RIVERSIDE COUNTY EMS AGENCY

ELECTRONIC PATIENT RECORD REPORT

FY 2020-21

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PREPARED FOR RIVERSIDE COUNTY EMS AGENCY, EMERGENCY MANAGEMENT DEPARTMENT

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Fiscal Year 2020-2021 presented unique challenges and trends in the provision of Emergency Medical Services (EMS). Following the Covid-19 shutdowns and stay at home orders, the volume of EMS electronic patient care records and overall responses were dramatically reduced. This report aims to create a comprehensive view into the EMS system from the perspective of electronic patient care report (ePCR) submission.

REMSA policy 7701 requires ePCRs to be completed in compliance with Title 22, Chapter 4, Article 8, Section 100170, and uploaded into the electronic system *within two hours* of patient transfer to an emergency department, or prior to the end of shift when subsequent emergency response is required. An analysis was done on the electronic patient record system which found that less than 1% of records were entered or modified beyond 24 hours, suggesting most records are entered in compliance with ePCR documentation standards. Less than 3% of ePCRs were entered and/or modified the following day, and nearly none (0.01%) were entered after 7 days. To get a more in depth look at the efficiency of the ePCR entry, data was pulled each day in 1-day increments, mean changes of ePCR totals were calculated, and evaluated based on any changes in count or record for the previous days. The data was also evaluated for total count of ePCR submissions, hour of day, day of week, transport type, location, and response.

For Fiscal Year 2020-21, there was a total of 462,859 reports generated. December displayed the greatest number of ePCRs generated for the 2020-2021 fiscal year with 42,599 reports in that month. Hour-15 or 3PM was the busiest hour of day accounting for approximately 6% of all reports. Fridays generated the greatest volume of incidents according to ePCR submissions with 14.7% of total ePCRs occurring on that day. Ambulance transports made up the majority of reports submitted each month. Emergency responses compared to non-emergency transport (interfacility/medical) also accounted for most, nearly 90%, of all ePCRs for the fiscal year (87.7%, 405,909 reports). Riverside County Fire Department and AMR-Riverside submitted the majority of ePCRs for the year (61.1%, 282,923 reports). According to EMS zone analysis, the Northwest zone of Riverside County carried the highest number of responses with 27.5% (125,315 records) of all ePCRs generated within this zone.

METHOD

Data between July 1st, 2020 and June 31st, 2021 was extracted from the Riverside County Imagetrend® Elite system using Imagetrend® Reportwriter. For Figure 2, data was extracted each day over several weeks. Record fields extracted were Incident Date, Incident Month Name-Year, Incident Week, Disposition (eDisposition.19), Agency Name (dAgency.03), Response Type of Service Requested (eResponse.05), Incident Patient Disposition (eDisposition.12), Scene Incident Location Type (eScene.09), and Count of Incident Patient Care Record Number-PCR (e.Record.01). Data was then de-duplicated by patient care record number and incidents conducted outside of Riverside County were removed for relevancy. For Figures 1 and 3-10, data included all of the previously mentioned fields. Then, categories were developed and collapsed as follows: for NEMSIS fields eResponse.12 (Emergency- 911 Response, Non-Emergency- Interfacility Transport & Medical Transport, Other- Intercept, Mutual Aid, Public Assistance, and Standby), transport type was determined by response EMS Vehicle Unit Number (eResponse.13), and scene incident location type was collapsed based on variable consistencies detailed in Appendix A.

