Facilitating and Implementing Team Science During the ECHO's Developmental Phase

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Science of Team Science (SciTS) 2018 Conference
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ECHO Environmental influences on Child Health Outcomes

NIH National Institutes of Health
Environmental influences on Child Health Outcomes (ECHO)

Outline

- What is ECHO?
- Major challenges during ECHO's developmental phase
- Application of team science principles
- Team science accomplishments so far

Environmental influences on Child Health Outcomes

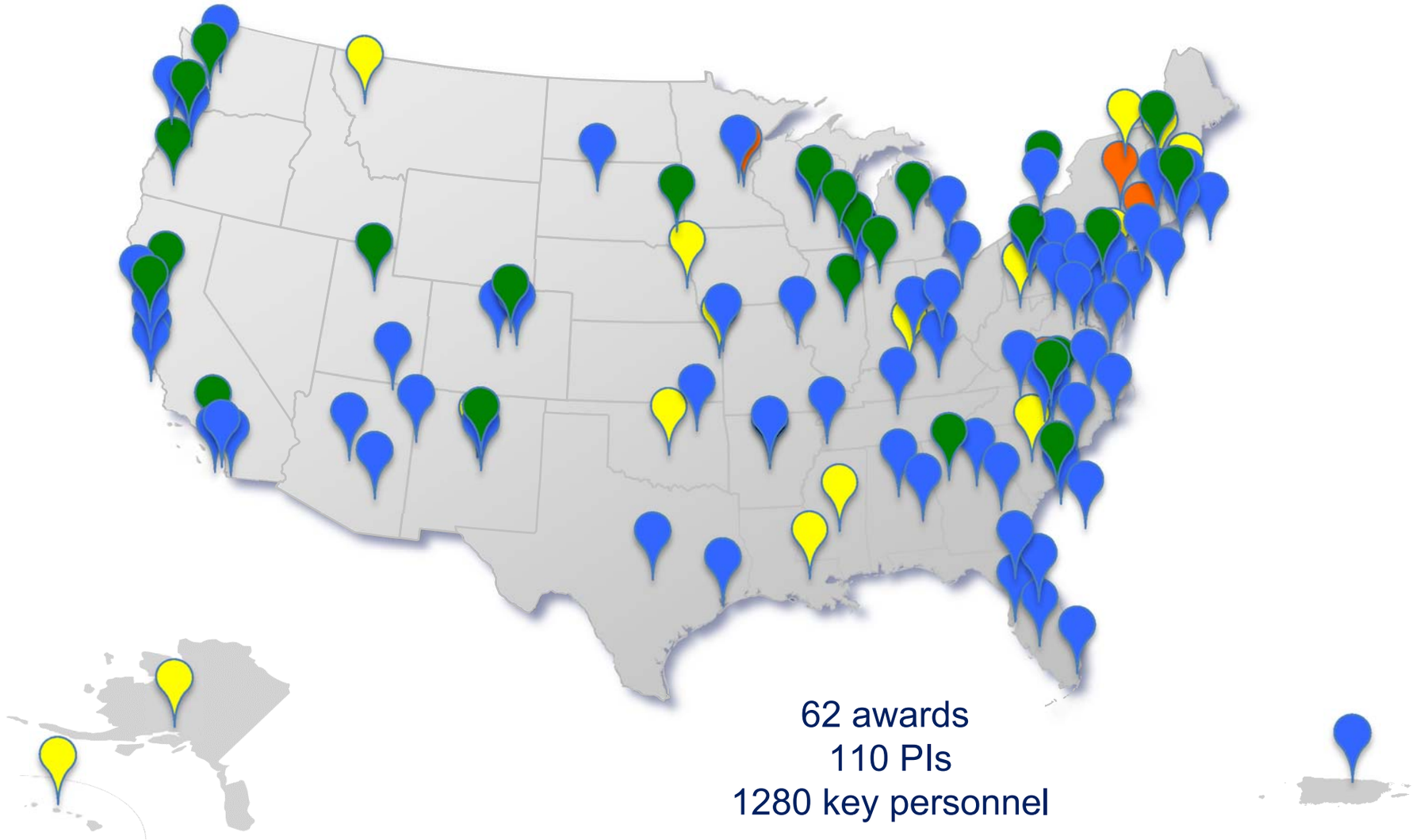
MISSION

Enhance the health of children for generations to come

VISION

To become one of our nation's pre-eminent research programs in child health

ECHO—A Nationwide Program



62 awards
110 PIs
1280 key personnel

44 states, DC, PR

NIH National Institutes of Health
Environmental influences on Child Health Outcomes (ECHO)

ECHO: A 7-year initiative using NIH's cooperative agreement mechanism

- Observational studies (35 cohort awards consisting of 84 existing cohorts)
  - Sufficient number of participants for power, heterogeneity, generalizability
  - Include newer technology, biological pathways
  - Modern concepts of cause-effect relationships
- Intervention trials (IDeA States Pediatric Clinical Trials Network of 17 sites)
  - Children underrepresented in clinical trials
  - Especially hard-to-reach populations - rural, medically underserved

Creating The ECHO-wide Cohort

Weaving together 84 individual cohorts

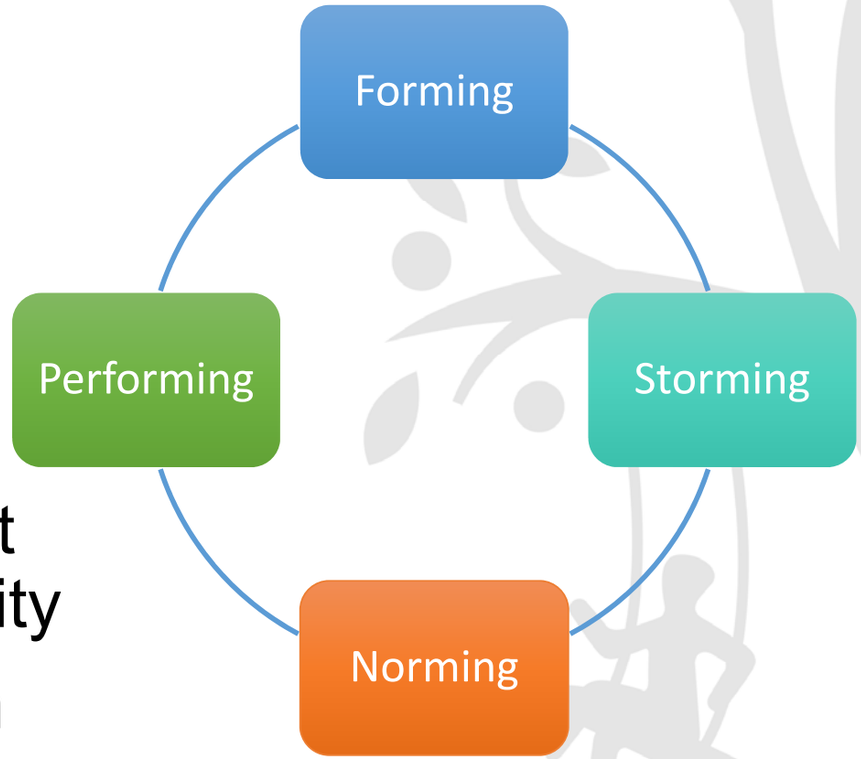
- Start with multiple existing cohorts of moms & kids
  - Increase likelihood of early successes
  - Continue to recruit new & follow existing participants
- A single *data platform* to conduct etiologic and prediction research
  - Harmonized existing measures
  - Standardized new measures
- Goal >50,000 children
- Build a national research resource

