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Geographic Variation in Hospital Emergency Department Visits in the Medicare Population

3M Clinical and Economic Research

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Executive Summary

A well-functioning delivery system within a managed care plan or geographic region should be able to minimize the need for emergency department visits. In this 3M Clinical and Economic Research report, the Potentially Preventable Emergency Department Visits (PPVs) methodology was used to identify emergency department visits that may be potentially preventable. If there are an excess number of PPVs compared to a national norm within a managed care plan or geographic region, it is likely the excess PPVs represent emergency department visits that could be avoided if the delivery system functioned effectively.

The study used a random data sample of five percent of Medicare fee-for-service (FFS) beneficiaries contained in the Medicare Standard Analytic Files for calendar year 2017 and 2018. The data from 2017 was used to determine the burden of chronic disease for each beneficiary and to risk adjust PPV rates in the 2018 data.

After excluding FFS beneficiaries who were not enrolled in part A and B for the full two-year period, 1,388,114 beneficiaries remained in the analysis database. These beneficiaries experienced 583,708 emergency department visits, of which 320,720 were a PPV (54.9 percent of the emergency department visits). Extrapolated to the entire Medicare population, the 320,720 PPVs represent $2.0 billion in annual FFS Medicare expenditures.

Based on a risk-adjusted national norm, the analysis found considerable PPV performance variation across census regions, states and Core Based Statistical Areas (CBSAs) from the Office of Management and Budget. Across states, PPV performance compared to the risk-adjusted national norm varied from 35.12 percent below expected for North Dakota to 70.87 percent above expected for the District of Columbia.

A best practice PPV norm was determined using 40 percent of the CBSAs with the best PPV performance that had at least 1,500 beneficiaries in the analysis data. To achieve PPV best practice performance nationally, overall PPV performance would need to improve by 14.35 percent, which would result in an annual reduction in Medicare expenditures of $256.4 million (12.8 percent of the $2.0 billion in PPV expenditures).

PPV performance can be an effective measure of delivery system performance within a managed care plan or geographic region. The extent of PPV performance variation indicates that there are PPV performance improvement opportunities in many geographic areas. The $256.4 million annual Medicare expenditure reduction gained through PPV best practice provides an achievable PPV quality improvement target.

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Introduction

In 2017, 18.5 percent of adults 65 years or older had at least one emergency departments (ED) visit with 33 percent of these patients having two or more ED visits.[1] Non-emergency conditions make up a significant proportion of ED visits. Many non-emergency visits were by individuals who either lack access to primary care altogether or whose primary care providers provide inadequate access to care, especially after hours or on weekends. Emergency departments have increasingly served as primary care providers of last resort, and non-emergent care provided in emergency departments has come to be seen as an indicator of the inadequacy of primary care services in the U.S.

ED overcrowding by those with minor medical conditions such as sore throats and earaches may also hinder an ED's ability to provide quality care. Many EDs are overcrowded and struggle to handle an increase in patient visits leading to delays in the treatment of serious conditions, long waiting times and ambulance diversions.[2] The majority of patients seen in the ED do not require any significant diagnostic evaluation or procedures and are discharged to home.[3] Much of this inappropriate ED utilization could be eliminated if the primary care system functioned as it should.

ED visits originate from a home setting or nursing home/rehabilitation setting. In particular, nursing home residents, who are treated in the ED for conditions such as urinary tract infections, could be more appropriately treated in the nursing home. Other conditions prompting ED visits for nursing home residents, such as those related to falls or pneumonia, could be avoided by preventing the adverse health event itself. Decreasing potentially preventable visits to EDs can reduce health care costs, lessen complications resulting from medical treatment for nursing home residents, and improve quality of care.

The objective of this report is to determine for Medicare beneficiaries the extent of geographic variation in the rate of ED visits that are potentially preventable and to quantify the financial impact of excess potentially preventable ED visits.

Potentially Preventable Emergency Department Visits (PPVs)

A well-functioning delivery system within a managed care plan or geographic region should be able to minimize the need for ED visits. Potentially Preventable ED Visits. (PPVs) are ED visits that can often be avoided. The occurrence of an excess number of PPVs is indicative of an ineffective delivery system. Of course, not every PPV can be prevented. But if there are an excess number of PPVs compared to national benchmarks within a managed care plan or geographic region, it is likely that the excess PPVs represent ED visits that could be avoided if the delivery system functioned more effectively. There are five broad categories of PPVs:

- ED visits for chronic disease management that could potentially have been managed in the outpatient setting (e.g., asthma)
- ED visits for minor acute conditions that could potentially have been managed in the outpatient setting (e.g., constipation)
- ED visits for signs and symptoms that do not require urgent care (e.g., lumbago)
- ED visits for minor trauma (contusions)
- ED visits that could potentially have been avoided for residents of a residential care facility such as a skilled nursing facility (e.g., trauma due to a fall)

The most prevalent PPVs are for minor trauma and pain. These hospital emergency department visits may result from lack of access to adequate primary care or inadequate coordination of ambulatory care services. PPVs also include chronic conditions (e.g., hypertension) for which

adequate monitoring and follow-up, such as proper medication management, could have prevented the ED visit. As such, the occurrence of high rates of PPVs within a managed care plan or geographic region may represent a failure of the ambulatory care delivery system. A comprehensive evaluation of potentially preventable ED visits can provide a more complete assessment of the continuity of care and functioning of the health care delivery system within a managed care plan or geographic region.

Appendix A contains PPV research articles and studies using PPVs, and Appendix B contains a more detailed description of the PPV methodology.

> 3M Clinical Risk Groups (CRGs) are used to risk adjust PPV rates. CRGs are a categorical clinical model that uses historical claims data to assign beneficiaries to a single mutually exclusive category that defines a beneficiary's chronic disease burden.

Risk Adjusting PPVs

To compare PPV rates across geographic regions and managed care plans, the PPV rates must be risk adjusted. 3M Clinical Risk Groups (CRGs) are used to risk adjust PPV rates. CRGs are a categorical clinical model that uses historical claims data to assign beneficiaries to a single mutually exclusive category that defines a beneficiary's chronic disease burden.[4] The CRGs (Version 2.1) are composed of 332 base CRGs that describe the beneficiary's most significant chronic conditions and explicit severity levels that distinguish differences in disease burden due to severity of illness resulting in 1,414 individual CRGs. The individual CRGs are aggregated into nine health statuses ranging from catastrophic to healthy.

Status 1 – Healthy
Status 2 – History of Acute Disease e.g., Chest Pain
Status 3 – Single Minor Chronic Disease e.g., Migraine
Status 4 – Minor Chronic Disease in Multiple Organ Systems e.g., Migraine and BPH
Status 5 – Single Dominant or Moderate Chronic Disease e.g., CHF
Status 6 - Dominant or Moderate Chronic Disease in Multiple Organ Systems, e.g., CHF, COPD
Status 7 - Dominant Chronic Disease in Three or More Organ Systems, e.g., CHF, COPD, DM
Status 8 - Malignancy, Under Active Treatment, e.g., Lung Cancer
Status 9 - Catastrophic Conditions, e.g., Major Organ Transplant

Based on the severity levels of the chronic conditions that comprise each status, beneficiaries in the nine statuses are assigned a severity level between one and six resulting in 53 aggregated CRG risk categories. Six of the aggregated CRGs in statuses 1 and 2 relate to pregnancy and delivery. Because this report analyzed Medicare data, the pregnancy and delivery CRGs were very low volume and were excluded from the analysis, resulting in the 47 CRG risk categories that were utilized to risk adjust the PPVs. The CRGs are a transparent system with a definition manual available for inspection. Appendix A contains CRG research articles and studies using CRGs, and Appendix C contains a more detailed description of the CRG methodology.

Potentially Preventable Return Emergency Department Visits (PPRED) Following Hospital Discharge

PPVs represent an evaluation of ED usage within a population and reflect the impact of adequate access to ambulatory care and/or the adequate coordination of ambulatory care services. Return ED visits following a hospital discharge primarily reflect the performance of hospitals and have a direct impact on PPV performance. While, in general, managed care plans primarily focus on and are measured on population management performance, they are highly dependent on hospital performance to achieve better overall population PPV performance. Because of this interdependence, managed care plans will often provide incentive plans to hospitals to improve ED usage performance. Managed care plans must understand and quantify the impact of hospital performance on population performance to develop an effective incentive plan for hospitals. The interrelationship between PPVs and return ED visits following a hospital discharge was examined as follows.

Potentially Preventable Return ED Visits (PPRED)

Potentially Preventable Return ED Visits (PPREDs) are return ED visits within 30 days following a prior hospitalization. PPREDs may result from deficiencies in the process of care (e.g., ED visit for a surgical wound infection) or inadequate post-discharge follow-up (e.g., prescription not filled) rather than unrelated events that occur post discharge (e.g., broken arm due to trauma). PPREDs may result from actions taken or omitted during the initial hospital stay, such as incomplete treatment or poor care of the underlying problem, or from poor coordination of services at the time of discharge and afterwards, such as incomplete discharge planning or inadequate access to care. The admissions considered at risk for a PPRED and the clinical circumstances under which a subsequent ED visit is considered potentially preventable are specified in the PPRED methodology logic. The PPRED designation is assigned to any admission that was followed by one or more potentially preventable ED visits during the 30 days following a hospital discharge. Appendix A contains PPRED research articles and studies using PPREDs.

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Risk Adjusting PPREDs

3M All Patient Refined Diagnosis Related Groups (APR DRGs) are a categorical clinical model composed of base categories (base APR DRGs) that are subdivided into four severity of illness subclasses.[5] These subclasses are unique to each base APR DRG and are based on the extent of physiologic decompensation or organ system loss of function. The four severity of illness subclasses are numbered sequentially from 1 to 4 indicating respectively, minor, moderate, major, and extreme severity of illness. The combination of the base APR DRGs and the four severity of illness subclasses constitute a system of patient risk classes. The APR DRG based risk classes are exhaustive and mutually exclusive resulting in a patient being assigned to one and only one risk class. The APR DRGs and severity of illness subclasses are used for performance

reporting in five U.S. states and as the basis of payment adjustments in 30 states. The APR DRG methodology is a transparent system with a full definition manual.

Overlap Between PPVs and PPREDs

An ED visit can simultaneously be a PPV and PPRED. If an ED visit is both a PPV and a PPRED (i.e., a potentially preventable return ED visit within 30 days of a hospital discharge), the subsequent PPRED visits following an admission are not eligible to be a PPV because those ED visits are more likely to be associated with the care and follow-up provided by the hospital and therefore reflect a hospital performance issue as opposed to a delivery system performance issue, which is more likely associated with a lack of adequate access to ambulatory care and/or the adequate coordination of ambulatory care in the community.
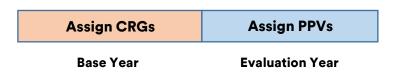
Determining PPV Relative Cost

Enhanced Ambulatory Patient Groups (EAPGs) are a categorical clinical model that categorizes patients according to the amount and type of resources used in an ambulatory visit such as an ED visit.[6] These resources include significant procedures, physical therapy, rehabilitation, dental procedures, medical visits, counseling, radiology, laboratory, drugs and biologicals, devices, supplies, ancillary tests, equipment, type of room, and treatment time. Patients in each EAPG have similar clinical characteristics and resource use. EAPGs were developed to encompass the full range of ambulatory settings including same day surgery units, hospital emergency rooms and outpatient clinics. EAPG relative resource weights are available that measure the relative costliness of each EAPG. The relative costliness of the mix of PPVs within a CRG risk class is determined by assigning each PPV to an EAPG and using the standard EAPG relative resource weights as a measure of the case mix of the PPVs in each CRG risk class.

National and Best Practice Norms

Each Medicare beneficiary is assigned to a CRG risk class based on their disease burden, which is determined from claims history data for the year preceding the year in which PPVs are assigned, as illustrated in Figure 1.

Figure 1: CRG and PPV assignment periods

Assign CRGs	Assign PPVs
Base Year	**Evaluation Year**

Within each CRG risk class a PPV relative weight is computed that reflects the PPV rate (frequency) and the case mix (relative costliness) of the PPVs. Thus, a higher weight for a CRG risk class can be the result of a high rate of PPV occurrence or that the mix of PPVs is more costly.

National Norm

A PPV national norm is calculated by summing the EAPG relative resource weights for all PPVs identified in the evaluation year within a CRG risk category—and across all beneficiaries assigned to the CRG risk category for the base year—and computing the mean value per beneficiary (referred to as the PPV national norm value). The end result is that each CRG risk class is assigned

a PPV relative weight that can be used to compute expected PPV performance. The expected PPV value (E) for any subset of beneficiaries is the number of beneficiaries in each CRG risk category times the PPV norm value for the CRG risk category and summed overall CRG risk categories (indirect rate standardization).

