THE OFFICE OF BEHAVIORAL AND SOCIAL SCIENCES RESEARCH

STRATEGIC PLAN 2017-2021

Healthier Lives through Behavioral and Social Sciences

National Institutes of Health
Office of Behavioral and Social Sciences Research

Foreword

As the United States' biomedical research agency, the National Institutes of Health (NIH) has been privileged to be the driving force of advances that improve the health of our diverse nation and the world. These advances extend to health-relevant behavioral and social sciences research that has identified and provided effective interventions for various behavioral and social determinants of health, substantially improving the health of the nation. The behavioral and social sciences are integral to the NIH mission to seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce illness and disability.

In recognition of the importance of behavioral and social sciences to the NIH mission, Congress created the Office of Behavioral and Social Sciences Research (OBSSR) in 1993. Over more than two decades, the OBSSR has been instrumental in advancing and coordinating the behavioral and social sciences at the NIH. During my tenure as Director of the NIH, the OBSSR has contributed substantially to a number of trans-NIH initiatives that have advanced not only behavioral and social sciences specifically, but also health research generally, most recently on the Precision Medicine Initiative and the Environmental Influences on Child Health Outcomes initiative. Last year, I was pleased to appoint Dr. William (Bill) Riley as Director of the OBSSR and Associate Director for Behavioral and Social Sciences Research at the NIH, and I asked the OBSSR to focus its efforts on the critical opportunities and challenges of the field that it is uniquely positioned to address.

As I stated in the NIH-Wide Strategic Plan, although much has been accomplished, much remains to be done. In that spirit, the OBSSR has undertaken the development of this strategic plan to guide the Office over the next five years. This plan, which I support wholeheartedly, is the result of months of consultation with the greater NIH community, our stakeholders, and the public. I am confident it will lead to new and innovative research efforts in the behavioral and social sciences that will contribute to the health of our nation.

Francis S. Collins, MD, PhD
Director, National Institutes of Health

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Acronyms and Abbreviations

bBSSR	basic Behavioral and Social Sciences Research
BD2K	Big Data to Knowledge
BSSR	Behavioral and Social Sciences Research
BSSR-CC	Behavioral and Social Sciences Research Coordinating Committee
CSR	Center for Scientific Review
DPCPSI	Division of Program Coordination, Planning, and Strategic Initiatives
DPP	Diabetes Prevention Program
FY	Fiscal Year
ICs	Institutes and Centers
ICOs	Institutes, Centers, and Offices
IGT	impaired glucose tolerance
NCI	National Cancer Institute
NIH	National Institutes of Health
OBSSR	Office of Behavioral and Social Sciences Research
OppNet	Basic Behavioral and Social Science Opportunity Network
ORBIT	Obesity-Related Behavioral Intervention Trials
PMI	Precision Medicine Initiative
PMI-CP	Precision Medicine Initiative Cohort Program
PROMIS	Patient-Reported Outcomes Measurement Information System
RDoC	Research Domain Criteria
SOBC	Science of Behavior Change
SPWG	Strategic Planning Working Group
SSB	sugar sweetened beverage
UCSF	University of California, San Francisco

Preface

The Office of Behavioral and Social Sciences Research (OBSSR) recently celebrated its 20th anniversary. Much has changed since the OBSSR opened in 1995 and released its first strategic plan two years later. When the OBSSR was created, it was not commonly accepted that behavioral and social factors were predominant influences of health. Today, this understanding is widely accepted, but our ability to modify these behavioral and social factors, and to maintain these changes over time with limited resources, remain critical challenges for the behavioral and social sciences. When the second strategic plan was developed 10 years ago, few could have imagined the technological advances that have transformed how we communicate and function, and have provided behavioral and social scientists with new tools to assess behavior and deliver scalable and adaptable interventions.

I cannot imagine a more exciting time than now to be a behavioral and social science researcher. Advances in technology, open data, and big data analytics are providing new and temporally dense information on large and varied samples. Transdisciplinary efforts by diverse disciplines, including genetics, neuroscience, computer science, and engineering, are reinvigorating the behavioral and social sciences with novel approaches and methodologies and are cross-pollinating behavioral and social sciences research approaches into their disciplines as well. This integration across disciplines is becoming so pervasive that some may wonder one day why the National Institutes of Health (NIH) needed an Office of Behavioral and Social Sciences Research. Until the day comes when health research spans and integrates the full continuum of influences from genetic to societal, the OBSSR will remain committed to coordinating the behavioral and social sciences at the NIH and to identifying and helping the NIH address the important behavioral and social research areas relevant to health.

The third OBSSR Strategic Plan reflects not only the rapidly changing nature of the behavioral and social sciences, but also builds upon many of the major opportunities highlighted in prior plans, such as the integration of social and behavioral sciences into the broader biomedical research effort and the role of complex dynamic modeling and other emerging methodologies to advance the behavioral and social sciences. The OBSSR is responsible for coordinating the full range of behavioral and social sciences at the NIH, but we must also focus our efforts. Therefore, this strategic plan targets a few key advances that we believe the OBSSR is uniquely positioned to achieve within the next five years.

Many individuals, groups, and organizations contributed to the development of this third OBSSR Strategic Plan. Their feedback was instrumental in identifying priority areas and generating the objectives described in this document. On behalf of the NIH and the OBSSR, I extend my thanks to all who contributed to this OBSSR Strategic Plan, Fiscal Years 2017-2021.

William T. Riley, PhD
Associate Director for Behavioral and Social Sciences Research
Director, Office of Behavioral and Social Sciences Research, NIH

Executive Summary

A scientific paradigm shift is occurring in the behavioral and social sciences. Fundamental or basic behavioral and social sciences research (bBSSR), integrated with advances in neuroscience, genetics, and emerging "omics" fields, is beginning to clarify the complex dynamic mechanisms that shape the brain, behavior, and environment. Advances in measurement science and technologies provide temporally dense, contextual data on human behavior and its influences at levels of granularity and precision previously unimaginable. Advances in technology are rapidly changing the reach, scalability, and adaptability of behavioral and social interventions. The expanding sources of population-level data and efforts to integrate these data provide both the platform to better monitor health and its behavioral and social influences and the ability to more rigorously assess population-level interventions.

The health of the nation is shaped primarily by behavioral and social influences. Therefore, it is critically important that the preeminent health research agency in the United States, the National Institutes of Health (NIH), focuses substantial effort and resources on advancing our understanding of and ability to modify these influences, at the individual and population levels, to improve health. As established by Congress more than 20 years ago, the role of the Office of Behavioral and Social Sciences Research (OBSSR) at the NIH is to coordinate the health-relevant behavioral and social sciences and to identify challenges and opportunities to advance these sciences in the service of the nation's health. These core roles remain guiding principles of this strategic plan.

The strategic plan includes three *equally important* scientific priorities, which reflect key research challenges that the OBSSR is uniquely positioned to address, along with four foundational processes to enhance and support these scientific priorities as well as the OBSSR's broader mission.

Priority One—Improve the synergy of basic and applied behavioral and social sciences research. New and innovative approaches to change behavior and social systems to improve health rely on fundamental research that characterizes novel mechanisms and targets. The OBSSR is committed to identifying and encouraging bBSSR to develop viable pathways to improve individual and population health. To do so, the OBSSR will work with the NIH Institutes and Centers to identify promising and emerging lines of bBSSR relevant to the health research mission of the NIH, stimulate new areas of bBSSR that address important research questions, and facilitate the translation of bBSSR findings to applied research.

Priority Two—Enhance and promote the research infrastructure, methods, and measures needed to support a more cumulative and integrated approach to behavioral and social sciences research. Technological and scientific advances offer exciting opportunities as well as novel challenges for behavioral and social sciences research. Varied and voluminous data from multiple data sources increase the importance of data sharing, harmonization, and integration. To take full advantage of the data being produced, a robust and open research infrastructure, including common data elements, ontologies, and consensus measurement metrics, must be developed and refined—a need that the OBSSR is uniquely positioned to address. Advances in science are often preceded by advances in measurement, and the OBSSR will continue to encourage new approaches that improve the precision, accuracy, and efficiency of measures of behavioral and social phenomena and their context. New data types and new measurement approaches necessitate new methodologies and analytics. The OBSSR is committed to encouraging a broad repertoire of methods and analytics to answer increasingly complex and relevant research questions.

Priority Three—Facilitate the adoption of behavioral and social sciences research findings in health research and in practice. A substantial gap remains between the research findings in the behavioral and social sciences and the implementation of this research in practice. The OBSSR can play an important role in narrowing this gap by encouraging behavioral intervention research in the context in which these interventions are intended to be delivered. To foster adoption of effective behavioral and social interventions, the OBSSR can disseminate research findings, encourage dissemination and implementation research, and partner with other agencies and entities to reduce the barriers to adoption of effective interventions.

To address these scientific priorities and the broader NIH efforts in the behavioral and social sciences, the OBSSR will rely on four foundational processes.

