



State Variation in the Hospital Costs of Gun Violence, 2010 and 2014

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Introduction

Although the scourge of gun violence in the United States continues unabated, little data are available on its financial cost to individuals and society, in particular the initial cost of medical care for victims of armed assault who survive to be treated in a hospital. We previously produced some of the only data on the hospital cost of armed assault in 2010 (Howell and Abraham 2013; Howell, Bieler, and Anderson 2014). Those reports showed that in 2010, the cost of medical care for gun violence was very high (over \$620 million for the nation), with wide variation in hospital use, mortality, and payer source across states. Further, costs were disproportionately concentrated among young minority men. Most costs were borne by taxpayers either because gunshot victims were uninsured or because they were covered by Medicaid. This brief provides information available for 2014 on hospital use, costs, and payer source for six states: Arizona, Florida, Kentucky, New Jersey, North Carolina, and Wisconsin.

With the implementation of the coverage provisions of the Affordable Care Act (ACA), we expect potentially dramatic shifts in payer source between 2010 and 2014, particularly in states that expanded Medicaid. The ACA included new tax credits for health insurance, health insurance reforms, an individual mandate, expansion of dependent coverage to include young adults up to age 26, and expansion of Medicaid coverage in states that opted in. Recent studies have found that the Medicaid expansion increased coverage and access to health care (Courtemanche et al. 2017; Garrett and Gangopadhyaya 2016; Kaestner et al. 2015; Kirby and Vistnes 2016; Wherry and Miller 2016) and reduced uncompensated care costs for hospitals (Blavin 2016).

Our findings on the costs of armed assault in the six study states are as follows:

- From 2010 to 2014, the rate of hospital use for armed assault remained stable in Florida, New Jersey, and North Carolina; increased in Kentucky and Wisconsin; and declined in Arizona.
- Hospital costs per patient were high, ranging from \$9,000 to \$18,000 in 2014.
- State policies on ACA Medicaid expansion, Medicaid waivers, and state-only funding for childless adults had a dramatic impact on the costs of hospital care for armed assault victims.
- The burden of costs shifted from uninsured patients and/or hospital uncompensated care to public coverage in the three states that expanded coverage for childless adults. Of this group,

Kentucky and New Jersey expanded Medicaid through the ACA option, and Wisconsin expanded coverage with state-only funding.

- The payer mix remained consistent from 2010 to 2014 in three states. Of this group, Florida and North Carolina did not expand Medicaid coverage under the ACA, and Arizona had a previous Medicaid waiver to cover low-income childless adults.

This brief updates the armed assault hospital cost estimates with data from 2014, the first year of full implementation of the ACA’s major coverage provisions. We provide data for Arizona, Florida, Kentucky, New Jersey, North Carolina, and Wisconsin; of these, Arizona, New Jersey, North Carolina, and Wisconsin were included in our previous brief. We selected these six states based on data availability, population size, geographic representation, and participation in the ACA Medicaid expansion (table 1). The states reflect a range of decisions on Medicaid coverage: Arizona, Kentucky, and New Jersey adopted the Medicaid expansion in 2014, but Florida, North Carolina, and Wisconsin did not. Arizona had a Section 1115 demonstration waiver in place in 2010 that provided coverage to childless adults with incomes up to 100 percent of the federal poverty level (FPL). Wisconsin also had a Section 1115 demonstration waiver to extend eligibility to 200 percent of FPL, but enrollment for the program was capped as of October 2009. In 2014, Wisconsin used state funds to provide eligibility to childless adults with incomes up to 100 percent of FPL and removed the enrollment cap. Most importantly, all six states have complete data for the analysis from the Healthcare Cost and Utilization Project, described later in this brief.

TABLE 1
Medicaid Eligibility Cutoff for Childless Adults, 2010 and 2014

	2010	2014
<i>Expansion states</i>		
Arizona	100% of FPL	138% of FPL
Kentucky	None	138% of FPL
New Jersey	None	138% of FPL
<i>Nonexpansion states</i>		
Florida	None	None
North Carolina	None	None
Wisconsin ^a	200% of FPL	100% of FPL

Sources: 2010 and 2014 Medicaid eligibility rules from Kaiser Family Foundation reports (Heberlein et al. 2011; Brooks et al. 2015).

Notes: FPL = federal poverty level. ^a Wisconsin placed a cap on the number of eligible individuals who could be covered under the waiver; in 2010, the state was no longer accepting new enrollees.

