. For the employee groups with full or flipped coverage, standard coverage was provided for one year, followed by the alternative form of coverage. We compared standard, full, and flipped coverage with a three-group, "pre–post" design. The group with the reduced-coverage plan received no coverage for smoking-cessation services before the plan was introduced. The study design for the analysis of the standard and reduced plans was therefore a simple comparison during the same period.

The costs to the benefit users were $42.50 for the behavioral program under 50 percent coverage, $85 for nicotine-replacement therapy under 50 percent coverage (including the cost of one prescription and one refill for nicotine gum or a transdermal patch), and $10 for nicotine-replacement therapy under full coverage (reflecting the $5 copayment required for one prescription and one refill).

Use of smoking-cessation services was tracked for two years in all groups except for the reduced-coverage group, which could be tracked for only one year. Users of the services were contacted six months after use to determine smoking-cessation rates.

Employee Groups and Time Line

In January 1993, GHC began offering standard coverage for smoking-cessation services to most enrollees. No enrollees had coverage before that time. We selected one large group of employees for the analysis of use of services under the standard benefit. The GHC marketing department designed and rated the three alternative coverage plans and selected employers with large groups of employees with which to negotiate them. The group studied for the standard form of coverage consisted of employees of the federal government. The reduced-coverage plan was negotiated with the state of Washington employee group. The state group was chosen for this comparison because its sociodemographic characteristics were known to be similar to those of the federal group. The reduced benefit went into effect in July 1993; state employees received no coverage of smoking-cessation services before that date.

The plans offering flipped and full coverage were introduced to selected groups in January 1994. The flipped coverage was offered to employees of the Boeing Company. Full coverage was offered to four groups: GHC employees, employees of the city of Seattle, and employees of King County and Pierce County in Washington. In 1993 all these groups, as well as employees of the federal government, had the standard benefit. In 1994, the federal group continued to receive standard coverage, and the other groups received alternative coverage.

Study Population

The study population for the analysis of use of services consisted of all adults, 18 to 64 years old, who were enrolled in GHC during all of 1993 and 1994 through one of the employers listed above. Sample sizes were as follows: standard coverage, 26,983; reduced coverage, 34,455; flipped coverage, 10,068; and full coverage, 18,499.

Automated Data Collection

Data on use of the behavioral program were obtained from automated files maintained by the Center for Health Promotion. Data on use of nicotine-replacement therapy (nicotine gum or transdermal patches) were obtained from GHC's automated pharmacy system.[13]

Survey Data Collection

Two telephone surveys were conducted. For both surveys, potential respondents received a letter in advance informing them of the survey and providing a number to call if they did not want to participate. Calls were made a week after the letter was mailed, and the interviewers obtained oral consent to complete the survey.

A survey was performed at the start of the study to compare the characteristics of GHC enrollees in the four coverage groups, including demographic characteristics, tobacco use, alcohol use, exercise, diet, seat-belt use, perceived health status, and perceived stress. To obtain completed data from at least 200 enrollees in each coverage group, four random samples of roughly 300 enrollees who were insured through the relevant employer contracts were selected. A total of 863 enrollees provided complete data at base line: 217 receiving standard coverage, 215 receiving reduced coverage, 204 receiving flipped coverage, and 227 receiving full coverage; the response rates were 74 percent, 74 percent, 70 percent, and 66 percent, respectively.

The survey of benefit users included members of the four study groups who used smoking-cessation services during a six-month period beginning with the sixth month that the benefit was offered. A benefit user was defined as a person who registered for the behavioral program (and paid for it if a copayment was required). Benefit users were contacted by telephone six months after the initial use of the benefit. Data were obtained on demographic characteristics, previous and current status with respect to smoking, and satisfaction with the services. To encourage accurate reporting of smoking status, survey participants were told in advance that a saliva sample might be collected to verify smoking status.[14]

The numbers of benefit users identified in the four groups during the six-month period were as follows: standard coverage, 158; reduced coverage, 113; flipped coverage, 27; and full coverage, 130. The total number of benefit users surveyed was 345, and the overall response rate was 81 percent. The numbers of respondents and response rates for the four groups were as follows: standard coverage, 130 (82 percent); reduced coverage, 94 (83 percent); flipped coverage, 23 (85 percent); and full coverage, 98 (75 percent).

Estimates of the Prevalence of Smoking

In 1991, a survey of a random sample of 5903 GHC enrollees (age range, 18 to 64 years) was conducted as part of a population-based study of smoking-cessation interventions.[15] A total of 2564 participants in this survey were enrolled in the current study. We used the data from these respondents, pooled with data from the survey of enrollees in the current study, to estimate the prevalence of smoking in the four benefit groups (Table 1).

Cost-Effectiveness Analysis

Cost effectiveness was calculated as the average cost per benefit user who stopped smoking. For each of the four coverage plans,

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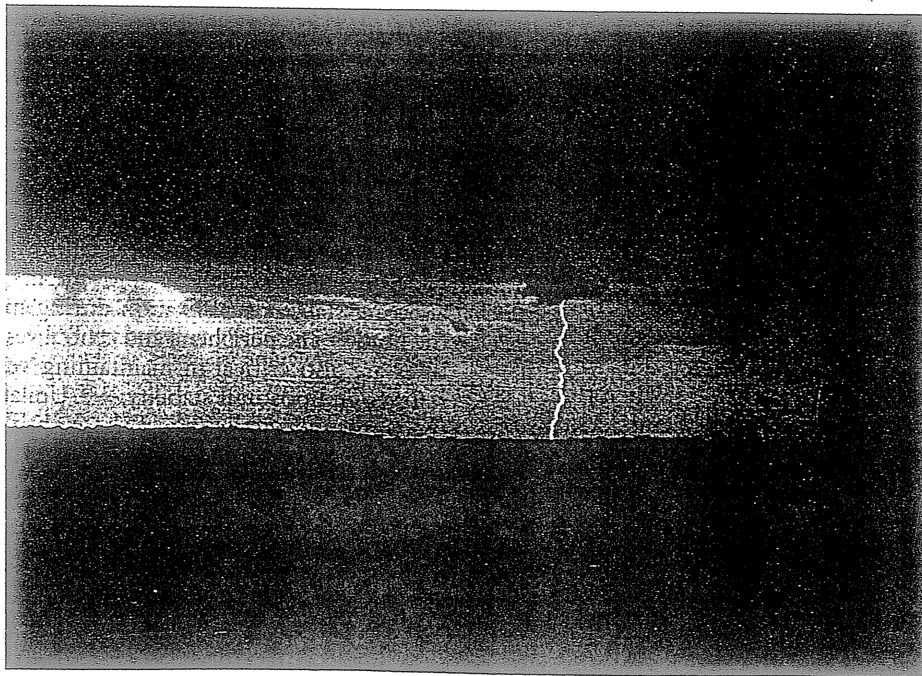

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