Figure 1: Total Number of ePCRs Generated in July 2020-June 2021 by Month

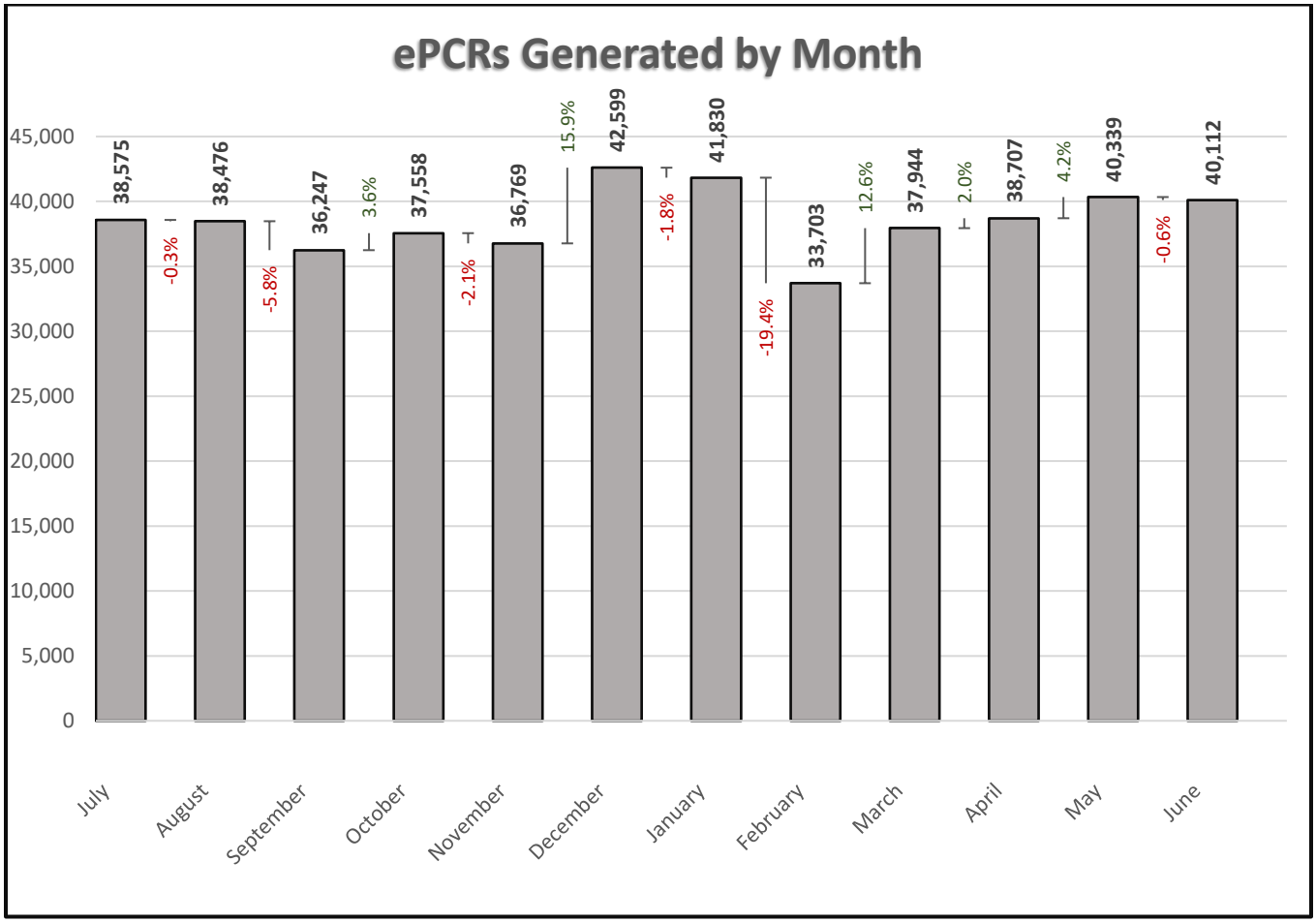


Figure 1 above displays the counts of ePCRs that were generated each month and the variation from month to month. The greatest decrease in ePCR volume occurred from January 2021 to February 2021 (-19.5%). This decline in volume followed the COVID-19 epidemic spikes which correlated with an overall increase in EMS services. The greatest increase occurred from the month of November to December in 2020 (+15.8%).

Figure 2: Mean Variation in PCR Delivery by Day

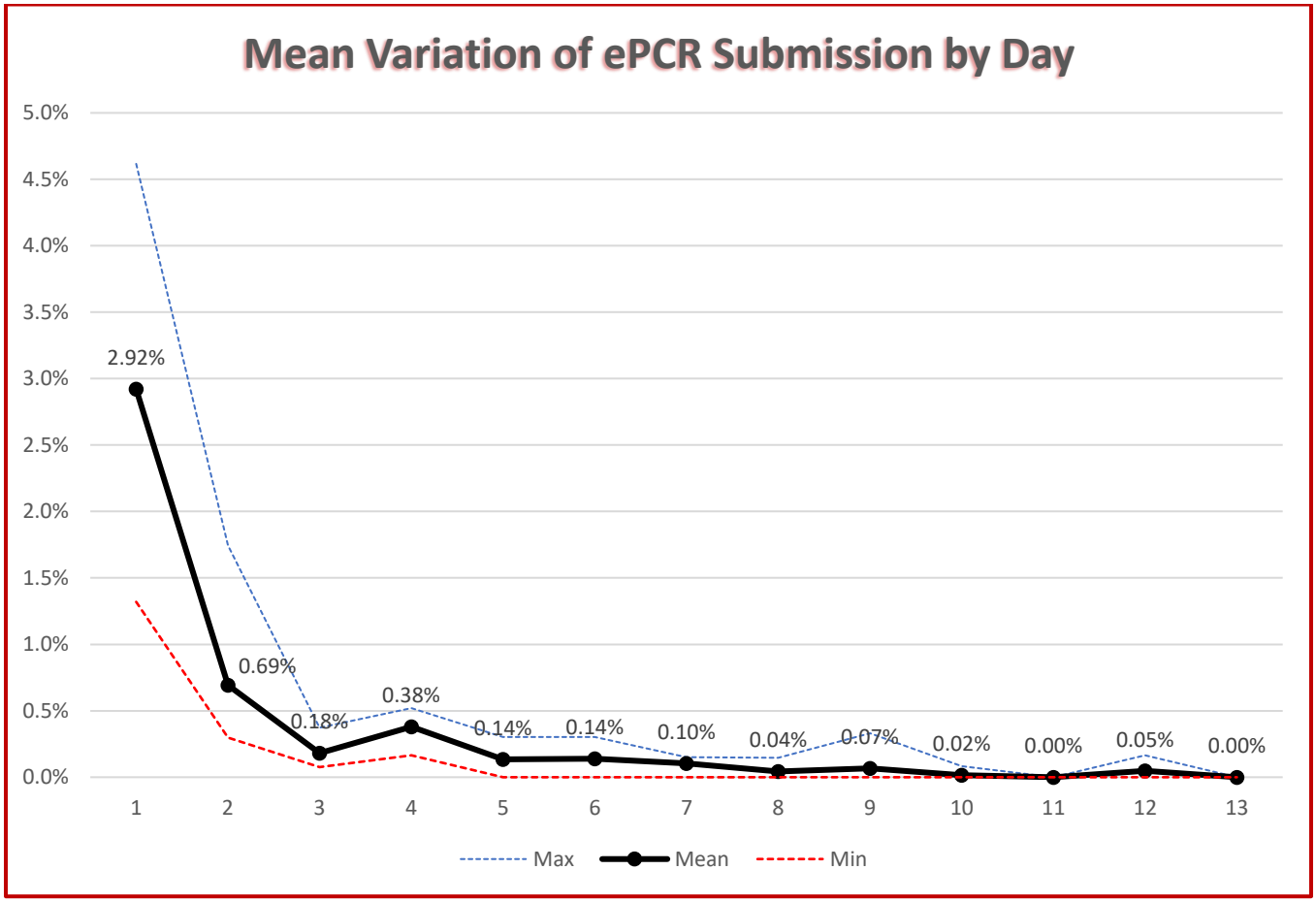


Figure 2 represents the mean variation in ePCR submission 1-13 days prior. Each day at 10 am records were collected for the previous day (12:00 AM-11:59 PM). This data collection was done at the same time each day to increase the validity of measure. A total of 7 total days were collected to calculate mean variations. The highest rate of change occurred 1 day later with a 2.92% mean increase in the count of ePCRs, and that rate incrementally decreased on days 2-13. These findings state 97.08% of all intended ePCRs were submitted within 1-day of the incident. Interestingly, the 9th day and 12th day displayed slight fluctuations in delayed ePCR submissions.

