



RIVERSIDE COUNTY EMS AGENCY  
**ELECTRONIC PATIENT RECORD REPORT**  
2022

JULY 10<sup>TH</sup>, 2023

PREPARED FOR RIVERSIDE COUNTY EMS AGENCY, EMERGENCY MANAGEMENT DEPARTMENT

# ELECTRONIC PATIENT RECORD REPORT 2022

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The 2022 calendar year displayed an overall increase in the volume of EMS responses which corresponded with a growth in volume of electronic patient care records. This followed the unique challenges and trends in the provision of Emergency Medical Services (EMS) from previous years. The COVID-19 shutdowns and stay at home orders implemented in 2020 led to an overall decline in EMS calls, and since then, the volume of EMS electronic patient care records and overall responses have increased. 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 patient records to be completed in compliance with the California Code of Regulations [Title 22](#), (Chapter 4, Article 7, Section §100170(6A); Article 8, Sections §100171) and uploaded in a timely manner following a response or patient transfer to an emergency department. To get a more in depth look at the efficiency of ePCR entry for the Riverside County EMS system, data was pulled in 1-day increments, and mean changes of ePCR totals were calculated and evaluated based on changes in record count. The data was also evaluated for total count of ePCR submissions, hour of day, day of week, transport type, location, validation score, and response type. Validation scores were analyzed to represent the quality of documentation for each record. For this analysis, records that did not involve patient contact were removed.

For the 2022 calendar year, a total of 560,843 ePCRs were generated. Approximately 97% of those records were entered within one day of the incident, 0.5% were entered the following day, and little change was observed beyond Day 3 (less than 1%) However, it was noted that there were a few reports that were delayed beyond the month mark (less than 0.3%), so the results of such delays are statistically negligible. December 2022 displayed the greatest number of ePCRs generated for the 2022 year with 50,333 reports in that month. 2PM was the busiest hour of day accounting for approximately 5.8% of all reports (32,525 reports). Fridays generated the greatest volume of incidents according to ePCR submissions with 14.8% (82,785 records) of total ePCRs occurring on that day. Ambulance transports made up most reports submitted throughout the year (290,959 records; 51.9%). Emergency responses compared to non-emergency transport (interfacility/medical) also accounted for most, nearly 87%, of all ePCRs for the year of 2022 (87.2%; 488,695 records). Riverside County Fire Department (34.3%) and AMR-Riverside (26.6%) combined account for more than 60% of all ePCRs submitted in 2022 (60.9%; 341,738 reports). According to EMS zone analysis, the Northwest zone of Riverside County carried the highest number of responses with 27% (151,675 records) of all ePCRs generated within this zone.

## METHOD

Data between January 1<sup>st</sup>, 2022, and December 31<sup>st</sup>, 2022, was extracted from the Riverside County Imagetrend® Elite system using Imagetrend® Reportwriter. Record fields extracted were Incident Date, 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), Transport Type as determined by EMS Vehicle Unit Number (eResponse.13) and Agency Type, and Incident Patient Care Record Number (e.Record.01). Data was then de-duplicated by Patient Care Record Number. Incidents originating outside of Riverside County were excluded from the analyses. Additional categories were developed and collapsed as follows:

- Response Type
  - *Emergency* = 911 Response
  - *Non-Emergency* = Interfacility Transport & Medical Transport;
  - *Other* = Intercept, Mutual Aid, Public Assistance, and Standby)
- “Scene Incident Location Type” was collapsed based on variable consistencies and detailed in Appendix, Sections A-B

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**Figure 1: Yearly Comparison of Total Number of ePCRs Generated**

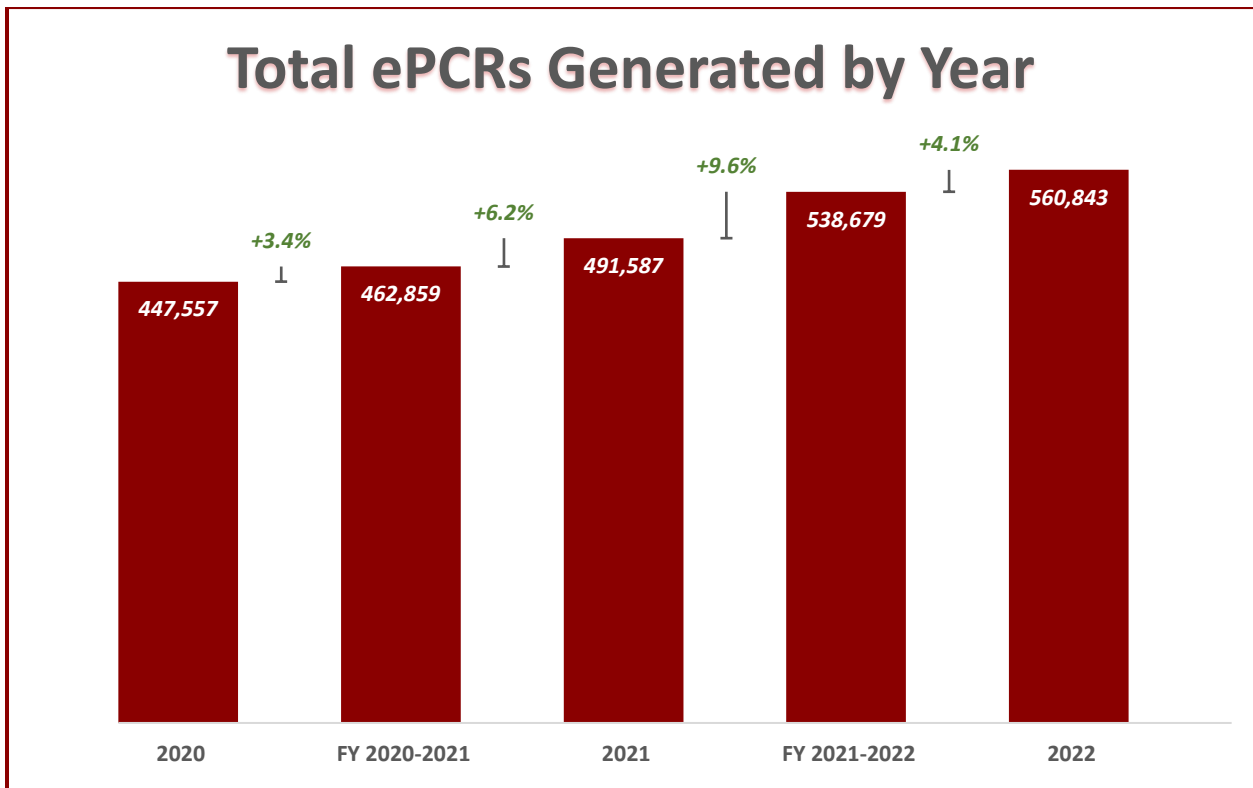


Figure 1 above displays the counts of ePCRs that were generated each year and the variation from year to year. The volume of ePCRs submitted has been steadily increasing each year. The greatest increase in ePCR volume occurred from the 2021 calendar year (491,587 records) to the 2021-2022 fiscal year (538,679 records). This was a proportionate increase of nearly 10%.

