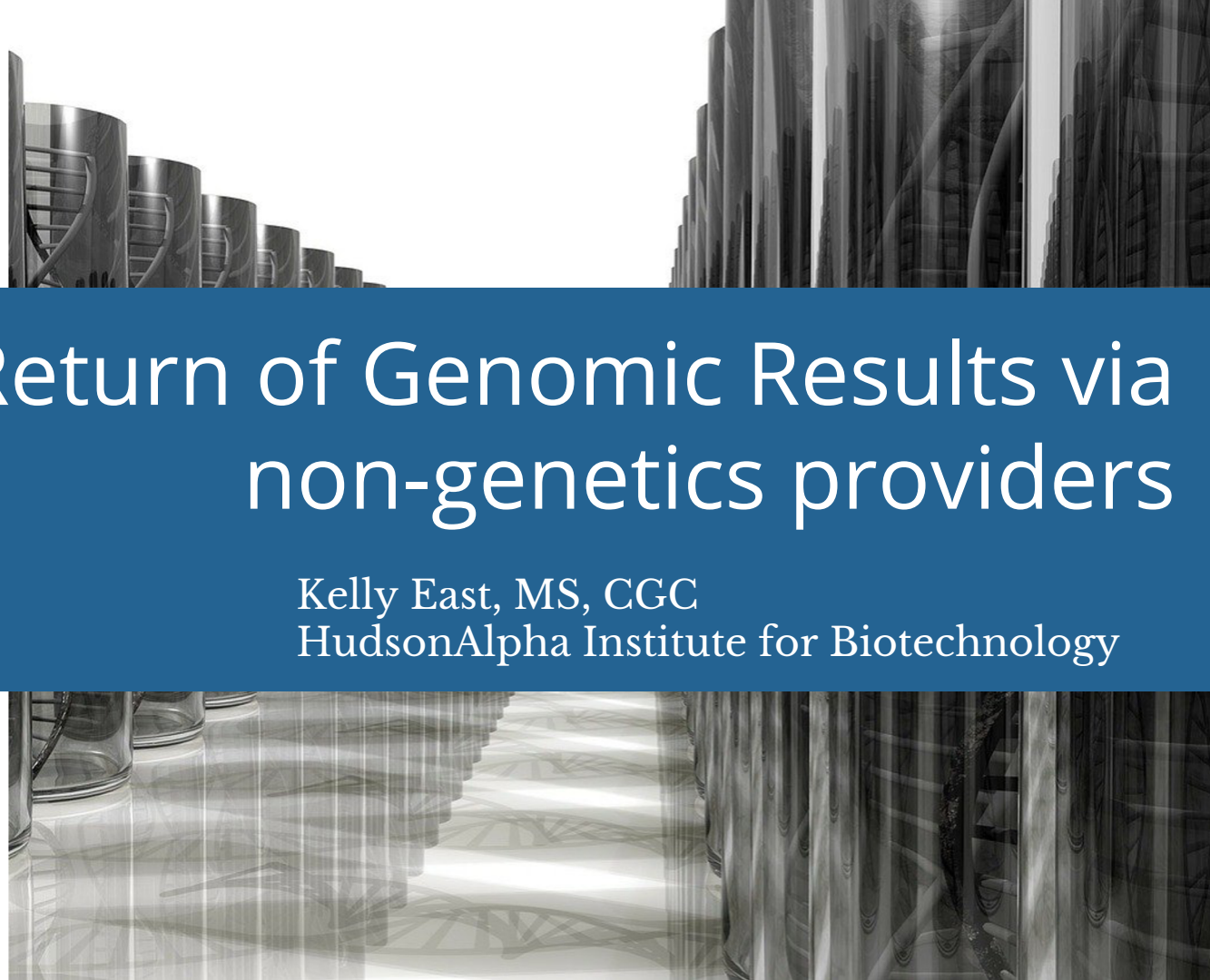
May 8, 2020



Return of Genomic Results via non-genetics providers

Kelly East, MS, CGC
HudsonAlpha Institute for Biotechnology

Global Genomic Medicine Collaborative

SouthSeq
ALABAMA KENTUCKY LOUISIANA MISSISSIPPI

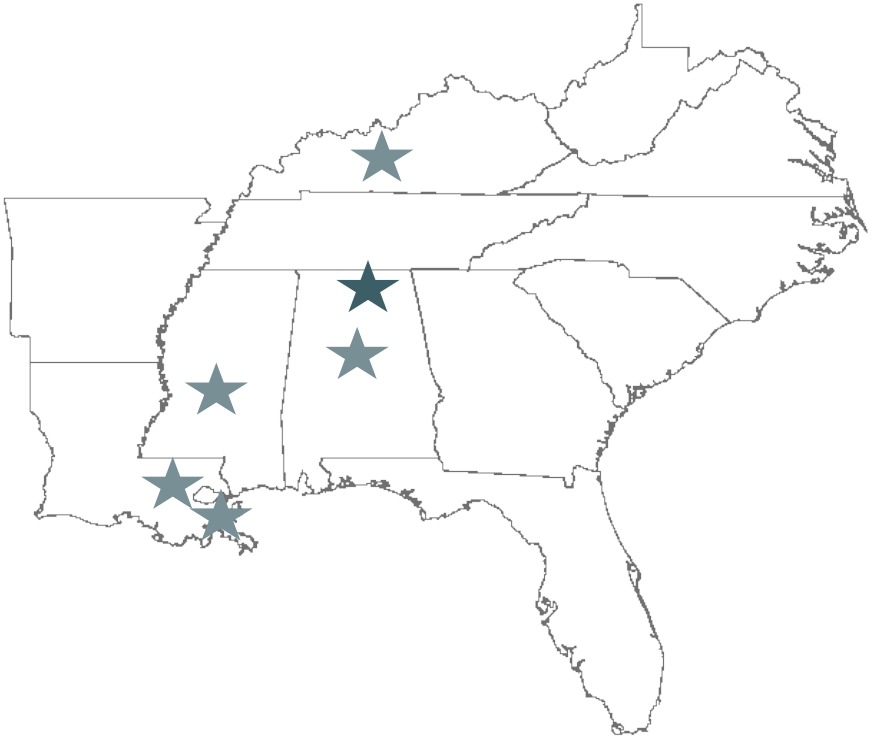
NIH Funded Project

Part of CSER (Clinical Sequencing Evidence-Generating Research) Consortium

Led by HudsonAlpha and the University of Alabama at Birmingham

SouthSeq Project

- Use of genome sequencing in NICUs (neonatal intensive care units) across the south, among infants with suspected genetic disorders
- Return of genome results via a NICU non-genetics healthcare provider



Recruitment

- 236 probands
- 65% trios
- 55% male
- 48% non-white
- 76% fit CSER diversity definition (race/ethnicity, rural zip code, or income)

Genome Analysis

- 218 (92%) cases with completed analysis