Figure 3: Total ePCRs Generated from by Incident Hour of Day

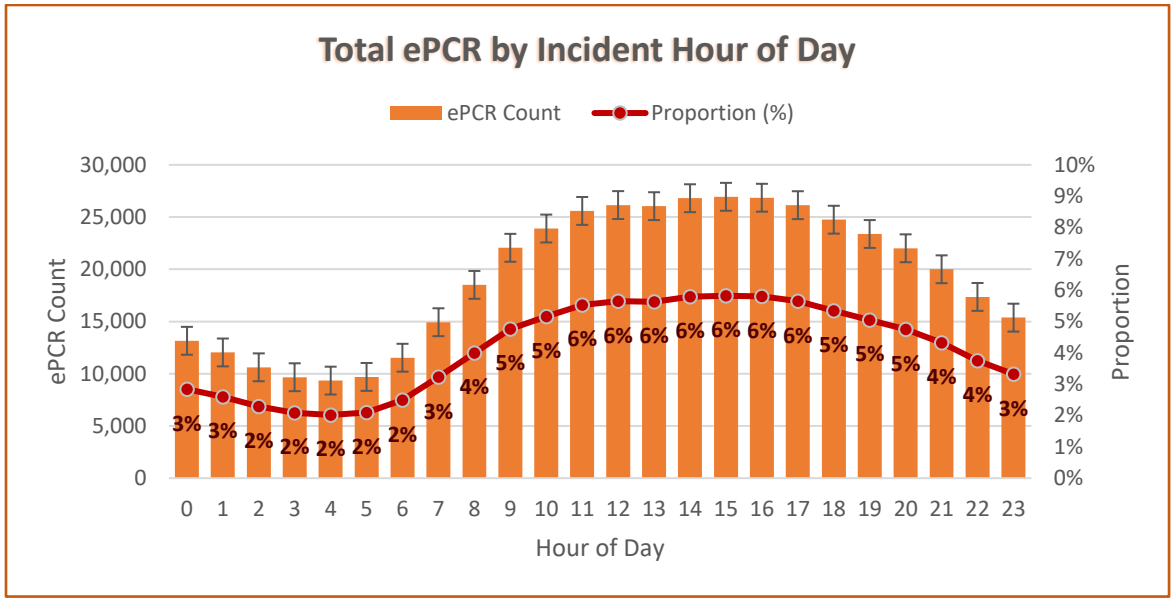


Figure 3 above represents the distribution of EMS incidents by the hour of day reported in each ePCR generated. It can be seen that the majority of incidents occurred between the hours of 9AM-9PM (69.3%). The error bars that do not overlap show significant difference among those hours. For instance, there is a significant difference in EMS incidents that occurred at 7AM and 8AM.

Figure 4: Total ePCRs Generated in by Incident Day of Week

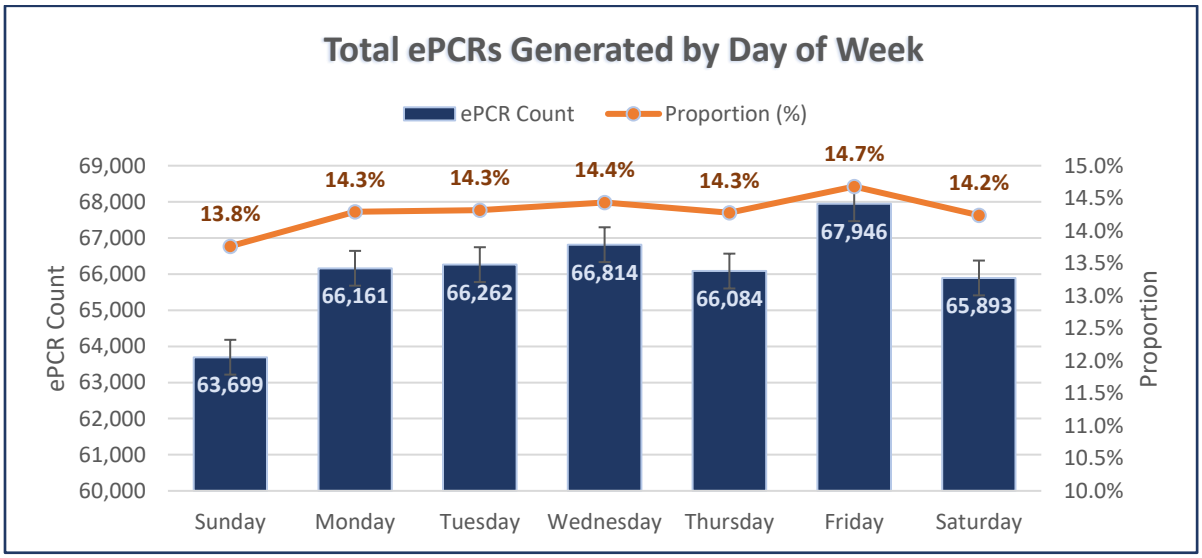


Figure 4 above represents the distribution of EMS incidents by the day of the week reported in each ePCR generated. It can be seen that the majority of incidents occurred on Wednesday and Friday with 14.4% and 14.7% of the ePCR distribution respectively. Sunday represents the day of the week with the fewest ePCRs generated/fewest EMS incidents at 13.8%. The error bars that do not overlap show significant difference among those days. For example, there is a significant difference in EMS incidents that occurred on Friday (14.7%) compared to Saturday (14.2%).