For any subset of beneficiaries, such as beneficiaries in a specific geographic region, the PPV actual value in a CRG risk category is computed by summing all the EAPG relative resource weights of the PPVs for beneficiaries assigned to the CRG risk category. By summing all the PPV relative resource weights across all beneficiaries across all CRG risk categories, the actual value (A) is determined. The actual value (A) represents good performance if (A-E) is negative (A<E) and poor performance if (A-E) is positive (A>E). The %(A-E)/E is the percent that actual performance is below expected (%(A-E)/E is negative) or above expected (%(A-E)/E is positive).

Best Practice Norm

In addition to the national PPV norm, this report also determined a "best practice" norm. Using the metropolitan areas identified in the Core Based Statistical Areas (CBSAs) from the Office of Management and Budget, PPV performance across metropolitan areas was examined. Using the national norm, the (A/E) for each CBSA with at least 1,500 beneficiaries is used to determine the subset of CBSAs with the best PPV performance and that constitutes 40 percent of the beneficiaries in the Medicare population sample included in the analysis. This subset of CBSAs is referred to as the PPV best practice CBSAs. For the PPV best practice CBSAs, the overall A/E is computed. The A/E ratio for the PPV best practice CBSAs is less than one and is a measure of the level of relative performance achieved by PPV best practice CBSAs. For example, an A/E ratio of 0.8 for the PPV best practice CBSAs means that in these CBSAs, the PPV performance is 20 percent (1 - 0.8) lower than would be expected compared to all CBSAs. The value of the PPV relative weight in each CRG risk category in the PPV national norm is multiplied by the A/E ratio for the PPV best practice CBSAs to create a PPV best practice norm. Rather than selecting an arbitrary performance percentile as a best practice norm, using a PPV best practice norm created in this way is a performance level that is actually being achieved in a substantial number of geographic areas and represents an achievable performance improvement level.

PPV Financial Impact

A PPV financial conversion factor is computed based on allowed Medicare payments (the amount actually paid by Medicare). The financial conversion factor is used to express PPV actual performance (A) and PPV expected performance (E) in financial terms so that the financial impact of a PPV performance difference (A-E) can be determined. By comparing the financial impact of PPVs at the level of each clinically meaningful CRG risk category, the clinical and financial aspects of care are linked, which can facilitate behavior change and performance improvement initiatives. The Medicare savings estimated in this report is conservative because it is based solely on the (A-E) difference. Thus, the underlying rate of PPVs as measured by E is accepted as a baseline level of underlying performance and only the PPV (A-E) difference is viewed as the basis for potential savings. The magnitude of the PPV (A-E) differences is directly related to the level of variation in PPVs across geographic regions. The greater the variation in PPVs across geographic regions, the greater the opportunity for savings. If there is little variation in PPVs across geographic regions, this analysis will conclude there is little opportunity for improvement and savings, essentially accepting the status quo as an acceptable level of performance.

Data

The study used data in the Medicare Standard Analytic Files (Limited Data Set or LDS) for calendar year 2017 and 2018. The LDS files contain 100 percent of Medicare fee-for-service (FFS) claims data for inpatient, outpatient, skilled nursing facilities and home health agencies. The LDS carrier file contains Medicare FFS claims data for professional providers, including physicians, physician assistants, clinical social workers, and nurse practitioners for a random sample of five percent of Medicare beneficiaries. The LDS Master Beneficiary Summary File (MBSF) contains enrollment data on all Medicare beneficiaries enrolled in or entitled to Medicare within a given calendar year.

To identify the burden of chronic disease and to assign CRGs, it was necessary to build a complete longitudinal record of all FFS claims for each Medicare beneficiary. Because the LDS carrier file was limited to a five percent sample of Medicare beneficiaries, the data in this study was limited to the beneficiaries in the LDS carrier file. The carrier file is a sample across all types of beneficiaries including beneficiaries in Medicare Advantage plans. To create a sample of FFS beneficiaries, the following edits were applied:

- Exclude beneficiaries who were not enrolled in both Part A and B for the full year (i.e., newly enrolled, disenrolled or reported died)
- Exclude beneficiaries who were enrolled in a managed care plan for one or more months
- Exclude beneficiaries who were enrolled in hospice

Calendar year 2017 was used to assign the CRG to each beneficiary and calendar year 2018 was used to assign the PPVs to each beneficiary. After these exclusions were applied, there were 1,388,114 beneficiaries in the analysis data. Of the 1,388,114 beneficiaries, 329,957 beneficiaries had one or more ED visits (23.8 percent), resulting in a total of 583,708 ED visits. 29,494 of those ED visits were a PPRED that followed a hospital discharge and were not eligible to be a PPV. 18,008 of the PPREDs would have been a PPV resulting in 320,720 PPVs (54.9 percent of the ED visits).

> By comparing the financial impact of PPVs at the level of each clinically meaningful CRG risk category, the clinical and financial aspects of care are linked, which can facilitate behavior change and performance improvement initiatives.

PPV Results by Risk Categories

Based on each beneficiary's claim history from 2017, beneficiaries were assigned to one of 47 CRG risk categories. Beneficiaries in each CRG risk category who had a PPV were identified using the 2018 data. Beneficiaries assigned to CRG status 3-9 all had at least one chronic disease. Table 1 contains summary data by CRG risk category for the beneficiaries with at least one chronic disease.

Table 1: PPV data by CRG risk category for beneficiaries with at least one chronic disease

	CRG Status		Severity Level					
			1	2	3	4	5	6
3	Single Minor Chronic Disease	Beneficiaries	65,271	15,539				
		ED Visits	10,797	4,302				
		PPVs	5,757	2,425				
		PPVs/1,000	88.2	156.1				
		PPV Weight	0.0307	0.0545				
		PPV $ Weight	21.27	37.77				
4	Minor Chronic Disease in Multiple Organ Systems	Beneficiaries	29,906	15,467	21,184	6,120		
		ED Visits	5,274	2,862	5,606	2,166		
		PPVs	2,848	1,498	3,139	1,257		
		PPVs/1,000	95.2	96.9	148.2	205.4		
		PPV Weight	0.0317	0.0342	0.0511	0.0740		
		PPV $ Weight	21.97	23.70	35.41	51.28		
5	Single Dominant or Moderate Chronic Disease	Beneficiaries	188,238	92,835	51,829	19,500	5,672	304
		ED Visits	43,864	31,571	20,132	9,479	2,835	106
		PPVs	24,052	17,547	11,466	5,505	1,546	60
		PPVs/1,000	127.8	189.0	221.2	282.3	272.6	197.4
		PPV Weight	0.0442	0.0650	0.0760	0.1002	0.1032	0.1032
		PPV $ Weight	30.63	45.04	52.67	69.44	71.52	71.52
6	Dominant or Moderate Chronic Disease in Multiple Organ Systems	Beneficiaries	131,904	116,473	98,172	78,452	54,610	36,839
		ED Visits	37,433	46,432	48,665	50,776	42,252	35,658
		PPVs	20,929	26,217	27,358	28,624	24,028	19,839
		PPVs/1,000	158.7	225.1	278.7	364.9	440.0	538.5
		PPV Weight	0.0552	0.0801	0.0998	0.1331	0.1624	0.2018
		PPV $ Weight	38.25	55.51	69.16	92.24	112.54	139.85
7	Dominant Chronic Disease in Three or More Organ Systems	Beneficiaries	27,445	31,652	17,434	14,431	13,916	17,017
		ED Visits	13,412	23,311	16,696	16,657	18,032	26,744
		PPVs	7,524	12,903	9,156	9,026	9,671	13,280
		PPVs/1,000	274.1	407.7	525.2	625.5	695.0	780.4
		PPV Weight	0.0982	0.1508	0.2001	0.2439	0.2787	0.3318
		PPV $ Weight	68.05	104.50	138.67	169.02	193.14	229.93
8	Malignancy under Active Treatment	Beneficiaries	3,205	3,975	4,156	2,170	542	
		ED Visits	1,026	1,908	2,291	1,570	460	
		PPVs	538	1,081	1,301	872	260	
		PPVs/1,000	167.9	271.9	313.0	401.8	479.7	
		PPV Weight	0.0594	0.0941	0.1195	0.1466	0.1610	
		PPV $ Weight	41.16	65.21	82.81	101.59	111.57	
9	Catastrophic Conditions	Beneficiaries	977	2,379	2,664	3,702	7,341	7,037
		ED Visits	428	1,245	2,206	3,942	7,817	13,459
		PPVs	239	723	1,269	2,102	3,619	5,510
		PPVs/1,000	244.6	303.9	476.4	567.8	493.0	783.0
		PPV Weight	0.0935	0.1047	0.1637	0.1753	0.1753	0.2924
		PPV $ Weight	64.79	72.56	113.44	121.48	121.48	202.63

There is nearly a nine-fold difference in the number of PPVs per 1000 beneficiaries across CRG risk category ranging from 88.2 to 783.0. The PPV relative weight for each CRG risk category reflects the combined impact of the PPV frequency and the relative costliness of the PPVs. The relative expected costliness of PPVs in each CRG risk category is determined by multiplying the PPV relative weight by the financial conversion factor of $692.99. The product of the number of PPVs in each CRG risk category and the PPV relative expected costliness for the CRG risk category summed over all CRG risk categories determines the expected PPV cost for any subset of beneficiaries.

Table 2 contains summary data by CRG risk category for beneficiaries who do not have a chronic disease. Status 1 is for beneficiaries who are healthy and have no significant acute diseases in their history. Healthy nonusers with no significant contact with the health care system and healthy beneficiaries who had a mention of a chronic disease in their history but no subsequent treatment

(potentially a rule out diagnosis) are assigned to separate CRGs. Across these three healthy Status 1 CRG categories, the PPVs per 1,000 varied from 64.8 to 103.5. There are four CRG risk categories in Status 2 for beneficiaries with a history of acute disease. The four significant acute CRG risk categories are for beneficiaries with significant acute disease, multiple or reoccurring significant disease, major trauma or major acute disease and significant acute disease with a mention of a chronic disease in their history but no subsequent treatment. Across these four significant acute Status 2 CRG categories, the PPVs per 1,000 varied from 129.2 to 195.9. While the variation in PPV/1,000 for status 1 and 2 was modest, status 1 and 2 had 199,756 of the beneficiaries (14.4 percent) and 18,207 of the PPVs (5.7 percent).

Table 2: PPV data by CRG risk category for beneficiaries with no chronic diseases

CRG Status			
1	Healthy	Beneficiaries	67,482
		ED Visits	10,319
		PPVs	5,678
		PPVs/1,000	84.14
		PPV Weight	0.0286
		PPV $ Weight	19.82
1	Healthy Non User	Beneficiaries	79,613
		ED Visits	9,746
		PPVs	5,164
		PPVs/1,000	64.86
		PPV Weight	0.0216
		PPV $ Weight	14.97
1	Healthy with Unconfirmed Chronic Disease	Beneficiaries	20,921
		ED Visits	4,056
		PPVs	2,165
		PPVs/1,000	103.48
		PPV Weight	0.0361
		PPV $ Weight	25.02
2	Multiple or Reoccurring Significant Acute Disease	Beneficiaries	6,187
		ED Visits	1,518
		PPVs	862
		PPVs/1,000	139.32
		PPV Weight	0.0461
		PPV $ Weight	31.95
2	Significant Acute Disease	Beneficiaries	13,124
		ED Visits	3,032
		PPVs	1,695
		PPVs/1,000	129.15
		PPV Weight	0.0412
		PPV $ Weight	28.55
2	Major Trauma Or Major Acute Disease	Beneficiaries	2,363
		ED Visits	834
		PPVs	463
		PPVs/1,000	195.94
		PPV Weight	0.0659
		PPV $ Weight	45.67
2	Significant Acute Disease With Unconfirmed Chronic Disease	Beneficiaries	10,066
		ED Visits	2,789
		PPVs	1,524
		PPVs/1,000	151.40
		PPV Weight	0.0533
		PPV $ Weight	36.94

PPV Results by Geographic Region

PPV %(A-E)/E and $(A-E) by Census Region

Table 3 contains the PPV %(A-E)/E and $(A-E) by census region for the national norm and best practice norm. Across census regions the PPVs/1,000 beneficiaries ranged from 197.2 for the west north central census region to 260.0 for the New England census region. The %(A-E)/E with the national norm ranged from 9.8 percent below expected for the west north central census region to 16.8 percent above expected for the New England census region. The %(A-E)/E with the best practice norm ranged from 3.1 percent above expected for the west north central census region to 33.6 percent above expected for the New England census region.

