The Need for 911 Research and Its Impact on Operations

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Over 25 years ago I started my first 911 center job in a large urban system in California. Our communication center was a secondary Public Safety Answering Point (PSAP), and as such, all 911 callers reporting a medical or fire emergency were transferred to our center from the 911 calltakers in the primary PSAP agency. With the rather auspicious title of System Status Controller, my primary role was to direct the dispatching and deployment of paramedic ambulances in the system. Most importantly, I was tasked with tracking the unit response time of every paramedic vehicle dispatched to each medical call. Indeed, paramedic response time – defined here as the elapsed time from unit notification until the responding crew reported that they were "on scene" – was the single most important performance measure in our system. A response time of less than 10 minutes was the mandated standard (later attempts were made to adjust this standard to 8 minutes to be more in line with what other "high performance" EMS systems were doing at the time). So a response of 9 minutes and 59 seconds was considered compliant, while a response time of exactly 10 minutes—one second more—was considered a response time "exception," which meant completing paperwork—and if I recorded too many exceptions in one shift, explaining to my operations director why I wasn't able to manage adequate system coverage for the day. It got even more complicated when response time was reported on a monthly basis. Ninety percent of all responses had to be within the mandated (9:59) standard. Also, the city was divided up into four zones, and zone compliance also had to meet the ninety percent standard. It was sometimes a stressful job, but more often interesting and even rewarding. Achieving a high compliance rate became a personal challenge at which I was determined to excel. And I got pretty good at it over time.

At first I didn't question whether a 9 minute and 59 second response time standard was a valid performance measure. After all, the folks who designed the system – much smarter and more experienced EMS professionals than me had determined this time frame to be significant. Bad things must start to happen to our patients if we can't get to them within 10 minutes, I reasoned. Other EMS systems had also implemented similar time performance requirements, at about the same time as ours; in fact many systems used a standard of 8 minutes or less for an Advanced Life Support (ALS) unit response – a time frame that ultimately became the premier EMS performance standard, touted by industry experts as the key to saving lives. This trend toward time-based EMS standards appears to have started sometime in the late 1970's, after several studies appeared to show an increase in survival rates among cardiac arrest victims due to rapid EMS response.[1,2] Our system alone spent hundreds of thousands of dollars each year staffing and deploying resources in order to stay in compliance to this one standard.

And once paramedic response time standards became widely used, dispatch time standards soon followed. The National Fire Protection Association (NFPA) ultimately came out with a controversial 60 second call processing standard (95% of the time) for all EMS and fire dispatch agencies. This time was measured from the time the 911 calltaker picked up the phone, until the time the first response crew was notified. The introduction of this new performance measure infused even more pressure and disquiet into an already stressful 911 environment, and placed the majority of 911 agencies out of compliance to the standard.

Before long, I started to doubt the prevailing wisdom that asserted time was the most important performance measure for medical 911 calls. After many

months of diligently documenting response time exceptions, and monitoring response times in general, I started paying closer attention to the transport disposition of each patient our paramedic crews handled. I began to inquire with the paramedics who treated those patients about how their cases turned out. I discovered that, on the surface at least, it didn't seem to matter how fast the paramedics got to the scene of the emergency. Most patients who had been reported to 911 with moderate or even serious symptoms could generally be stabilized either by the paramedics on scene, or by the hospital emergency department staff once the ambulance arrived at its destination, regardless of the recorded response time. As for the most critical patients – those reported to 911 in cardiac or respiratory arrest—they were rarely resuscitated, even when our recorded response time was less than half of our 9 minute and 59 second standard.

After a while, my doubts turned into more serious questions about how we measured performance in dispatch, and prehospital care, in general. However, not being much into research at the time, I never completely realized that my questions were actually a series of interesting and timely study topics: When does paramedic response time make a difference in case outcome? If so, what is the critical time frame for response, and treatment? Which patient conditions are the most time critical? How accurate are emergency medical dispatchers (EMDs) at correctly identifying the highest priority, and lowest priority cases? What factors determine EMD accuracy? Are there other more important measures than paramedic response time that can predict improved survivability in cardiac arrest cases? What role does bystander CPR, or dispatcher-assisted telephone CPR instructions play? Also, was there even a standard definition for the term "response time"? And if response time was so critical, what about the time it took for the caller to recognize an emergency, pick up the phone, dial 911, speak to the primary PSAP calltaker, be transferred to a secondary PSAP, and speak to an EMD about the problem? All of this elapsed time was being discounted in our system, as was the time it took for the paramedics to actually make contact with the patient and begin treatment, after their "on scene" time had been recorded by the dispatchers. It's probably no coincidence that others with more knowledge and experience than me had already started asking many of these same questions.

Today of course, we have the benefit of some good research that has been done over the years since my time as a System Status Controller, and the answers to many of these questions are clearer to us now. For instance, we know that rapid response time has very little impact on improving patient outcomes – at least in the vast majority of patient conditions—including many cardiac arrests.[3, 4, 5] Further, much (mostly unpublished) data tells us that it takes much longer than 60 seconds to accurately process a call in the 911 center, ultimately inducing the NFPA to change its standard (NAED 2008-2012, unpublished).

As with any good body of research, the work already completed leads to more questions and scientific discussions about what is now known, how it should be applied in practice, and, of course, what new knowledge must we seek to answer the latest set of questions.

From a more global perspective, what I learned from my experience in 911 is that many of the assumptions we've made in the prehospital, emergency dispatch, and public safety professions—assumptions that drive many of our core standards and practices—are not based on sound evidence and rigorous research. In particular, emergency dispatch science is a young field with much to be learned. Now we are ready to explore this world with you, our valued readers and contributors, through the lens of our new research journal.

The beauty of the research we do in the field of emergency dispatch is that almost all of it has immediate, real-world application to an actual health care, prehospital, public health, or public safety practice that is being put to use every day in countless cities, towns, and counties around the globe. We can literally impact whole populations of people, including some of the most vulnerable and less fortunate among us: children, the elderly, the poor, and the chronically ill. So, with spirit and earnestness, let's begin.

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