

Poster 23: Inclusion of Medically Underserved Populations in a Cohort with Developmental and Epileptic Encephalopathies



¹Stephanie Peck, M.A., ²Erin L. Heinzen, Pharm.D., Ph.D., ³Thomas Felton, M.S. C.G.C., ¹Susan E. Wilson, D.N.P., A.N.P.-B.C.,
⁴Kimberly Foss, M.S., C.G.C., ¹Yulissa Gonzalez, B.S., ¹Zheng Fan, M.D., ⁵Muge Gucsavas-Calikoglu, M.D., M.P.H., ¹Yael Shiloh-Malawsky, M.D.,
¹Senyene E. Hunter, M.D., Ph.D.

¹Department of Neurology, ²Division of Pharmacotherapy and Experimental Therapeutics, ³McLendon Clinical Laboratories, ⁴Department of Genetics, ⁵Department of Pediatrics,
University of North Carolina at Chapel Hill



Background

- ❖ Genetic Determinants of Neurological and Developmental Disorders (GDNDD) identifies genetic variants in developmental and epileptic encephalopathies (DEE)
- ❖ Individuals with epilepsy are more likely to represent underserved populations
 - ❖ Nationally, children with seizures are:
 - ❖ More likely to live in poverty
 - ❖ 36% public insurance (Medicaid, Medicare)
 - ❖ 16% African American and non-Hispanic
 - ❖ 23% Hispanic
- ❖ Due to limited diversity in genetic research, rare variants can have unclear significance in people from diverse ancestral backgrounds

Objective

- ❖ Enroll ≥ 60% of participants from medically underserved populations (historically underrepresented in research) for genomic sequencing in a DEE cohort
- ❖ UNC Child Neurology clinic treats >1,700 children/year
 - ❖ Primary referral for NC (75/100 counties Tier 1 or 2)
 - ❖ ~75% public insurance
 - ❖ ~20% African American
 - ❖ 15% Hispanic
 - ❖ 12% Non-English preferred language

Methods

- ❖ Single center prospective study
- ❖ Recruited individuals with DEE and negative genetic testing and their biological relatives (trios)
- ❖ Medical providers reported barriers to enrollment
- ❖ Used new and existing recruitment and enrollment techniques (Table 2)

Results

Table 1. Definition of underserved

Diversity Category	Represented in Research	Underrepresented in Biomedical Research (definition)
Race and Ethnicity	Identify as White and non-Hispanic	Identify as other than White and non-Hispanic (i.e. Asian; Black, African, African American; Hispanic, Spanish, Latino; Native Hawaiian, Pacific Islander; Middle Eastern, North African)
Geography	Reside in urban metropolitan areas	Reside in rural and non-metropolitan areas
Household Income	>200% Federal Poverty Level	Annual Household Income ≤200% of the Federal Poverty Level
Access to care	Can obtain/pay for medical care	Cannot easily obtain or pay for medical care as needed

Adapted from The All of Us Guide for Diversity and Inclusion

Table 2. Strategies for inclusion of traditionally underserved populations

Potential Barrier	Opportunity/Challenge	Mitigation	Provided By
Sampling bias	Actively recruit a diverse cohort	*Diverse research staff (**fluent bilingual members)	Research Staff
		*Engage neurology clinic to assist with recruitment	Neurology clinic providers
		*Encourage presentation of potential barriers by clinic providers during initial referral (actively solicit)	Research Staff
		*Address potential barriers with potential participant to determine mitigation strategy	Research Staff
Non-English Language	Informed consent	*Professional interpreters	UNC Hospitals
		**Bilingual MyChart Script	Research Staff, Inclusive Science Program
	Transition from neurology clinic to UNC Clinical and Translational Research Center (CTRC)	*Complete informed consent in UNC neurology clinic given participant familiarity with clinic environment	UNC Hospitals
		*Interpreters involved in transition from clinic to CTRC	
		*Perform blood draw for research study in tandem with clinical blood draw (obviates CTRC meeting)	
	IRB-approved documents (e.g., consent forms) in preferred language	*Translation by professors (North Carolina State University Department of Foreign Language, UNC and Duke University Schools of Global Health)	University professors
		MULTilingual Research Advancement for heaLth (MURAL) program	Inclusive Science Program
		*Professional translational services	3 services
Rurality	Travel limitations	*Remote informed consent and enrollment via DocuSign (IRB-approved)	Research Staff
	Remote visits		
Rurality, Socio-economic	Blood draws	*UNC neurology ancillary clinic (provides proximity, avoids hospital-associated fees) instead of UNC academic center (neurology clinic or CTRC)	Research technician (transport sample)
		*Research sample in tandem with clinical blood draw	
		*Weekend availability (e.g., employment-related restrictions, childcare needs)	Research Staff

