

Hospital Analysis

Nishant Sharma

July 19, 2016

ANALYZE THE HEALTHCARE COST AND UTILIZATION IN WISCONSIN HOSPITALS

```
hosp<-read.csv("HospitalCosts.csv")
```

```
hosp
```

##	AGE	FEMALE	LOS	RACE	TOTCHG	APRDRG
## 1	17	1	2	1	2660	560
## 2	17	0	2	1	1689	753
## 3	17	1	7	1	20060	930
## 4	17	1	1	1	736	758
## 5	17	1	1	1	1194	754
## 6	17	0	0	1	3305	347
## 7	17	1	4	1	2205	754
## 8	16	1	2	1	1167	754
## 9	16	1	1	1	532	753
## 10	17	1	2	1	1363	758
## 11	17	1	2	1	1245	758
## 12	15	0	2	1	1656	753
## 13	15	1	2	1	1379	751
## 14	15	1	4	1	2346	758
## 15	15	1	7	1	4006	753
## 16	15	1	4	1	2181	758
## 17	14	1	1	1	628	754
## 18	14	1	4	1	2463	758
## 19	15	1	3	1	1956	753
## 20	14	1	3	1	1802	758
## 21	13	1	1	1	3188	812
## 22	17	1	2	1	2129	566
## 23	12	0	1	1	7421	249
## 24	15	1	1	1	1122	422
## 25	13	1	2	4	1173	754
## 26	12	0	2	1	3625	812
## 27	11	1	2	1	3908	50
## 28	15	0	1	1	3994	139
## 29	11	0	0	1	1033	753
## 30	10	0	2	1	2860	141
## 31	11	0	2	1	3814	420
## 32	7	0	0	1	1132	139
## 33	16	1	2	6	1163	751
## 34	17	1	1	1	610	751
## 35	6	0	3	1	9530	97
## 36	15	1	1	1	1268	811

## 37	17	1	4	1	2582	753
## 38	16	1	2	1	1287	755
## 39	17	1	3	1	6594	930
## 40	13	1	0	1	909	755
## 41	7	0	0	1	2530	347
## 42	11	1	2	2	1534	753
## 43	3	0	5	1	14243	720
## 44	16	1	3	1	1699	754
## 45	2	0	2	1	7298	53
## 46	16	1	1	1	636	754
## 47	15	1	1	1	626	754
## 48	1	0	2	1	3782	53
## 49	14	1	2	1	1444	753
## 50	14	1	2	1	1183	754
## 51	14	1	5	1	3045	754
## 52	14	1	5	1	3624	754
## 53	14	1	12	1	6810	760
## 54	1	0	1	1	1409	249
## 55	13	0	2	1	1211	754
## 56	1	0	4	1	9606	53
## 57	1	1	1	1	1411	249
## 58	15	1	0	1	607	754
## 59	1	0	1	1	2932	249
## 60	1	0	3	1	5075	139
## 61	14	1	1	1	762	753
## 62	16	1	6	1	6329	753
## 63	17	1	1	1	1226	753
## 64	3	1	4	1	8223	710
## 65	17	0	2	1	1193	776
## 66	13	1	2	1	1076	754
## 67	12	1	6	1	17434	115
## 68	12	1	2	1	1647	753
## 69	14	1	7	1	3865	754
## 70	13	1	1	1	628	754
## 71	15	1	1	1	806	755
## 72	0	1	41	1	29188	602
## 73	0	0	2	1	4717	138
## 74	0	0	12	1	15129	137
## 75	0	1	2	1	1085	640
## 76	0	0	3	1	1607	640
## 77	0	1	3	1	1499	640
## 78	0	1	3	1	7648	53
## 79	0	1	2	1	1527	640
## 80	0	0	2	1	1483	640
## 81	0	1	4	1	2844	640
## 82	0	1	3	1	3124	640
## 83	0	0	3	1	1760	640
## 84	0	1	2	1	1278	640
## 85	0	1	2	1	1620	640
## 86	0	1	2	1	1220	640

