

Potentially Avoidable ED Utilization in Washington

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Key Findings

- Emergency department (ED) claims accounted for 19% of total medical cost, excluding pharmacy, in Washington in 2021.
- About 40% of ED claims in 2021 were primary care sensitive – potentially avoidable through better coordination with primary care.
- Primary care sensitive ED claims were low cost on average (\$491 per claim), but by volume accounted for 18% of total ED cost, or over \$900 million.
- Medicaid paid a greater proportion of primary care sensitive claims in 2021 than commercial or Medicare plans for the study sample.
- About 18% of ED claims were behavioral health sensitive (i.e., alcohol, drugs or mental health) that may have been avoidable through evidence-based treatment and intervention programs. Most (16%) of the behavioral health sensitive ED claims were alcohol attributable.
- Behavioral health sensitive claims averaged \$994 per claim and accounted for \$850 million, or 17% of total costs.

Background

Many emergency department (ED) visits are potentially avoidable through better access to and coordination with primary care¹. This excess ED volume results in increased wait time for patients^{2,3} and adds to the burden of understaffed EDs³. In this report, we examine statewide patterns and costs in potentially avoidable ED utilization using data from the Washington All-Payer Claims Database (WA-APCD) from 2016–2021.

Assessing ED claims

The New York University Emergency Department Algorithm (NYU-EDA)⁴ is a commonly used method to evaluate ED utilization in health care systems. Using full medical records, the NYU team assigned probabilities that a primary diagnosis for an ED visit falls in the following mutually exclusive categories: 1) ED treatment required; 2) ED treatment required, but potentially preventable with primary care; 3) emergency, treatable by primary care facilities; 4) non-emergency; 5) injury; 6) alcohol related; 7) drug related; 8) mental health; and 9) unclassified. For example, a primary diagnosis of abdominal pain was given a 33% probability of being “ED treatment required”, and a 66% probability of being “emergency treatable by primary care.” Similarly, certain injury diagnoses

may also have a high probability of being “alcohol related.”

We applied the NYU-EDA algorithm to ED claims in the Washington All Payer Claims Database (WA-APCD) from 2016–2021.

“Emergency department treatment required, but potentially preventable with primary care” includes emergencies, such as diabetic insulin shock, that could potentially have been prevented through better disease management. “Emergencies treatable by primary care” would include acute conditions requiring immediate care, such as gastrointestinal infection, but that do not require full ED facilities. We refer to these two categories, together with non-emergencies (which could have avoided ED through better communication with primary care), as “primary care sensitive” ED visits.

Many mental health, alcohol- and drug-related ED visits could potentially be prevented by improved access to behavioral health services. We refer to these three categories as “behavioral health sensitive.”

While some injuries presenting to ED may be minor and treatable by primary care, the NYU-EDA algorithm does not distinguish between these. In this report we will presume that injury claims are appropriate uses of ED. We refer to injuries together with the “ER required” category as “unavoidable.”

Unclassified visits are those for which the primary diagnosis alone does not provide enough information to assign a category.

COVID-19 diagnosis codes do not exist in the NYU-EDA algorithm. In 2020 and 2021, we identified COVID-19 claims following Tuominen et al⁵. We further distinguish COVID-19 emergencies from non-emergency claims for

COVID-19 testing or exposure. We grouped COVID-19 emergencies with “unavoidable” and COVID-19 non-emergencies with “primary care sensitive.”

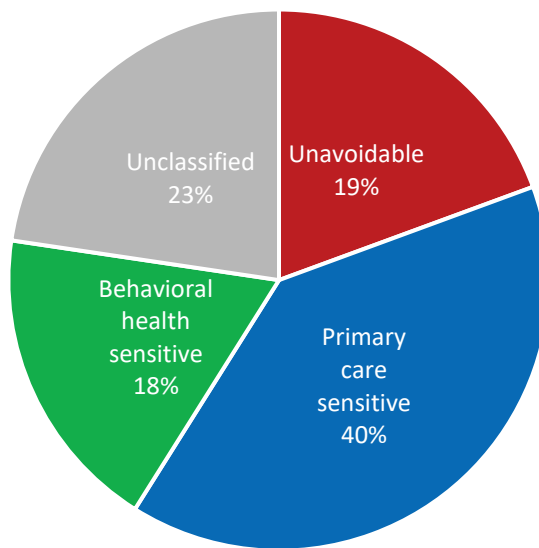
Hierarchy of categories used in this report:

- Unavoidable
 - ED Required
 - Injury
 - COVID-19 emergencies
- Primary care sensitive
 - Emergencies treatable by primary care
 - Preventable emergencies
 - Non-emergencies
 - COVID-19 non-emergencies
- Behavioral health sensitive
 - Alcohol
 - Drug
 - Mental health
- Unclassified

Results

About 40% of ED claims were primary care sensitive (Figure 1), including 3.4% for COVID-19 sensitive (Figure 1), including 3.4% for COVID-19

Figure 1. Percent of ED claims by category – all payers, 2021.



testing or exposure (Table 1). Behavioral health sensitive claims comprised another 18% of claims, with alcohol-related claims (16.1%) by far the largest contributor.