^aSampling bias due to lack of diversity in genetic studies. ++Spanish. ^Patient identifiers/data will not be shared. +Method successfully employed in pilot study

FIGURE 1. LANGUAGE

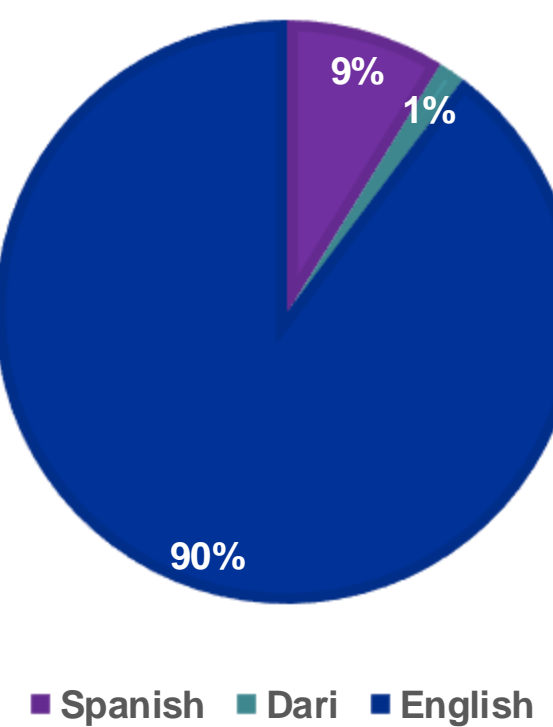
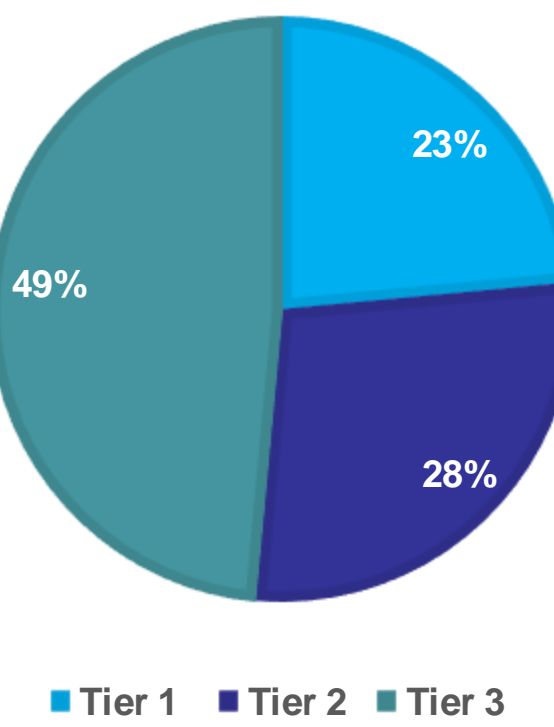


FIGURE 2. RURALITY*



*Based on average unemployment rate, median household income, % growth in population, and adjusted property tax base per capita; Tier 1 = Most Distressed, Tier 3 = Least Distressed

