



Using ACG Output as Control Variables in Program Evaluations

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Background

■ Medica

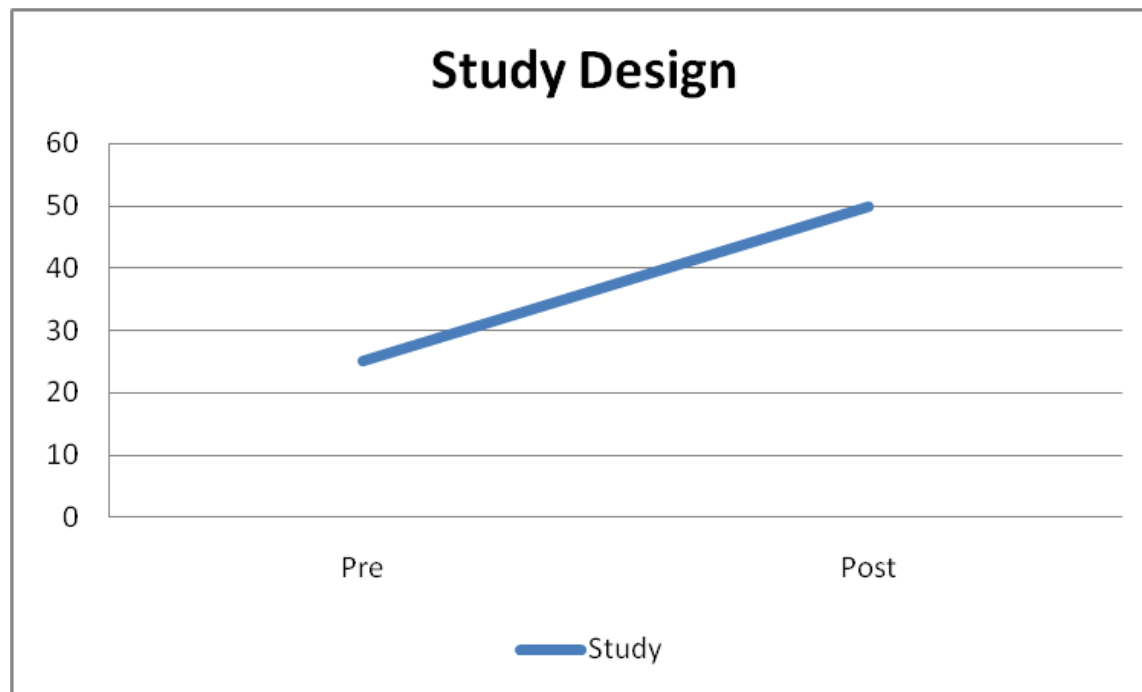
- Regional health plan
- Many internal & external health management programs
- Require evaluations & analysis to determine which programs should:
 - Continue
 - End
 - Expand / change

Study #1: Overview

- Medica has been partnering with area provider groups to provide care coordination in the clinics, at the point of care
- Program evaluation measured the effectiveness of the pilot programs
- Outcome variables included:
 - Cost
 - Inpatient, outpatient, ER, pharmacy etc.
 - Utilization
 - Inpatient stays, outpatient visits, utilization of specified procedures, RX fills, etc.

