**Supplementary Material**

1. **Matched case-control logistic regression (Chapter 7, Hosmer and Lemeshow1):**

Let $y\_{il}$ and $X\_{il}$ be the response and covariate values respectively of the $l^{th}$ observation of the $i^{th}$ stratum. Then, the conditional likelihood of a stratum with $m$ observations and $k$ cases, i.e., observations that have a response of 1, is:

$P\left(X\_{i1},X\_{i2},…,X\_{im},\sum\_{j=1}^{m}y\_{ij}=k\right)=\frac{exp\left(\sum\_{j=1}^{k}β^{T}X\_{ij}\right)}{\sum\_{J\in C\_{k}^{m}}^{}exp\left(\sum\_{j\in J}^{}β^{T}X\_{ij}\right)}$,

where $C\_{k}^{m}$ is the set of all subsets of size $k$ of the set $\{1,2,…,m\}$, and $β$ is the vector of coefficients corresponding to the covariates. This likelihood expression is the probability of the observed data relative to the probability of assigning responses of 1 to $k$ observations out of the $m$ total in the stratum and responses of 0 to the remaining $m-k$ observations. The full conditional log likelihood is then the product of the conditional likelihoods for each stratum, and the estimator $\hat{β}$ is chosen to maximize the conditional likelihood.

In our study, each stratum consists of one prioritized patient and one or more patients who were roomed later but arrived at the waiting room earlier than the prioritized patient (deprioritized patients). Furthermore, patients prioritized in violation of FCFS are assigned a response of 1, deprioritized patients are assigned a response of 0, and $k=1$. Then, the conditional likelihood of a stratum in our case becomes

$$P\left(X\_{i1},X\_{i2},…,X\_{im},\sum\_{j=1}^{m}y\_{ij}=1\right)=\frac{exp\left(β^{T}X\_{i1}\right)}{\sum\_{j=1}^{m}exp\left(β^{T}X\_{ij}\right)}.$$

This likelihood expression gives the probability of our observed stratum relative to the probability of assigning a response of 1 to a single observation and responses of 0 to the remaining observations. The interpretation of the log-odds is similar to standard logistic regression.

A modified Cox proportional hazards model is used to calculate $\hat{β}$ since the conditional likelihood for a particular stratum is the same as the partial likelihood of a Cox model that has $k$ simultaneous deaths from a risk set of size $m$.

1. **Multicollinearity Analysis (Fox and Monette2; Chapter 4, Buteikis3)**

In order to ensure that there are no significant effects of multicollinearity in our models, we calculated generalized variable inflation factors (GVIF). For variables with one degree of freedom, the GVIF becomes the variable inflation factor (VIF). For variables with more than one degree of freedom, calculating $\left[(GVIF)^{\frac{1}{2η}}\right]^{2}$ allows us to use the same VIF thresholds as for continuous variables (i.e., those with one degree of freedom). As can be seen from Table S1, the highest value for this calculation in both models turned out to be approximately 1.94, which is below the recommended threshold. Thus, we conclude that multicollinearity is not a concern for either model as no predictor is close to a VIF value that would be worrying.

Table S1 Generalized Variance Inflation Factors (GVIF) for the different predictors along with degrees of freedom for the weighted logistic regression and the 1:M matched case-control models.

|  |  |  |
| --- | --- | --- |
|  |  | $$\left[(GVIF)^{\frac{1}{2η}}\right]^{2}$$ |
| **Predictor** | **Degrees of Freedom, η** | **Weighted Logistic Regression Model** | **1:M Matched Case-control Model** |
| Age | 1 | 1.210 | 1.184 |
| Sex | 1 | 1.055 | 1.069 |
| Race | 3 | 1.568 | 1.568 |
| Ethnicity | 2 | 1.938 | 1.929 |
| Complaint Category | 12 | 1.016 | 1.016 |
| Weighted Elixhauser score | 1 | 1.160 | 1.158 |
| Day of week | 6 | 1.016 | -- |
| Time of day | 5 | 1.055 | -- |
| Hourly average end of triage to provider | 1 | 1.275 | -- |

1. **Sensitivity Analysis**

We conducted three sets of sensitivity analyses to test the robustness of our results. First, we repeated our statistical analysis with a margin of 10 and 20 minutes when identifying patient encounters that violated FCFS, see Tables S2 through S5 below. Second, we used age as a categorical variable by grouping age into four bins in both of our statistical models; see Tables S6 and S7. Finally, we repeated our statistical analysis by excluding patients with eye complaints from the study; see Tables S8 and S9.