FIGURE 3. INSURANCE

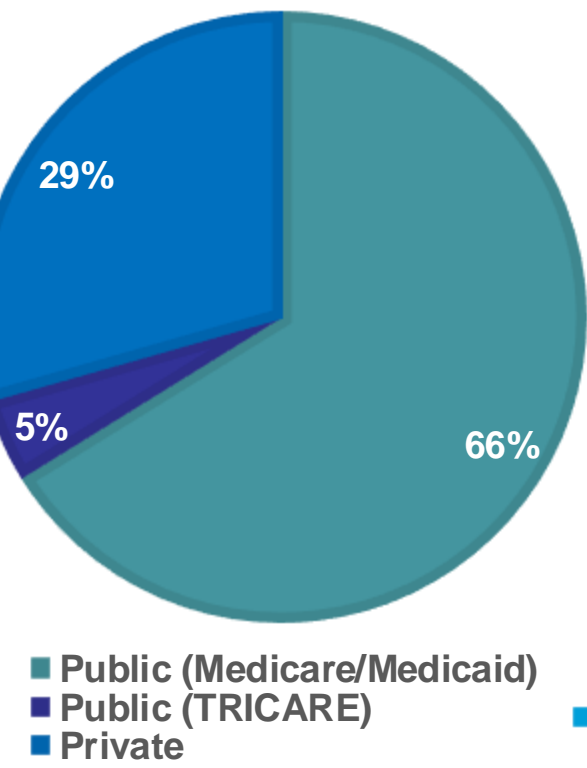


FIGURE 4. ETHNICITY

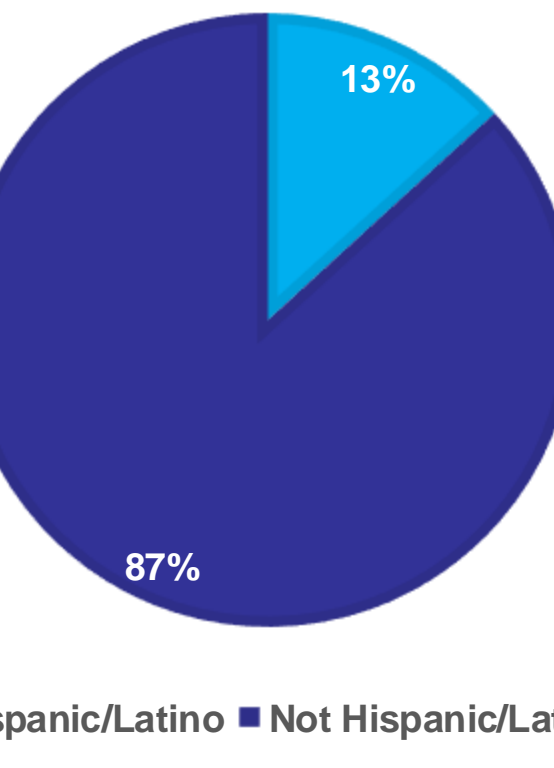
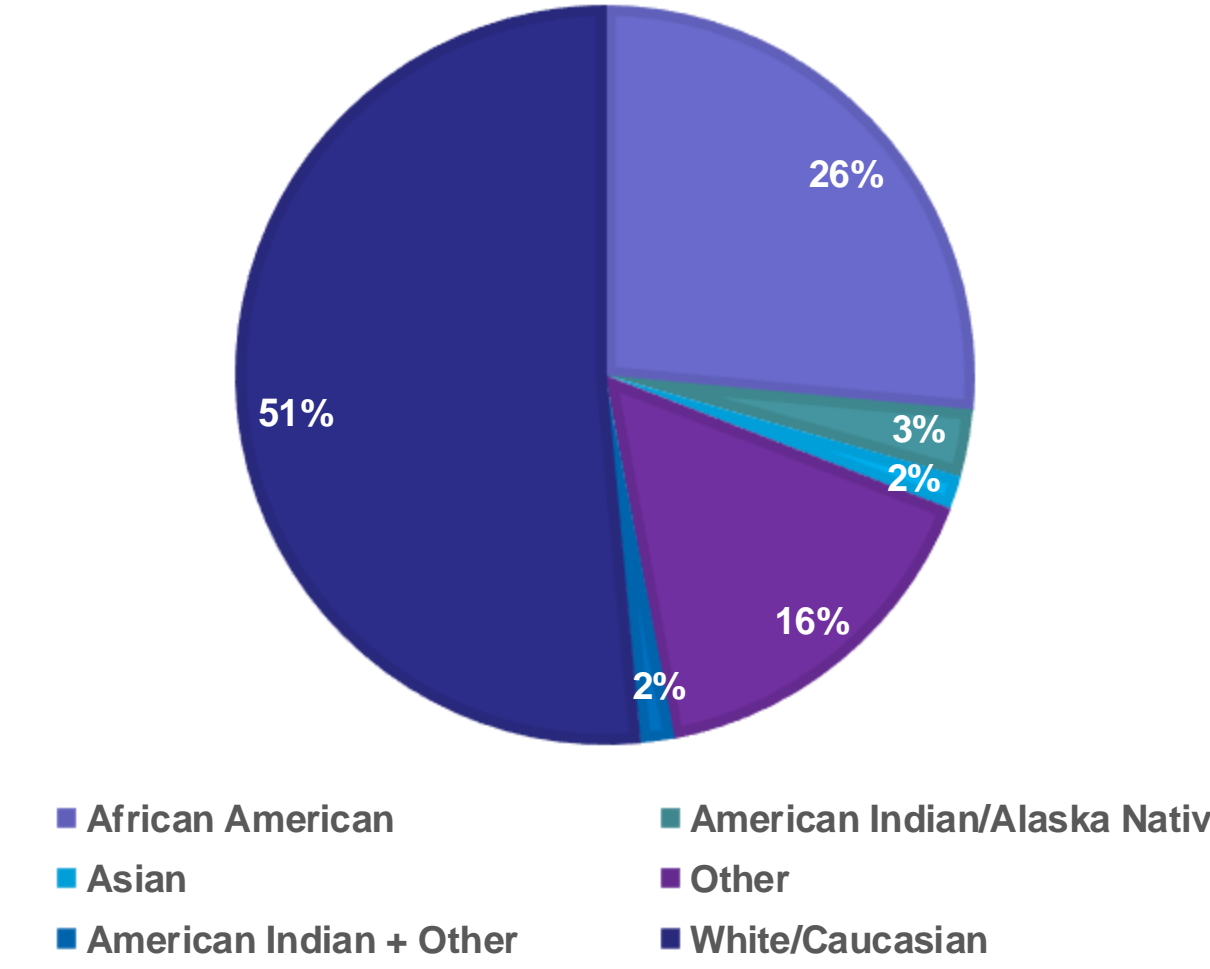


