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The Effects of the State of Tennessee Immunization Policy Change of 2011 - 2012 on Vaccination Uptake in East Tennessee

Abstract

In the United States, funding for the purchase of vaccines depend on annual Congressional allocations. These allocations fluctuate from year to year as Congress responds to changes in national needs for immunizations. The Affordable Care Act requires first dollar coverage of immunizations and other preventive care, allowing a reduction in federal funding for vaccine purchase and a reallocation of funds to other uses such as infrastructure development. In fiscal year 2012, the loss of funds allocated from the American Recovery and Reinvestment Act required action by states to ensure appropriate use of remaining funds. In Tennessee, the response was a policy change that redefined the population who would receive immunizations at health departments.

Keywords

Immunizations, Policy, Funding, Congress, Federal Vaccinations, Preventive Care

Federally-funded vaccine purchase in the US has historically depended on annual allocations by Congress, variations in which have been shown to effect the rate of vaccine uptake¹. With the inclusion of first dollar coverage of immunizations and other preventive care in the Patient Protection and Affordable Care Act (ACA) since September 23, 2010, federal policies regarding the funding of vaccines in the Vaccines for Children (VFC) program have shifted toward a reduction in access to federally-funded vaccines for insured persons². A federal policy change in 2011 eliminating American Recovery and Reinvestment Act (ARRA) stimulus funds decreased the available funds for vaccine purchase through Section 317. In response, the State of Tennessee implemented a policy effective October 1, 2011 restricting the provision of previously free vaccines required for entry into school, preschool, or daycare by local health departments (LHDs). Prior to this policy change, LHDs immunized all Tennesseans who presented for immunization. With the change, children ineligible for vaccines under VFC, may receive vaccines at LHDs under very limited circumstances with an administration fee that varied from \$10 to \$20³. Table 1 provides a summary of the restrictions the policy change places on immunizations at LHDs.

Table 1: Summary of Restrictions Placed on Free Immunization Provided to Children by Policy Change, Tennessee, effective October 1, 2011

Age Group; Vaccines For Children (VFC) Eligibility	Policy
Birth through 18 years; VFC eligible	❖ Any VFC eligible child can get all of the vaccines recommended for them at any health department.
Birth through age 6 years; Not VFC eligible	<ul style="list-style-type: none"> ❖ All recommended vaccines should be provided by a healthcare provider who can bill insurance. ❖ However, if children do come to a health department, they will be given vaccines.
Age 7 through 18 years; Not VFC eligible	<ul style="list-style-type: none"> ❖ School-required vaccines should be provided by a healthcare provider who can bill insurance. ❖ Health departments will give these children any vaccines they need to meet Tennessee school entry requirements and get an immunization certificate for school.

The purpose of this preliminary study is to determine the effects of the change in funding from the cessation of ARRA stimulus funding and the subsequent state-level policy change regarding the provision of free vaccines in LHDs on vaccination uptake in East Tennessee. This study looks at the median numbers of immunizations from year to year. The unit of analysis is the individual vaccination. This study uses LHD immunizations data collected by the Multi-Network Practice and Outcome Variation Examination Study (MPROVE) by the East Tennessee Practice Based Research Network (PBRN) which consists of the East Tennessee Region (ETR) of the Tennessee Department of Health, the Knox County Health Department (KCHD), and the University of Tennessee, Department of Public Health.