Table S2 Coefficients, adjusted odds ratios (aOR), and likelihood-ratio test (LRT) p-values for the weighted logistic regression model for a margin of 10 minutes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Predictor** |  **aOR** | **aOR 95% Confidence Intervals**  | **LRT *p*-values** | **2-sided *p*-values** |
| Age | 1.003 | (1.002,1.005) | **<0.001** | **<0.001** |
| Sex (Baseline: Female) |  |  | 0.005 |  |
|  Male | 1.079 | (1.024,1.138) |  | 0.005 |
| Race (Baseline: Caucasian) |  |  | **<0.001** |  |
|  African American  | 0.762 | (0.717,0.809) |  | **<0.001** |
|  Asian | 0.735 | (0.603,0.898) |  | 0.003 |
|  Other | 0.798 | (0.700,0.910) |  | **<0.001** |
| Ethnicity (Baseline: Not Hispanic or Latino) |  |  | 0.051 |  |
|  Hispanic or Latino | 0.849 | (0.740,0.974) |  | 0.019 |
|  Other | 1.034 | (0.769,1.390) |  | 0.826 |
| Complaint Category (Baseline: Gastrointestinal) |  |  | **<0.001** |  |
|  Cardiovascular | 1.339 | (1.228,1.460) |  | **<0.001** |
|  Ear, Nose, Throat | 1.281 | (1.111,1.479) |  | **<0.001** |
|  General/Environmental | 1.549 | (1.401,1.713) |  | **<0.001** |
|  Genitourinary | 0.942 | (0.831,1.068) |  | 0.351 |
|  Neurologic | 1.431 | (1.292,1.586) |  | **<0.001** |
|  Obstetrics/Gynecology | 1.174 | (1.007,1.369) |  | 0.040 |
|  Ophthalmology | 3.726 | (3.144,4.415) |  | **<0.001** |
|  Orthopedic | 1.053 | (0.953,1.163) |  | 0.307 |
|  Respiratory | 1.323 | (1.183,1.479) |  | **<0.001** |
|  Skin | 1.193 | (1.073,1.327) |  | **0.001** |
|  Substance Abuse | 0.963 | (0.761,1.218) |  | 0.753 |
|  Trauma | 1.460 | (1.264,1.685) |  | **<0.001** |
| Weighted Elixhauser score | 1.016 | (1.011,1.020) | **<0.001** | **<0.001** |
| Day of week (Baseline: Monday)  |  |  | **<0.001** |  |
|  Tuesday | 1.073 | (0.980,1.175) |  | 0.130 |
|  Wednesday | 0.968 | (0.881,1.063) |  | 0.495 |
|  Thursday | 1.223 | (1.114,1.341) |  | **<0.001** |
|  Friday | 1.136 | (1.036,1.246) |  | 0.007 |
|  Saturday | 0.622 | (0.561,0.690) |  | **<0.001** |
|  Sunday | 0.673 | (0.607,0.747) |  | **<0.001** |
| Time of day (Baseline: 12 pm to 4 pm)  |  |  | **<0.001** |  |
|  12 am to 4 am | 0.803 | (0.733,0.878) |  | **<0.001** |
|  4 am to 8 am | 0.058 | (0.046,0.073) |  | **<0.001** |
|  8 am to 12 pm | 0.292 | (0.263,0.324) |  | **<0.001** |
|  4 pm to 8 pm | 0.982 | (0.908,1.063) |  | 0.657 |
|  8 pm to 12 am | 1.209 | (1.119,1.305) |  | **<0.001** |
| Hourly average end of triage to provider | 1.016 | (1.016,1.017) | **<0.001** | **<0.001** |