Data and Methods

This study examines hospital use and costs resulting from firearm assaults. Data for the study derive from the State Inpatient Databases (SID) and State Emergency Department Databases (SEDD) made available by the Healthcare Cost and Utilization Project of the Agency for Healthcare Research and Quality.

The SEDD and SID contain abstracts for each emergency department visit and inpatient hospital discharge in the study states. The abstracts report patient demographic characteristics, expected payment source (i.e., insurance status), hospital charges for each visit, and external cause-of-injury

codes, which permit identification of firearm assault injuries.¹ When a person is admitted first to the emergency department (ED) and then to the hospital, their utilization and charges (including ED charges) are included in the inpatient hospital data. The Medicare hospital cost-to-charge ratio is used to convert charges to costs. The denominators for emergency department (ED) visit and hospital discharge rates per 100,000 people are derived from the decennial Census (for 2010 estimates) and the American Community Survey (for 2014 estimates).

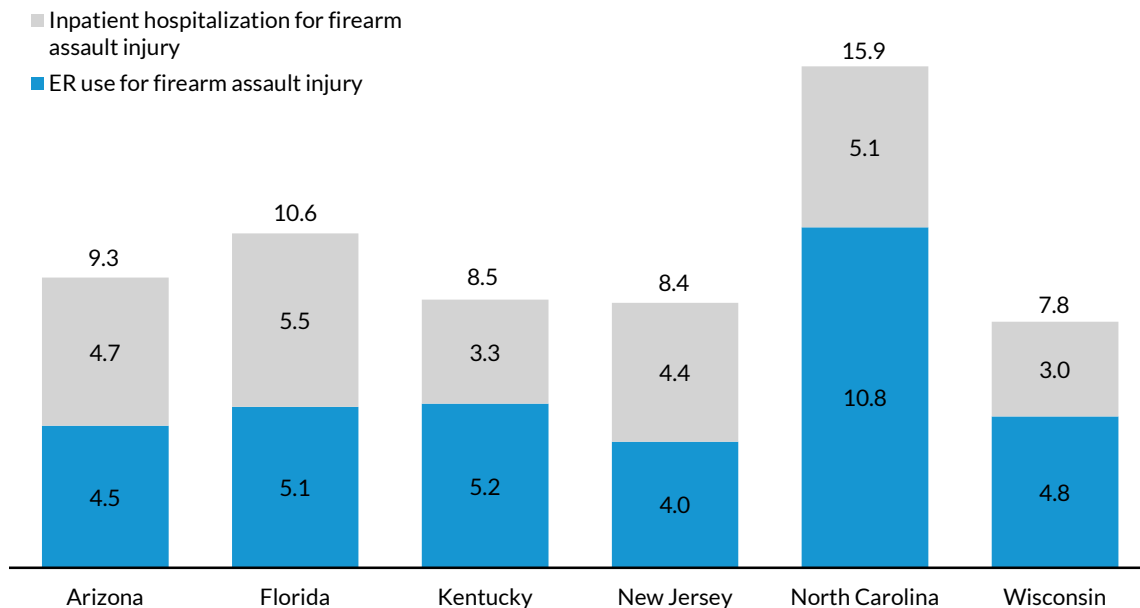
Findings

Use

Figure 1 shows use of the ED and inpatient hospital for firearm assault victims in the study states in 2014. North Carolina has the highest use rate; 15.9 people per 100,000 in the state used either the ED or had an inpatient hospital stay to treat firearm assault injuries. Among the remaining five states, the use rate ranges from 7.8 in Wisconsin to 10.6 per 100,000 in Florida. North Carolina's higher total use rate is driven by higher use of the ED (10.8 per 100,000). The other states' ED use rates range from 4.0 to 5.2 per 100,000. Inpatient hospital use ranges from 3.0 per 100,000 (Wisconsin) to 5.5 (Florida).

