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Original article

The Influence of Deductible Health Plans on Receipt of the Human Papillomavirus Vaccine Series

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A B S T R A C T

Purpose: To evaluate whether enrollment in deductible health plans (DHP) with higher patient cost-sharing requirements than traditional health maintenance organization plans (HMP) decreased initiation and completion of the human papillomavirus (HPV) vaccine series recommended for prevention of cervical cancer.

Methods: This was a retrospective observational study of 9- to 26-year-old females at Kaiser Permanente Georgia and Kaiser Permanente Colorado who were HPV vaccine naive at time of enrollment in a self-pay DHP or HMP in 2007. Estimates of rates of initiation and completion of the HPV vaccine series from plan enrollment in 2007 through December 2009 were obtained using Cox proportional hazards regressions (accounting for censoring) on samples matched on the propensity to enroll in a DHP versus HMP.

Results: Initiation of the HPV vaccine series was 22.2% and 24.4% in the DHP and HMP groups, respectively, at Kaiser Permanente Georgia; completion was 12.3% and 14.4% in the DHP and HMP groups, respectively. Human papillomavirus vaccine series initiation was higher at Kaiser Permanente Colorado, but completion was lower. In the Cox proportional hazards regressions, rates of initiation and completion of the HPV vaccine series did not differ significantly ($p \leq .05$) by plan type (DHP vs. HMP) at both sites. The primary care visit rate included in these regressions had a significant, positive association with initiation and completion of the HPV vaccine series.

Conclusions: Enrollment in a DHP versus an HMP did not directly affect initiation or completion of the HPV vaccine series among age-eligible females. Independent of plan type, more frequent primary care visits increased initiation and completion rates.

IMPLICATIONS AND CONTRIBUTION

Concerns that potentially high cost sharing required in deductible health maintenance organization plans might decrease receipt of an important prevention service—such as the human papillomavirus vaccine series—are not supported by this study's findings. More frequent contacts with primary care physicians are more influential for initiation and completion of the human papillomavirus vaccine series.

Beginning in the early 2000s, health maintenance organizations (HMOs) responded to employers' requests to broaden insurance products beyond traditional health maintenance organization plans (HMPs) by introducing deductible health plans (DHPs), sometimes referred to as high-deductible or consumer-directed health plans. Deductible health plans rely on consumers to manage health care cost inflation [1,2], in part by increased patient cost sharing for selected services. Consumers

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are assumed to be price sensitive and, therefore to reduce demand for medical services—more for discretionary or ineffective medical services and less for effective prevention services—when their out-of-pocket costs for medical services increase [3–6].

Randomized controlled trials of the effect of DHPs versus HMPs on receipt of medical services have not been conducted, so evidence on possible DHP effects must be obtained from survey and observational studies. A survey of the United States (US) national population found that 31% of adults enrolled in a DHP reported "delayed or avoided" care owing to plan costs, compared with 17% in comprehensive plans [7]. Observational studies have found mixed evidence that DHP enrollment might decrease receipt of recommended prevention services, such as screening mammograms, Papanicolaou tests, well-child visits, and lipid screening [8–12].

The three-dose human papillomavirus (HPV) vaccine series is a recommended, effective cancer prevention service. The Advisory Committee on Immunization Practices recommended in June 2006 (published in March 2007) that a three-dose vaccine series with the second and third doses be administered 2 and 6 months, respectively, after the first dose [13]. The recommended age for vaccination of females is 11–12 years, but the vaccine can be administered as early as age 9 years. Catch-up vaccination is recommended for females aged 13–26 years who have not been previously vaccinated [14].

Some studies that examined whether receipt of the HPV vaccine series might be affected by insurance status found that receipt of the HPV vaccine series is higher among privately insured patients compared with publicly insured ones [15–17]; however, when uninsured or underinsured patients received the HPV vaccine series at no cost, receipt of the series was similar [18]. Receipt of the HPV vaccine series may be sensitive to patient cost-sharing level. One survey found that "moderate" cost versus "free" HPV vaccination decreased the intention to vaccinate [19].