**Figure 2: Total Number of ePCRs Generated in 2022 by Month**

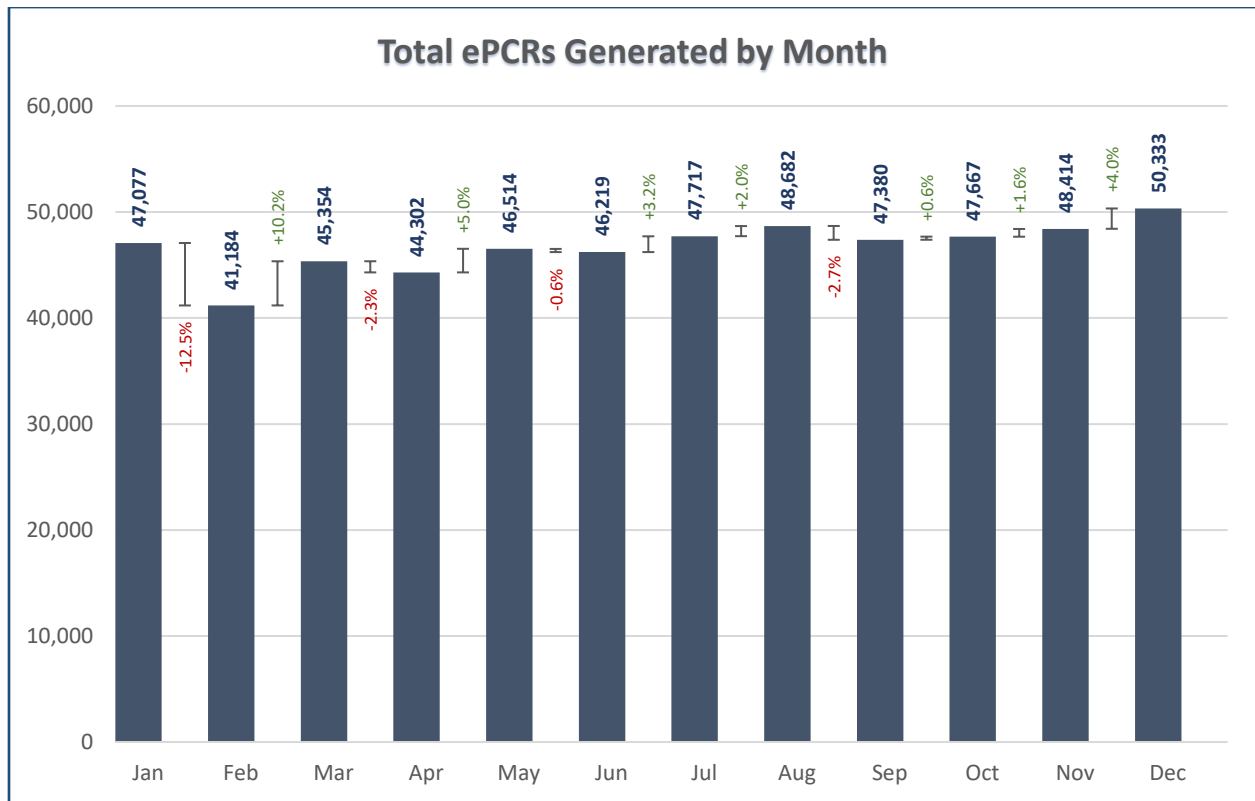


Figure 2 above displays the counts of ePCRs that were generated each month and the variation from month to month. The greatest decrease in ePCR volume occurred from January 2022 to February 2022 (-12.5%). This decline in volume is consistent with the shorter number of days within the month of February (28) compared to January (31). The greatest increase occurred from the month of February to March in 2022 (+10.2%).

**Figure 3: ePCR Completeness in 2022 by Validation Score**

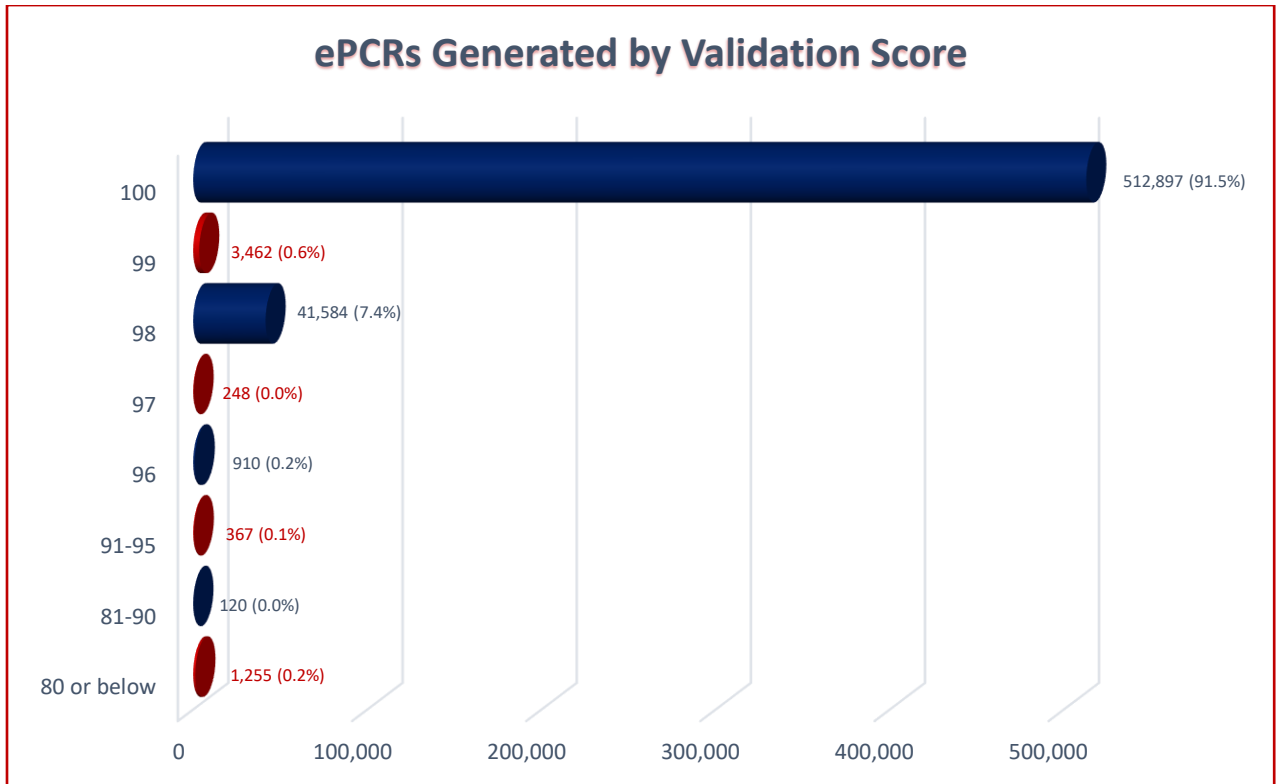


Figure 3 above displays the distribution of validation scores for ePCRs for incidents that consist of patient contact. Each record generates a validation score based on quality of documentation. Nearly 92% of ePCRs generated a validation score of 100. There is an obvious difference in the volume of records submitted with validation scores of 98 compared to 97 or 99. Less than 1% (0.22%; 1,255 records) generated validation scores less than or equal to 80.