FIGURE 5. RACE



Results continued

- ❖ 68 probands with DEE enrolled (n = 158 total)
 - ❖ 84% (n = 57) from underserved populations
 - ❖ 10% (n = 7) with non-English preferred language
 - ❖ 51% (n = 35) from tier 1 or 2 designated counties
 - ❖ 66% (n = 45) with public insurance
 - ❖ 50% (n = 34) identified as racial/ethnic minorities**
 - ❖ Pathogenic variants detected in 2 participants enrolled using mitigation strategies
 - ❖ Likely pathogenic *GRIA2* variant
 - ❖ Barrier: non-English language (Spanish), rurality
 - ❖ Pathogenic somatic *MTOR* variant
 - ❖ Barrier: non-English language (Dari), rurality
- **As documented in medical record

Conclusions

- ❖ Individuals with epilepsy are:
 - ❖ More likely to represent underserved populations
 - ❖ Less likely to be included in genetic research
- ❖ Population of medically underserved individuals enrolled (>60%) is comparable to that of our clinic
- ❖ GDNDD demonstrates the feasibility of prioritizing ancestrally diversity and inclusion of medically underserved individuals in genetic research, per NHGRI Strategic Vision

References

- ❖ Mapes BM, Foster CS, Kusnoor SV, et al. Diversity and inclusion for the All of Us research program: A scoping review. *PLoS One*. 2020;15(7):e0234962
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