



An Analysis of Behavioral Health Emergency Department Boarding from CY 2020 Emergency Department Discharge Data in Oregon

INTRODUCTION

Many emergency departments (ED) experience crowding and heavy resource demands that affect the delivery of quality medical care and compromises patient safety. A major cause of ED crowding is “boarding”.¹ The American College of Emergency Physicians (ACEP) defines a “boarded patient” as a patient who remains in the emergency department after the patient has been admitted or placed into observation status at the facility, but has not been transferred to an inpatient or observation unit. Unfortunately, no standard definition exists that defines boarding in terms of the length of stay in the ED. However, for this analysis, ED boarding is defined as a stay in the ED longer than 6 hours, which is similar to the definition used in the previous Oregon Health Authority’s commissioned study, *ED Boarding of Psychiatric Patients in Oregon*, published in 2016.

There are a number of reasons why a hospital may experience ED boarding. It can be caused by a hospital operating close to capacity or by hospital-wide inefficiencies.² Another consistent cause of ED boarding in many hospitals is a lack of resources that can facilitate the timely disposition of behavioral health patients who present to the ED for care. In Oregon, these patients composed 31% of ED visits in 2020, which is a 2 percent increase from 2019. These patients also have twice the rate of longer stays (more than 6 hours) than those with non-behavioral health diagnoses.

ANALYSIS

This analysis performed an in-depth review of behavioral health claims based on Uniform Bill data, intending to understand the magnitude of ED boarding at Oregon hospitals due to behavioral health issues. Staff from Apprise Health Insights, a subsidiary of the Oregon Association of Hospitals and Health Systems (OAHHS), analyzed hospital emergency department health claims data for the state’s 60 acute care hospitals. Behavioral health data were analyzed where a mental health or substance abuse diagnosis was present in any of the 25 diagnosis codes captured on the patient’s record. The source of the data for analysis is emergency department discharge billing data collected by Apprise since October 2014. The calendar year 2019 is the first year of data that included both admission and discharge times, which makes this analysis possible.

The data were evaluated via three different perspectives and compares ED behavioral health data vs. total ED data:

- 1) Time spent in the ED
- 2) Break down of age groups
- 3) Payor Type and Charges

The analysis also looks at the number of visits versus the number of patients to get a sense of how many of these visits are from the same patients.

FINDINGS

Table 1a: Time in the ED – By Visits

Time in the ED	Behavioral Health ED Visits		Non-Behavioral Health ED Visits		Total ED Visits	
	Count	Percentage	Count	Percentage	Count	Percentage
0-6 hours	275,551	82%	689,234	92%	964,785	89%
7-24 hours	36,158	11%	41,200	5%	77,358	7%
24+ hours	22,860	7%	19,551	3%	42,411	4%
Total	334,569	100%	749,985	100%	1,084,554	100%

Table 1b: Time in the ED – By Patients

Time in the ED	Behavioral Health ED Patients		Non-Behavioral Health ED Patients		Total ED Patients	
	Count	Percentage	Count	Percentage	Count	Percentage
0-6 hours	170,221	78%	452,428	90%	622,649	86%
7-24 hours	28,504	13%	35,468	7%	63,972	9%
24+ hours	19,560	9%	17,256	3%	36,816	5%
Total	218,285	100%	505,152	100%	723,437	100%

Table 1a shows that about 82 percent of behavioral health visits to the ED are 6 hours or less, compared to 89 percent of all ED visits. However, the rate for longer stays (more than 6 hours) is about twice as high for behavioral health visits (18%) compared to non-behavioral health visits (8%).

When de-duplicated to unique patients (Table 1b), the pattern for time in the ED by patients with a behavioral health diagnosis follows similar trends as those based on visits. About 24 percent of the patients with a behavioral health diagnosis spent more than 6 hours in the ED compared with about 10 percent for patients with non-behavioral health diagnoses.