## 87	0	1	2	1	1134	640
## 88	16	1	0	1	1235	754
## 89	0	0	3	1	1656	640
## 90	0	0	4	5	4072	639
## 91	0	0	2	5	1393	143
## 92	0	0	0	5	615	254
## 93	16	1	1	1	779	755
## 94	0	0	2	1	1385	640
## 95	0	0	2	1	1224	640
## 96	0	1	3	1	1779	640
## 97	0	0	2	1	1526	640
## 98	15	1	1	1	882	754
## 99	0	0	1	1	2075	581
## 100	0	0	17	1	12042	633
## 101	0	0	2	1	1309	640
## 102	0	0	2	1	1290	640
## 103	0	0	2	1	1280	640
## 104	0	0	3	1	1719	640
## 105	0	1	2	1	1102	640
## 106	0	1	3	1	1543	640
## 107	0	1	2	1	1174	640
## 108	0	1	2	1	1105	640
## 109	0	0	2	1	1335	640
## 110	0	0	2	1	1550	640
## 111	0	0	4	1	2473	640
## 112	0	0	2	1	1322	640
## 113	0	0	4	1	2553	640
## 114	15	0	5	1	2835	753
## 115	0	1	2	1	1191	640
## 116	0	0	2	1	1439	640
## 117	0	1	2	1	1237	640
## 118	0	0	2	1	1265	640
## 119	0	1	4	1	2280	640
## 120	0	0	2	1	1096	640
## 121	0	1	2	1	1156	640
## 122	0	0	2	1	1199	640
## 123	13	1	10	1	5615	754
## 124	0	1	4	1	2518	640
## 125	15	0	0	1	625	754
## 126	0	1	2	1	1246	640
## 127	0	1	3	1	1821	640
## 128	0	0	5	1	3101	626
## 129	12	1	2	1	1293	754
## 130	0	1	2	1	1176	640
## 131	0	0	3	1	1891	640
## 132	5	1	2	1	10584	53
## 133	13	1	3	1	2373	754
## 134	0	0	1	1	935	640
## 135	0	0	2	1	1395	640
## 136	0	0	2	1	1561	640

## 137	0	1	7	1	6912	636
## 138	12	1	2	1	1157	754
## 139	0	0	3	1	2197	640
## 140	0	0	4	1	2288	640
## 141	16	1	4	1	2348	754
## 142	0	0	2	1	1320	640
## 143	0	1	2	1	1139	640
## 144	0	1	4	1	2134	639
## 145	0	0	2	1	1407	640
## 146	0	0	2	1	1982	640
## 147	0	0	4	1	2539	640
## 148	0	0	2	1	1528	640
## 149	0	1	2	1	1513	640
## 150	0	1	2	1	1191	640
## 151	0	0	2	1	1280	640
## 152	0	0	2	1	3977	139
## 153	0	1	2	1	1269	640
## 154	0	0	2	1	1501	640
## 155	0	1	2	1	1396	640
## 156	0	0	3	1	1777	640
## 157	0	1	1	1	833	640
## 158	0	1	1	1	715	640
## 159	17	1	5	1	2936	751
## 160	0	0	2	1	1375	640
## 161	0	0	2	1	1330	640
## 162	0	0	2	1	1628	640
## 163	0	0	2	1	1368	640
## 164	12	1	1	1	622	755
## 165	17	0	2	1	14174	23
## 166	7	0	1	1	6425	57
## 167	3	0	1	1	8084	57
## 168	4	1	1	1	6762	347
## 169	0	0	39	1	26356	421
## 170	0	0	2	1	1305	640
## 171	0	0	2	1	1416	640
## 172	0	0	2	1	877	640
## 173	15	1	1	1	622	758
## 174	0	1	4	1	2082	640
## 175	0	1	2	1	1096	640
## 176	0	0	3	1	2028	640
## 177	0	0	2	1	1104	640
## 178	0	1	2	1	1093	640
## 179	0	1	4	1	2592	640
## 180	13	0	1	1	1125	758
## 181	0	0	4	1	3609	640
## 182	0	0	3	1	2118	639
## 183	0	0	2	1	1805	640
## 184	0	0	1	1	2825	580
## 185	0	1	2	1	1299	640
## 186	0	0	2	1	1413	640