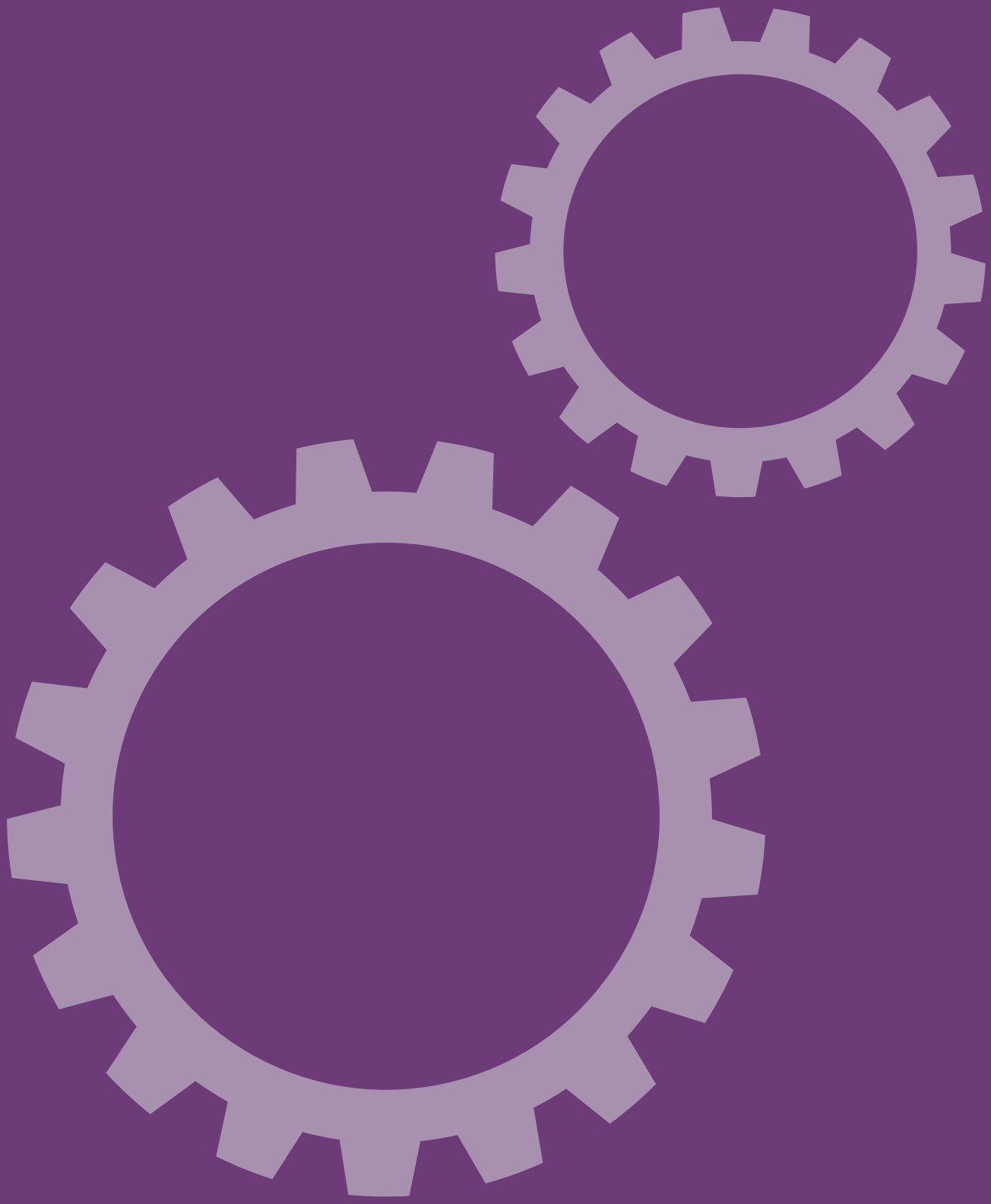
Communicating behavioral and social sciences research findings

Coordinating behavioral and social sciences research programs across the NIH and integrating behavioral and social sciences research within the larger NIH research enterprise

Training the next generation of behavioral and social science researchers

Evaluating the impact of behavioral and social sciences research and addressing scientific policies that support this research

These foundational processes are central functions consistent with the OBSSR mission that can be marshalled to meet the objectives of the scientific priorities outlined in this strategic plan.



Introduction

Health over the life course is the result of a complex and dynamic interplay of multidimensional influences that range from genetic determinants to social and environmental determinants. This confluence of multilevel influences on health and behavior over the life course is illustrated by Glass and McAtee, who described these multilevel influences as nested hierarchies of influences that occur within and outside the individual (see Figure 1).[1] Behavioral and social determinants account for approximately half of the premature deaths in the United States.[2] Understanding these behavioral and social determinants, how they interact with biology, and how they can be modified to improve wellness requires a robust and rigorous behavioral and social sciences research (BSSR) agenda. The National Institutes of Health's (NIH's) Office of Behavioral and Social Sciences Research (OBSSR) is uniquely positioned to advance the BSSR that ultimately improves the nation's health. The OBSSR mission reflects the important role of BSSR in support of the NIH mission to seek fundamental knowledge about the nature and behavior of living systems and to apply that knowledge to enhance health, lengthen life, and reduce illness and disability.

The mission of the OBSSR is to:

- Enhance the impact of health-related behavioral and social sciences research
- Coordinate behavioral and social sciences research conducted or supported by the NIH and integrate these sciences within the larger NIH research enterprise
- Communicate health-related behavioral and social sciences research findings to various stakeholders within and outside the federal government

AXIS OF NESTED HIERARCHIES

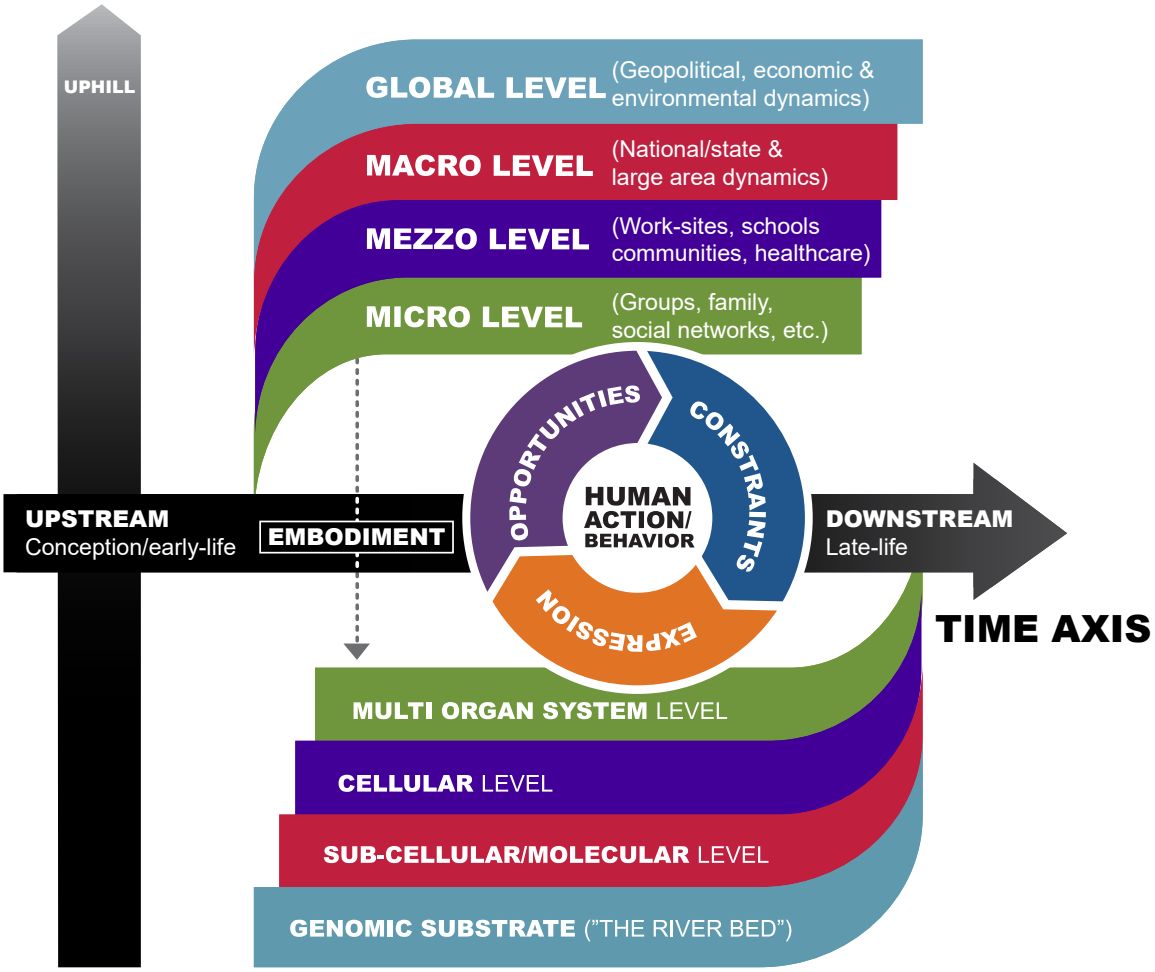


Figure 1: The society-behavior-biology nexus as depicted in multidimensional space. Adapted from Soc Sci Med, 62(7), Glass TA, McAtee MJ, Behavioral science at the crossroads in public health: extending horizons, envisioning the future, pp. 1650-71, 2006. Permission from Elsevier.

