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2 **Prisoners seeking healthcare in emergency department**

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12  
13 **Abstract**

14 **Objectives:** To evaluate inmate referrals to emergency department of a tertiary  
15 healthcare facility in terms of demographical and clinical characteristics as well  
16 as their impact on the department.

17 **Method:** The retrospective cross-sectional study was conducted at Ankara  
18 Numune Training and Research Hospital, Ankara, Turkey, and comprised data  
19 of incarcerated patients who were brought to the emergency department from  
20 January 01, 2010, to December 31, 2012. . Demographical characteristics,  
21 consultations, duration of hospitalisation, recurrent admissions, disposal and  
22 mortality rates were noted. The referrals were grouped as surgical conditions,  
23 medical disorders, Eye, Ear, Nose, Throat problems, injury and psychiatric  
24 disorders. The groups were then subdivided according to diagnosis. SPSS 22  
25 was used for data analysis.

26 **Results:** Of the 856 patients, 804(93.4%) were men and 52(6.1%) were  
27 women. The overall mean age was 37.54±14.81 years (range: 15-83 years).  
28 The number of patients was the highest in the medical group 363(42.4%) and

29 the lowest in the Eye, Ear, Nose, Throat group 56(6.5%). Mean age of the  
30 surgical group was significantly lower than the medical group ( $p<0.001$ ) but  
31 significantly higher than that of the trauma group ( $p=0.001$ ).

32 **Conclusion:** Functional emergency response units, strict emergency triage of  
33 inmates, and their rapid care and management in jails can help avoid referring  
34 these patients to already overcrowded emergency departments.

35 **Key Words:** Prisoners, Healthcare, Emergency department.

36

### 37 **Introduction**

38 The prison population usually has worse overall health conditions than the  
39 general population. Prisons are characterised by poor health and healthcare  
40 services, which are far inferior to those available in society at large, and reasons  
41 include poor health and sanitary conditions, lack or shortage of medical  
42 resources and services, and reduced access to healthcare services. These factors  
43 increase the risk of developing medical disorders, and result in frequent hospital  
44 visits among prisoners compared to their age- and gender-matched free  
45 counterparts [1,2].

46 Although several health conditions affect the prison population, healthcare  
47 practices are usually neglected and poorly organised in various prisons  
48 worldwide. Healthcare systems and resources at such facilities are inadequate,  
49 and, hence, public hospitals and emergency departments (ED) are used for the  
50 admission of sick prisoners [3]. Studies have investigated the prevalence of  
51 chronic disorders, admissions of newly-released prisoners and repeat  
52 admissions in the ED or experiences in healthcare services of prisons [2,4-6].

53 The environment in the ED is ever-changing and uncertain, and it faces sudden  
54 patient consultations on a constant basis. Prisons currently face numerous  
55 emergency cases almost every day [4]. The population of a prison is not  
56 representative of the general population so demographics of this population is  
57 utmost important. The current study was planned to highlight inmate referrals to

58 the ED of a tertiary healthcare facility in terms of their demographic and clinical  
59 characteristics as well as their impact on ED.

60

### 61 **Materials and Methods**

62 The retrospective cross-sectional study was conducted at Ankara Numune  
63 Training and Research Hospital, Ankara, Turkey, and comprised data of  
64 incarcerated patients who were brought to ED from January 01, 2010, to  
65 December 31, 2012. After approval from the institutional ethics committee,  
66 repetitive entries of the patients were retrieved from the hospital's computerised  
67 medical record database

68 The hospital is a tertiary healthcare institution with approximately 200,000  
69 annual admissions to the ED, which is the designated first medical contact of  
70 inmate patients. The hospital has now become the referral hospital for the  
71 admission of prisoners in the province and from penal institutions outside the  
72 province, and provides a 12-bed facility for inmates. Data included in the  
73 current study related to imprisoned adult patients of either gender. Those aged  
74 <18 years and without isolated orthopaedic trauma were excluded, and so were  
75 those with missing hospital record.