## 187	0	1	3	1	2354	640
## 188	16	1	0	1	622	754
## 189	0	1	2	1	1214	640
## 190	17	0	1	1	887	758
## 191	0	1	3	1	1843	640
## 192	16	1	2	1	1275	754
## 193	0	1	4	1	2090	640
## 194	0	1	2	1	1111	640
## 195	15	1	5	1	3102	758
## 196	15	1	1	1	743	758
## 197	0	1	3	1	1505	640
## 198	0	0	2	1	1277	640
## 199	0	1	2	1	1096	640
## 200	0	0	3	1	1828	640
## 201	0	0	2	1	1581	640
## 202	15	0	0	1	607	754
## 203	0	1	2	1	1128	640
## 204	0	0	2	1	1976	640
## 205	17	0	6	1	4227	753
## 206	17	0	5	1	3315	753
## 207	0	0	3	1	2144	640
## 208	0	0	2	1	1283	640
## 209	13	1	2	1	1302	751
## 210	0	1	3	1	1725	640
## 211	0	1	0	1	2847	581
## 212	0	1	3	1	1947	640
## 213	5	0	3	1	7923	53
## 214	0	0	3	1	1669	640
## 215	0	0	3	1	1669	640
## 216	14	1	1	1	707	751
## 217	0	1	2	1	1404	640
## 218	0	0	2	1	1272	640
## 219	14	1	1	1	888	754
## 220	0	1	2	1	1161	640
## 221	16	0	1	1	2112	755
## 222	0	0	2	1	1286	640
## 223	0	0	2	1	1454	640
## 224	0	0	1	1	874	640
## 225	17	0	3	1	1753	750
## 226	0	1	3	1	2129	626
## 227	0	1	3	1	2149	626
## 228	17	1	3	1	1749	753
## 229	0	1	2	1	1317	640
## 230	0	1	2	1	1281	640
## 231	13	0	1	1	607	755
## 232	0	0	3	1	2330	640
## 233	0	0	8	1	5014	640
## 234	0	1	3	1	2029	640
## 235	0	1	3	1	1530	640
## 236	0	0	3	1	2220	626

## 237	0	0	2	1	1267	640
## 238	0	0	3	1	2057	640
## 239	0	0	2	1	1351	640
## 240	0	1	18	1	10649	626
## 241	0	1	3	1	2777	640
## 242	0	1	3	1	1915	640
## 243	0	0	2	1	1420	640
## 244	0	0	2	1	1337	640
## 245	15	0	6	1	20195	49
## 246	0	1	2	1	1096	640
## 247	0	0	3	1	2187	640
## 248	17	1	3	1	3023	51
## 249	0	1	3	1	1748	640
## 250	0	1	2	1	1141	640
## 251	0	0	3	1	1795	640
## 252	0	1	2	1	1436	640
## 253	0	0	2	1	1156	640
## 254	12	1	3	1	2195	754
## 255	0	0	2	1	1263	640
## 256	0	1	2	1	1324	640
## 257	16	0	1	2	8159	313
## 258	0	0	3	1	1874	640
## 259	0	0	2	1	1538	640
## 260	0	0	4	1	3257	640
## 261	0	1	2	1	1576	633
## 262	0	0	15	1	8631	614
## 263	0	1	2	1	1173	640
## 264	14	0	2	1	2401	753
## 265	0	0	3	1	2516	640
## 266	0	0	2	1	1446	640
## 267	0	0	3	1	1807	640
## 268	0	0	2	1	1307	640
## 269	0	1	2	1	1096	640
## 270	0	0	2	1	1395	640
## 271	0	0	3	1	1739	640
## 272	0	1	2	1	1298	640
## 273	0	0	1	1	921	640
## 274	0	0	7	1	8184	634
## 275	0	1	3	1	2051	640
## 276	0	1	3	1	1743	640
## 277	0	1	2	NA	1156	640
## 278	0	0	2	1	1491	640
## 279	0	0	2	1	1286	640
## 280	0	1	3	1	1772	640
## 281	0	0	2	1	1437	640
## 282	0	1	4	1	2724	640
## 283	0	0	2	2	1291	640
## 284	0	1	2	1	1211	640
## 285	0	1	2	1	1096	640
## 286	0	0	2	1	1280	640

