

# Impact of the CVS tobacco sales removal on smoking cessation: when CVS Health quit tobacco, many smokers quit, too

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## Background

Smoking is the leading cause of preventable death and disease, responsible for more than 480,000 deaths each year and totaling \$133 billion in medical costs and \$156 billion in lost productivity.<sup>1, 2</sup> Quitting smoking is the single best way for smokers to improve their health, and nearly 70 percent of smokers try to quit each year.<sup>2</sup> Comprehensive cessation programs that include quit lines, cessation counseling, nicotine replacement therapy, and/or education increase the likelihood of a successful quit.<sup>3, 4</sup> Data shows that restricting access to tobacco, for example, through excise taxes, advertising limitations, and age restrictions, as well restricting the locations where tobacco can be used, also increases successful quitting, with reductions of up to 12 percent.<sup>5, 6, 7, 8, 9</sup> Recognizing that the sale of tobacco in a retail pharmacy conflicted with the delivery of health care services and the company's purpose of helping people on their path to better health, CVS Health stopped selling tobacco in its pharmacies on September 3, 2014. On the same day, the company launched a comprehensive program to encourage and support smokers in their efforts to quit, including smoking cessation counseling with MinuteClinic providers and retail pharmacists, nicotine replacement therapy products, smoking cessation medications, a dedicated quit line, and online resources.

As the one-year anniversary of the tobacco sales removal approached, the CVS Health Research Institute evaluated the impact of CVS/pharmacy's tobacco sales removal on nationwide cigarette pack and nicotine patch purchases. There were two specific questions of interest: 1) Compared to states with no CVS/pharmacy stores, what was the impact of the tobacco sales removal on cigarette pack purchases (a proxy for smoking cessation) and nicotine patch purchases (a proxy for quit attempts) in states that have CVS/pharmacy stores?; and 2) Did the impact of the tobacco sales removal vary depending on CVS/pharmacy's market share in a given state?

## Methods

We used an interrupted time series design<sup>10</sup> to conduct our evaluation, with 32 monthly measurements in the pre-removal (January 2012 – August 2014) and eight in the post-removal period (September 2014 – April 2015, the most recent month with data available for evaluation). IRI Worldwide provided cigarette pack and nicotine patch purchasing data from drug, food, big box, dollar, convenience, and gas station retailers in 26 states: AL, AR, AZ, CO, FL, GA, IL, IN, KY, LA, MD, MI, MO, NC, NV, NY, OH, OK, OR, PA, SC, TN, VT, VA, WA, and WI.<sup>11</sup> The first outcome, cigarette packs per smoker, was defined for each state as purchased cigarette packs divided by the number of adults in the state (from the American Community Survey)<sup>12</sup> times the state's prevalence of adult smokers (from the Behavioral Risk Factor Surveillance Survey).<sup>13</sup> The second outcome was nicotine patch purchases per smoker, calculated similarly. The cigarette packs per smoker outcome was intended as a proxy for smoking cessation at the population level, while nicotine patch purchases per smoker was a proxy for population-level quit attempts.

To compare the removal's impact in states with CVS/pharmacy stores to states without, we included 13 states where CVS/pharmacy's market share was  $\geq 15$  percent (obtained from the company's proprietary data) as intervention group states: AL, FL, GA, IL, IN, MD, NC, NV, NY, OH, PA, SC, and VA. Three states with no CVS/pharmacy stores, OR, WA, and CO, were control group states. To assess whether the removal's impact varied depending on CVS/pharmacy's market share, we analyzed data from all 26 states, using the log of CVS/pharmacy's market share (to account for the observed non-linear pattern of diminishing returns as market share increased) as the independent variable. In each of the linear regression models, we adjusted for the known seasonality in smoking quit attempts (e.g., New Year's resolutions to quit occur every January). Finally, in order to assess whether other factors, such as a concurrent health campaign or economic change, and not the CVS/pharmacy tobacco sales removal, were responsible for a change in cigarette purchases, we assessed soda purchases in intervention and control states during the same time period.

