The Scientific Evidence
When I began my literature search into the
science of SSM, I was surprised that there
was no scientific evidence to support the prac-
tice. All of the writings pertaining to SSM
were in EMS trade magazines or were written
as though the process was based on science.
Most were written by people who had a pro-
prietary interest in implementing the prac-
tice.34 The only numbers published relative
to SSM were from the city of Tulsa, OK. Fol-
lowing implementation of SSM, response
time dropped from 6 minutes, 46 seconds to
6 minutes, 9 seconds—a savings of 37 sec-
onds. However, this savings is clinically
insignificant, and furthermore, ambulance
maintenance costs were increased by 46% af-
after implementation of SSM because the
ambulance fleet was constantly on the road.4
In reality, it is impossible to predict where
and when calls will occur with any degree of
certainty. Historical data from a 20-week
interval, or even a one-year interval, are sta-
tistically insufficient to make any reasonable
prediction of call location or timing.
In preparing for this article, I discussed this
concept with two university-based statisti-
cians. One figured that it would take 20-40
years of historical data to make a reasonably
accurate probability prediction as to call lo-
cation and timing. The other stated that it
would probably take 100 or more years of
data before any predictions would approach
significance in terms of probability. He
likened it to predicting the weather. Even
with over 100 years of weather data, tempera-
ture predictions are still relatively inaccurate.
The meteorologists get close, but they are
rarely correct. And, predicting temperatures
is a lot less complicated than predicting EMS
calls. The statistical calculation necessary to
determine the probability of where and when
a particular EMS call will occur is massive
and would require a super computer to solve.
There are some meaningful data, but these
are often not integrated into SSM models.
Demand for EMS is higher for certain sub-
sets of the population. For example, persons
of low income are more likely to access EMS
than those of higher income. Likewise, elder-
ly patients are more likely to summon EMS
than their younger counterparts. Thus, the
demand will be greater in areas where there is
more poverty and more elderly. We can state
that the probability of an ambulance
responding to a nursing home, assisted-care
facility or neighborhood with a high percen-
tage of elderly residents is greater than in other
areas. Likewise, the probability of an ambu-

de-
lance responding to an impoverished neighborhood, public housing project or homeless shelter is greater than you would see in an affluent neighborhood. But, over the last two decades, there has been a federal and state mandate to relocate economically disadvantaged folks throughout the community rather than concentrating them in rows of public housing or "projects." This throws a wrench into predicting where the poor folks are. Finally, and this will be a great revelation for many, most traffic accidents occur on busy roadways. Thus, we can reasonably predict that the probability of an accident occurring on a major highway during morning rush will be greater than at midnight on a lonely neighborhood street. Do we really need a computer to tell us that we will have more EMS calls at nursing homes, in impoverished neighborhoods or on major thoroughfares during rush hour?

In an interesting study, researchers in Ontario, Canada, evaluated the impact of SSM on EMS personnel following its implementation. They found that SSM resulted in employees being forced to sit in idling or moving ambulances for extended periods of time. In fact, during a 12-hour shift, EMS personnel spent 56% of their time roaming or on standby (exclusive of responding to calls). After implementation of SSM, a survey found that 71% of EMTs and paramedics reported an increase in back pain, while 93% reported back pain or discomfort from simply sitting in the ambulance.

SSM is purported to: Optimize response times, maximize use of personnel and equipment (a cost-saving measure), increase skills retention by exposing personnel to a variety of calls, decrease potential for the EMS system to become "swamped," limit exposure to high-stress areas and provide a shorter travel distance to the scene. Whether these are true is open to conjecture. But I think I can safely say, as have others, that SSM does result in unrelenting and overly tight staffing schedules due to projected system demands and status.

It does not provide any significant leeway in the event of an MCI or disaster. In these cases, mutual aid must be obtained from neighboring agencies or personnel called in from home. Furthermore, with SSM, there is less chance that field personnel will have a "light shift" where they can relax, catch up on paperwork, stock the ambulance or review cases. It is important to remember that there is a lot more to EMS than simply running calls. One of the big problems is that you never have any real place to call home—a station where you can relax, grab a bite to eat, lie down, read, watch television, exercise or take care of basic human needs (shower, toilet, sink). This was evident to me one day when I stopped into a Texaco station in south Forth Worth where ambulance crews frequently "post." After fueling my car, I went into the bathroom. There, beside the toilet, was a copy of Emergency Medical Services Magazine.

It seems reasonable to assume that SSM increases work stress due to constantly changing assignments that make it harder for EMS providers to learn the geography of their response areas or become familiar with the neighborhoods they are entering. Furthermore, anticipating the call that never comes can also be stressful. I have known paramedics working in an SSM system who spent nine hours of an 11-hour shift in the ambulance, on the road, and were only dispatched to three calls. The rest of the time they were "hanging" or being relocated for coverage. Also, SSM causes an increase in vehicle maintenance and miles traveled. This is a real cost that must be considered by any EMS operation considering implementing SSM. Finally, and this may be among the most important factors, SSM discriminates against low-volume areas (read affluent, sparsely populated, away from major roadways) due to long response times. If the SSM system is operating as it should, ambulances should be constantly directed to perceived high-volume areas and away from low-volume areas. I'll bet that the taxpayers would not like to hear this! Is this practice really fair for EMS providers and consumers?

Conclusion

If you look through all of the SSM-related smoke and mirrors, you will see the true story. Fixed ambulance stations are costly. This is especially so if you make a commitment to respond to all service areas in a predetermined time, at least 90% of the time, or pay a monetary penalty. It costs nothing more than increased vehicle costs to "post" the ambulance at the Texaco station or the local 7-11 convenience store. Ambulances and personnel are much cheaper than fixed ambulance stations. Thus "high-performance" systems, most notably public utility models, use SSM, although others have adopted it or one of its variations. I can't document the following statement with science—but just with experience and emotion. I believe that employee satisfaction, morale and pay are generally lower in systems that use SSM, while employee turnover, stress and physical ailments are higher. If SSM is such a great deal, why has not a single major fire department adopted the practice? Phoenix, Los Angeles, Seattle, New York, Chicago, Dallas, Houston and virtually all other large U.S. fire departments use fixed stations for their fire and EMS operations. This is not to say they don't move assets around in response to system demand. But, they always have a home base. That is what I grieve most about SSM. As I think back to my career in EMS, some of the best days of my life were spent in ambulance and fire stations with friends and coworkers. We were kindred spirits. SSM has killed that camaraderie and that, my friends, is a shame.

Next Month: EMS Myth #8
Public Utility Models are the most efficient model for providing prehospital care

References


