Pitfalls to Avoid When Evaluating Programs Targeting High ED Utilizers

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Literature

3 studies have estimated the "impact" of Navigation programs
All 3 studies use a one-group pre/post research design

Results
• ED visits decreased by 28% (Tadros et al. 2012)
• EMS transports decreased by 32% (Rinke et al. 2012)
• EMS responses decreased by 54% (Tangherlini et al. 2016)

Limitations: "This "regression to the mean" could introduce bias [in favor of "bene-fit] since this study did not employ case controls."
Austin/Travis County - Study Design

Classic pre/post with comparison group
– Also used treatment group as own controls

Enrollment Period: Jan 2013 – Sept 2015
ED visits, some demographic variables (age, gender, etc.)
Unit of Analysis = Patient-months

Pre/Post Dividing Line
– Program enrollees => start date
– Comparison group => Sept 26, 2012

Comparison Group (1,386 patients)
– 2+ ED visits in 30-day period within previous year AND 1+ chronic conditions; OR
– 1+ ED visit within previous year AND 2+ chronic conditions
– Travis County resident
– Medicaid, MAP, or unfunded

Treatment (CHP) Group (603 patients)
– 2+ chronic conditions
– Travis County resident
– Medicaid, MAP [Medical Access Program], or unfunded

Preliminary Results
• If simply compare 1yr pre-post:
  – 26.3% reduction in ED visits among 603 patients

  – But let’s look under the hood …

Preview of Results – CHP Group

Fig 1: Avg Number of ED Visits Per Period (1YR Pre/Post)

26.3% decrease
(1YR pre/post)
Results – Comparison Group (n=1,386)

• Comparison group patients with 2+ ED visits during the 30-day period prior to Sept 26, 2012 “returned to normal” immediately (n = 1,386).

Fig 4: Avg Number of ED Visits Per Period (1YR Pre/Post)

31.1% decrease (1YR pre/post)

Results – Comparison Group (100 Sickest)

• 100 sickest comparison group patients with 2+ ED visits during the 30-day period prior to Sept 26, 2012 “returned to normal” immediately.

Fig 5: Avg Number of ED Visits Per Period (1YR Pre/Post)

22.9% decrease (1YR pre/post)

Bottom Line

Program enrollees very likely would have improved anyway.

- Bad luck => reversion to mean
- Bad health => alternative social services
Regression to the Mean

- Things tend to even out over time
- Makes natural variation look like a Positive Result
- KEY POINT: Affects any study in which patient selection is based on the same variable as is being measured as an outcome.

Strategies to Avoid Regression to the Mean Pitfall

Quasi Experimental vs Experimental Design

- Is random assignment used? yes no
- Is there a control group or multiple measures? yes no
- Quasi-experiment
- Non-experiment
Option 1: Add a Comparison Group

**Non Equivalent Group Design**

“Difference in Differences” Study Design

Option 2: Take More Measures

**Time Series Design**

From: Regression to the mean: what it is and how to deal with it.
Int J Epidemiol | IJE vol.34 no.1 © International Epidemiological Association 2004, all rights reserved.
Option 3: Staggered Introduction of Intervention