



National Children's Study: Briefing for NCS Federal Advisory Committee

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Outline



- Introduction to the NCS
- NCS Status update
- Sample size estimation
- Identification of process steps to increase efficiency
- Main Study protocol development, review process and timeline
- NCS Research Day

National Children's Study



- Congressionally mandated by Children's Health Act of 2000
- An integrated system of activities to examine the relationships between environmental exposures and genetics on growth, development and health
- Environment is broadly defined to include factors such as air, water, soil, dust, noise, diet, social and cultural setting, access to health care, socio-economic status and learning

What the law says



The Study is required to:

(1) Incorporate behavioral, emotional, educational, and contextual consequences to enable a complete assessment of the physical, chemical, biological, and psychosocial environmental influences on children's well-being;

(2) Gather data on environmental influences and outcomes on diverse populations of children, which may include the consideration of prenatal exposures; and

(3) Consider health disparities among children, which may include the consideration of prenatal exposures."

NCS Principles



- Data driven
- Evidence based
- Community and participant informed

Examples of Exposure Areas of Interest



- Exposure to industrial chemicals and byproducts in the air, water, soil and commercial products
- Exposure to natural products in the air, water, soil and commercial products
- Exposure to pharmaceuticals used for therapy and in the environment
- Radiation exposure
- Effects of proximity to manufacturing, transportation and processing facilities

Examples of Exposure Areas of Interest



- Living with animals, insects and plants
- Media and electronic device exposure, noise
- Access to routine and specialty healthcare
- Learning opportunities that are structured and unstructured
- Diet and exercise
- Family and social network dynamics in cultural and geographic context

Examples of Outcome Areas of Interest



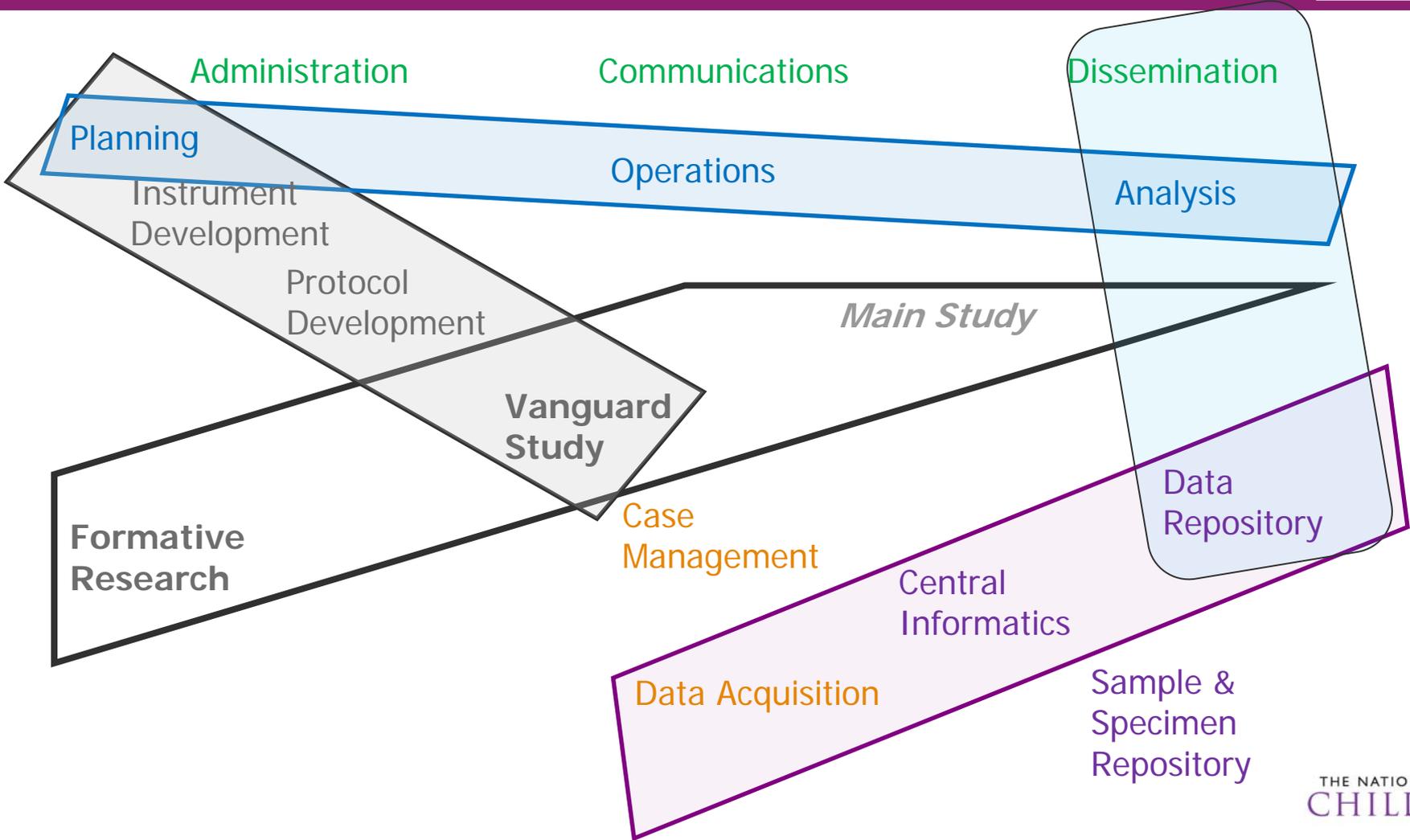
- Interpersonal relationships and bonding
- Inflammatory processes including allergies, asthma and infections
- Genetic and epigenetic status
- Epilepsy and other neurologic disorders
- Cardiovascular screening and function
- Childhood cancer
- Multidisciplinary multidimensional aspects of sensory input, learning and behavior
- Precursors and early signs of chronic diseases such as obesity, asthma, hypertension and diabetes