Figure 5: Total ePCRs Generated by EMS Transport (Monthly Aggregate)

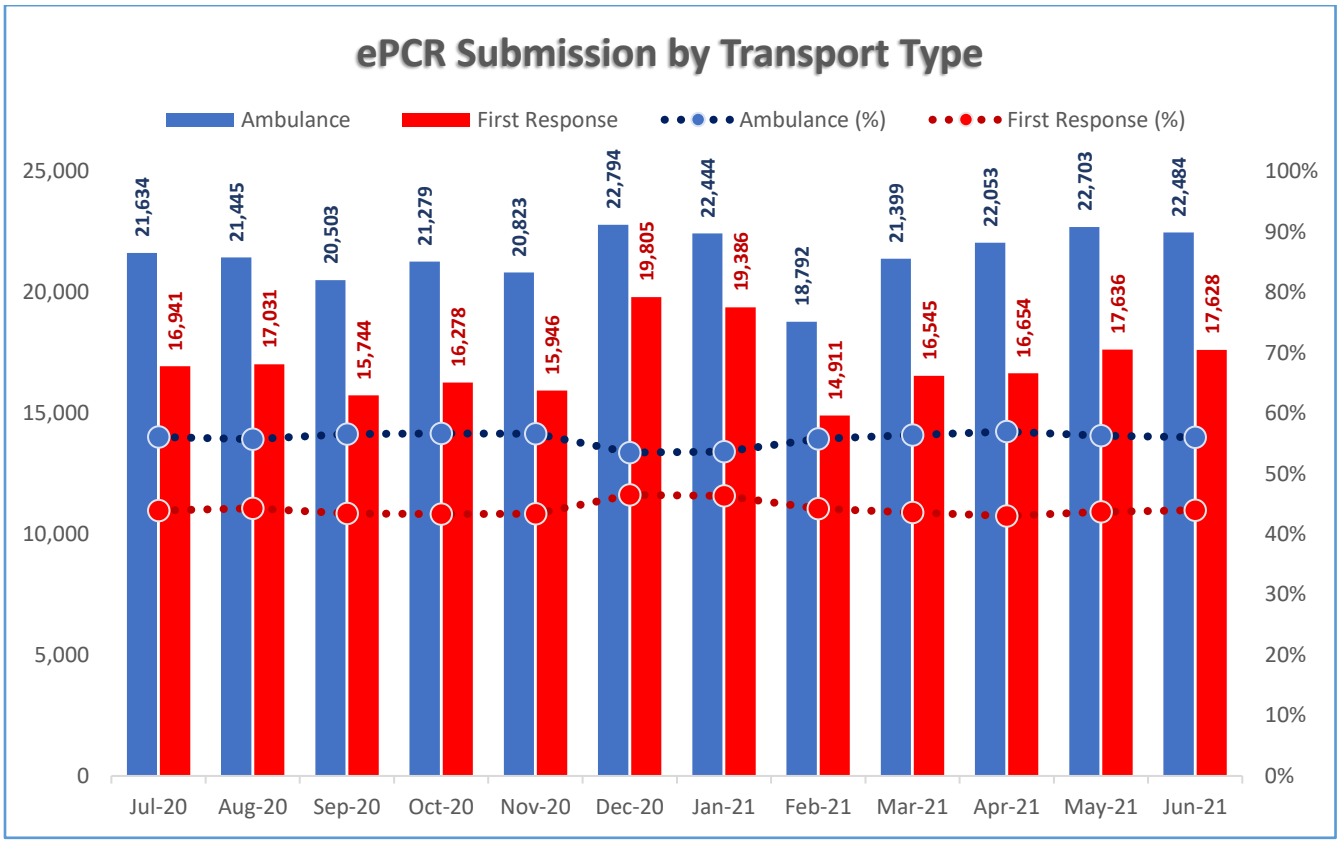


Figure 5 above represents the total number of electronic patient care records generated by EMS transports. December was the month with the greatest number of ePCRs for both Ambulance and First Response transports. December and January represent the months with the least difference ePCR submissions for ambulance (53.5%,53.7%) and first responders (46.5%,46.3%). February was the month with the lowest number of ePCRs generated for both Ambulance and First Response transports (18,792 and 14,911 reports respectively).

