High blood pressure is a major cardiovascular disease risk factor and contributed to >362,895 deaths in the United States during 2010 (1). Approximately 67 million persons in the United States have high blood pressure, and only half of those have their condition under control (2). An estimated 46,000 deaths could be avoided annually if 70% of patients with high blood pressure were treated according to published guidelines (3, 4). To assess blood pressure control among persons with health insurance, CDC and the National Committee for Quality Assurance (NCQA) examined data in the 2010–2012 Healthcare Effectiveness Data and Information Set (HEDIS). In 2012, approximately 113 million adults aged 18–85 years were covered by health plans measured by HEDIS. The HEDIS controlling blood pressure (CBP) performance measure is the proportion of enrollees with a diagnosis of high blood pressure confirmed in their medical record whose blood pressure is controlled. Overall, only 64% of enrollees with diagnosed high blood pressure in HEDIS-reporting plans had documentation that their blood pressure was controlled. Although these findings signal that additional work is needed to meet the 70% target, modest improvements since 2010, coupled with focused efforts, might make it achievable.

NCQA developed HEDIS to measure the performance in care and service of health insurance plans. HEDIS measures are reported by two thirds of all U.S. health plans, representing approximately three fourths of the U.S. population receiving managed care. To account for differences in population demographics and coverage, NCQA usually collects and reports HEDIS results by Medicare, Medicaid, and commercial health plan categories. Because of differences in how health maintenance organizations (HMOs) and preferred provider organizations (PPOs) capture some data, NCQA further stratifies results by reporting plan type. This report provides aggregate national and adjusted regional estimates and rates reported by plan category and type.*

All plans that reported enrollment figures and valid CBP HEDIS measure rates† were included in the calculation of

*Regional values are adjusted to account for differences in plan distribution across HHS regions. The reference population was the overall number of members, aged 18–85 years, in each reporting health plan category and type in 2010. Before 2010, fewer than five PPOs in each category reported valid CBP measures.
†Defined as having ≥30 patients in the target population sample (CBP measure denominator) and passing the NCQA audit review.
nearly 11% of members (approximately 12.4 million) had confirmed hypertension and were eligible for the CBP measure; of those, 64% (7.9 million) had their high blood pressure under control. Adjusted control rates were ≥60% for all U.S. Department of Health and Human Services (HHS) regions, with rates of 59.5%–68.2% across regions.

Modest improvements occurred in the 50th and 90th percentile plan-level rates from 2010 to 2012 (Table 2). In 2012, 50th percentile rates for all plan categories/types were below the clinical target of 70%, and 90th percentile rates were ≥70% for only commercial and Medicare HMOs and Medicare PPOs. Adjusted odds ratios for meeting the 70% target rate demonstrated that performance improved over time, with differences between regions and plan categories/types; NCQA-accredited plans had greater success than nonaccredited plans (Table 3).

**Editorial Note**

In 2012, HHS launched the Million Hearts initiative.*** For clinical settings, one of the Million Hearts goals is to achieve ≥70% control among U.S. adults with diagnosed hypertension by 2017. Overall, HEDIS-reporting plans were 72% more likely to have CBP measure rates meeting this target in 2012 than in 2010. However, despite these improvements, the median rates

### TABLE 1. Blood pressure control among health plan members with diagnosed hypertension,* by plan category, type, and U.S. Department of Health and Human Services (HHS) region† — Healthcare Effectiveness Data and Information Set (HEDIS), 2012