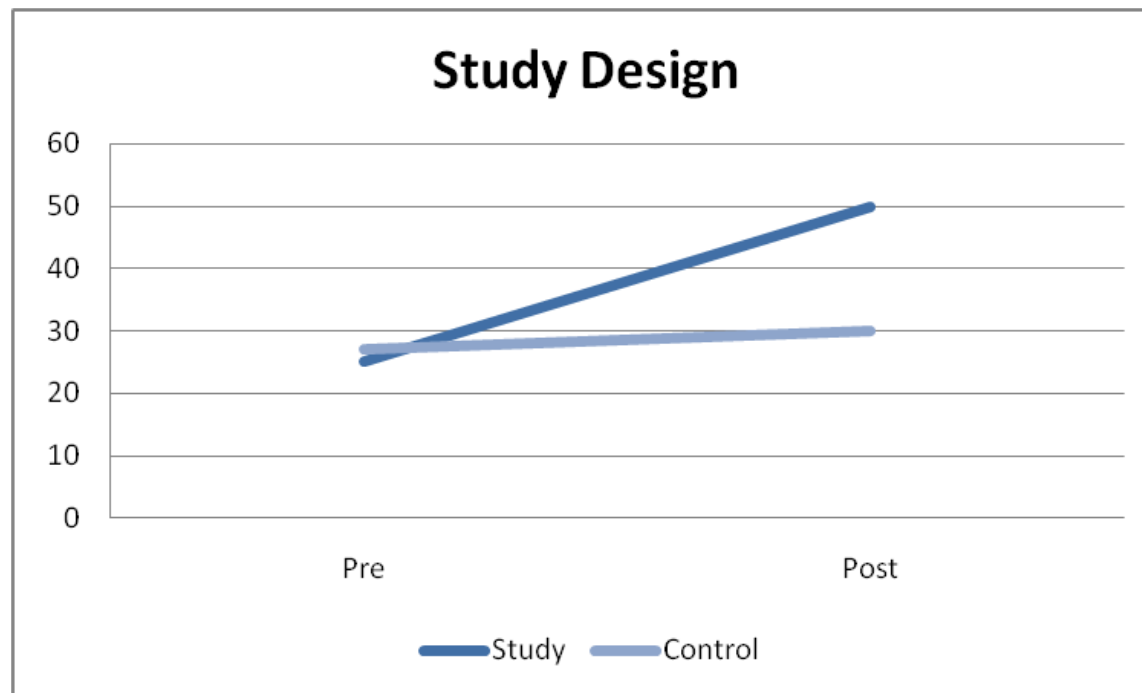
Study #1: Method

- Compared the trend of the *study sample*



Study #1: Method

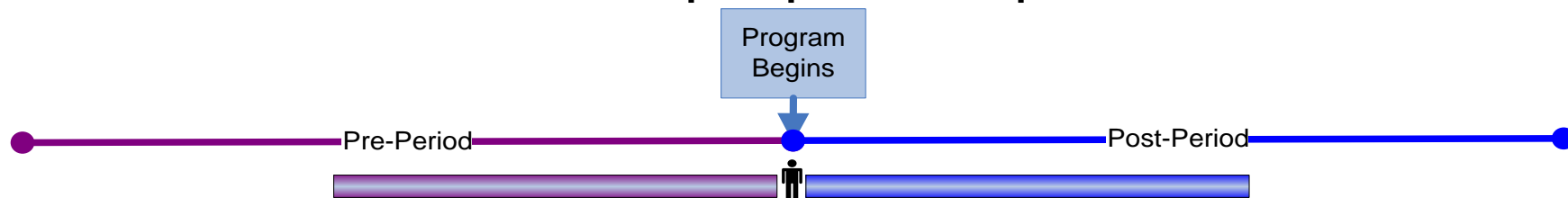
- Compared the trend of the *study sample* to the trend of the *control sample*.



See Nyman, Barleen & Dowd (2009) for an example of the use of a difference-in-difference model for program evaluation.
See Bertrand, Duflo & Mullainathan (2004) for caveats in using this methodology.

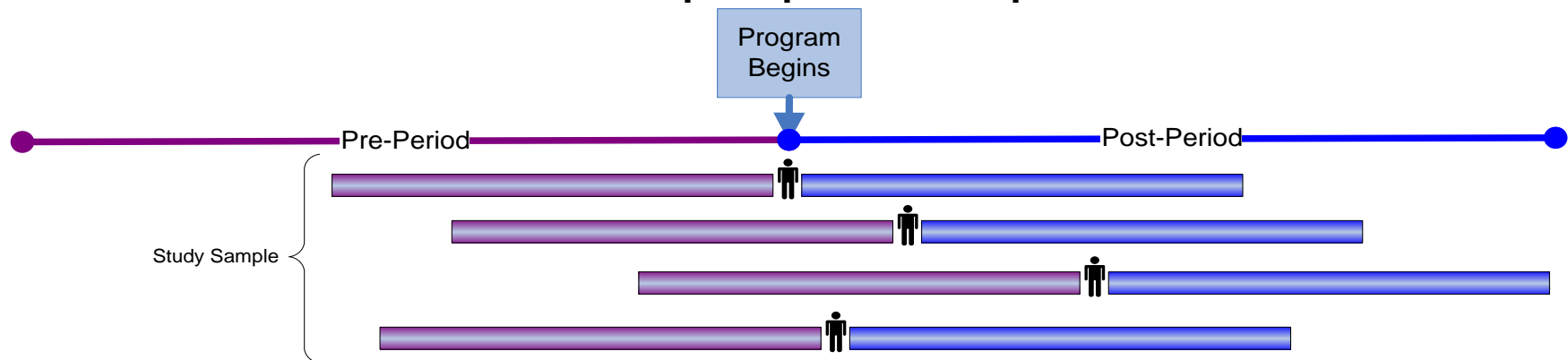
Study #1: Method

- Created a customized input file using each study and control member's unique pre and post timelines.