- 29% primary diagnosis (P/LP)
- 14% primary VUS
- 2% secondary finding

Result Return

- 200 results returned
- 56% in-person
- 30% phone
- 14% certified letter
- Avg 68 days from consent to result ready
- Avg 20 days from result ready to return

Data as of 02/20

Genome Result Return by NICU Providers

Randomization

- By clinical site
- By result type

Standard of Care
Return of Results by Genetic Counselor

Experimental
Return of Results by trained NICU Provider

Non-inferiority clinical trial, based on parent/care-giver empowerment
Primary outcome: GCOS and FACToR surveys

Training Intervention

Half-day training for NICU providers (physician and mid-level) responsible for return of SouthSeq genome results in experimental arm

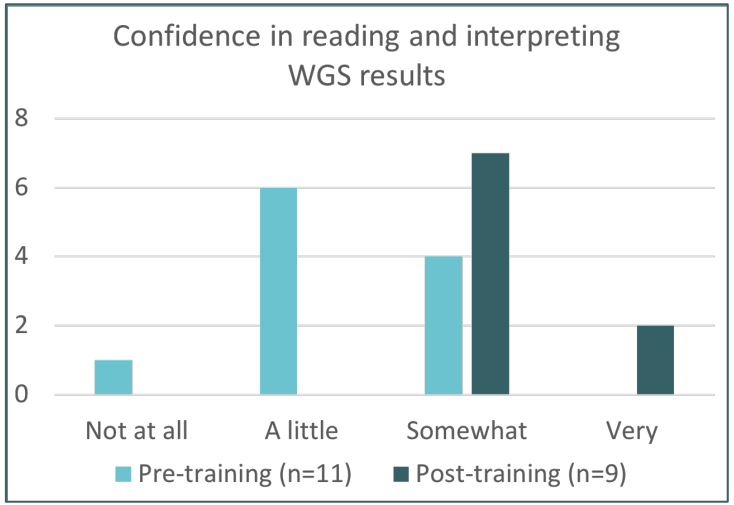
Combination of didactic teaching, small group discussion, hands-on activities, and simulation