The distribution of ED claims by category differed by age, sex, and payer (Table 1). Males had a higher percentage of behavioral health sensitive claims (20%) compared to females (17%). Females had a higher percentage of primary care sensitive claims (42%) compared to males (37%).

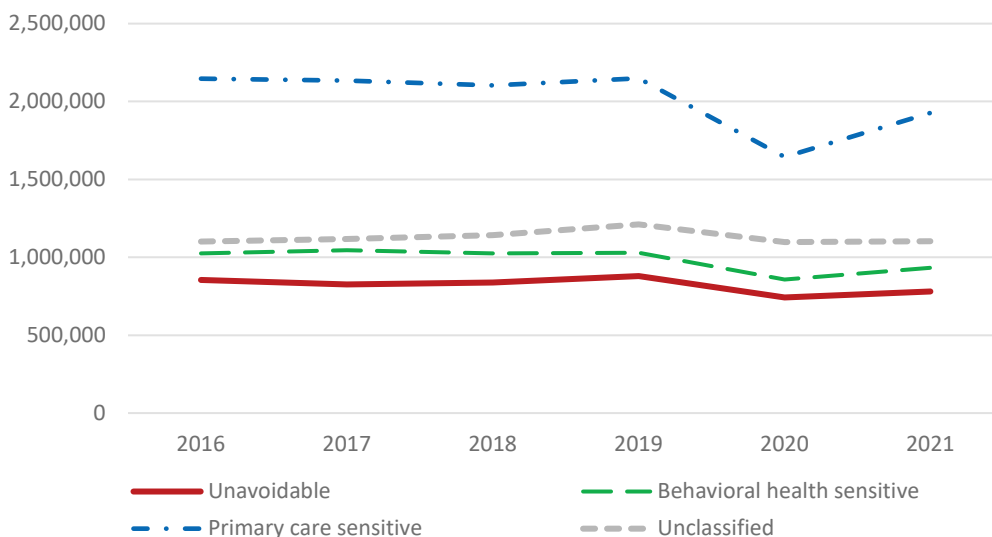
Younger patients, under 19 years old, had the highest percentage of behavioral health sensitive claims (27%) compared to 17% for age 19–64 and 16% for age 65 and older. Patients aged 65 and older had the highest percentage of unavoidable ED visits (22%) compared to 20% for age 19–64 and 11% for the youngest age group. Working-aged adults (aged 19 to 64 years) had the highest percentage of claims associated with COVID-19 emergencies, emergencies, treatable by primary care, and drug-attributable claims. Older patients, age 65+, also had the highest percentage of

unclassified (27%) claims. From their high relative costs (Figure 3), the unclassified group appears to include patients with serious illness in need of emergency care.

Commercial plans paid the largest percentage of COVID-19 emergency claims and alcohol-attributable claims in the study. Both commercial and Medicare covered the same percentage of unavoidable ED claims (21.3%), Medicaid paid a higher proportion (42.5%) of ED primary care sensitive claims compared with commercial (36.1%) and Medicare (37.0%).

The number of unclassified claims increased slightly from 2016–2019, (Figure 2). Other categories remained fairly constant through 2019. The volume of claims dropped in 2020 for all categories, particularly primary care sensitive claims, almost certainly due to pandemic restrictions. The number of claims in all categories rebounded in 2021, though not quite back to 2019 levels. COVID-19 diagnosis codes did not exist before 2020 and were not included in these trends.

Figure 2. Total volume of ED claims by category, 2016–2021.



The top 20 primary diagnoses in terms of number of claims for unavoidable, primary care sensitive, behavioral health sensitive, and unclassified visits are provided in the appendix.

Cost

In 2021, emergency department (ED) visits accounted for \$5.1 billion in medical costs, including insurance-paid and out-of-pocket amounts. ED claims accounted for 19% of total medical cost in WA-APCD, excluding pharmacy.

Primary care sensitive claims had a total cost of over \$900 million in paid claims in 2021. Behavioral health sensitive claims had a total cost of over \$850 million in paid claims in 2021, although the total number of those claims was less than half of primary care sensitive claims.