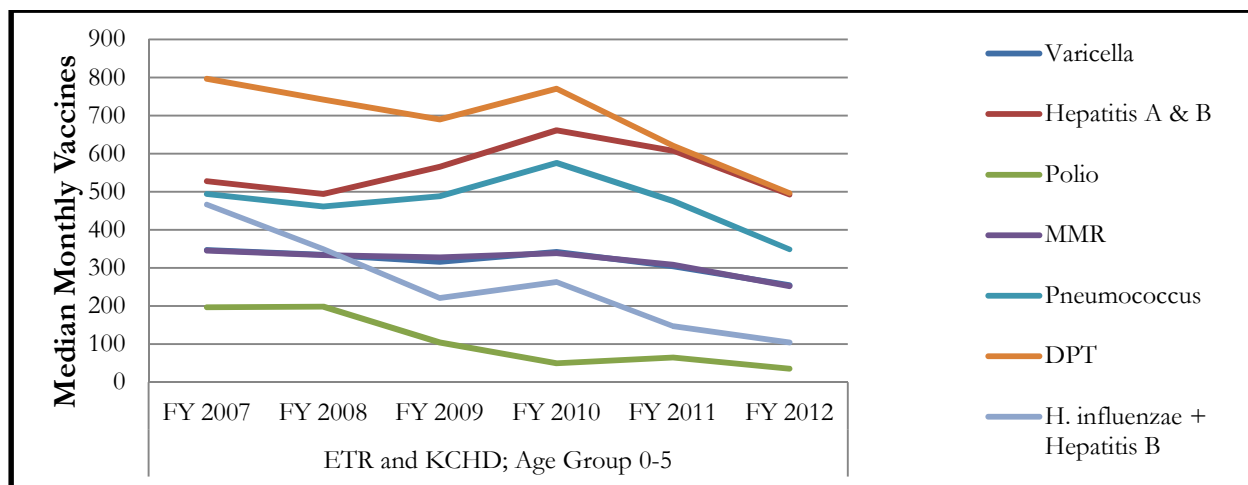
METHODS

The policy change affects only LHDs so the data collection included only KCHD and the 15 LHDs of the East Tennessee Region. Data were collected through the computerized Patient, Tracking, Billing, and Management Information System (PTBMIS) from both the KCHD and ETR, spanning October 2007 through October 2012. PTBMIS is an LHD-activity data collection system used statewide by LHDs and does not include non-LHD provider data. An internal non-billing coding system provides a means for consistent record keeping. According to the US Census, the catchment population includes 1,190,412 persons, across 16 counties⁴. Monthly immunization counts were obtained for two age groups: birth through five years and six years to eighteen years. For the analysis, we included only those vaccines required by the State of Tennessee for admission to school⁴. These vaccines include Diphtheria-pertussis-tetanus (DPT); Polio; measles-mumps-rubella (MMR); *H. Influenza* type B (HiB); Hepatitis B; Pneumococcus, influenza and Varicella⁴. Hepatitis A was included along with Hepatitis B. Vaccine data were categorized into vaccine types: combination vaccines were categorized into one vaccine type only. At KCHD the provision of pediatric primary care was transferred to another provider so vaccines given at this clinic before the transfer were not included in the analysis. The Mann-Whitney test was used to determine the significance of the difference in numbers of vaccines administered year to year, producing p-values for each age group and each vaccine. The level of significance for statistical tests was set at $p < 0.05$. Statistical analysis was performed in SPSS version 20.

RESULTS

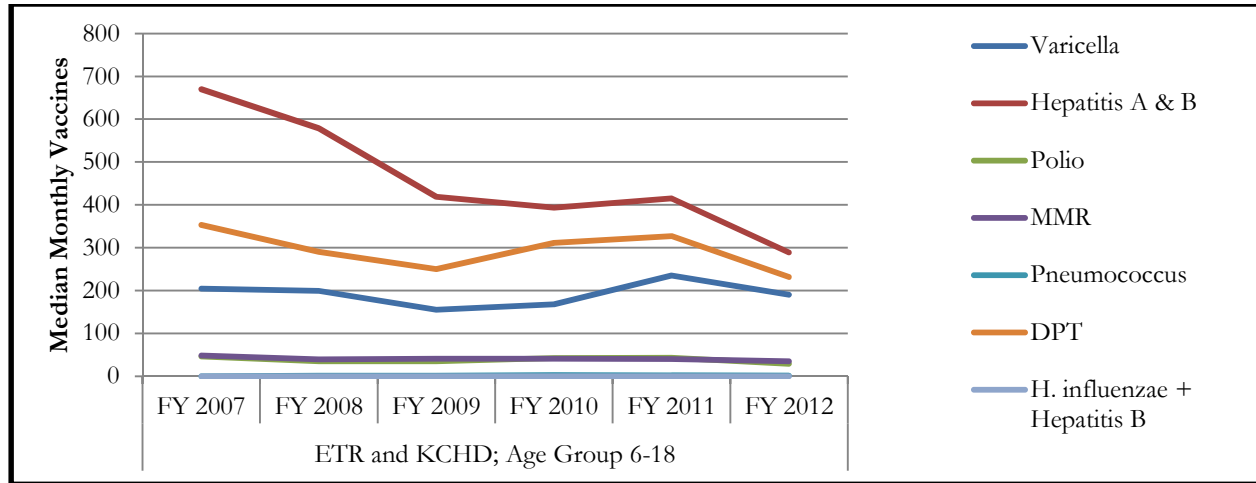
Graphs 1 and 2 show vaccine uptake by age group and vaccine type from fiscal year (FY) 2008 to FY 2012. Overall vaccine uptake at LHDs decreased from 53,792 in FY 2008 to 39,451 in FY 2012. Graph 1 shows a peak of vaccination uptake in FY 2010 followed by a decrease in vaccination uptake for children birth-5 years during FY 2012 compared to 2011 for all vaccines, with a steeper decrease for DPT, Hepatitis A&B and Pneumococcus. There were statistically significant changes in vaccinations for all vaccines except Varicella and MMR, which declined at a slower rate than other vaccinations through the period from FY 2010 through 2012. Comparing FY 2011 to 2010 a general decline is also seen, but only statistically significant in the case of *H. influenza*.

