

Qualitative Comparative Analysis and Implementation Research: An Introduction

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January 7, 2016

QCA CyberSeminar: Overview

- I. Introduction to QCA (Miech)
- II. Applying QCA Within A Study (Miech)
- III. Applying QCA Across Multiple Studies (Damschroder)
- IV. Comments and Q&A (Both)
- V. Final Reflections (Both)

Poll Question #1

Where do you consider to be your primary area(s) of expertise in terms of methods? (as a researcher or as a consumer of research) (may select more than one)

- Qualitative Research
- Quantitative Research
- Mixed Methods
- QI, Lean, Systems Engineering, Process Improvement
- Other/Not Applicable

Poll Question #2

What do you consider to be your primary affiliation(s)? (may select more than one)

- VA
- University
- Government (other than VA)
- Research Institute
- Other

Poll Question #3

When did you first hear about Qualitative Comparative Analysis?

- Never heard of it until very recently
- 2015 (before hearing about this CyberSeminar)
- 2014
- 2013 or earlier

Poll Question #4

How would you describe your current level of familiarity with Qualitative Comparative Analysis?

- None
- Have heard a little about QCA
- Familiar with basic approach but have not yet used QCA
- Applied QCA in own work in informal, exploratory way
- Applied QCA in own work in formal, extended way

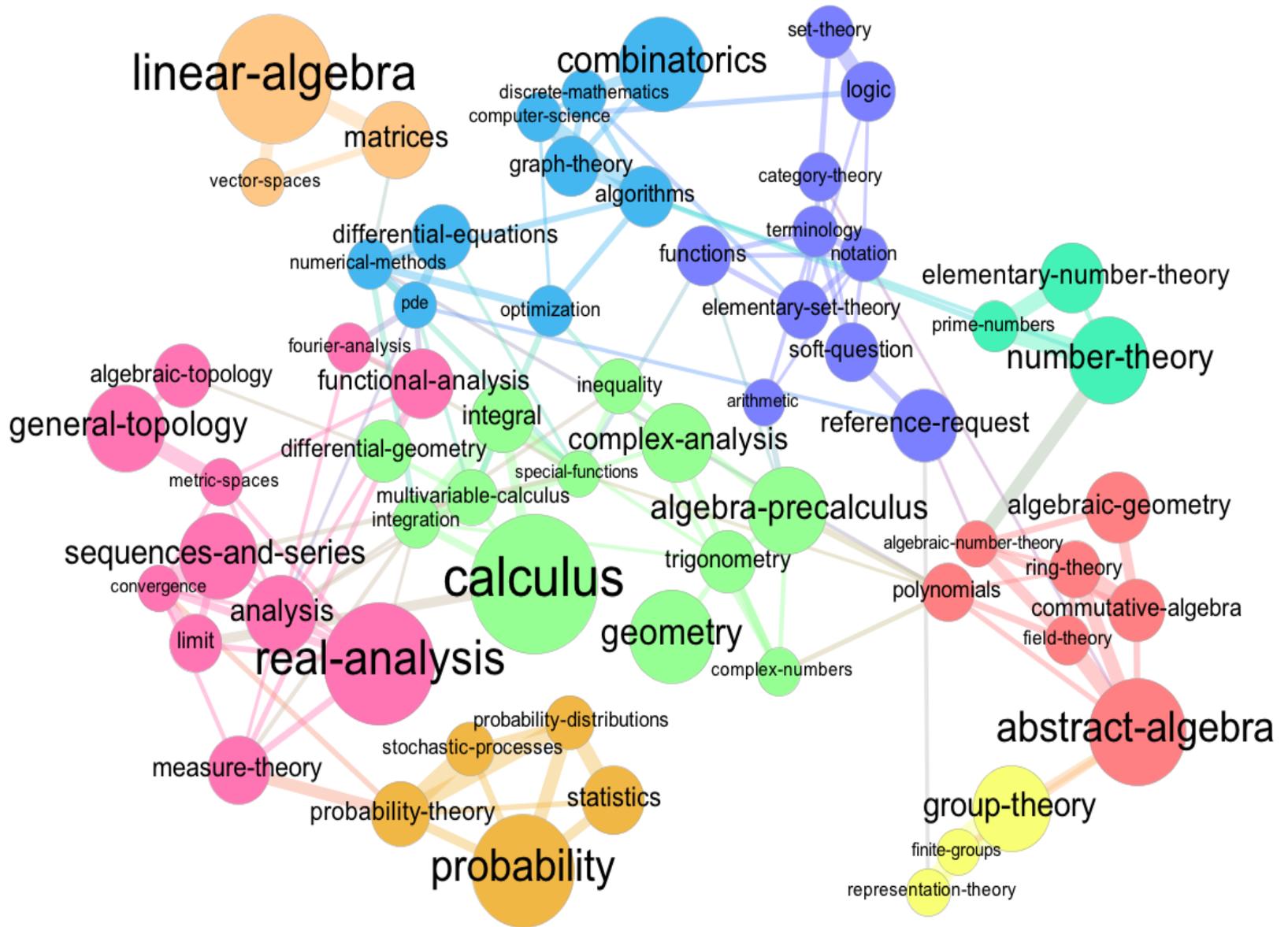
Poll Question #5

How would you describe your current level of interest in Qualitative Comparative Analysis?