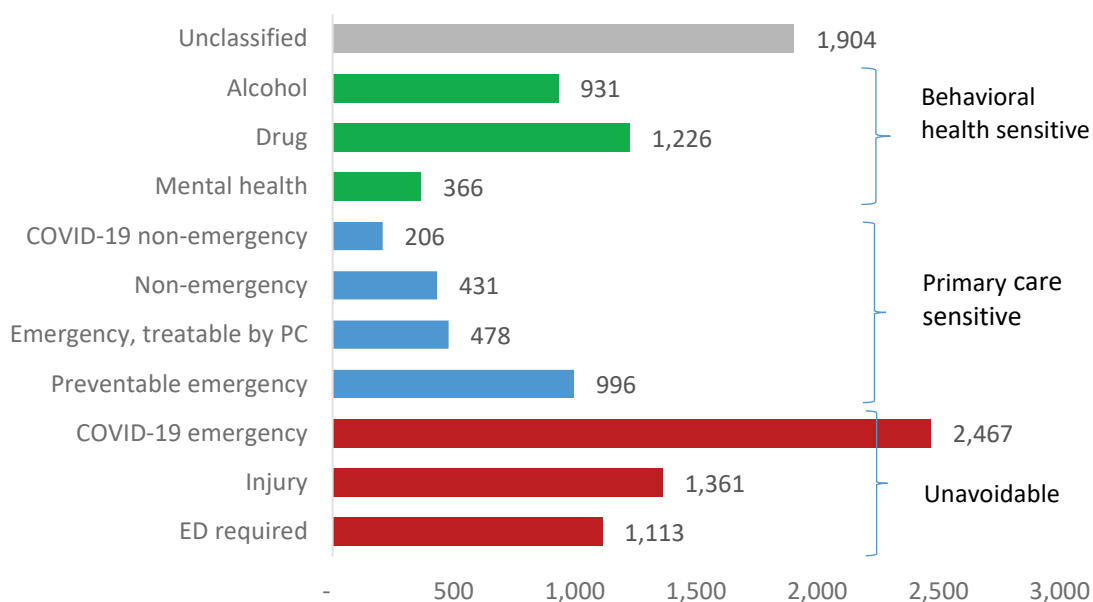
COVID-19 emergencies had the highest cost per claim in 2021 at \$2,467 (Figure 3, Table 2). Unclassified claims were a close second at \$2,203 per claim. COVID-19 non-emergencies had the lowest cost per claim at \$206, followed by mental health (\$366), non-emergencies

(\$431) and emergencies treatable by primary care (\$478).

Primary care sensitive ED claims accounted for 40% of claims and 18% of total cost. Behavioral health sensitive claims accounted for 18% of claims and about 17% of costs. Unavoidable ED visits accounted for 19% of claims and 24% of costs.

The fact that unclassified claims were among the most expensive suggests that this category represents serious illness, probably requiring emergency room services, even though their status as such could not be determined by diagnosis code alone. With both high volume and high cost per claim, unclassified claims accounted for the largest share (41%) of total cost (Table 2).

Figure 3. Cost per claim (\$US) for ED claims by category – All payers, 2021.



Conclusion

Four in ten (40%) ED claims in 2021 were primary care sensitive – potentially avoidable through better coordination with and access to primary care. Many ED claims (14.5%) were for non-emergencies. These visits could be reduced through better communication and increased access to primary care before deciding the ED is the best place to be treated. A statewide nurse call center could be one strategy to achieve this. Other primary care sensitive ED visits – emergencies treatable by primary care facilities (17.4%) and emergencies for preventable conditions (4.2%) – could also be reduced through improved access to primary care.

Many ED visits were alcohol and drug related (18% of claims). It is likely that some of these ED visits could have been avoided through evidence-based interventions and more robust access to behavioral health and substance use services.

Emergency department wait times have been increasing nationwide⁶. ED wait times are related to total ED volume⁷. Strengthening patients' access to primary care and substance use treatment might allow some of these patients to be treated in a more appropriate setting, reducing the burden on understaffed ED units and reducing patients' wait times.

Limitations

The NYU-EDA algorithm assigns a likelihood of an ED visit being necessary, non-emergency, etc., based on the primary diagnoses on medical billing claims. Though useful for assessing aggregate patterns in ED utilization on average, the algorithm cannot and should not be used to assess the appropriateness of individual ED visits⁸.

We use the number of ED claims as a proxy measure for the volume of ED utilization. There is no clear method to bundle line-item billing claims into distinct ED visits. A single ED visit may generate more than one claim, and a more complex visit is more likely to generate more claims than a simpler one.