Table 2a: Break Down of Age Groups – By Visits

Age Group	Behavioral Health ED Visits		Non-Behavioral Health ED Visits		Total ED Visits	
	Count	Percentage	Count	Percentage	Count	Percentage
0-19	19,109	6%	145,998	19%	165,107	15%
20-29	57,294	17%	102,591	14%	159,885	15%
30-59	175,194	52%	262,542	35%	437,736	40%
60+	82,972	25%	238,854	32%	321,826	30%
Total	334,569	100%	749,985	100%	1,084,554	100%

Table 2b: Break Down of Age Groups – By Patients

Age Group	Behavioral Health ED Patients		Non-Behavioral Health ED Patients		Total ED Patients	
	Count	Percentage	Count	Percentage	Count	Percentage
0-19	14,808	7%	111,327	22%	126,135	17%
20-29	36,970	17%	64,765	13%	101,735	14%
30-59	107,370	49%	166,943	33%	274,313	38%
60+	59,137	27%	162,117	32%	221,254	31%
Total	218,285	100%	505,152	100%	723,437	100%

Tables 2a and 2b evaluate the age group of ED visits and ED patients. Slightly more than half (52%) of behavioral health visits to the ED is from age group 30-59, compared to 35% for non-behavioral health visits, and 40% of all ED visits for the same age group. Of patients in the 0-19 age group, most visited the ED for non-behavioral reasons, compared to other age groups.

Table 3a: Break Down of Payer Type

Age Group	Behavioral Health ED Visits		Non-Behavioral Health ED Visits		Total ED Visits	
	Count	Percentage	Count	Percentage	Count	Percentage
Commercial	52,794	16%	197,080	26%	249,874	23%
Medicaid	156,721	47%	259,090	35%	415,811	38%
Medicare	86,359	26%	206,535	28%	292,894	27%
Other	17,058	5%	47,439	6%	64,497	6%
Self-Pay	21,637	6%	39,841	5%	61,478	6%
Total	334,569	100%	749,985	100%	1,084,554	100%

Table 3a shows that Medicare and Medicaid paid for 73% of behavioral health visits to the ED, compared to 65% of all ED visits.

Table 3b: Break Down of Charges

Time in the ED	Behavioral Health Min Total Charges	Behavioral Health Max Total Charges	Behavioral Health Avg Total Charges	Total ED Min Total Charges	Total ED Max Total Charges	Total ED Avg Total Charges
0-6 hours	\$0	\$180,202	\$3,263	\$0	\$180,202	\$3,087
7-24 hours	\$0	\$1,217,128	\$14,231	\$0	\$1,217,128	\$13,825
24+ hours	\$0	\$246,726	\$6,013	\$0	\$246,727	\$6,426
Total	\$0	\$1,217,128	\$4,309	\$0	\$1,217,128	\$3,745

Table 3b shows that the range of charges for both behavioral health visits as well as non-behavioral health visits to be very wide, with the average charge only slightly more for behavioral health visits vs other visits. As time in the ED increases, the average charges increase.

Substance Abuse vs Mental Health

When breaking down the behavioral health data into substance abuse and mental health, ED boarding begins to show some differences. About 16% of Mental health patients spent 7-24 hours and 14% spent 24+ hours in the ED. This is a 3% increase compared to behavioral health patients' 7-24 hours counts and a 5% increase compared to behavioral health patients' 24+ counts. When looking at patients with a substance abuse diagnosis, 81% of them spent only 0-6 hours in the ED. This is about 11% more than mental health patients.

CONCLUSION

Under the definition used for ED boarding in this analysis, about 1 in 5 patients with a behavioral health diagnosis end up in an ED boarding situation in Oregon hospitals. More than half are in the 30-59 age group, and likely to be on either Medicare or Medicaid.

APPENDIX: CY 2020 BEHAVIORAL HEALTH DATA

Notes Regarding Methodology and Calculations

To determine if a patient had a diagnosis related to behavioral health, the record of the hospital ED visit needs to have one of the 433 diagnoses that falls into the substance abuse category or one of the 319 diagnoses that is in the mental health category. The substance abuse and mental health codes are from the Vermont Medicaid ICD-10 Project HP Enterprise Services using their list of ICD-10 diagnosis codes. In some cases, the patient would have both a substance abuse and a mental health diagnosis. When this occurred, this would be counted only once when determining the number of behavioral health visits. As a result, if you add all the substance abuse and mental health visits, they will always be more than the total of behavioral health visits.

