

## Emergency room use under the ACA: Is patient access to appropriate care settings improving?



### Executive summary

Emergency room (ER) utilization is one of the barometers to track progress towards achieving certain Affordable Care Act (ACA) goals: ER use should likely drop with better access to care and a more efficient health care system. ER use is driven by many factors; among them, perceived need for urgent care, severity of the medical condition, availability and accessibility of ER and other ambulatory care, and physician referrals to the ER. However, studies suggest that uninsured individuals—who may lack access to alternative care settings—might also use ERs for non-emergency conditions.<sup>1,2</sup>

ERs can be an expensive care setting for routine or preventative care, since they maintain 24-hour staff and have a wide range of capabilities, services, and equipment, including resource-intensive technologies. Most ERs are not set up for continuity of care, and are not a substitute for a primary care relationship, nor can they address the broader social determinants of health.

Under new value-based payment models, including those under the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA), health care payers (government and private health plans) and health systems are striving to find ways to lower total cost of care while maintaining high quality. This includes reducing costs through more appropriate use of ERs.

Are stakeholders' efforts working? Has inappropriate ER utilization decreased and has patient access to alternative care settings improved? Deloitte Center for Health Solutions' analysis of recent trends in ER use finds:<sup>3</sup>

### **The growth in ER visit rates (ER visits per 100 population) has generally been slower in Medicaid expansion (ME) states than in non-expansion states, particularly over longer time horizons (two-to-three years following expansion):**

- Prior to 2014, the growth in ER visit rates was similar in Medicaid expansion and non-expansion states. However, between 2013 and 2014, the year when most Medicaid expansion programs started, the growth in ER visit rates was generally slower in ME states.
- In the District of Columbia and many of the six states (California, Colorado, Connecticut, Minnesota, New Jersey, and Washington) that expanded Medicaid earlier than 2014, ER visit rates increased in the first year following the expansion, but stabilized or even slightly decreased two-to-three years after their expansions.

### **Following the 2014 expansions, new Medicaid enrollees reported fewer issues in accessing alternative care settings, including primary care, compared to the uninsured.**

- Our analyses of the National Health Interview Survey (NHIS) show that in 2014, just four percent of the new Medicaid enrollees (compared to 30 percent of the uninsured) reported the ER as their usual care setting. In 2014, nine in ten of the newly Medicaid insured visited a primary care physician compared to just 51 percent of the uninsured.
- In 2015, people new to Medicaid were slightly more likely to cite lack of access to other care settings as the reason for an ER visit compared to those who enrolled in Medicaid in 2014 (though the percentage was much lower compared to pre-expansion years). In 2015, 33 percent of new Medicaid enrollees said they visited an ER because they had no other place to go (versus 24 percent in 2014 and 52 percent in 2013).

**Markets with a higher concentration of urgent care centers (UCCs) have lower ER visit rates. UCCs are sparse in markets with higher ER visit rates, most of which have larger uninsured and Medicaid populations. However, more UCCs are accepting the new Medicaid enrollees, and may be emerging as an alternative to ERs.**

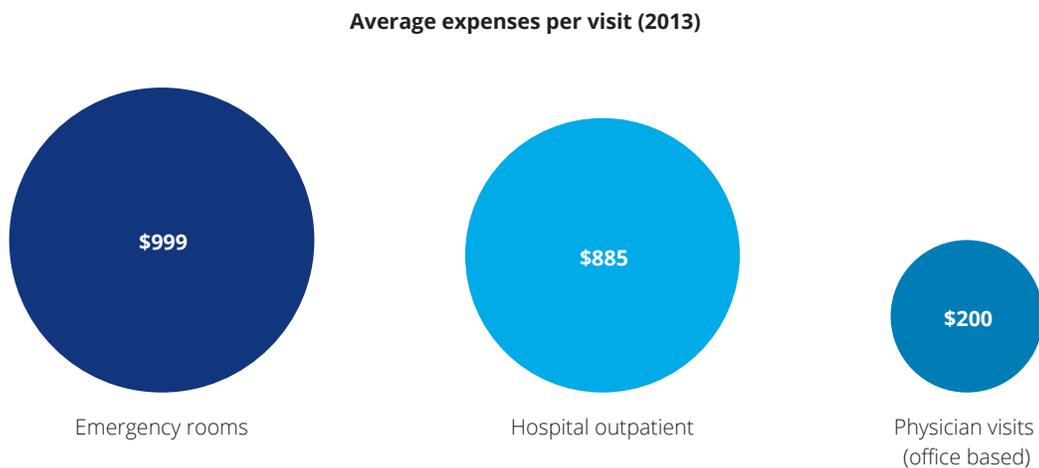
- Between 2011 and 2014, median ER visit rates in the local markets (hospital referral regions or HRRs) with the highest concentration of UCCs per capita were generally lower than in areas with lower UCC concentration. In markets with moderate-to-low UCC concentration, many of which have a high concentration of Medicaid enrollees, we found high median ER visit rates.

- Our analysis of survey data from the Urgent Care Association of America (UCAOA) shows that UCCs are increasingly serving Medicaid patients. In 2014, for instance, the share of total UCC visits by Medicaid patients was 15 percent, compared to just five percent in 2013.

### Emergency rooms: Expensive essentials

Health system emergency rooms can play a vital role in patient care by providing essential and sometimes life-saving services for patients with urgent medical conditions. However, ERs' use of specialty physicians, 24-hour staffing, and highly sophisticated technology makes them one of the most expensive health care settings (Figure 1).

**Figure 1. Emergency rooms are an expensive care setting compared to outpatient facilities**



Source: Medical Expenditure Panel Survey, 2013

While most ER visits are not preventable, but rather prompted by the seriousness of the underlying medical condition, anecdotal evidence and literature on the topic suggest that some ER visits—especially by the uninsured—appear to be driven by a lack of access to alternative sites of care, such as primary care.<sup>4</sup>

Our analyses using NHIS data between 2011 and 2015 are consistent with these findings. In 2015, for instance, one-third of the uninsured reported that ERs were their “usual place of getting care,” compared to just 12 percent of overall respondents (Figure 2).