To achieve best practice across all regions, overall PPV performance would need to improve by 14.35 percent, which would generate $9.2 million in reduced Medicare expenditures. The 1,388,114 beneficiaries in the analysis data represent 3.59 percent of the 38,665,082 Medicare FFS beneficiaries in 2018.[7] Extrapolating the reduction in Medicare expenditures from these beneficiaries to the full Medicare FFS population results in an estimated annual reduction of Medicare expenditures of $256.4 million, assuming PPV performance is improved by the 14.35 percent needed to achieve best practice nationally. It is important to keep in mind the $256.4 million represents a reduction in expenditures from achieving best practice $(A-E). The 320,720 PPVs represent $73.3 million in Medicare expenditures ($A) which extrapolated to the full Medicare FFS population is $2.0 billion. While the $2.0 billion reflect Medicare expenditures associated with PPVs, only the $256.4 million reduction is viewed as achievable in the short term. Approximately one-third of Medicare beneficiaries are enrolled in a Medicare Advantage (MA) Plan. The PPV performance in MA plans may differ from Medicare FFS so MA plan beneficiaries are not included in the estimated PPV reduction in Medicare expenditures.

Table 3: PPV %(A-E)/E and $(A-E) by Census Region

Region		Count Benef	Count PPVs	PPVs per 1000 Benef	%(A-E)/E PPV Nat Norm	%(A-E)/E PPV BP Norm	PPV $(A-E) Nat Norm	PPV $(A-E) BP Norm
New England	ME, VT, NH, CT, MA, RI	78,205	20,336	260.03	16.80	33.56	692,572	1,210,004
Middle Atlantic	NY, NJ, PA	174,276	37,413	214.68	-8.14	5.05	-763,090	413,949
South Atlantic	FL, GA, SC, NC, VA, WV, DC, MD, DE	305,134	74,873	245.38	3.88	18.78	633,560	2,684,977
E North Central	IL, WI. MI, IN. OH	212,275	51,026	240.38	4.15	19.10	477,617	1,920,962
E South Central	KY, TN, AL, MS	97,793	24,456	250.08	-0.13	14.21	-6,767	661,580
W South Central	TX, OK, AR, LA	148,401	35,488	239.14	-1.98	12.09	-158,679	847,057
W North Central	MN, IA, MO, KS, NE, SD, ND	100,994	19,915	197.19	-9.81	3.13	-513,758	143,593
Mountain	AZ, NM, UT, CO, NV, WY, ID, MT	96,064	19,193	199.79	-3.68	10.15	-172,144	415,406
Pacific	CA, OR, WA, HI, AK	174,972	38,020	217.29	-2.17	11.87	-189,311	906,418
Total		1,388,114	320,720	231.05	0.00	14.35	0	9,203,945

PPV %(A-E)/E and $(A-E) by State

Table 4 contains the PPV %(A-E)/E and $(A-E) by state for the national norm and best practice norm. The PPVs/1,000 beneficiaries ranged from 130.18 for North Dakota to 406.46 for the District of

Table 4: PPV %(A-E)/E and $(A-E) by State

State	Count Benef	Count PPVs	PPVs per 1000 Benef	%(A-E)/E PPV Nat Norm	%(A-E)/E PPV BP Norm	$(A-E) PPV Nat Norm	$(A-E) PPV BP Norm
Alabama	23,675	6,191	261.50	0.98	15.47	12,699	175,122
Alaska	3,451	736	213.27	2.82	17.58	4,398	23,938
Arizona	28,123	5,924	210.65	2.29	16.98	31,788	205,632
Arkansas	18,214	3,874	212.69	-5.26	8.34	-48,945	67,812
California	117,877	26,883	228.06	0.58	15.01	34,904	789,407
Colorado	19,223	4,037	210.01	2.96	17.74	27,552	144,285
Connecticut	14,634	4,336	296.30	25.48	43.48	204,937	305,890
Delaware	6,878	1,598	232.33	1.70	16.29	6,199	52,090
DC	2,475	1,006	406.46	70.87	95.39	92,952	109,413
Florida	92,161	20,640	223.96	-7.03	6.31	-361,790	284,076
Georgia	38,527	9,149	237.47	-1.79	12.31	-36,866	222,077
Hawaii	4,573	781	170.79	-17.05	-5.15	-37,366	-9,866
Idaho	8,253	1,564	189.51	-16.81	-4.88	-68,023	-17,254
Illinois	59,705	13,147	220.20	-1.33	12.84	-42,040	356,020
Indiana	33,376	8,079	242.06	5.26	20.36	95,346	322,972
Iowa	19,369	3,169	163.61	-21.67	-10.43	-214,958	-90,471
Kansas	16,784	3,182	189.59	-14.02	-1.68	-120,218	-12,595
Kentucky	24,386	6,235	255.68	2.86	17.62	38,813	209,343
Louisiana	20,150	5,837	289.68	10.35	26.18	117,921	260,956
Maine	8,616	2,070	240.25	12.53	28.68	54,645	109,382
Maryland	32,329	8,813	272.60	19.82	37.01	334,999	547,138
Massachusetts	36,477	10,168	278.75	23.89	41.67	468,945	715,272
Michigan	45,595	11,555	253.43	1.32	15.86	33,679	354,648
Minnesota	14,387	3,596	249.95	11.15	27.10	83,539	177,569
Mississippi	18,922	5,116	270.37	7.61	23.05	77,095	204,259
Missouri	30,072	7,144	237.56	1.59	16.17	26,078	231,869
Montana	6,784	1,008	148.58	-24.13	-13.24	-76,489	-36,709
Nebraska	11,224	1,519	135.33	-28.54	-18.29	-158,614	-88,871
Nevada	11,432	2,238	195.77	-5.97	7.53	-34,553	38,121
New Hampshire	9,480	1,908	201.27	-2.88	11.06	-13,427	45,074
New Jersey	44,306	9,111	205.64	-9.67	3.29	-230,898	68,730
New Mexico	9,431	2,012	213.34	-0.33	13.98	-1,486	55,511
New York	73,425	15,383	209.51	-12.71	-0.18	-496,878	-6,305
North Carolina	48,553	12,856	264.78	10.28	26.11	267,049	593,077
North Dakota	4,079	531	130.18	-35.12	-25.81	-71,094	-45,687
Ohio	48,376	12,631	261.10	13.64	29.95	363,411	697,735
Oklahoma	21,991	5,422	246.56	-2.58	11.40	-30,932	119,377
Oregon	16,311	3,119	191.22	-9.43	3.57	-73,655	24,397
Pennsylvania	56,545	12,919	228.47	-1.15	13.04	-35,314	351,524
Rhode Island	3,902	868	222.45	-1.27	12.90	-2,669	23,730
South Carolina	29,366	7,060	240.41	6.35	21.62	94,167	280,174
South Dakota	5,079	774	152.39	-24.25	-13.38	-58,490	-28,221
Tennessee	30,810	6,914	224.41	-8.16	5.02	-135,373	72,857
Texas	88,046	20,355	231.19	-4.14	9.61	-196,722	398,912
Utah	8,651	1,757	203.10	-5.54	8.02	-23,243	29,417
Vermont	5,096	986	193.49	-8.17	5.01	-19,859	10,657
Virginia	43,229	10,672	246.87	9.57	25.30	212,745	491,615
Washington	32,760	6,501	198.44	-7.52	5.75	-117,593	78,542
West Virginia	11,616	3,079	265.07	3.72	18.61	24,104	105,317
Wisconsin	25,223	5,614	222.57	2.10	16.76	27,221	189,587
Wyoming	4,167	653	156.71	-14.42	-2.14	-27,692	-3,598

Columbia. The %(A-E)/E with the national norm ranged from 35.12 percent below expected for North Dakota to 70.87percent above expected for DC. The %(A-E)/E with the best practice norm ranged from 25.81 percent below expected for North Dakota to 95.39 percent above expected for D.C.

Figure 1 is a U.S. map with the %(A-E)/E for the national norm by state color coded as follows:

Green:	%(A-E)/E >10% below expected – 12 states
Yellow:	%(A-E)/E 0 -10% below expected – 16 states
Orange:	%(A-E)/E 0 -10% above expected – 17 states
Red:	%(A-E)/E >10% above expected – 6 states

Wide PPV performance variation is not only across states but also within states. The state of residency of the beneficiary was used to assign beneficiaries to a state in Table 4. Using the metropolitan areas identified in the Core Based Statistical Areas (CBSAs) from the Office of Management and Budget, Appendix D contains PPV %(A-E)/E and $(A-E) for the national norm and best practice for each CBSA with at least 1,000 beneficiaries in the analysis database. Some CBSAs encompass multiple states. For example, the Philadelphia metropolitan area encompasses parts of New Jersey, Delaware and Maryland. When a CBSA encompassed more than one state, the CBSA in Appendix D was assigned to the primary state associated with the CBSA (the Philadelphia metropolitan area was assigned to Pennsylvania).

Figure 2: PPV %(A-E)/E performance by state
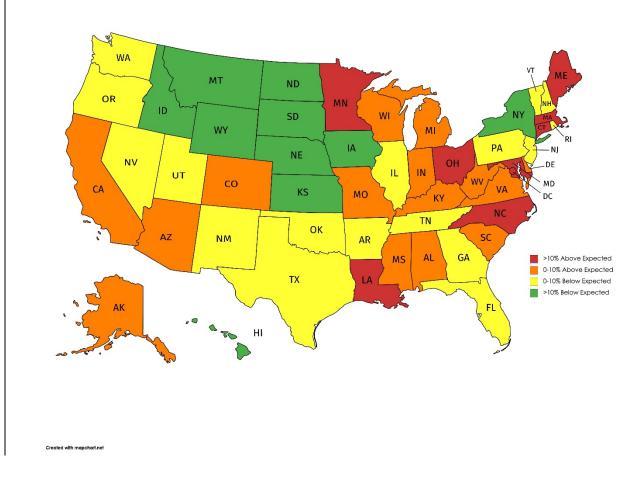

Created with mapchart.net

Table 5 contains the nine CBSAs in Pennsylvania with at least 1,000 beneficiaries in the analysis database. The PPV performance of the CBSAs in the southeast portion of the state is consistently below expected for the national norm. However, the performance in the rest of the state is consistently above expected for the national norm.

PPREDs relate to return ED visits following a hospital discharge and were excluded as a PPV because the return ED visit is primarily a hospital performance issue as opposed to the performance of the delivery system within a geographic region. To examine the relationship between hospital and delivery system performance, a national PPRED norm was created and the PPRED %(A-E)/E was computed for each state. Across states the correlation between the PPRED %(A-E)/E and the PPV %(A-E)/E was 0.32. The modest positive correlation indicates that hospital performance in preventing potentially preventable return ED visit and delivery system performance in preventing potentially preventable ED visits tends to be similar within geographic regions, even though PPREDs were excluded from the PPVs.

Table 5: PPV %(A-E)/E and $(A-E) for the seven largest CBSAs in Pennsylvania

CBSA	Count Benef	Count PPVs	PPVs per 1000 Benef	%(A-E)/E PPV Nat Norm	PPV $(A-E) Nat Norm	%(A-E)/E PPV BP Norm	PPV $(A-E) BP Norm
Pennsylvania	56,545	12,919	228.47	-1.15	-35,314	13.04	351,524
South East Region							
Philadelphia-Camden-Wilmington	28,551	2,213	77.49	-0.71	-10,949	13.54	182,851
Lancaster	2,469	149	60.54	-22.48	-30,034	-11.35	-13,265
Harrisburg-Carlisle	2,300	171	74.35	-5.71	-7,172	7.83	8,601
York-Hanover	2,092	132	62.97	-19.32	-21,855	-7.74	-7,656
Reading	1,971	108	55.03	-32.40	-36,025	-22.70	-22,070
Rest of State							
Pittsburgh	6,393	580	90.75	17.71	60,487	34.60	103,352
Scranton--Wilkes-Barre--Hazleton	3,479	315	90.51	13.03	25,150	29.25	49,380
Erie	1,120	97	86.18	12.79	7,585	28.98	15,027
Chambersburg-Waynesboro	1,033	97	94.18	17.53	10,056	34.40	17,254

PPV Frequency

Table 6 contains the EAPG assigned to the 28 PPVs comprising at least one percent of the PPVs. The highest volume PPVs are for minor musculoskeletal and skin problems and nonspecific symptoms such as abdominal pain.

Summary and Conclusions

The 1,388,114 beneficiaries in the analysis database had 583,708 ED visits of which 320,720 were a PPV (54.9 percent of the ED visits). The 320,720 PPVs represent $2.0 billion in annual Medicare expenditures. If PPV best practice was achieved nationally, overall PPV performance would need to improve by 14.35 percent, which would result in an annual reduction in Medicare expenditures of $256.4 million (12.8 percent of the $2.0 billion in PPV expenditures).

There was significant PPV performance variation across census regions, states and CBSAs. Across states, PPV performance based on a national norm varied from 35.12 percent below expected for North Dakota to 70.87 percent above expected for DC.

PPV performance is an important measure of delivery system performance in a managed care plan or geographic region. The extent of PPV performance variation across states indicates there are PPV performance improvement opportunities in many geographic areas.