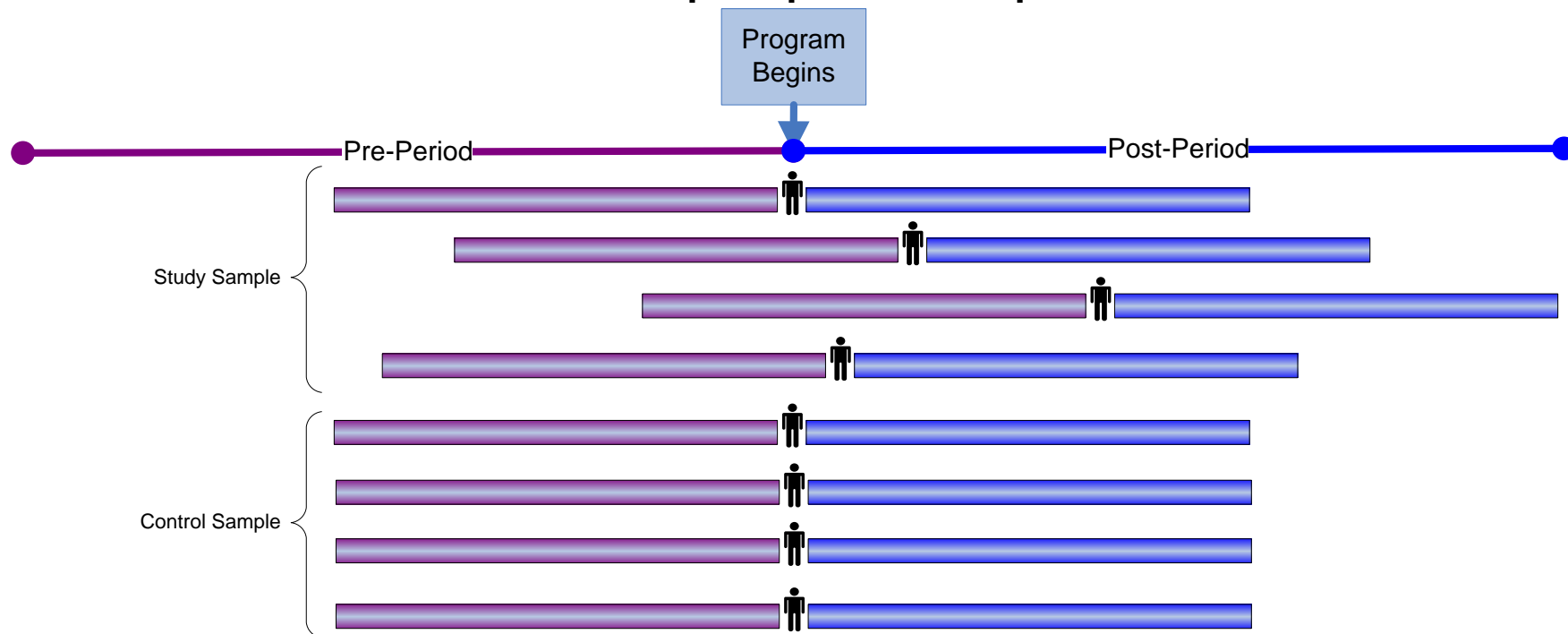
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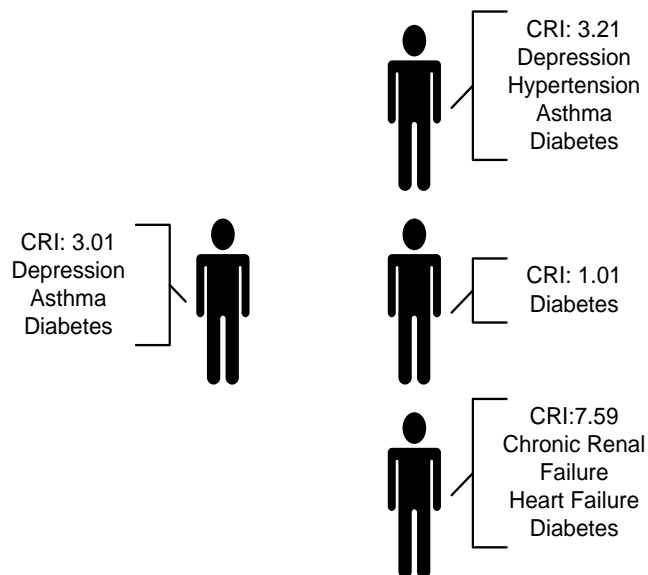
- Created a customized input file using each study and control member's unique pre and post timelines.