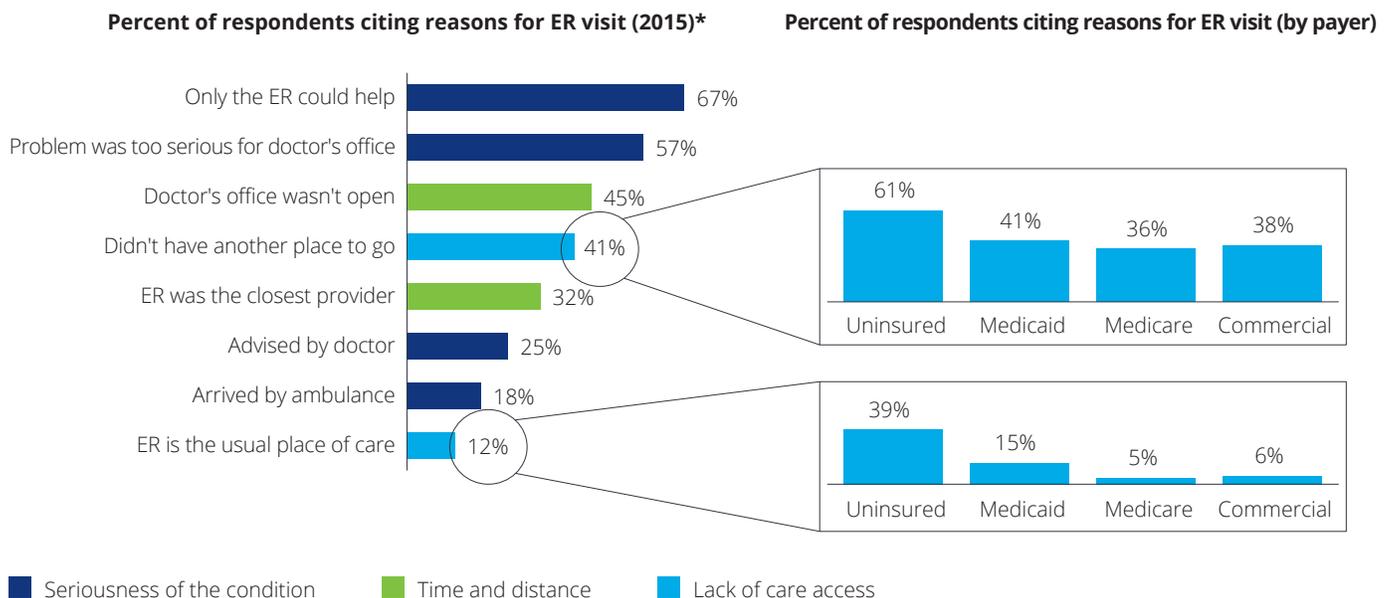
Preventable ER visits, that is, ER visits for conditions that are preventable or treatable with access to more appropriate care settings, can increase spending for all stakeholders. For health systems, uncompensated care from ER use is a big issue; health systems cannot turn away patients on the basis of insurance status or ability to pay.<sup>5</sup> The Centers for Medicare and Medicaid Services (CMS) found about 55 percent of ER services go uncompensated.<sup>6</sup> State health agencies and health plans are also concerned about inappropriate ER utilization if patients could be treated at a lower cost in

alternative care settings.<sup>7</sup> A 2010 Network for Excellence in Health Innovation (NEHI) report estimated that ER overutilization leads to about \$38 billion in wasteful health care spending every year.<sup>8</sup>

Recent policy initiatives and marketplace changes, such as the state Medicaid expansions under ACA and the proliferation of UCCs, could potentially increase access to more appropriate care settings and reduce ER use. However, increased Medicaid coverage could also lead to increases in ER visits<sup>9</sup> resulting from pent-up patient demand. Moreover, the newly insured may have cultural and behavioral patterns of care-seeking, may not be used to making primary care appointments, or may not have established a regular primary care provider relationship.<sup>10</sup>

Another consideration is whether UCCs might affect the pattern of ER use. Although most UCCs tend to primarily focus on privately insured populations, many are beginning to accept more Medicaid patients. Most UCCs have shorter waiting times and lower out-of-pocket costs compared to ERs and could prove increasingly attractive to new Medicaid enrollees.

**Figure 2. Uninsured are more likely to visit ERs due to lack of access to other care settings**



\*Multiple responses allowed

Source: Deloitte analysis based on data from NHIS, 2015

Studies of these trends' impact on ER visits are mixed. For instance, one in two emergency physicians reported seeing an increase in Medicaid patients visiting ERs since 2014, according to a 2015 American College of Emergency Physicians survey. They also reported little or no reduction in ER visits due to availability of other care sites, including urgent care centers.<sup>11</sup> However, a 2016 Health Affairs study concluded there was no significant increase in ER visits in Medicaid expansion states compared to non-expansion states in 2014.<sup>12</sup> Additionally, a state report on Oregon's Coordinated Care Organization program, which manages care for a majority of Medicaid enrollees, suggested a decline in ER use since the 2014 Medicaid expansion.<sup>13</sup>