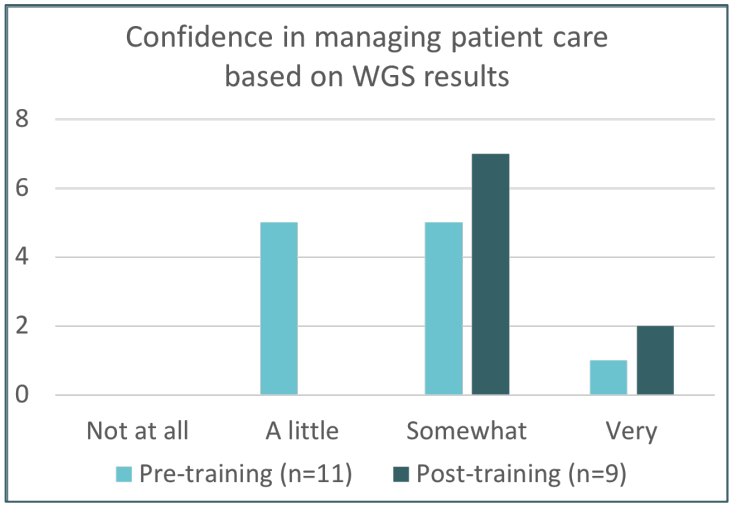
In-person training as well as with distance/virtual option available

Pre/Post Training Surveys

32 providers have been trained across the 5 clinical sites

- 55% of providers reported no genetics training prior to SouthSeq participation
- 55% reported ordering genetic tests at least once a week
- 36% reported having seen a genome sequencing report in clinical practice





Data as of 02/20

Error and Safety Monitoring

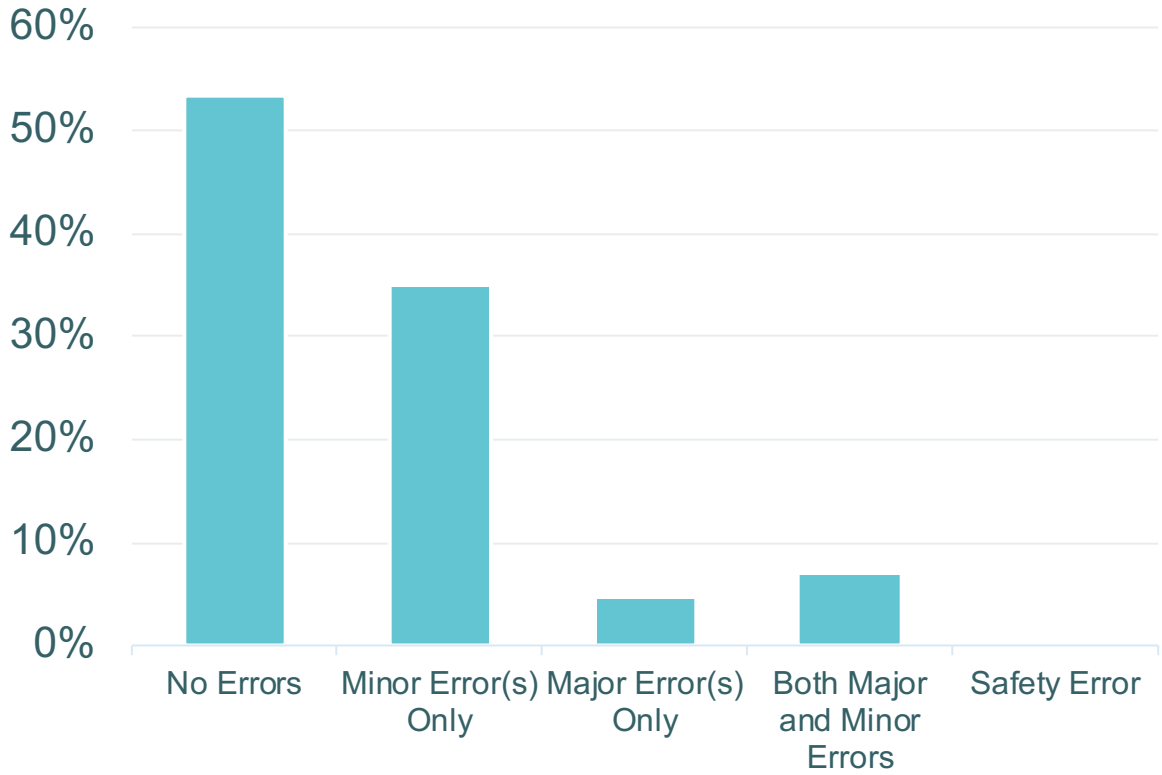
- Recording of result disclosures by both clinical trial arms, uploaded to HudsonAlpha GCs
- Experimental arm recordings reviewed by HudsonAlpha GCs in specified timeframe to track and record errors