**Figure 4: Variation of ePCR Submission by Daily Increments**

Days Following Incident	Variation in ePCRs Submitted (%)	2 STD Below Average	2 STD Above Average
1	3.28%	0.63%	5.93%
2	0.51%	-0.14%	1.16%
3	0.27%	-0.30%	0.84%
4	0.25%	-0.30%	0.81%
5	0.22%	-0.24%	0.67%
6	0.16%	-0.25%	0.56%
7	0.15%	-0.37%	0.67%
8	0.17%	-0.43%	0.76%
9	0.07%	-0.19%	0.32%
10	0.02%	-0.04%	0.09%
11	0.03%	-0.10%	0.16%
12	0.01%	-0.07%	0.09%
13	0.00%	0.00%	0.00%
14	0.00%	0.00%	0.00%
1 Month	0.28%	-0.09%	0.64%

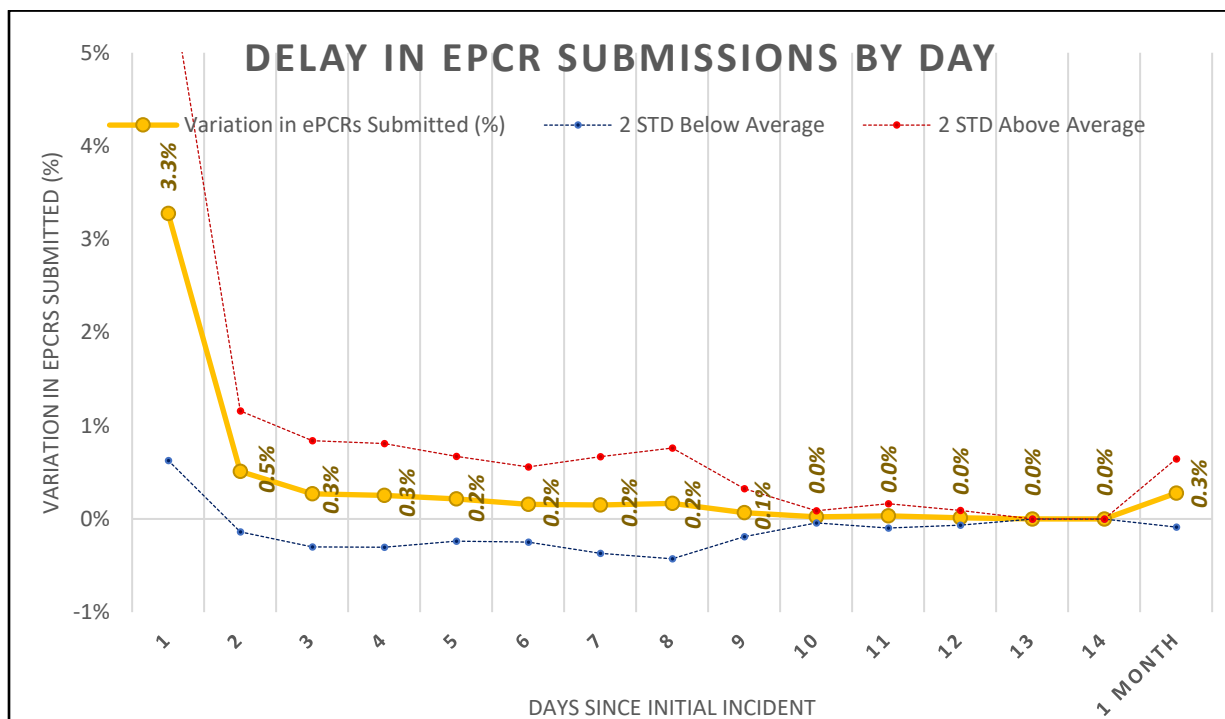


Figure 4 represents the mean variation in ePCR submission within 1-12 days of the incident. Each day at 8 am records were collected for the previous day (12:00 AM-11:59 PM), then again each day for 1 month. There were no changes noted following 8 days. However, there were several records submitted beyond 2 weeks up to 1 month following the incident. This data collection was done at the same time each day to increase the validity of measure. A total of 15 days were collected to calculate mean variations over time. Within 24 hours, there was an average of 96.7% of patient care records submitted. There was a slight increase in delayed record submissions on the 8<sup>th</sup> day (+0.02%), 11<sup>th</sup> day (+0.03%), and 1 month (+0.28%) after the incident. However, nearly all electronic patient care records were submitted within the first day of the incident (~97%), and there was a nominal increase observed for delayed submissions over the next month. In all, nearly 100% were submitted by day 3.