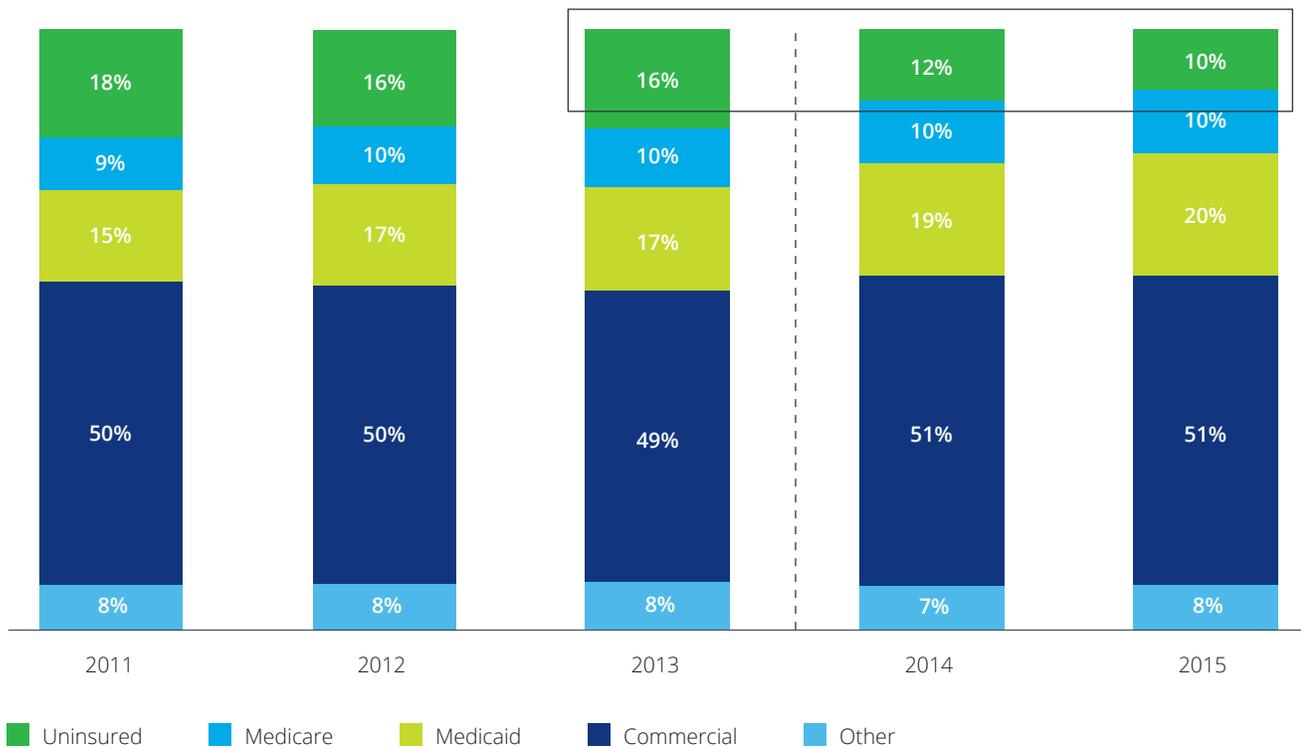
To shed additional light on the impact of these trends on ER visits, we analyzed data on ER visits from the American Hospital Association (AHA) and NHIS.

**The share of visits by the uninsured in total emergency room visits has declined since 2014**

Not surprisingly, as more people have shifted from being uninsured to obtaining coverage under Medicaid and commercial (health insurance exchange) programs, we have seen a shift in the patient mix for ER care. Our analyses using NHIS data show that while between 2011 and 2013 the share of ER visits by the uninsured was relatively constant (17 percent on average), following the 2014 Medicaid expansions, the 2014 and 2015 uninsured share in the ER patient mix decreased by four and two percentage points, respectively (Figure 3).

To further determine whether the change in patient mix impacted ER visit rates, particularly in states that expanded Medicaid, we analyzed AHA data between 2008 and 2014 on the number of visits per capita to health system-affiliated ERs in the states that expanded Medicaid (ME states) compared to those that did not (non-ME states).

**Figure 3. The share of uninsured in the ER patient mix has declined after the 2014 Medicaid expansions**



Source: Deloitte analysis based on data from NHIS

**The rate of growth in ER visits in Medicaid expansion states is likely to slow over time**

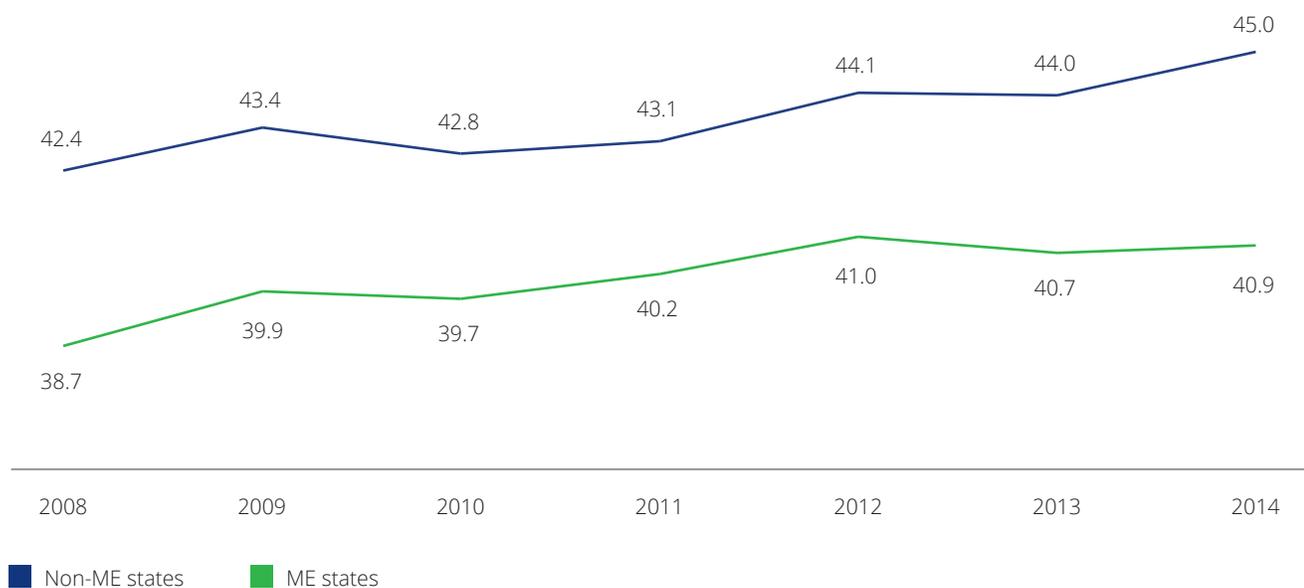
Although absolute rates of ER visits per 100 lives over the past years have been consistently lower in ME states compared to the rates in non-ME states, the trends for ME and non-ME states were similar prior to 2014. Following the 2014 Medicaid expansions, however, the trends diverged: the ER visit rate in non-ME states increased slightly, while the rate for ME states remained relatively constant (Figure 4).