Table 6: EAPG of the 28 PPVs comprising at least one percent of the PPVs

	EAPG of PPV	Count	Percent
661	LEVEL II MUSCULOSKELETAL & CONNECTIVE TISSUE DIAGNOSES	26,178	8.2
674	CONTUSION, OPEN WOUND, TRAUMA TO SKIN & SUBCUTANEOUS TISSUE	23,864	7.4
628	ABDOMINAL PAIN	18,442	5.8
871	SIGNS, SYMPTOMS & OTHER FACTORS INFLUENCING HEALTH STATUS	16,840	5.3
656	BACK & NECK DIAGNOSES EXCEPT LUMBAR DISC DIAGNOSES	14,937	4.7
727	ACUTE LOWER URINARY TRACT INFECTIONS	13,355	4.2
627	NON-BACTERIAL GASTROENTERITIS, NAUSEA & VOMITING	13,325	4.2
576	LEVEL I OTHER RESPIRATORY DIAGNOSES	12,480	3.9
675	OTHER SKIN, SUBCUTANEOUS TISSUE & BREAST DIAGNOSES	10,219	3.2
561	VERTIGINOUS DIAGNOSES EXCEPT FOR BENIGN VERTIGO	9,914	3.1
562	INFECTIONS OF UPPER RESPIRATORY TRACT & OTITIS MEDIA	9,457	2.9
271	PHYSICAL THERAPY	8,450	2.6
599	HYPERTENSION	7,994	2.5
270	OCCUPATIONAL THERAPY	7,541	2.4
530	HEADACHES OTHER THAN MIGRAINE	7,324	2.3
624	LEVEL I GASTROINTESTINAL DIAGNOSES	6,028	1.9
694	ELECTROLYTE DISORDERS	6,004	1.9
630	CONSTIPATION	5,389	1.7
601	LEVEL I CARDIAC ARRHYTHMIA & CONDUCTION DIAGNOSES	5,306	1.7
711	DIABETES WITH OTHER MANIFESTATIONS & COMPLICATIONS	4,639	1.4
602	ATRIAL FIBRILLATION	3,742	1.2
564	LEVEL I OTHER EAR, NOSE, MOUTH, THROAT & CRANIAL/FACIAL DIAGNOSES	3,641	1.1
826	ACUTE ANXIETY & DELIRIUM STATES	3,556	1.1
658	LUMBAR DISC DIAGNOSES WITH SCIATICA	3,550	1.1
663	PAIN	3,513	1.1
563	DENTAL & ORAL DIAGNOSES & INJURIES	3,474	1.1
573	COMMUNITY ACQUIRED PNUEMONIA	3,454	1.1
553	LEVEL I OTHER OPHTHALMIC DIAGNOSES	3,242	1.0

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Appendix A: Bibliography of Publicly Available Articles and Reports on PPVs, CRGs, APR DRGs, EAPGs, PPREDs

All articles and reports are publicly available and are listed in chronological order. The opinions and conclusions in these articles and reports are solely those of the authors.

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Potentially Preventable Return Visits to the Emergency Department (PPR EDs)

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Appendix B: Potentially Preventable Emergency Department Visits (PPVs)

This Appendix gives an overview of the Potentially Preventable Emergency Department Visits (PPVs), a methodology that can be used to determine the amount of variability in emergency department visits and to estimate the potential magnitude of avoidable emergency department visits.

PPV Assignment Criteria

Potentially unnecessary hospital emergency room visits are not unusual. In 2011, there were over 136 million visits to emergency departments (EDs) throughout the United States,[1] many of which were for non-emergency conditions. Many of these non-emergency visits were by people who either lack access to primary care altogether or whose primary care providers provide inadequate access to care, especially after hours or on weekends. Emergency departments have increasingly served as primary care providers of last resort, and non-emergent care provided in emergency departments has come to be seen as an indicator of the inadequacy of primary care services in the U.S. Researchers have found that Emergency Department (ED) overcrowding by those with minor medical conditions such as sore throats and earaches may also hinder an ED's ability to provide quality care. Many EDs, after all, are already overcrowded and struggling to handle an increase in patient visits. These visits originate from a home setting or nursing home/rehabilitation hospital setting.

Background on Emergency Department use and overuse

Increasing use of the Emergency Department (ED) as a source of first-contact care for non-emergent conditions has contributed to overcrowding, which in turn causes a number of complications, as pointed out by the American College of Emergency Physicians, the Institute of Medicine, and the Government Accounting Office.[2] These complications include:

- Delays in the treatment of serious problems, including heart attacks
- Increased waiting times for people with minor illnesses
- Reduced promptness and quality of pain management
- Hallway boarding of admitted patients
- Ambulance diversions
- Decreased physician productivity

Evidence for ED utilization for non-emergent care comes from the National Hospital Ambulatory Medical Care Survey: 2011 Emergency Department Summary (U.S. Department of Health and Human Services)[3] and includes the following:

- 28 percent of ED patients had no diagnostic or screening services performed.
- 49 percent of ED patients had no procedures performed (the most frequent procedure performed was infusion of intravenous fluids).
- 43 percent of patients were designated as either semi-urgent (able to wait an hour to be seen) or non-urgent at the time of arrival by the triage nurse.
- The great majority of patients (83 percent) were discharged to home: 11.9 percent were admitted to hospital, another 2.1 percent to an observation unit, and 2.1 percent were transferred to another hospital.

Analysts have pointed out that much of this inappropriate utilization could be eliminated if our primary care system functioned as it should. Many analysts have attempted to estimate the magnitude of this burden, with varying success.

- Relevant information from the Emergency Department survey cited above includes:
- About 3.6 percent of ED visits were made by patients who had been seen in the same ED within the last 72 hours.
- About 2.1 percent of ED visits were made by patients who had been discharged from the hospital within the last 7 days.
- Though overall ED visits increased, the number of visits considered emergent or urgent (15.9 million) did not change significantly from 2005, nor did the number of patients arriving by ambulance (18.4 million).

With respect to nursing homes, older adults, particularly nursing home residents, comprise a large and growing percentage of those visiting the ED. Prior research has identified conditions that may lead to potentially preventable visits to an ED among nursing home residents. Researchers argue that some of these conditions, such as urinary tract infections, could be more appropriately treated in the nursing home. Other conditions prompting ED visits, such as those related to falls or pneumonia, may have been avoided by preventing the adverse health event itself. Decreasing potentially preventable visits to EDs may reduce health care costs, lessen trauma or complications resulting from medical treatment for nursing home residents, and improve quality of care.

According to a recently published survey on ED visits and Medicaid, with respect to children, a handful of conditions account for more than half of all ED visits by both privately insured and Medicaid-covered children aged 0 to 12 years: acute respiratory and other common infections and injuries. Together, these conditions accounted for 53 percent of ED visits by children with Medicaid and almost 60 percent of all visits by privately insured children. Very few other condition groups account for a large enough share of visits that, if redirected to other care settings, could have a real impact on patient volume in emergency departments. This is strong evidence supporting the idea that settings other than emergency departments could manage a large share of visits by children, but these settings would require capacity to treat 1) urgent and common childhood infections; and 2) minor or uncomplicated injuries."[4]

Classification methodologies addressing preventable emergency visits

There have been several methods developed to identify potentially preventable emergency visits with the goal of reducing their frequency. Of greatest relevance:

- New York University Emergency Department Visit (NYU ED) severity algorithm
- The Emergency Severity Index (ESI)
- The 3M Potentially Preventable Emergency Department Visits (PPV) methodology, based on the 3M™ Enhanced Ambulatory Patient Grouping (EAPG) System

The NYU ED classification description divides patients into four categories of need based on a three-step process: first on the severity of findings at the time of admission to the ED, then based on the types of services provided in the ED, and then finally the diagnosis assigned to the patient at the end of the visit. First a determination of "emergent" versus "non-emergent" need is made based on demographics, vital signs, primary symptoms and comorbid conditions. Then the emergent cases are separated into "emergent, primary care treatable" and "emergent, ED care needed" based on whether the patient received any services that would have only been available in an ED setting and unavailable in a primary care setting. A "preventability percentage" is assigned based on the initial research sample. Thus (and this is from their web site) "for abdominal pain, the algorithm assigns a specific percentage of the visit into the categories of 'non-emergent,'

'emergent/primary care treatable,' and 'emergent/ED care needed-not preventable/avoidable' based on what we observed in our sample for cases with an ultimate discharge diagnosis of abdominal pain." Finally, the group of "emergent, ED care needed" patients are further separated into groups considered to be "preventable/avoidable" with adequate primary care services, or "not preventable/avoidable." This last distinction is based on the whether an ambulatory care sensitive condition diagnosis code was assigned to the patient at the time of discharge from the ED, and the probability of that diagnosis being preventable or avoidable derived from previous analyses.[5]

A number of studies have evaluated the NYU ED classification system, some favorable and some not.[6] A comprehensive study of the details of the system by the Washington State Hospital Association (WHSA) found several defects:[7]

- The model has not been updated since 2001, so that the additions and changes in diagnostic coding and clinical practice have not been incorporated.
- The classification system includes the category of "unclassifiable" and in their study 42 percent of cases fell into this category.
- The model does not evaluate each visit claim as necessary or unnecessary, appropriate or not appropriate.

A recent article highlighted some of the many factors pertaining to avoidable ED visits, "Previous studies have found a lower rate of resource utilization for non-urgent patients; however, our analysis shows a high rate of interventions for even the lowest acuity visits. This suggests that health care services are needed even for the lowest acuity visit and calls into question the designation of a non-urgent ED visits as being unnecessary." Categorizing an ED visit as unnecessary depends not only on patient acuity but also the appropriateness of the site of service and availability of alternate sources of acute, unscheduled care. The ED may in fact be an appropriate site of service for a non-urgent presentation or complaint if there are no other available sites to provide timely care to the patient.[8]

This article highlights the need to look at avoidable ED visits as part of a coordinated care or integrated delivery system approach. That is, the challenge for the integrated delivery systems that are being implemented is to exactly address the challenge in the last sentence of this excerpt. A second methodology examining appropriateness and severity of ED visits, The Emergency Severity Index (ESI), provides an example of a purely clinically based approach to severity classification, and relies on signs of acuity such as hypotension, fever, tachycardia, and selected high-risk symptoms, and was designed to classify severity at the bedside for individual patients. It can be also used to stratify severity for performance evaluations for groups of ED patients, but requires either prospective data gathering or retrospective chart review. For research purposes, therefore, the ESI has much higher costs than a system based on routinely available computerized clinical data.[9]

Assign EAPG

A patient's individual outpatient services are assigned to EAPGs. EAPGs are a comprehensive method of determining a patient's reason for an ambulatory visit and are used in the PPV logic to identify patients that had candidate PPV events. The standard EAPG logic partitions outpatient services into separate days and assigns the individual outpatient services to an EAPG. Each EAPG is assigned to one of five categories comprised of per-diem visits, significant procedure, ancillary service, incidental services and medical visit indicator. The medical visit EAPG is used to identify candidate potentially preventable Emergency Department (ED) visits. PPV evaluation for the majority of EAPGs is based on the medical reason for why the patient was seen in the ED, not the specific services performed during the encounter. For instance, if a patient is seen in the ED for a headache and a CT scan is performed, the PPV logic will evaluate if the visit for the headache may

have been prevented. Refer to the EAPG section of this manual for a detailed description of EAPG methodology. There is a small subset of significant procedure EAPGs that are potentially preventable. For example, bunion procedures, circumcisions, fitting of contact lenses, etc.

Outpatient encounters for per-diem visits and significant procedures determine the categorization for the reason for the visit and are not assigned a medical EAPG. Only those outpatient encounters with a medical visit indicator that do not also have a per-diem or significant procedure performed are classified with a medical visit EAPG. However, there are a select set of ancillary procedures that dominate the cost of the visit and are categorized as significant procedure EAPGs. For example, performing an MRI for mild low back pain may not be useful to establish a diagnosis. Outpatient encounters that are found on the list of significant procedure ancillary EAPGs are reassigned to a medical visit EAPG based on the reason for the ambulatory visit.

