Small Change : Big Reward
Data and Patient Care in Cardiac Arrest

Lucinda Klann BA, EMT-P
Analyst/state CARES coordinator
MN Resuscitation Consortium
National Data Director- HeartRescue Project
“The only way to improve a system is to measure what you are doing”

-Dr. Mickey Eisenberg
How does that translate in MN?
(we aren’t as fancy)

• In MN we say:
  – Measure- improve

-Measure- improve

• Measure- improve...

No matter how big your service, how state of the art your equipment- if you don’t continually measure and change and improve- you could be doing better.
So....We covered the obvious

- What does it really mean? And what should you measure?
- When you get it what should you do with it?
- Who can help??
What should you do with it???

• Considerations
  – Who is looking at your data?
  – What level will they understand?
  – What type of improvement are you looking for?

or

or
3 Fundamental Questions for Improvement

1. What are we trying to accomplish?

2. How will we know that a change is an improvement?

3. What changes can we make that will result in improvement?

And now implement a plan, do, study, act

Aims, Measures, & Tests of Change

When you combine the 3 questions with the...

PDSA cycle, you get...

...the Model for Improvement

What are we trying to accomplish?

How will we know that a change is an improvement?

What change can we make that will result in improvement?
Measurement is Central to the Ability to Improve

• The purpose of measurement in QI work is for learning not judgment!

• All measures have limitations, but the limitations do not negate their value for learning.

• You need a balanced set of measures to determine if the process has improved, stayed the same or become worse.
Understanding OHCA Data

Utstein criteria
Utstein Definition and Rational

“Survival from witnessed VF should be the main summary statistic of a community’s EMS system performance.”

Witnessed VF is the best way to achieve case equivalency across time and across communities because these arrest are the most likely to survive and present a uniform population or set of circumstances.
Overall data:

Overall survival from OHCA
Data

Overall survival from OHCA

Larger to Smaller
A different way to look at the same information

Another metric may be better...

Bystander CPR Rate
Use of Public Access Defibrillation
Return of ROSC in the field
Response times
Community Example:

![Community Example Chart]

- **Overall**: 3.6%
- **Utstein**: 20%

Year 2011
Data

2011: 3.60%
2012: 8%
2013: 25%

Overall: 50%
Utstein: 50%
Data

- 2011: 3.6%
- 2012: 8%
- 2013: 25%

Overall and Utstein data trends from 2011 to 2013.
THE DATA (try not to snooze)
What is that CARES thing?

CARES = Cardiac Arrest Registry to Enhance Survival

- 2004- CDC collaborated with Emory University & AHA to develop a registry that could help increase OHCA survival rates
- 2005- pilot tested CARES in the Atlanta metropolitan area
- Expanded to 6 additional metro sites the next year
- 2010 expanded into entire states (HeartRescue)
- 2013 there are approximately:
  - EMS Agencies: over 580
  - Hospitals: 1000 (close to 20% of all hospitals in the US)
  - 13 statewide registries
  - 55 communities in 23 states
Helping Communities Identify Opportunities for Improvement

- CARES helps local EMS administrators and community leaders answer such questions as:
  - Who is affected in my community?
  - When and where are cardiac events happening?
  - What parts of the system are working well?
  - What parts of the system could work better?
  - How can we improve emergency cardiac treatment?
MN CARES

CARES Case Volume

- 561 cases in 2010
- 801 cases in 2011
- 1,647 cases in 2012
- 1,778 cases in 2013
WHY should **you** care about CARES data?

- the odds of surviving an out of hospital cardiac arrest in MN vary from 0 - 50%
- disparities in outcome this extreme are unacceptable
- as more of MN participates in CARES, confidential benchmarking can occur
- We can start to dispel some long standing myths—“they all die”, “CPR doesn’t matter…”
- We can share best practices and can use data to bring funds to your community
  - AED, bystander CPR training, equipment
Data particulars

• 55 prehospital data points
  – 5-20 minutes to enter

• 10 hospital data points
  – 10-20 minutes to enter

• 2 types of data
  – CARES essential
    • ANYONE in CARES must complete and all audited
  – HRP essential
    • Only required for and audited for HRP
Common questions about the data

• Is it all inclusive? Almost...
  – Includes all ages
  – All etiologies except trauma are now collected

• What is a CARES case?
  • Out of hospital arrest, any etiology except trauma
  • EMS CPR or AED defib

• Why isn’t this research?
  • Not source data verified
  • QA/QI purposes
• Who can use the data and who decides?
  – A data sharing committee decides
    • Committee made up of members of the hospital and prehospital community, MRC data coordinator and medical director, CARES representative from Atlanta
  – Anyone can apply with a proposal for a de-identified, aggregate data set
Reports and new modules
### Demographics

#### Caros Demo

Presumed Cardiac Arrest Etiology: Presumed Cardiac Etiology, Unknown | Service Date: From 1/1/11 Through 12/31/2011 | Resuscitation Attempted by 911 Responders: Yes

#### Gender

- **Male:** 42.8%
- **Female:** 57.2%

#### Age

- **Total**
  - 20-29: 2
  - 30-39: 1
  - 40-49: 2
  - 50-59: 2
  - 60-70: 1
  - 70-79: 1
  - 80+: 1