**Figure 5: Total ePCRs Generated in 2022 by Incident Hour of Day**

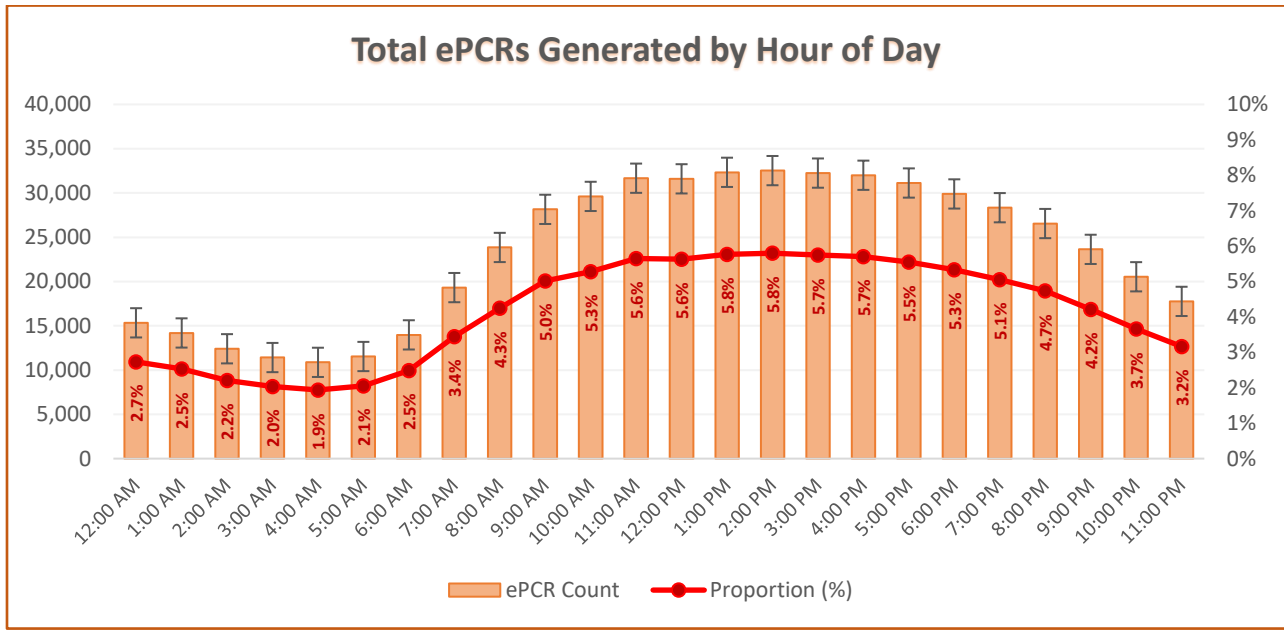


Figure 5 above represents the distribution of EMS incidents by the hour of day reported in each ePCR generated. It can be seen that the majority of incidents occurred between the hours of 9AM-7PM (60.5%). 2PM was the busiest with 32,525 records (5.8%) generated at that time. The error bars that do not overlap show significant difference among those hours. For instance, there is a significant difference in EMS incidents that occurred at 7AM and 8AM.

**Figure 6: Total ePCRs Generated in 2022 by Incident Day of Week**

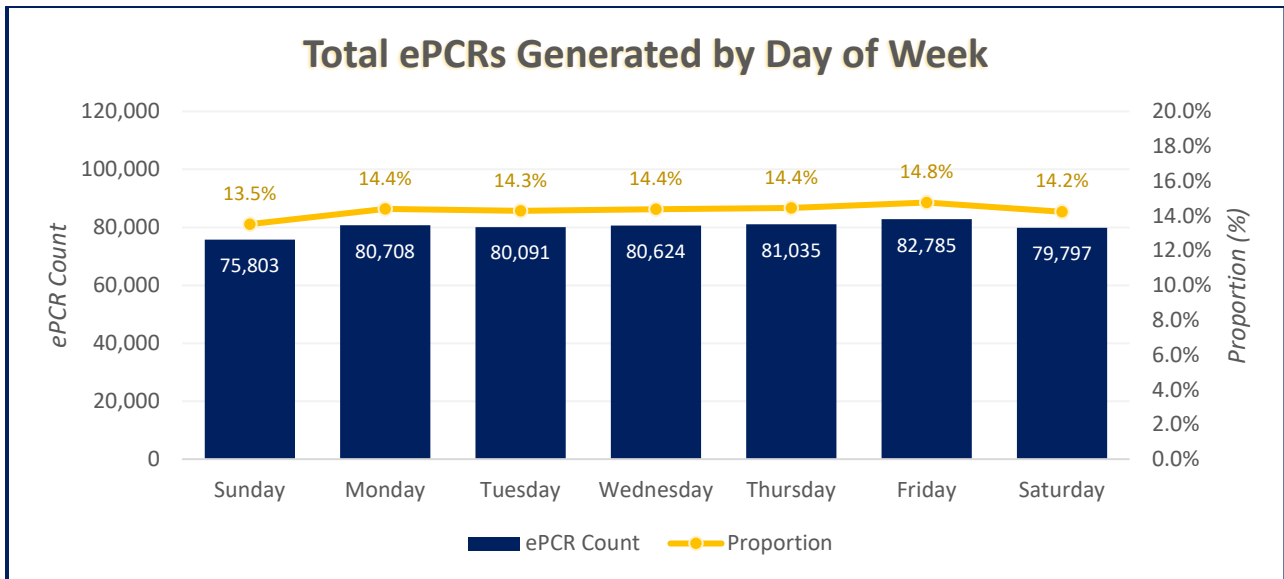


Figure 6 above represents the distribution of EMS incidents by the day of the week reported in each ePCR generated. Most incidents occurred on Friday with 14.8% of the ePCR distribution respectively. Sunday represents the day of the week with the fewest ePCRs generated at 13.5%. However, there was no significant difference in EMS incidents that occurred on any day of the week.