Determine if the outpatient visit occurred in a hospital emergency room

Treatment for outpatient services can occur in many health care settings. PPVs are only assigned to visits that occurred in a hospital's emergency department. Outpatient visits with charges for the following revenue codes or Evaluation and Management HCPCS/CPT codes (CPT codes, descriptions and materials only © 2019 American Medical Association. All Rights Reserved):

Revenue center codes
0450 Emergency department general
0451 EMTALA emergency medical screening
0452 ER beyond EMTALA screening
0456 Urgent Care
0459 Other emergency room
0981 Emergency room

E&M HCPCS/CPT codes
99281 Emergency Department visit (straight forward decision making)
99282 Emergency Department visit (low complexity)
99283 Emergency Department visit (expanded problem focus exam/moderate complexity)
99284 Emergency Department visit (detail exam/mod complexity)
99285 Emergency Department visit (high complexity) are identified as ED visits for a patient
G0380 Lev 1 hosp type B ED visit
G0381 Lev 2 hosp type B ED visit
G0382 Lev 3 hosp type B ED visit
G0383 Lev 4 hosp type B ED visit
G0384 Lev 5 hosp type B ED visit
G0390 Trauma Respons w/hosp Criti

Determine if reason for the visit is an ambulatory care sensitive condition

PPVs are emergency room visits that may result from a lack of adequate access to care or ambulatory care coordination. Similar to PPAs, PPVs are ambulatory sensitive conditions (e.g., asthma) which adequate patient monitoring and follow-up (e.g., medication management) should be able to reduce or eliminate. PPVs are inefficient and expensive either because the care could have been provided in a less expensive setting that was not available, or because inadequate care of a chronic or sub-acute problem in the outpatient setting resulted in an acute deterioration, or a combination of both. In addition, when a PPV occurs shortly following a hospitalization, the PPV may be the result of actions taken or omitted during the hospital stay, such as incomplete treatment or poor care of the underlying problem and/or poor coordination with the primary care or specialist physicians.

The PPV methodology utilizes the 3M™ Enhanced Ambulatory Patient Grouping (EAPG) System as its foundation, in order to identify those emergency department services that are potentially preventable. The 3M EAPGs are a classification methodology that categorizes all ambulatory patient services, regardless of setting, in the same way that diagnosis related groups (DRGs) comprehensively categorize inpatient hospital services. EAPGs have the following characteristics that are necessary for any ambulatory patient classification system:

- Comprehensiveness – all ambulatory services are included
- Administrative simplicity – uses claims data, and chart review is not needed
- Homogeneous resource use within each patient class
- Clinical meaningfulness
- Minimal Upcoding and Code Fragmentation – minimal opportunities for providers to assign patients to higher paying classes through upcoding (e.g. codes for "simple" and "complex" procedures are placed in separate classes)
- Flexibility - The patient classification methodology is flexible enough to accommodate a full range of options for incorporating ancillary services into the visit payment.

The EAPG based potentially preventable ED visits/services classification methodology consists of Diagnostic and Procedural axes of classification. The first step in developing a patient classification methodology is to choose the initial classification variable. In DRGs, the principal diagnosis is used to classify patients into a set of mutually exclusive major diagnostic categories (MDCs). For EAPGs, the initial classification variables are procedures rather than diagnoses. The procedures that could be performed on an ambulatory basis were assigned to one of two classes:

Significant Procedures. These are ordinarily scheduled in advance, constitute the reason for the visit, and dominate the time and resources expended during the visit. Significant procedures range in scope from debridement of nails and excision of a skin lesions to pacemaker replacements and stress tests. Significant procedures need to be scheduled and consume the vast majority of the resources for that visit (all the above examples fall into that category) and these are their defining characteristics.

Ancillary Services. These include tests and procedures that can assist in diagnosis or treatment at the time of a medical encounter. Examples of ancillary procedures range from simple injections and immunizations to a cardiogram.

ED patients who do not undergo a significant or ancillary procedure are assigned to a PPV diagnostic group based on the diagnostic code that is the reason for the visit.

In addition to this Diagnostic and Procedural classification, all EAPGs are divided into those that are and are not potentially preventable when they occur in the ED. Finally, all PPVs are divided into the following categories:

- Potential areas of overuse
- Acute infections that could be treated in a primary care setting
- Chronic illnesses related to malignancy
- Mental health and substance abuse encounters
- Other chronic illnesses except mental health, substance abuse and malignancy

Understanding that the rate of preventable ED visits will never be zero, the PPV methodology examines all ED visits for opportunities for improvement.

Determine if patient was admitted from a residential nursing care facility

Research suggests increased Emergency Department (ED) visits from nursing home residents could be prevented with better quality of care was taken at the nursing care facility. For example, if a patient had a UTI the facility should have been able to treat it, therefore the event would have been avoided. These visits start in the nursing home/rehabilitation hospital setting. Like PPA, PPV also uses Nursing Care Residential Sensitive Condition Criteria.

In addition to the ambulatory sensitive conditions described above, additional diagnoses are considered PPVs specifically for patients admitted from a residential nursing care facility. Patients treated in the ED for acute major eye infections as well as patients treated for osteomyelitis, septic arthritis and other musculoskeletal infections are considered candidate PPVs. The full list of EAPGs that represents both the ambulatory sensitive conditions and the residential nursing care facility sensitive conditions are detailed in the PPV section of this manual. Thus, patients are identified as PPV candidates if they are treated in the emergency room directly coming from a residential nursing care facility and assigned a residential nursing care facility sensitive condition.

The same logic used with the PPA assignment for residential nursing care facility identification is used with PPV assignment. Residential nursing care facilities are designated as one of the following places of service: SNF, nursing home, inpatient psychiatric facility, Intermediate Care Facility/Individuals with Intellectual Disabilities, residential substance abuse treatment facility, psychiatric residential treatment center, comprehensive inpatient rehabilitation facility. Refer to the place of service section of this manual for detailed logic for residential nursing care facility identification.

Determine if reason for the visit is a trauma-related condition

Additional trauma criteria are applied to determine if a PPV is potentially preventable for those patients treated in the ED coming from a residential nursing care facility. If a visit has a significant procedure EAPG assigned, and the reason for the visit is trauma-related, and the patient came from a residential nursing care facility, the ED visit would be considered preventable. This is based upon the premise that a nursing home facility should have measures to avoid trauma. For example, if a patient fell and sustained a hip fracture the fracture may have been avoided all together by preventing the adverse event, in this case a fall. A list of trauma diagnoses, when coded as the principal diagnosis, determines if the reason for the ED visit was trauma related.

Potentially preventable visits (PPV) output

Potentially preventable visits (PPV) contain a number of outputs including risk status, exclusion status, and reason.

There are two risk (R) statuses for PPV: At Risk Potentially Preventable (RP) and At Risk Not Potentially Preventable (RN).

There are two exclusion (E) statuses for PPV: Excluded Potentially Preventable (EP) and Excluded Not Potentially Preventable (EN). Within PPV, there are a few scenarios where exclusion logic is applied:

1. Exclusion logic is applied if the outpatient visit date falls on or within the admit and discharge dates of an inpatient admission. Any PPV claim that fits that criteria will be returned with a status of EP or EN and assigned a reason of 92 - Inpatient admission overlap.

2. If enabled, exclusion logic is applied if a line item is performed in an ER environment (place of service value of 23). Any PPV claim that fits that criteria will be returned with a status of EP or EN and assigned a reason of 97 - Line item performed in an ER setting.
3. If enabled, exclusion logic is applied to exclude claims that are not coded with a bill type of '13' indicating a claim not performed in an outpatient setting. Any PPV claim that fits that criteria will be returned with a status of EP or EN and assigned a reason of 98 - Non-outpatient facility claim.

For PPV, there are specific medical EAPGs that require additional code level detail to determine the potential preventability of a visit. For these EAPGs, the principal diagnosis is required to make a final determination. If the principal diagnosis for the claim is not considered potentially preventable, the claim will be returned with a status of RN. If the principal diagnosis is considered potentially preventable, the claim will be returned with a status of RP and the relevant reason assigned.

Additionally, for EAPGs that require code level detail, a PPV may not be assigned in some cases due to diagnosis specific age criteria. If the principal diagnosis is potentially preventable but is associated with specific age criteria, the admission is not considered potentially preventable if the patient's age falls within that range. In this case, the claim will be returned with a status of RN.

Potentially Preventable (RP)

- 21 - Potentially Preventable

PPV Reasons

- 0 - Not Potentially Preventable
- 1 - Acute illness not related to infection
- 2 - Acute infections that could be treated in a primary care setting
- 3 - Chronic illnesses related to malignancy
- 4 - Other chronic illnesses except mental health, substance abuse and malignancy
- 5 - Mental health and substance abuse encounters
- 6 - Trauma
- 7 - Not appropriate for ED
- 92 - Inpatient admission overlap
- 97 - Line item performed in an ER setting (exclusion logic)
- 98 - Non outpatient facility claim (exclusion logic)

Grouper assignment to one of the following EAPGs is not compatible with PPV and will output an error return (RX):

- EAPG 993 Inpatient only procedures
- EAPG 994 User customizable inpatient procedures
- EAPG 999 Other unassigned

Interventions to help reduce preventable emergency visits

PPVs can identify patterns of potentially avoidable emergency department visits and may suggest areas where primary care services should be improved. If inappropriate ED utilization is to be minimized, however, structural changes in the organization and delivery of first contact care will be essential.
The following are recommendations from the medical literature on community initiatives that can help reduce unnecessary ER visits:

- Establish medical homes where primary care physicians coordinate patients' care.
- Start a telephone line where nurses direct callers to the best places for care.
- Enroll children in telemedicine programs.
- Improve the availability of after-hours care.
- Increase enrollment in safety net programs.
- Simplify health information so patients can learn to care for themselves and avoid the ER.
- Educate the community on appropriate ER visits.
- Create case management programs to help people manage chronic diseases.
- Start workplace wellness programs to bolster workers' health.
- Establish urgent care centers to take on patients who are not necessarily seen in an ED but who were not able to obtain a timely primary care physician appointment or in fact who do not have a primary care physician.

Prevalence and potential cost savings related to preventable Emergency Department visits

The Minnesota Department of Health published a study on the volume and payments for potentially preventable events within the state. They identified 1.2 million potentially preventable Emergency Department (ED) visits with an associated cost of $1.3 billion in 2012 alone.[10] The distribution of the PPVs were observed to fall predominately upon Medicaid where Medicaid enrollees accounted for 14 percent of the population but 41 percent of PPVs. The New York State Department of Health has been publicly reporting PPVs for the Medicaid program since 2011.[11] In 2011 there were 2,568,757 PPVs, a rate of 45.44 per 100 people. In 2013 the rate had barely changed at 45.31 per 100 people with 2,741,677 PPVs. Education, information and incentives are required to lower these rates with the potential to unlock billions of dollars for state budgets and the knock-on effects of reducing ED crowding and the need to maintain excess high-cost ED capacity.

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Appendix C: Description of CRG Logic

Clinical Risk Groups (CRGs) are a categorical clinical model that uses historical claims data to assign individuals to a single mutually exclusive category that defines an individual's chronic disease burden (Hughes, 2004). Each CRG is composed of a base CRG that describes the patient's most significant chronic conditions and two to six explicit severity levels that distinguish differences in disease burden due to severity of illness (e.g., a patient with diabetes and congestive heart failure at severity level 3). The CRG logic follows the logical progression of a disease. The CRG assignment process is as follows:

Phase 1: Categorize diagnoses and procedures

- All diagnoses are assigned to an MDC (Major Diagnostic Category)
- Within each MDC, diagnoses are assigned to one of 557 EDCs (Episode Diagnostic Categories)
- All procedures are assigned to one of 640 EPCs (Episode Procedure Category)
- Each EDC is categorized as dominant chronic, moderate chronic, minor chronic, chronic manifestation, significant acute or minor acute
- Only one diagnosis from an inpatient admission is needed to establish an EDC
- Two diagnoses from different days are needed to establish an EDC for outpatient visits except for diagnoses for selected conditions and diagnosis codes which are in fact procedures (e.g., history of a heart transplant)
- For inpatient services diagnoses from physician and other professional claims are not used (i.e., only the hospital claim is used).
- Diagnoses from "other" providers (e.g., ambulances, freestanding laboratory, etc.) are not used.
- Some diagnosis codes create multiple EDCs. (e.g., the diabetic neuropathy code creates both the chronic disease EDC for diabetes and the chronic manifestation EDC for diabetic neuropathy EDC).
- Conditionality rules are also applied and affect diagnosis or severity assignment:
  - Persistence and recurrence rules (e.g., hypertension must persist over a period of time to be considered an established diagnosis)
  - Demographic (e.g., congestive heart failure among children vs. adults)
- The temporal relationship between EDCs and EPCs is used to establish final EDCs
  - EDCs can cause other EDCs to be "ignored"
    - Acquired hemiplegia removes stroke from contributing to the severity of illness rating
  - EPCs can cause EDC and EPCs to be "ignored"
    - Angioplasty removes Angina from the severity logic
    - Kidney transplant causes renal dialysis to be removed from the severity logic

Phase 2: Identify chronic illnesses and specify their severity of illness

- Each MDC with a chronic EDC will be assigned a PCD (Primary Chronic Disease)

- Only one PCD can be assigned per MDC. If there is more than one EDC within an MDC, the PCDs will be selected in hierarchical order within the MDC (e.g., dominant chronic EDCs selected before moderate chronic EDCs)

- Some chronic EDCs cannot become PCDs if a certain other EDC is present (e.g., skin ulcers cannot be a PCD if diabetes is present)

- After a PCD is selected it is assigned a severity of illness level

- The severity level assignment for each PCD is establish by the presence of related conditions (e.g., skin ulcers in a diabetic)

Phase 3: Assign the CRG

- Assignment to one of 272 base CRGs based on the combination of PCDs that are present

- The highest volume diseases or combinations of diseases are assigned a unique base CRG, for example:
    - Diabetes
    - Diabetes with CHF
    - Diabetes with CHF and COPD

- All CRGs are assigned to one of nine hierarchical health statuses ranging from catastrophic to healthy

    Status 1 – Healthy
    Status 2 – History of Acute Disease e.g., Chest Pain
    Status 3 – Single Minor Chronic Disease e.g., Migraine
    Status 4 – Minor Chronic Disease in Multiple Organ Systems e.g., Migraine and BPH
    Status 5 – Single Dominant or Moderate Chronic Disease e.g., Diabetes
    Status 6 - Dominant or Moderate Chronic Disease in Multiple Organ Systems, e.g., Diabetes, and COPD
    Status 7 - Dominant Chronic Disease in Three or More Organ Systems, e.g., CHF, Diabetes, and COPD
    Status 8 - Malignancy, Under Active Treatment, e.g., Lung Cancer
    Status 9 - Catastrophic Conditions, e.g., Major Organ Transplant

- Assignment is done from most serious (catastrophic) to least serious (healthy)

- Each base CRG is subdivided into discrete severity subclasses based on the severity levels of the PCDs

The CRGs (Version 2.1) are composed of 332 base CRGs that describes the individual's most significant chronic conditions and explicit severity levels that distinguish differences in disease burden due to severity of illness resulting in 1,414 individual CRGs.

