**Background:** Optimal response & triage of car crash victims has been shown to improve outcomes. Helicopter Emergency Medical Services (HEMS) play a key role in this response [1,2].

**Objectives:**
1) Assess whether fatal crash site patterns follow population patterns in continental U.S.
2) Examine how HEMS coverage of population & fatal motor vehicle crash (MVC) sites has changed between 2004 and 2007.

**Supporting Detail (Continental U.S.)**

<table>
<thead>
<tr>
<th>Year</th>
<th>HEMS Candidate Population</th>
<th>% Covered</th>
<th>HEMS Candidate Crash Locations</th>
<th>% Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>153,662,616</td>
<td>63%</td>
<td>150,316</td>
<td>54%</td>
</tr>
<tr>
<td>2007</td>
<td>153,662,616</td>
<td>61%</td>
<td>150,316</td>
<td>61%</td>
</tr>
</tbody>
</table>

Change in HEMS Coverage (2004-2007)

- Population Coverage = 6,093,836
- Fatal Crash Site Coverage = 11,072

% Change in Coverage between 2004 & 2007

- Population = +9.3%
- Fatal Crashes = +13.7%

**Conclusion:** Study demonstrates that fatal motor vehicle crash density patterns (2) differ from population density patterns (1). Thus, for trauma response, consideration of historical motor vehicle crash locations (4) provides a valuable alternative to population locations (3) when assessing HEMS base placement & coverage patterns. Of particular interest are rural areas shown to have large numbers of fatal crashes but little or no air medical service coverage. Between 2004 and 2007, the percent change in population and fatal crash sites covered by HEMS in the continental U.S. was +9.3% for population and +13.7% for fatal crash sites.

**Methods (Part 1):** Acquired over 200,000 geocoded fatal crash sites from USDOT for the period 2001 to 2006 to provide a representative set of ‘serious injury’ crash locations. Mapped population centroids & fatal crash locations. Calculated densities for each. Compared population density patterns (1) with fatal crash density patterns (2).

**Result:** Crash density patterns differ from population density pattern.

**Methods (Part 2):** Overlaid 2004 HEMS base locations from *Atlas & Database of Air Medical Services (ADAMS)* on population (centroid) & fatal crash-site maps. Plotted 10-min rotor wing fly circles (~ 20 min response) for each HEMS base. Added Trauma Center locations. Excluded ground transport candidates (defined as population centroids & crash sites within 8 miles of a trauma center). Remaining population centroids & crash sites are considered candidates for HEMS response. Repeated for 2007 HEMS base locations. Examined change in HEMS fly circle coverage between 2004 and 2007.

**Result:** By 2007, addition of (or changes to) HEMS base locations increased the percent population covered to 69% & the percent of fatal crash sites covered to 61%. Percent change in coverage between 2004 & 2007 was 9.3% (population) & 13.7% (fatal crash sites).

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