**Figure 7: Total ePCRs Generated in 2022 by EMS Transport**

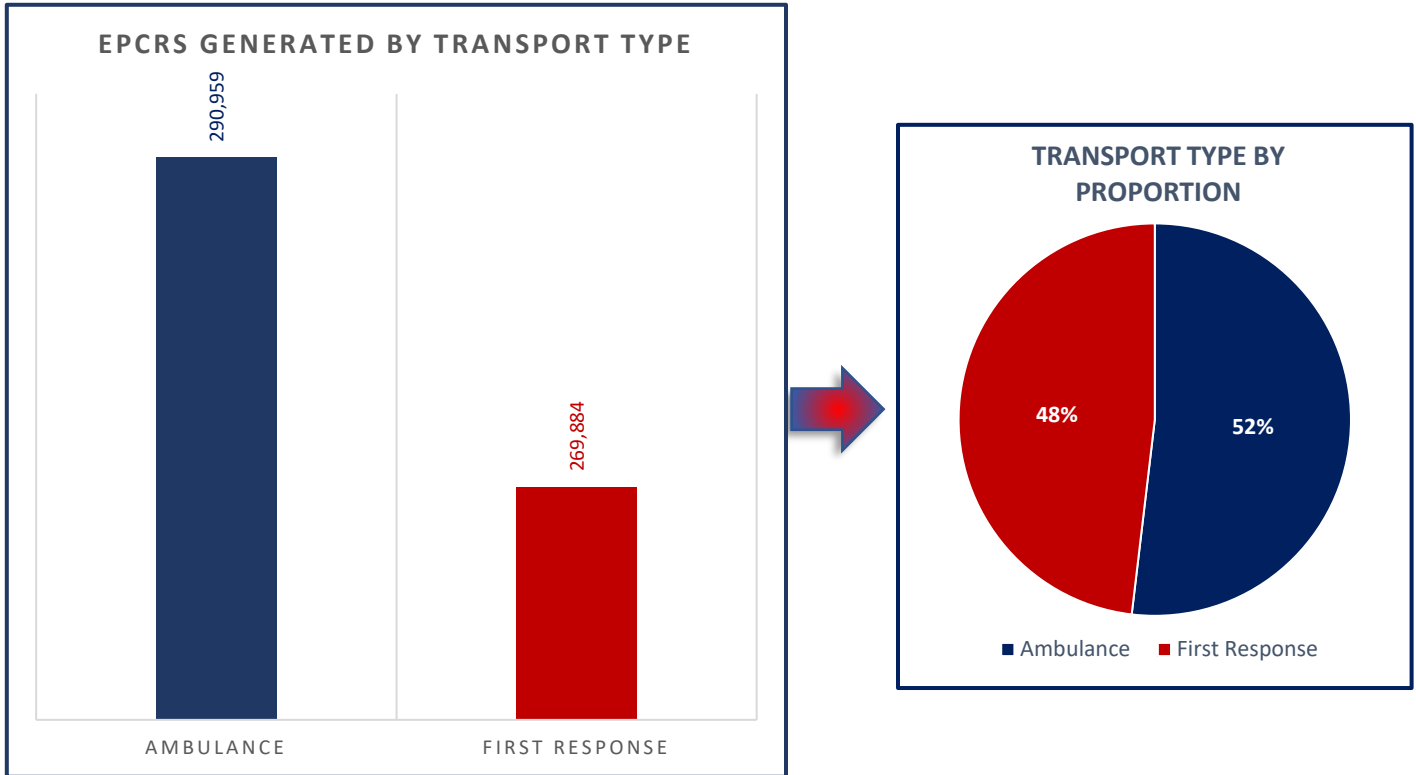


Figure 7 above represents the total number of electronic patient care records generated by EMS transports. December 2022 was the month with the greatest number of ePCRs for First Response transports (22,890 records; 52.1%) and Ambulance transports (21,008 records; 47.9%). March 2022 represents the month with the least difference ePCR submissions for ambulance (49%) and first responders (51%). February was the month with the lowest number of ePCRs generated for both Ambulance and First Response transports (17,331 and 18,724 reports respectively).

