

SwarmFest 2013

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Doing more with less? An Agent-Based Tale of Emergency Medical Services and Shrinking Budgets in Piedmont, Italy.

Abstract:

In Italy's Piedmont region, medical emergency coverage is taken care by the "118 Piemonte" EMS (Emergency Medical Service). First line intervention and lifesaving treatments are provided on-place by paramedics and physicians, transportation to Emergency Departments ensured in the least time; every year, half a million phone calls are answered, resulting in over 300.000 ground and air transports performed (as of data from 2011).

Speaking of shrinking budgets, health services are no exception: repeated rounds of cuts started to impact since a few years, and a macro-reorganization already affected Piedmont's EMS. What's been left out, till now, are many day-to-day activities, micro expenses, very difficult even to simply track, which, repeated over and over, make up for a sizeable share of the budget. Activities which, incidentally, constitute the EMS core.

Ground ambulance services, for instance, are completely outsourced, and provided by a plethora of different entities, ranging from the venerable "Croce Rossa Italiana", Italy's Red Cross, to tiny private cooperatives, operated by a few volunteers, perhaps owning a single vehicle. Different (very different, sometimes) price tags are attached to every provider, territorial competence is often fuzzy and overlapping areas are the norm. After triaging emergency calls, phone operators are supposed to take instantaneous decisions about sending the appropriate crew aboard the right vehicle on the scene. Needless to say, considerations about costs aren't a priority when life-saving interventions are required. Decisions about so-called "walking wounded", on the other hand, lend themselves to further evaluation: in such cases, a (cheaper) vehicle driven from a remote location and a paramedic would probably do the job. A doctor can be spared for an eventual, worse accident. To complicate things, different contractors operate under different terms, the extremes being a flat rate and a pay-per-call contracts.

As it stands now, an operator would deem the problem undecidable, lacking complete and accurate information on, besides other variables, costs.

Fortunately, detailed data about one year's worth of incoming phone calls has been made available, inclusive of times, diagnoses, street addresses. An agent-based model is being built upon those data, providing a valuable tool to investigate alternative cost-effective scenarios, and supplying guidance to operators and decision-makers, while keeping an eye on the money "saved" and the other on the consequences.

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