Minor Error	**Major Error**	**High-risk Safety Error**
Error in non-critical detail that has little expected impact on patient understanding and medical decision making	Error in critical detail that has a significant impact on patient care and medical decision making	High risk of immediate and detrimental impact on patient safety
End-of-study feedback	Real-time feedback	Notify safety board; real-time feedback

Preliminary Error Data

44 results have been returned and reviewed in the experimental arm (by NICU non-genetics providers)

27 negative
12 positive
5 uncertain



Data as of 04/20

Error Examples

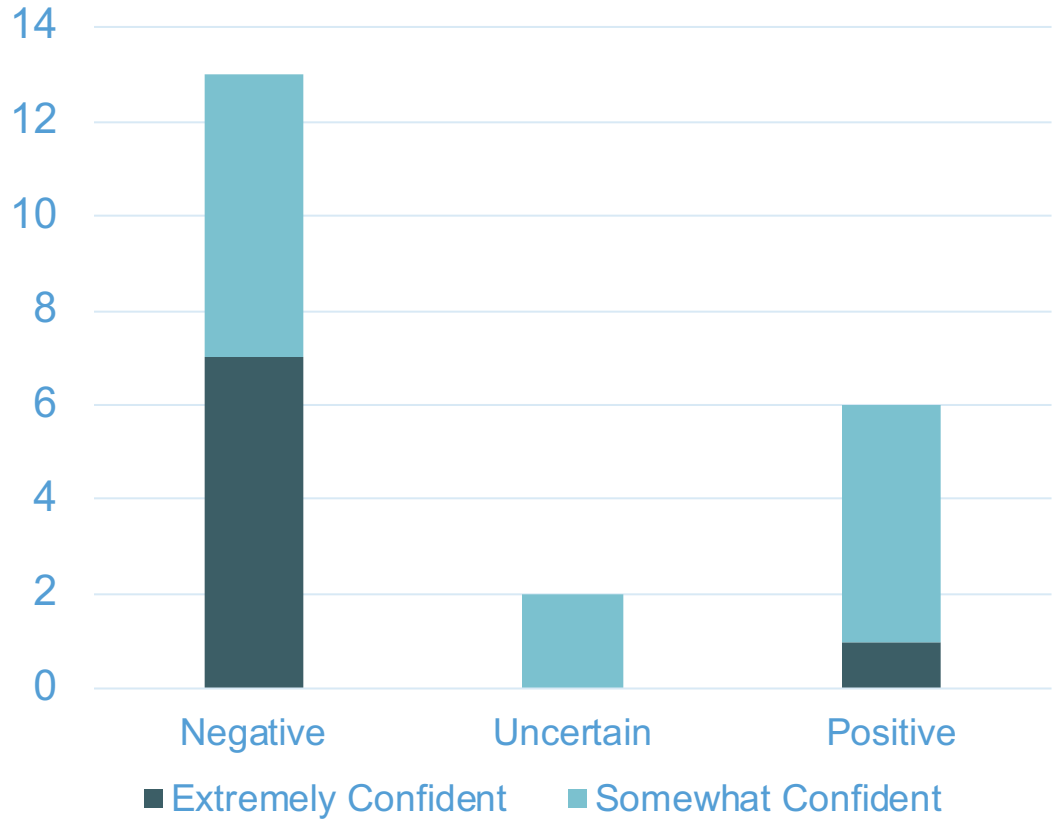
Major: over interpreting negative results, misquoting recurrence risk for family members

Minor: omitting secondary result discussion, missed opportunities to clarify complex topics, including limitations of negative secondary results