**Figure 8: ePCRs Generated in 2022 by Response Type**

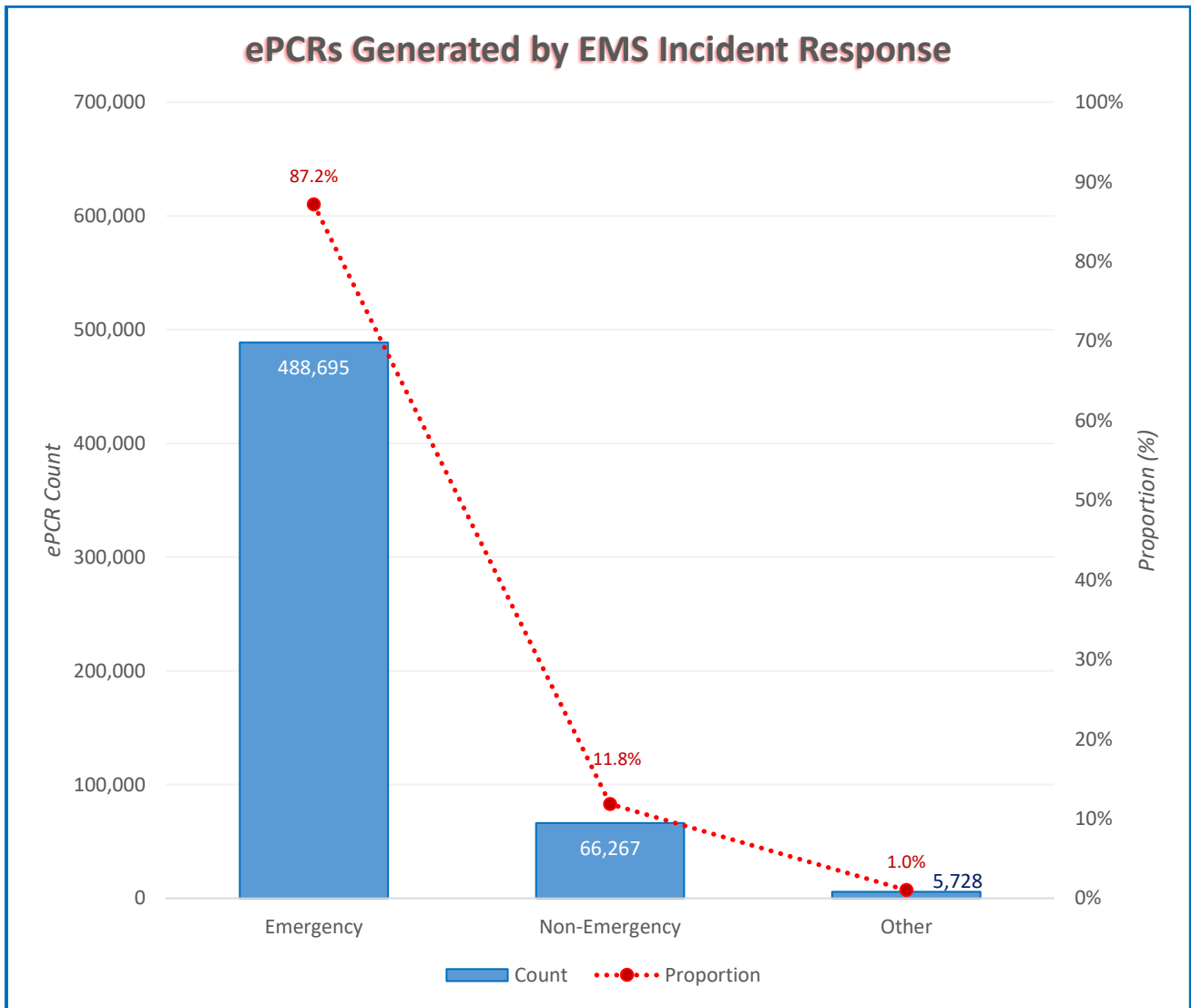


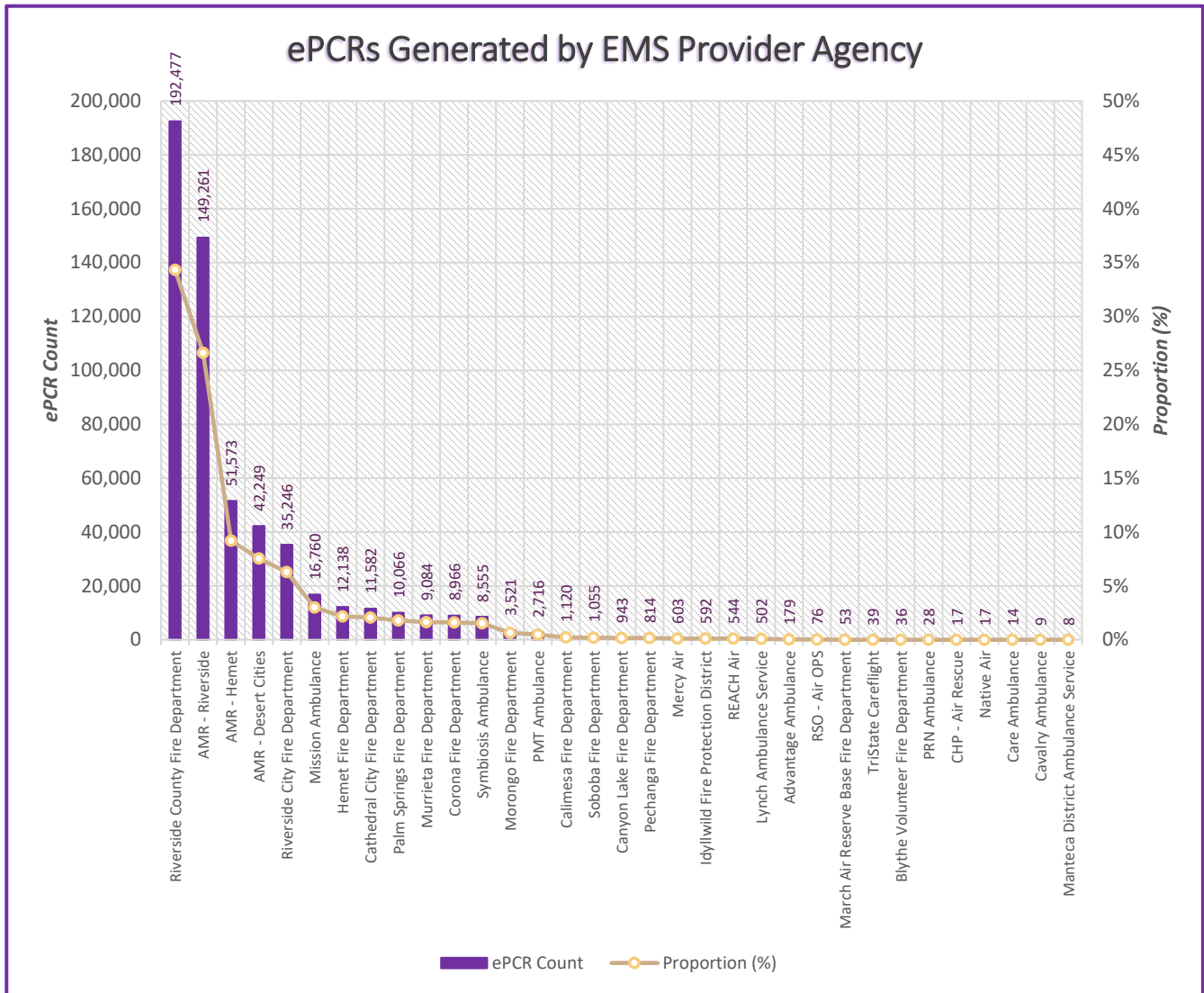
Figure 8 above represents the distribution of ePCRs generated by each type of EMS response. Emergency responses made up the majority of ePCRs generated throughout 2022 (488,695 records; 87.2%). Nearly 12% of records were from non-emergency response calls. .

**Figure 9: Total ePCRs Generated in 2022 by Incident Patient Disposition**

<b>Incident Patient Disposition</b>	<b>ePCR Count</b>	<b>Proportion</b>
<i>Patient Treated and Transported by this EMS Unit</i>	234,395	41.8%
<i>Patient Treated and Care Transferred to Another EMS Unit</i>	100,962	18.0%
<i>Canceled at Scene by Another Unit, No Patient Contact</i>	50,009	8.9%
<i>Canceled Enroute</i>	37,368	6.7%
<i>Assist another/same Agency</i>	35,871	6.4%
<i>Patient Treated, Refused Transport</i>	34,898	6.2%
<i>No Patient Found</i>	19,531	3.5%
<i>Patient Refused Evaluation/Care, No Transport</i>	12,563	2.2%
<i>Public Assist</i>	9,869	1.8%
<i>Patient Treated and Transported with this Crew in Another EMS Unit</i>	9,753	1.7%
<i>Canceled Prior to En Route</i>	3,695	0.7%
<i>Resuscitation Attempted, Dead at Scene, No Transport</i>	2,865	0.5%
<i>Dead at Scene, No Resuscitation, No Transport</i>	2,673	0.5%
<i>No Assessment, Care Transferred to Another EMS Unit</i>	1,853	0.3%
<i>REMSA - Assess and Refer</i>	968	0.2%
<i>Patient Treated, Transported by Law Enforcement</i>	871	0.2%
<i>Patient Treated, Transported by Private Vehicle</i>	662	0.1%
<i>Non-Patient Transport (Crew, Equipment, Team, etc.)</i>	484	0.1%
<i>Standby: No Services or Support Provided</i>	474	0.1%
<i>Patient Treated and Transported to Landing Zone by this EMS Unit</i>	444	0.1%
<i>Standby: Public Safety, Fire, or EMS Operational Support Provided</i>	364	0.1%
<i>Blank</i>	89	0.0%
<i>Patient Condition Precludes Interfacility Transport</i>	82	0.0%
<i>Patient Transported but Refused Evaluation/Care</i>	51	0.0%
<i>MCI Patients Triage and Care Transferred to Other EMS Units</i>	40	0.0%
<i>False Call / False Alarm</i>	9	0.0%
<b>Total</b>	<b>560,843</b>	<b>100%</b>