FIGURE 1

Rate of Hospital Use for Firearm Assault Injury per 100,000 People, 2014



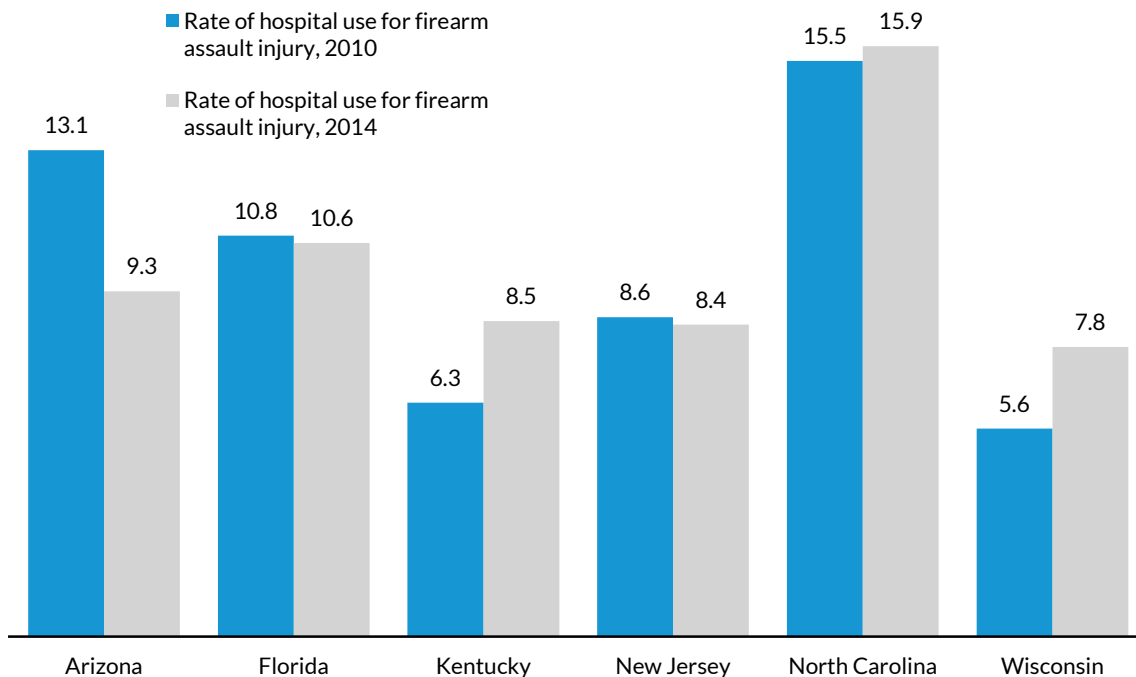
Source: Authors' calculations based on SID and SEDD data. State population data are from the 2014 American Community Survey.

Note: Inpatient and ER use may not sum to total use because of rounding.

Figure 2 shows the change in overall hospital use from 2010 to 2014 in each study state. Hospital use dropped from 13.1 to 9.3 per 100,000 in Arizona. In contrast, use rose in Kentucky (from 6.3 to 8.5 per 100,000) and Wisconsin (from 5.6 to 7.8 per 100,000). Hospital use for armed assault in the other three states changed little during this period.

FIGURE 2

Change in Rate of Hospital Use for Firearm Assault Injury per 100,000 People, 2010 to 2014



Sources: Authors' calculations based on SID and SEDD data. State population data are from the 2014 American Community Survey.

Costs

Our previous brief documented hospital costs for armed assault and highlighted significant state-level variation in these costs. Table 2 shows those costs for 2014, separately for ED and inpatient hospital costs. As shown, total costs are driven by the much higher inpatient hospital costs. Florida, the most populous state in our study, has the highest total hospital costs at \$28 million. In Kentucky, the least populous state, \$4 million is attributed to firearm assault. As shown in table 2, the average cost per patient ranges from \$9,000 (North Carolina) to \$18,000 (New Jersey). North Carolina has a higher rate of ED visits, which are substantially less expensive than hospital stays.

TABLE 2

Hospital Costs for Firearm Assault Injury in Select States, 2014*Thousands of dollars*

State	Emergency department costs	Inpatient costs	Total hospital costs	Total hospital cost per patient
Arizona	\$970	\$8,923	\$9,894	\$16
Florida	\$2,362	\$25,800	\$28,162	\$13
Kentucky	\$442	\$3,296	\$3,738	\$10
New Jersey	\$767	\$12,400	\$13,167	\$18
North Carolina	\$2,612	\$10,700	\$13,312	\$9
Wisconsin	\$852	\$5,610	\$6,463	\$14

Source: Authors' calculations based on SID and SEDD data.

Table 3 shows total hospital costs for armed assault in 2010 and 2014 and the difference in costs between the two years. Total costs declined moderately in Arizona and Florida, but total costs increased in the other four states. Increases were substantial in Kentucky, which saw an increase of \$579,000 (an 18 percent increase); New Jersey, which saw an increase of more than \$3.3 million (a 34 percent increase); and Wisconsin, which saw an increase of \$2.7 million (a 72 percent increase).