- Pre-period input file was run through version 8.2

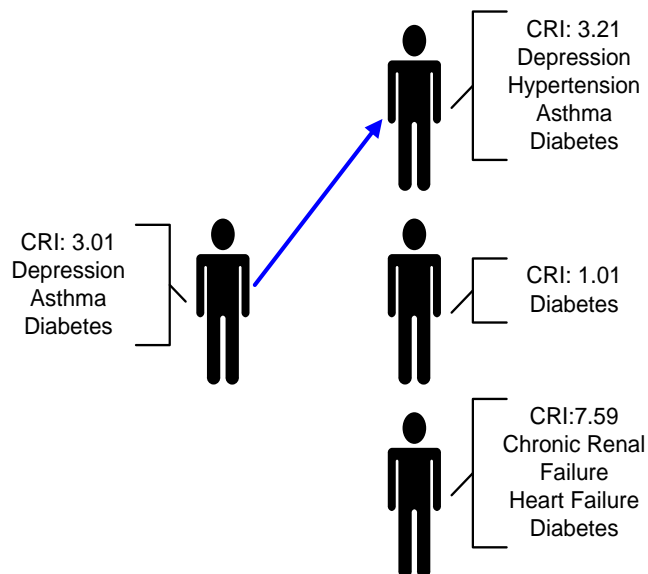
Study #1: Method

- Study members matched to control members using pre-period ACG output.
 - Each study member was matched to the control member who is most similar on specified variables.



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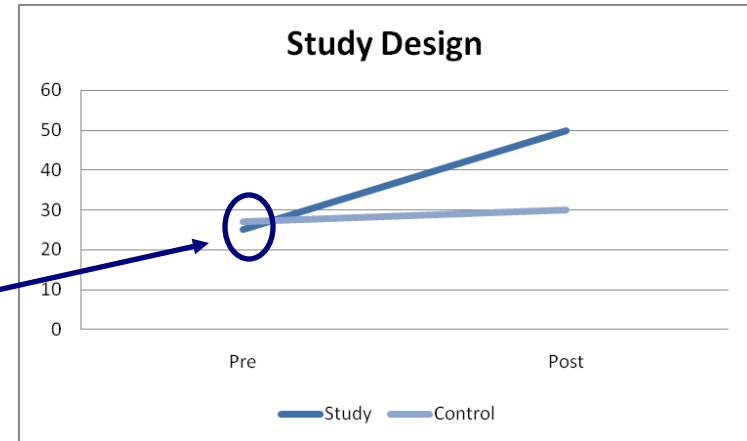
Study #1: Method

- 670 study & 670 matched control members

Variable	Study	Control
# Members	670	670
Average Age	56	56
% Male	53%	53%
# Chronic Conditions	3.24	3.14
Average CRI	4.98	4.81
% Frail	8%	8%
# Hospital Dominant Conditions	0.16	0.15

Study #1: Analysis

- Matching helped ensure the study and control groups were equivalent in the pre-period.
- However, differences can persist:
 - Unmeasured / unanticipated variables
 - Impossible to match perfectly
- ACG output and other pertinent variables were used as control variables in the multivariate logistic regression analyses used to determine outcomes.
 - Allowed us to determine each variable's impact on outcomes.



Study #1: Results

- Older age associated with greater cost savings (negative trend)
- Having more chronic/ hos. dom. conditions and higher predicted risk associated with less savings.

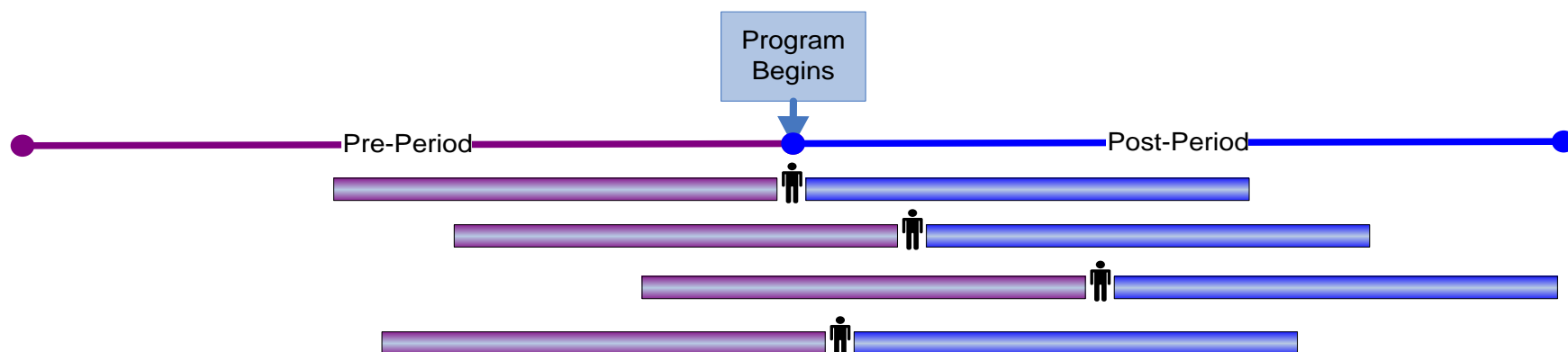
Variable	Impact	Sig.
Age	Neg	<.0001
Frailty	Pos	<.0001
# Hospital Dominant Conditions	Pos	<.0001
# Chronic Conditions	Pos	<.0001
Renal Failure	Pos	<.0001
CRI (predicted risk)	Pos	<.0001