Substance Abuse: The following 433 diagnosis codes were used to determine if a patient had a form of substance abuse when visiting a hospital:

F1010, F1011, F10120, F10121, F10129, F1014, F10150, F10151, F10159, F10180, F10181, F10182, F10188, F1019, F1020, F1021, F10220, F10221, F10229, F10230, F10231, F10232, F10239, F1024, F10250, F10251, F10259, F1026, F1027, F10280, F10281, F10282, F10288, F1029, F10920, F10921, F10929, F1094, F10950, F10951, F10959, F1096, F1097, F10980, F10981, F10982, F10988, F1099, F1110, F1111, F11120, F11121, F11122, F11129, F1114, F11150, F11151, F11159, F11181, F11182, F11188, F1119, F1120, F1121, F11220, F11221, F11222, F11229, F1123, F1124, F11250, F11251, F11259, F11281, F11282, F11288, F1129, F1190, F11920, F11921, F11922, F11929, F1193, F1194, F11950, F11951, F11959, F11981, F11982, F11988, F1199, F1210, F1211, F12120, F12121, F12122, F12129, F12150, F12151, F12159, F12180, F12188, F1219, F1220, F1221, F12220, F12221, F12222, F12229, F1223, F12250, F12251, F12259, F12280, F12288, F1229, F1290, F12920, F12921, F12922, F12929, F1293, F12950, F12951, F12959, F12980, F12988, F1299, F1310, F1311, F13120, F13121, F13129, F1314, F13150, F13151, F13159, F13180, F13181, F13182, F13188, F1319, F1320, F1321, F13220, F13221, F13229, F13230, F13231, F13232, F13239, F1324, F13250, F13251, F13259, F1326, F1327, F13280, F13281, F13282, F13288, F1329, F1390, F13920, F13921, F13929, F13930, F13931, F13932, F13939, F1394, F13950, F13951, F13959, F1396, F1397, F13980, F13981, F13982, F13988, F1399, F1410, F1411, F14120, F14121, F14122, F14129, F1414, F14150, F14151, F14159, F14180, F14181, F14182, F14188, F1419, F1420, F1421, F14220, F14221, F14222, F14229, F1423, F1424, F14250, F14251, F14259, F14280, F14281, F14282, F14288, F1429, F1490, F14920, F14921, F14922, F14929, F1494, F14950, F14951, F14959, F14980, F14981, F14982, F14988, F1499, F1510, F1511, F15120, F15121, F15122, F15129, F1514, F15150, F15151, F15159, F15180, F15181, F15182, F15188, F1519, F1520, F1521, F15220, F15221, F15222, F15229, F1523, F1524, F15250, F15251, F15259, F15280, F15281, F15282, F15288, F1529, F1590, F15920, F15921, F15922, F15929, F1593, F1594, F15950, F15951, F15959, F15980, F15981, F15982, F15988, F1599, F1610, F1611, F16120, F16121, F16122, F16129, F1614, F16150, F16151, F16159, F16180, F16183, F16188, F1619, F1620, F1621, F16220, F16221, F16229, F1624, F16250, F16251, F16259, F16280, F16283, F16288, F1629, F1690, F16920, F16921, F16929, F1694, F16950, F16951, F16959, F16980, F16983, F16988, F1699, F17200, F17201, F17203, F17208, F17209, F17210, F17211, F17213, F17218, F17219, F17220, F17221, F17223, F17228, F17229, F17290, F17291, F17293, F17298, F17299, F1810, F1811, F18120, F18121, F18129, F1814, F18150, F18151, F18159, F1817, F18180, F18188, F1819, F1820, F1821, F18220, F18221, F18229, F1824, F18250, F18251, F18259, F1827, F18280, F18288, F1829, F1890, F18920, F18921, F18929, F1894, F18950, F18951, F18959, F1897, F18980, F18988, F1899, F1910, F1911, F19120, F19121, F19122, F19129, F1914, F19150, F19151, F19159, F1916, F1917, F19180, F19181, F19182, F19188, F1919, F1920, F1921, F19220, F19221, F19222, F19229, F19230, F19231, F19232, F19239, F1924, F19250, F19251, F19259, F1926, F1927, F19280, F19281, F19282, F19288, F1929, F1990, F19920, F19921, F19922, F19929, F19930, F19931, F19932, F19939, F1994, F19950, F19951, F19959, F1996, F1997, F19980, F19981, F19982, F19988, F1999, F550, F551, F552, F553, F554, F558