Table S3 Coefficients, adjusted odds ratios (aOR), and likelihood-ratio test (LRT) results for the matched 1:M logistic regression model for a margin of 10 minutes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Predictor** |  **aOR** | **aOR 95% Confidence Intervals** | **LRT *p*-values** | **2-sided *p*-values** |
| Age | 1.009 | (1.005,1.013) | **<0.001** | **<0.001** |
| Sex (Baseline: Female) |  |  | 0.580 |  |
|  Male | 1.036 | (0.913,1.177) |  | 0.580 |
| Race (Baseline: Caucasian) |  |  | **<0.001** |  |
|  African American  | 0.637 | (0.550,0.738) |  | **<0.001** |
|  Asian | 0.696 | (0.426,1.137) |  | 0.147 |
|  Other | 0.601 | (0.436,0.828) |  | 0.002 |
| Ethnicity (Baseline: Not Hispanic or Latino) |  |  | 0.489 |  |
|  Hispanic or Latino | 1.033 | (0.741,1.440) |  | 0.850 |
|  Other | 1.502 | (0.778,2.900) |  | 0.225 |
| Complaint Category (Baseline: Gastrointestinal) |  |  | **<0.001** |  |
|  Cardiovascular | 1.368 | (1.115,1.677) |  | 0.003 |
|  Ear, Nose, Throat  | 1.286 | (0.910,1.818) |  | 0.154 |
|  General/Environmental | 1.542 | (1.218,1.954) |  | **<0.001** |
|  Genitourinary | 1.020 | (0.748,1.390) |  | 0.901 |
|  Neurologic | 1.673 | (1.300,2.152) |  | **<0.001** |
|  Obstetrics/Gynecology | 1.237 | (0.871,1.757) |  | 0.235 |
|  Ophthalmology | 4.392 | (2.972,6.492) |  | **<0.001** |
|  Orthopedic | 1.167 | (0.916,1.486) |  | 0.212 |
|  Respiratory | 1.458 | (1.104,1.927) |  | 0.008 |
|  Skin | 1.415 | (1.093,1.833) |  | 0.008 |
|  Substance Abuse | 0.325 | (0.189,0.560) |  | **<0.001** |
|  Trauma | 1.496 | (1.055,2.123) |  | 0.024 |
| Weighted Elixhauser score | 1.017 | (1.006,1.028) | 0.003 | 0.003 |

Table S4 Coefficients, adjusted odds ratios (aOR), and likelihood-ratio test (LRT) p-values for the weighted logistic regression model for a margin of 20 minutes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Predictor** | **aOR** | **aOR 95% Confidence Intervals**  | **LRT *p*-values** | **2-sided *p*-values** |
| Age | 1.004 | (1.003,1.006) | **<0.001** | **<0.001** |
| Sex (Baseline: Female) |  |  | 0.162 |  |
|  Male | 1.039 | (0.985,1.096) |  | 0.162 |
| Race (Baseline: Caucasian) |  |  | **<0.001** |  |
|  African American  | 0.734 | (0.690,0.781) |  | **<0.001** |
|  Asian | 0.745 | (0.610,0.910) |  | 0.004 |
|  Other | 0.761 | (0.667,0.869) |  | **<0.001** |
| Ethnicity (Baseline: Not Hispanic or Latino) |  |  | 0.167 |  |
|  Hispanic or Latino | 0.905 | (0.788,1.040) |  | 0.158 |
|  Other | 1.160 | (0.864,1.558) |  | 0.324 |
| Complaint Category (Baseline: Gastrointestinal) |  |  | **<0.001** |  |
|  Cardiovascular | 1.213 | (1.112,1.324) |  | **<0.001** |
|  Ear, Nose, Throat | 1.168 | (1.011,1.349) |  | 0.035 |
|  General/Environmental | 1.558 | (1.408,1.723) |  | **<0.001** |
|  Genitourinary | 0.798 | (0.701,0.907) |  | **<0.001** |
|  Neurologic | 1.259 | (1.135,1.397) |  | **<0.001** |
|  Obstetrics/Gynecology | 1.123 | (0.963,1.310) |  | 0.140 |
|  Ophthalmology | 3.639 | (3.071,4.311) |  | **<0.001** |
|  Orthopedic | 1.030 | (0.932,1.138) |  | 0.560 |
|  Respiratory | 1.236 | (1.104,1.384) |  | **<0.001** |
|  Skin | 1.195 | (1.075,1.330) |  | **0.001** |
|  Substance Abuse | 1.013 | (0.803,1.277) |  | 0.916 |
|  Trauma | 1.465 | (1.268,1.693) |  | **<0.001** |
| Weighted Elixhauser score | 1.015 | (1.011,1.020) | **<0.001** | **<0.001** |
| Day of week (Baseline: Monday)  |  |  | **<0.001** |  |
|  Tuesday | 1.049 | (0.958,1.149) |  | 0.303 |
|  Wednesday | 0.935 | (0.851,1.027) |  | 0.161 |
|  Thursday | 1.250 | (1.139,1.371) |  | **<0.001** |
|  Friday | 1.154 | (1.052,1.265) |  | 0.002 |
|  Saturday | 0.596 | (0.537,0.663) |  | **<0.001** |
|  Sunday | 0.610 | (0.548,0.679) |  | **<0.001** |
| Time of day (Baseline: 12 pm to 4 pm)  |  |  | **<0.001** |  |
|  12 am to 4 am | 0.770 | (0.703,0.843) |  | **<0.001** |
|  4 am to 8 am | 0.048 | (0.037,0.062) |  | **<0.001** |
|  8 am to 12 pm | 0.241 | (0.216,0.269) |  | **<0.001** |
|  4 pm to 8 pm | 0.957 | (0.885,1.036) |  | 0.276 |
|  8 pm to 12 am | 1.179 | (1.092,1.273) |  | **<0.001** |
| Hourly average end of triage to provider | 1.017 | (1.016,1.017) | **<0.001** | **<0.001** |

