

Request for Information (RFI): NICHD Strategic Plan Fiscal Years 2020-2024

Notice Number: NOT-HD-18-031

Key Dates

Release Date: January 2, 2019

Response Date: February 15, 2019

Related Announcements

None

Issued by

Eunice Kennedy Shriver National Institute of Child Health and Human Development ([NICHD](#))

Purpose

Purpose

The *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) is updating its strategic plan to help guide the research it supports over the next five years. The purpose of this Request for Information (RFI) is to solicit feedback on the scientific themes, goals, and opportunities under consideration for the new NICHD strategic plan.

Background

For more than five decades, NICHD has provided both national and international leadership for research involving children, pregnant women, and people with disabilities. In the fields of developmental biology, reproductive health, child development, pediatrics, population health, and medical rehabilitation, the institute's broad research portfolio has advanced the biomedical and behavioral health of our nation.

Today, the United States and the global community face an array of challenges, such as the opioid crisis and high rates of maternal mortality, that threaten to erode gains in public health. At the same time, technology breakthroughs, whether in genome sequencing, artificial intelligence, mobile devices or other fields, offer new opportunities for scientific discovery and advancements in health and wellbeing. NICHD must remain well-positioned to accelerate the basic, translational, and clinical science needed to address these challenges and opportunities. There is a great need for innovative and transformative work to harness new technologies and methods that address health disparities and improve prevention efforts among the populations we serve. Therefore, in January 2018, NICHD launched a collaborative process involving external and internal stakeholders to propose overarching scientific themes for its updated strategic plan. Six themes have emerged from this process for public consideration.

Information Requested

NICHD seeks input from researchers in academia and industry, health care professionals, patient and family advocates, scientific or professional organizations, federal partners, internal NIH stakeholders, and other interested members of the public. Organizations are strongly encouraged to submit a single response that reflects the views of their organization and membership as a whole.

Specifically, NICHD seeks comments and suggestions on the following research themes, goals, and opportunities:

Research Theme #1: Understanding Early Human Development

Goal: Enhance knowledge of genes and regulatory networks at the single- and multi-cell levels during preconception, conception, and gestation to understand human development, improve fertility, and reduce pregnancy loss.

Opportunities: This goal includes the development of novel platforms, tools, and techniques to characterize the early stages of development. By categorizing and profiling single cells, as well as integrating these data, we will better understand novel cell types in humans and model organisms, signaling pathways in vertebrate development, the role of 'omics in controlling development, and gene regulatory elements that potentially cause disease. This work will be enhanced by research on the influence of environmental exposures on early development, which may help to identify potential targets for prevention. Additionally, this work will capitalize on newly available technology to identify and describe the full range and function of cell types present during development. This research area provides opportunities to understand at a cellular level what developmental factors contribute not only to typical development but also to infertility, miscarriage, stillbirth, birth defects, and other congenital conditions.

Research Theme #2: Setting the Foundation for a Healthy Pregnancy and Lifelong Wellness

Goal: Improve pregnancy outcomes to maximize the lifelong health of the woman and her child(ren).

Opportunities: This goal is focused on the developmental origins of health, including the development of early indicators of risk for threats to maternal health during pregnancy, such as preeclampsia, gestational diabetes, post-partum hemorrhage, and placental anomalies. It also includes understanding how these pregnancy-related conditions contribute to maternal mortality and influence health and wellbeing later in life. Research in this area aims to determine the biological underpinnings of these conditions and potential targets for intervention by studying genotypic, phenotypic, exposure, and other biomarkers. This work includes efforts to incorporate new and/or existing datasets to better understand the course and complications of pregnancy that contribute to health outcomes for woman and child through adulthood. Continued study of the placenta, including non-invasive methods to determine placental health, will play a key role in this opportunity. This work will inform new prevention strategies by considering lifestyle factors (e.g., maternal weight, substance misuse, etc.), exposure to infectious diseases, nutrition, and other influences during pregnancy that promote health or lead to disease at the very earliest stages of life. Understanding the contributors to morbidity and mortality will help to identify and validate targets for preventing preterm birth and related adverse events. Testing of early interventions, both domestically and globally, will be a vital component of this research opportunity.

Research Theme #3: Promoting Gynecological, Andrological, and Reproductive Health

Goal: Enable men and women to manage fertility and minimize the impact of gynecological and andrological conditions.