76 Data was retrieved from the hospital's computerised medical record database  
77 and patient files, and was recorded on a pre-designed proforma containing  
78 demographic characteristics, consultations from other departments, reason  
79 behind ED admission, hospitalisation duration, recurrent admissions, admission  
80 time, and disposal and mortality rates. Emergency referrals were grouped  
81 according to surgical conditions, including gastrointestinal symptoms (GIS) and  
82 genitourinary symptoms (GUS); medical disorders, including cardiorespiratory,  
83 neurological, internal, dermatological and musculoskeletal symptoms); eye, ear,  
84 nose, and throat (EENT) problems; injuries; and psychiatric disorders. The  
85 groups were further subdivided based on diagnosis.

86 Data was analysed using SPSS 22. Mean and standard deviation (SD) were  
87 calculated as descriptive statistics of continuous variables that were not  
88 normally distributed, whereas categorical variables were expressed as  
89 frequencies and percentages. The correlation between categorical variables was  
90 assessed using Pearson's chi-square test. Shapiro–Wilk test was used to assess  
91 normality when the sample size was <50, whereas the Kolmogorov–Smirnov  
92 test was used if the sample size was >50. In the analysis of the significance of  
93 the difference between the measurement values of the groups, Shapiro–Wilk  
94 test was used to control normality, and Mann–Whitney U-test was used when  
95 the normality criteria were not met. Non-parametric comparison of the groups  
96 was carried out using the Kruskal–Wallis test with Bonferroni–Dunn procedure  
97 as the post hoc test.  $P < 0.05$  was considered statistically significant.

98

## 99 **Results**

100 Of the 856 patients, 804(93.4%) were men and 52(6.1%) were women. The  
101 overall mean age was  $37.54 \pm 14.81$  years (range: 15-83 years). November was  
102 the month that had the maximum influx 100(11.7%). The number of patients  
103 was highest in the medical group 363(42.4%) and lowest in the EENT group  
104 56(6.5%). The most frequent referrals in the subgroups were 140(38.6%) with  
105 cardiorespiratory problems in the medicine group, 83(58.9%) with non-specific  
106 abdominal pain in surgery group, 23(37%) with suicide attempts in psychiatry  
107 groups, and 33(59%) with upper respiratory tract infections in the EENT group  
108 (Table 1).

109 Regarding the cause of ED visit at individual level, trauma accounted for  
110 183(21.4%) cases, the upper extremity was the most exposed region 67(71%),  
111 and blunt trauma was the most frequent injury type 143(80.3%) (Figure 1).

112 A total of 42 (4.9%) patients exhibited different types of malignancies; 13(31%)  
113 from the gastrointestinal system, particularly stomach 5(38.4%); 11(26.2%)  
114 from the respiratory system, particularly lung 7(63.6%); 8(19%) from the

115 haematological system; and 5(12%) each from the reproductive and  
116 neurological systems. Also, 9(1%) patients presented with communicable  
117 diseases, particularly hepatitis, and among them, 3(33.3%) had end-stage  
118 hepatic disease. Besides, 1(0.11%) inmate was a kidney transplant follow-up  
119 patient, and 1(0.11%) presented with complications due to a sex reassignment  
120 operation.

121 There were 566(66.1%) requests for consultations from other departments  
122 (Figure 2).

123 Men had greater recurrent admission rates than women ( $p=0.033$ ). Diagnostic  
124 groups also varied according to gender ( $p<0.001$ ). Women were more  
125 frequently diagnosed with psychiatric problems than men ( $p<0.05$ ). No  
126 significant difference was observed with respect to hospitalisation rates and  
127 outcomes in terms of gender ( $p>0.05$ ) (Table 2).

128 The mean patient age was significantly lower in the surgical group than in the  
129 medical group ( $p<0.001$ ), and it was significantly higher than that of the injury  
130 group ( $p=0.001$ ). The mean age was significantly higher for the deceased  
131 patients than for those who were treated and discharged ( $p=0.003$ ) and those  
132 discharged from the ED ( $p<0.001$ ) (Table 3).

133 There were 246(28.6%) hospitalisations with a mean duration of  $7.77\pm 8.9$  days  
134 (range: 1-48 days). The most frequent hospitalisations were in cardiology  
135 56(6.5%), emergency surgery (ES) 45(5.3%), and emergency internal medicine  
136 (EIM) 40(4.7%). In terms of clinical outcomes, 228(26.7%) were discharged  
137 with full recovery, 17(2%) died, and 2(0.2%) were referred to another  
138 institution from the ED. There were 298(34.8%) recurrent referrals to the ED,  
139 and, of them, 80(25.5%) were hospitalised and 4(1.34%) died.