#### Mean Age: 47.3

#### Location Type

<table>
<thead>
<tr>
<th>Location Type</th>
<th>Count</th>
</tr>
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<tbody>
<tr>
<td>Home/Residence</td>
<td>0 - 85.7%</td>
</tr>
<tr>
<td>Other</td>
<td>1 - 14.3%</td>
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<tr>
<td>Data</td>
<td>National</td>
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<tr>
<td>-------------------------------------------</td>
<td>----------</td>
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<tr>
<td>Age</td>
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<tr>
<td>Mean</td>
<td>86.2</td>
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<tr>
<td>Median</td>
<td>88.0</td>
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<tr>
<td>Gender (%)</td>
<td>N=15477</td>
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<tr>
<td>Female</td>
<td>3200 (20.5)</td>
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<tr>
<td>Male</td>
<td>9477 (61.4)</td>
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<tr>
<td>Race (%)</td>
<td>N=15138</td>
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<tr>
<td>American Indian/Alaskan</td>
<td>74 (0.5)</td>
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<tr>
<td>Asian</td>
<td>211 (1.4)</td>
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<tr>
<td>Black/African-American</td>
<td>3019 (20.3)</td>
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<tr>
<td>Hispanic/ Latino</td>
<td>777 (4.9)</td>
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<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td>120 (0.8)</td>
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<tr>
<td>White</td>
<td>5791 (37.5)</td>
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<tr>
<td>Unknown</td>
<td>4611 (30.5)</td>
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<tr>
<td>Location of Arrest (%)</td>
<td>N=15480</td>
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<tr>
<td>Healthcare Facility</td>
<td>923 (4.7)</td>
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<tr>
<td>Home/Residence</td>
<td>15416 (67.5)</td>
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<td>Industrial Place</td>
<td>74 (0.5)</td>
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<tr>
<td>Nursing Home</td>
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<tr>
<td>Other</td>
<td>314 (2.0)</td>
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<td>Place of Premarital Death</td>
<td>210 (1.4)</td>
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<td>Place of Premarital Death</td>
<td>1671 (64.7)</td>
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<tr>
<td>Street/Highway</td>
<td>778 (3.1)</td>
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<td>Transport Center</td>
<td>52 (0.3)</td>
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<td>Arrest witnessed (%)</td>
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<td>Bystander Witnessed</td>
<td>3204 (20.7)</td>
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<td>Witnessed by EMS</td>
<td>1481 (17.6)</td>
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<td>Unwitnessed</td>
<td>8105 (52.6)</td>
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<td>Who initiated CPR (%)</td>
<td>N=15480</td>
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<tr>
<td>Net Applicable</td>
<td>41 (2.7)</td>
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<td>Total Bystanders</td>
<td>5418 (35.3)</td>
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<tr>
<td>First Responder</td>
<td>3933 (25.2)</td>
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<td>Emergency Medical Services (EMS)</td>
<td>3629 (23.4)</td>
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<td>Was an AED applied prior to EMS arrival?</td>
<td>% N=15483</td>
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<tr>
<td>Yes</td>
<td>3773 (25.2)</td>
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<td>No</td>
<td>11607 (74.8)</td>
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<tr>
<td>Who first applied automated external defibrillator (%)</td>
<td>N=1590</td>
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<tr>
<td>Total Bystanders*</td>
<td>884 (17.7)</td>
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<td>First Responder</td>
<td>3170 (62.3)</td>
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<td>Who first defibrillated the patient (%)</td>
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<td>Net Applicable</td>
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<td>Total Bystanders*</td>
<td>206 (1.8)</td>
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<tr>
<td>First Responder</td>
<td>3043 (25.3)</td>
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<tr>
<td>Responding EMS Personnel</td>
<td>3273 (27.3)</td>
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<td>First Arrest Rhythm (%)</td>
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<td>VF/VT/Unknown Uncheckable Rhythm</td>
<td>3200 (20.8)</td>
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<td>Asystole</td>
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<tr>
<td>Nonsustained PACED</td>
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<td>Unknown Uncheckable Rhythm</td>
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<td>Sustained NSRAC (%)</td>
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<tr>
<td>Yes</td>
<td>4752 (29.7)</td>
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<tr>
<td>No</td>
<td>10716 (66.3)</td>
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<td>Was hypothermia care provided in the field (%)</td>
<td>N=15485</td>
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<tr>
<td>Yes</td>
<td>1959 (12.7)</td>
</tr>
<tr>
<td>No</td>
<td>13526 (87.3)</td>
</tr>
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</table>
New modules and Reports

Dispatch Module
- 2 MN agencies participating
- Useful for internal benchmarking
- Interesting data being uncovered
- Providing platform for discussion

In hospital hypothermia or TTM
- In beta testing
- Can be used to track in hospital arrests as well as OHCA
- May prove useful for MN hospitals wishing to track in hospital arrests
Reports

- Working on more user friendly reporting ability (create your own reports)
- Adding ability to run by FR, city, etc.
- Reports committee meeting in a week- will know more
- New Hospital report- compares your hospital to national data and state data (by request)
Some interesting facts for 2013 (MN)

- 1418 Cardiac CARES cases
- 32% female
- 70% occurred at home
- 7% occurred in NH
- 46% bystander witnessed (39% national)
- 36% rec’d bystander CPR (40% national)
- 9% bystander AED (17.5%)
- 2% bystander shock (2%)
- 32% VF/VT/shockable (23%)
- 16% field hypo (15.5%)
- 45% died in field (27.5%)
- 27.5% admitted (27.5%)
- 12.5% dc with good cpc (8%)
- 39% Utstein survival (33%)
WHY I HAVE THE BEST JOB!

• I have the privilege of spending my time with Minnesota’s finest
• I have been so impressed- from the smallest hospitals and services to the largest
• Dedicated, hard working people!
• THANK YOU!
Questions?

This life was saved by someone who knew CPR.