Figure 6: ePCR Submission from by Response Type

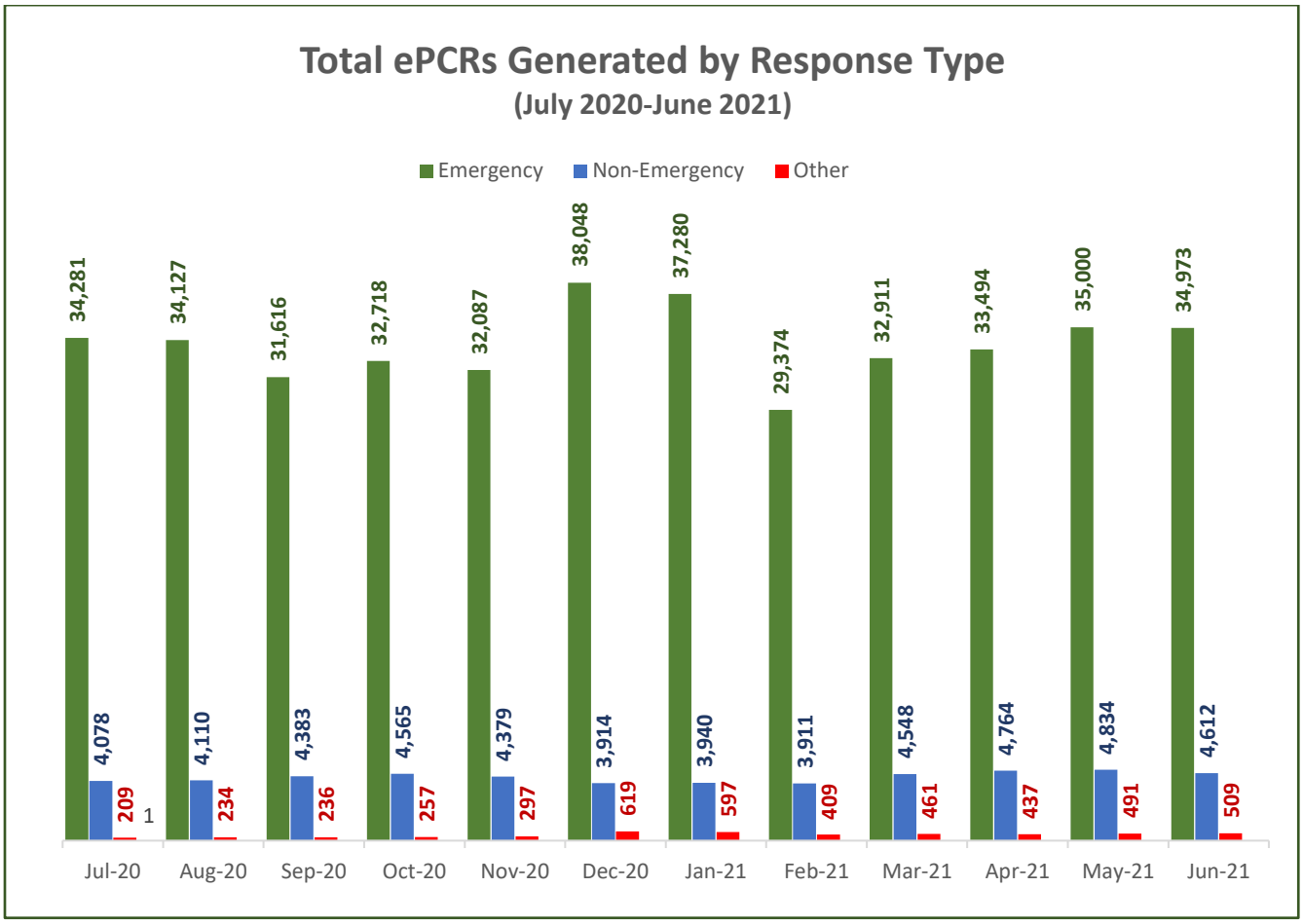
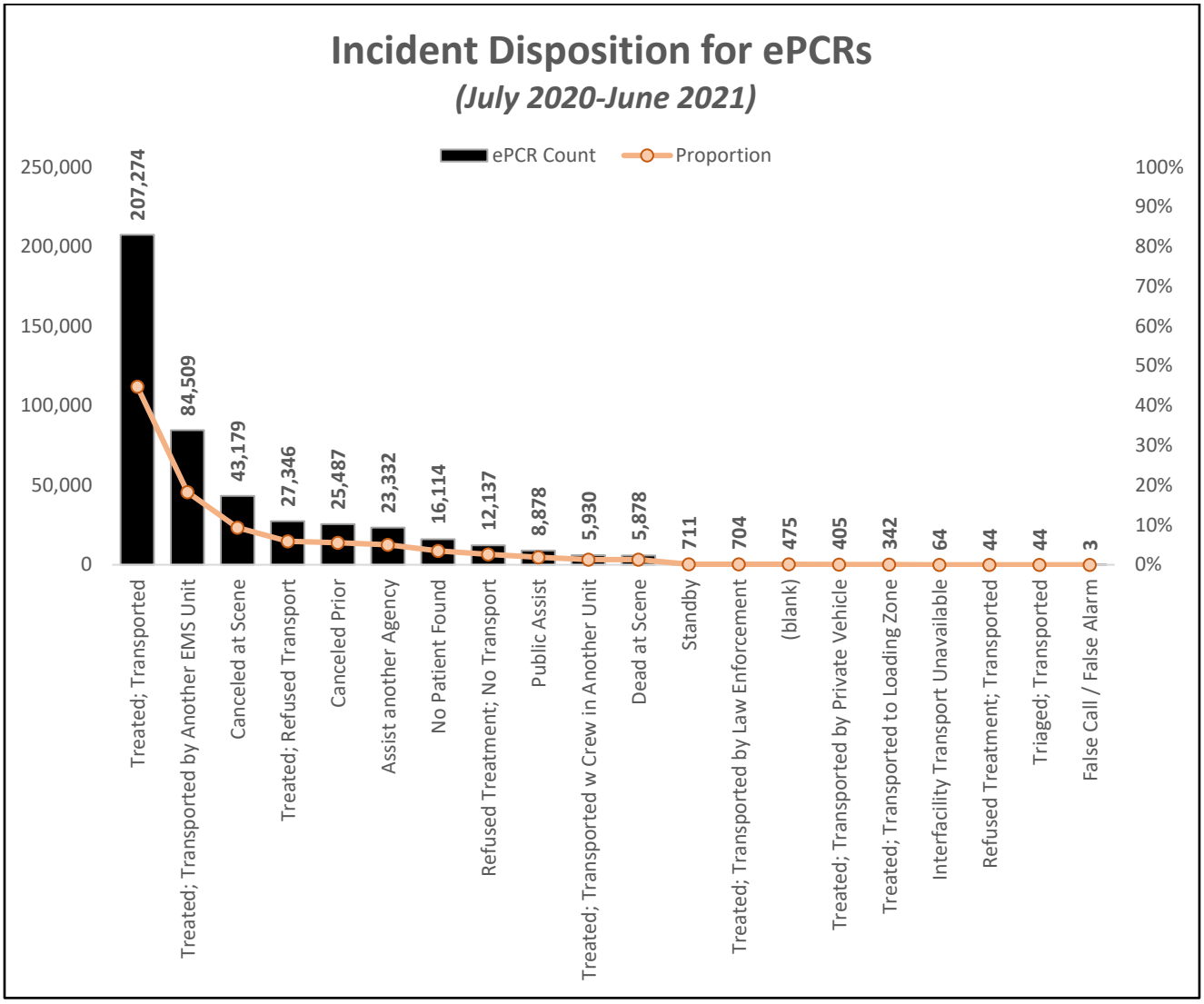