At present, no comprehensive statewide database of ED visits including facility capacity, patient volume and time to treatment exists, so we cannot make any direct connections between the volume of potentially avoidable ED visits and wait time. Our conclusions in this regard are therefore reasonable, but speculative.

The WA-APCD does not receive claims from self-insured plans, so commercially insured patients are under-represented in this study, and uninsured patients are not represented at all. This uneven representation is a potential source of bias in our results.

Table 1. Percent of ED claims by category by age, sex, and primary payer in 2021. Percentages give the percent of claim in each category within each demographic group, so each row totals 100%.

		Unavoidable			Primary care sensitive				Behavioral health sensitive			Unclassified
		ED required	Injury	COVID-19 emergency	Preventable emergency	Emergency, treatable by PC	Non-emergency	COVID-19 non-emergency	Mental health	Drug	Alcohol	
Total	4,873,944	16.0	0.7	2.6	4.2	17.4	14.5	3.4	0.4	1.9	16.1	22.7
Female	2,782,658	16.6	0.4	2.6	4.2	18.4	15.6	3.4	0.3	1.8	14.4	22.3
Male	2,180,656	15.5	1.0	2.8	4.2	16.2	13.1	3.8	0.6	2.1	17.3	23.3
1: age < 19	667,521	9.2	0.1	1.9	4.0	18.2	15.7	3.3	0.1	1.8	25.3	20.3
2: age 19-64	2,669,513	16.1	1.1	3.0	4.3	19.2	15.0	3.1	0.7	2.6	13.9	21.0
3: age 65+	1,626,414	18.9	0.3	2.4	4.1	14.4	13.2	4.4	0.0	0.8	14.8	26.6
Commercial	809,261	17.5	0.2	3.6	2.9	17.0	13.5	2.7	0.0	1.3	21.5	19.8
Medicaid	2,487,831	13.8	1.1	2.5	4.6	19.2	15.6	3.1	0.7	2.4	15.7	21.4
Medicare	1,712,106	18.5	0.4	2.4	4.2	15.0	13.3	4.5	0.2	1.4	14.2	25.8

Table 2. Total cost and average cost per claim (\$US), including insurance-paid and out-of-pocket cost, of ED claims in 2021 by category.

	Number of claims	Total cost (\$ millions)	Cost per claim (\$ dollars)	Percent of claims	Percent of cost
Unavoidable	945,474	1,237	1,308	19.4	24.1
ED required	781,267	870	1,113	16.0	16.9
Injury	34,306	47	1,361	0.7	0.9
COVID-19 emergency	129,901	321	2,467	2.7	6.2
Primary care sensitive	1,927,049	946	491	39.5	18.4
Preventable emergency	202,958	202	996	4.2	3.9
Emergency, treatable by PC	847,081	405	478	17.4	7.9
Non-emergency	704,751	304	431	14.5	5.9
COVID-19 non-emergency	172,259	36	206	3.5	0.7
Behavioral health sensitive	897,441	852	949	18.4	16.6
Mental health	19,873	7	366	0.4	0.1
Drug	92,497	113	1,226	1.9	2.2
Alcohol	785,070	731	931	16.1	14.2
Unclassified	1,103,980	2,102	1,904	22.7	40.9
Total	4,873,944	5,137	1,054	100	100

Appendix

Top 20 non-COVID-19 primary diagnoses for a) unavoidable, b) primary care sensitive c) behavioral health sensitive, and d) unclassified ED claims in 2021. Diagnosis codes are grouped using CCS diagnosis categories.⁹

a) Unavoidable – (top 20 diagnoses account for 84% of unavoidable claims)

Primary diagnosis	Percent
Nonspecific chest pain	17.2
Abdominal pain	11.6
Cardiac dysrhythmias	10.0
Other lower respiratory disease	8.5
Alcohol-related disorders	4.1
Syncope	3.7
Spondylosis; intervertebral disc disorders; other back problems	3.3
Acute cerebrovascular disease	3.2
Calculus of urinary tract	3.2
Diverticulosis and diverticulitis	2.9
Gastrointestinal hemorrhage	2.2
Acute myocardial infarction	1.9
Other connective tissue disease	1.9
Fluid and electrolyte disorders	1.7
Intestinal obstruction without hernia	1.6
Appendicitis and other appendiceal conditions	1.6
Biliary tract disease	1.5
Respiratory failure; insufficiency; arrest (adult)	1.4
Pancreatic disorders (not diabetes)	1.4
Nausea and vomiting	1.4

b) Primary care sensitive – (top 20 diagnoses account for 76% of primary care sensitive claims)