| Region § | HEDIS reporting and membership | Patients with diagnosed hypertension | Hypertensive patients with controlled blood pressure |
|----------|---------------------------------|-------------------------------------|--------------------------------------------------|
|          | Plans (millions) | Members (millions) | No. (millions) | Raw | Adjusted ‡ | No. (millions) | Raw | Adjusted ‡ |
| National | 894               | 113.44               | 12.36          | (10.9) | —         | 7.91           | (64.0) | —         |
| Commercial HMO | 193               | 34.54               | 2.94           | (8.5)  | —         | 2.03           | (69.2) | —         |
| Commercial PPO | 140               | 53.70               | 4.36           | (8.1)  | —         | 2.57           | (58.8) | —         |
| Medicaid  | 119               | 13.82               | 0.45           | (3.3)  | —         | 0.26           | (57.0) | —         |
| Medicare HMO | 310               | 8.16                | 3.30           | (40.5) | —         | 2.25           | (68.1) | —         |
| Medicare PPO | 132               | 3.22                | 1.30           | (40.5) | —         | 0.80           | (61.2) | —         |
| HHS Region (Headquarters) |                  |                     |                |       |           |                |       |           |
| 1 (Boston) | 82                | 7.52                | 0.76           | (10.1) | (10.7) | 0.51           | (66.9) | (65.9) |
| 2 (New York) | 108              | 14.73               | 1.74           | (11.8) | (11.4) | 1.10           | (63.2) | (62.7) |
| 3 (Philadelphia) | 123            | 13.10               | 1.72           | (13.1) | (12.2) | 1.09           | (63.6) | (63.0) |
| 4 (Atlanta) | 164              | 21.05               | 2.86           | (13.6) | (12.6) | 1.69           | (59.0) | (59.5) |
| 5 (Chicago) | 188              | 18.49               | 2.20           | (11.9) | (10.9) | 1.42           | (64.5) | (65.0) |
| 6 (Dallas) | 99                | 9.74                | 1.31           | (13.4) | (11.4) | 0.78           | (59.7) | (59.5) |
| 7 (Kansas City) | 77                | 4.83                | 0.75           | (15.5) | (10.8) | 0.48           | (63.6) | (64.8) |
| 8 (Denver) | 44                | 3.43                | 0.29           | (8.4)  | (7.3)   | 0.19           | (67.5) | (67.6) |
| 9 (San Francisco) | 114          | 23.38               | 2.55           | (10.9) | (10.0) | 1.78           | (69.8) | (68.2) |
| 10 (Seattle) | 66                | 5.15                | 0.49           | (9.5)  | (8.0)   | 0.30           | (61.0) | (60.3) |

Abbreviations: HMO = health maintenance organization; PPO = preferred provider organization.

* The percentage of patients seen with diagnosed hypertension is not a measure of hypertension prevalence, but describes the number of patients with disease meeting the hypertension case definition that were seen during the first 6 months of the calendar year divided by the total number of health plan beneficiaries aged 18–85 years.

† Listed with headquarters city for each region; territories not included. Region 1 (Boston): Connecticut, Maine, Maryland, New Hampshire, Rhode Island, and Vermont; Region 2 (New York): New Jersey and New York; Region 3 (Philadelphia): Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia; Region 4 (Atlanta): Alabama, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee; Region 5 (Chicago): Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin; Region 6 (Dallas): Arkansas, Louisiana, New Mexico, Oklahoma, and Texas; Region 7 (Kansas City): Iowa, Kansas, Missouri, and Nebraska; Region 8 (Denver): Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming; Region 9 (San Francisco): Arizona, California, Hawaii, and Nevada; Region 10 (Seattle): Alaska, Idaho, Oregon, and Washington.

§ The HHS regions, listed with headquarters city for each, territories not included, are as follows: Region 1 (Boston): Connecticut, Maine, Maryland, New Hampshire, Rhode Island, and Vermont; Region 2 (New York): New Jersey and New York; Region 3 (Philadelphia): Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia; Region 4 (Atlanta): Alabama, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee; Region 5 (Chicago): Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin; Region 6 (Dallas): Arkansas, Louisiana, New Mexico, Oklahoma, and Texas; Region 7 (Kansas City): Iowa, Kansas, Missouri, and Nebraska; Region 8 (Denver): Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming; Region 9 (San Francisco): Arizona, California, Hawaii and Nevada; Region 10 (Seattle): Alaska, Idaho, Oregon, and Washington.

¶¶ Regional values were adjusted to account for differences in plan distribution across HHS regions. The reference population was the overall number of members, aged 18–85 years, in each reporting health plan category and type.

*** HHS, in collaboration with nonprofit and private organizations, launched Million Hearts (http://www.millionhearts.hhs.gov), a combination of clinical and community evidence-based interventions and strategies aimed at preventing 1 million heart attacks and strokes during the 5-year period of 2012–2016.
for the measure among all plan categories/types in 2012 was below this target, and the top 10% of performing plans were barely achieving it. In particular, <15% of Medicare and commercial PPOs met the target. Commercial and Medicare HMOs were twice as likely to have met the target, but <30% were successful. NCQA-accredited plans were twice as likely to have met the 70% clinical target as nonaccredited programs, with the highest percentages occurring among accredited commercial and Medicare Advantage HMOs. The extra level of accountability taken on by accredited plans might better focus their efforts on improving blood pressure control for their members with hypertension.