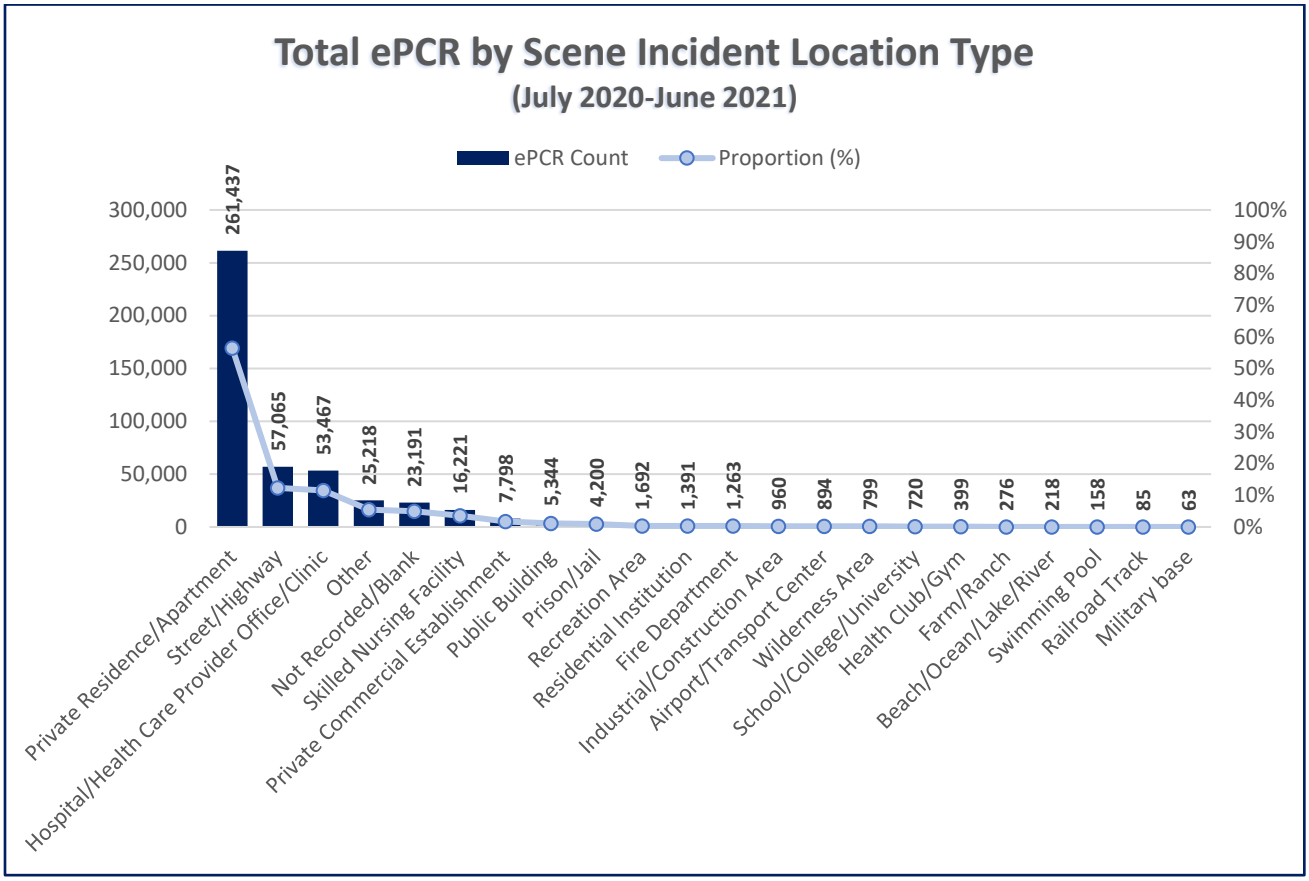
Figure 6 above represents the distribution of ePCRs generated by each type of EMS response. Emergency responses made up the majority of ePCRs generated throughout the 2020-2021 fiscal year (405,909 reports; 87.7%). December displayed the greatest number of emergency responses (38,048; 9.4%) and May 2021 showed the greatest number of non-emergency responses according to ePCRs generated (4,834 reports;9.3%).