##	287	13	1	1	1	735	755
##	288	0	0	2	1	1280	640
##	289	0	0	2	1	1383	640
##	290	0	1	3	1	1660	640
##	291	0	0	2	1	1458	640
##	292	0	0	2	1	1427	640
##	293	0	1	2	1	1217	640
##	294	0	1	2	1	1096	640
##	295	0	1	2	1	1099	640
##	296	16	1	2	1	2711	812
##	297	0	1	2	1	1099	640
##	298	0	0	1	1	871	640
##	299	17	0	2	1	1418	753
##	300	17	1	4	1	2936	751
##	301	16	0	1	1	2543	420
##	302	17	0	1	1	4833	952
##	303	16	1	0	1	2570	811
##	304	16	0	2	2	10002	21
##	305	16	0	2	1	1385	758
##	306	16	1	3	1	6692	53
##	307	15	1	1	1	783	758
##	308	15	1	4	1	2255	751
##	309	15	0	1	1	12024	92
##	310	15	0	3	1	2089	751
##	311	14	1	1	1	627	755
##	312	14	1	2	1	1321	751
##	313	14	1	1	1	763	755
##	314	17	1	3	1	1688	751
##	315	13	1	1	1	1760	751
##	316	13	1	2	1	1306	754
##	317	13	1	6	1	3674	758
##	318	12	1	2	1	1348	753
##	319	12	0	1	1	622	755
##	320	12	0	1	1	767	755
##	321	11	0	1	1	1178	422
##	322	11	0	1	1	869	756
##	323	10	0	7	1	17524	317
##	324	14	1	1	1	625	756
##	325	8	0	1	1	3588	139
##	326	10	0	0	1	2925	344
##	327	9	0	3	1	10562	114
##	328	17	1	2	1	1436	758
##	329	4	0	3	1	9230	206
##	330	14	0	4	1	10756	53
##	331	15	0	18	1	11685	753
##	332	1	1	1	1	1711	723
##	333	17	1	7	1	48388	911
##	334	17	1	1	1	851	54
##	335	15	1	1	1	634	753
##	336	14	1	6	1	3656	753

## 337	17	1	1	1	616	753
## 338	0	1	1	1	1688	138
## 339	15	0	9	1	16520	225
## 340	12	1	3	1	1786	753
## 341	14	1	1	1	972	751
## 342	1	0	1	1	2117	58
## 343	1	0	2	1	8050	53
## 344	17	1	4	1	9932	53
## 345	16	1	2	1	1422	753
## 346	16	1	2	1	1381	753
## 347	0	1	3	1	2877	422
## 348	0	0	1	1	2805	138
## 349	0	0	2	1	4412	138
## 350	15	1	5	1	11125	740
## 351	0	1	2	1	1818	249
## 352	0	0	5	1	4296	640
## 353	0	0	3	1	1887	640
## 354	0	1	2	1	1418	640
## 355	0	1	2	1	1136	640
## 356	0	1	2	1	1475	640
## 357	0	1	2	1	1099	640
## 358	0	1	3	1	1538	640
## 359	1	0	2	1	1651	249
## 360	17	1	1	1	1106	753
## 361	0	0	1	1	1097	640
## 362	13	0	2	1	1273	754
## 363	0	1	2	1	1362	640
## 364	0	0	3	1	3342	640
## 365	12	1	5	1	11877	344
## 366	16	1	1	1	547	754
## 367	0	0	6	1	5568	640
## 368	0	1	7	1	4288	639
## 369	0	1	7	1	5788	614
## 370	16	1	4	1	2238	754
## 371	0	0	2	1	1283	640
## 372	0	1	0	1	2531	581
## 373	0	1	23	1	13112	614
## 374	0	0	3	1	3497	640
## 375	0	0	3	1	1832	640
## 376	0	1	3	1	1685	640
## 377	0	0	2	1	1135	640
## 378	0	1	2	1	1156	640
## 379	13	1	1	1	548	751
## 380	0	1	2	1	1303	640
## 381	0	1	3	1	1890	640
## 382	11	0	2	1	1285	753
## 383	0	0	3	1	1674	640
## 384	0	1	2	1	1128	640
## 385	0	0	4	1	2595	640
## 386	0	0	3	1	1782	640