- Not very interested
- Somewhat interested
- Interested
- Extremely interested

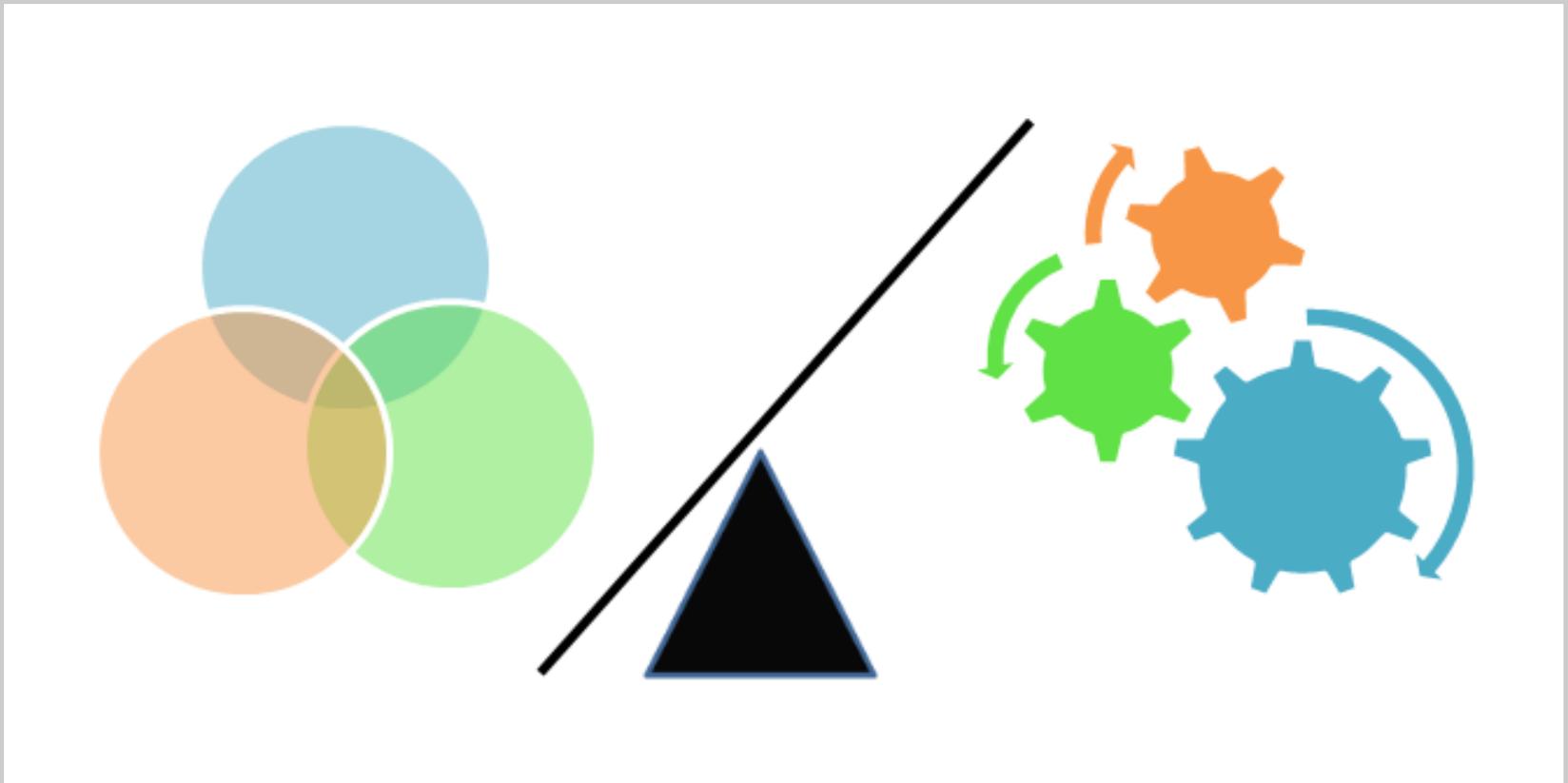
Qualitative Comparative Analysis

- Can identify combinations of conditions that directly and explicitly connect with an outcome
- Well-established method that has been in use since the 1980s, especially in political science
- Numerical method for case-oriented research that requires close familiarity with the qualitative dataset of interest
- Uses Boolean algebra, NOT correlations
- Suited for small-N and intermediate-N studies



• Source: <http://i.stack.imgur.com/sL17t.png>

Determine Necessary & Sufficient Conditions for Change To Occur



Qualitative Comparative Analysis

- Uses numbers to represent "membership" in a defined group or set
 - not an interval-level measurement of a dimensional property like height, weight, or length
- Offers a “third way” to analyze data that both complements and draws upon traditional qualitative and quantitative approaches focuses on cases, conditions, and combinations (rather than variables)

Qualitative Comparative Analysis

- Answers research questions like "What combinations of conditions directly connected to the outcome of interest, such that cases with those specific combinations also always had the outcome present?"
- Example of “configurational causality” where outcomes consistently emerge from specific combination of conditions

Qualitative Comparative Analysis

- QCA systematically reveals direct, explicit connections between specific conditions - including combinations of conditions - and implementation outcomes
- Researchers use set-theoretic methods to discern real-world “solutions” based on the observed data that directly link particular configurations of conditions to outcomes with optimal coverage and consistency

Qualitative Comparative Analysis

- Researchers employ both their case knowledge as well as specialized QCA software when iteratively assessing different conditions and combinations
- Researchers discern real-world solutions that link conditions with outcomes
- QCA can yield surprising and unexpected results

Qualitative Comparative Analysis

- Allows for complex causality, where specific conditions can combine together to exert a joint causal influence
 - Investigators may be surprised that a specific condition by itself does not consistently track with implementation success but does when combined with another particular condition
- QCA allows for equifinality, where multiple solutions can lead to the same implementation outcome
 - Researchers may not have expected to find multiple pathways to implementation success in their dataset