The percent of patients seen with diagnosed hypertension was greatest in the southeastern states associated with the “stroke belt” (HHS regions 3, 4, and 6), a geographically identified region of high stroke morbidity and mortality (5). Blood pressure control was worst in the Northwest and South (HHS regions 4, 6, and 10). HHS region 10, in the Northwest, has low antihypertensive medication use among persons with self-reported hypertension (6). In the South, despite higher antihypertensive medication use (6), overall blood pressure control for their members with diagnosed hypertension (%)

| Plan category | Reporting plan type | Year | Plans | 50th | 90th | Overall | Nonaccredited | Accredited |
|---------------|---------------------|------|-------|------|------|---------|---------------|------------|
| Commercial    | HMO                 | 2010 | 238   | 65.0 | 73.0 | (23.1)  | (14.9)        | (25.1)     |
|               |                     | 2011 | 218   | 65.2 | 74.1 | (21.6)  | (9.6)         | (23.3)     |
|               |                     | 2012 | 199   | 66.3 | 76.2 | (28.6)  | (14.0)        | (32.7)     |
|               | PPO                 | 2010 | 40    | 49.9 | 64.8 | (5.0)   | (0.0)         | (16.7)     |
|               |                     | 2011 | 96    | 56.3 | 67.6 | (5.2)   | (5.6)         | (5.0)      |
|               |                     | 2012 | 141   | 59.9 | 68.2 | (7.1)   | (5.0)         | (7.4)      |
| Medicaid      | HMO                 | 2010 | 128   | 57.1 | 67.2 | (5.5)   | (3.3)         | (7.4)      |
|               |                     | 2011 | 137   | 56.4 | 67.6 | (4.4)   | (3.1)         | (5.5)      |
|               |                     | 2012 | 148   | 57.5 | 69.1 | (8.1)   | (5.2)         | (10.0)     |
| Medicare Advantage | HMO | 2010 | 289   | 62.3 | 71.6 | (14.9)  | (9.4)         | (25.5)     |
|               |                     | 2011 | 309   | 63.4 | 74.4 | (22.7)  | (16.9)        | (32.5)     |
|               |                     | 2012 | 310   | 64.4 | 75.5 | (26.8)  | (21.0)        | (35.5)     |
|               | PPO                 | 2010 | 87    | 55.5 | 67.2 | (5.8)   | (7.2)         | (0.0)      |
|               |                     | 2011 | 123   | 55.0 | 69.0 | (8.9)   | (5.3)         | (21.4)     |
|               |                     | 2012 | 132   | 60.7 | 70.9 | (14.4)  | (15.6)        | (11.9)     |

**Abbreviations:** HMO = health maintenance organization; PPO = preferred provider organization.

* The controlling blood pressure (CBP) measure value of health plans at the 50th and 90th percentiles for the measure. Fifty percent of health plans had better (i.e., higher) CBP measure values than the health plan that represents the 50th percentile and 10% of plans had better values than the health plan that represents the 90th percentile.

| Characteristic | Comparison | Odds ratio (95% CI) |
|---------------|------------|--------------------|
| Plan category | Medicaid versus commercial | 0.21 (0.14–0.34) |
|               | Medicare Advantage versus commercial | 1.44 (1.11–1.86) |
| Reporting plan type | PPO versus HMO | 0.30 (0.22–0.42) |
| Reporting year | 2012 versus 2010 | 1.72 (1.30–2.27) |
|               | 2012 versus 2011 | 1.37 (1.05–1.79) |
| Accreditation status | “Yes” versus “no” | 2.00 (1.55–2.58) |
| HHS Region (Headquarters)* | 1 (Boston) versus others | 1.76 (1.12–2.77) |
|               | 2 (New York) versus others | 1.03† (0.67–1.59) |
|               | 3 (Philadelphia) versus others | 1.26† (0.83–1.91) |
|               | 4 (Atlanta) versus others | 0.24 (0.15–0.40) |
|               | 5 (Chicago) versus others | 1.49 (1.02–2.18) |
|               | 6 (Dallas) versus others | 0.12 (0.05–0.27) |
|               | 7 (Kansas City) versus others | 0.63† (0.38–1.03) |
|               | 8 (Denver) versus others | 1.32† (0.76–2.31) |
|               | 9 (San Francisco) versus others | 1.04† (0.66–1.63) |
|               | 10 (Seattle) versus others | 0.32 (0.16–0.63) |

**Abbreviations:** CI = confidence interval; HHS = U.S. Department of Health and Human Services; HMO = health maintenance organization; PPO = preferred provider organization.