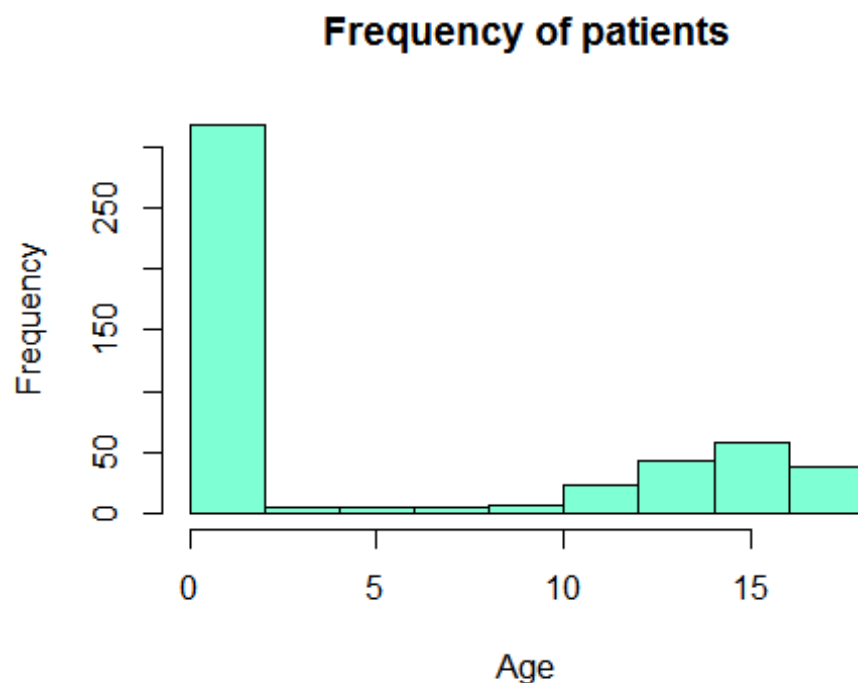
## 387	0	1	2	1	1251	640
## 388	0	0	3	1	1997	640
## 389	16	1	1	1	532	755
## 390	0	0	2	1	1758	640
## 391	0	0	2	1	1369	640
## 392	0	0	2	1	1096	640
## 393	0	0	2	1	1477	640
## 394	16	1	1	1	840	753
## 395	0	0	2	1	1340	640
## 396	0	0	2	1	1236	640
## 397	0	0	5	1	4677	640
## 398	17	0	2	1	3285	754
## 399	9	0	1	1	10585	308
## 400	12	0	3	1	1808	753
## 401	0	0	1	1	1051	640
## 402	16	1	3	1	2201	758
## 403	0	1	4	3	3041	626
## 404	0	0	1	1	550	640
## 405	0	1	2	1	1156	640
## 406	17	1	1	1	3800	753
## 407	0	0	2	1	1039	640
## 408	0	1	3	1	1769	633
## 409	0	0	2	1	1794	640
## 410	0	0	2	1	1578	640
## 411	8	0	2	2	1153	758
## 412	0	0	3	1	1883	640
## 413	0	0	2	6	1535	640
## 414	0	1	2	1	1200	640
## 415	0	1	3	1	1946	640
## 416	0	1	2	1	1875	640
## 417	0	1	3	1	1908	640
## 418	0	0	3	1	2080	640
## 419	0	0	2	1	1408	640
## 420	0	0	3	1	2008	640
## 421	17	0	4	1	2977	754
## 422	0	0	2	1	1278	640
## 423	0	0	2	1	1408	640
## 424	0	1	2	1	1083	640
## 425	0	0	3	1	1964	640
## 426	0	0	2	1	1231	640
## 427	0	0	3	1	1845	640
## 428	0	0	2	1	1428	640
## 429	14	1	5	4	2735	753
## 430	0	1	7	1	5934	640
## 431	0	1	3	1	1888	640
## 432	0	1	3	1	1431	640
## 433	14	0	2	1	9129	225
## 434	0	0	1	1	651	640
## 435	0	1	4	1	3969	640
## 436	0	0	2	1	1363	640