Table S5 Coefficients, adjusted odds ratios (aOR), and likelihood-ratio test (LRT) results for the matched 1:M logistic regression model for a margin of 20 minutes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Predictor** | **aOR** | **aOR 95% Confidence Intervals** | **LRT *p*-values** | **2-sided *p*-values** |
| Age | 1.009 | (1.005,1.014) | **<0.001** | **<0.001** |
| Sex (Baseline: Female) |  |  | 0.541 |  |
|  Male | 1.045 | (0.908,1.204) |  | 0.541 |
| Race (Baseline: Caucasian) |  |  | **<0.001** |  |
|  African American  | 0.618 | (0.526,0.726) |  | **<0.001** |
|  Asian | 0.830 | (0.487,1.416) |  | 0.494 |
|  Other | 0.532 | (0.375,0.757) |  | **<0.001** |
| Ethnicity (Baseline: Not Hispanic or Latino) |  |  | 0.471 |  |
|  Hispanic or Latino | 1.136 | (0.791,1.632) |  | 0.491 |
|  Other | 1.518 | (0.739,3.122) |  | 0.256 |
| Complaint Category (Baseline: Gastrointestinal) |  |  | **<0.001** |  |
|  Cardiovascular | 1.317 | (1.051,1.651) |  | 0.017 |
|  Ear, Nose, Throat  | 1.250 | (0.852,1.833) |  | 0.254 |
|  General/Environmental | 1.538 | (1.187,1.992) |  | **0.001** |
|  Genitourinary | 0.880 | (0.622,1.245) |  | 0.471 |
|  Neurologic | 1.535 | (1.160,2.031) |  | 0.003 |
|  Obstetrics/Gynecology | 1.414 | (0.960,2.083) |  | 0.079 |
|  Ophthalmology | 5.076 | (3.281,7.854) |  | **<0.001** |
|  Orthopedic | 1.100 | (0.845,1.432) |  | 0.478 |
|  Respiratory | 1.478 | (1.083,2.018) |  | 0.014 |
|  Skin | 1.366 | (1.034,1.806) |  | 0.028 |
|  Substance Abuse | 0.330 | (0.183,0.597) |  | **<0.001** |
|  Trauma | 1.461 | (0.999,2.137) |  | 0.051 |
| Weighted Elixhauser score | 1.020 | (1.008,1.033) | **0.001** | **0.001** |