140

## 141 Discussion

142 Emergency medicine specialists provide triage-based medical care round the  
143 clock to patients with acute medical or surgical conditions as well as injuries.

144 During this time, they encounter different patient characteristics and attitudes,  
145 including the inmate population. Thus, clinical and demographical  
146 characterisation is required for such a challenging patient population [7, 8].

147 Women form the minority of the inmate population, with percentages of female  
148 inmates ranging 4-6% among various countries [2]. Consistent with these  
149 findings, the present study revealed female inmate percentage of 6.1%. Female  
150 prisoners also require advanced healthcare services received by their male  
151 counterparts. However, this need is seldom adequately met owing to a more  
152 limited access to healthcare services compared with men and overall society [9,  
153 10]. The reasons for conviction among female prisoners are generally distinct,  
154 and they have a separate pattern compared to that of the male prisoners. They  
155 are physically and emotionally vulnerable because they are mothers caring for  
156 their kids alone, and they mostly belong to economically, socially and  
157 educationally poor social environments. They frequently have a history of  
158 alcohol and drug abuse. Moreover, they may have previously experienced  
159 physical and sexual harassment as well as social disadvantages when they were  
160 outside of prison. Hence, a substantial prevalence of mental health illnesses has  
161 been observed in women [11-13]. The most common reason behind admission  
162 to the ED among the female prisoners was psychiatric disorders, of which  
163 hunger strike and suicide attempt were the most common. Literature suggests  
164 that, in addition to the above-mentioned reasons, the increased risk of  
165 committing suicide can be attributed to the traditional Turkish social structure,  
166 which exerts social and psychological pressure upon women. However,  
167 presentations due to hunger strike are also common among female prisoners,  
168 and due to political reasons, they appear as a major reason behind admission to  
169 the ED. Suicide was the leading cause of admission to the ED in both genders,  
170 and suicide can also be considered a consequence of prison conditions  
171 triggering depression, anxiety and stress-related emotional reactions.

172 Medical emergencies, particularly cardiovascular disorders, were on top of the  
173 list in the current study. Literature [2, 11, 13, 14] has indicated an increased  
174 prevalence of risky behaviours, such as smoking and substance abuse, owing to  
175 an increased burden of the risk factors for cardiovascular and cerebrovascular  
176 disorders, negative social conditions, and anxiety and depression caused by  
177 these conditions. Co-morbidities were not questioned in the present study, but  
178 the higher mean age of patients in the medical emergency group compared to  
179 those in all other groups was attributed to the increased prevalence of co-  
180 morbidities in addition to the causes indicated in the literature[2,11,13,14].  
181 Thus, acute or chronic renal disease and their related complications and diabetic  
182 emergencies were the most common reasons behind admission to the ED.

183 Injuries with unquestionable causes were the second most common reason, and  
184 they were more common in younger patients and men. Although limited, the  
185 results of studies regarding unintentional injuries in prisoners are correlated  
186 with those of the present study [15, 16]. Orthopaedic injuries are the most  
187 common type of injuries. Moreover, 76% of all patients with this type of injury  
188 were discharged from the ED, thereby indicating that many of these injuries  
189 were not severe. Therefore, patients presenting with these injuries did not need  
190 to be admitted to the ED. Only one death, which was caused by traumatic brain  
191 injury, was observed.

192 Although the incidence of surgical conditions shows variability in literature [2,  
193 4], non-specific abdominal pain is the most common reason behind visiting the  
194 ED, and the current study, too, had similar findings. This may be due to  
195 psychiatric and social factors. In one study[4], a general assessment of the  
196 reasons behind admission to the ED indicated that determining the actual risk  
197 statuses of the prisoners before ED admission, starting an appropriate treatment  
198 regimen or continuing and ensuring compliance to any available treatment for  
199 chronic disorders, registering patients for standard cardiovascular monitoring,  
200 and establishing pre-ED healthcare services by organising prison hospitals in

201 line with the European Council's recommendations in Article No. 46.2 may  
202 prevent the admission of prisoners to the ED, and Avoid the negative  
203 circumstances occurring during these visits [17].