It is too soon to know whether the slowdown in ER visit rates in ME states is likely to continue; however, evidence from states that expanded Medicaid earlier suggests a slowing of ER use over the last several years following the expansion. Between 2010 and 2012, six states (California, Colorado, Connecticut, Minnesota, New Jersey, and Washington) and the District of Columbia took advantage of a special ACA provision and Section 1115 waivers to include low-income,

childless adults and secured federal funding to partially expand their Medicaid programs before the 2014 deadline. Existing evidence indicates that these states were successful in gradually enrolling low-income adults in Medicaid, and that these efforts might have helped these states be better prepared in terms of their outreach and enrollment processes for the 2014 (fuller) Medicaid expansions.<sup>14, 15</sup>

Among some of these early-expansion states we see a pattern: after an initial increase in ER visit rates post-expansion, the growth in ER visit rates slowed down. In Connecticut, New Jersey, and Colorado, an increase in ER visits in the first year or two was followed by a slowdown, although post-expansion levels were not always absolutely lower than pre-expansion ones (Figure 5). In California, although aggregate ER rates have been growing since expansion, likely due to state-specific factors, the pattern for enrollees in the Low Income Health Program (LIHP) (one of the main parts of the early expansion) followed a similar pattern of initial increase

**Figure 4. In 2014, the ER visit rate (ER visits per 100) was stable for ME states and growing in non-ME states**



Source: Deloitte analysis based on data from the AHA

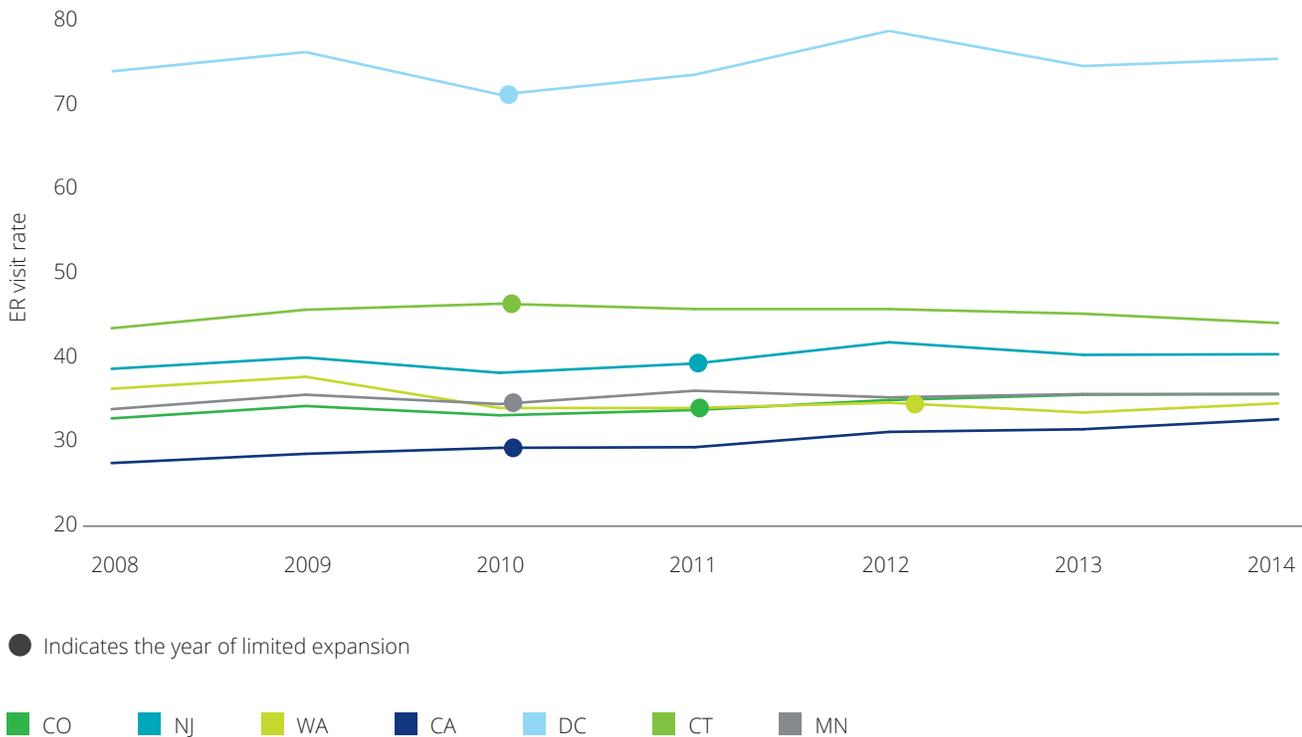
followed by subsequent decrease. A group of LIHP enrollees which had never previously used the county indigent health services initially visited ERs at a much higher rate, leading to an increase in the visit rates. These rates steadily declined over time and eventually matched the lower rate of other LIHP enrollees.<sup>16</sup>

Many state- and health system-level factors could influence ER visit rates in addition to states' decision to expand Medicaid. We conducted regression analyses which included controls for health system organizational characteristics (such as size, urban/rural location, ownership type, teaching status, and being part of a health system versus being independent); for case

and payer mix; and for Hospital Referral Regions (HRR) socio-economic characteristics such as share of public insurance, unemployment, and poverty rates. (Refer to Appendix for methodology details.)

The regression results are consistent with the descriptive analyses: ER visits at health systems located in early Medicaid expansion states increased during the first year after expansion. However, the rate of increase declined during the second year, and ER visit rates declined in subsequent years (more than three years post-expansion). In addition, these patterns were most pronounced in HRRs where the decline in uninsured rates was the largest.

**Figure 5. ER visit rate for early expansion states slowed down after initial increase**



Source: Deloitte analysis based on data from the AHA

**Reasons for changes in ER visits and usage trends**

Our descriptive and regression analyses show that although ER visit rates might initially increase post-expansion, they are likely to stabilize and might even decline over time. These results are consistent with analyses of pre-ACA Medicaid expansions (between 2000 and 2009) in eight states that found no evidence of long-term increased use of emergency services or erosion of perceived access to care among enrolled adults.<sup>17</sup> What are the underlying reasons behind these trends?

When analyzing reasons for ER use among NHIS survey respondents, the uninsured, and new Medicaid enrollees (see Methodology for a definition of new

Medicaid enrollees), we found evidence that suggests improved access to care following the recent Medicaid expansions, particularly in 2014. Compared to the uninsured, new Medicaid enrollees were more likely to report visiting ERs due to the seriousness of the underlying medical condition rather than due to lack of access to other sites of care (Figure 6). For instance, in 2014 just 24 percent of the new Medicaid enrollees (compared to one in two uninsured) cited not having another place to go for care as a reason for their ER visit.