Figure 7: Incident Patient Disposition by Total Count/Proportion of All ePCRs



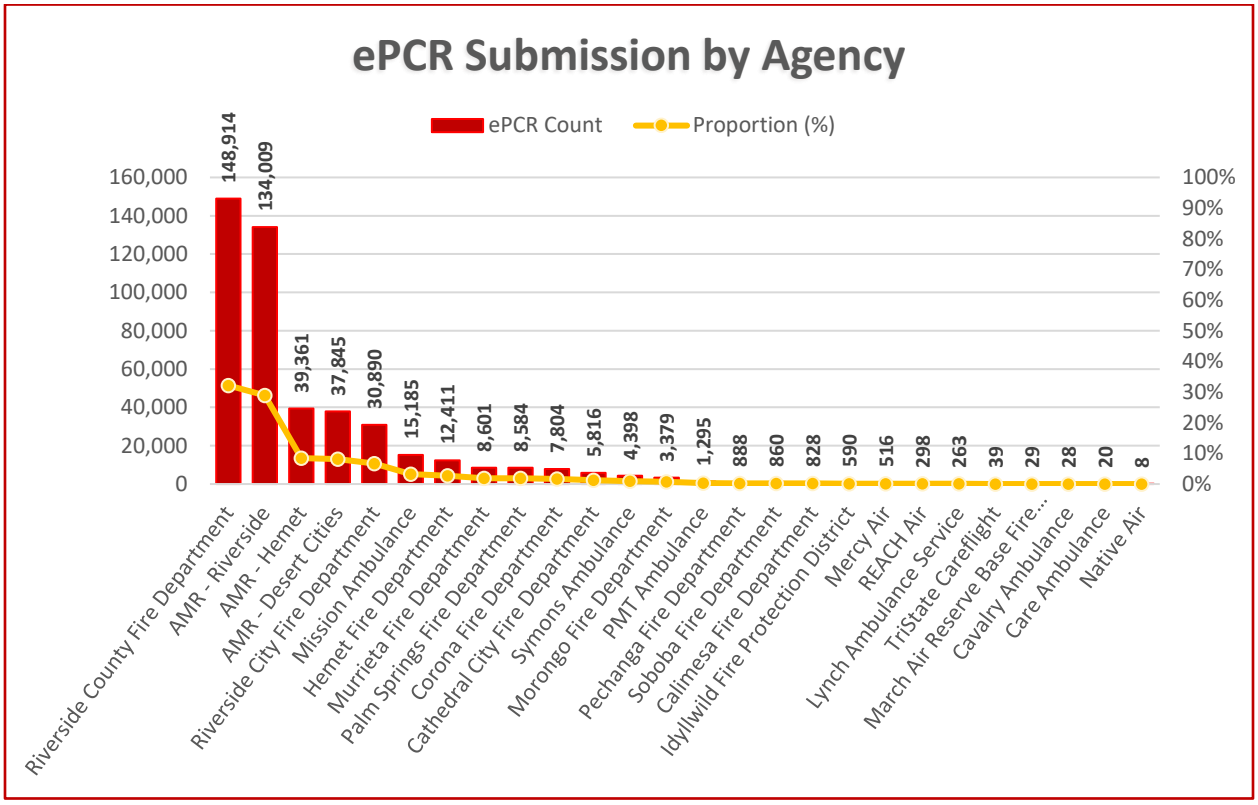
The figure above represents the total number and proportion of ePCRs in 2020-2021 by Incident Patient Disposition. Patient incident disposition is taken from ImageTrend NEMSIS value eDisposition.12. From the data, it can be seen that the majority of patients encountered were treated and transported by the same EMS unit (207,274 records, 44%). Approximately, 14.8% of the reports submitted were due to calls that were canceled at the scene or prior to EMS arrival.

Figure 8: Total ePCR Count by Scene Incident Location Type ***(see Appendix for Breakdown)***



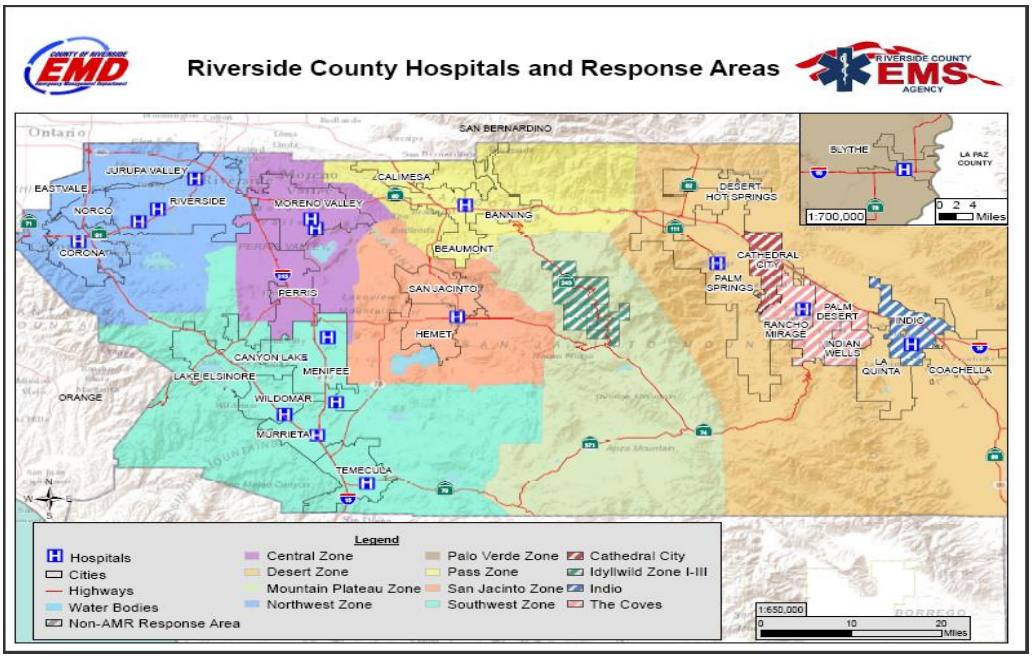
The figure above displays the total number and proportion of ePCRs by Scene Incident Location Type in 2020. The 15 scene incident location types with greatest frequency of records are shown in this figure. There were more than 65 different location types then collapsed into 29 categories (shown in appendix). Most of the incidents that were reported occurred in the private residence or apartment of the EMS patient (253,220 records, 57%). 5% (22,371 records) of the total ePCRs submitted did not include a scene incident location type, shown as "Not Recorded/Blank".