Study #2: Overview

- Analysis to examine factors associated with engagement and retention in one of Medica's internal Health Management programs.

Study #2: Method

- Created a customized input file using each study and control member's unique pre and post timelines.



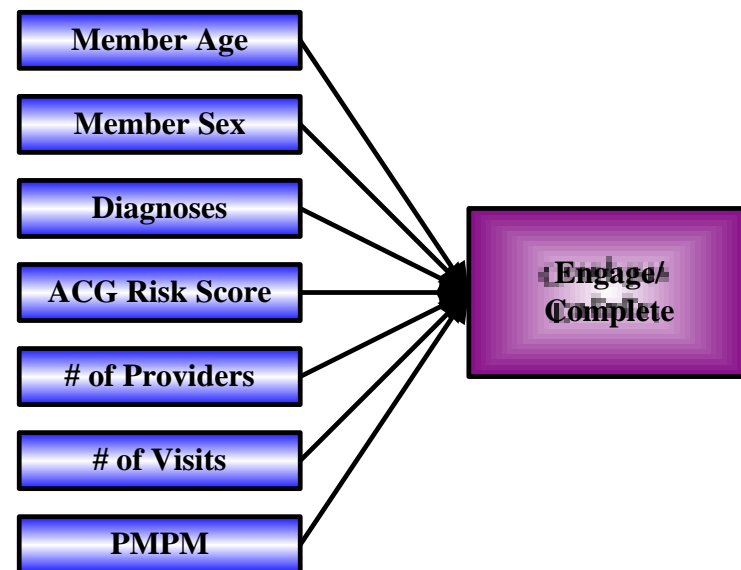
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Study #2: Method

- Two outcome measures were dummy-coded:
 - Engagement
 - 0 = Identified for program, did not engage
 - 1 = Identified for program, did engage
 - Complete
 - 0 = Disenrolled from program prior to completion
 - 1 = Completed program

Study #2: Analysis

- ACG output and other pertinent variables were included as independent variables in 2 multivariate logistic regression analyses.
 - Allowed us to determine each variable's association with engagement and program completion.



Study #2: Results

■ Engagement

- Men were less likely to engage in the program
- Members with chronic conditions were more likely to engage.

Characteristic	Odds Ratio	p-Value
Male Member	0.77	<.0001
Frailty	1.34	<.0001
Asthma	1.14	0.002
Arthritis	1.26	<.0001
CHF	1.21	0.01
COPD	1.31	0.002
CRF	1.56	0.05
Depression	1.23	<.0001
Diabetes	1.12	0.009
Hyperlipidemia	1.27	<.0001
Hypertension	1.19	<.0001
Ischemic Heart Disease	1.23	0.001
Low Back Pain	1.11	0.003

Study #2: Results

■ Program Completion

- Members with higher predicted risk were more likely to complete the program.
- Members with depression were more likely to disenroll prior to completion.

Characteristic	Odds Ratio	p-Value
Male Member	1.16	0.22
Frailty	1.2	0.28
<i>Unscaled Pred. Risk</i>	1.06	0.0002
Asthma	0.95	0.72
Arthritis	1.21	0.16
CHF	1.4	0.13
COPD	1.21	0.46
CRF	2.91	0.06
Depression	0.62	<.0001
Diabetes	1.1	0.52
Hyperlipidemia	1.17	0.17
Hypertension	1.4	0.004
Ischemic Heart Disease	1.66	0.005
Low Back Pain	0.83	0.13

Conclusions

- ACG grouper was successfully used in 4 ways:
 1. To create customized output files based on members' individual timelines
 2. To match study members to control members
 3. To statistically control for individual differences in risk and comorbidity
 4. To assess factors that are associated with outcome variables