Over the past decades, BSSR has contributed substantially to the understanding of health and disease and to improvements in public health. Among the many public health contributions, BSSR has been instrumental in the reduction of tobacco use and smoking-related illnesses,[3] improved control of infectious diseases,[4] increased screening behaviors,[5] and reduced environmental exposures.[6]

Multi-component interventions using an array of strategies to train, incentivize, and sustain behavior change have been evaluated. For example, efforts to change eating and physical activity behaviors have proven more effective than drug therapy in preventing the onset of type 2 diabetes among high-risk individuals.[7] BSSR has provided essential insights on adherence to anti-retroviral treatments for HIV/AIDS where failure to follow these complex regimens correctly can lead to resistance.[8]

Although BSSR has improved the understanding of health and disease and contributed to many public health successes, significant challenges remain. The relative contributions of complex and dynamic behavioral and social mechanisms to health are difficult to assess. Sustaining behavior change as treatment intensity wanes also remains challenging. Overcoming these and other challenges requires forward-leaning stewardship in health-relevant BSSR that the OBSSR was created to address.

The U.S. Congress established the OBSSR in 1993, in recognition of the importance of health-related behavioral and social sciences and their contributions to the NIH mission (see Appendix A). Since opening as an NIH Office in 1995, the OBSSR has developed two previous strategic plans.[9] Partnering with the 27 NIH Institutes and Centers (ICs) and the offices within the Office of the Director during the past two decades, the OBSSR has worked to achieve the goals and objectives of these previous strategic plans. The current strategic plan builds upon the efforts of the OBSSR and its partners to achieve these earlier priorities while recognizing the accelerating pace of change in the behavioral and social sciences specifically, and health research generally. (See Appendix B for a description of the processes leading to the current strategic plan.)

The behavioral and social sciences at the NIH include a multidisciplinary set of research disciplines that have in common the study of behavior and social processes and the interactions among individuals, social groups, institutions, and the social and physical environments that are relevant to health. To further the behavioral and social sciences, researchers study the interplay between behavioral and environmental mechanisms, focusing on causal and explanatory factors that occur not only within the organism (e.g., genetics, neurobiology), but also outside the organism (e.g., physical, familial, community, cultural, policy, and societal influences). The complex, bidirectional impacts of these external influences—the environment on behavior and behavior on the environment—are essential to understanding how behavior and the environment interact with the organism to affect health and wellbeing. This broad perspective on the underpinnings of behavior, from genetic through societal influences, provides the behavioral and social sciences with a unique perspective of these dynamic interactions that can influence health outcomes across an individual's lifespan and across generations.

In acknowledgment of the OBSSR mission and the opportunity to contribute to improved health, the OBSSR Strategic Plan for Fiscal Years 2017-2021 represents a major effort to integrate BSSR fully into the nation's health research agenda. The OBSSR has the responsibility to coordinate an extensive range of research in the behavioral and social sciences; however, it also must focus its resources on challenges and opportunities that it is uniquely positioned to address. Consequently, the strategic planning process included assessment and identification of the areas of BSSR that (1) have the potential to produce the greatest impact for the largest proportion of health-related BSSR and (2) present challenges and opportunities that the OBSSR is uniquely positioned to address.

The scientific objectives targeted by this plan are organized within the three scientific priorities that emerged from a broad and systematic inquiry and planning process (see Figure 2). An overarching theme of these three scientific priorities is to encourage a more cumulative and integrated BSSR enterprise that extends from basic science through the adoption of approaches to improve the nation's health.

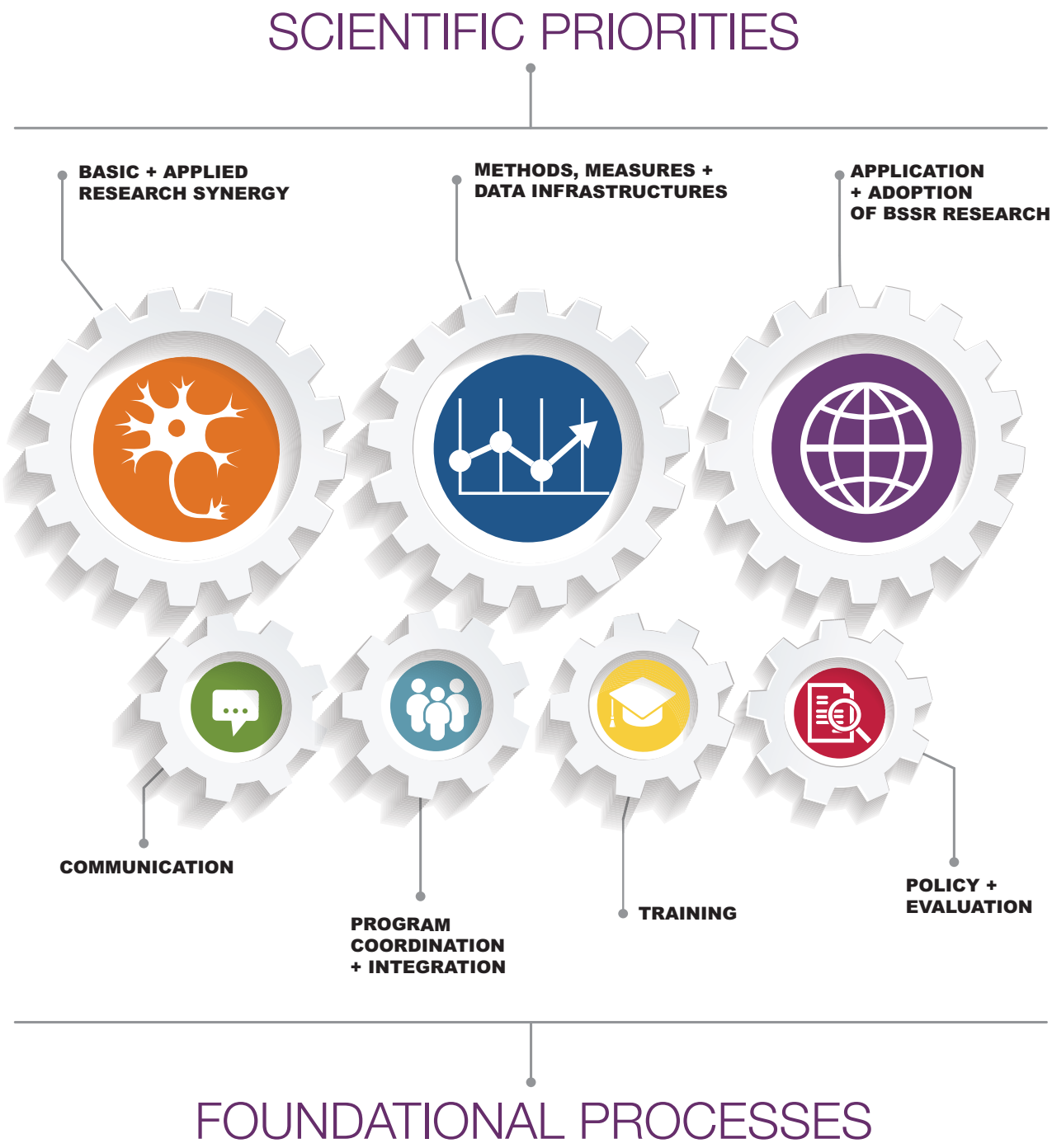


Figure 2: The OBSSR Strategic Plan, Fiscal Years 2017-2021. Three scientific priorities, supported by four foundational processes, help achieve the OBSSR's mission and improve the nation's health.

Our scientific vision encompasses a science that builds and improves upon the research that preceded it, and then integrates these advances into the broader biomedical and behavioral research effort. The OBSSR scientific priorities are to:

Improve the synergy of basic and applied behavioral and social sciences research

Enhance and promote the research infrastructure, methods, and measures needed to support a more cumulative and integrated approach to behavioral and social sciences research

Facilitate the adoption of behavioral and social sciences research findings in health research and in practice

The order of these three priorities follows the translational process from fundamental discovery research through implementation and adoption, and all three are *equally important* in the strategic plan.

To address these scientific priorities and the broader NIH efforts in the behavioral and social sciences, the OBSSR will rely on four foundational processes.