Implementing Team Science to Promote Transdisciplinary Research in ECHO

- Team science as a learning system
- Convert tensions to positive energy
- Promote innovative ideas
- Improve our program processes and outcomes in real time
- Translate results to actionable items for implementation

Major challenges during developmental phase

- Communication – *too much, too little*!
- Engaging diverse perspectives
- Competing demands for investigator time
- Balancing ECHO-wide vs. cohort-specific research interests
- Determining common data elements to collect that balance comprehensiveness and feasibility
- Agreeing on sharing of data and biospecimen samples



Team Science Facilitation Activities To Date

1. Team Science speaker invited to in-person meetings
   - Inspirational and motivational learning
2. Team Science group activity at in-person meetings
   - Engage small groups in applying team science principles to challenges identified and in providing innovative solutions
3. Evaluations at in-person meetings
   - Survey of meeting participants to gauge aspects of collaboration
   - Evaluate what works and what needs improvement and trends over time
4. Translate results to actionable items for implementation
5. Coordinate scientific flash-talks for collaboration ideas involving multi-cohorts

Team Science Activities at ECHO Steering Committee In-person Meetings

1. Presentation on team science principles and helpful concepts
2. Small group discussion questions:
   - What are challenges and barriers for completing tasks at hand?
   - How can team science principles tackle this challenging task?
   - What novel ideas can we pilot to successfully complete this task?
3. Large group report out of discussion results and collection of summary notes

In-Person Meeting Evaluations to Gauge Team Science Progress

Evaluation topics:

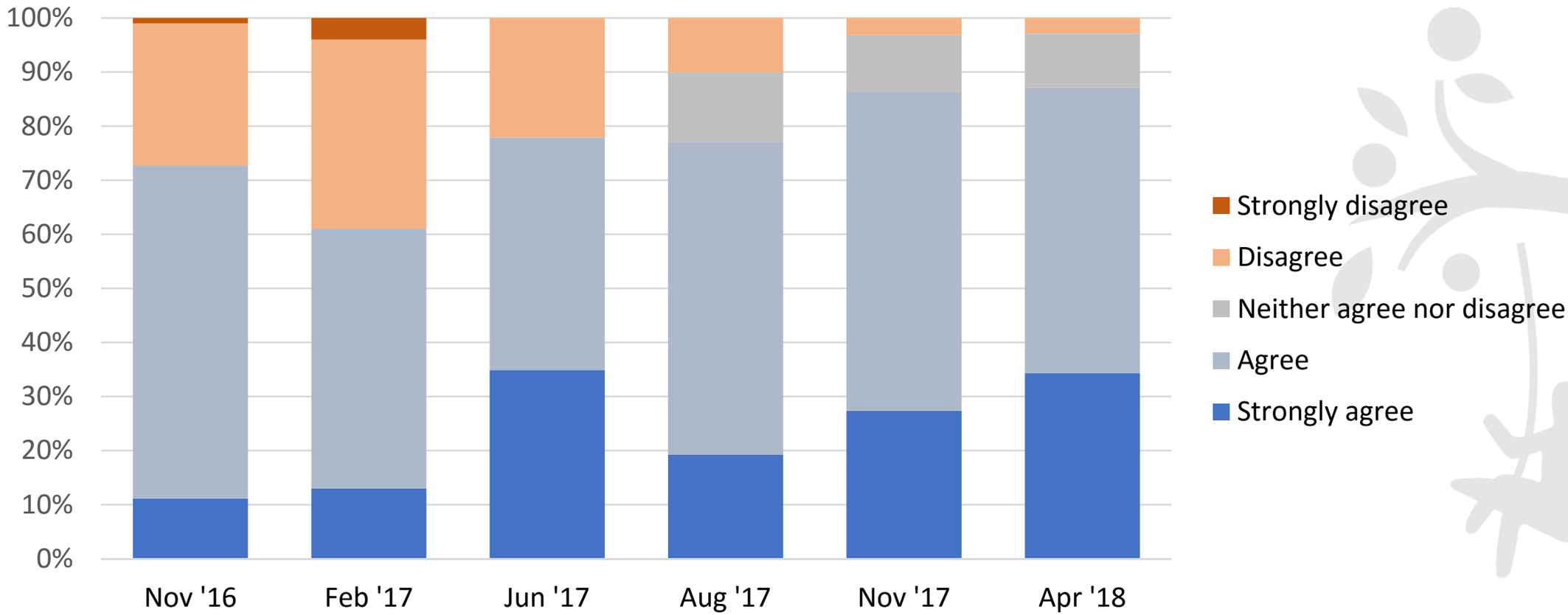
- Networking opportunities
- Common language
- Communications
- “Team science” activities

Evaluation respondents:

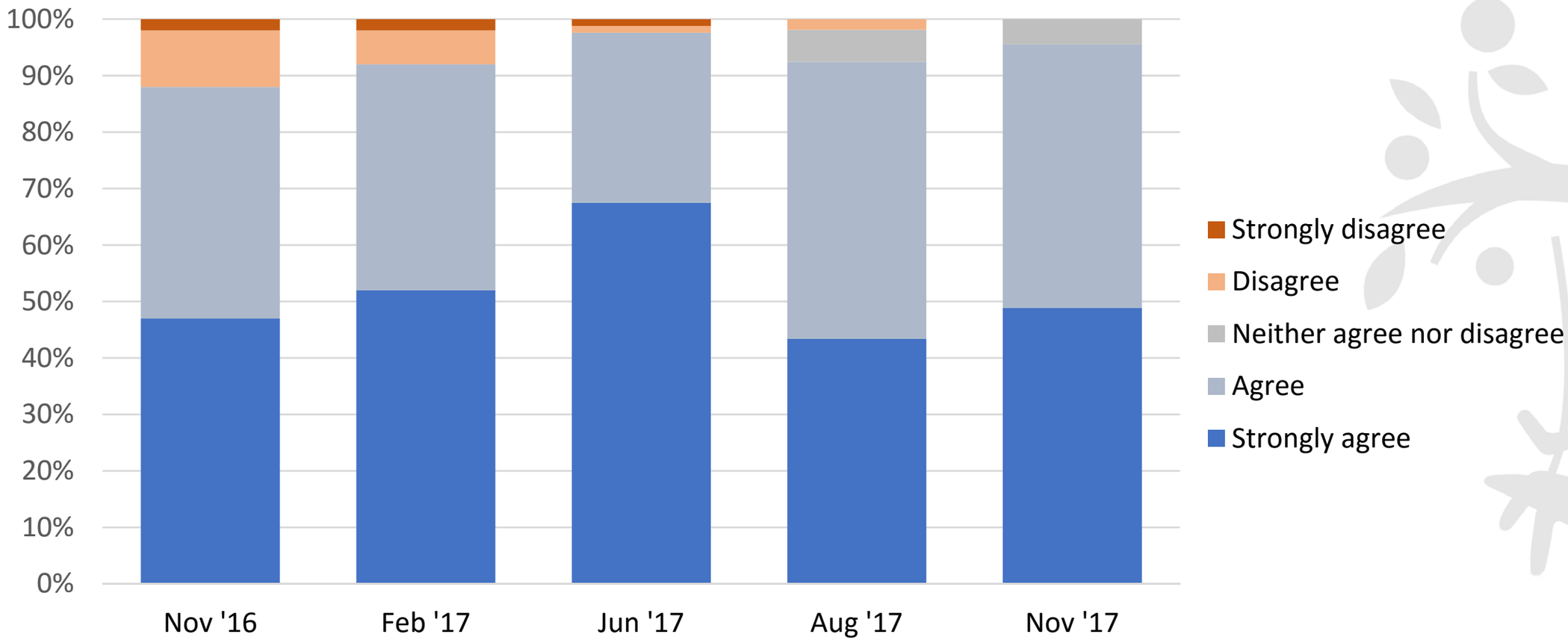
- Nov. 2016 Kick-off, n= 132
- Feb. 2017, n= 100
- Jun. 2017, n= 86
- Aug. 2017, n= 108
- Nov. 2017, n= 95
- Apr. 2018, n=70

Note: Approximately 70-80% of meeting attendees are repeat attendees.

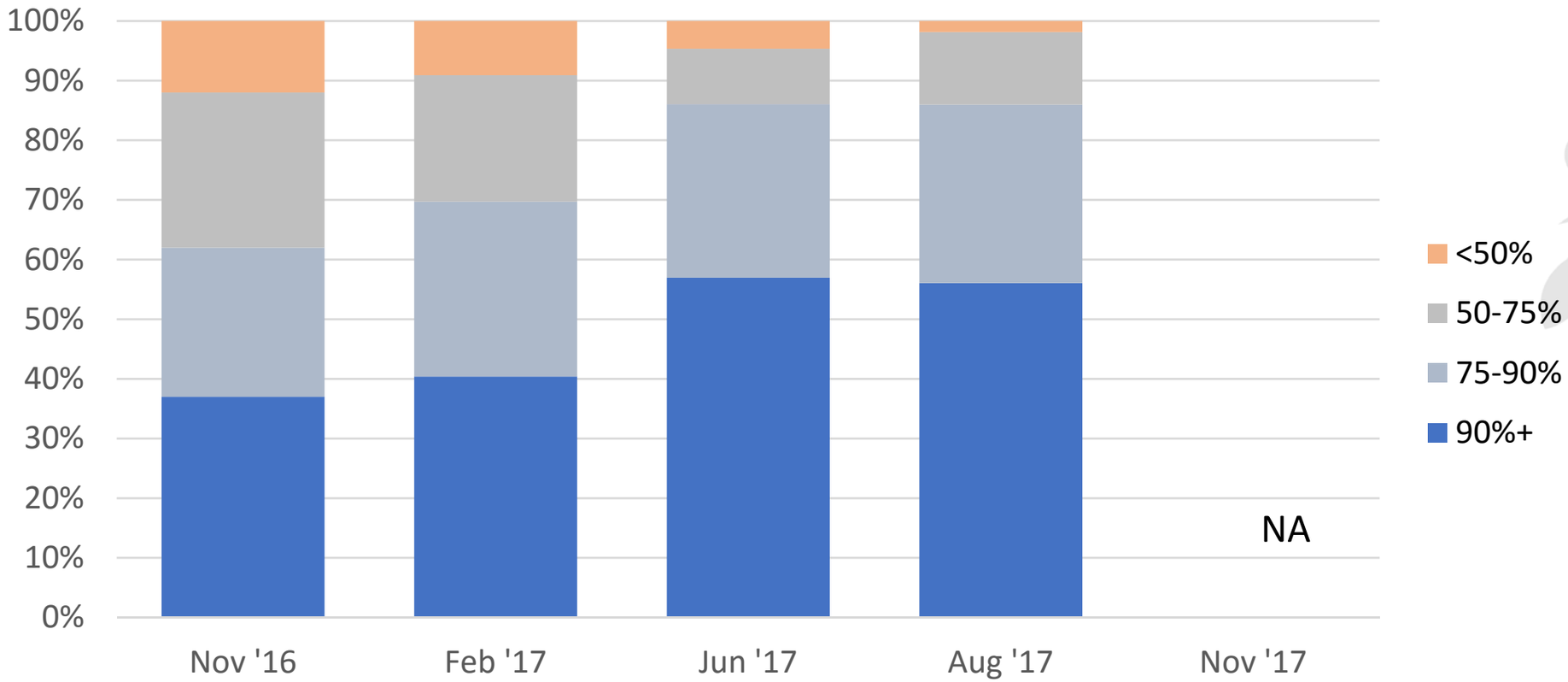
Evaluation results: “I had sufficient opportunities to network across all ECHO components”