Table S6 Coefficients, adjusted odds ratios (aOR), and likelihood-ratio-test (LRT) p-values for the weighted logistic regression model with age as a categorical variable.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Predictor** | **aOR** | **aOR 95% Confidence Intervals**  | **LRT *p*-values** | **2-sided *p*-values** |
| Age (Baseline: 18 to 40) |  |  | **< 0.001** |  |
|  40 to 55 | 0.965 | (0.903,1.032) |  | 0.296 |
|  55 to 70 | 1.165 | (1.084,1.252) |  | **< 0.001** |
|  Above 70 | 1.210 | (1.107,1.322) |  | **< 0.001** |
| Sex (Baseline: Female) |  |  | 0.005 |  |
|  Male | 1.079 | (1.023,1.138) |  | 0.005 |
| Race (Baseline: Caucasian) |  |  | **< 0.001** |  |
|  African American  | 0.755 | (0.710,0.803) |  | **< 0.001** |
|  Asian | 0.720 | (0.589,0.881) |  | **0.001** |
|  Other | 0.785 | (0.688,0.897) |  | **< 0.001** |
| Ethnicity (Baseline: Not Hispanic or Latino) |  |  | 0.133 |  |
|  Hispanic or Latino | 0.880 | (0.766,1.011) |  | 0.071 |
|  Other | 1.083 | (0.806,1.454) |  | 0.597 |
| Complaint Category (Baseline: Gastrointestinal) |  |  | **< 0.001** |  |
|  Cardiovascular | 1.257 | (1.152,1.371) |  | **< 0.001** |
|  Ear, Nose, Throat | 1.237 | (1.073,1.428) |  | 0.004 |
|  General/Environmental | 1.558 | (1.409,1.723) |  | **< 0.001** |
|  Genitourinary | 0.833 | (0.733,0.945) |  | 0.005 |
|  Neurologic | 1.379 | (1.244,1.528) |  | **< 0.001** |
|  Obstetrics/Gynecology | 1.143 | (0.980,1.332) |  | 0.088 |
|  Ophthalmology | 3.602 | (3.041,4.267) |  | **< 0.001** |
|  Orthopedic | 0.996 | (0.901,1.100) |  | 0.932 |
|  Respiratory | 1.282 | (1.146,1.436) |  | **< 0.001** |
|  Skin | 1.169 | (1.051,1.301) |  | 0.004 |
|  Substance Abuse | 0.960 | (0.760,1.213) |  | 0.735 |
|  Trauma | 1.433 | (1.240,1.656) |  | **< 0.001** |
| Weighted Elixhauser score | 1.014 | (1.009,1.018) | **< 0.001** | **< 0.001** |
| Day of week (Baseline: Monday)  |  |  | **< 0.001** |  |
|  Tuesday | 1.131 | (1.033,1.239) |  | 0.008 |
|  Wednesday | 0.987 | (0.899,1.085) |  | 0.793 |
|  Thursday | 1.273 | (1.160,1.397) |  | **< 0.001** |
|  Friday | 1.193 | (1.088,1.308) |  | **< 0.001** |
|  Saturday | 0.623 | (0.561,0.692) |  | **< 0.001** |
|  Sunday | 0.655 | (0.589,0.727) |  | **< 0.001** |
| Time of day (Baseline: 12 pm to 4 pm)  |  |  | **< 0.001** |  |
|  12 am to 4 am | 0.799 | (0.729,0.874) |  | **< 0.001** |
|  4 am to 8 am | 0.057 | (0.044,0.072) |  | **< 0.001** |
|  8 am to 12 pm | 0.271 | (0.244,0.302) |  | **< 0.001** |
|  4 pm to 8 pm | 0.982 | (0.908,1.062) |  | 0.650 |
|  8 pm to 12 am | 1.206 | (1.116,1.302) |  | **< 0.001** |
| Hourly average end of triage to provider | 1.017 | (1.016,1.017) | **< 0.001** | **< 0.001** |

Table S7 Coefficients, adjusted odds ratios (aOR), and likelihood-ratio-test (LRT) p-values for the matched 1:M logistic regression model with age as a categorical variable.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Predictor** | **aOR** | **aOR 95% Confidence Intervals** | **LRT *p*-values** | **2-sided *p*-values** |
| Age (Baseline: 18 to 40) |  |  | **< 0.001** |  |
|  40 to 55 | 0.903 | (0.764,1.066) |  | 0.227 |
|  55 to 70  | 1.231 | (1.026,1.478) |  | 0.025 |
|  Above 70 | 1.615 | (1.287,2.025) |  | **< 0.001** |
| Sex (Baseline: Female) |  |  | 0.457 |  |
|  Male | 1.052 | (0.92,1.204) |  | 0.457 |
| Race (Baseline: Caucasian) |  |  | **< 0.001** |  |
|  African American  | 0.650 | (0.557,0.760) |  | **< 0.001** |
|  Asian | 0.706 | (0.421,1.183) |  | 0.186 |
|  Other | 0.570 | (0.408,0.798) |  | **0.001** |
| Ethnicity (Baseline: Not Hispanic or Latino) |  |  | 0.460 |  |
|  Hispanic or Latino | 1.085 | (0.767,1.533) |  | 0.656 |
|  Other | 1.553 | (0.776,3.108) |  | 0.214 |
| Complaint Category (Baseline: Gastrointestinal) |  |  | **< 0.001** |  |
|  Cardiovascular | 1.331 | (1.075,1.648) |  | 0.009 |
|  Ear, Nose, Throat  | 1.275 | (0.888,1.833) |  | 0.188 |
|  General/Environmental | 1.642 | (1.281,2.106) |  | **< 0.001** |
|  Genitourinary | 0.921 | (0.664,1.277) |  | 0.620 |
|  Neurologic | 1.595 | (1.224,2.078) |  | **< 0.001** |
|  Obstetrics/Gynecology | 1.238 | (0.858,1.786) |  | 0.253 |
|  Ophthalmology | 4.735 | (3.136,7.151) |  | **< 0.001** |
|  Orthopedic | 1.103 | (0.854,1.423) |  | 0.453 |
|  Respiratory | 1.455 | (1.081,1.958) |  | 0.013 |
|  Skin | 1.377 | (1.052,1.802) |  | 0.020 |
|  Substance Abuse | 0.332 | (0.187,0.589) |  | **< 0.001** |
|  Trauma | 1.389 | (0.963,2.005) |  | 0.079 |
| Weighted Elixhauser score | 1.017 | (1.005,1.029) | 0.005 | 0.005 |