Mental Health: The following 319 diagnosis codes were used to determine if a patient had a mental health issue when visiting a hospital:

F0150, F0151, F0280, F0281, F0390, F0391, F04, F05, F060, F061, F062, F0630, F0631, F0632, F0633, F0634, F064, F068, F070, F0781, F0789, F079, F09, F200, F201, F202, F203, F205, F2081, F2089, F209, F21, F22, F23, F24, F250, F251, F258, F259, F28, F29, F3010, F3011, F3012, F3013, F302, F303, F304, F308, F309, F310, F3110, F3111, F3112, F3113, F312, F3130, F3131, F3132, F314, F315, F3160, F3161, F3162, F3163, F3164, F3170, F3171, F3172, F3173, F3174, F3175, F3176, F3177, F3178, F3181, F3189, F319, F320, F321, F322, F323, F324, F325, F328, F3281, F3289, F329, F330, F331, F332, F333, F3340, F3341, F3342, F338, F339, F340, F341, F348, F3481, F3489, F349, F39, F4000, F4001, F4002, F4010, F4011, F40210, F40218, F40220, F40228, F40230, F40231, F40232, F40233, F40240, F40241, F40242, F40243, F40248, F40290, F40291, F40298, F408, F409, F410, F411, F413, F418, F419, F42, F422, F423, F424, F428, F429, F430, F4310, F4311, F4312, F4320, F4321, F4322, F4323, F4324, F4325, F4329, F438, F439, F440, F441, F442, F444, F445, F446, F447, F4481, F4489, F449, F450, F451, F4520, F4521, F4522, F4529, F4541, F4542, F458, F459, F481, F482, F488, F489, F5000, F5001, F5002, F502, F508, F5081, F5082, F5089, F509, F5101, F5102, F5103, F5104, F5105, F5109, F5111, F5112, F5113, F5119, F513, F514, F515, F518, F519, F520, F521, F5221, F5222, F5231, F5232, F524, F525, F526, F528, F529, F53, F530, F531, F54, F59, F600, F601, F602, F603, F604, F605, F606, F607, F6081, F6089, F609, F630, F631, F632, F633, F6381, F6389, F639, F640, F641, F642, F648, F649, F650, F651, F652, F653, F654, F6550, F6551, F6552, F6581, F6589, F659, F66, F6810, F6811, F6812, F6813, F688, F68A, F69, F70, F71, F72, F73, F78, F79, F800, F801, F802, F804, F8081, F8082, F8089, F809, F810, F812, F8181, F8189, F819, F82, F840, F842, F843, F845, F848, F849, F88, F89, F900, F901, F902, F908, F909, F910, F911, F912, F913, F918, F919, F930, F938, F939, F940, F941, F942, F948, F949, F950, F951, F952, F958, F959, F980, F981, F9821, F9829, F983, F984, F985, F988, F989, F99

Datasets used: Apprise Health Insights collects discharge data which includes hospital patient claim information provided in the Uniform Bill for inpatient and outpatient settings. Data is collected from 60 Oregon hospitals, 3 Ambulatory Surgery Centers, 3 Washington hospitals, and Legacy Unity. Only data for Oregon acute care hospitals (60 hospitals) are used in this analysis.

By Hospital Visit: This report is comprised of the discharge dataset for CY 2020. These are unique visit counts of how many times a behavioral health patient went to an emergency room in Oregon.

By Patients: This report is comprised of the discharge dataset for CY 2020. These are unique de-duplicated counts of behavioral health patients who went to an emergency room in Oregon.

Notes:

¹Higginson, I. (2012). Emergency department crowding. *Emergency Medicine Journal*, 29, 437-443

²Rabin, E., Kocher, K., McClelland, M., Pines, J., Hwang, U., Rathlev, N., ..., & Weber, E. (2012). Solutions to emergency department 'boarding' and crowding are underused and may need to be legislated. *Health Affairs*, 31(8), 1757-1766.