A more detailed description of CRGs is available at: https://apps.3mhis.com/docs/Groupers/Clinical_Risk_Grouping_CRG/methodology_overview/grp401_crg_v2.1_meth_overview.pdf

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Appendix D: PPV %(A-E)/E and $(A-E) by CBSA

State	CBSA	Count Benef	Count PPVs	PPVs per 1000 Benef	%(A-E)/E PPV Nat Norm	$(A-E) PPV Nat Norm	%(A-E)/E PPV BP Norm	$(A-E) PPV BP Norm
Alabama	Birmingham-Hoover, AL	3,829	284	74.17	-6.23	-13,077	7.23	13,264
Alabama	Huntsville, AL	2,163	161	74.47	-6.57	-7,848	6.84	7,146
Alabama	Montgomery, AL	1,410	112	79.55	5.05	3,739	20.13	13,025
Alabama	Mobile, AL	1,331	89	67.24	-18.95	-14,499	-7.32	-4,897
Alabama	Daphne-Fairhope-Foley, AL	1,084	82	75.60	-3.20	-1,876	10.69	5,487
Alabama	Tuscaloosa, AL	1,072	88	81.85	-0.23	-141	14.09	7,508
Alabama	Florence-Muscle Shoals, AL	1,002	103	102.57	36.22	18,939	55.77	25,501
Alabama	Rural Alabama	4,471	379	84.88	8.85	21,386	24.47	51,706
Alabama	Aggregate small CBSAs	7,009	562	80.23	1.14	4,409	15.66	52,762
Alaska	Anchorage, AK	1,820	148	81.57	22.58	18,951	40.17	29,484
Alaska	Rural Alaska	967	33	34.06	-45.72	-19,222	-37.93	-13,945
Alaska	Aggregate small CBSAs	668	55	82.63	27.07	8,148	45.30	11,926
Arizona	Phoenix-Mesa-Scottsdale, AZ	15,542	1,251	80.49	10.74	84,058	26.63	182,303
Arizona	Tucson, AZ	3,968	238	60.00	-12.17	-22,862	0.43	713
Arizona	Prescott, AZ	2,166	157	72.67	5.46	5,652	20.60	18,633
Arizona	Lake Havasu City-Kingman, AZ	1,712	143	83.52	14.11	12,249	30.48	23,147
Arizona	Rural Arizona	789	38	48.58	-29.83	-11,291	-19.76	-6,540
Arizona	Aggregate small CBSAs	3,832	207	54.14	-21.50	-39,377	-10.23	-16,391
Arkansas	Little Rock-North Little Rock-Conway, AR	4,175	334	80.09	10.56	22,125	26.42	48,430
Arkansas	Fayetteville-Springdale-Rogers, AR-MO	2,043	153	74.78	-0.62	-664	13.64	12,706
Arkansas	Fort Smith, AR-OK	1,545	103	66.50	-15.08	-12,639	-2.89	-2,118
Arkansas	Rural Arkansas	4,490	215	47.97	-34.08	-77,178	-24.62	-48,760
Arkansas	Aggregate small CBSAs	6,947	555	79.82	7.18	25,727	22.56	70,726
California	Los Angeles-Long Beach-Anaheim, CA	31,567	2,097	66.43	-16.61	-289,523	-4.65	-70,824
California	San Francisco-Oakland-Hayward, CA	14,178	1,208	85.17	21.60	148,646	39.05	235,008
California	San Diego-Carlsbad, CA	8,500	580	68.28	-2.96	-12,274	10.96	39,745
California	Riverside-San Bernardino-Ontario, CA	8,090	696	86.02	13.21	56,287	29.46	109,746
California	Sacramento--Roseville--Arden-Arcade, CA	7,090	602	84.94	16.75	59,880	33.51	104,742
California	San Jose-Sunnyvale-Santa Clara, CA	5,096	347	68.06	0.25	596	14.64	30,685
California	Oxnard-Thousand Oaks-Ventura, CA	3,486	234	66.98	-9.53	-17,053	3.45	5,395
California	Fresno, CA	3,223	226	70.07	-3.95	-6,433	9.84	14,016
California	Bakersfield, CA	2,427	161	66.23	-14.87	-19,455	-2.65	-3,034
California	Santa Maria-Santa Barbara, CA	2,425	185	76.15	12.69	14,410	28.86	28,661
California	Stockton-Lodi, CA	2,251	204	90.67	21.84	25,353	39.33	39,921
California	Salinas, CA	2,249	161	71.62	6.16	6,474	21.39	19,669

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California	San Luis Obispo-Paso Robles-Arroyo Grande, CA	2,116	160	75.61	14.86	14,347	31.35	26,461
California	Santa Rosa, CA	2,038	157	77.17	8.24	8,297	23.77	20,934
California	Visalia-Porterville, CA	1,977	132	66.99	-12.76	-13,422	-0.24	-219
California	Chico, CA	1,949	161	82.61	9.58	9,758	25.31	22,536
California	Redding, CA	1,840	156	84.52	26.57	22,624	44.73	33,311
California	Santa Cruz-Watsonville, CA	1,740	101	58.05	-10.70	-8,384	2.12	1,453
California	Modesto, CA	1,583	154	97.27	32.11	25,934	51.07	36,071
California	Vallejo-Fairfield, CA	1,521	157	103.39	49.97	36,311	71.49	45,431
California	Merced, CA	1,224	109	89.34	22.04	13,684	39.55	21,477
California	Yuba City, CA	1,118	69	62.08	-16.88	-9,765	-4.95	-2,504
California	Eureka-Arcata-Fortuna, CA	1,093	62	56.78	-15.32	-7,778	-3.16	-1,404
California	Rural California	2,571	99	38.37	-43.30	-52,206	-35.16	-37,074
California	Aggregate small CBSAs	6,725	519	77.24	8.72	28,880	24.33	70,429
Colorado	Denver-Aurora-Lakewood, CO	6,741	529	78.48	8.38	28,348	23.93	70,800
Colorado	Colorado Springs, CO	2,801	219	78.33	10.27	14,159	26.09	31,463
Colorado	Fort Collins, CO	1,527	127	83.31	25.92	18,149	43.99	26,935
Colorado	Boulder, CO	1,039	75	71.88	8.00	3,836	23.50	9,850
Colorado	Rural Colorado	2,390	77	32.34	-52.14	-58,353	-45.27	-44,308
Colorado	Aggregate small CBSAs	4,707	349	74.22	8.78	19,548	24.40	47,478
Connecticut	Hartford-West Hartford-East Hartford, CT	4,391	437	99.43	24.03	58,620	41.83	89,233
Connecticut	Bridgeport-Stamford-Norwalk, CT	4,009	327	81.57	8.47	17,692	24.04	43,911
Connecticut	New Haven-Milford, CT	3,514	393	111.86	36.25	72,478	55.81	97,568
Connecticut	Norwich-New London, CT	1,260	141	112.28	34.04	24,896	53.27	34,076
Connecticut	Aggregate small CBSAs	970	103	106.57	38.92	20,068	58.85	26,540
Delaware	Salisbury, MD-DE	3,928	355	90.50	17.97	37,521	34.90	63,729
Delaware	Dover, DE	1,300	93	71.82	-11.37	-8,301	1.35	861
Delaware	Rural Delaware	7	1	118.11	37.03	155	56.69	207
District of Columbia	Washington-Arlington-Alexandria, DC-VA-MD-WV	24,047	2,035	84.62	18.65	221,701	35.68	370,854
Florida	Miami-Fort Lauderdale-West Palm Beach, FL	16,543	1,355	81.93	-1.98	-18,945	12.09	101,315
Florida	Tampa-St. Petersburg-Clearwater, FL	11,547	883	76.48	-9.20	-61,976	3.84	22,602
Florida	Orlando-Kissimmee-Sanford, FL	7,859	600	76.31	-8.03	-36,269	5.17	20,443
Florida	Jacksonville, FL	6,999	570	81.43	1.78	6,901	16.38	55,601
Florida	North Port-Sarasota-Bradenton, FL	6,535	425	65.05	-13.74	-46,935	-1.36	-4,073
Florida	Cape Coral-Fort Myers, FL	4,825	272	56.40	-26.55	-68,176	-16.01	-35,954
Florida	Deltona-Daytona Beach-Ormond Beach, FL	3,563	266	74.70	-4.24	-8,160	9.51	16,013
Florida	Palm Bay-Melbourne-Titusville, FL	3,413	219	64.26	-21.40	-41,372	-10.12	-17,106
Florida	Port St. Lucie, FL	3,002	231	76.98	-4.02	-6,703	9.76	14,236

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Florida	Naples-Immokalee-Marco Island, FL	2,951	196	66.32	-7.59	-11,137	5.67	7,282
Florida	Pensacola-Ferry Pass-Brent, FL	2,621	247	94.28	15.96	23,576	32.61	42,109
Florida	Lakeland-Winter Haven, FL	2,583	151	58.40	-29.15	-43,006	-18.98	-24,489
Florida	Ocala, FL	2,346	160	68.28	-15.08	-19,716	-2.90	-3,311
Florida	The Villages, FL	1,777	129	72.63	-7.68	-7,440	5.57	4,718
Florida	Crestview-Fort Walton Beach-Destin, FL	1,733	158	91.41	14.36	13,784	30.77	25,832
Florida	Punta Gorda, FL	1,726	115	66.36	-19.15	-18,805	-7.55	-6,484
Florida	Homosassa Springs, FL	1,447	107	73.86	-6.37	-5,042	7.06	4,886
Florida	Sebastian-Vero Beach, FL	1,430	113	79.03	2.15	1,648	16.81	11,270
Florida	Gainesville, FL	1,288	95	73.89	-5.62	-3,930	7.92	4,840
Florida	Panama City, FL	1,215	100	81.98	4.69	3,093	19.71	11,367
Florida	Tallahassee, FL	1,064	108	101.96	33.37	18,811	52.51	25,885
Florida	Rural Florida	2,319	130	55.85	-31.38	-41,048	-21.53	-24,632
Florida	Aggregate small CBSAs	3,010	267	88.82	10.18	17,117	25.99	38,219
Georgia	Atlanta-Sandy Springs-Roswell, GA	16,932	1,279	75.53	1.13	9,912	15.64	119,886
Georgia	Augusta-Richmond County, GA-SC	2,798	158	56.49	-22.08	-31,037	-10.90	-13,395
Georgia	Savannah, GA	1,425	94	66.12	-10.65	-7,780	2.18	1,391
Georgia	Columbus, GA-AL	1,334	95	70.92	-11.52	-8,534	1.18	766
Georgia	Macon, GA	1,053	117	110.70	37.44	22,005	57.17	29,381
Georgia	Rural Georgia	4,697	308	65.48	-18.10	-47,098	-6.35	-14,439
Georgia	Aggregate small CBSAs	11,002	905	82.25	2.65	16,170	17.38	92,843
Hawaii	Urban Honolulu, HI	2,851	158	55.29	-22.65	-31,998	-11.55	-14,272
Hawaii	Aggregate small CBSAs	1,734	102	59.08	-9.56	-7,501	3.42	2,350
Idaho	Boise City, ID	2,224	189	84.96	18.47	20,417	35.48	34,287
Idaho	Rural Idaho	1,347	18	13.07	-80.31	-49,764	-77.48	-41,987
Idaho	Aggregate small CBSAs	5,454	332	60.88	-14.46	-38,900	-2.19	-5,142
Illinois	Chicago-Naperville-Elgin, IL-IN-WI	39,412	2,999	76.09	-0.25	-5,158	14.07	256,295
Illinois	Peoria, IL	2,205	147	66.67	-14.09	-16,709	-1.76	-1,827
Illinois	Rockford, IL	1,705	153	89.66	16.02	14,624	32.67	26,083
Illinois	Ottawa-Peru, IL	1,120	80	71.77	-0.74	-413	13.51	6,630
Illinois	Springfield, IL	1,014	103	101.98	31.59	17,204	50.48	24,039
Illinois	Rural Illinois	4,682	252	53.91	-30.48	-76,693	-20.50	-45,114
Illinois	Aggregate small CBSAs	11,303	987	87.31	13.07	79,064	29.30	154,968
Indiana	Indianapolis-Carmel-Anderson, IN	8,320	809	97.21	25.66	114,439	43.69	170,418
Indiana	Evansville, IN-KY	1,795	165	91.72	16.16	15,874	32.83	28,201
Indiana	South Bend-Mishawaka, IN-MI	1,475	114	77.28	1.65	1,279	16.23	11,032
Indiana	Fort Wayne, IN	1,455	135	93.08	14.23	11,694	30.63	22,005
Indiana	Terre Haute, IN	1,143	97	85.23	1.40	931	15.95	9,286
Indiana	Rural Indiana	3,097	127	40.97	-45.98	-74,842	-38.22	-54,413
Indiana	Aggregate small CBSAs	10,953	880	80.35	2.53	15,043	17.24	89,691
Iowa	Omaha-Council Bluffs, NE-IA	4,183	324	77.53	6.64	13,994	21.94	40,444
Iowa	Des Moines-West Des Moines, IA	2,829	162	57.28	-20.25	-28,510	-8.80	-10,840