Table S8 Coefficients, adjusted odds ratios (aOR), and likelihood-ratio test (LRT) p-values for the weighted logistic regression model without ophthalmology patients.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Predictor** | **aOR** | **aOR 95% Confidence Intervals**  | **LRT *p*-values** | **2-sided *p*-values** |
| Age | 1.005 | (1.003,1.006) | **<0.001** | **<0.001** |
| Sex (Baseline: Female) |  |  | 0.017 |  |
|  Male | 1.068 | (1.012,1.126) |  | 0.017 |
| Race (Baseline: Caucasian) |  |  | **<0.001** |  |
|  African American  | 0.738 | (0.694,0.785) |  | **<0.001** |
|  Asian | 0.679 | (0.553,0.833) |  | **<0.001** |
|  Other | 0.759 | (0.664,0.868) |  | **<0.001** |
| Ethnicity (Baseline: Not Hispanic or Latino) |  |  | 0.169 |  |
|  Hispanic or Latino | 0.895 | (0.778,1.030) |  | 0.122 |
|  Other | 1.130 | (0.835,1.528) |  | 0.428 |
| Complaint Category (Baseline: Gastrointestinal) |  |  | **<0.001** |  |
|  Cardiovascular | 1.271 | (1.165,1.386) |  | **<0.001** |
|  Ear, Nose, Throat | 1.260 | (1.093,1.452) |  | **0.001** |
|  General/Environmental | 1.588 | (1.437,1.756) |  | **<0.001** |
|  Genitourinary | 0.834 | (0.735,0.946) |  | 0.005 |
|  Neurologic | 1.392 | (1.256,1.543) |  | **<0.001** |
|  Obstetrics/Gynecology | 1.176 | (1.010,1.370) |  | 0.037 |
|  Orthopedic | 1.004 | (0.909,1.109) |  | 0.936 |
|  Respiratory | 1.309 | (1.170,1.464) |  | **<0.001** |
|  Skin | 1.183 | (1.064,1.315) |  | 0.002 |
|  Substance Abuse | 0.965 | (0.766,1.216) |  | 0.763 |
|  Trauma | 1.463 | (1.268,1.689) |  | **<0.001** |
| Weighted Elixhauser score | 1.013 | (1.008,1.018) | **<0.001** | **<0.001** |
| Day of week (Baseline: Monday)  |  |  | **<0.001** |  |
|  Tuesday | 1.132 | (1.033,1.241) |  | 0.008 |
|  Wednesday | 1.002 | (0.912,1.102) |  | 0.959 |
|  Thursday | 1.273 | (1.159,1.398) |  | **<0.001** |
|  Friday | 1.158 | (1.054,1.271) |  | 0.002 |
|  Saturday | 0.625 | (0.563,0.695) |  | **<0.001** |
|  Sunday | 0.681 | (0.613,0.757) |  | **<0.001** |
| Time of day (Baseline: 12 pm to 4 pm)  |  |  | **<0.001** |  |
|  12 am to 4 am | 0.785 | (0.717,0.860) |  | **<0.001** |
|  4 am to 8 am | 0.058 | (0.045,0.073) |  | **<0.001** |
|  8 am to 12 pm | 0.262 | (0.236,0.292) |  | **<0.001** |
|  4 pm to 8 pm | 0.959 | (0.886,1.038) |  | 0.300 |
|  8 pm to 12 am | 1.185 | (1.097,1.280) |  | **<0.001** |
| Hourly average end of triage to provider | 1.017 | (1.016,1.017) | **<0.001** | **<0.001** |