Communicating behavioral and social sciences research findings

Coordinating behavioral and social sciences research programs across the NIH and integrating behavioral and social sciences research within the larger NIH research enterprise

Training the next generation of behavioral and social science researchers

Evaluating the impact of behavioral and social sciences research and addressing scientific policies that support this research

Scientific Priorities

Priority One

Improve the Synergy of Basic and Applied Behavioral and Social Sciences Research

Fundamental science is a pillar of NIH research and discovery. The NIH has a strong history of supporting basic or fundamental biomedical research across a wide range of disciplines, including behavioral and social sciences. Scientists must understand the range of complex and dynamic processes that contribute to human health, from the molecular level to the societal level, to develop interventions that effectively prevent and/or treat disease. Basic BSSR (bBSSR) seeks further understanding of the processes that govern individual behavior and the behavior of social systems and groups, including both animal and human studies. The NIH has been committed to basic discovery research since its inception. That commitment has been reinforced recently with the NIH-Wide Strategic Plan: Fiscal Years 2016-2020, highlighting fundamental research as a key scientific priority,[10] as well as in a recent letter in *Science* reaffirming the NIH's commitment to basic research.[11]

Discovery research into the fundamental processes that influence behavior and social systems and their influences on health contributes to the NIH mission. Supporting bBSSR that has a plausible pathway to, or implication for, health is a priority for the NIH, and the OBSSR assists the NIH by focusing its bBSSR efforts on basic research potentially relevant to health. A range of bBSSR areas have clear relevance to health, including but not limited to stress and resilience, social learning, self-regulation, decision making, executive control, and social influences on health and disease. Improved understanding of these and other influential bBSSR mechanisms is critical to informing clinical and translational studies that can help improve health and wellbeing.

In a study designed to determine potential mechanisms for the initiation and maintenance of behavior change, researchers examined the involvement of dopamine, a neurotransmitter that mediates pleasure in the brain, in the formation and extinction of habitual behavior. They found that habitual behavior strongly correlated with increased dopamine signaling in the striatum while suppressing habitual behavior correlated with decreased dopamine signaling. Stimulating dopamine signaling promoted habit formation. The role of dopamine signaling in the transition between goal-directed to habitual behaviors could provide critical insights in gaining greater control over habitual behaviors and in maintaining goal-directed behaviors long term.[12]

The OBSSR and the NIH have engaged in a number of initiatives to accelerate bBSSR that can be readily translated into applied health research.

- In 2009, the NIH initiated the Basic Behavioral and Social Science Opportunity Network (OppNet) to expand the NIH basic science portfolio to understand better how behavioral and social processes influence the biology and behavior of individuals and groups. During its five-year funding period, OppNet enhanced the coordination of bBSSR and supported more than 100 projects.
- Translating Basic Behavioral and Social Science Discoveries into Interventions to Reduce Obesity (the Obesity-Related Behavioral Intervention Trials or ORBIT Consortium) is a trans-NIH initiative led by the National Heart, Lung, and Blood Institute, in partnership with the National Institute of Diabetes and Digestive and Kidney Diseases, National Cancer Institute (NCI), *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, and OBSSR. The initiative funded seven projects to use findings from basic research on human behavior to develop more effective weight control interventions.

- The Science of Behavior Change (SOBC) program is an ongoing NIH Common Fund effort that seeks to promote basic and translational research on the initiation, personalization, and maintenance of behavior change via an improved understanding of the underlying principles of behavior change.[13] The SOBC program uses a mechanisms-focused, experimental medicine approach to behavior change research and seeks to develop the tools required to implement such an approach.

It is through these and other initiatives that the NIH and OBSSR can encourage and support bBSSR that lays the foundation needed to develop new approaches to change behavior and social systems to improve health. Conceptual models of intervention development have been improved by encouraging a theoretical basis for these models. Extending the basis for these intervention models to include basic behavioral and social sciences research findings has the potential to identify new mechanisms and produce innovative strategies targeting these mechanisms to facilitate change in behavioral and social sciences processes that influence health.

Objective 1.1

Identify and encourage promising basic behavioral and social sciences research relevant to health

1.1.1 Identify bBSSR scientific needs with potential for translation and develop initiatives to address these needs in coordination with relevant NIH Institutes, Centers, and Offices (ICOs)

1.1.2 Develop trans-NIH initiatives to support bBSSR in promising areas with shared interests across ICOs

1.1.3 Coordinate with other sponsors of bBSSR (e.g., National Science Foundation) to identify complementary bBSSR efforts relevant to the NIH

Objective 1.2

Facilitate greater bidirectional interaction of basic and applied behavioral and social science researchers to facilitate the translation of basic to applied behavioral and social sciences

1.2.1 Assist in the translation, communication, and dissemination of bBSSR findings, both animal and human, that could be incorporated into applied BSSR relevant to health

1.2.2 Facilitate the dissemination of basic research questions that emanate from the results of applied behavioral and social health research projects

1.2.3 Stimulate greater collaboration and transdisciplinary research between basic and applied behavioral and social science researchers

Using a factorial design of various sociodemographic and socioeconomic determinants, nine-year mortality rates of middle-aged urban adults were predicted from an interaction of sex, race, and individual poverty status with African American men living below the poverty level having the highest mortality rates. Neighborhood economic status contributed to predictions of mortality above these individual characteristics, and neighborhood income inequality interacted with individual poverty status to predict mortality. These findings indicate that the socioeconomic characteristics of neighborhoods contribute to mortality over and above individual economic factors, and more in-depth characterization of neighborhood influences may improve our understanding of health and health disparities.[14]

Priority Two

Enhance and Promote the Research Infrastructure, Methods, and Measures Needed to Support a More Cumulative and Integrated Approach to Behavioral and Social Sciences Research

Recent scientific and technological advances in the biomedical, behavioral, and social sciences are generating massive amounts of information from the molecular and genetic levels to clinical and community outcomes. These advances present new challenges. For instance, working with data generated across research disciplines increases the likelihood that the constructs of interest will be defined and measured differently. This limits the ability to harmonize data across disparate datasets. Computing power and interoperability, as well as data storage, archiving, retrieval, and visualization must also be addressed. In addition, creating and managing big data will entail developing standards for transparency and, particularly in the behavioral and social sciences, will raise important ethical and privacy concerns.

> “Our ability to improve health increasingly hinges on our ability to manage and make sense of the enormous amounts of data being produced by scientific research.[16]”
>
> —Francis Collins, Director, NIH, 2015

One effort to address these challenges is the trans-NIH Big Data to Knowledge (BD2K) initiative, designed “to support the research and development of innovative and transforming approaches and tools to maximize and accelerate the integration of big data and data science into biomedical research.”[15] BD2K centers will improve the ability of the research community to use increasingly large and complex datasets by developing and distributing innovative approaches, methods, software, and tools. BD2K training efforts will prepare researchers, including behavioral and social science researchers, to extract meaningful information from these large and complex datasets.

Another NIH big data effort promises a future that will allow scientists to personalize treatments based on individual characteristics. In 2015, the President of the United States announced the Precision Medicine Initiative (PMI) to expand understanding of the ways in which people and their health are unique, and to deliver more individualized diagnoses and care.[17] The PMI Cohort Program (PMI-CP) is enrolling more than one million volunteers to provide the scale and scope needed to address research on an array of diseases and health issues and to understand a wide range of variables that influence health, from genes to large-scale social factors. The OBSSR has contributed to these and other trans-NIH initiatives to ensure that they incorporate comprehensive multilevel perspectives of health and disease.

The behavioral and social sciences share similar big data promises and challenges. BSSR projects, across a variety of disciplines, are creating large-scale discovery datasets that provide access to multiple combinations of variables, from granular individual-level data to systems-wide information. Data streams from smartphones and wearable sensors result in datasets that are temporally dense, voluminous, and complex, even for a single individual. Increasingly, behavioral and social science researchers are characterizing behavior, its influences, and its relation to health status by utilizing the digital footprints of individuals interacting with technologies and social media throughout the day. The resulting large data streams require big data approaches and analytics to extract meaningful information from the wealth of information available.

In addition to big data approaches and analytics, the behavioral and social sciences face other unique challenges from open and shared datasets that currently limit the potential cumulative power of these sciences. The harmonization of precise and accurate measures is one such challenge. The behavioral and social sciences suffer from a cacophony of measures for the same or similar construct, which may produce confusing or contradictory findings. Currently, researchers use the same construct name but mean different things, or use different construct names but mean the same thing. A more cumulative and integrated science that builds on prior research recognizes that a new construct or measure is justified only with substantive proof that it adds significant scientific value over and above all of its progenitors.

> “The grandest discoveries of science have been but the rewards of accurate measurement . . .[18]”
>
> —Lord Kelvin,1871

Propensity score-based methods are widely used to draw causal inferences between factors in the behavioral and social sciences. These methods, however, depend on the assumption that identifying covariates in a statistical model presupposes the lack of unobserved confounding factors. In light of these shortcomings, researchers tested propensity score-based methods against a newly proposed approach called the Marginal Treatment Effect, a method that does not rely on the same assumption.[19] The findings led these researchers to propose the Smoothing Difference Propensity Score-Based Method, which allows researchers to better estimate counterfactual outcomes and treatment effects. This research will allow scientists to infer more accurately the causal nature of the outcome of interest with greater clarity and efficiency.