204 In a busy and overcrowded ED providing services to approximately 200000  
205 admissions annually, mixed management of inmates and the general population  
206 leads to untoward consequences for both populations. As inmates are inclined  
207 toward demonstrating aggressive behaviour, which is aggravated by the  
208 unfavourable and hostile prison environment, they are more likely to  
209 demonstrate violence and odd behaviour during their visits to the ED. This leads  
210 to physical and verbal threats, assault, workplace chaos, and escape attempts by  
211 prisoners [4]. The discharge rate of 71.6% among the prisoners treated in  
212 departments other than the ED without being hospitalised suggests that  
213 emergency physicians, who strictly work according to the international and  
214 legal regulations for the rights of sick prisoners in a busy, chaotic, and highly  
215 unstable ED setting, remain in a self-defensive mode and seek consultations  
216 from other departments. This prolongs a patient's stay in the ED.

217 In recent years, overcrowded EDs have been a global issue, preventing EDs  
218 from providing appropriate help to those who are in need and who seek medical  
219 attention for serious disorders. The long durations spent by patients in the EDs  
220 is the major factor leading to ED overcrowding. This not only depends on  
221 patient- and disease-specific factors, but also on system-related factors. The  
222 productivity of an ED is lowered by overcrowding and excessively long ED  
223 stays [7, 8, 18, 19].

224 The security guards accompanying the prisoner patients request to be given  
225 priority in patient care for security reasons and this causes conflicts between the  
226 other patients and their relatives and emergency staff. Separate observation unit  
227 and separate staff have to be provided during the observation of this patient  
228 group in the ED. Also, increased costs due to recurrent admissions of these  
229 patients is another problem considering the number of patients discharged in the



230 current study. These problems are experienced every day in our ED as it has a  
231 central role in providing health services to prisoners.

232 Inmate patients face unique challenges in the ED in terms of both logistics and  
233 security and require extra measures and staff, and custodial guards need to  
234 accompany these patients as well. All these factors lead to overcrowding and  
235 chaos in the EDs and prevent professionals in these units to practise their  
236 routines and provide services to other patients who are in need of emergency  
237 care [4].

238 The current study is limited by the fact that it is a single-centre assessment in an  
239 urban teaching hospital in Turkey. However, it does provide an important  
240 pioneering research in a specific area.

241

## 242 **Conclusion**

243 Inmate overcrowding in the EDs is a major problem all over the world. This  
244 should be addressed by implementing suitable emergency response units  
245 capable of performing various interventions and making different diagnoses,  
246 which are dedicated to the emergency triage of inmates, and rapid care and  
247 management without referring these patients to the already overcrowded EDs.

248

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252

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320 **Table 1: Referral patterns**

<b>Surgical</b>	<b>GIS</b>	<b>GUS</b>
	Nonspecific abdominal pain Acute appendicitis Biliary tract disorders Pancreatitis Peptic ulcer perforation Ileus Hernias Abscess, hemorrhoids	Pregnancy and complications Ovarian disorders Urinary tract infections Renal colic Hematuria
<b>Medical</b>	<b>Cardiovascular</b>	<b>Respiratory</b>
	Acute coronary syndromes (ACS): chest pain Acute Heart failure: acute pulmonary edema Dysrhythmias Hypertensive emergencies Syncope Thromboembolism- Aortic disorders <b>Internal</b> Anemia Acute renal failure and chronic renal disease Diabetes mellitus and its related complications General disorders Hepatitis and its related complications Caustic ingestion Oncologic emergencies Gastrointestinal hemorrhage Foreign body <b>Musculoskeletal</b> <b>Dermatological</b>	Spontaneous pneumothorax Lower respiratory tract infections Hemoptysis Dyspnea  <b>Neurological</b> Headache Seizure Intracranial mass Stroke Gait disorders
<b>Patients with psychiatric disorders</b>	Anxiety disorder Bipolar affective disorder Depression Suicide Psychosis Dissociative disorder Panic disorder Hunger strike Withdrawal syndromes	
<b>Patients with injury</b>		
<b>Patients with EENT problems</b>	Conjunctivitis Visual disturbance Epistaxis Foreign body Vertigo Upper respiratory infections	

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322 GIS: Gastrointestinal system; GUS: Genitourinary system; EENT: Eye, ear,  
323 nose, and throat.

