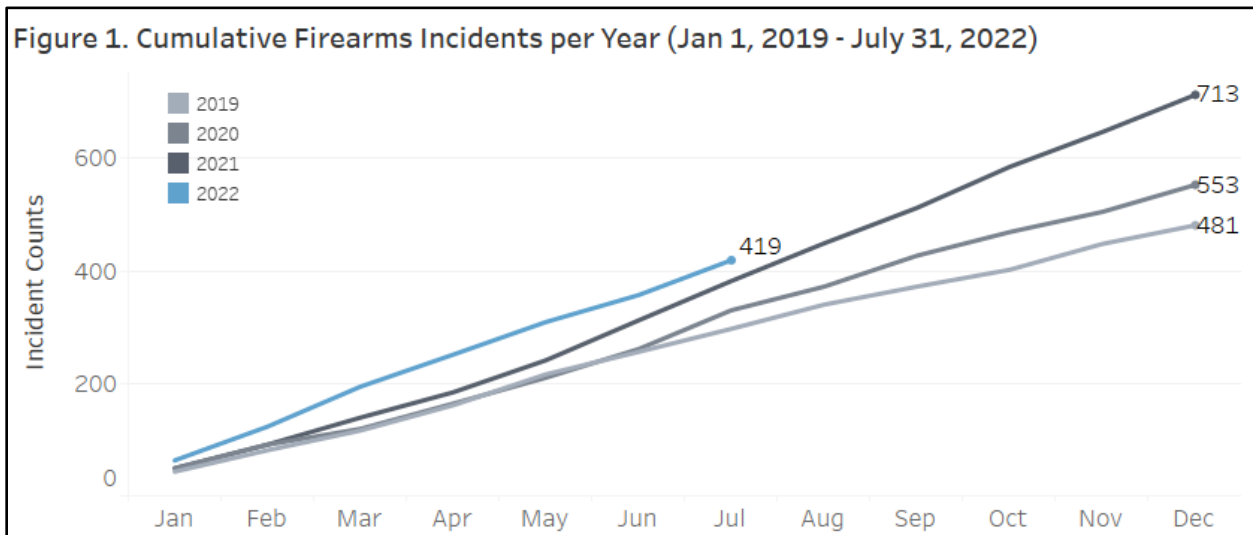


**Purpose:** This QI report characterizes clinical aspects of EMS incidents involving firearm injuries.

**Background:** Gun violence and firearm injuries have been on an increasing trend both nationally and locally. According to the King County Prosecuting Attorney’s office, the number of shots fired incidents rose by over 50% and the number of overall shooting victims rose by 70% in year 2021 compared to the average of the previous four years.<sup>1</sup> For many years, the Assessment, Policy Development, and Evaluation (APDE) Unit at Public Health – Seattle & King County have monitored hospitalizations and deaths due to firearms. More recently, the EMS Division has partnered with APDE to integrate EMS information to address data gaps and improve ongoing surveillance. Dashboards characterizing time trends, demographics, injury severity, method of injury, transport types, and geographical distribution of EMS incidents involving firearm injuries were made available starting in May 2022 (<https://kingcounty.gov/depts/health/data/firearms/EMS.aspx>).<sup>2</sup> In the following report, we provide additional details of EMS involvement and care to better understand firearm injury incidents.

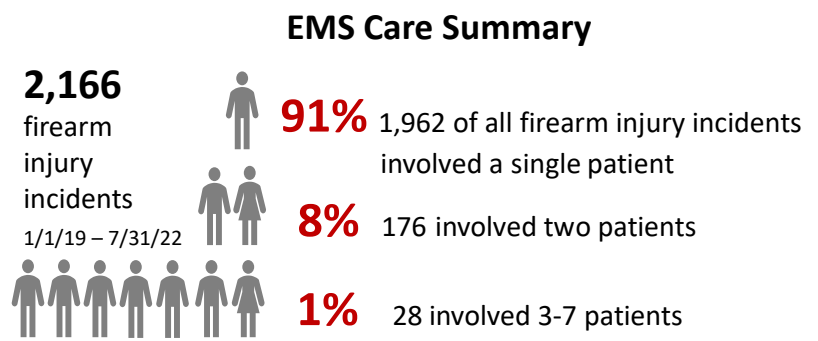
**Methods:** We used the King County EMS data repository to identify firearm injury incidents occurring between January 1, 2019 - July 31, 2022. Suspected firearm injury incidents were identified through a combination of primary and secondary impressions, patient chief complaint, patient injury details, and search terms (“GSW”, “GUNSHOT”, “GUN SHOT”, “FIREARM”, “FIRE ARM”, “BULLET”, “RIFLE”) in the narrative. Multiple manual reviews helped refine and validate the best search approach.