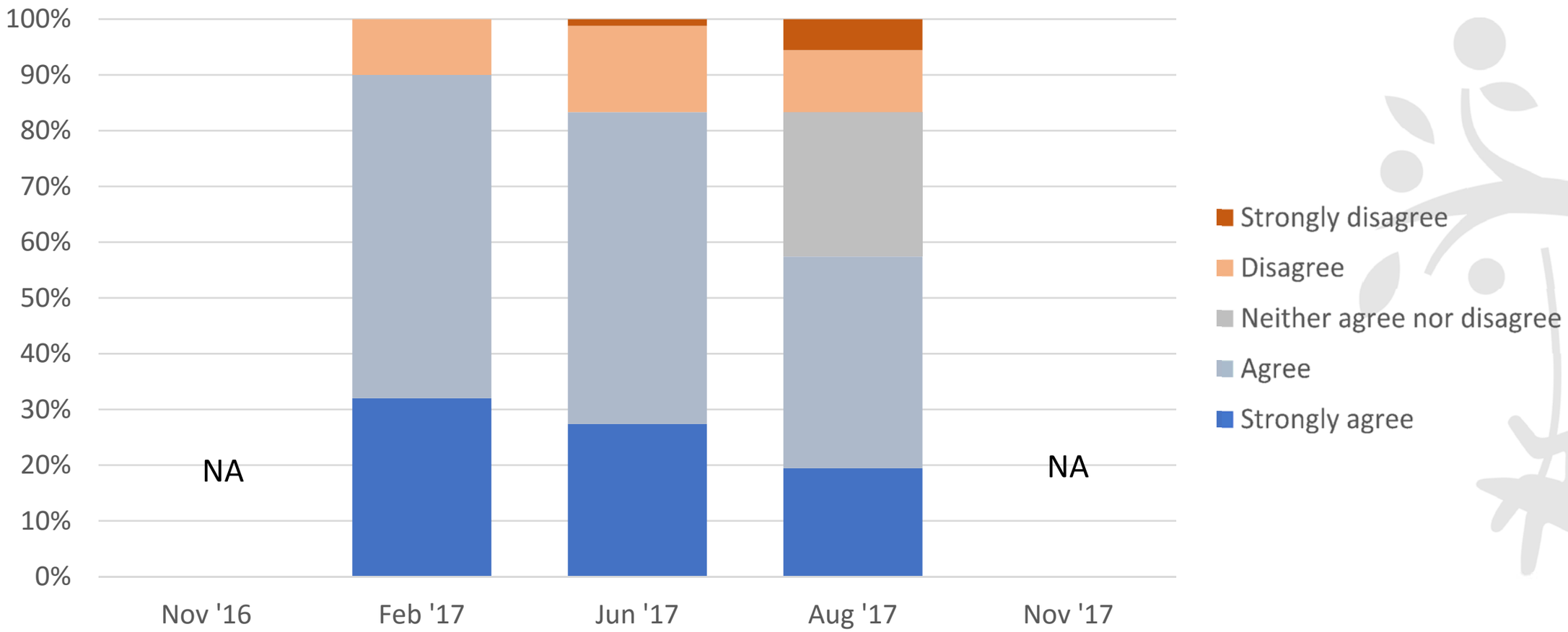
“My breakout session leader(s) made sure everyone had opportunities to voice their views”



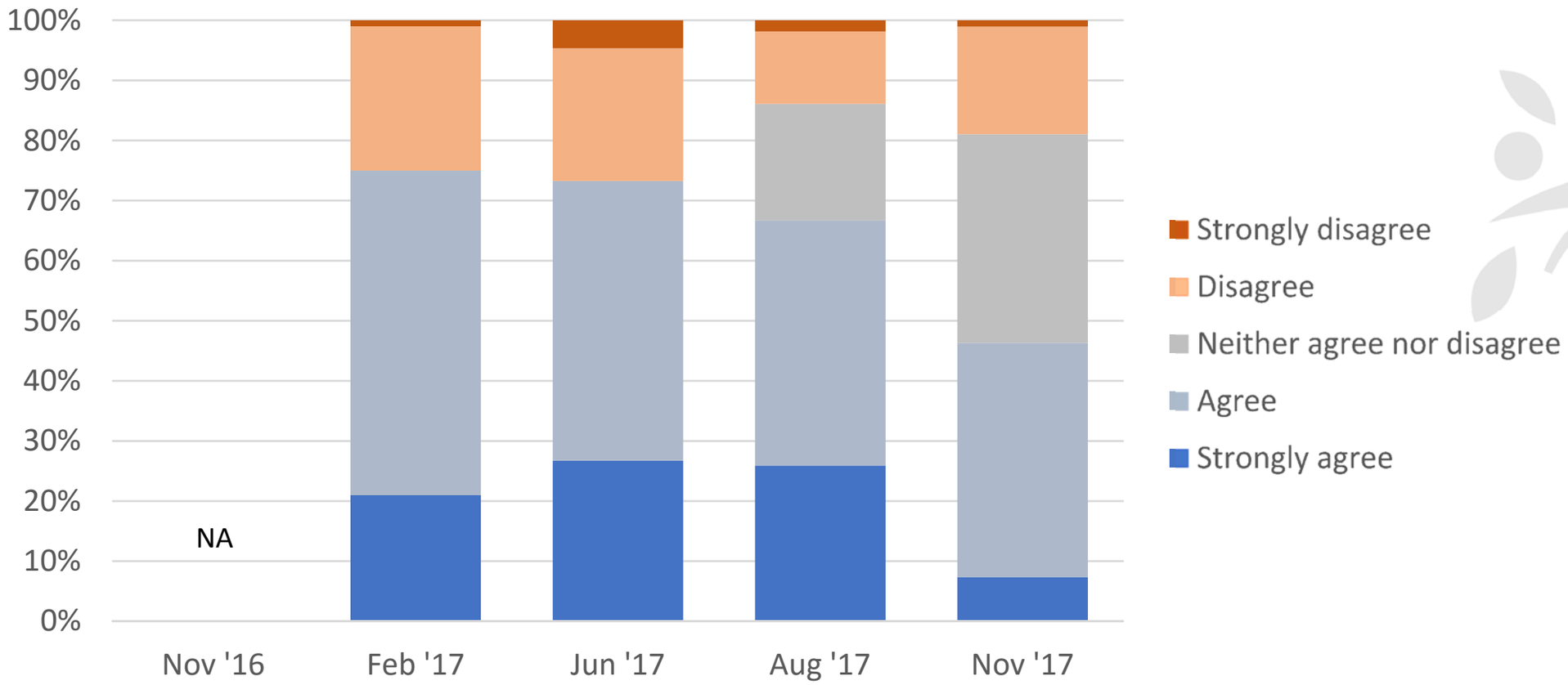
“What proportion of acronyms and specialized terms that attendees used in the meeting did you understand?”