Qualitative Comparative Analysis

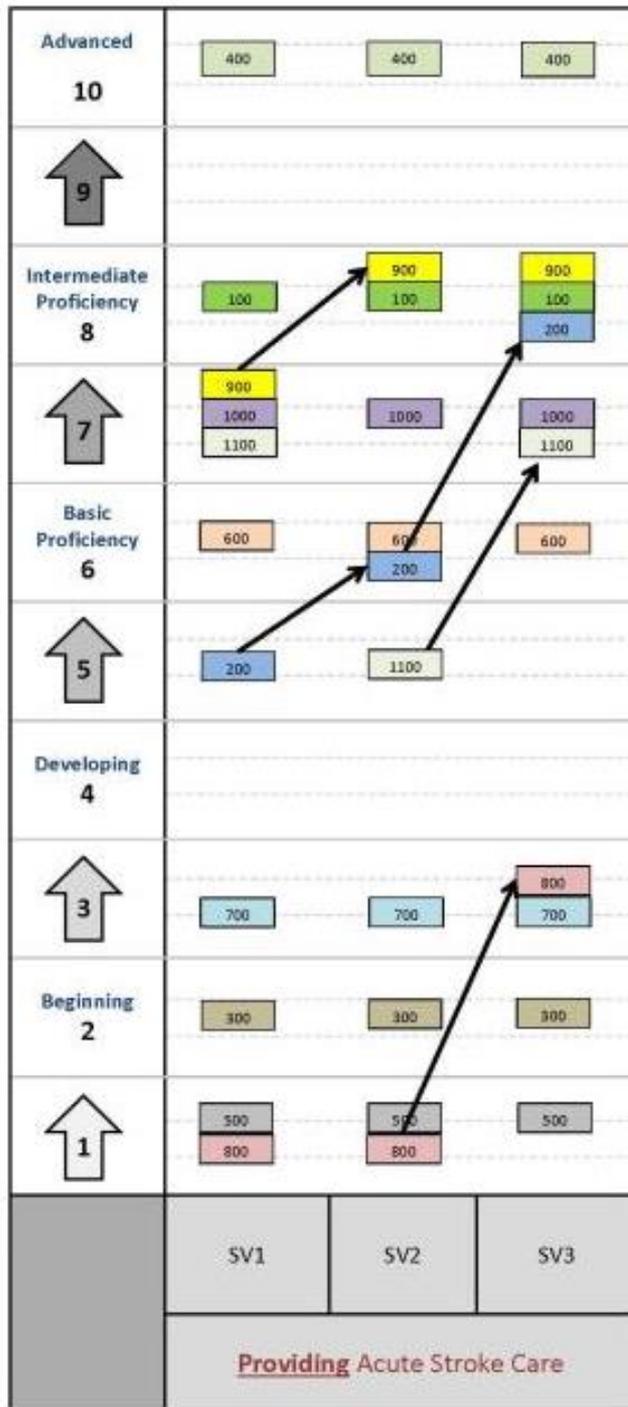
- Crisp Set QCA
- Fuzzy Set QCA

QCA Within-Study Example: RE-INSPIRE

- VA QUERI SDP #11-190 (funded by VA QUERI Program)
- Prospective, longitudinal study of acute stroke care at 11 VAMCs around the United States
- Annual site visits at all 11 VAMCs for 3 years: 2012-2015
- 33 in-person site visits, 300+ interviews, 150+ participants

QCA Within-Study Example: RE-INSPIRE

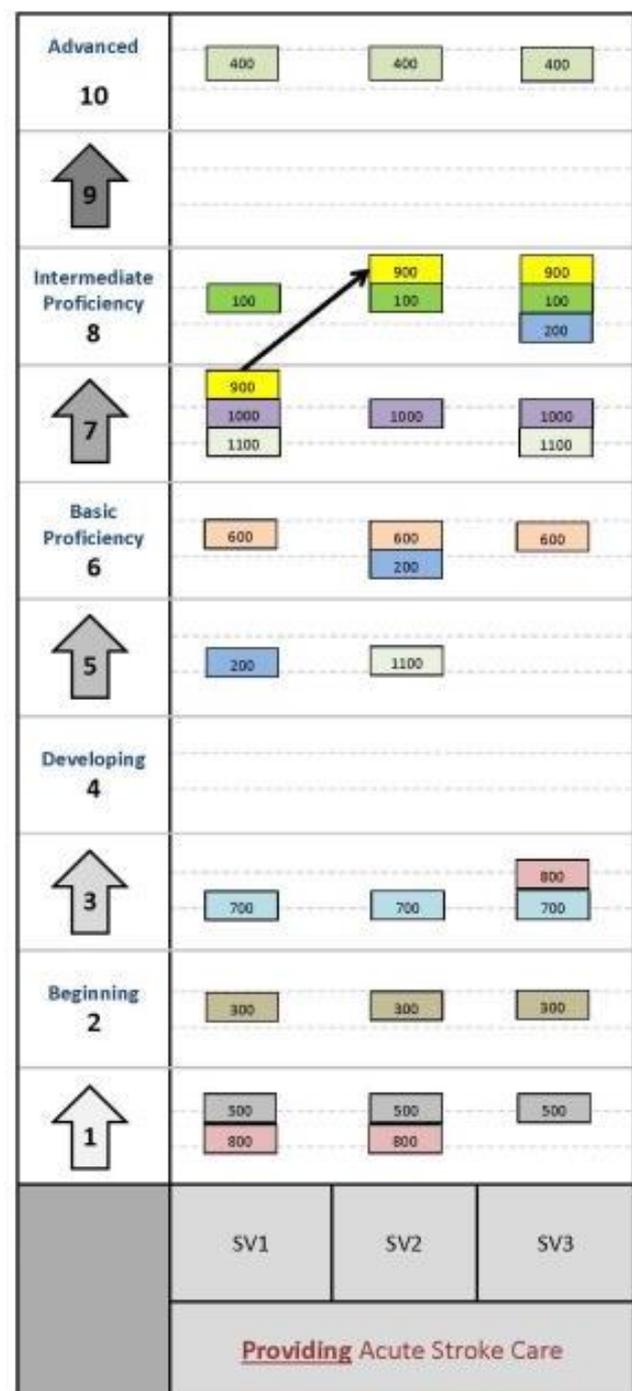
- Special emphasis on the influence of local context on how acute stroke care was organized at VAMCs and the way change process unfolded over time
- Multiple Analytic Strategies
 - Qualitative
 - Mixed Methods
 - Qualitative Comparative Analysis