Provider Confidence

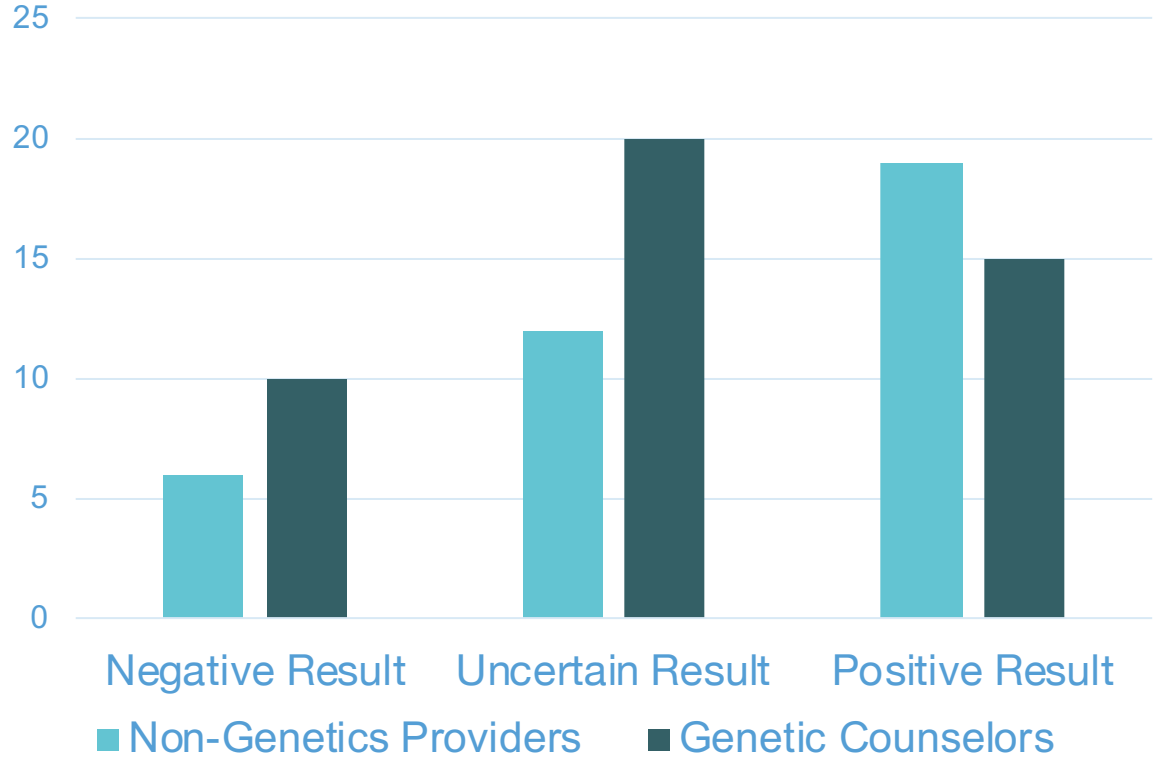
Following result disclosure, all providers indicate their confidence as well as perception of the participant's understanding.

All non-genetics providers thus far have indicated they are either "Extremely" or "Somewhat" confident returning each case.



Data as of 04/20

Length of Disclosure



Averages for all result and provider types are <20 min

Genetic counselors have longer negative and uncertain conversations

Non-genetic providers have longer positive result conversations

Data as of 04/20

Future Directions

- Reduce turn around times and explore rapid work-flow
- Study contents of audio recordings to compare result communication between GC and non-genetics providers
- Compare results of error tracking with primary outcome findings (GCOS and FACToR surveys)
- Follow-up research with providers regarding perceived strengths of training intervention and on-going gaps
- Explore factors influencing provider confidence and willingness to return results

Acknowledgements

HudsonAlpha
(Huntsville, AL)
Greg Cooper
Greg Barsh
Michelle Amaral
Kevin Bowling
Meagan Cochran
Kelly East
Candice Finnila
David Gray
Veronica Greve
Susan Hiatt
Adam Hott
Whitley Kelley
Don Latner
James Lawlor
Tom May
Michelle Thompson

UAB
(Birmingham, AL)
Bruce Korf
Ashley Cannon
Wally Carlo
Maria Danila
Jeff Foster
Anna Hurst
Amanda Luedecke
Joshua Melnick
Lee Ann Merin
Elizabeth Rahn
Dave Redden
Jaimie Richards
Ken Saag
Brian Sims
NICU, CVICU, and MFM Teams

UMMC
(Jackson, MS)
Renate Savich
Laura Hendon
Brian Kirmse
Carly Tuura
Heather Williams
Elizabeth White
NICU Team

University of Louisville
(Louisville, KY)
Kyle Brothers
Sarah Deans
Kelly Jackson
Carla Rich
Josie Timmons
NICU Team

Woman's Hospital
(Baton Rouge, LA)
Steve Spedele
Hillary Janani
Kelly Laborde
NICU Team

Children's New Orleans
(New Orleans, LA)
Jessica Patrick-Esteve
Marla Johnston
Hannah Meddaugh
NICU Team

And Countless Others

SouthSeq
ALABAMA KENTUCKY LOUISIANA MISSISSIPPI

Special thanks to all of our SouthSeq patient participants and their families!

Questions?

“I really feel like because we decided to take part in the study, we are months, if not years, ahead of the game. Who knows how long it would have taken us to get a diagnosis otherwise?”
~Mother of a SouthSeq baby

keast@hudsonalpha.org