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327 **Table 2: Clinical comparison of the characteristics of the participants in**  
 328 **terms of gender.**

Variable	Category	P value				
		Male		Female		
		n	%	n	%	
<b>Recurrence</b>						
	Yes	287	35.7%	11	21.2%	0.033
	No	517	64.3%	41	78.8%	
<b>Referral Groups</b>						
	Surgical	158	19.7%	16	30.8%	<0.001
	Medical	343	42.7%	20	38.5%	
	Psychiatric	67	8.3%	13	25%	
	Injury	180	22.4%	3b	5.8%	
	EENT	56	7.0%	0b	0.0%	
<b>Hospitalization</b>						
	Absent	576	71.6%	34	65.4%	0.334
	Yes	228	28.4%	18	34.6%	
<b>Outcome</b>						
	Exitus	16	2.0%	1	1.9%	0.542
	Discharged with full recovery	211	26.2%	17	32.7%	
	Discharged from the ED	576	71.6%	33	63.5%	
	Dispatched	1	0.1%	1	1.9%	

EENT: Eye, ear, nose, and throat; ED: Emergency department.

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332 **Table 3: Comparison of the clinical characteristics of the participants in**  
 333 **terms of age.**

Variable	Category	n	Mean	SD	Median	Min	Max	p value
<b>Gender</b>	<b>Male</b>	804	37.64	14.8	35	15	83	0.326
	<b>Female</b>	52	35.9	15.04	31.5	16	70	
<b>Referral groups</b>	<b>Surgical</b>	174	36.07	13.39	33	16	79	<0.001
	<b>Medical</b>	363	43.96	14.89	44	15	81	

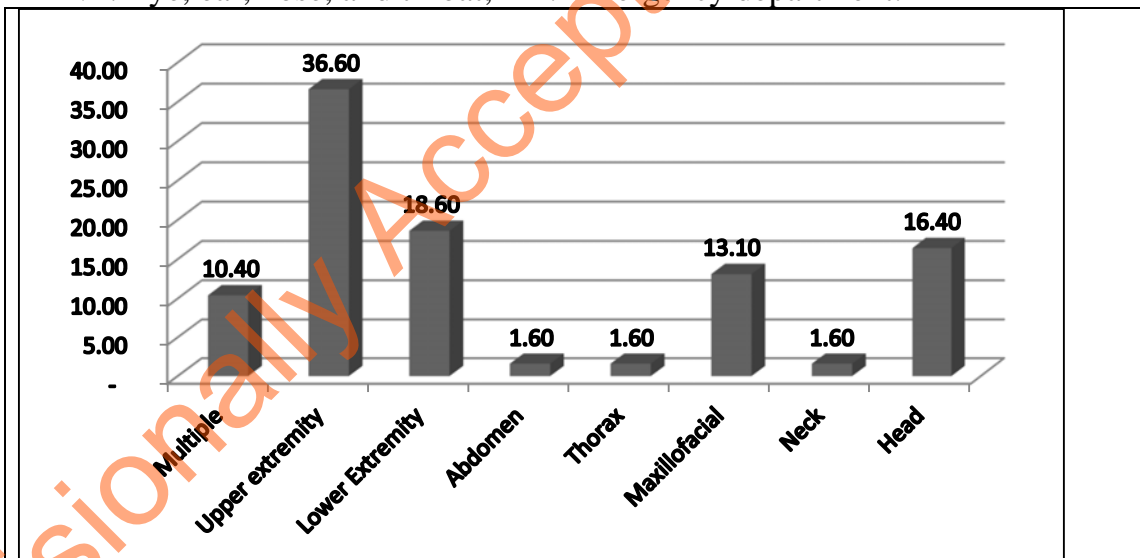
	<i>Psychiatric</i>	80	31.13	12.39	28	16	82	
	<i>Injury</i>	18	30.11	11.05	28	15	69	
	<i>EENT</i>	56	33.91	15.04	30.5	17	83	
<b>Hospitalization</b>	<b>Absent No</b>	610	34.93	13.86	32	15	83	<b>&lt;0.001</b>
	<b>Yes</b>	246	44	15.12	43.5	16	81	
<b>Outcome</b>	<b>Exitus</b>	17	57.88	13.2	60	27	76	
	<b>Discharged with full recovery</b>	228	42.99	14.8	43	16	81	<b>&lt;0.001</b>
	<b>Discharged from the ED</b>	609	34.89	13.73	32	15	83	
	<b>Dispatched</b>	2	50.5	44.55	50.5	19	82	

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EENT: Eye, ear, nose, and throat; ED: Emergency department.