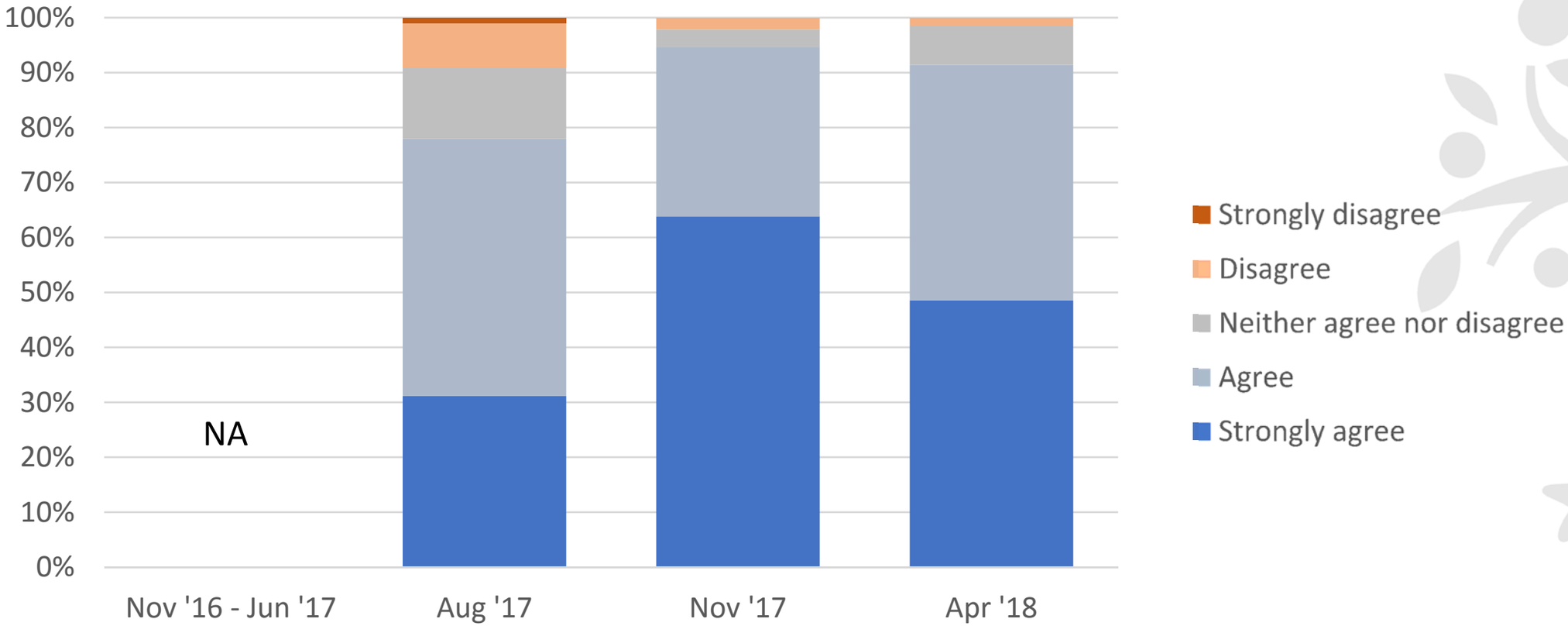
“Team Science speaker introduced me to new/helpful concepts for *working collaboratively within ECHO”*



“Team Science small group discussions produced *concrete ideas to enhance trans-disciplinary science in ECHO*”



"[*ECHO program component/Multi-cohort emerging science*] flash talks were effective in encouraging collaboration"



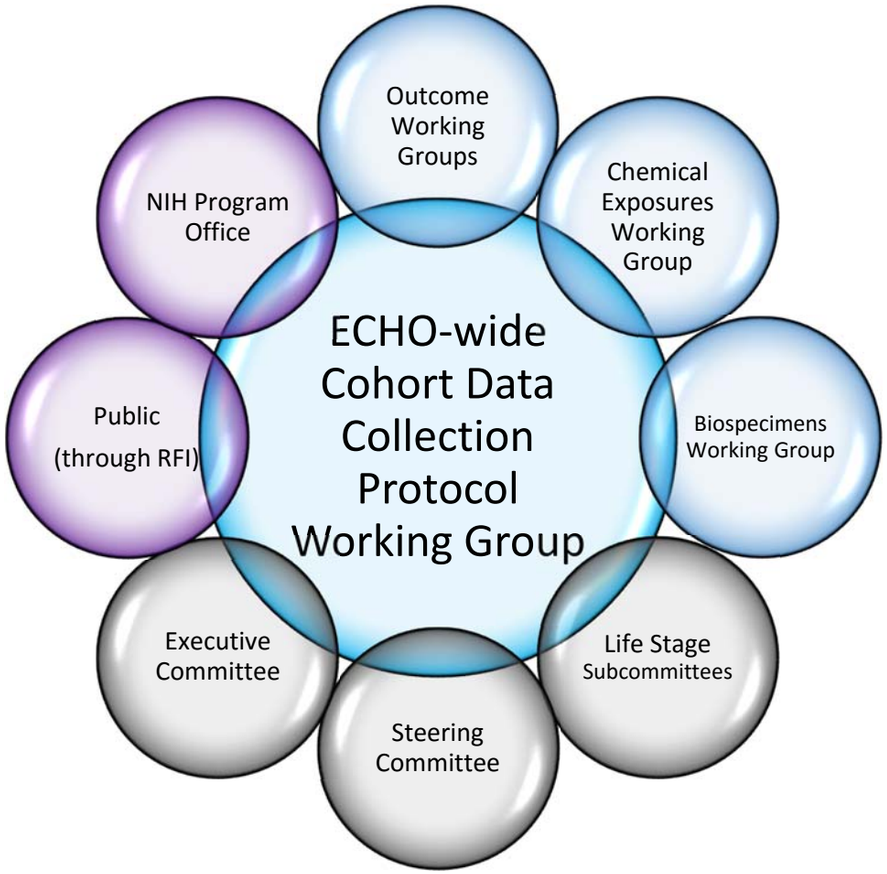
Meeting Evaluation Summary

- Perceived networking opportunities improved over time
- Breakout session leaders improved in and maintained allowing all members to voice their views
- Use of appropriate common language improved (use of acronyms are discouraged)
- Having a “team science” speaker was well received initially; however over time, the enthusiasm for “team science” presentation and tabletop activities waned given participants were anxious to focus on scientific content related work.
- Consequently, scientific flash talks were introduced in more recent meetings which were received highly favorably.