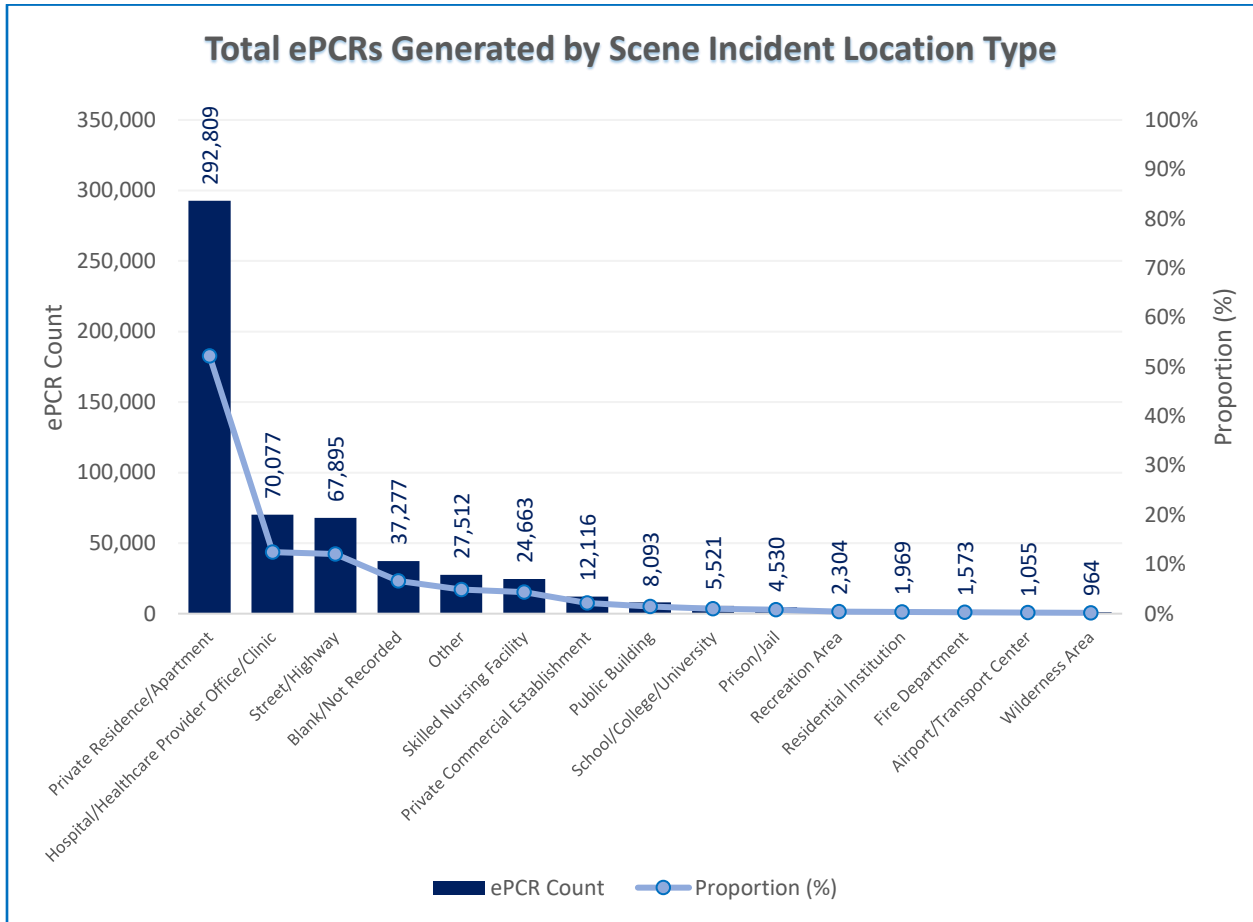
The table above represents the total number and proportion of ePCRs in 2022 by Incident Patient Disposition. Patient incident disposition is taken from ImageTrend NEMIS value eDisposition.12. From the data, it can be seen that the majority of patients encountered were treated and transported by the same EMS unit (234,395 records; 41.8%). Approximately, 16.2% of the reports submitted were due to calls that were canceled at the scene or prior to EMS arrival. Records that did not include an incident patient disposition were labeled as "Blank" (89 records; 0.0%).

**Figure 10: Total Number of ePCRs Generated in 2022 by Agency**



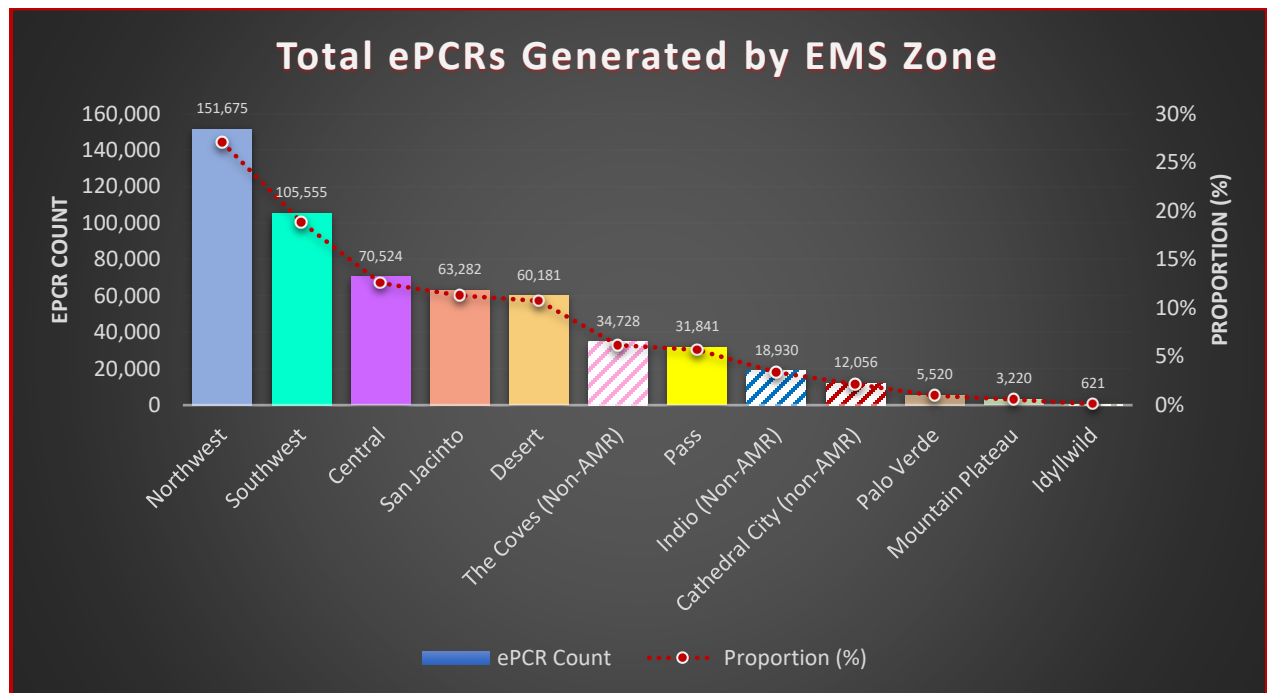
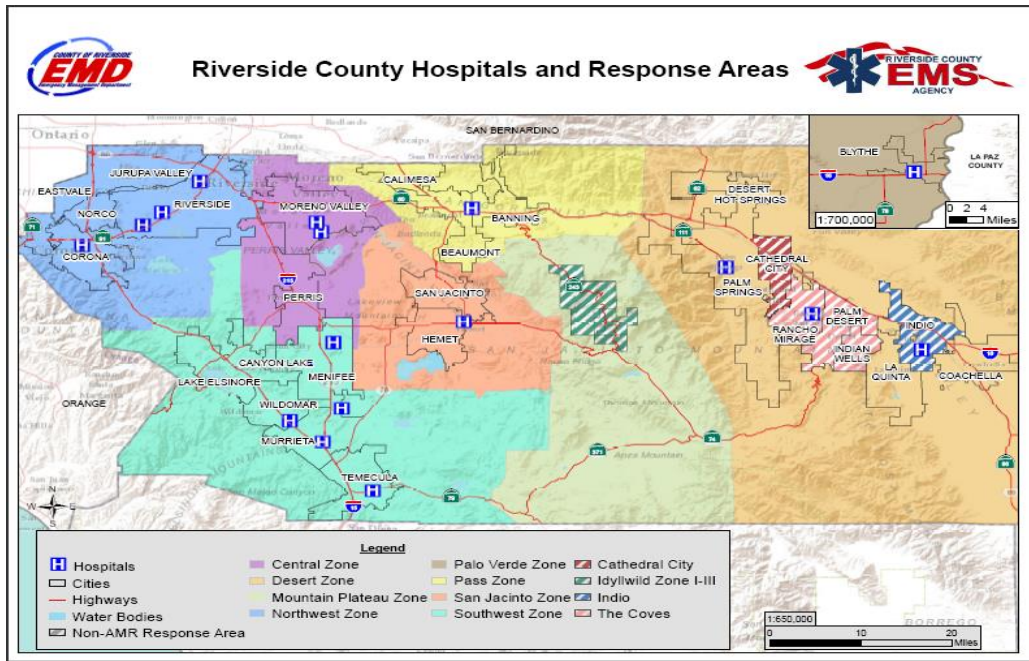
The figure above shows the distribution of EMS patient care reports submitted by each provider agency from Jan 2022-Dec 2022. Riverside County Fire Department represents the agency that makes up the largest proportion of ePCRs received during this time with 192,477 reports (34.3%). AMR Riverside was the second agency with the most ePCRs generated during that time with 149,261 reports (26.6%).