* Listed with headquarters city for each region; territories not included. Region 1 (Boston): Connecticut, Maine, Maryland, New Hampshire, Rhode Island, and Vermont; Region 2 (New York): New Jersey and New York; Region 3 (Philadelphia): Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia; Region 4 (Atlanta): Alabama, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee; Region 5 (Chicago): Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin; Region 6 (Dallas): Arkansas, Louisiana, New Mexico, Oklahoma, and Texas; Region 7 (Kansas City): Iowa, Kansas, Missouri, and Nebraska; Region 8 (Denver): Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming; Region 9 (San Francisco): Arizona, California, Hawaii and Nevada; Region 10 (Seattle): Alaska, Idaho, Oregon, and Washington.

† Denotes no statistically significant association (p≥0.05).
control is worse than in most other regions. Blacks represent a larger proportion of the population in this region compared with others (7), and despite being more aware of and likely to be treated for their hypertension than whites, blacks are less likely to have their high blood pressure controlled (8).

The findings in this report are subject to at least five limitations. First, HEDIS data are limited to those persons insured by reporting health plans. This excludes all fee-for-service Medicare members, a group with a considerable hypertension burden. Second, the CBP measure is based on a sample of plan members with diagnosed hypertension treated during the first 6 months of each reporting year; therefore, the reported percentage of patients seen with diagnosed hypertension should not be misconstrued as a prevalence estimate, because hypertension prevalence among all U.S. adults aged ≥18 years is approximately 30% (2). Third, the CBP measure does not capture persons who have hypertension, but have no recorded diagnosis in the medical record; therefore, it does not describe the effectiveness of plans in identifying hypertension among its members, but only the control of blood pressure among those with documented hypertension diagnoses. Control rates might be overestimated if the proportion of members with undiagnosed hypertension is high. Fourth, it was impossible to risk-adjust HEDIS results to account for population differences (e.g., chronic disease comorbidity prevalence) when comparing CBP values across category/plan types and regions (9). Finally, plans can be attributed to multiple HHS regions because of service area overlap; therefore, some larger plans might be overrepresented across multiple regions, potentially minimizing findings of differences by region.

Performance measures such as HEDIS are tools that can be used to promote health initiatives and assess their effectiveness. They can be used to recognize successful plans and identify areas for improvement (10). Additionally, public reporting on these measures and including the results in accreditation might spur providers and the plans they work with to follow evidence-based treatment guidelines and effectively track management of their hypertensive patients. Million Hearts encourages health plans to continue improvements in the identification, monitoring, and treatment of patients with hypertension. Strategies for improvement might include supporting the implementation of standardized hypertension treatment protocols and health information technology in clinical settings and modifications in health-care coverage/reimbursement (e.g., improved coverage of clinical preventive services and reduced medication copayments).

What is already known on this topic?
Uncontrolled high blood pressure is a major public health problem. Focused efforts to improve blood pressure control can greatly improve health outcomes. Performance measures can be used to assess the effectiveness of health insurance plans in controlling high blood pressure among their members with hypertension.

What is added by this report?
In 2012, nearly 113.4 million members were covered under plans that reported valid Healthcare Effectiveness Data and Information Set (HEDIS) controlling high blood pressure (CBP) performance rates. Nationally, nearly 11% of plan members were eligible for the CBP measure, of whom 64% had their blood pressure under control. Adjusted control rates were ≥60% (range = 59.5%–68.2%) for all U.S. Health and Human Services regions, which was a modest improvement from 2010 rates.

What are the implications for public health practice?
Based on recent improvements measured through HEDIS, the Million Hearts clinical target of ≥70% blood pressure control among hypertensive patients by 2017 is achievable, but further work is needed to effectively identify, monitor, and treat patients with hypertension.

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