## 437	0	1	2	1	1118	640
## 438	0	1	2	1	1543	640
## 439	14	0	1	1	678	754
## 440	14	1	2	1	1463	760
## 441	17	0	3	1	8439	204
## 442	0	1	5	1	4304	640
## 443	0	1	3	1	1890	640
## 444	0	0	3	1	1933	640
## 445	0	1	2	1	1281	640
## 446	10	1	2	1	1160	753
## 447	0	0	2	1	1120	640
## 448	16	1	2	1	1164	754
## 449	0	1	2	1	1083	640
## 450	0	0	2	1	1465	640
## 451	0	1	2	1	1083	640
## 452	0	0	2	1	1768	634
## 453	14	1	4	1	2296	561
## 454	0	0	2	1	1284	640
## 455	13	1	4	1	2632	758
## 456	0	0	3	1	1952	640
## 457	0	0	4	1	2100	640
## 458	17	1	2	1	2217	560
## 459	0	0	2	1	1281	640
## 460	0	1	2	1	1250	640
## 461	6	0	2	1	8398	115
## 462	0	0	2	1	1263	640
## 463	0	1	2	1	1178	640
## 464	0	1	24	1	13040	863
## 465	0	1	3	1	1517	640
## 466	0	0	3	4	3126	640
## 467	0	1	4	1	2049	640
## 468	0	0	2	1	1245	640
## 469	16	0	1	1	3578	723
## 470	0	1	3	1	1603	640
## 471	0	1	3	1	2840	640
## 472	0	1	2	1	1411	640
## 473	0	1	2	1	1175	640
## 474	0	0	2	1	1689	640
## 475	0	1	3	1	2023	640
## 476	12	0	2	1	1310	753
## 477	0	0	2	1	2540	640
## 478	0	0	7	1	10431	636
## 479	0	0	3	1	2204	633
## 480	0	0	3	1	2218	640
## 481	0	0	2	1	1382	640
## 482	0	1	2	1	1115	640
## 483	11	0	1	1	629	753
## 484	0	0	1	1	825	640
## 485	0	0	3	1	1701	640
## 486	0	0	2	1	1273	640

```
## 487  0      0  2   1  1270   640
## 488  0      1  2   1  1106   640
## 489  0      1  2   1  1065   640
## 490  0      0  2   1  1264   640
## 491  0      0  2   1  1282   640
## 492  0      0  2   1  1393   640
## 493 15      1  4   2  3074   758
## 494  0      0  2   1  1266   640
## 495  0      1  3   1  1886   640
## 496  0      1  6   1  5881   636
## 497  0      1  2   1  1171   640
## 498  0      1  2   1  1171   640
## 499  0      1  2   1  1086   640
## 500  0      0  4   1  4931   640
```

##1Record patient stats-frequency of patients and max expenditure

```
hist(hosp$AGE,main = "Frequency of patients",col = "aquamarine",xlab = "Age")
```



```
attach(hosp)
AGE<-as.factor(AGE)
summary(AGE)#Thus infants have max hospital visits
```

```
##   0    1    2    3    4    5    6    7    8    9   10   11   12   13   14   15   16   17
## 307  10    1    3    2    2    2    3    2    2    4    8   15   18   25   29   29   38
```

```
aggregate(TOTCHG~AGE,FUN=sum,data = hosp)
```

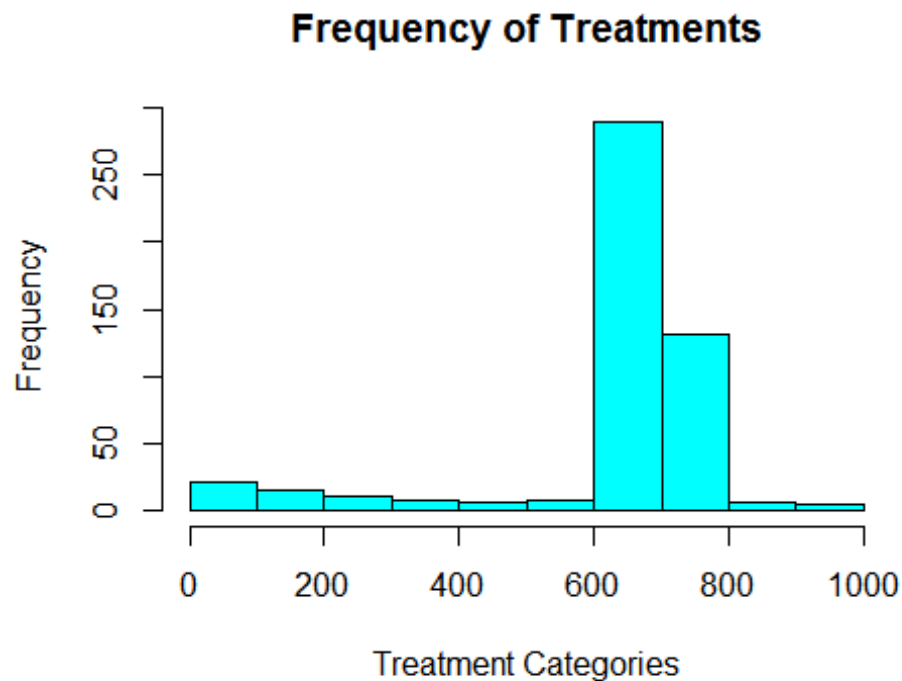
```
##      AGE TOTCHG
## 1      0 678118
## 2      1 37744
## 3      2  7298
## 4      3 30550
## 5      4 15992
## 6      5 18507
## 7      6 17928
## 8      7 10087
## 9      8  4741
## 10     9 21147
## 11    10 24469
## 12    11 14250
## 13    12 54912
## 14    13 31135
## 15    14 64643
## 16    15 111747
## 17    16 69149
## 18    17 174777
```

```
max(aggregate(TOTCHG~AGE,FUN=sum,data=hosp))
```

```
## [1] 678118
```