Successful accomplishments to date

- Highly engaged and productive committees, working groups, and task forces;
- Communication channels that meet varying “receiver” needs;
- Establishing and agreeing on publication, data sharing, biospecimen processing and sharing policies;
- Development and ratification of the ECHO-wide Cohort Protocol

Protocol Development: Team Science at Work

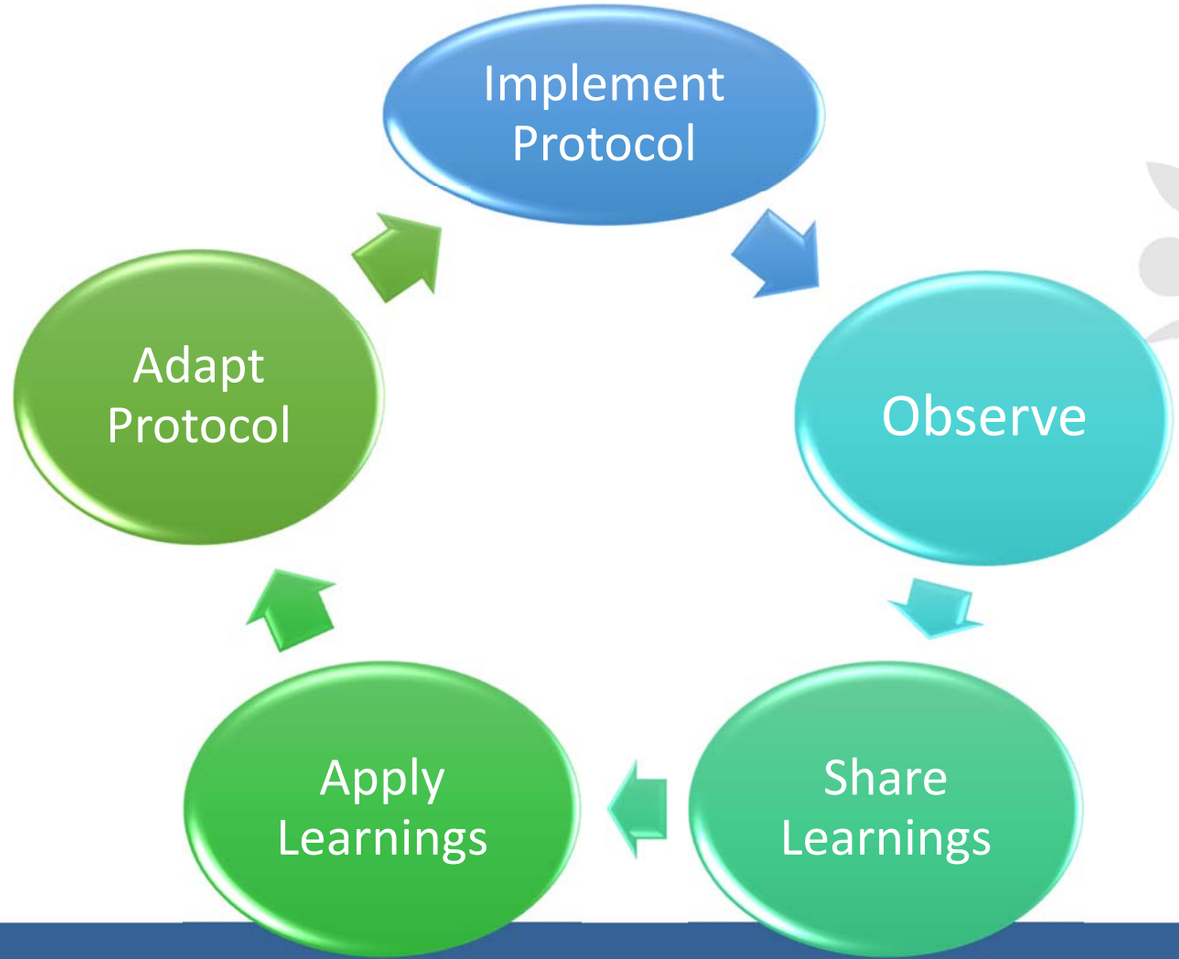


The ECHO-wide Cohort Data Collection Protocol Working Group has:

- Engaged with the broad ECHO community
- Reconciled and incorporated feedback
- Sought compromises across diverse opinions
- Arrived at a coherent protocol that reflects months of refinement (after many versions)
- Protocol Version 1.0 “echoes” overarching desire to **standardize** new collection of essential data elements
- Next comes **innovation**

Develop, Implement, Evaluate ECHO-wide Cohort Data Collection Protocol

Opportunities for all to contribute to *Virtuous cycle*



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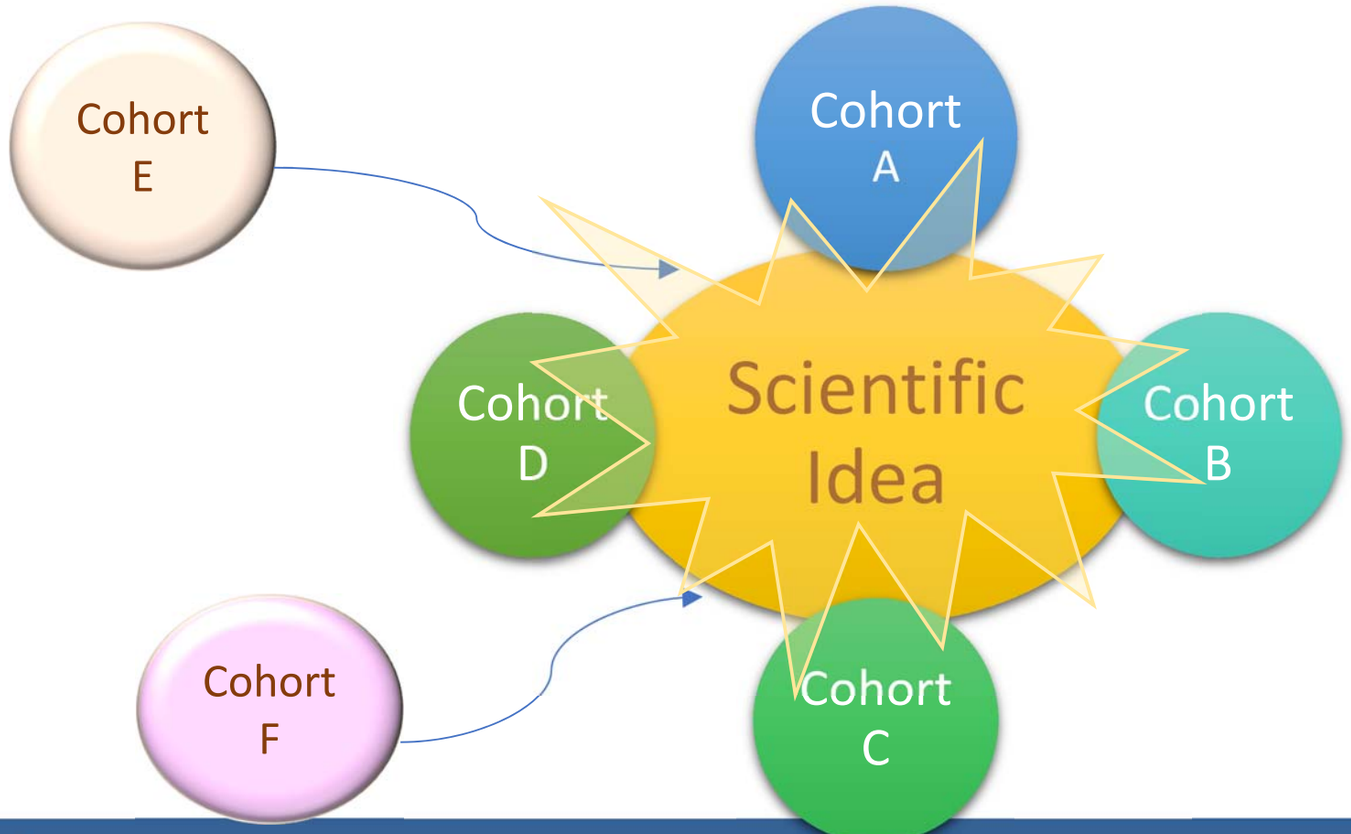
- Establishing and agreeing on publication, data sharing, biospecimen processing and sharing policies;
- Development and ratification of the ECHO-wide Cohort Protocol; and
- Development of collaborative & collective analyses and publications