Graph 1: Median of the Monthly Vaccination Uptake in East Tennessee Before and After Policy Change of October 1, 2011 for the Younger Age Group, 0-5 years By Fiscal Year



Graph 2, for the older age group, shows a peak of vaccination uptake in FY 2011 followed by a sharp reduction in vaccination counts of DPT, Varicella, and Hepatitis A&B during FY 2012 compared to 2011, but statistically significant reductions in vaccinations in the older age group are found only for Hepatitis A&B. Pneumococcus, *H. Influenzae*, and MMR vaccines remained steady during this two-year period.

Graph 2: Median of the Monthly Vaccination Uptake in East Tennessee Before and After Policy Change of October 1, 2011 for the Older Age Group, 6-18 years By Fiscal Year



A review of Table 2 which compares immunizations in fiscal year 2011 to fiscal year 2012 reveals reductions in the median number of vaccines for both age groups with the single exception of *H. influenzae* for the older group. The younger group experienced statistically significant reductions in almost all types of vaccine, which is interesting given the older group were expected to experience the effect more than the younger group which experienced significant change for Hepatitis A and B only.

Table 2: Significance of Changes in Vaccination Uptake, 2010-2012, Knox County and East Tennessee

Age Group		Monthly median		p Comparison
		FY 2011	FY 2012	
Birth through 5 years	Varicella	304	254	0.260
	Hepatitis A/B	607	492	0.004
	Polio	64	35	0.035
	MMR	308	252	0.225
	Pneumococcus	475	348	0.000
	DPT	621	496	0.009
	H. influenza	147	104	0.000
	Total	2541	1991	0.007
Six years through 18 years	Varicella	235	190	0.225
	Hepatitis A/B	415	289	0.006
	Polio	43	29	0.088
	MMR	40	35	0.386
	Pneumococcus	2	1	
	DPT	327	231	0.065
	H. influenza	0	0	
	Total	1049	712	0.065

IMPLICATIONS

Results of this study show that 1) Vaccination uptake through LHDs has declined since 2007; 2) Since the decline was evident prior to the policy change it is not possible to completely isolate the effects of the policy change alone on vaccine uptake; 3) The steeper decline in vaccine uptake for specific vaccines in both age groups after the policy went into effect at least suggests that the policy change may have negatively impacted vaccine uptake. Continued study of vaccination uptake in East Tennessee is warranted; especially given the effects of first dollar coverage for preventive care mandated by the ACA and the federal reallocation of funding for vaccinations such as the changes in the Section 317 rule effective October 1, 2012.

Tracking vaccine uptake in children is important for understanding and estimating the impact of policy changes on health services delivery. This study provides some evidence that the policy changes in 2011 may have had a detrimental impact on vaccine uptake, but the study also highlights the difficulty in showing direct cause-and-effect. Documenting public health services delivery, such as vaccines for children, will become increasingly important as the ACA becomes more widely implemented. Although policymakers designed the policy to address the provision of vaccinations for school-age children, the effect was seen in younger children as well. The proliferation of alternative vaccination sites such as pharmacies may have had the effect of pulling some parents from the health departments to these sites as well. Continued study of the effects of vaccination policy on the uptake of vaccines in East Tennessee is an important part of the documenting service delivery.

There are several limitations to this study. We were unable to include influenza due to data collection issues, which is frequently used as a benchmark for vaccination programs, since not all influenza vaccine data were documented through PTBMIS. We cannot fully attribute the downward trend to the policy change because a downward trend was already occurring for the younger group starting in FY 2010. This trend may have multiple causes and the policy change was only one of the potential reasons for the reduction in vaccinations.

SUMMARY BOX:

What is Already Known about This Topic? Immunization programs, such as the VFC program, rely on annual Congressional budget allocations which fluctuate from year-to-year. Such fluctuations have been shown to effect vaccination uptake.

What is Added by this Report? The change in funding caused by the elimination of ARRA funds in FY 2012 forced changes in vaccination administration policy at the state level. These changes had some effect on vaccination uptake in East Tennessee although a downward trend in vaccination uptake was already established prior to the policy implementation.

What are the Implications for Public Health Practice, Policy, and Research? Public Health agencies are faced with continued challenges in the delivery of immunizations. Continued monitoring of the effects of policy changes is an important activity in documenting public health service delivery.

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