**Figure 11: 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 2022 calendar year. The 15 scene incident location types with greatest frequency of records are shown in this figure. There were a total of 24 different location types then collapsed into 22 categories (shown in Appendix A). The scene incident location types from non-emergency responses are also shown (Appendix B) and it was found that 78.7% (52,121 incidents) come from hospital settings. Overall, most of the records indicated that the incident occurred in a private residence or apartment location (292,809 records, 52.2%). 6.6% (37,277 records) of the total ePCRs submitted did not include a scene incident location type, shown as “Not Recorded/Blank”.

**Figure 12: Total Number of ePCRs Generated in 2022 by EMS Zone**



The figure above represents the number and proportions of ePCRs generated within each EMS Zone from January 1<sup>st</sup>, 2022-December 31<sup>st</sup>, 2022. Most records originated within the Northwest EMS Zone with 151,675 records (27%). The EMS zone with the lowest frequency of generated records was the Idyllwild Zone with 621 records (0.1%). This analysis was done using data extracted from ImageTrend Elite using the scene incident city name (escene.17) and matched to corresponding zones. Approximately 0.5% (2,709) of the records were removed from this analysis due to incident city documented as missing/blank.

## Appendix A- Scene Location Breakdown for All Incidents

Original Scene Location Type	Count	Scene Location Type	Count	Proportion
Private Residence/Apartment	292,809	Private Residence/Apartment	292,809	52.2%
Street and Highway	67,895	Street/Highway	67,895	12.1%
Hospital	55,180	Hospital/Healthcare Provider Office/Clinic	70,077	12.5%
Healthcare provider office/clinic	13,206			
Urgent Care	1,691			
(blank)	37,025	Not Recorded/Blank	37,277	6.6%
Not Recorded	250			
Not Applicable	2			
Other	27,512	Other	27,512	4.9%
Skilled Nursing Facility	24,663	Skilled Nursing Facility	24,663	4.4%
Private Commercial Establishment	12,116	Private Commercial Establishment	12,116	2.2%
Public Building	8,093	Public Building	8,093	1.4%
School/College/University	5,521	School/College/University	5,521	1.0%
Prison/Jail	4,530	Prison/Jail	4,530	0.8%
Recreation area	2,304	Recreation Area	2,304	0.4%
Residential institution	1,969	Residential Institution	1,969	0.4%
Fire Department	1,573	Fire Department	1,573	0.3%
Airport/Transport Center	1,055	Airport/Transport Center	1,055	0.2%
Wilderness area	964	Wilderness Area	964	0.2%
Industrial or construction area	900	Industrial or construction area	900	0.2%
Health Club/Gym	654	Health Club/Gym	654	0.1%
Swimming Pool	277	Swimming Pool	277	0.0%
Farm/Ranch	239	Farm/Ranch	239	0.0%
Beach/Ocean/Lake/River	202	Beach/Ocean/Lake/River	202	0.0%
Railroad Track	119	Railroad Track	119	0.0%
Military base	94	Military base	94	0.0%
<b>Total</b>			<b>560,843</b>	<b>100%</b>

## **Appendix B- Scene Location Breakdown for Non-Emergency Responses**

<b>Original Scene Location Type</b>	<b>Count</b>	<b>Scene Location Type</b>	<b>Count</b>	<b>Proportion</b>
Hospital	52,121	Hospital/Healthcare Provider Office/Clinic	54,123	81.7%
Healthcare provider office/clinic	1,886			
Urgent Care	116			
Skilled Nursing Facility	4,984	Skilled Nursing Facility	4,984	7.3%
Private Residence/Apartment	2,543	Private Residence/Apartment	2,543	4.0%
Other	1,486	Other	1,486	2.3%
Prison/Jail	1,170	Prison/Jail	1,170	1.8%
(blank)	831	Not Recorded/Blank	855	1.2%
Not Applicable	2			
Airport/Transport Center	482	Airport/Transport Center	482	0.8%
Street and Highway	182	Street and Highway	182	0.3%
School/College/University	134	School/College/University	134	0.2%
Public Building	116	Public Building	116	0.2%
Residential institution	60	Residential institution	60	0.1%
Private Commercial Establishment	38	Private Commercial Establishment	38	0.1%
Fire Department	16	Fire Department	16	0.0%
Recreation area	14	Recreation area	14	0.0%
Industrial or construction area	9	Industrial or construction area	9	0.0%
Health Club/Gym	4	Health Club/Gym	4	0.0%
Military base	3	Military base	3	0.0%
Farm/Ranch	1	Farm/Ranch	1	0.0%
Railroad Track	1	Railroad Track	1	0.0%
Swimming Pool	1	Swimming Pool	1	0.0%
Wilderness area	1	Wilderness Area	1	0.0%
<b>Total</b>			<b>66,267</b>	<b>100%</b>



## 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. 2021.  
<https://ems.ca.gov/wp-content/uploads/sites/71/2021/01/EMSA-REGS-2020-12-15.pdf>

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*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.*

*Report prepared by Stephani Harrington & Catherine Borna Farrokhi, Data & Reporting Unit, Riverside County EMS Agency.*

*For more information, please contact Riverside County EMS Administrator, Dan Bates [dbates@rivco.org](mailto:dbates@rivco.org)*

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