Like most recommended screening or prevention services provided by HMOs, the HPV vaccine series is usually exempt from patient cost sharing, such as co-payments or coinsurance. Nevertheless, recommended screening and prevention services might be affected by the higher cost-sharing provisions of DHPs compared with the lower cost-sharing provisions of HMPs, for several reasons.

One reason is possible confusion among insured patients about covered services, specifically which services are exempt from co-payments and deductibles [20,21]. A survey of KP adults enrolled in a DHP found that 84% knew that their plan included a deductible; however, 48% were unaware that prevention services required little or no out-of-pocket costs [21]. Confusion and uncertainty may result in deferred receipt of recommended cancer screening services such as mammograms or colorectal cancer screening [20]. One study found that parental intention to initiate the HPV vaccine series among age-eligible daughters was more likely among those who believed that their insurance covered the cost of the HPV vaccine series than among those who believed the cost was not covered [22].

Another reason is the indirect effect on receipt of prevention services that might occur because of the sensitivity of primary care visit rates to cost sharing. Primary care visits—whether for preventive, acute, or chronic care—represent opportunities for assessing, counseling, recommending, and providing screening and prevention services [23–26]. Intended or actual receipt of HPV vaccinations has been associated with physician recommendation or frequency of physician contact [17,27–30]. Primary care visit rates, however, decrease with increased patient cost sharing [5]. Physician visits are more costly, on average, for DHP enrollees than for HMP enrollees because of co-payment differentials, coinsurance, and annual deductibles. Thus, higher patient cost sharing of DHPs may decrease opportunities for ascertaining and ensuring that patients receive the HPV vaccine series.

The objective of our study was to evaluate the influence of DHP versus HMP enrollment on initiation and completion of the three-shot HPV vaccine series. One working hypothesis was that DHP versus HMP enrollment would result in significantly decreased rates of initiation and completion of the HPV vaccine series among age-eligible females, attributable to the possible confusion of some HMO enrollees about which services are exempt from DHP co-payments and deductibles. The other working hypothesis was that part of the effect of DHP versus HMP enrollment on receipt of the HPV vaccine series might be indirect. With higher cost sharing in DHPs, primary care visit rates would be lower than in HMPs, and DHP enrollees would have opportunities for physicians to assess, inform, and motivate them to be up-to-date on recommended prevention services.

Methods

Setting

Kaiser Permanente Georgia (KPGA) and Kaiser Permanente Colorado (KPCO) were the first Kaiser Permanente (KP) regions to introduce DHPs, beginning in 2003. At the time of this study, KPGA provided comprehensive medical services to approximately 260,000 enrollees (59% Caucasian and 33% African-American) in the Atlanta area. Kaiser Permanente Colorado provided comprehensive medical services to approximately 470,000 enrollees (70% Caucasian and 17% Hispanic) in the Denver/Boulder area. The study protocol was reviewed, approved, and monitored by the institutional review boards of both study sites.

Sample definition

The primary sample used in analysis for this article consisted of 9- to 26-year-old females who obtained KP insurance through a self-pay (sometimes called individual, or direct-pay) DHP or HMP selected in 2007 (N = 3,676 at KPGA; N = 2,533 at KPCO). Additional criteria included were that subjects were HPV vaccine naive and enrolled with KP for at least 12 months before 2007 plan selection.

Samples were also defined for age-eligible females with KP insurance through an employer-sponsored DHP or HMP. Employer-sponsored plans can be classified into two types: employers who offer employees a choice of a KP DHP or HMP (typically small and midsize employers) and those who offer only a KP DHP or HMP (typically large employers). We focused on self-pay plans because of the higher levels of cost sharing required of patients and families compared with employer-sponsored plans offering DHPs. For example, at KPGA, the median annual family deductible in self-pay plans was $6,000, compared with $1,500 in employer plans offering a DHP or HMP choice and $400 in employer plans offering no choice. If any cost-sharing effect of DHPs on receipt of the HPV vaccine series were to be observed, it would most likely be in the self-pay plans.