	900_SV1	900_SV2
OUTCOME	7	8
Cosmo	1	1
Ext. Pol	1	1
Structural	1	2
Networks	1	1
Culture	0	1
Tension	1	1
Goals	0	0
Lrng Climate	1	1
Ldrshp Engmt	1	1
Access Info	0	1
Self-eff	1	1
Ident w/Org	1	1
Planning	1	2



TOTAL 22 CFIR Constructs



CFIR Scoring

+2 = construct had strong positive influence on implementation

+1 = construct had weak to moderate positive influence

0 = construct present but no discernible influence

-1 = construct had weak to moderate negative influence

-2 = construct had strong negative influence on implementation

	900_SV1	900_SV2	DIFF
OUTCOME	7	8	1
Cosmo	1	1	0
Ext. Pol	1	1	0
Structural	1	2	1
Networks	1	1	0
Culture	0	1	1
Tension	1	1	0
Goals	0	0	0
<u>Lrng Climate</u>	1	1	0
<u>Ldrshp Engmt</u>	1	1	0
Access Info	0	1	1
Self-eff	1	1	0
<u>Ident w/Org</u>	1	1	0
Planning	1	2	1



|TOTAL 22 CFIR Constructs

	OUTCOME	Cosmo	Ext. Pol	Structural	Networks	Culture	Tension	Rel. Priority
100_D1-2	0	0	0	1	1	1	0	0
100_D2-3	0	1	0	0	0	0	0	0
200_D1-2	1	0	-1	0	0	0	-1	-1
200_D2-3	2	1	0	1	0	0	0	0
300_D1-2	0	2	0	1	1	0	-1	1
300_D2-3	0	0	0	-1	0	1	1	0
400_D1-2	0	0	1	0	0	0	0	0
400_D2-3	0	0	0	0	0	0	0	0
500_D1-2	0	0	0	-1	0	0	0	-1
500_D2-3	0	-1	1	0	0	-1	0	1
600_D1-2	0	0	0	1	0	0	0	0
600_D2-3	0	0	0	0	0	0	0	0
700_D1-2	0	0	0	0	0	-1	0	0
700_D2-3	0	0	0	0	0	-1	-1	-1
800_D1-2	0	0	0	-1	0	1	0	0
800_D2-3	2	0	0	1	1	0	0	3
900_D1-2	1	0	0	1	0	1	0	-1
900_D2-3	0	0	-1	0	0	-1	0	0
1000_D1-2	0	1	1	0	1	1	0	1



	OUTCOME	Cosmo	Ext. Pol	Structural	Networks	Culture	Tension	Rel. Priority
100_D1-2	0	0	0	1	1	1	0	0
100_D2-3	0	1	0	0	0	0	0	0
200_D1-2	1	0	-1	0	0	0	-1	-1
200_D2-3	2	1	0	1	0	0	0	0
300_D1-2	0	2	0	1	1	0	-1	1
300_D2-3	0	0	0	-1	0	1	1	0
400_D1-2	0	0	1	0	0	0	0	0
400_D2-3	0	0	0	0	0	0	0	0
500_D1-2	0	0	0	-1	0	0	0	-1
500_D2-3	0	-1	1	0	0	-1	0	1
600_D1-2	0	0	0	1	0	0	0	0
600_D2-3	0	0	0	0	0	0	0	0
700_D1-2	0	0	0	0	0	-1	0	0
700_D2-3	0	0	0	0	0	-1	-1	-1
800_D1-2	0	0	0	-1	0	1	0	0
800_D2-3	2	0	0	1	1	0	0	3
900_D1-2	1	0	0	1	0	1	0	-1
900_D2-3	0	0	-1	0	0	-1	0	0
1000_D1-2	0	1	1	0	1	1	0	1



