Who ya gonna call?

PRIORITY PARITY OR DISPATCH MISMATCH?

An ‘experiment’ in 911 call-processing & Fire first-response

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TWO SIMPLE OBJECTIVES

- Try and set a new all time low for bad Eagle jokes
- Spend a few minutes talking about something or other to do with EMS
BRIEF UPDATE FROM EAGLE CREEK
“YOU CAN’T JUST LEAVE THAT ‘LYIN THERE”
THAT’S NOT A ‘LYIN, THAT’S MY EAGLE’
Aggressive airway management
RAY FOWLER
LOTS OF MEDIA BUZZ
PREDICTIVE MODELING
Something or other to do with EMS

+ Calls come into 911
+ They get assigned a priority
+ Is it reasonable use those priorities to determine how your system responds?
+ You don’t have to do this in brute force fashion
A SNAPSHOT OF LOUISVILLE

- 16th largest city
  - 750k population
    - > 1 million during working hours
  - 384 square miles
  - 100k individual EMS calls-for-service

- Tiered 911 EMS response
  - 3rd-service EMS (BLS/ALS)
  - Fire first-response (BLS)
    - One urban fire district
    - 18 suburban fire districts
911 call processing

- MPDS Pro-QA
- A few-hundred major call-types
  - Over a-thousand once you count suffixes & modifiers
- 6 priority designations
  - ECHO, DELTA, CHARLIE, BRAVO, ALPHA, OMEGA
Prior to the new 3rd-service

- No universal standardized Fire response to EMS calls

Subsequently standardized using MPDS Pro-QA

Since then, Suburban Fire Districts have reduced responses

- ECHOs, some DELTAS & a few CHARLIES, etc

July 1, 2013, most SFDs ➔ ECHOs only (1% of all calls)

- Limited personnel and financial resources
- Focus on calls where “we can make a difference”

Good or bad idea?
CALL-TAKING AND DISPATCH 101

- Variety of call-processing platforms
  - MPDS/Pro-QA, APCO, Powerphone, etc.
- Assign a call-type and corresponding priority designation
- Sickest patients get the fastest/most appropriate response
  - Who goes first and what resources gets dispatched
    - BLS, ALS, or both; Fire, EMS, or both
- Use precious resources efficiently
  - Don’t divert resources to less sick patients when sicker ones are waiting
  - Don’t spend precious resources where they’re not needed
IN A PERFECT WORLD...

Louisville

- ECHO call-type would be highly ‘sensitive’
  - All cardiac/respiratory arrests typed & dispatched as ECHOs
  - No arrests categorized as lower priority call-types
    - Where they might not get the fastest response
  - Ideally, you want the

- ECHO call-type would be very ‘specific’
  - No lower priority non-arrests typed & dispatched as ECHOs
  - Patients who aren’t very sick don’t get a high-priority response
A LITTLE LIKE FISHING

- You’d want your net (ECHOs) to be fine enough to catch all the big ones (arrests) without letting any slip through.
- But you wouldn’t want the net (ECHO) to be so fine that you’d glom things by up catching all the little ones too (non-arrests).
The Sad Truth

No perfect 911 call-processing system

- 2nd, 3rd or 4th-party callers with limited to no medical training
- Communicate subtle findings by phone
- From an often difficult scene
- The difference between an arrest getting typed & dispatched as an ECHO vs. DELTA only a mouse click away
- Arrest taking last few agonal respirations perceived as ‘patient is breathing’ ➔ DELTA
- COPDer not in arrest, but about to stop breathing ➔ DELTA
BOTTOM LINE: WHAT WE TRIED TO EXPLAIN

CPR & defibrillation < 4-5 minutes

- EMS transport resources not designed for this
- Fire systems built to handle first-response
  - Battalions in every neighborhood/on every corner
  - Resources typically more available
    - Declining suppression demand
WHAT WE TRIED TO EXPLAIN

911 call-processing algorithm
- Never made to catch all arrests in highest priority type (ECHOs)
- ECHO not all that sensitive for arrests
- So, if you only send Fire on ECHOs, then many patients in cardiac arrest are never going to see a first-responder
- Lose valuable time in doing early CPR and rapid defibrillation
To add insult to injury

- For those who are about to, or already have stopped breathing (respiratory failure/arrest) some of those are going to become cardiac arrests without early aggressive airway intervention
- Bottom line: a whole lot of these cases are going to show up in a variety of other call-types (BRAVOs & CHARLIEs, as well as DELTAs)
DATA COLLECTION/ANALYSIS

July 1, 2012–June 30, 2013

- No matter how these calls get typed, prioritized & dispatched
- EMS crews verified patient in cardiac arrest/respiratory failure
- Query the EMS electronic patient care reporting system
  + Zoll RescueNet
- All patients who got CPR or assisted ventilations:
- “Arrests”
Correlated these runs with the 911 CAD system

- On how many was Fire 1°- dispatched?
- Based on this data, project how many will Fire be 1°- dispatched on when they go to ECHO-only
- How much delay is introduced when Fire is not 1°- dispatched?
Arrest Demand for Suburban Fire Districts before and after July 2013

- Total arrests in Suburban Fire Districts: 623
- Arrests primary dispatched before July 2013: 371 (59.55%)
- Arrests primary dispatched after July 2013: 149 (23.32%)
- Actual arrests responded on after July 2013: 512 (82.18%)
RESULTS

Cardiac & respiratory arrests by call-type & priority

- NON-ECHO: 76%
- ECHO: 24%
FIRST ON-SCENE RESPONSE TIME

Average response time to arrests by fire when primary dispatched: 5:31

Average response time to arrests by EMS: 8:52

Difference: 3:18
Arrest demand for Suburban Fire Districts before and after July 2013

Total arrests in Suburban Fire

- 623

Primary dispatched on before July 2013

- 371 (59.55%) primary dispatched on before July 2013

Primary dispatched on after July 2013

- 149 (23.32%) primary dispatched on after July 2013

Actual arrests responded on after July 2013

- 512 (82.18%) actual arrests responded on by Suburban Fire (primary & secondary dispatch)
and to add DOUBLE INSULT TO INJURY

+ Even though First-responders don’t get 1° dispatched on these non-ECHO cardiac and respiratory arrests
+ They’re still going to end up getting 2° dispatched once EMS arrives on-scene and calls for back-up
+ But now it’s a lost opportunity
SO WHAT DO YOU NEXT NEXT?

- How to pick-up more of these non-ECHO arrests?
- Without picking up too much demand?
- Do you just brute force it
  - Blindly starting adding on some or all of the DELTAs & maybe CHARLIEs too
- Or can you use our own data to tailor make your responses
- Focus specifically on those call-types where the really time sensitive calls---cardiac & respiratory arrests arrests hang-out?
Pick-out arrest call-types

Predicted added 911 call-volume & call-types required to pick-up NON-ECHO arrests

- 810 additional calls (10%)
- 3474 additional calls (45%)
- 9591 additional calls (124%)
- 23752 additional calls (308%)

Additional Pro-QA Call-types

# of Cardiac arrest & assisted ventilations
Completed a pilot
Currently negotiating picking up more demand, but in a more focused fashion, to pick up more arrests