TABLE 3

Total Hospital Costs from Firearm Assault Injury by State, 2010 and 2014*Thousands of dollars*

State	Total hospital costs, 2010	Total hospital costs, 2014	Percentage change in total hospital costs, 2010–14
Arizona	\$10,866	\$9,894	–8.9%
Florida	\$30,561	\$28,162	–7.8%
Kentucky	\$3,159	\$3,738	18.3%
New Jersey	\$9,857	\$13,167	33.6%
North Carolina	\$12,615	\$13,312	5.5%
Wisconsin	\$3,757	\$6,463	72.0%

Source: Authors' calculations based on SID and SEDD data.

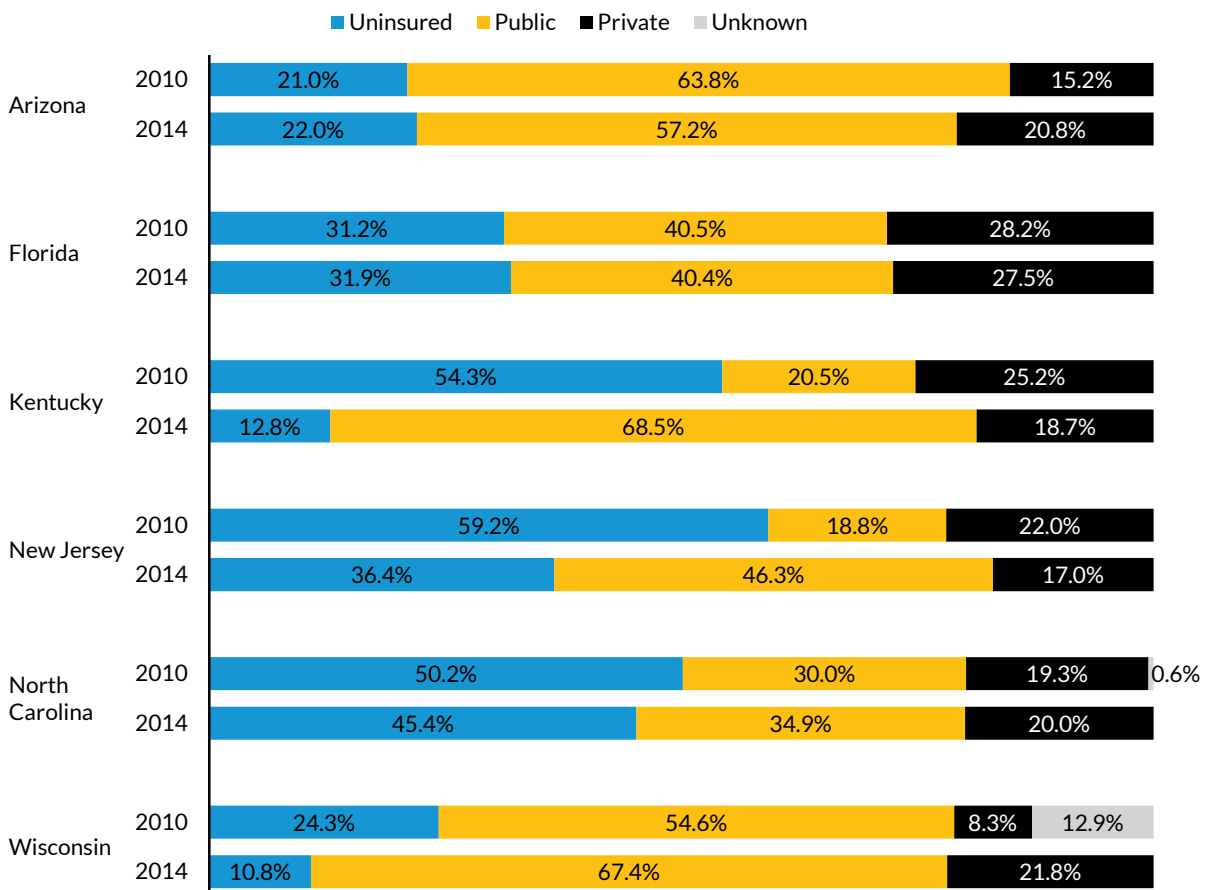
Our previous brief showed that a majority of hospital costs for armed assault are borne by the public, either as uncompensated care for the uninsured or through Medicaid. The Medicaid expansions should shift the insurance mix, especially in the two study states where the Medicaid eligibility level changed dramatically for childless adults (Kentucky and New Jersey, see table 1). Figure 3 shows the share of total costs for armed assault patients with private coverage, public coverage, and no coverage for both 2010 and 2014. Despite modestly expanding Medicaid in 2014, Arizona showed little change in the insurance composition of its costs. As expected, the percentage of uninsured patients fell dramatically in Kentucky and New Jersey, both Medicaid expansion states with large increases in eligibility for childless adults. Kentucky saw the largest drop in uninsured patients, from 54.3 to 12.8 percent. This drop coincides with a correspondingly large increase in the number of publicly insured

patients (48.5 percentage points). Similar patterns are observed in New Jersey (22.8 percentage point drop in uninsured; 27.5 percentage point increase in publicly insured). Both states also saw a modest decrease in the share of privately insured victims of armed assault.