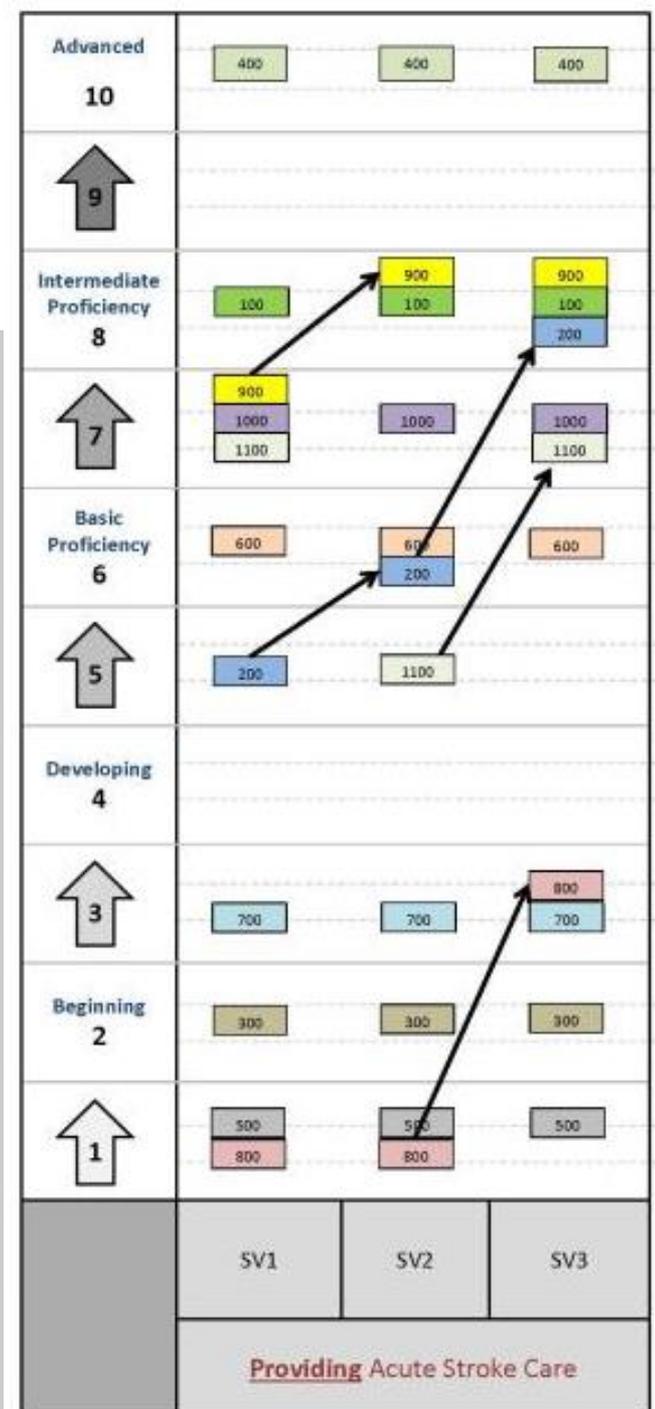
	OUTCOME	Cosmo	Structural	Reflect&Eval	Networks	Culture	Rel. Priority
200_D2-3	2	1	1	1	0	0	0
800_D2-3	2	0	1	0	1	0	3
1100_D2-3	2	1	0	1	-1	0	0
200_D1-2	1	0	0	1	0	0	-1
900_D1-2	1	0	1	0	0	1	-1
100_D1-2	0	0	1	0	1	1	0
100_D2-3	0	1	0	0	0	0	0
300_D1-2	0	2	1	-1	1	0	1
300_D2-3	0	0	-1	0	0	1	0
400_D1-2	0	0	0	0	0	0	0
400_D2-3	0	0	0	0	0	0	0
500_D1-2	0	0	-1	-1	0	0	-1
500_D2-3	0	-1	0	0	0	-1	1
600_D1-2	0	0	1	0	0	0	0
600_D2-3	0	0	0	0	0	0	0
700_D1-2	0	0	0	0	0	-1	0
700_D2-3	0	0	0	0	0	-1	-1
800_D1-2	0	0	-1	0	0	1	0
900_D2-3	0	0	0	0	0	-1	0
1000_D1-2	0	1	0	0	1	1	1



	OUTCOME	Cosmo	Structural	Reflect&Eval	Networks	Culture	Rel. Priority
200_D2-3	2	1	1	1	0	0	0
800_D2-3	2	0	1	0	1	0	3
1100_D2-3	2	1	0	1	-1	0	0
200_D1-2	1	0	0	1	0	0	-1
900_D1-2	1	0	1	0	0	1	-1
100_D1-2	0	0	1	0	1	1	0
100_D2-3	0	1	0	0	0	0	0
300_D1-2	0	2	1	-1	1	0	1
300_D2-3	0	0	-1	0	0	1	0
400_D1-2	0	0	0	0	0	0	0
400_D2-3	0	0	0	0	0	0	0
500_D1-2	0	0	-1	-1	0	0	-1
500_D2-3	0	-1	0	0	0	-1	1
600_D1-2	0	0	1	0	0	0	0
600_D2-3	0	0	0	0	0	0	0
700_D1-2	0	0	0	0	0	-1	0
700_D2-3	0	0	0	0	0	-1	-1
800_D1-2	0	0	-1	0	0	1	0
900_D2-3	0	0	0	0	0	-1	0
1000_D1-2	0	1	0	0	1	1	1

	Impl Outcome	Reflect&Eval	Goals	Planning	Structural
200_D2-3	1	1	1	0	1
800_D2-3	1	0	1	1	1
1100_D2-3	1	1	1	1	0
200_D1-2	1	1	0	0	0
900_D1-2	1	0	0	1	1
100_D1-2	0	0	1	0	1
100_D2-3	0	0	0	0	0
300_D1-2	0	0	0	0	1
300_D2-3	0	0	0	0	0
400_D1-2	0	0	0	0	0
400_D2-3	0	0	0	0	0
500_D1-2	0	0	0	0	0
500_D2-3	0	0	1	1	0
600_D1-2	0	0	0	0	1
600_D2-3	0	0	1	0	0
700_D1-2	0	0	0	0	0
700_D2-3	0	0	0	0	0
800_D1-2	0	0	0	1	0
900_D2-3	0	0	0	0	0
1000_D1-2	0	0	0	1	0