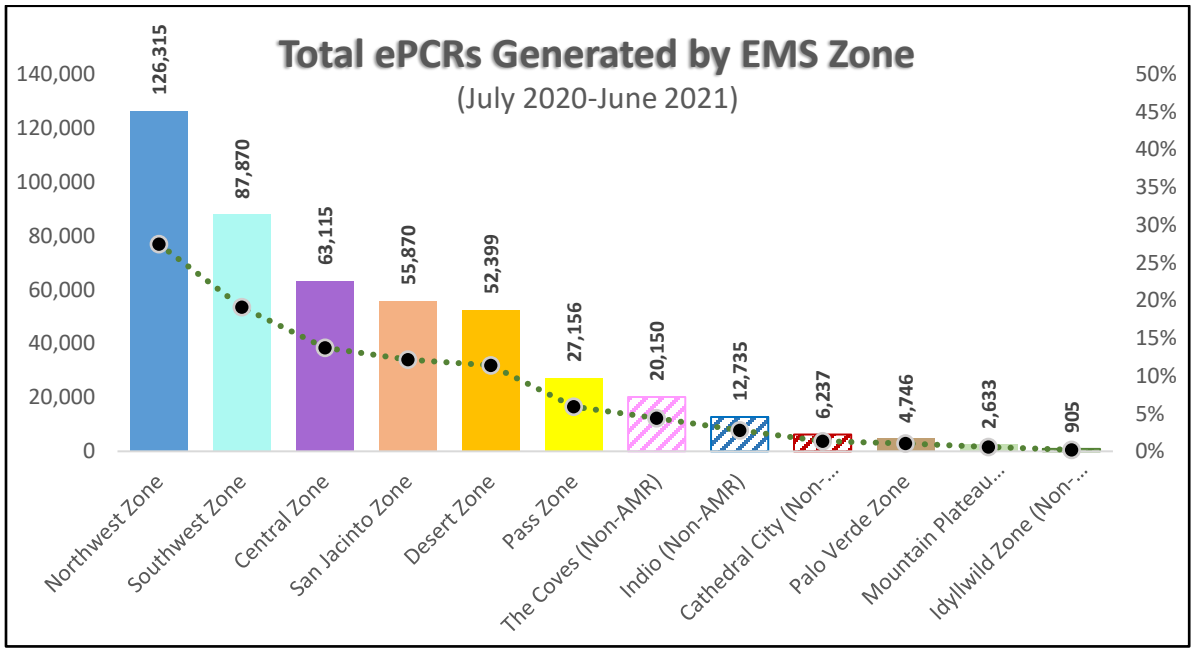
Figure 9: Total Number of ePCRs Generated by Agency



The figure above shows the distribution of EMS patient care reports submitted by each provider agency from July 2020-June 2021. Riverside County Fire Department represents the agency that makes up the largest proportion of ePCRs received during this time with 148,914 reports (32.2%). AMR Riverside was the second agency with the most ePCRs generated during that time with 134,009 reports (29%).

Figure 10: Total Number of ePCRs Generated by EMS Zone





The figure above represents the number and proportions of ePCRs generated within each EMS Zone from July 1st,2020-June 30th, 2021. The majority of records originated within the Northwest EMS Zone with 126,315 records (27.5%). The EMS zone with the lowest frequency of generated records was the Idyllwild Zone (Non-AMR) with 905 records. This analysis was done using data extracted from ImageTrend Elite using the scene incident city name (escene.17) and matched to corresponding zones. Less than 1% (2,644) of the records were removed from this analysis due to occurrences within unincorporated areas or incident city was missing/blank.

References

- Riverside County Emergency Medical Services Agency (REMSA) Policy 7701 https://www.remsa.us/policy/7701.pdf
- State of California. California Code of Regulations, Title 22. Social Security, Division 9. Prehospital Emergency Medical Services. State of California Emergency Medical Services Authority / Health and Human Services Agency. 2014. http://www.emsa.ca.gov/Media/Default/PDF/Title%2022%20Division%209%20Regulations.pdf#View=Fi tV
- Riverside County Emergency Medical Services Agency (REMSA), *All EMS System ePCRs-Week 152019*. http://remsa.us/documents/reports/APOT/Week15ePCRs.pdf

Data in this report is provided by the efforts of the Riverside County EMS System and its Providers in ensuring quality care and documentation of patient encounters.

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Appendix A

Original Scene Location Type	Count	Scene Location Type	Count	Proportion (%)
Airport/Transport Center	894	Airport/Transport Center	894	0.2%
Beach/Ocean/Lake/River	218	Beach/Ocean/Lake/River	218	0.0%
Farm/Ranch	276	Farm/Ranch	276	0.1%
Fire Department	1,263	Fire Department	1,263	0.3%
Healthcare provider office/clinic	9,215	Hospital/Health Care Provider Office/Clinic	53,467	11.6%
Hospital	42,397			
Urgent care	1,855			
Health Club/Gym	399	Health Club/Gym	399	0.1%
Industrial and construction area	960	Industrial/Construction Area	960	0.2%
Military base	63	Military Base	63	0.0%
Not Recorded	69	Not Recorded/Blank	23,191	5.0%
(blank)	23,122			
Skilled Nursing Facility	16,221	Skilled Nursing Facility	16,221	3.5%
Other	25,218		25,218	5.4%
Prison/Jail	4,200	Prison/Jail	4,200	0.9%
Private Commercial Establishment	7,798	Private Commercial Establishment	7,798	1.7%
Private Residence/Apartment	261,437	Private Residence/Apartment	261,437	56.5%
Public Building	5,344	Public Building	5,344	1.2%
Railroad Track	85	Railroad Track	85	0.0%
Recreation area	1,692	Recreation Area	1,692	0.4%
Residential institution	1,391	Residential institution	1,391	0.3%
School/College/University	720	School/College/University	720	0.2%
Street and Highway	57,065	Street/Highway	57,065	12.3%
Swimming Pool	158	Swimming Pool	158	0.0%
Wilderness area	799	Wilderness Area	799	0.2%