Multi-cohort Emerging Science Flash-Talks



Ongoing Collective Analyses

Child Outcome	Stage Completed	# Cohorts	# Participants
Obesity prevalence and trajectories	Draft manuscript	70	37,603 (83,571 obs)
Geography, SES, and gestational age at birth	Descriptive statistics	53	34,732
Severe asthma prevalence and trends	Cohort contribution forms	39	
Maternal smoking and autism spectrum disorder	Method to address confounding		

Working Together

To enhance the health of children for generations to come

ECHO

Environmental influences
on Child Health Outcomes

A program supported by the NIH

www.echochildren.org

Extra slides

Team Science Speaker
L. Michelle Bennett, PhD
Director, Center for Research Strategy, NCI
August 16, 2017

Integrating Visions

Cohorts

ECHO

Collaboration
Communication

- Trust and psychological safety
- Active Listening
- Yes, And ….
- Disagreement

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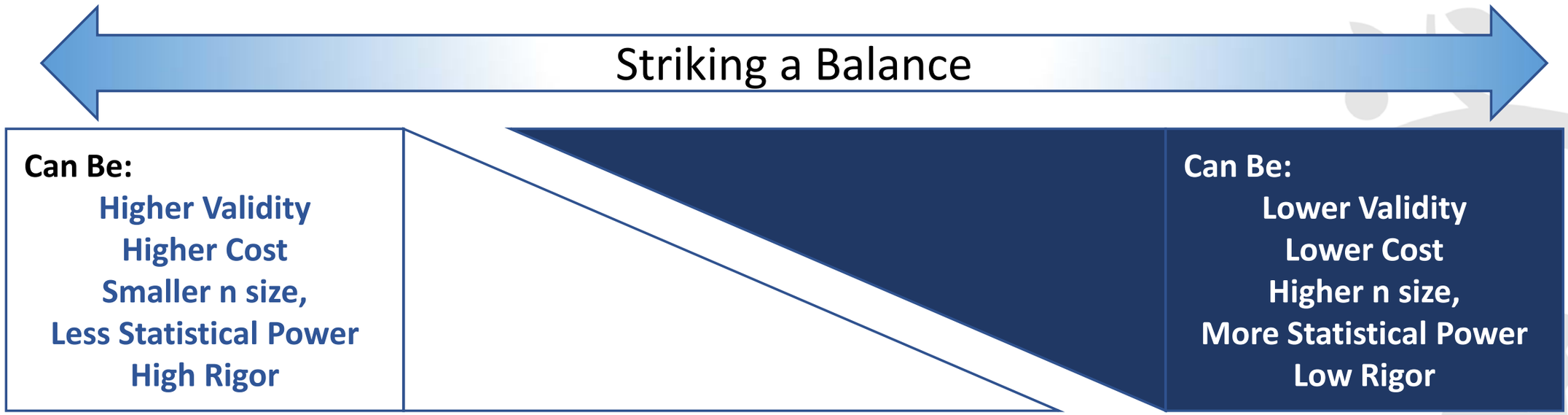
Small group discussion example:
Integrating Cohorts and ECHO

- What tensions are you experiencing? (7 min)
- Select the top 2-3 (2 minutes)
- What solutions can we do so ECHO can achieve maximum impact
  - Brainstorm ideas -- *using Yes, And….* (8 min)
  - Narrow down possibilities and select the approaches that could have greatest impact in relieving, overcoming, or eliminating the tension (8 min)
- Report out

Protocol Development: Tension between Essential vs. Recommended Data Elements

Balancing costs to participants and resources with collecting valid and reliable measures.