NCS Structure



- The NCS is an integrated system of activities
- All components and phases together form the NCS
- Current major components are the
 - NCS Vanguard Study- pilot phase for methods-runs for 21 years-started in 2009 with 7 centers- expanded in 2010 with 30 additional centers
 - NCS Main Study-exposure response phase- runs for 21 years about 3 years time shifted from Vanguard Study-planned start in 2012
 - NCS Substudies- studies within studies
 - Formative Research-short term limited studies, often methods development, to support and inform the Vanguard and Main Studies

NCS Activities



NCS Vanguard Study Goals



- Vanguard Study designed to evaluate:
 - Feasibility (technical performance)
 - Acceptability (impact on participants, study personnel, and infrastructure)
 - Cost (personnel, time, effort, money)
- of
 - Study recruitment
 - Logistics and operations
 - Study visits and study visit assessments

Alternate Recruitment Substudy



- NCS Vanguard is now at 37 locations across the country with 30 engaged in new recruitment using one of three different strategies
 - Household based- participants learn about the Study through field workers walking through neighborhoods
 - Provider based- participants learn about the Study through trusted health care providers with a broad definition of provider including physicians, public health nurses, midwives, etc.
 - Direct to the public- participants learn about the Study directly through media and community outreach
- The goal is to compare strategies to assemble a toolkit for cost effective directed recruitment for the Main Study launch
- Both direct data analysis and predictive modeling employed

NCS Recruitment as of June 2011



	Provider	Enhanced Household	Direct	All Alt. Recruitment	Initial Household	All Vanguard
Locations	10	10	10	30	7	37
Recruitment Duration, months	7	7	7		18 full + 9 monitoring	
Women Identified for contact	3350	18600	6200	28200	33650	61850
Women contacted	2000	15900	2150	20100	30800	50900
Women Eligible	600	1550	750*	2900	2600	5500
Women consented	500	850	750*	2050	1600	3650
Babies	100	150	^	250	700	1000

Numbers above have been rounded to the nearest 50, following NCS policy for public data sets

^ - indicates estimate rounds to zero

*- indicates estimate of low-intensity participants

Recruitment Interpretation



- **Household based recruitment:** (going door to door with field workers) about 10% of the women contacted are eligible and of those between 55 to 65% of them enroll in the Study
- **Provider based recruitment:** about 30% of the women are eligible (remember in provider based recruitment, the women must reside in the preselected geographic segments) and about 85% of eligible women enroll. Perhaps the trusted environment improves the consent rate
- **Direct to public:** about 35% of women who voluntarily contact the NCS field office are eligible and essentially 100% of them enroll
- *Speed of enrollment:* household contact is the fastest followed by direct to public approach

Extent of NCS Coverage in Household Based Recruitment



	% of estimated births in geographic segment
NCS Identifies as Eligible	37 -44
Enroll in NCS	25-28 (= 64-67% of eligible)
Birth of child into NCS	20-22 (=80% of enrolled)
6 month Visit	19-21 (=95% of births)

Priority improvement targets:

- Better identification of eligible and pregnant women
- Better retention between enrollment and birth

Sample Size Calculations



- **Goal:** 100 000 participants after 21 years to have sufficient longitudinal data on exposures and conditions with <5% prevalence
 - Modeling by several groups* using optimistic assumptions for starting population of 100 000 children estimates population remaining after 21 years of 39 000 to 45 000
 - Estimates for compliance with projected study visit schedule are fewer than 10% of initial participants will have all data points
- If NCS can retain 90% of enrolled women (currently= 80%) and then retain child cohort with 1 to 3% annual attrition, the NCS should enroll about 225 000 pregnant women by consensus estimates with over 250 000 by NCHS projections

* NCS Program Office, Battelle, Booz Allen Hamilton, Research Triangle Institute, Westat and National Center for Health Statistics (NCHS)

Opportunities to Increase Recruitment Efficiency



- Better identification of pregnant women (currently in the mid 30% to mid 40% range)
- Better retention of enrolled pregnant women (currently in the 80% range)
- Increase number of primary sampling units
 - Add more geographic areas to current roster, but maintain probability sample to minimize bias
- Enlarge secondary sampling units to include at least 1000 live births per year

Protocol Development



- Main Study protocol to emphasize early data collection during pregnancy and childhood because the largest knowledge gaps and potentially influential events occur during these time periods
- Visit frequency will diminish after 5 years
- Recruitment phase is targeted as 2 years for any location. Multiple geographic locations can form a primary sampling unit

Protocol Development Process



- Inputs: Vanguard Protocol data, NCS Scientific Plan and subsequent IOM review, comments from multiple advisors and consultants
- Process: Multidisciplinary team contributed to draft concept document
- Review: NCS Federal Advisory Committee, Interagency Coordinating Committee comments on concept
- Next steps: Draft protocol document, NIH OD subcommittee review, revised protocol, comments by multiple parties, submit to OMB in fourth quarter calendar year 2011

NCS Research Day



- Natcher Conference Center is reserved for August 24, 2011 to highlight NCS Scientific progress and invite future collaboration
- All NIH Institutes and Centers, other HHS agencies and other federal departments will be invited
- Open to public
 - professional societies and advocacy groups will be invited
- Focus is on scientific accomplishments and opportunities
- Learn, collaborate, innovate

Summary



- Based on NCS field data and re-examination of assumptions and projections, propose to increase recruitment sample size and number of locations for the NCS
- Multiple methods to improve efficiencies
- Protocol Development on target for 2012 implementation
- NCS Research Day August 24, 2011