Primary diagnosis	Percent
Abdominal pain	11.1
Nonspecific chest pain	6.5
Skin and subcutaneous tissue infections	6.2
Other lower respiratory disease	6.1
Spondylosis; intervertebral disc disorders; other back problems	5.2
Urinary tract infections	5.0
Other connective tissue disease	4.7
Other non-traumatic joint disorders	4.5
Other upper respiratory infections	4.2
Headache; including migraine	3.8
Nausea and vomiting	3.1
Conditions associated with dizziness or vertigo	2.8
Malaise and fatigue	1.8
Chronic obstructive pulmonary disease and bronchiectasis	1.8
Other skin disorders	1.7
Diabetes mellitus with complications	1.6
Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	1.5
Disorders of teeth and jaw	1.5
Essential hypertension	1.4

- c) Behavioral health sensitive – (top 20 diagnoses account for 97% of behavioral health sensitive claims)

Primary diagnosis	Percent
Other injuries and conditions due to external causes	14.9
Superficial injury; contusion	14.1
Sprains and strains	12.2
Open wounds of extremities	10.1
Fracture of upper limb	7.6
Open wounds of head; neck; and trunk	5.9
Fracture of lower limb	4.7
Other fractures	3.9
Anxiety disorders	3.1
Intracranial injury	3.0
Schizophrenia and other psychotic disorders	2.9
Substance-related disorders	2.2
Mood disorders	2.2
Complication of device; implant or graft	2.2
Joint disorders and dislocations; trauma-related	1.7
Fracture of neck of femur (hip)	1.6
Allergic reactions	1.3
Complications of surgical procedures or medical care	1.2
Burns	1.1
Skull and face fractures	1.0

- d) Unclassified – (top 20 diagnoses account for 57% of unclassified claims)

Primary diagnosis	Percent
Residual codes; unclassified	6.6
Septicemia (except in labor)	5.6
Other complications of pregnancy	4.7
Other gastrointestinal disorders	3.8
Other nervous system disorders	3.6
Fever of unknown origin	3.0
Suicide and intentional self-inflicted injury	2.7
Other connective tissue disease	2.6
Other injuries and conditions due to external causes	2.5
Other lower respiratory disease	2.5
Other diseases of kidney and ureters	2.5
Genitourinary symptoms and ill-defined conditions	2.4
Other screening for suspected conditions (not mental disorders or infectious disease)	2.3
Pleurisy; pneumothorax; pulmonary collapse	2.3
Viral infection	2.0
Fluid and electrolyte disorders	1.8
Acute and unspecified renal failure	1.7
Other circulatory disease	1.7
Hypertension with complications and secondary hypertension	1.5
Phlebitis; thrombophlebitis and thromboembolism	1.2

¹ Lines LM, Li NC, Mick EO, Ash AS. Emergency department and primary care use in Massachusetts 5 years after health reform. *Med Care*. 2019;57(2):101-108. doi: 10.1097/MLR.0000000000001025.

² Horwitz LI, J Green, and EH Bradley, United States emergency department performance on wait time and length of visit. *Ann Emerg Med*. 2010 February ; 55(2): 133–141. doi:10.1016/j.annemergmed.2009.07.023.

³ Fitzpatrick, Alex. ER visits are getting longer amid hospital staffing shortages. *Axios*, Sept 15, 2023.

<https://www.axios.com/2023/09/15/hospital-er-visit-time-length> (accessed 1/18/24)

⁴NYU Center for Health and Public Service Research, [Faculty & Research | NYU Wagner](#) (accessed 3/7/2024)

⁵ Tuominen et al. *BMC Emergency Medicine* (2020) 20:97 <https://doi.org/10.1186/s12873-020-00392-1>

⁶ Fitzpatrick, Alex. ER visits are getting longer amid hospital staffing shortages. *Axios*, Sept 15, 2023.

<https://www.axios.com/2023/09/15/hospital-er-visit-time-length> (accessed 1/18/24)

⁷National Center For Health Statistics. NCHS Fact Sheet June 2019

⁸ Schuur, JD. Moving Beyond the NYU Algorithm for Emergency Department Visit Appropriateness. *JAMA Network Open*. 2024;7(1):e2350455. doi:10.1001/jamanetworkopen.2023.50455

⁹ Agency for Health Care Research, Health Care Utilization Project, Clinical Classification Software. [Clinical Classifications Software \(CCS\) for ICD-10-PCS \(beta version\) \(ahrq.gov\)](#)