**Results:** During the evaluation period, EMS has responded to a total of 2,166 firearm incidents. These EMS incidents have increased year over year since 2019 (Figure 1). Thus far for 2022 (through July 31), EMS has been involved in 419 firearm incidents.



Some of the basic demographic characteristics in King County were consistent with other regions. Over 80% involved males (n=1,760). The most common age group was 25-44 years, though over the years, there have been an increasing number of firearm incidents involving individuals ages 18-24 years. Almost half of all firearm incidents occurred at a private residence (46%, n=997). Although risk varies substantially by King County geography, all parts of King County were impacted by firearm injuries (see above link for map).

With regard to EMS care, these events have a spectrum of severity that require a range of EMS resources and triage. ALS attended to about half of all EMS firearm incidents (52%, n=1,132). In nearly a quarter of the incidents (23%, n=501), the patient died at the scene. Sometimes, the patient had already expired upon EMS arrival (n=327) while other times, the patient was pronounced following EMS treatment efforts (n=174).



Definitive care for serious firearm injury typically requires hospital-based surgical intervention. EMS in King County have advanced different strategies to bridge critical patients to definitive care by using lifesaving interventions (e.g., tourniquets, special bandaging, field blood transfusion). Tourniquets were applied by EMS in approximately 12% of firearm incidents (n=258). Importantly, EMS also managed tourniquets placed prior to their arrival by laypersons or law enforcement. In these instances, EMS must manage the tourniquet and decide if they should remove, replace, or leave in place the initial tourniquet. Specialty hemostatic agents were used uncommonly (<1%). As expected, the majority of tourniquet and hemostatic agent usage were for incidents where there were severe or life-threatening injuries. IV/IO was documented for 42% of firearm incidents (n=919) and was specific to incidents with ALS involvement and critical patients. The whole blood field program was implemented in a phased manner such that all of King County now is eligible for this resource in life-threatening hemorrhagic shock. Overall, 3% of firearm incidents (n=60) have been eligible and treated with field transfusion, with the large majority of field transfusions occurring during the latter half of 2021 and into 2022 as the program has been implemented across all of King County.

EMS is also responsible for strategic triage to hospitals. Over half of transported patients (54%, n=902/1664), went to the level 1 trauma center, Harborview Medical Center, in downtown Seattle. The majority of these incidents (82%, n=742/902) triaged downtown were determined to have severe injuries.

**Conclusion:** In King County, incidents involving firearms are increasing over time. Having the ability to accurately identify these incidents in a timely manner provides an important tool to address key questions about who are being affected, why they're being affected, and how to prevent future occurrences.<sup>3</sup>

**Medical Director's Comment:** Like many other parts of the U.S., gun violence has increased in King County, presenting a challenge to community health. EMS has advanced multiple strategies that involve BLS and ALS interventions in order to better treat these patients. Moreover, EMS information is helping support nearly real-time surveillance here in King County, an initiative that can aid public health strategies to interrupt gun violence and make our communities safer and healthier.

**References:**

1. King County Prosecuting Attorney: 2021 Year End King County Firearm Violence Report. <https://kingcounty.gov/~media/depts/prosecutor/documents/2022/2021-year-end-report-shots-fired.ashx?la=en>. Accessed Aug 2022.
2. Public Health – Seattle & King County: The Impact of Firearms in King County. <https://kingcounty.gov/depts/health/data/firearms.aspx>. Accessed Aug 2022.
3. King County Prosecuting Attorney: King County Gun Violence Data – Crime Strategies Unit. A public health approach to understanding gun violence in King County. <https://kingcounty.gov/depts/prosecutor/criminal-overview/csu.aspx>. Accessed Aug 2022.

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