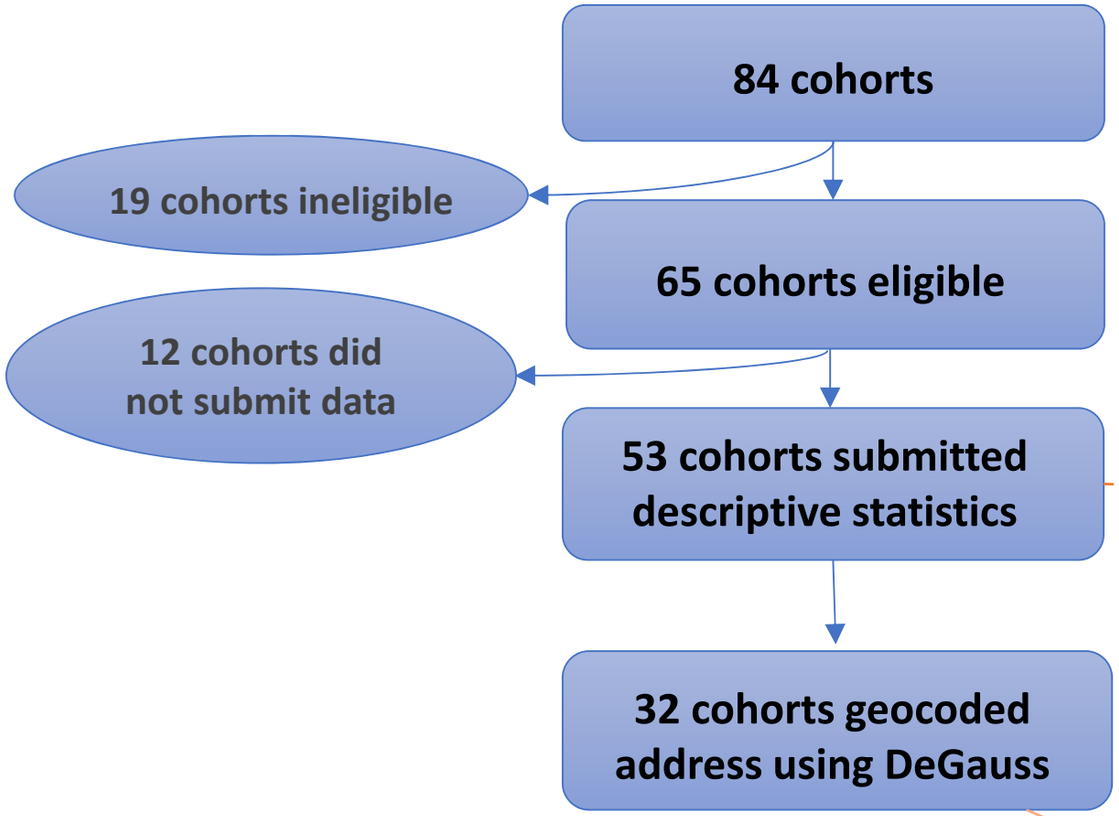


e.g.,
Biomarkers, DNA (chemical assay costs)
Direct Behavior Observation (time & costs)
Face to Face, In Person

e.g.,
Cognitive Computer Tasks, in person but automated data entry and scoring

e.g.,
Self-report questionnaires
Online and Remote Assessment

An example of a collective analysis: *Racial and Geographic Variation in Associations of Sociodemographic Status with Gestational Age at Birth*



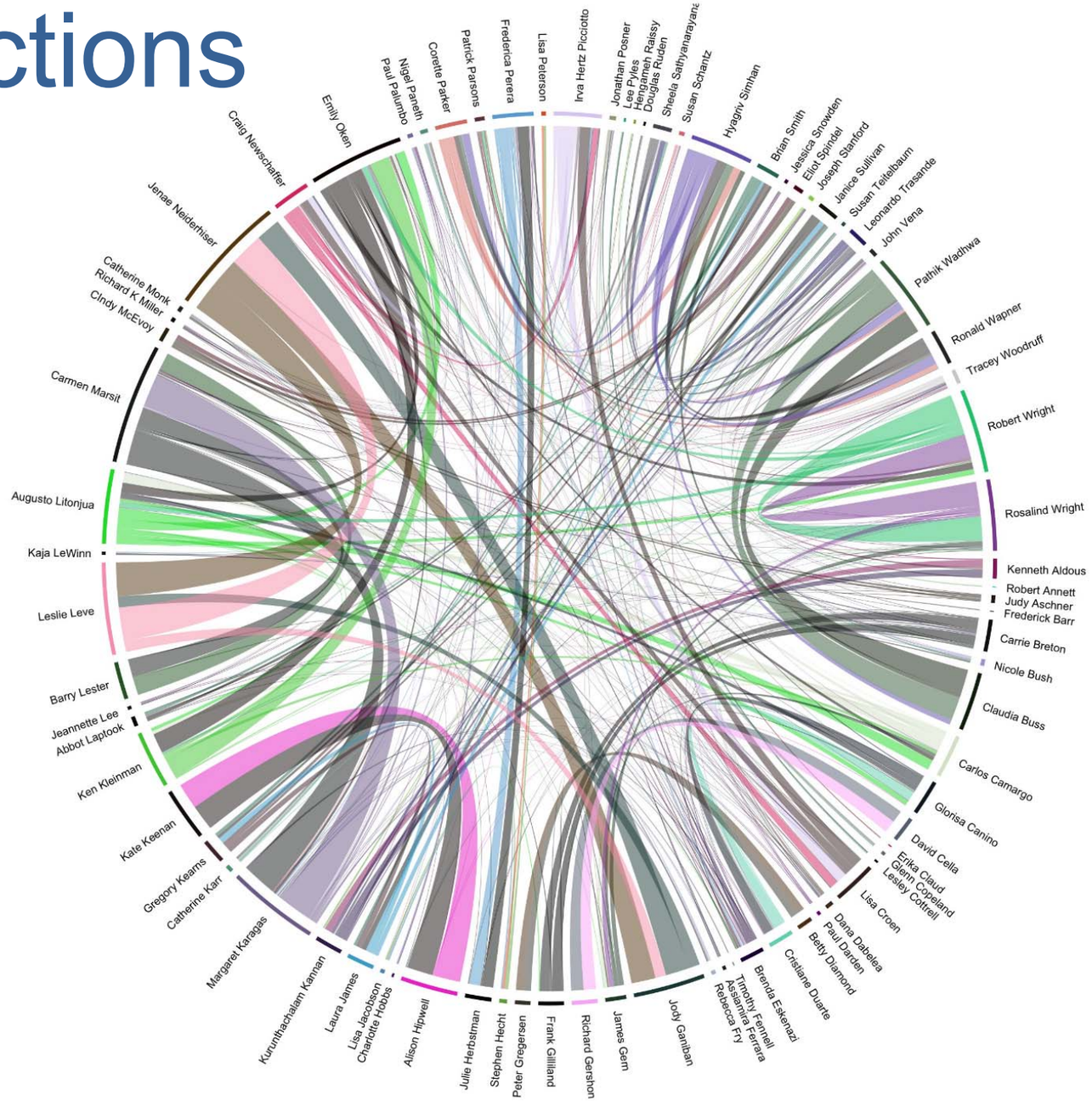
34732 participants eligible for analysis

Gestational age (weeks)	22-34	34-37	37-39	39-41	41-43
Number of participants (%)	579 (2%)	1902 (5%)	8603 (25%)	19878 (57%)	3770 (11%)

25152 addresses from 32 cohorts successfully geocoded

PubMed Connections

ECHO PIs
with shared publications
through April 2018



ECHO