	Impl Outcome	Reflect&Eval	Goals	Planning	Structural
200_D2-3	1	1	1	0	1
800_D2-3	1	0	1	1	1
1100_D2-3	1	1	1	1	0
200_D1-2	1	1	0	0	0
900_D1-2	1	0	0	1	1
100_D1-2	0	0	1	0	1
100_D2-3	0	0	0	0	0
300_D1-2	0	0	0	0	1
300_D2-3	0	0	0	0	0
400_D1-2	0	0	0	0	0
400_D2-3	0	0	0	0	0
500_D1-2	0	0	0	0	0
500_D2-3	0	0	1	1	0
600_D1-2	0	0	0	0	1
600_D2-3	0	0	1	0	0
700_D1-2	0	0	0	0	0
700_D2-3	0	0	0	0	0
800_D1-2	0	0	0	1	0
900_D2-3	0	0	0	0	0
1000_D1-2	0	0	0	1	0



	Impl Outcome	Reflect&Eval	Goals	Planning	Structural
200_D2-3	1	1	1	0	1
800_D2-3	1	0	1	1	1
1100_D2-3	1	1	1	1	0
200_D1-2	1	1	0	0	0
900_D1-2	1	0	0	1	1
100_D1-2	0	0	1	0	1
100_D2-3	0	0	0	0	0
300_D1-2	0	0	0	0	1
300_D2-3	0	0	0	0	0
400_D1-2	0	0	0	0	0
400_D2-3	0	0	0	0	0
500_D1-2	0	0	0	0	0
500_D2-3	0	0	1	1	0
600_D1-2	0	0	0	0	1
600_D2-3	0	0	1	0	0
700_D1-2	0	0	0	0	0
700_D2-3	0	0	0	0	0
800_D1-2	0	0	0	1	0
900_D2-3	0	0	0	0	0
1000_D1-2	0	0	0	1	0

	CFIR Construct						
	Reflecting & Evaluating	Planning	Structural Characteristics	N	Coverage-Raw	Coverage-Unique	Consistency
Solution 1	GAIN: +1 or +2			3	60%	60%	100%
Solution 2		GAIN: +1 or +2	GAIN: +1 or +2	2	40%	40%	100%
Solution Coverage = 100%							

QCA: Reflections

- RE-INSPIRE has > 300 interview transcripts systematically tagged with qualitative, categorical & CFIR codebooks
- provides rich, in-depth source of material for developing evidence-based & context-sensitive explanations for these two QCA solutions
- example of how QCA and traditional qualitative research can directly inform one another in implementation research

QCA: Reflections

- Qualitative analysis alone would not have revealed the relationship between positive change the implementation outcome and positive change in Reflecting & Evaluating, or in the combination of Planning and Structural Characteristics
- Return to qualitative analysis to develop “thick descriptions” of QCA solutions and possible explanations
 - QCA silent on how and why these quantitative and potentially generalizable solutions obtained in real world

QCA: Reflections

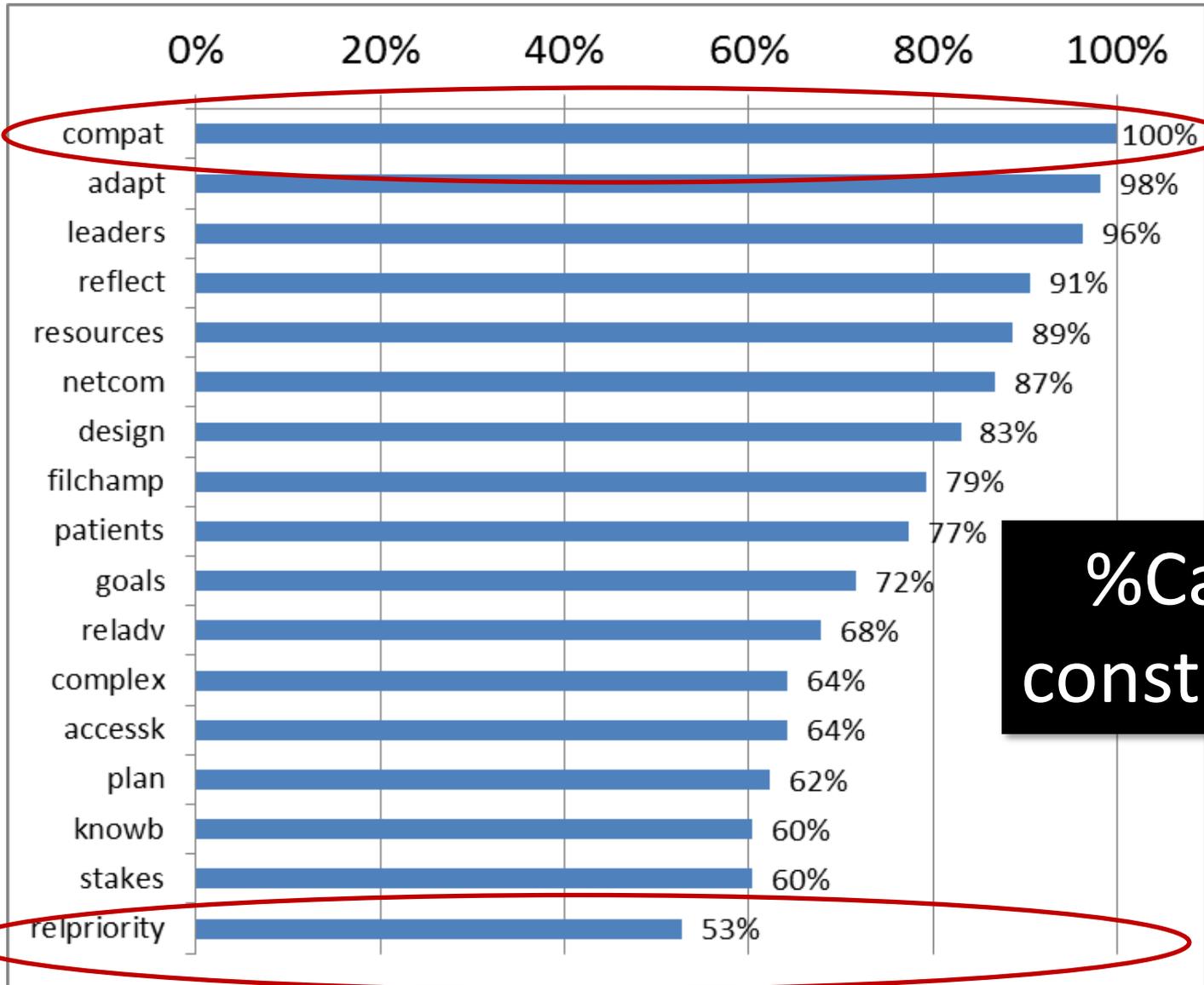
- Distinguish between “necessary” & “sufficient” conditions
 - including combinations of conditions
- Independently verify solutions within other datasets
 - investigators can look beyond their own project or study in an attempt to replicate findings independently by collaborating with other implementation researchers to run queries against other existing national and international datasets and/or previously published study results
- QCA can be applied across studies