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Iowa	Davenport-Moline-Rock Island, IA-IL	2,086	170	81.55	10.07	10,788	25.87	24,229
Iowa	Cedar Rapids, IA	1,380	149	108.03	34.74	26,637	54.08	36,259
Iowa	Rural Iowa	6,446	148	22.92	-68.90	-226,787	-64.43	-185,476
Iowa	Aggregate small CBSAs	6,613	437	66.14	-10.00	-33,688	2.91	8,577
Kansas	Wichita, KS	3,353	263	78.53	7.32	12,448	22.72	33,785
Kansas	Topeka, KS	1,702	129	75.77	-0.18	-159	14.15	11,077
Kansas	Rural Kansas	3,442	71	20.66	-72.15	-127,681	-68.15	-105,471
Kansas	Aggregate small CBSAs	5,532	394	71.15	-5.57	-16,085	7.98	20,167
Kentucky	Louisville/Jefferson County, KY-IN	6,103	454	74.34	-5.72	-19,083	7.81	22,769
Kentucky	Lexington-Fayette, KY	1,929	185	95.82	26.29	26,665	44.41	39,394
Kentucky	Rural Kentucky	7,098	545	76.75	-6.10	-24,535	7.37	25,920
Kentucky	Aggregate small CBSAs	7,564	650	85.98	7.57	31,698	23.00	84,280
Louisiana	New Orleans-Metairie, LA	3,355	325	96.98	20.31	38,068	37.58	61,588
Louisiana	Lafayette, LA	2,558	209	81.76	0.10	139	14.46	18,311
Louisiana	Shreveport-Bossier City, LA	2,382	242	101.57	24.14	32,606	41.96	49,556
Louisiana	Baton Rouge, LA	2,366	180	76.17	-6.86	-9,195	6.51	7,633
Louisiana	Lake Charles, LA	1,169	117	100.03	26.07	16,758	44.16	24,825
Louisiana	Houma-Thibodaux, LA	1,146	95	83.11	1.97	1,276	16.60	9,400
Louisiana	Rural Louisiana	2,323	198	85.29	3.52	4,673	18.38	21,318
Louisiana	Aggregate small CBSAs	5,048	474	93.85	14.13	40,639	30.51	76,740
Maine	Portland-South Portland, ME	2,930	310	105.94	49.70	71,414	71.18	89,448
Maine	Bangor, ME	1,048	64	61.34	-20.73	-11,650	-9.35	-4,597
Maine	Rural Maine	3,354	196	58.46	-22.27	-38,940	-11.12	-17,000
Maine	Aggregate small CBSAs	1,311	146	111.41	60.57	38,181	83.61	46,092
Maryland	Baltimore-Columbia-Towson, MD	15,554	1,427	91.75	19.86	163,830	37.06	267,382
Maryland	Hagerstown-Martinsburg, MD-WV	1,565	135	86.17	7.90	6,841	23.38	17,711
Maryland	Rural Maryland	743	77	104.02	33.11	13,323	52.22	18,373
Maryland	Aggregate small CBSAs	2,265	218	96.30	22.26	27,519	39.80	43,036
Massachusetts	Boston-Cambridge-Newton, MA-NH	24,121	2,244	93.05	20.14	260,689	37.38	423,169
Massachusetts	Worcester, MA-CT	4,022	397	98.63	30.29	63,915	48.99	90,394
Massachusetts	Springfield, MA	3,433	326	94.98	26.32	47,087	44.45	69,535
Massachusetts	Barnstable Town, MA	2,484	208	83.65	9.77	12,817	25.52	29,281
Massachusetts	Pittsfield, MA	1,281	128	99.81	32.48	21,725	51.50	30,118
Massachusetts	Rural Massachusetts	65	6	90.17	24.31	794	42.15	1,204
Massachusetts	Aggregate small CBSAs	697	55	78.40	8.38	2,928	23.93	7,313
Michigan	Detroit-Warren-Dearborn, MI	17,843	1,631	91.38	7.86	82,309	23.33	213,791
Michigan	Grand Rapids-Wyoming, MI	2,932	330	112.63	42.52	68,278	62.98	88,429
Michigan	Lansing-East Lansing, MI	2,164	129	59.63	-25.28	-30,258	-14.56	-15,237
Michigan	Flint, MI	1,783	136	76.16	-12.67	-13,648	-0.13	-125
Michigan	Ann Arbor, MI	1,420	89	62.58	-17.58	-13,134	-5.75	-3,757
Michigan	Kalamazoo-Portage, MI	1,375	100	72.87	-2.17	-1,543	11.86	7,364
Michigan	Rural Michigan	5,223	267	51.14	-32.70	-89,948	-23.04	-55,429

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Michigan	Aggregate small CBSAs	12,954	1,078	83.19	5.97	42,071	21.18	130,515
Minnesota	Minneapolis-St. Paul-Bloomington, MN-WI	7,327	679	92.71	20.28	79,372	37.54	128,488
Minnesota	Duluth, MN-WI	1,102	81	73.91	0.63	356	15.08	7,395
Minnesota	Rural Minnesota	2,287	85	37.18	-48.41	-55,294	-41.01	-40,960
Minnesota	Aggregate small CBSAs	5,946	537	90.29	20.69	63,789	38.01	102,474
Mississippi	Jackson, MS	2,825	216	76.42	2.46	3,594	17.17	21,918
Mississippi	Gulfport-Biloxi-Pascagoula, MS	2,053	193	94.13	19.08	21,459	36.17	35,573
Mississippi	Tupelo, MS	1,093	89	81.48	7.11	4,095	22.48	11,327
Mississippi	Rural Mississippi	5,165	344	66.67	-14.44	-40,268	-2.16	-5,268
Mississippi	Aggregate small CBSAs	6,225	610	98.07	26.03	87,366	44.11	129,497
Missouri	St. Louis, MO-IL	11,743	1,076	91.65	11.11	74,565	27.05	158,810
Missouri	Kansas City, MO-KS	8,499	737	86.72	14.93	66,351	31.42	122,127
Missouri	Springfield, MO	1,829	163	89.03	14.94	14,666	31.43	26,987
Missouri	Rural Missouri	6,300	315	50.01	-33.50	-109,963	-23.95	-68,763
Missouri	Aggregate small CBSAs	7,147	573	80.11	3.39	13,014	18.23	61,174
Montana	Rural Montana	2,731	54	19.88	-70.53	-90,042	-66.30	-74,020
Montana	Aggregate small CBSAs	4,049	293	72.44	7.10	13,477	22.47	37,296
Nebraska	Lincoln, NE	1,691	89	52.38	-24.32	-19,726	-13.46	-9,546
Nebraska	Rural Nebraska	3,005	35	11.53	-83.94	-125,485	-81.64	-106,724
Nebraska	Aggregate small CBSAs	3,035	184	60.77	-16.44	-25,154	-4.45	-5,957
Nevada	Las Vegas-Henderson-Paradise, NV	6,782	508	74.87	0.02	80	14.38	44,230
Nevada	Reno, NV	2,187	143	65.51	-6.03	-6,367	7.46	6,893
Nevada	Rural Nevada	233	4	18.38	-74.50	-8,667	-70.84	-7,207
Nevada	Aggregate small CBSAs	2,207	132	59.90	-16.04	-17,504	-3.99	-3,810
New Hampshire	Manchester-Nashua, NH	2,257	166	73.65	1.25	1,417	15.77	15,696
New Hampshire	Claremont-Lebanon, NH-VT	1,867	52	27.62	-59.65	-52,833	-53.86	-41,717
New Hampshire	Concord, NH	1,107	90	81.58	16.60	8,909	33.33	15,645
New Hampshire	Rural New Hampshire	550	14	25.66	-63.38	-16,926	-58.12	-13,574
New Hampshire	Aggregate small CBSAs	1,682	99	59.13	-14.65	-11,833	-2.41	-1,699
New Jersey	Allentown-Bethlehem-Easton, PA-NJ	4,637	377	81.32	-0.17	-436	14.16	32,412
New Jersey	Atlantic City-Hammonton, NJ	1,747	117	66.99	-17.60	-17,320	-5.77	-4,968
New Jersey	Trenton, NJ	1,610	151	93.52	16.51	14,790	33.24	26,029
New Jersey	Aggregate small CBSAs	1,809	168	92.64	17.48	17,283	34.34	29,689
New Mexico	Albuquerque, NM	2,776	175	62.95	-8.37	-11,063	4.78	5,524
New Mexico	Rural New Mexico	852	29	33.77	-47.86	-18,303	-40.38	-13,503
New Mexico	Aggregate small CBSAs	5,780	447	77.30	9.53	26,946	25.25	62,421
New York	New York-Newark-Jersey City, NY-NJ-PA	80,297	4,933	61.44	-19.96	-852,734	-8.48	-316,673
New York	Albany-Schenectady-Troy, NY	3,426	252	73.46	-4.23	-7,706	9.51	15,150
New York	Buffalo-Cheektowaga-Niagara Falls, NY	2,952	281	95.33	16.31	27,345	33.00	48,388
New York	Rochester, NY	2,579	236	91.60	18.07	25,059	35.02	42,458