In response to these types of measurement concerns, the Patient-Reported Outcomes Measurement Information System (PROMIS) developed a common scale or metric on which all measures of a given construct can be expressed. To achieve this, PROMIS developed and tested item banks using modern psychometric theory that, in addition to producing more precise and efficient measures, allow different measures of the same construct to be co-calibrated.[20] As a result, different instruments measuring the same construct can be expressed on a single metric, aiding data harmonization and integration.

Another approach to addressing this data harmonization and integration challenge is to develop consensus measures for specific constructs. PhenX, for example, has developed a curated set of measurement protocols for specific phenotypic constructs.[21] The NCI Grid-Enabled Measures website utilizes a crowdsourcing wiki approach to cataloging the various measures of a given social or behavioral construct.[22] The National Library of Medicine has generated a directory of common data elements that serves as a repository for commonly accepted measures and data structures that, if adopted by researchers, would facilitate data integration across studies.[23]

Total daily time out-of-home of elderly independent adults was unobtrusively and objectively assessed for one year using in-home motion and contact activity sensors. More hours out-of-home was associated with better cognitive function, physical functioning, and emotional state. For example, those with mild or greater cognitive impairment based on the Clinical Dementia Rating spent 1.67 fewer hours/day outside the home and were 12 percent less likely to leave the home on any given day than those without any cognitive impairment. Home-based activity sensing may enable unobtrusive and longitudinally intensive monitoring for early indicators of cognitive, functional, and emotional decline.[26]

Recent technological advances are rapidly changing the ability to passively sense behavior and its influences. The emergence of smartphones, now used by greater than two-thirds of U.S. adults, provides both a platform for experience sampling or ecological momentary assessment and an array of passive sensors that can be used to sense activity, sample the environment via audio or video, or assess sensory, motor, or cognitive performance in real time. The data from these technologies generate “digital phenotypes” that incorporate variability and patterns over time.[24] The proliferation of these new sensor technologies offers new approaches to measuring behavior and its influences but presents the challenges of validating and harmonizing data across devices. The data from these technologies also present new challenges to privacy and research ethics that must be addressed.[25] The OBSSR will continue to support research to develop, test, and validate new and increasingly sophisticated approaches to measure behavioral and social factors.

As behavioral and social sciences continue to move forward in the collective and cumulative enterprise of harmonizing precise and accurate measures, sustained efforts in formulating behavioral ontologies and taxonomies are critical. One international group of researchers has developed a taxonomy of behavioral intervention strategies.[27] Within the NIH, efforts such as the Research Domain Criteria (RDoC) being developed by the National Institute of Mental Health represent efforts to catalog the constellation of behavioral, developmental, or social characteristics that, as a group, can be correlated with specific clinical outcomes or disorders.[28]

A more cumulative science also will require new approaches and methods for evaluating behavioral and social interventions, which are greatly influenced by the characteristics that the individual or system brings to the intervention and the context in which the intervention is delivered. Different sample characteristics and different contexts likely have contributed to the failures to replicate the results observed in psychological studies.[29] In addition, because these interventions are multi-component and each study tends to modify the admixture of these intervention components, meta-analyses of randomized controlled trials for a given social or behavioral problem seldom provide guidance on how to improve the intervention. Optimization designs utilizing factorial and sequential randomization provide an alternative approach to understand better the combination and sequence of intervention components that will produce the desired effect.[30] Series of single case studies as well as methodologies borrowed from engineering and computer science (e.g., computational dynamic models) provide the opportunity to iterate and improve interventions as they are evaluated. This accelerates the ability to optimize interventions and the time required to produce empirical findings. These methodologies and measures allow researchers to tailor behavioral and social interventions that account for individual and contextual differences. Tailored intervention approaches have been shown to be effective in a number of studies,[31] and tech-enabled interventions have provided the opportunity to tailor interventions not only to the individual at baseline, but also dynamically and adaptively throughout the course of the intervention.[32]

Using a computational modeling approach based on community survey and market data, researchers evaluated a simple environmental manipulation or "nudge" on the selection of non-sugar sweetened beverages (non-SSBs) by adolescents in low income–area corner stores in Baltimore, Maryland. Modeling simulations revealed that placement of non-SSBs in the optimal location (front cooler, second or third shelf down) produces a 2.8 times higher rate of non-SSB purchases compared to placement on the bottom shelf of the cooler farthest from the entrance. The study estimates that a shift in product placement alone would result in 5.2 million more non-SSBs purchased by Baltimore adolescents annually. This computational modeling simulation demonstrates the potential impact of a relatively simple environmental manipulation to change behaviors associated with increased susceptibility to obesity among adolescents.[33]

Another potentially confounding aspect of social or behavioral intervention research, especially higher level interventions at the organizational or community levels, is that they are sometimes more difficult to control or manipulate. Quasi-experimental designs such as interrupted time series and regression discontinuity designs have been used in a number of such studies and provide an important alternative methodology to evaluate these interventions.

Policy changes that potentially affect behavior and health are often difficult to assess unless researchers can rapidly obtain a stable baseline prior to the policy change and follow the effects for some period following the change. The NIH has the capacity to accelerate the grant application and funding process and has done so previously for rapid research on policy changes and naturalistic experiments.[34] The OBSSR will continue to support the expansion of these rapid funding efforts for time-sensitive natural experiments and to enhance the scientific rigor of these natural experiments.

The transition to more iterative intervention development methodologies and more common constructs and measures will be challenging, but an open, transparent, rigorous, and cumulative science requires such a transition.

Objective 2.1

Encourage data integration and replication in the behavioral and social sciences

2.1.1 Coordinate the development of behavioral and social sciences research taxonomies and phenotypes including construct mapping, common data elements, and ontology development

2.1.2 Encourage and assist in the development of measurement harmonization, not only of multiple measures for a given construct, but also across disease or sociodemographic groups and across the lifespan

2.1.3 Assist in the development and coordination of research collaborations that facilitate data sharing, linking, and integration across existing datasets, including the application of behavioral and social sciences principles to promote data sharing and integration

Objective 2.2

Facilitate the development and testing of new measurement approaches

2.2.1 Encourage advances in the precise measurement of social and behavioral phenomena, particularly above the level of the individual (e.g., families, social groups, workplaces, communities, policies, and cultures)

2.2.2 Leverage technologies to advance new measurement approaches

2.2.3 Facilitate access to a wide range of validated social and behavioral measures, and coordinate measurement efforts across the NIH

Objective 2.3

Expand the repertoire of methods available to behavioral and social science researchers

2.2.1 Encourage the development, adaptation, testing, and/or application of novel and rigorous methods and analytics in the behavioral and social sciences

2.2.2 Leverage innovative technologies, methods, and analytics to optimize, deliver, and evaluate behavioral and social interventions, particularly intensively adaptive interventions

2.2.3 Facilitate the use of rigorous and replicable methods applicable to interventions targeted at levels above the individual (e.g., population health interventions, natural experiments)

Priority Three

Facilitate the Adoption of Behavioral and Social Sciences Research Findings in Health Research and in Practice

A significant gap exists between what research shows will improve health and what is provided to individuals, families, communities, and organizations to improve health.[35] Behavioral and social science interventions at the individual and population levels have significantly improved the nation's health; however, much more could be achieved if the chasm between research and practice was reduced and the time from research findings to widespread application was shortened.

Some of the challenges to adoption of effective behavioral and social sciences interventions are common to the broader biomedical research enterprise, but some are unique to behavioral and social interventions. Compared to medical interventions, the settings in which behavioral and social interventions are implemented are much broader and more varied and have fewer formal regulatory structures to ensure that effective approaches are adopted. Often, the settings in which the behavioral and social interventions are delivered (e.g., communities, public health services, workplaces, governments) have constrained resources. The for-profit system that drives dissemination and adoption of pharmaceutical and medical device interventions is essentially nonexistent for behavioral and social interventions. Although health insurers have begun to reimburse certain behaviorally and socially oriented preventive health and disease management services, most of the well-researched and effective behavioral and social interventions remain outside of the health insurance reimbursement system.[36] Further economic research evaluating the cost-to-benefit ratio of certain behavioral and social interventions may encourage greater financial support for their provision.

Adoption of effective behavioral and social sciences interventions also has been hindered by the complexity and resource-intensive requirements of these interventions. Often, practitioners implementing these interventions must be specially trained, and treatment fidelity, along with effectiveness, often dissipates as the intervention moves from the research setting to the practice setting. To promote treatment fidelity, researchers typically develop treatment manuals and training materials, but these interventions often require subsequent modifications based on context, service delivery, and resource constraints. For example, the Diabetes Prevention Program (DPP) initially consisted of six months of weekly group sessions followed by six months of less frequent follow-up maintenance trainings.[37] DPP has now been successfully implemented in practice, but primarily because researchers evaluated a shortened and simplified version of the intervention. Although DPP was successfully shortened and simplified without a significant loss of efficacy, the tension between developing a behavioral and social sciences intervention that is robust and powerful as well as short, simple, and easily implemented is a significant challenge for the field.