Use QCA Across Studies to Reveal *Combinations* of CFIR Constructs →

 U.S. Department of Veterans Affairs	Studies	Cases
	7	53

- Behavioral Change Programs
 - Group-based weight management
 - Phone-based coaching for lifestyle change
 - Technology-enabled weight management program
- TeleRetinopathy Program
- Specialty Care
 - SCAN-ECHO
 - Specialty Care Neighborhood
 - E-Consults

17 Conditions: CFIR Constructs



**%Cases with
construct scores**

Assessing “fit” of solution configurations

- Consistency
 - The proportion of cases in a configuration that share the same outcome
 - E.g., 80% of cases with positive Leadership Engagement with positive Reflecting & Evaluating were successful
 - 20% of such cases were unsuccessful
- Coverage
 - Proportion of cases with the outcome of interest that are represented in a configuration
 - E.g., 75% of successful cases are represented by solution set

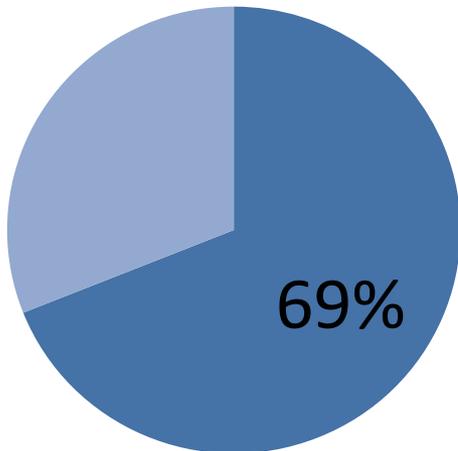
Stepwise Analysis of Conditions-1

- Success = f (Compatibility, Adaptability, Leadership Engagement, Reflecting & Evaluating)
 - $2^4=16$ possible combinations; 13 covered by cases
 - N=46; 26 Success; 20 NOT Success

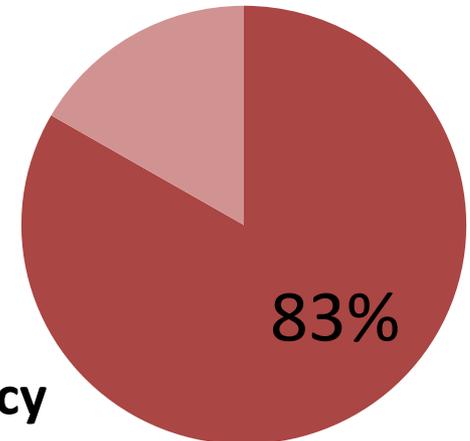
Leadership Engagement * Reflecting & Evaluating

Not Negative

Positive



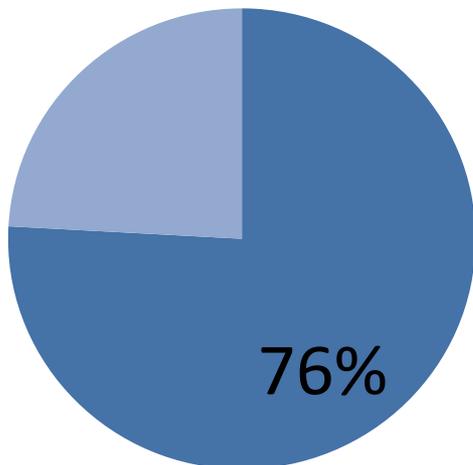
**ADJUSTED
Coverage**



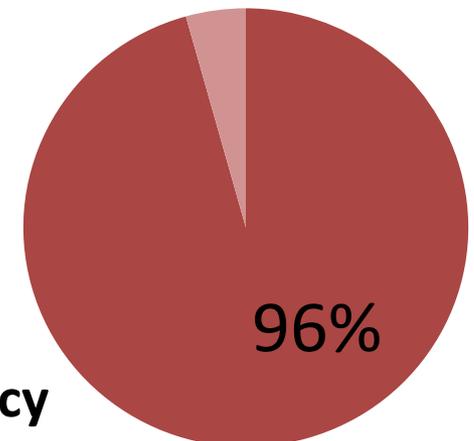
Consistency

Stepwise Analysis of Conditions-2

- Success = f (Compatibility, Adaptability, Leadership, R&E, **Networks & Comm, Design Quality**)
 - $2^6=64$ possible combinations; 23 covered by cases
 - N=36; 23 Success; 13 NOT Success