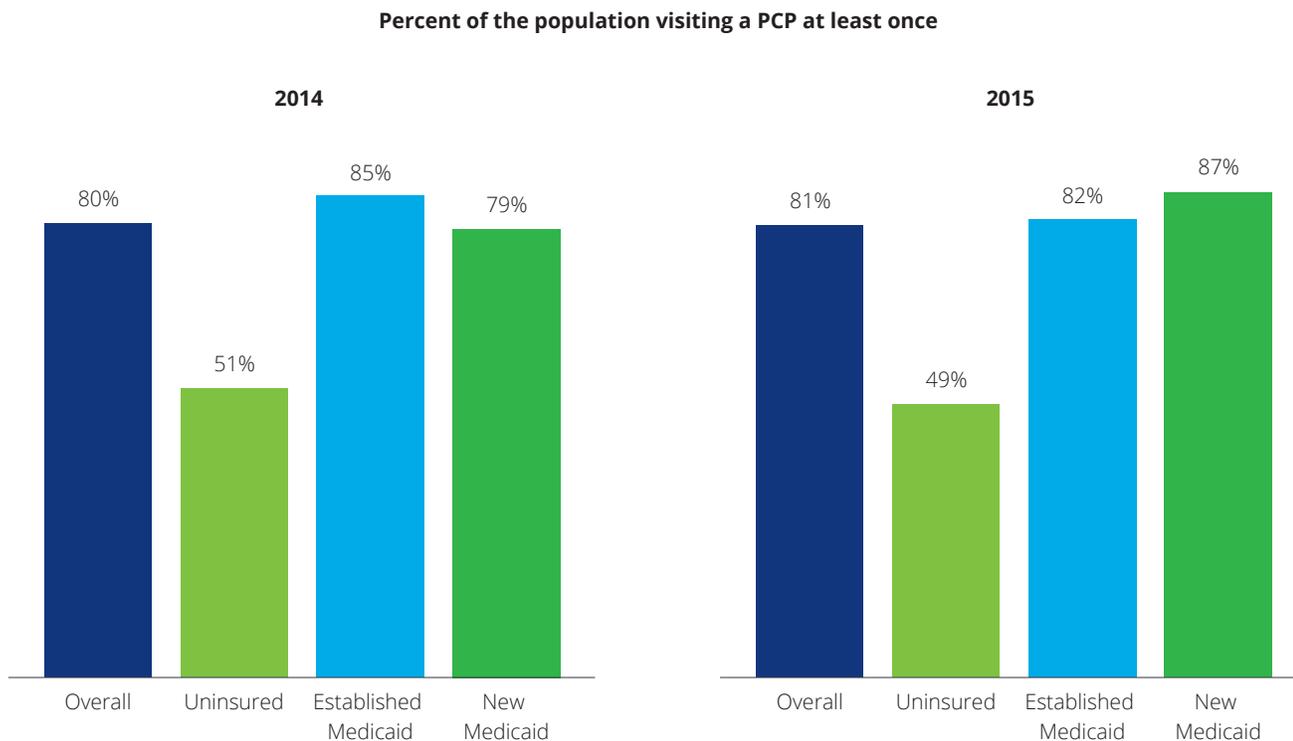
Additionally, the new Medicaid enrollees visited a primary care physician (PCP) at a much higher rate compared to the uninsured in both 2014 and 2015 (Figure 7).

**Figure 6. The newly covered faced fewer access issues compared to the uninsured**



Source: Deloitte analysis based on data from NHIS

Figure 7. New Medicaid enrollees visited a PCP at a much higher rate compared to the uninsured in 2014 and 2015



Source: Deloitte analysis based on data from NHIS

Compared to the uninsured, new Medicaid enrollees were more likely to report visiting ERs due to the seriousness of the underlying medical condition rather than due to lack of access to other care sites.

These results are consistent with a 2016 Department of Health and Human Services (HHS) review of existing studies on Medicaid expansions' impact on access to care, which found that preventive visits in expansion states increased by 41 percent but remained unchanged in non-ME states; and that, more generally, unmet care among low-income adults in ME states declined following the expansions.<sup>18</sup> Another study found that 72 percent of surveyed adults who gained Medicaid coverage during the expansion said they used their coverage to go to a health care provider. Of these, two-thirds also reported that they would not have been able to access care prior to gaining coverage.<sup>19</sup>

However, our NHIS analyses suggest that access to alternative sites of care—shown by the slightly higher percentage of respondents reporting that ERs were the closest providers or that they had nowhere else to go—might have decreased somewhat in 2015 compared to 2014 among new Medicaid enrollees (Figure 6). Furthermore, ER use among new enrollees appears to have increased somewhat in 2015, due to both appropriate (seriousness of the condition) as well as potentially preventable (ER as the “usual place of care”) reasons (Figure 6).

Anecdotal evidence and studies suggest that the reasons for these trends may include a mismatch of resources, physicians, and facilities in the midst of increased and changing demand for care, as well as cultural and behavioral reasons:<sup>20</sup>

- Some new enrollees in early expansion states faced challenges in obtaining care due to poor care coordination and a shortage of providers, especially in rural areas.<sup>21</sup>

- Frequent ER use may reflect a constellation of psychosocial and medical needs that cannot typically be addressed solely through primary care access. The needs of some new Medicaid enrollees, who often have high medical comorbidities and sometimes face difficulty in getting timely prescription refills, might not often be met outside the ER without more extensive care coordination efforts.<sup>22</sup>
- It may take several years to see behavior changes in new Medicaid enrollees who used ERs as their typical place of care.<sup>23</sup>
- The clinical or demographics characteristics of those enrolling in Medicaid expansion's first year(s) may be different than those signing up in later years.

Many states are increasing their efforts to educate Medicaid enrollees and direct them to appropriate sites of care. (See the sidebar on the following page.)