The change in coverage for armed assault victims in Wisconsin is unclear. As indicated above, Wisconsin did not expand Medicaid under the ACA but instead chose to cover low-income childless adults with state dollars. The state shows an apparent 13.5 percentage point decrease in the uninsured and a 12.8 percentage point increase in the publicly insured. However, if patients with an unidentified primary payer in 2010 (12.9 percent) were mostly publicly insured, then this amounts to virtually no change in the payer mix for firearm assault victims in Wisconsin.

FIGURE 3

Coverage of Hospital and Emergency Room Costs for Armed Assault, 2010 and 2014



Source: Authors' calculations based on SID and SEDD data.

Discussion

In 2014, hospital use for armed assault varied substantially across the states, with the highest rates in North Carolina (15.9 per 100,000) and Florida (10.6 per 100,000). Emergency department use was particularly high in North Carolina, compared with the other states. Use declined in Arizona from 2010 to 2014 but was stable or increased in the other study states. Hospital costs also varied substantially across states. The average cost per patient was high, ranging from \$9,000 per patient in North Carolina to \$18,000 in New Jersey. Most states experienced hospital cost increases for armed assault during the study period; the exceptions were Arizona and Florida.

Given the time frame of the study, the shift in the payer mix in three states is of particular interest. Kentucky saw a very dramatic decline in the share of costs attributable to the uninsured, and New Jersey also saw a substantial decline. Although Wisconsin saw a substantial decrease in its share of costs attributable to the uninsured, interpretation of the state's change in payer mix is complicated by the large share of patients with unidentified payers in 2010. Kentucky and New Jersey took up the ACA Medicaid expansion, adding coverage for low-income childless adults. Wisconsin also expanded coverage for this group using state dollars without expanding Medicaid. Arizona did not experience such a decline, likely because the state was already covering low-income childless adults in 2010 using its Medicaid waiver.

The data suggest that expanding coverage through Medicaid or state funds reduced uninsurance rates among victims of armed assault. This in turn likely led to reductions in medical bills for the victims and their families. It may have also had an impact on uncompensated care for hospitals treating such patients. Thus, hospitals treating armed assault victims likely benefited from the Medicaid expansion (and, in Wisconsin, from the state-funded expansion) for childless adults during this period.

It is unclear whether patient care for the newly insured changed during the time period, or whether treatment patterns and costs changed for assault victims after their discharge from the hospital. More research is needed on this important topic. This brief assesses changes in the hospital costs of armed assault during a time of expanding health insurance coverage, finding large shifts away from uninsurance in Kentucky and New Jersey. Congress is now considering partial repeal of the Affordable Care Act through the budget reconciliation process with no clearly defined replacement (Blumberg, Buettgens, and Holahan 2016). This analysis indicates that a contraction of coverage, particularly for low-income adults, would put victims and the hospitals that treat them at greater risk for bearing the costs of armed assault. For example, if Kentucky's payer mix returns to 2010 pre-ACA levels, over 50 percent of the state's armed assault victims with emergency room or hospital stays would be uninsured.

Notes

1. The six external cause-of-injury codes used to identify firearm assault visits are E965.0, E965.1, E965.2, E965.3, E965.4, and E979.4.

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Embry M. Howell is a senior fellow in the Health Policy Center at the Urban Institute, where she focuses on research and evaluation concerning health programs for vulnerable populations, particularly women and children. She employs both qualitative and quantitative research methods to evaluate these issues, often using administrative records to create research databases. To this end, she helped design the federal Medicaid research database. She is also an accomplished project director, helping direct an evaluation of the San Mateo County adult coverage initiative, evaluations of Children's Health Initiatives in three California counties, a policy analysis of universal vaccine coverage in New York, four studies of children's mental health services, case studies of the health care safety net in five cities, an evaluation of a national infant mortality prevention program, and an evaluation of a demonstration program for pregnant substance abusers. Howell's work has extended beyond the United States to

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