The effectiveness and cost benefits of prescribing diet and exercise, in contrast to using the drug metformin, in delaying the onset/prevention of type 2 diabetes in people with impaired glucose tolerance (IGT) was evaluated in the Diabetes Prevention Program (DPP). The study's findings showed a substantial reduction in the conversion from IGT to diabetes with the behavioral intervention, a strategy that proved to be cost-effective and to have lasting positive effects in a 10-year follow-up. In response to this success, the Y (formerly known as the YMCA), in collaboration with the NIH, Centers for Disease Control and Prevention, and Robert Wood Johnson Foundation, tested and later adopted an abbreviated and validated DPP intervention model. The widespread success demonstrated by the Y trial (average weight loss of about 5 percent and Medicare savings of $2,650 for each person enrolled) prompted the coverage of this intervention by Medicare.[38]

Leveraging technologies for delivering behavioral and social interventions has been effective in addressing some of these dissemination and implementation challenges. Treatment fidelity is maintained by the automated delivery of intervention algorithms. Technology-based behavioral and social interventions are also scalable. Although more resources are initially required to develop technology-based interventions, subsequent costs of delivery are reduced and intervention reach is extended, particularly to individuals with limited access to in-person intervention options. An additional advantage of technology-based interventions for dissemination is their promise for being more effective as they become more intensively adaptive over the treatment course.[39]

Facilitating adoption of BSSR findings, particularly at the population level, also depends on building research collaborations between wide-ranging areas such as demography, anthropology, education, housing, transportation, economics, and justice. Advancing population health science may help BSSR reveal important health and disease pathways, such as the mechanisms responsible for the relationship of income and education inequalities on health outcomes. As summarized in a report issued by the Agency for Healthcare Research and Quality, in partnership with the NIH and OBSSR, "Although we may have less control of the levers of change in population health than in individually-based interventions, even small systemic shifts or 'nudges' have considerable reach that produce large population impacts."[40]

Women who randomly received housing vouchers that enabled them to move from high-poverty to low-poverty neighborhoods were less likely to be obese and be diagnosed with diabetes than those who did not receive these vouchers. The women also experienced improved mental health, with measures of wellbeing more strongly associated with changes in economic surroundings than with racial segregation.[41]

A number of studies illustrate that even the most efficacious medical interventions may be less effective if they do not account for behavioral and social risk factors. In adherence studies, researchers have documented that up to 20 percent of patients fail to fill new prescriptions, and 50 percent of patients with chronic health conditions discontinue their medication within six months.[42] The OBSSR partnered with ICs across the NIH to form the Adherence Research Network, encouraging more research in the field and evaluating how the NIH can best disseminate information on evidence-based methods to improve adherence to medical interventions.

Research methods that facilitate the adoption of behavioral and social interventions are a crucial component of any effort to advance dissemination and implementation. The NIH has supported dissemination and implementation research for more than a decade, and this research has resulted in findings that influence how providers are trained, monitored, and supported, and how the systems in which they deliver treatment can be modified to facilitate the adoption of effective interventions. Critical to this effort is that behavioral and social interventions should be evaluated in the context in which the interventions are anticipated to be delivered. These contexts, however, add challenges and complexities to the research design that need to be addressed through innovations in research methodology that retain as much internal validity as possible while strengthening external validity.

Over the years, the NIH has supported research that has produced many effective behavioral and social interventions that hold promise for improving health. Without widespread adoption, however, their utility is diminished. It is important to address barriers to adoption while encouraging intervention research that is relevant and responsive to those who deliver these interventions. Methodologies better suited to intervention evaluation in these settings may provide evidence that supports adoption. Broader consideration of the evidence produced from alternative, pragmatic, and adaptive designs will improve the basis for determining effectiveness of behavioral and social interventions evaluated in the context in which they are intended to be delivered.

Objective 3.1

Encourage research that studies mechanisms and interventions in context

3.1.1 Cultivate research that elucidates factors influencing the adoption of behavioral and social interventions, particularly analyses that consider effects at the individual, provider, and system levels

3.1.2 Promote hybrid effectiveness-implementation designs that test interventions in the environment in which they are intended to be delivered

Objective 3.2

Enhance the relevance and scalability of behavioral and social interventions

3.2.1 Foster stakeholder involvement throughout BSSR, and rapid, relevant, and responsive research that serves stakeholder needs

3.2.2 Encourage the use of technologies to expand the scalability and reach of behavioral and social interventions

3.2.3 Conduct meta-analyses and other systematic review methods on selected topics that will facilitate adoption of evidence-based interventions

Objective 3.3

Foster collaborations with agencies and entities that utilize and/or deliver behavioral and social sciences research findings, and evaluate systemic and policy changes that facilitate or impede adoption of effective approaches

Foundational Processes

Process One

Communicating behavioral and social sciences research findings

Science thrives when scientists communicate more effectively. Public communication encourages scientists to think about the big picture and succinctly explain what their research means to society. In BSSR, public communication provides the opportunity to describe the scentific approaches behind discoveries that may seem "intuitive." The apparent accessibility of many behavioral and social sciences concepts can result in misunderstandings about the science that underpins some of these concepts. Therefore, BSSR may benefit from a well-orchestrated and long-term communications effort to frame appropriately the science and its impact.

Communication is a core function for the OBSSR to accomplish its mission. Communication has been a key component of both the 1997 and 2007 OBSSR strategic plans, illustrating the importance of this foundational process over its 20-year history. OBSSR communications efforts should encompass science communication and public engagement. The OBSSR communications framework is inextricably linked to and in service of its mission and scientific priorities.

> "If you can't explain it simply, you don't understand it well enough."
>
> —Albert Einstein

This communications framework is based on three guiding principles:

1. Communication must be comprehensive and complete. It should utilize an integrated approach that targets internal NIH audiences and extramural researchers as well as NIH leadership, through peer-reviewed journal articles, and various media channels.
2. Communication must explain research findings and make them relevant to multiple target populations. Using terms that audiences understand facilitates broad dissemination and integration into everyday activities that affect thoughts, decisions, and behaviors. Effectively communicating about the meaning, relevance, and potential impact of research findings also increases the likelihood that they can be considered in the policymaking process.
3. Communication must adapt continuously to new technologies and terms of engagement. The lag between scientific journal publication and best practice can be shortened by leveraging the multiple media and/or channels through which people communicate. The OBSSR will share research findings more rapidly with new and more diverse audiences using new tools, as well as develop new options for interactivity and information sharing and exchange.

OBSSR communications efforts are intended to serve a broad and diverse audience of stakeholders. These include but are not limited to NIH BSSR program staff, NIH leadership, the BSSR community at large (e.g., academia, advocacy organizations, research institutions, associations), the broader biomedical research community, policymakers, health practitioners, and the general public.

Communication objectives

The OBSSR has been, and will continue to be, recognized as a leading resource, convener, supporter, and purveyor of health-related BSSR, both within the NIH and across the wider scientific community. The OBSSR seeks to broaden awareness of the role of behavioral and social factors in health research and to disseminate influential research findings to foster a collective understanding that BSSR is critical to solving both short-term and long-term health problems affecting individuals and society.

Within the NIH, the communications objectives of the OBSSR are to:

- Ensure the NIH community knows and understands the OBSSR's priorities
- Provide opportunities for the NIH community to communicate BSSR needs and plans to the OBSSR
- Obtain feedback regularly from the NIH community to ensure that the OBSSR is fulfilling its mission, making progress toward its priorities, and serving the BSSR needs of NIH ICOs
- Highlight the impact of BSSR across the entire NIH research enterprise

Beyond the NIH, the communications objectives of the OBSSR are to:

- Provide relevant and accurate information about BSSR to key stakeholders
- Utilize the full range of communication channels to highlight BSSR across the BSSR community, biomedical community, and general public
- Serve as a resource for media by providing examples of the impact of BSSR on health
- Highlight the research of leaders in the field
- Describe innovative emerging areas of research
- Serve as a resource for disseminating significant BSSR advances

Process Two

Coordinating behavioral and social sciences research programs across the NIH and integrating behavioral and social sciences research within the larger NIH research enterprise

Program coordination has been a core mission of the OBSSR since its inception. Each NIH IC has its own BSSR objectives consistent with its mission. These objectives often overlap, creating opportunities for cooperative and collaborative trans-NIH priorities and projects that the OBSSR is charged with facilitating. BSSR research gaps also develop when new and emerging BSSR areas are not fully aligned with NIH IC objectives. In such cases, the OBSSR's role is to identify these gaps and provide leadership to address them.

The OBSSR is fortunate to have a diverse and dedicated BSSR community at the NIH with whom it partners to achieve its program coordination goals. Program coordination across such a varied research agenda requires trust, mutual respect, and coordinated communications across the NIH ICOs. During its 20 years of existence, the OBSSR has developed a strong and functional network of NIH behavioral and social sciences program staff, and it is incumbent on the OBSSR to continue to strengthen and expand this network.