## Results

In the eight months after CVS/pharmacy stores stopped selling cigarettes, there was an additional 1 percent decrease in cigarette pack sales in intervention states compared with control group states. This decrease represents an on-average decrease of 0.14 cigarette packs per smoker in each month following the tobacco sales removal (95 percent confidence interval, -0.06 to -0.22;  $p=0.001$ ) in intervention versus control group states (**Table 1**). Overall, in the eight months post-removal, the average smoker in an intervention state purchased five fewer packs.

**Table 1.**

Post tobacco sales removal reduction in cigarette packs, comparing intervention versus control group states				
	Immediate change	Monthly reduction, per smoker after the removal	Total reduction per smoker in the 8 months after the removal	Total reduction in states with $\geq 15\%$ market share in the 8 months after the removal
States with $\geq 15\%$ CVS/pharmacy market share	Non-significant	-0.14 packs (-0.06 to -0.22) $p=0.0010$	-5 packs (-2 to -8)	-95,245,308 packs (-38,641,176 to -151,779,816)

Extrapolating our 0.14 packs per smoker reduction to all smokers in states where CVS/pharmacy's market share is 15 percent or greater, an estimated 95.2 million fewer cigarette packs were sold in the eight months following the removal.

As expected, the impact of the CVS/pharmacy tobacco sales removal did vary by CVS/pharmacy's market share in a given state. Between August 2014 (pre-removal) and September 2014 (post-removal), there was a two-fold greater reduction in cigarette pack purchases in states with the highest market share as compared to states with the lowest market share,  $p=0.0404$ .

Our analysis of nicotine patch purchases provides evidence of the CVS/pharmacy tobacco sales removal's impact on quit attempts. **Table 2** shows that compared with purchase rates in the control group, the tobacco sales removal was associated with an immediate 4 percent increase in purchases in the intervention group, an average of five packages per 1,000 smokers (95 percent confidence interval, 1 to 9;  $p=0.0284$ ). This surge in nicotine patch purchases immediately following the tobacco sales removal decreased to pre-removal levels over the subsequent months.

**Table 2.**

Post tobacco sales removal difference in nicotine patch package purchases per 1,000 smokers, comparing intervention versus control group states			
	Increase in patch purchases per 1,000 smokers in the first month after the removal	Monthly change in patch purchases per 1,000 smokers after the removal	Immediate increase in patch purchases in states with $\geq 15\%$ market share
States with $\geq 15\%$ CVS/pharmacy market share	5 purchases (1 to 9) $p=0.0284$	-1 purchases (-0.1 to - 2) $p < 0.0378$	96,700 purchases (19,340 to 174,059)

Extrapolated to all adult smokers in states with  $\geq 15$  percent CVS/pharmacy market share, an additional 96,700 (95 percent confidence interval, 19,340 to 174,059) packages of nicotine patches were purchased in September 2014 as a result of the CVS/pharmacy tobacco sales removal.

Finally, our soda analyses showed no statistically significant differences in soda purchases between intervention and control states at the time of or in the eight months following the CVS/pharmacy removal.

## Discussion

In this study, we found that the CVS/pharmacy tobacco sales removal was associated with a 1 percent reduction in cigarette pack sales, the equivalent of 0.14 fewer packs per smoker per month. During the eight months following the tobacco sales removal, the average smoker purchased a total of five fewer cigarette packs. Previous studies indicate that the smoking cessation pattern we observed is typical in the setting of efforts to reduce smoking.<sup>14</sup> At the same time, nicotine patch sales increased by 4 percent, or five packages per 1,000 smokers in the month immediately following the tobacco sales removal, returning to pre-removal levels over time. We saw no differences in the consumption of soda which continues to be sold at CVS/pharmacy stores. This evidence indicates that CVS Health's decision to stop selling tobacco and to implement a robust smoking cessation program had a significant, nationwide impact on the public's health.

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