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### **State programs to improve care access and reduce preventable ER use among Medicaid enrollees**

Many states are trying to reduce preventable ER use among Medicaid enrollees. We highlight a few recent examples:

#### **Preventive care for new Medicaid enrollees**

As a first step towards wellness, states are making sure that the new Medicaid enrollees get timely health screenings. Michigan's expansion program, for instance, requires new members to schedule a preventive health visit with a PCP within 60 days of enrollment. As a result, more than half of enrollees had visited a PCP by the end of 2014. Furthermore, new enrollees had completed health risk assessments at more than twice the rate of members in a typical private insurance plan.<sup>24</sup>

#### **Investing in primary care professionals**

Shortages of clinicians, nurse practitioners, and behavioral health providers are often cited as a reason behind the lack of appropriate and timely access to care among Medicaid recipients.<sup>25</sup> As a result, several states' health departments are working closely with the federal National Health Service Corps program to fill in potential staffing gaps in underserved areas by providing scholarships and educational loans repayment for PCPs, nurses, and other health care professionals in these areas, and are increasing recruitment and retention efforts.<sup>26,27</sup> For instance, in Washington, the number of Corps physicians increased significantly between 2007 and 2014, from 78 to 336.<sup>28</sup>

#### **Building community health centers**

Many Medicaid expansion states used additional federal funding under ACA to increase the number of community health centers, build a broader array of primary care services, extend operating hours, hire additional primary care professionals, and renovate or expand existing clinical spaces. In Ohio, 40 health centers operating in 219 sites statewide provide preventive and primary health care services to over 500,000 new Medicaid enrollees.<sup>29</sup>

#### **Targeting ER "super-utilizers"**

States have often been challenged by Medicaid "super-utilizers"—beneficiaries who overuse ERs. Spurred by the success of health care organizations under the Robert Wood Johnson Foundation (RWJF) initiative to identify and manage care for these super-utilizers,<sup>30</sup> some states have launched their own programs for Medicaid ER super-utilizers. For instance, Washington implemented a statewide patient data exchange system to identify frequent ER users; once identified, state agencies help make primary care appointments for them. The state also increased educational efforts to advise these over-users on what constitutes a true medical emergency. As a result, ER visits by frequent Medicaid users declined 11 percent in the second year of implementation.<sup>31</sup>

#### **Financial disincentives to discourage non-emergency ER visits**

Several states are implementing punitive measures in an attempt to curb preventable ER visits. States such as New Mexico, Arizona, and West Virginia have either increased or have plans to increase their Medicaid enrollees' ER copayments for non-emergency ER use.<sup>32</sup> Washington Health Care Authority, in an attempt to restrict inappropriate ER use, announced in 2011 that it will not pay for more than three "non-emergency" visits every year by Medicaid enrollees.<sup>33</sup>

Several of these programs are new and their combined impact on ER visits is not yet known; however, they have the potential to improve access to appropriate care for Medicaid enrollees.

**UCCs may emerge as an alternative to ERs for lower-acuity patients**

One way health plans and health care systems may improve access to lower-cost and convenient urgent care outside of the ER is to encourage patients to use urgent care centers when appropriate. (See the following sidebar.)

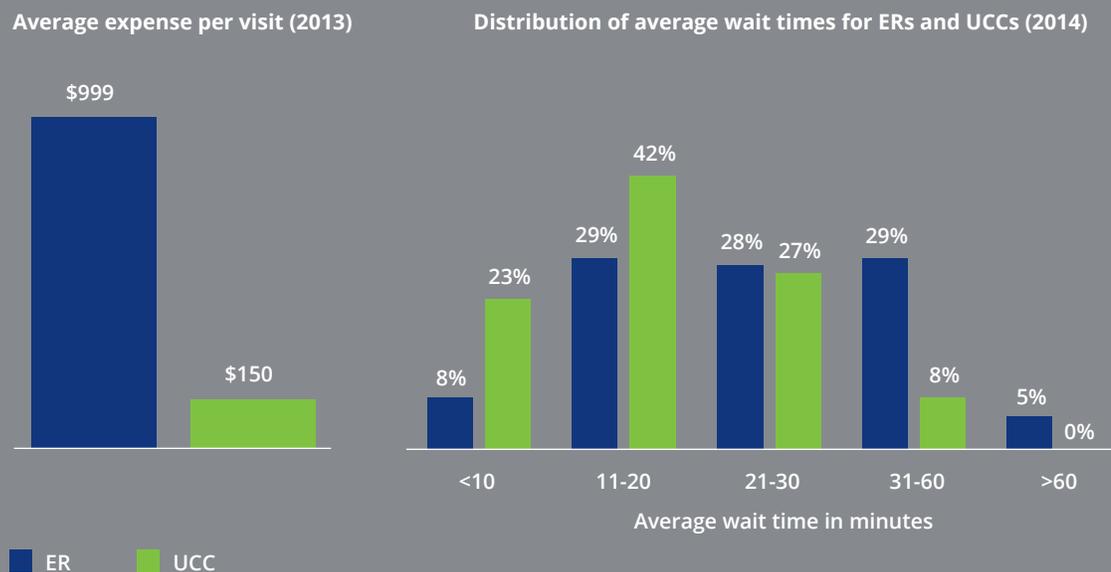
**What are UCCs?**

UCCs are care centers that typically have extended hours of operation, on-site physicians, and x-ray, lab testing, and other treatment capabilities for low-acuity but urgent medical conditions, such as mild body pain, headaches, minor injuries, and fractures.<sup>34</sup> Most UCCs are walk-in facilities and do not require appointments.

With quicker patient turnaround compared to ERs, UCC wait times are much shorter. For instance, in 2014 about two-thirds of patients visiting UCCs were seen within 20 minutes of arrival, compared to only one-third of patients visiting ERs.