#2. Most Expensive Treatments

```
hist(APRDRG,col = "cyan1",main = "Frequency of Treatments",xlab = "Treatment Categories")
```



```
APRDRG_fact<-as.factor(hosp$APRDRG)
summary(APRDRG_fact)
```

```
##  21  23  49  50  51  53  54  57  58  92  97 114 115 137 138 139 141 143
##   1   1   1   1   1  10   1   2   1   1   1   1   2   1   4   5   1   1
## 204 206 225 249 254 308 313 317 344 347 420 421 422 560 561 566 580 581
##   1   1   2   6   1   1   1   1   2   3   2   1   3   2   1   1   1   3
## 602 614 626 633 634 636 639 640 710 720 723 740 750 751 753 754 755 756
##   1   3   6   4   2   3   4 267   1   1   2   1   1  14  36  37  13   2
## 758 760 776 811 812 863 911 930 952
##  20   2   1   2   3   1   1   2   1
```

```
which.max(summary(APRDRG_fact))
```

```
## 640
##  44
```

```
df<-aggregate(TOTCHG~APRDRG,FUN = sum,data=hosp)
df
```

```
##   APRDRG TOTCHG
## 1      21  10002
## 2      23  14174
## 3      49  20195
## 4      50   3908
## 5      51   3023
## 6      53  82271
## 7      54   851
## 8      57  14509
## 9      58   2117
## 10     92  12024
## 11     97   9530
## 12    114  10562
## 13    115  25832
## 14    137  15129
## 15    138  13622
## 16    139  17766
## 17    141   2860
## 18    143   1393
## 19    204   8439
## 20    206   9230
## 21    225  25649
## 22    249  16642
## 23    254   615
## 24    308  10585
## 25    313   8159
## 26    317  17524
## 27    344  14802
## 28    347  12597
## 29    420   6357
## 30    421  26356
```

```
## 31    422    5177
## 32    560    4877
## 33    561    2296
## 34    566    2129
## 35    580    2825
## 36    581    7453
## 37    602   29188
## 38    614   27531
## 39    626   23289
## 40    633   17591
## 41    634    9952
## 42    636   23224
## 43    639   12612
## 44    640  437978
## 45    710    8223
## 46    720   14243
## 47    723    5289
## 48    740   11125
## 49    750    1753
## 50    751   21666
## 51    753   79542
## 52    754   59150
## 53    755   11168
## 54    756    1494
## 55    758   34953
## 56    760    8273
## 57    776    1193
## 58    811    3838
## 59    812    9524
## 60    863   13040
## 61    911   48388
## 62    930   26654
## 63    952    4833
```

`df[which.max(df$TOTCHG),]` *#category 640 has the highest hospitaliation frequency and cost.*

```
##      APRDRG TOTCHG
## 44      640 437978
```

#3. Analyze if race of patients is related to costs

`hosp<-na.omit(hosp)` *#first we remove "NA" values*

`hosp$RACE<-as.factor(hosp$RACE)`

`model_aov<-aov(TOTCHG~RACE,data = hosp)`

`model_aov` *#ANOVA RESULTS*

Call:

`aov(formula = TOTCHG ~ RACE, data = hosp)`

##

Terms:

RACE Residuals

```
## Sum of Squares      18593279 7523518505
## Deg. of Freedom      5      493
##
## Residual standard error: 3906.493
## Estimated effects may be unbalanced
```

```
summary(model_aov)
```

```
##           Df      Sum Sq  Mean Sq F value Pr(>F)
## RACE        5 1.859e+07   3718656   0.244  0.943
## Residuals   493 7.524e+09  15260687
```

```
summary(hosp$RACE)#getting max hospital cost per race
```

```
##    1    2    3    4    5    6
## 484    6    1    3    3    2
```

#4. Analyze severity of hospital cost by Age and gender

```
hosp$FEMALE<-as.factor(hosp$FEMALE)
```

```
model_lm4<-lm(TOTCHG~AGE+FEMALE,data = hosp)#calling Regression funtion
```

```
summary(model_lm4)
```

```
##
## Call:
## lm(formula = TOTCHG ~ AGE + FEMALE, data = hosp)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -3403   -1444    -873    -156   44950
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   2719.45     261.42  10.403 < 2e-16 ***
## AGE             86.04      25.53   3.371 0.000808 ***
## FEMALE1       -744.21     354.67  -2.098 0.036382 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3849 on 496 degrees of freedom
## Multiple R-squared:  0.02585,    Adjusted R-squared:  0.02192
## F-statistic: 6.581 on 2 and 496 DF,  p-value: 0.001511
```

```
summary(hosp$FEMALE)#comapring genders
```

```
##    0    1
## 244 255
```

#5. Analyze whether Length of stay(LOS) is realted to age,gender and race

```
hosp$RACE<-as.factor(hosp$RACE)
```

```
model_lm5<-lm(LOS~AGE+FEMALE+RACE,data = hosp)
```

```
summary(model_lm5)
```

```
##
## Call:
## lm(formula = LOS ~ AGE + FEMALE + RACE, data = hosp)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -3.211 -1.211 -0.857  0.143 37.789
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  2.85687    0.23160   12.335  <2e-16 ***
## AGE         -0.03938    0.02258   -1.744   0.0818 .
## FEMALE1      0.35391    0.31292    1.131   0.2586
## RACE2       -0.37501    1.39568   -0.269   0.7883
## RACE3        0.78922    3.38581    0.233   0.8158
## RACE4        0.59493    1.95716    0.304   0.7613
## RACE5       -0.85687    1.96273   -0.437   0.6626
## RACE6       -0.71879    2.39295   -0.300   0.7640
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3.376 on 491 degrees of freedom
## Multiple R-squared:  0.008699, Adjusted R-squared: -0.005433
## F-statistic: 0.6156 on 7 and 491 DF, p-value: 0.7432
```

#6.Variable that mainly affect hospitalization cost

```
model_lm6<-lm(TOTCHG~AGE+FEMALE+RACE+LOS+APRDRG,data = hosp)
summary(model_lm6)
```

```
##
## Call:
## lm(formula = TOTCHG ~ AGE + FEMALE + RACE + LOS + APRDRG, data = hosp)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -6367   -691   -186    121  43412
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  5024.9610   440.1366   11.417  < 2e-16 ***
## AGE          133.2207    17.6662    7.541 2.29e-13 ***
## FEMALE1     -392.5778    249.2981   -1.575   0.116
## RACE2        458.2427   1085.2320    0.422   0.673
## RACE3        330.5184   2629.5121    0.126   0.900
## RACE4       -499.3818   1520.9293   -0.328   0.743
## RACE5      -1784.5776   1532.0048   -1.165   0.245
## RACE6      -594.2921   1859.1271   -0.320   0.749
## LOS          742.9637    35.0464   21.199  < 2e-16 ***
## APRDRG       -7.8175     0.6881  -11.361  < 2e-16 ***
## ---
```



```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2622 on 489 degrees of freedom
## Multiple R-squared:  0.5544, Adjusted R-squared:  0.5462
## F-statistic: 67.6 on 9 and 489 DF,  p-value: < 2.2e-16
'''
```