Opportunities: There is an opportunity to improve basic biological understanding of the male and female reproductive organs; knowledge that may lead to treatments for conditions that affect them. NICHD is interested in the use of integrated genetic and phenotypic exposure data to understand the underlying mechanisms of conditions such as endometriosis, fibroids, pelvic pain, vulvodynia, pelvic organ dysfunction, undescended testes, cryptorchidism, varicocele, and other factors that affect urogenital health. We will maintain a focus on the science of pediatric gynecology, especially as it relates to congenital conditions or complex pediatric gynecologic conditions. Understanding the basic biology of healthy reproductive development, especially the role of menstruation and endometrial biology in health processes, will lead to new avenues for addressing gynecologic conditions. Ensuring options to allow women and men to manage their fertility, as well as developing solutions for infertility, will continue to be an area of focus for NICHD. The institute will seek to identify modifiable factors to solve infertility both through basic science, as well as through an examination of clinical and epidemiologic data on treatments used prior to

assisted reproductive technologies.

Research Theme #4: Identifying Sensitive Time Periods to Optimize Health Interventions

Goal: Understand sensitive time periods during development and rehabilitation when prevention and treatment strategies may have the greatest impact.

Opportunities: This opportunity focuses on change brought on by normal development or by injury or disease. For our efforts to be successful, there is a need to understand sensitive time periods in which an exposure to a disease or event—or the use of a particular intervention—will have the greatest impact. NICHD aims to identify the timing and mechanisms of plasticity in early developmental stages. Investigations of the mechanisms that determine the initiation and termination of these sensitive time periods, including different periods during gestation, will be a novel and transformative area of science. In addition, identification of sensitive time periods after disease or injury when plasticity is high will inform the timing of prevention and management, including early interventions for intellectual, developmental, and learning disabilities and therapeutic approaches in critical care and rehabilitation settings. Exploring factors that can promote health during these sensitive time periods, such as nutrition, sleep, or behavioral interventions, will be a key component of this effort. Including very early exposures, whether to infectious disease, to early language interventions, or to technologies or digital media will help us to understand the impact of the environment on the health of the developing child. The plasticity of systems, whether motor, cognitive, or behavioral, will be a key component of this work. Finally, looking at social determinants, in conjunction with biological factors, that influence these sensitive time periods will enhance our ability to target interventions.

Research Theme #5: Improving Health During the Transition From Adolescence to Adulthood

Goal: Improve the transition from adolescence to adulthood by identifying behavioral, social, environmental, and biological factors that enhance health, especially for adolescents with disabilities or other chronic conditions.

Opportunities: The period of adolescence is poorly understood, but encompasses rapid and transformative development of cognitive, behavioral, social, and health behaviors that continue throughout life. Hormonal changes in the adolescent, and their impact on the development and maturation of the reproductive organs, contribute to the significance of this period. NICHD aims to identify the behavioral, cognitive, social, environmental, hormonal, endocrine, and genetic factors that contribute to adolescent development and may give rise to specific health behaviors that place the adolescent at higher risk for specific disorders in adulthood. Lifestyle factors, such as diet, sleep, and exposure to social media and other technologies, will be a focus of the environmental and behavioral aspects of this opportunity. Finally, the impact of the medical transition from pediatric to adult care, especially for children with disabilities or other chronic diseases, has been understudied and will be an area of interest for NICHD.

Research Theme #6: Ensuring Safe and Effective Therapeutics and Devices

Goal: Develop, test, and validate safe and effective therapeutics and devices specifically for pregnant and lactating women, children, and individuals with disabilities.

Opportunities: Pregnant and lactating women, children, and individuals with disabilities have specific needs that can only be addressed through their inclusion in the development, testing, and validation of therapeutics and devices. Evaluating medications, including safe and effective dosing, in these specific populations will allow for better management and treatment of common conditions. This opportunity includes the potential to use real-world data—such as electronic health records, existing datasets available through research networks or registries, or other big data approaches—to discover potential adverse events, positive outcomes, or common comorbidities in these populations. Finally, acceptability and adherence research to ensure that these interventions can be meaningfully used in these populations will enable implementation efforts in health systems.

SPR Members comment here: <https://www.societyforpediatricresearch.org/nichd-draft-strategic-plan/>