Furthermore, the average cost for a UCC visit in 2013 was \$150, compared to \$999 for an ER visit (Figure 8). While this difference might partly reflect the greater acuity of some patients in the ER, studies have found that the cost of some common low-acuity conditions were lower in UCCs compared to ERs. For instance, the average cost for nine common, lower-acuity medical conditions (including allergies, bronchitis, sinusitis, and urinary tract infections) ranged between \$345 and \$665 when treated in an ER, compared to a range of between \$97 and \$127 when treated in a UCC, according to claims submitted at Medica Choice Network in 2010.<sup>35</sup>

**Figure 8. UCCs have shorter wait times and lower costs compared to ERs**



Source: Deloitte analysis based on average ER expense data from Medical Expenditure Panel Survey, and wait time data from CMS; UCC spend and wait time data from Urgent Care Association of America (UCAOA) Benchmarking Survey, 2015

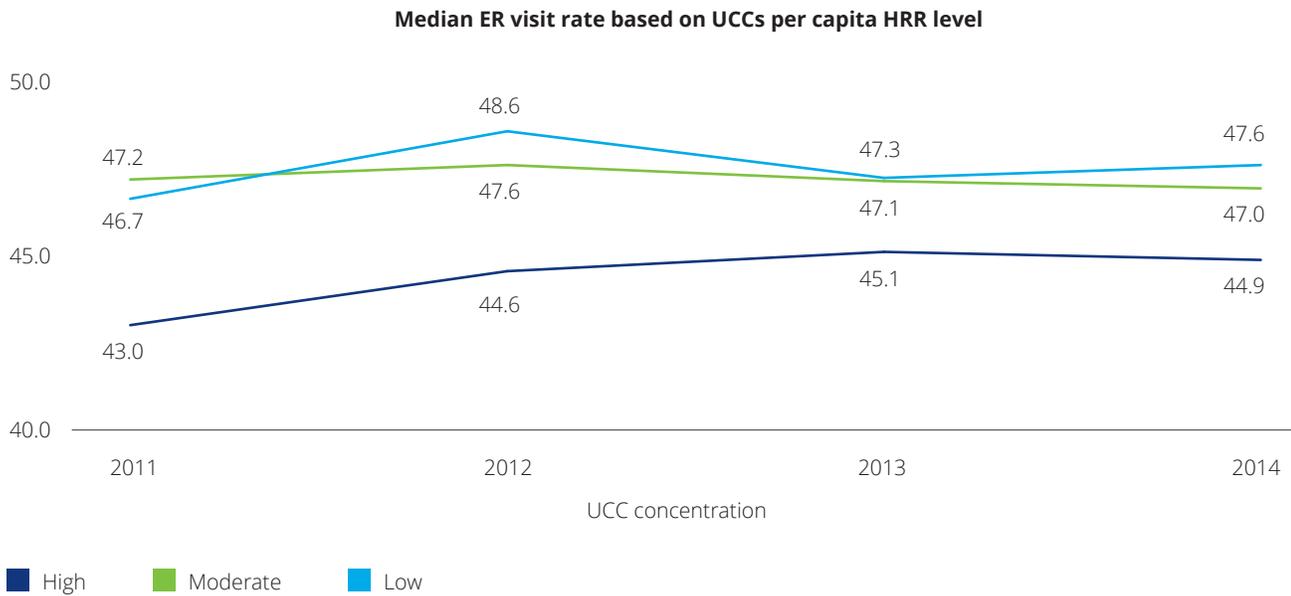
**Emergency room use under the ACA: Is patient access to appropriate care settings improving?**

The number of UCCs has increased significantly over the past several years. Today there are nearly 7,300 UCCs in the United States, according to the UCAOA.<sup>36</sup> With their increased availability, lower costs, and shorter waiting times, UCCs could provide a viable alternative to ERs for lower-acuity patients. Have UCCs meaningfully impacted ER visits yet, given their focus on privately insured populations?<sup>37</sup>

To answer this question, we analyzed trends in ER visit rates between 2011 and 2014 by the concentration of UCCs in the area (HRRs), measured as the number

of UCCs per 1,000 people. We found that ER rates were generally lower in HRRs with high (top tercile) UCC concentrations (Figure 9). Lower rates might reflect either the substitution effect or market factors. Generally, UCCs tend to be located in urban and semi-urban areas with higher shares of privately insured—and generally healthier—populations. One would expect ER visit rates to be lower in markets with these characteristics and higher in markets (similar to those with a lower concentration of UCCs) that are rural and have a greater share of uninsured and Medicaid populations compared to other regions.<sup>38</sup>

**Figure 9. ER visit rates are lower in regions with higher UCC concentration**

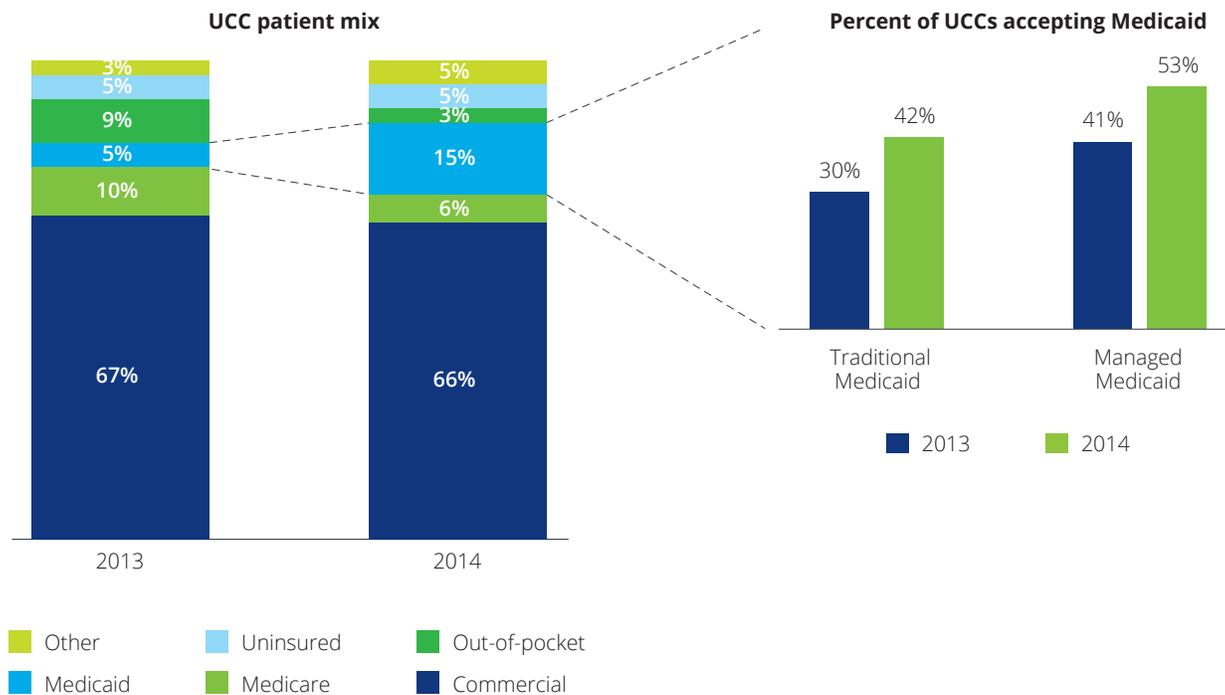


Source: Deloitte analysis based on ER visits data from the AHA, and UCC locations at zip-code level from the UCAOA