The OBSSR's program coordination functions are also served by the Behavioral and Social Sciences Research Coordinating Committee (BSSR-CC). The BSSR-CC consists of representatives from each of the NIH ICOs who are appointed by their respective directors. The BSSR-CC is charged with helping to coordinate BSSR across the NIH and with advising the OBSSR Director on BSSR at the NIH. The BSSR-CC is critical to the OBSSR's program coordination mission. Strengthening the coordination and advisory functions of this body is crucial for meeting the various scientific and foundational objectives of this plan.

Integrating BSSR within the larger NIH biomedical research enterprise was an objective of the first OBSSR strategic plan, and over time the value of integrating BSSR within the broader biomedical research efforts of the NIH has increased. Biology and behavior are inextricably linked. Our genes evolved from behaviors such as assortative mating and in response to various environmental challenges. The field of epigenetics examines how the environment alters gene expression. Psychological stressors and other environmental factors affect genetic, molecular, cellular, and organ functions. Health-risk behaviors such as smoking, poor diet, and sedentary behavior have powerful, long-term effects on health. Behavioral and social systems are critical to preventing and managing infectious and chronic disease processes.

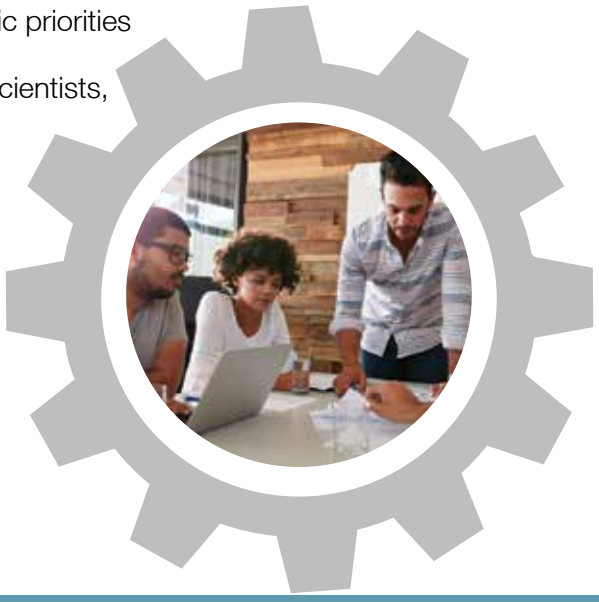
Integration of BSSR within the larger NIH biomedical research enterprise can take many forms. Behavioral and social science researchers can be encouraged to incorporate genetic, molecular, cellular, and organ function factors in their research. Likewise, genetic, molecular, cellular, and organ system researchers can be encouraged to incorporate behavioral and social factors that impinge on these biomedical systems. Medical trials researchers can be encouraged to utilize more sophisticated measures for behavioral and social factors such as medication adherence and social context that potentially affect treatment delivery and efficacy.

Epidemiological research, particularly recent cohort studies, is an area that has successfully integrated biomedical and behavioral/social factors to understand better the determinants of health. The PMI-CP, the Environmental Influences on Child Health Outcomes program, and the Adolescent Brain and Cognitive Development project provide recent examples of how behavioral and social determinants of health are being integrated into large research efforts. The OBSSR, together with the BSSR community, has an obligation to these large cohort programs to continue to improve the measurement of behavioral and social factors, increasing their precision and accuracy while reducing participant burden. The contributions of behavioral and social scientists to the larger biomedical research enterprise not only improve biomedical research efforts, but also stimulate improvements in the methods and measures of the behavioral and social sciences.

Program coordination and integration objectives

To enhance the coordination and integration of BSSR within the larger NIH research enterprise, OBSSR will:

- Strengthen the functions of the BSSR-CC as the primary organizational body through which the OBSSR plans and executes its coordination and integration functions
- Utilize co-funding and administrative supplements to facilitate coordination and integration of BSSR and to align better NIH research support with the OBSSR scientific priorities
- Facilitate coordination between intramural behavioral and social scientists, and between intramural and extramural BSSR staff
- Identify opportunities for integrating BSSR into the broader research enterprise and coordinating with the entire NIH research community
- Coordinate with other offices within the NIH Office of Director, Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI) where BSSR can be used to foster common goals



Process Three

Training the next generation of behavioral and social science researchers

The OBSSR recognizes the importance of scientific stewardship, particularly in developing the scientific talent and skills needed to advance health-related behavioral and social sciences. Across the continuum from undergraduates through senior researchers, NIH training programs can nurture and expand the pool of researchers prepared to address the critical challenges in the behavioral and social sciences.

Training researchers in the behavioral and social sciences is foundational for implementing many of the OBSSR's strategic planning objectives. Basic and applied behavioral and social science researchers must understand each other's methods, key findings, and research needs to improve the synergy between basic and applied BSSR. As technologies produce varied and voluminous data about human behavior and context, behavioral and social science researchers must be able to generate, manage, and effectively analyze these data. Training in dissemination and implementation approaches provides key skills to move interventions from research to practice.

Training of scientists from various fields is an important component to strengthening the transdisciplinary research approaches that are increasingly critical as the science becomes more complex and multilevel in nature. The OBSSR has and will continue to offer training in the behavioral and social sciences to scientists across a wide array of disciplines. Recent increased interest from computer scientists, engineers, and mathematicians in behavioral and social science problems has infused the field with new ideas and approaches. Training programs can assist biomedical researchers to better integrate BSSR concepts into their studies, and training programs that expand behavioral and social scientists' capabilities in areas such as genetics, neuroscience, and the microbiome can improve research integration.

As a key part of OBSSR activities, training has supported the various strategic objectives of the office over the years. An ongoing evaluation of the various training efforts that the OBSSR supports will inform future OBSSR training efforts. The breadth of potential training needs to support a robust and effective BSSR workforce exceeds the OBSSR's resources. Therefore, it is important for the OBSSR to prioritize and support training needs that (1) address important and emerging needs of behavioral and social science researchers, (2) have an impact on and relevance for large proportions of the BSSR community, and (3) the OBSSR is uniquely positioned to provide.

Training objectives

To enhance the training of the next generation of behavioral and social science researchers, the OBSSR will:

- Continue to focus efforts on the training of early-stage investigators in key research skills that will advance health-related BSSR
- Support postdoctoral training in emerging and transdisciplinary areas such as population health
- Facilitate mentoring programs in the behavioral and social sciences
- Expand training reach via the development and dissemination of online training programs
- Create and support fellowships addressing the strategic priorities of the office
- Provide training in support of the scientific priorities of this strategic plan
- Facilitate training of social and behavioral science researchers on communicating BSSR to media, lay people, policymakers, etc.
- Inspire researchers from other fields to enter BSSR by offering cross-training opportunities
- Integrate evaluation in all OBSSR training efforts

Process Four

Evaluating the impact of behavioral and social sciences research and addressing scientific policies that support this research

In achieving its mission, the OBSSR is dedicated to ensuring stewardship of public resources. As a first step, the OBSSR Strategic Plan establishes clear goals and objectives. To ensure that its activities help attain these goals and objectives, the OBSSR is dedicated to strengthening ways to help manage and monitor the BSSR portfolio and to shaping scientific policies and procedures to facilitate an efficient and productive health-related BSSR agenda.

The OBSSR has begun a detailed process to review and characterize existing NIH investments in BSSR. A preliminary analysis of the general structure and characteristics of the NIH BSSR portfolio reveals that the NIH supports a meaningful and substantive BSSR portfolio. Ongoing analyses will gauge the portfolio more accurately, identifying where research is concentrated and where OBSSR guidance can help the NIH to continue to support cutting-edge science. Employing new portfolio analytic tools, program evaluation, and other techniques will also help guide the OBSSR and the NIH ICs to understand better the scientific directions of BSSR, and whether BSSR investments can produce the type and quality of results expected.

Maintaining a robust BSSR portfolio has many challenges. BSSR tends to address complex and dynamic processes that are sometimes difficult to isolate or manipulate, thereby limiting the internal validity that is achievable. To the degree that reviewers focus more on internal than external validity of the grant application, BSSR may not perform as well in review. Although NIH ICs generally view BSSR as important to their mission, BSSR research may not be among their higher priorities. The OBSSR does not have the authority to award grants, so it must rely on IC funding priorities. Therefore, program coordination, including strategic use of co-funding and trans-NIH initiatives, supports and complements the policy and evaluation efforts of the OBSSR to assess and address gaps in the BSSR portfolio.