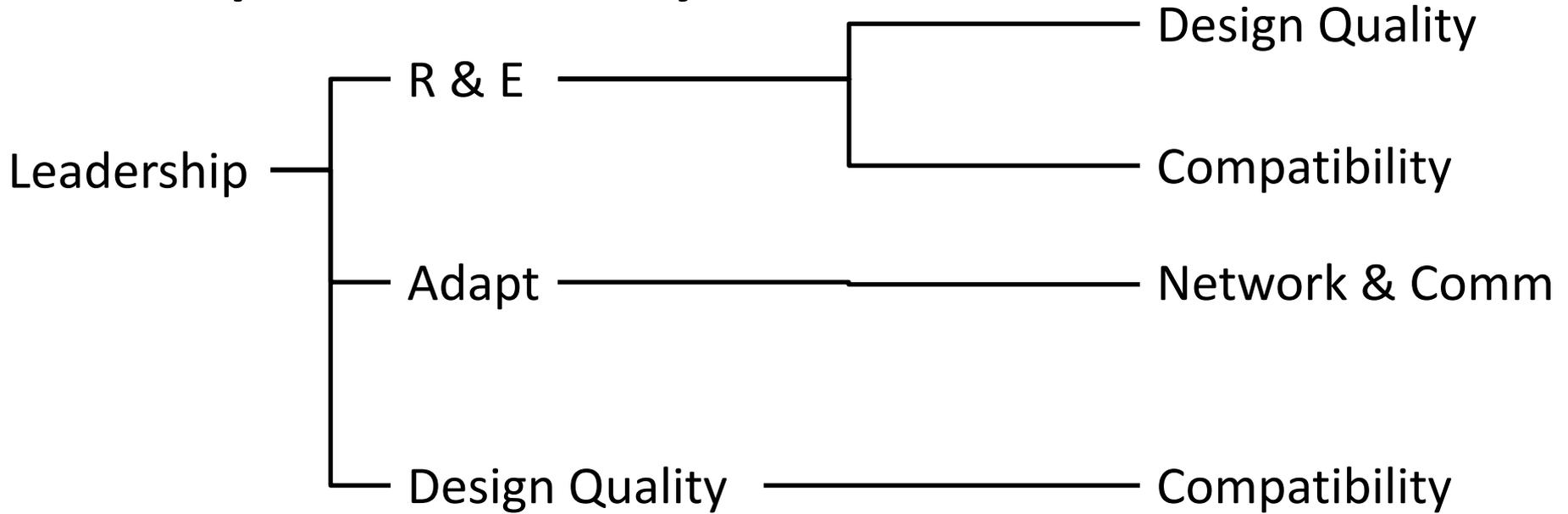


**ADJUSTED
Coverage**



Consistency

Stepwise Analysis of Conditions-2



Adapt * Network & Comm * R&E * Compatibility

Conclusions

- Continue to build case repository
 - More coverage of possible combinations
 - Overcome missing data
- Different solutions depending on the case set used in analysis
 - Confirmation of complex causality
 - Leadership Engagement, Reflecting & Evaluating, Compatibility
- **Must KNOW your data** – link results back to qualitative data
 - A priori theories
 - Triangulate
 - Process tracing

QCA Software

- QCA software is free
- Can be downloaded at COMPASSS website
 - www.compass.org/software.htm
- QCA program most commonly used is fs/QCA
 - Supports both crisp-set and fuzzy-set QCA
 - Other QCA programs also available at COMPASSS
- Many newcomers to QCA discover there is learning curve associated with figuring out how to use QCA software
 - not unusual to spend 10-20 hours in order to become proficient

QCA Books

- Ragin CC. Redesigning social inquiry: Fuzzy sets and beyond. Chicago: University of Chicago Press; 2008.
- Rihoux B, Ragin CC. Configurational comparative methods: Qualitative comparative analysis (QCA) and related techniques. Sage; 2009.
- Schneider CQ, Wagemann C. Set-theoretic methods for the social sciences: A guide to qualitative comparative analysis. Cambridge University Press; 2012.

Selected QCA Resources and Articles

- Cragun, D, Pal, T, Vadaparampil, ST, Baldwin, J, Hampel, H, & DeBate, R.D (2015). Qualitative Comparative Analysis A Hybrid Method for Identifying Factors Associated With Program Effectiveness. *Journal of Mixed Methods Research*.
- Qualitative Comparative Analysis: A Rigorous Qualitative Method for Assessing Impact
 - <http://www.coffey.com/assets/Ingenuity/Qualitative-Comparative-Analysis-June-2015.pdf>
- Devers, KJ (2013). Using Qualitative Comparative Analysis (QCA) to Study Patient-Centered Medical Homes
 - http://www.urban.org/research/publication/using-qualitative-comparative-analysis-qca-study-patient-centered-medical-homes/view/full_report

VA Pulse: VA QCA Special Interest Group



Poll Question #6

How would you now describe your level of interest in Qualitative Comparative Analysis?

- Not very interested
- Somewhat interested
- Interested
- Extremely interested

Questions & Comments

- **Thank you!**
 - **CFIR Online Support**
www.CFIRGuide.org
 - **Contact**
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Laura.Damschroder@va.gov