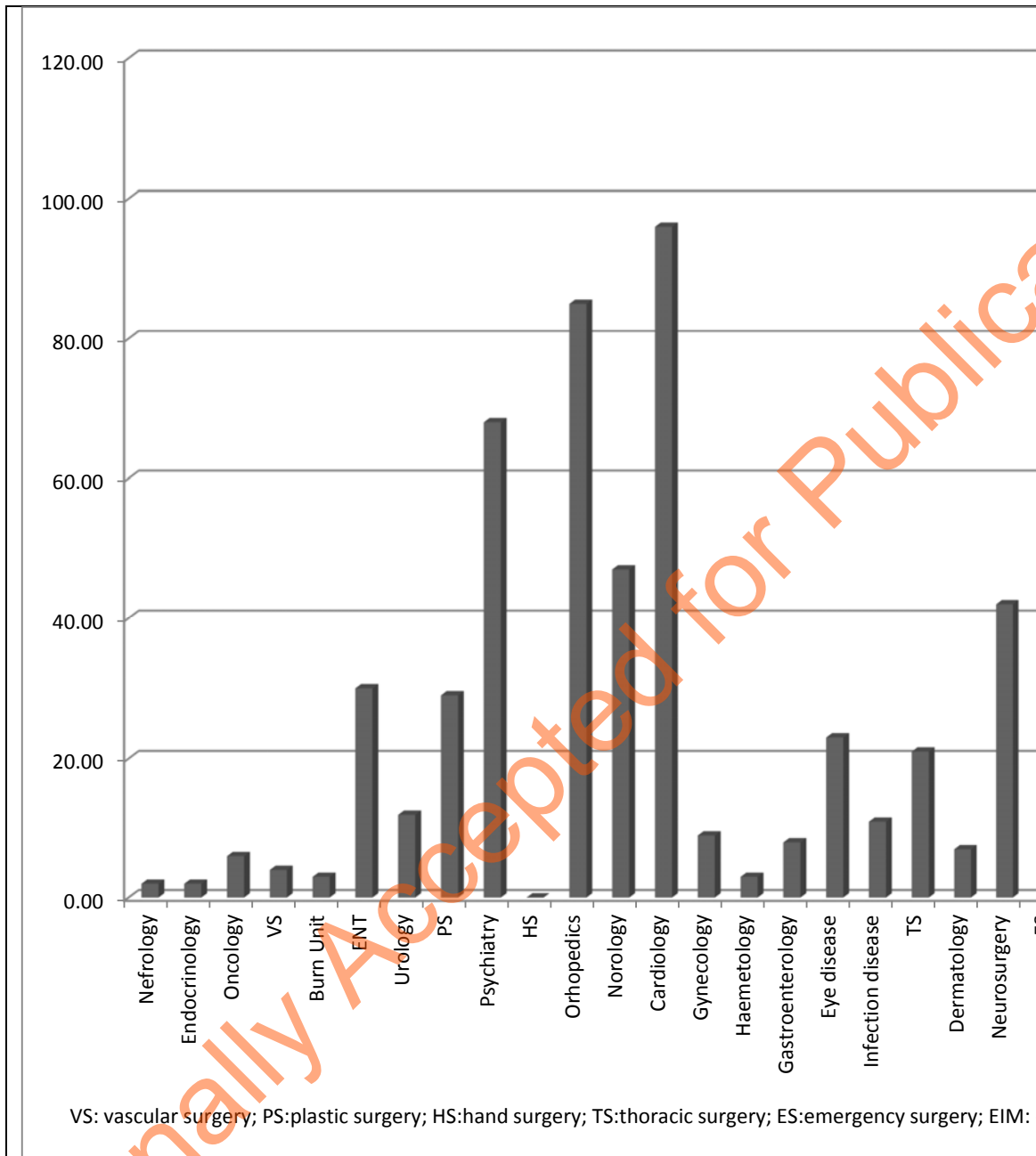
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Figure 1: Trauma region and incidence

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342 **Figure 2: Incidence of other department consultations**

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