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New York	Syracuse, NY	2,484	164	66.06	-10.45	-13,271	2.40	2,666
New York	Utica-Rome, NY	1,484	130	87.49	13.08	10,410	29.31	20,395
New York	Binghamton, NY	1,260	90	71.41	-0.78	-490	13.46	7,397
New York	Kingston, NY	1,140	72	63.21	-11.95	-6,779	0.68	339
New York	Rural New York	2,331	147	63.01	-16.29	-19,806	-4.28	-4,546
New York	Aggregate small CBSAs	7,449	659	88.41	14.79	58,796	31.26	108,692
North Carolina	Charlotte-Concord-Gastonia, NC-SC	9,587	859	89.61	20.33	100,594	37.60	162,684
North Carolina	Virginia Beach-Norfolk-Newport News, VA-NC	8,630	701	81.18	3.63	17,019	18.51	75,815
North Carolina	Raleigh, NC	4,508	369	81.79	7.06	16,850	22.42	46,802
North Carolina	Myrtle Beach-Conway-North Myrtle Beach, SC-NC	4,359	327	75.09	4.23	9,212	19.19	36,522
North Carolina	Asheville, NC	2,997	221	73.79	2.23	3,341	16.90	22,154
North Carolina	Greensboro-High Point, NC	2,374	217	91.34	12.08	16,196	28.17	33,021
North Carolina	Winston-Salem, NC	2,196	192	87.21	8.11	9,958	23.63	25,363
North Carolina	Durham-Chapel Hill, NC	2,166	153	70.57	-4.85	-5,402	8.80	8,570
North Carolina	Hickory-Lenoir-Morganton, NC	1,887	153	80.89	2.41	2,487	17.10	15,450
North Carolina	Wilmington, NC	1,797	140	77.92	1.81	1,729	16.43	13,690
North Carolina	Fayetteville, NC	1,624	153	94.48	15.31	14,115	31.85	25,688
North Carolina	New Bern, NC	1,092	88	80.46	4.43	2,581	19.41	9,899
North Carolina	Rocky Mount, NC	1,005	114	113.44	40.61	22,817	60.79	29,869
North Carolina	Rural North Carolina	4,746	300	63.25	-19.16	-49,300	-7.56	-17,004
North Carolina	Aggregate small CBSAs	12,950	1,240	95.75	22.18	156,025	39.72	244,289
North Dakota	Rural North Dakota	1,507	28	18.88	-72.71	-52,540	-68.79	-43,472
North Dakota	Aggregate small CBSAs	1,498	70	46.63	-34.20	-25,160	-24.76	-15,928
Ohio	Cleveland-Elyria, OH	8,433	747	88.53	11.25	52,326	27.22	110,691
Ohio	Cincinnati, OH-KY-IN	7,763	660	84.98	8.43	35,550	23.99	88,461
Ohio	Columbus, OH	6,168	572	92.68	17.13	57,930	33.94	100,378
Ohio	Dayton, OH	3,067	315	102.65	27.75	47,389	46.08	68,823
Ohio	Youngstown-Warren-Boardman, OH-PA	2,440	222	91.04	15.41	20,549	31.97	37,289
Ohio	Toledo, OH	2,401	210	87.55	10.31	13,612	26.14	30,185
Ohio	Akron, OH	2,243	212	94.65	16.76	21,120	33.52	36,933
Ohio	Canton-Massillon, OH	1,518	172	113.07	44.30	36,518	65.01	46,862
Ohio	Rural Ohio	2,599	129	49.74	-38.20	-55,378	-29.33	-37,186
Ohio	Aggregate small CBSAs	14,764	1,401	94.87	18.29	150,085	35.27	253,060
Oklahoma	Oklahoma City, OK	6,195	545	88.00	11.46	38,855	27.46	81,391
Oklahoma	Tulsa, OK	4,527	308	68.10	-13.13	-32,292	-0.66	-1,426
Oklahoma	Rural Oklahoma	4,345	229	52.63	-32.57	-76,562	-22.90	-47,065
Oklahoma	Aggregate small CBSAs	6,311	572	90.61	15.34	52,707	31.89	95,823
Oregon	Portland-Vancouver-Hillsboro, OR-WA	5,438	442	81.23	15.33	40,690	31.88	74,001
Oregon	Eugene, OR	1,463	78	53.65	-21.42	-14,823	-10.14	-6,137
Oregon	Medford, OR	1,384	113	81.57	20.39	13,249	37.67	21,404
Oregon	Salem, OR	1,143	93	81.79	16.48	9,166	33.20	16,147
Oregon	Bend-Redmond, OR	1,113	47	42.51	-36.07	-18,494	-26.89	-12,059
Oregon	Rural Oregon	1,033	12	11.89	-81.47	-37,428	-78.81	-31,662
Oregon	Aggregate small CBSAs	5,823	294	50.53	-28.46	-81,121	-18.19	-45,348

State	CBSA	Count Benef	Count PPVs	PPVs per 1000 Benef	%(A-E)/E PPV Nat Norm	$(A-E) PPV Nat Norm	%(A-E)/E PPV BP Norm	$(A-E) PPV BP Norm
Pennsylvania	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	28,551	2,213	77.49	-0.71	-10,949	13.54	182,851
Pennsylvania	Pittsburgh, PA	6,393	580	90.75	17.71	60,487	34.60	103,352
Pennsylvania	Scranton--Wilkes-Barre--Hazleton, PA	3,479	315	90.51	13.03	25,150	29.25	49,380
Pennsylvania	Lancaster, PA	2,469	149	60.54	-22.48	-30,034	-11.35	-13,265
Pennsylvania	Harrisburg-Carlisle, PA	2,300	171	74.35	-5.71	-7,172	7.83	8,601
Pennsylvania	York-Hanover, PA	2,092	132	62.97	-19.32	-21,855	-7.74	-7,656
Pennsylvania	Reading, PA	1,971	108	55.03	-32.40	-36,025	-22.70	-22,070
Pennsylvania	Erie, PA	1,120	97	86.18	12.79	7,585	28.98	15,027
Pennsylvania	Chambersburg-Waynesboro, PA	1,033	97	94.18	17.53	10,056	34.40	17,254
Pennsylvania	Rural Pennsylvania	2,649	164	61.80	-19.32	-27,167	-7.74	-9,520
Pennsylvania	Aggregate small CBSAs	10,476	906	86.50	8.18	47,483	23.70	120,338
Rhode Island	Providence-Warwick, RI-MA	7,654	728	95.18	19.11	80,988	36.20	134,182
South Carolina	Greenville-Anderson-Mauldin, SC	4,410	296	67.01	-8.73	-19,582	4.37	8,576
South Carolina	Columbia, SC	4,272	288	67.43	-5.23	-11,028	8.37	15,411
South Carolina	Charleston-North Charleston, SC	3,956	370	93.61	26.52	53,794	44.68	79,251
South Carolina	Hilton Head Island-Bluffton-Beaufort, SC	1,817	100	55.16	-12.64	-10,048	-0.10	-70
South Carolina	Spartanburg, SC	1,603	145	90.49	18.29	15,543	35.27	26,208
South Carolina	Florence, SC	1,310	132	100.75	27.66	19,816	45.98	28,808
South Carolina	Rural South Carolina	1,930	147	76.35	2.72	2,704	17.46	15,179
South Carolina	Aggregate small CBSAs	3,701	302	81.65	10.77	20,355	26.66	44,082
South Dakota	Sioux Falls, SD	1,190	66	55.54	-18.96	-10,716	-7.33	-3,623
South Dakota	Rural South Dakota	1,422	33	23.50	-65.95	-44,855	-61.07	-36,320
South Dakota	Aggregate small CBSAs	2,353	161	68.29	0.38	417	14.78	14,340
Tennessee	Nashville-Davidson--Murfreesboro--Franklin, TN	6,119	428	69.88	-10.13	-33,387	2.77	7,991
Tennessee	Memphis, TN-MS-AR	5,914	471	79.70	5.60	17,326	20.76	56,144
Tennessee	Knoxville, TN	4,020	280	69.74	-10.75	-23,403	2.06	3,915
Tennessee	Chattanooga, TN-GA	2,787	203	72.74	-7.88	-12,017	5.34	7,122
Tennessee	Kingsport-Bristol-Bristol, TN-VA	1,475	119	80.98	1.18	966	15.70	11,233
Tennessee	Clarksville, TN-KY	1,111	92	82.44	6.20	3,704	21.44	11,204
Tennessee	Rural Tennessee	4,372	297	67.85	-15.05	-36,422	-2.86	-6,052
Tennessee	Aggregate small CBSAs	8,239	561	68.04	-12.21	-54,007	0.39	1,525
Texas	Dallas-Fort Worth-Arlington, TX	20,062	1,590	79.26	-0.76	-8,406	13.49	130,936
Texas	Houston-The Woodlands-Sugar Land, TX	15,102	1,118	74.02	-3.20	-25,572	10.70	74,855
Texas	San Antonio-New Braunfels, TX	7,788	468	60.06	-18.81	-75,100	-7.16	-24,997
Texas	Austin-Round Rock, TX	6,053	428	70.79	-1.56	-4,700	12.57	33,153
Texas	El Paso, TX	1,692	117	69.24	-5.59	-4,808	7.96	5,985
Texas	McAllen-Edinburg-Mission, TX	1,591	139	87.18	-1.31	-1,278	12.85	10,945
Texas	Killeen-Temple, TX	1,582	114	72.27	-5.76	-4,843	7.76	5,707
Texas	Beaumont-Port Arthur, TX	1,547	123	79.79	-5.15	-4,641	8.47	6,678

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Texas	Corpus Christi, TX	1,351	91	67.52	-12.85	-9,321	-0.34	-218
Texas	Tyler, TX	1,184	93	78.74	-1.65	-1,086	12.46	7,158
Texas	Amarillo, TX	1,165	84	72.11	-5.34	-3,281	8.25	4,436
Texas	Brownsville-Harlingen, TX	1,157	102	88.45	-2.19	-1,590	11.84	7,509
Texas	Lubbock, TX	1,105	86	78.17	-3.52	-2,181	10.33	5,605
Texas	Longview, TX	1,082	98	90.84	16.06	9,428	32.72	16,793
Texas	Waco, TX	1,006	77	76.65	1.59	834	16.16	7,435
Texas	Rural Texas	9,249	487	52.67	-30.97	-151,456	-21.06	-90,083
Texas	Aggregate small CBSAs	14,744	1,275	86.47	8.94	72,488	24.57	174,276
Utah	Salt Lake City, UT	2,686	203	75.58	4.70	6,317	19.73	23,178
Utah	Ogden-Clearfield, UT	1,933	127	65.44	-4.84	-4,458	8.82	7,103
Utah	Provo-Orem, UT	1,099	64	58.63	-19.75	-10,988	-8.23	-4,005
Utah	St. George, UT	1,006	71	70.61	1.45	705	16.01	6,795
Utah	Rural Utah	913	26	28.69	-55.06	-22,248	-48.62	-17,177
Utah	Aggregate small CBSAs	732	59	81.27	14.88	5,340	31.37	9,844
Vermont	Burlington-South Burlington, VT	1,409	120	85.12	24.19	16,189	42.01	24,588
Vermont	Rural Vermont	1,370	30	21.68	-67.83	-43,402	-63.21	-35,372
Vermont	Aggregate small CBSAs	1,450	148	101.88	45.94	32,227	66.89	41,030
Virginia	Richmond, VA	6,227	557	89.45	19.52	63,029	36.67	103,562
Virginia	Roanoke, VA	2,110	166	78.69	11.62	11,977	27.64	24,915
Virginia	Lynchburg, VA	1,934	119	61.45	-18.19	-18,313	-6.45	-5,678
Virginia	Charlottesville, VA	1,495	109	72.72	2.65	1,948	17.39	11,159
Virginia	Blacksburg-Christiansburg-Radford, VA	1,053	99	94.06	22.37	12,549	39.94	19,589
Virginia	Rural Virginia	6,458	480	74.25	-1.57	-5,297	12.56	37,072
Virginia	Aggregate small CBSAs	5,270	500	94.97	22.55	63,811	40.13	99,328
Washington	Seattle-Tacoma-Bellevue, WA	12,412	841	67.75	-1.54	-9,113	12.59	65,167
Washington	Spokane-Spokane Valley, WA	2,968	223	75.06	7.75	11,102	23.21	29,084
Washington	Kennewick-Richland, WA	1,683	120	71.31	-3.63	-3,136	10.20	7,696
Washington	Bremerton-Silverdale, WA	1,573	115	73.08	8.92	6,522	24.55	15,701
Washington	Olympia-Tumwater, WA	1,348	68	50.41	-22.85	-13,943	-11.77	-6,283
Washington	Yakima, WA	1,289	126	97.83	38.46	24,273	58.33	32,195
Washington	Port Angeles, WA	1,004	53	52.87	-21.91	-10,322	-10.71	-4,410
Washington	Bellingham, WA	1,001	64	63.79	-3.48	-1,597	10.37	4,157
Washington	Rural Washington	1,845	25	13.75	-78.16	-62,926	-75.02	-52,822
Washington	Aggregate small CBSAs	6,155	351	57.01	-17.12	-50,230	-5.23	-13,411
West Virginia	Huntington-Ashland, WV-KY-OH	2,340	255	108.82	30.84	41,591	49.61	58,518
West Virginia	Charleston, WV	1,374	120	87.58	9.56	7,277	25.28	16,829
West Virginia	Rural West Virginia	2,982	166	55.61	-27.49	-43,562	-17.08	-23,673
West Virginia	Aggregate small CBSAs	3,411	318	93.20	12.23	24,002	28.33	48,638
Wisconsin	Milwaukee-Waukesha-West Allis, WI	5,564	564	101.36	29.97	90,113	48.62	127,854
Wisconsin	Madison, WI	2,978	177	59.54	-10.97	-15,143	1.80	2,178
Wisconsin	Green Bay, WI	1,033	79	76.37	1.36	731	15.90	7,500

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Wisconsin	Rural Wisconsin	4,706	180	38.31	-47.24	-111,857	-39.67	-82,141
Wisconsin	Aggregate small CBSAs	8,671	724	83.46	12.47	55,592	28.61	111,551
Wyoming	Rural Wyoming	1,483	26	17.35	-74.24	-51,396	-70.54	-42,707
Wyoming	Aggregate small CBSAs	2,555	209	81.76	22.30	26,396	39.85	41,251

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