Table S9 Coefficients, adjusted odds ratios (aOR), and likelihood-ratio test (LRT) results for the matched 1:M logistic regression model without ophthalmology patients.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Predictor** | **aOR** | **aOR 95% Confidence Intervals** | **LRT *p*-values** | **2-sided *p*-values** |
| Age | 1.008 | (1.004,1.012) | **<0.001** | **<0.001** |
| Sex (Baseline: Female) |  |  | 0.526 |  |
|  Male | 1.046 | (0.911,1.200) |  | 0.526 |
| Race (Baseline: Caucasian) |  |  | **<0.001** |  |
|  African American  | 0.635 | (0.542,0.745) |  | **<0.001** |
|  Asian | 0.681 | (0.400,1.161) |  | 0.158 |
|  Other | 0.675 | (0.476,0.957) |  | 0.027 |
| Ethnicity (Baseline: Not Hispanic or Latino) |  |  | 0.333 |  |
|  Hispanic or Latino | 0.927 | (0.647,1.328) |  | 0.679 |
|  Other | 1.651 | (0.795,3.428) |  | 0.179 |
| Complaint Category (Baseline: Gastrointestinal) |  |  | **<0.001** |  |
|  Cardiovascular | 1.363 | (1.099,1.692) |  | 0.005 |
|  Ear, Nose, Throat  | 1.318 | (0.914,1.901) |  | 0.139 |
|  General/Environmental | 1.626 | (1.265,2.089) |  | **<0.001** |
|  Genitourinary | 0.957 | (0.688,1.331) |  | 0.794 |
|  Neurologic | 1.592 | (1.218,2.080) |  | **<0.001** |
|  Obstetrics/Gynecology | 1.305 | (0.901,1.892) |  | 0.159 |
|  Orthopedic | 1.115 | (0.863,1.442) |  | 0.404 |
|  Respiratory | 1.521 | (1.128,2.050) |  | 0.006 |
|  Skin | 1.372 | (1.046,1.800) |  | 0.022 |
|  Substance Abuse | 0.323 | (0.182,0.574) |  | **<0.001** |
|  Trauma | 1.540 | (1.065,2.229) |  | 0.022 |
| Weighted Elixhauser score | 1.022 | (1.009,1.034) | **<0.001** | **<0.001** |

1. **Supplementary information on the study population**

In Tables S10, S11, and S12 below, we provide breakdown of demographic information for the study population according to complaint category.

Table S10 Race breakdown of study patients by complaint category. Race columns provide the number of patients and the corresponding percentage for each complaint category.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Complaint Category** | **Sample Size** | **Caucasian** | **African-American** | **Asian** | **Other****Race** |
| All Complaints | 15781 | 8015(50.79%) | 4529(28.70%) | 283(1.79%) | 2954(18.72%) |
| Cardiovascular | 2278 | 1112(48.82%) | 762 (33.45%) | 46 (2.02%) | 358 (15.72%) |
| Ear, Nose, Throat | 624 | 336(53.85%) | 169 (27.08%) | 11 (1.76%) | 108 (17.31%) |
| General/Environmental | 1321 | 620(46.93%) | 485 (36.71%) | 21 (1.59%) | 195 (14.76%) |
| Gastrointestinal | 3796 | 1862(49.05%) | 987 (26.00%) | 85 (2.24%) | 862 (22.71%) |
| Genitourinary | 977 | 557(57.01%) | 221 (22.62%) | 19 (1.94%) | 180 (18.42%) |
| Neurologic | 1298 | 636(49.00%) | 392 (30.20%) | 24 (1.85%) | 246 (18.95%) |
| Obstetrics/Gynecology | 555 | 157(28.29%) | 171 (30.81%) | 17 (3.06%) | 210 (37.84%) |
| Ophthalmology | 312 | 161(51.60%) | 90 (28.85%) | 4 (1.28%) | 57 (18.27%) |
| Orthopedic | 1565 | 856(54.70%) | 410 (26.20%) | 15 (0.96%) | 284 (18.15%) |
| Respiratory | 1132 | 526(46.47%) | 407 (35.95%) | 18 (1.59%) | 181 (15.99%) |
| Skin | 1182 | 714(60.41%) | 287 (24.28%) | 13 (1.10%) | 168 (14.21%) |
| Substance | 214 | 166(77.57%) | 27 (12.62%) | 3 (1.40%) | 18 (8.41%) |
| Trauma | 527 | 312(59.20%) | 121 (22.96%) | 7 (1.33%) | 87 (16.51%) |

