Ambulance Allocation: What's the Right Balance?

02/07/2020 **Aditya C. Shekhar (/contact/221659/aditya-c-shekhar)**

At the local, state, and even federal levels, there's significant discussion concerning exactly what EMS resources communities need and how they should be allocated. A community with too many staffed units risks devoting too much money to salaries and equipment. Further, its providers might feel bored or unhelpful as the number of calls they answer during a shift is likely to be low, causing potential issues with retention.

On the other hand, a community with too few staffed EMS units risks overworked providers and not having adequate coverage to meet the demand of constituents. In these underresourced communities, crews will likely spend significant portions of their shifts running calls, possibly leading to burnout and high turnover.

There's a balance between having too many and too few EMS units. Finding this balance and other decisions involving resource allocation often consider trends in call volume, response times, and budgetary resources. There are also demographic and resource-usage variations within communities to take into account. Some populations served by EMS agencies inherently request service at higher rates than others. Elders and constituents without access to adequate primary or preventive care are more likely to use EMS resources, while communities primarily populated with younger, healthier constituents will have less of a need for them.

Methods

To understand nationwide trends in resource allocation, investigators examined the Firehouse National Run Survey (https://www.emsworld.com/article/1221789/firehouse-national-run-survey) published in the December 2018 edition of EMS World to identify how communities around the country allocate their resources based on population and usage statistics. They isolated 70 departments that provided data to the survey and performed statistical analyses describing their resource allocation.

These departments all submitted statistics on the size of the population they served, the number of ambulances they staffed, and the number of total EMS calls they received in a year. From this reported data, investigators calculated nationwide averages for three key variables: the number of constituents per ambulance (availability), the yearly calls an average ambulance received (workload), and the yearly calls per constituent for each department (usage).

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Results

From the 70 departments studied, each ambulance served an average of 21,057 people (availability). This average ambulance went on 2,408 EMS calls a calendar year, which translated to a workload of roughly 6½ calls in an average 24-hour period. In terms of usage, there were an average of 0.1225 ambulance calls per constituent. These numbers don't apply uniformly to every department nationwide, but they do provide a general illustration of nationwide usage and resource allocation.

Rural communities had the highest constituent-per-ambulance rates—for instance, the highest availability occurred in a community where two ambulances served 4,000 people. If your closest hospital is a long transport away, the second ambulance is a lifeline when the first one is out on a call. By contrast, urban ambulances served significantly larger populations, and the lowest availability occurred in a community where the average ambulance served 135,681 people.

Ambulances at different departments also responded to a varying number of calls: An average ambulance in the department with the highest workload responded to 10,985 calls over the year, while an average ambulance at the lowest-workload department responded to just 1,322. Different populations also utilized EMS resources at vastly different rates. Of the 70 departments, the community with the highest per-person usage generated 0.2844 runs per person, while the community with the lowest generated only 0.0523.

Conclusions

The data from these 70 departments offer insight into how resources are procured and allocated on a nationwide basis. It is worth noting that the per-department statistics are averages and might not represent all units within a system—in other words, not all ambulances in a department are equally busy, and especially busy areas within large departments might be allocated more resources to reduce the strain on crews.

There also exists tremendous local variation between how resources are allocated, which can be uniquely determined by local leaders familiar with a region. For instance, an ambulance service that covers a significant amount of land area with a small population might benefit by having multiple units located in different areas of their district to allow for a timely response to all constituents. Conversely, not all areas within a suburban or urban EMS coverage zone request services at the same rates, and most departments selectively position units to best manage demand. Some services might also have a higher constituent-per-ambulance rates because they receive significant call volumes from hospital transfers, assisted-living facilities, or nursing homes.

Hopefully agency leaders and the EMS community can use data like this to understand what sorts of conclusions their colleagues are reaching when it comes to resource and unit allocation and compare their own results to nationwide trends. Further studies could look at other metrics—for example, response times or patient outcomes—to see what levels of allocation might be best from the patients' perspective. One metric that might also present interesting results is personnel satisfaction compared between units of various call volumes to identify, from the providers' perspective, what is a reasonable workload for an EMS crew. That being said, the three variables outlined in this article are good metrics to use when making decisions about resource allocation.

Allocation Statistic	***Nationwide Average***
Availability (constituents per ambulance)	21,057
Workload (yearly calls per ambulance)	2,408
Usage (calls per constituent)	0.1225

Aditya C. Shekhar is a research scientist, EMS educator, and writer. His articles about the physiologic progression of heart attacks have been read globally and won awards in the field of cardiology. He has taught paramedic, EMT, EMR, and CPR courses in the United States and internationally and has designed online educational content for EMS providers.

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Comments

Submitted bychuckd660@yahoo.com on 02/11/2020

I enjoy data driven surveys and this one seems to be coming up more and more. Providers leaving the profession from burn out to lack of wages ect. I feel the tiered system modal is where EMS should be turning to. The amount of savings a department can make by turning to this system is astronomical! Let's face facts 85-90% of all 911 emergency calls are basic level care calls. However we send paramedics to them. This is a poor management of resources and leads to burnout! If you used more BLS ambulances and less paramedic QRV trucks you accomplish more and do it more efficiently. You keep paramedics burnout and turnover low and this gives incentive to EMT basics and intermediates to go to paramedic school. I feel that mostly all departments are looking to save money while not affecting patient care so perhaps moving forward more articles based on research can and will be done highlighting the benefits of a tiered system! I work for a private hospital based paramedic system that uses lean six sigma and I personally have showed where we can save 1.6 million dollars by reducing paramedic units and increasing BLS units earning me a black belt in lean! The times are changing with insurance reimbursements and lack there of so maybe moving forward you and our constituents will begin studying this theory! Stay safe

Chuck D
NRP, CCEMTP, DMT, FPC

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