Historically many UCCs have not typically accepted Medicaid coverage due to lower payment rates.<sup>39</sup> However, accepting more patients with Medicaid might be a good way for UCCs to grow, given the surge of new Medicaid enrollees following the expansions and increased Medicaid payment rates in some states. Indeed, our analyses of survey data from UCAOA show

that UCCs are increasingly accepting both fee-for-service (FFS) and managed Medicaid patients and, as a result, Medicaid comprises a larger share of patients. In 2014, for instance, the share of UCC visits by Medicaid patients was 15 percent compared to just five percent in 2013 (Figure 10).

**Figure 10. UCCs are increasingly accepting Medicaid enrollees**



Source: UCAOA Benchmarking Survey, 2015

**What are health plans and providers doing to increase UCC utilization?**

In an attempt to reduce ER costs, health plans are offering lower copays for UCCs and increasing educational efforts.<sup>40</sup> Blue Shield of California has a section on its website, "Are you prepared for a non-emergency," which lists common conditions for which members should seek care in a UCC instead of an ER.<sup>41</sup> Similarly, Humana prominently lists on its website UCC features such as affordability, shorter waiting times, lower costs, high quality of care, and relatively easier access, as well as a "Find an urgent care center" button that displays a list of nearby UCCs.<sup>42</sup>

Health systems are also increasingly encouraging patients to use UCCs. San Francisco-based Dignity Health recently opened a UCC in a joint venture with GoHealth, a large urgent care provider, to increase access for its patients. The health system will also educate the community about conditions that are more appropriately treated in an UCC setting, which should help Dignity Health better manage population health.<sup>43</sup>

## Implications for health care stakeholders

ER care is an important component of health care spending, and is often a potential savings target for health systems, states, and health plans.

### Health systems

The shift to value-based care and the strengthened incentives for it under MACRA will likely lead to health system executives' renewed focus on identifying ways to reduce costs and maintain quality. As a result, executives may want to shape their strategies to include a potentially new role for ERs.

### Expand access to lower-cost settings

As more people gain coverage under various ACA provisions (e.g., Medicaid expansion, health exchanges), health systems may want to consider acquiring or creating joint ventures with UCCs to complement their ER offerings, reduce uncompensated care costs, and avoid putting undue strain on limited resources such as PCPs and nurses. Large health systems such as HCA and Tenet have acquired several UCCs in the past few years, and their investments might be starting to pay off. HCA had over one million UCC visits in 2015, a 500 percent increase compared to the previous year.<sup>44</sup>

### Better direct patients to the right care setting

One of the frequent challenges faced by the newly insured is navigating the unfamiliar and often complex web of coverage features, benefits, and costs. As a result, some health systems are using technology to steer patients to the right care setting. For instance, in 2016, California-based Sutter Health and Alameda Health System started employing technology and analytics to identify frequent ER users, and steered them to more appropriate care settings through increased education and coordination activities.<sup>45</sup> Health systems are also beginning to invest in "patient access call centers" with 24/7 guidance to appropriate care settings.<sup>46</sup>

### States

State initiatives, like the ones we described earlier in the paper, are a starting point to improve access and educate people about where to get good primary and urgent care. While it may be too early to quantify the impact of various state initiatives on ER use, recent studies have shown that the new Medicaid enrollees have better preventive and primary care options than were previously available.<sup>47</sup>

### Health plans

As more uninsured individuals gain coverage, health plans' knowledge of their members' health care services use patterns should help steer these members to the most appropriate care settings. For instance, Molina Healthcare's study of its new Medicaid enrollees from Michigan found that they used ERs at twice the rate of Molina's traditional Medicaid members.<sup>48</sup> Access to preventive services such as screenings, and timely access to primary care and alternative care settings such as UCCs, could improve early disease detection and management. This will likely help health plans better manage costs while preserving care access.

Health care executives may want to shape their strategies to include a new role for ERs.

## Appendix: Methodology

### Definition of “New Medicaid” enrollees

This variable is based on NHIS responses. We classified respondents as “New Medicaid” enrollees if they:

- Answered “yes” for health insurance coverage under “Medicaid” and
- Answered “yes” for “change” in coverage in past 12 months.”

### Regression analyses

We conducted regression analyses to better understand the association of various state and health system-level factors—apart from states’ decision to expand Medicaid—with ER visit rates. In these analyses, the unit of observation is an individual hospital in a given year. We included the following variables in these analyses:

### Dependent variable:

- Visit rates in AHA health system-affiliated ERs between 2010 and 2014. The dependent variable is in log form to avoid constraining outcomes to grow by the same amount in each health system, and to account for the large variation in ER visit rates.

### Independent variables:

- Medicaid expansion status (yes, no) of the state in which the hospital is located.
- Hospital organizational characteristics such as location (urban/rural), ownership (government, not-for-profit, for-profit), teaching status, availability of intensive care facilities, size, and being part of a health system.
- Patient and payer mix variables such as Medicaid and Medicare share of patients, disproportionate share status, case mix, fraction of acute admissions.
- Socioeconomic variables at HRR level such as public insurance share, uninsured rate, unemployment rate, and poverty rate
- Five year and 306 HRR indicators.

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## Acknowledgements

We wish to thank Robert Garvin, Es Nash, Megan Cormier, Jerry Bruno, Wendy Gerhardt, Sarah Thomas, Christina DeSimone, Kiran Jyothi Vipparthi, and the many others who contributed their ideas and insights to this project.

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## Endnotes

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