Table S11 Sex and ethnicity breakdown of study patients by complaint category. Sex and ethnicity columns provide the number of patients and the corresponding percentage for each complaint category.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Complaint Category** | **Sample Size** | **Male**  | **Female** | **Not Hispanic or Latino**  | **Hispanic or Latino** | **Other****Ethnicity** |
| All complaints | 15781 | 6681(42.34%) | 9100 (57.66%) | 13069(82.81%) | 2576(16.32%) | 136(0.86%) |
| Cardiovascular | 2278 | 1032 (45.30%) | 1246 (54.70%) | 1964(86.22%) | 296(12.99%) | 18(0.79%) |
| Ear, Nose, Throat | 624 | 290 (46.47%) | 334 (53.53%) | 528(84.62%) | 87(13.94%) | 9(1.44%) |
| General/Environmental | 1321 | 637 (48.22%) | 684 (51.78%) | 1143(86.53%) | 170(12.87%) | 8(0.61%) |
| Gastrointestinal | 3796 | 1387 (36.54%) | 2409 (63.46%) | 2993(78.85%) | 776(20.44%) | 27(0.71%) |
| Genitourinary | 977 | 519 (53.12%) | 458 (46.88%) | 798(81.68%) | 170(17.40%) | 9(0.92%) |
| Neurologic | 1298 | 475 (36.59%) | 823 (63.41%) | 1066(82.13%) | 222(17.10%) | 10(0.77%) |
| Obstetrics/Gynecology | 555 | 2 (0.36%) | 553 (99.64%) | 356(64.14%) | 196(35.32%) | 3(0.54%) |
| Ophthalmology | 312 | 139 (44.55%) | 173 (55.45%) | 260(83.33%) | 45(14.42%) | 7(2.24%) |
| Orthopedic | 1565 | 763 (48.75%) | 802 (51.25%) | 1299(83.00%) | 248(15.85%) | 18(1.15%) |
| Respiratory | 1132 | 475 (41.96%) | 657 (58.04%) | 974(86.04%) | 148(13.07%) | 10(0.88%) |
| Skin | 1182 | 584 (49.41%) | 598 (50.59%) | 1042(88.16%) | 130(11.00%) | 10(0.85%) |
| Substance | 214 | 136 (63.55%) | 78 (36.45%) | 198(92.52%) | 16(7.48%) | 0(0.00%) |
| Trauma | 527 | 242 (45.92%) | 285 (54.08%) | 448(85.01%) | 72(13.66%) | 7(1.33%) |

Table S12 Mean age and age group breakdown of study patients by complaint category. Age group columns provide the number of patients and the corresponding percentage for each complaint category.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Complaint Category** | **Sample Size** | **Mean Age**  | **18 to 40** | **40 to 55** | **55 to 70** | **Above 70** |
| All Complaints | 15781 | 47.7 | 6124(50.79%) | 4259 (26.99%) | 3487 (22.10%) | 1911(12.11%) |
| Cardiovascular | 2278 | 51.3 | 687 (30.16%) | 652 (28.62%) | 602 (26.43%) | 337(14.79%) |
| Ear, Nose, Throat | 624 | 45.5 | 272(43.59%) | 170 (27.24%) | 114 (18.27%) | 68(10.90%) |
| General/Environmental | 1321 | 50.1 | 435(32.93%) | 371 (28.08%) | 334 (25.28%) | 181(13.70%) |
| Gastrointestinal | 3796 | 45.2 | 1690 (44.52%) | 1027 (27.05%) | 730 (19.23%) | 349(9.19%) |
| Genitourinary | 977 | 49.9 | 341(34.90%) | 252 (25.79%) | 231 (23.64%) | 153(15.66%) |
| Neurologic | 1298 | 47.9 | 500(38.52%) | 343 (26.43%) | 286 (22.03%) | 169(13.02%) |
| Obstetrics/Gynecology | 555 | 33.4 | 441(79.46%) | 82(14.77%) | 21 (3.78%) | 11(1.98%) |
| Ophthalmology | 312 | 47.9 | 117(37.50%) | 77(24.68%) | 83 (26.60%) | 35(11.22%) |
| Orthopedic | 1565 | 49.5 | 527(33.67%) | 440 (28.12%) | 393 (25.11%) | 205(13.10%) |
| Respiratory | 1132 | 50.3 | 368(32.51%) | 310 (27.39%) | 284 (25.09%) | 170(15.02%) |
| Skin | 1182 | 47.7 | 438(37.06%) | 347 (29.36%) | 275 (23.27%) | 122(10.32%) |
| Substance | 214 | 40.0 | 113(52.80%) | 78(36.45%) | 19 (8.88%) | 4(1.87%) |
| Trauma | 527 | 50.4 | 195(37.00%) | 110 (20.87%) | 115 (21.82%) | 107(20.30%) |