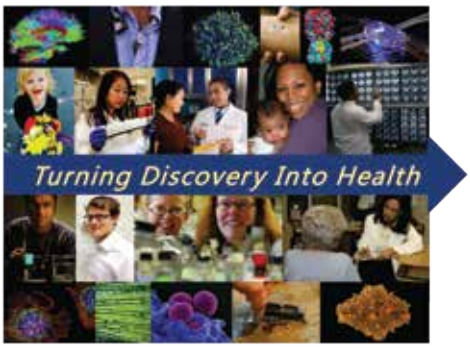
Policy and evaluation objectives

To help address important research gaps and monitor and track progress in meeting its strategic goals and mission, the OBSSR will:

- Lead and support ongoing review and analysis of the BSSR portfolio within and outside of the NIH
- Strengthen the portfolio analysis capabilities of the OBSSR to monitor and track BSSR funding trends and research advances and to identify and evaluate strategic challenges and opportunities
- Direct and support program evaluation projects to assess the scientific progress and impact of BSSR programs and initiatives and OBSSR-specific initiatives by developing, identifying, and applying key metrics of success from BSSR initiatives and programs
- Monitor, identify, and address challenges unique to the behavioral and social sciences in the NIH scientific review process in collaboration with ICs and the Center for Scientific Review (CSR), including assisting CSR in recruiting reviewers with appropriate BSSR expertise
- Foster and maintain greater collaboration between BSSR program staff and scientific review officers
- Monitor and advise the NIH leadership on BSSR-related legislative and policy actions and initiatives that may impact NIH programs and the public
- Foster and maintain a supportive and collaborative working relationship with BSSR stakeholder organizations, and encourage collaborations across public- and private-sector partners to optimize the efficiency and effectiveness of the OBSSR in advancing its mission
- Develop and disseminate reports and position papers on health-related BSSR, including (1) responses to specific requests from NIH leadership, other federal agencies, or Congress on health-related BSSR projects and initiatives and (2) independent systematic reviews or consensus reports for evidence-based policy and decision making

NIH-Wide Strategic Plan

Fiscal Years 2016-2020



Integration of the OBSSR Strategic Plan with the NIH-Wide Strategic Plan

The OBSSR Strategic Plan was developed to be in alignment with and in support of the recently released 2016-2020 NIH-Wide Strategic Plan, "Turning Discovery into Health," and is intended to align with and complement the NIH Strategic Plan. The framework for the NIH-Wide Strategic Plan focuses on four objectives:

1. Advance opportunities in biomedical research
2. Foster innovation by setting NIH priorities
3. Enhance scientific stewardship
4. Excel as a federal science agency by managing for results

Under the first objective to advance opportunities in biomedical research, three key areas are highlighted: (1) fundamental science, (2) treatments and cures, and (3) health promotion and disease prevention. The first scientific priority of the OBSSR Strategic Plan, "Improve the Synergy of Basic and Applied Behavioral and Social Sciences Research," is directly relevant to the fundamental science efforts outlined in the first objective of the NIH-Wide Strategic Plan, which states that "fundamental science also includes basic behavioral and social science research that generates knowledge of how living systems interact with and are influenced by experiences at the individual, family, social, organizational, and environmental levels." The synergies envisioned between basic and applied BSSR require a robust and relevant fundamental science of behavior and social influences that can feed new and innovative approaches to modifying behavior and social systems to improve health. This basic to applied synergy is also closely aligned with the second area of "treatments and cures," translating fundamental science findings into new and innovative treatments for disease.

The two remaining scientific priorities of the OBSSR Strategic Plan, "Enhance and Promote the Research Infrastructure, Methods, and Measures Needed to Support a More Cumulative and Integrated Approach to Behavioral and Social Sciences Research," and "Facilitate the Adoption of Behavioral and Social Sciences Research Findings in Health Research and in Practice," are aligned with the areas regarding "treatments and cures" and "health promotion and disease prevention" in the NIH-Wide Strategic Plan. Findings from BSSR have contributed substantially to health promotion and disease prevention efforts, and many of the individual and population health advances outlined in this OBSSR Strategic Plan are examples from health promotion and disease prevention research that the OBSSR will continue to support in collaboration with the NIH Office of Disease Prevention.

BSSR extends beyond prevention, however, and also provides approaches to manage disease and its impacts. The NIH-Wide Strategic Plan area regarding "treatments and cures" refers to various efforts to "gain a better understanding of the cumulative and synergistic impacts that multiple chronic conditions and comorbidities can exert upon the human body, thereby informing efforts to develop therapeutic and preventive approaches for these complex challenges." By enhancing the methods, measures, and data infrastructure needs of BSSR and facilitating the adoption of BSSR findings, the OBSSR Strategic Plan supports research that informs efforts to develop and evaluate new prevention and treatment approaches.

Among the OBSSR's foundational processes, the policy and evaluation component, "Evaluating the impact of behavioral and social sciences research and addressing scientific policies that support this research" is closely aligned with NIH Objective 2, "Foster Innovation by Setting NIH Priorities" and NIH Objective 4, "Excel as a Federal Science Agency by Managing for Results," outlined in the NIH-Wide Strategic Plan. The OBSSR supports the NIH-wide efforts to evaluate the impact of our activities on health science and to prioritize activities that will produce the greatest impact on health science and ultimately on the health of the nation. The policy and evaluation objectives in this strategic plan will assist the OBSSR in managing for results and using evaluation data to set its priorities as well as those for the BSSR efforts of the NIH more broadly.

The foundational process of "Training the next generation of behavioral and social science researchers" is closely aligned with the NIH Objective 3 to "Enhance Scientific Stewardship." Recruiting and retaining an outstanding biomedical research workforce includes recruiting and retaining an outstanding BSSR workforce. The OBSSR's training efforts as outlined in this strategic plan are designed to produce a diverse and productive BSSR community utilizing cutting-edge methods, measurement, and analytic approaches that will ensure the rigor and reproducibility of BSSR, consistent with NIH Objective 3.

The remaining two OBSSR foundational processes, "Communicating behavioral and social sciences research findings" and "Coordinating behavioral and social sciences research programs across the NIH and integrating behavioral and social sciences research within the larger NIH research enterprise," do not map directly to objectives of the NIH-Wide Strategic Plan. These OBSSR foundational processes, however, support the various objectives of the plan, are core to the research coordination functions of the OBSSR as established by Congress, and are consistent with the goals and objectives of DPCPSI, which is the organizational division of the NIH Office of the Director in which the OBSSR resides.

By being aligned with the NIH-Wide Strategic Plan, the OBSSR Strategic Plan fully integrates with and supports the NIH mission and objectives. The OBSSR and its strategic plan are in service to the broader NIH mission to seek fundamental knowledge about the nature and behavior of living systems and to apply that knowledge to enhance health, lengthen life, and reduce illness and disability.

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Appendix A: The OBSSR

Statutory Language

From the Public Health Service Act, which is captured in the Public Health and Welfare, 42 U.S.C. § 283c (1994):

Sec 404A. [283c] (a) There is established within the Office of the Director of NIH an office to be known as the Office of Behavioral and Social Sciences Research (in this section referred to as the "Office"). The Office shall be headed by a director, who shall be appointed by the Director of NIH.

(b)(1) With respect to research on the relationship between human behavior and the development, treatment, and prevention of medical conditions, the Director of the Office shall—

(A) coordinate research conducted or supported by the agencies of the National Institutes of Health; and

(B) identify projects of behavioral and social sciences research that should be conducted or supported by the national research institutes, and develop such projects in cooperation with such institutes.

(2) Research authorized under paragraph (1) includes research on teen pregnancy, infant mortality, violent behavior, suicide, and homelessness. Such research does not include neurobiological research, or research in which the behavior of an organism is observed for the purpose of determining activity at the cellular or molecular level.

Appendix B: Strategic Planning Process

The Office of Behavioral and Social Sciences Research's (OBSSR's) goal in this strategic planning process was to ensure that future directions and activities align with its mandated mission. Moreover, the strategic plan is meant to be adaptable to the rapidly changing nature of behavioral and social sciences research (BSSR), allowing for updates as the field advances. The strategic plan for 2017-2021 will position the OBSSR to catalyze advances in the behavioral and social sciences and capitalize on current and anticipated breakthroughs in BSSR over the next five or more years.

The OBSSR approached strategic planning as an iterative process, involving both external input from a wide range of scientific content areas and disciplines, and from internal input from the various NIH Institutes and Centers (ICs) and the Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI) Program Offices. The processes involved in developing this strategic plan were:

- The OBSSR formed a BSSR Strategic Planning Working Group (SPWG; see Appendix C) to provide advice on the process and input on the content of the plan.
- The OBSSR Director met with the NIH Director, Principal Deputy Director, and DPCPSI Director to discuss and obtain approval for the strategic planning process and feedback on initial directions.
- The OBSSR Director presented and discussed the strategic plan approach with the NIH Behavioral and Social Sciences Research Coordinating Committee (BSSR-CC).
- The OBSSR Director and Deputy Director met with IC Directors and their leadership teams to discuss future OBSSR directions and how the OBSSR could serve the BSSR needs of the IC. In parallel, OBSSR staff met with the BSSR-CC member and other BSSR staff at the IC to discuss future OBSSR directions and how the OBSSR could serve the BSSR needs of the IC.
- The OBSSR issued a Request for Information (RFI): Soliciting Input for the Office of Behavioral and Social Sciences Research (OBSSR) FY 2016-2020 Strategic Plan. Responses were requested from researchers in academia and industry, health care professionals, patient advocates and advocacy organizations, scientific or professional organizations, federal agencies, and the public.
- The OBSSR and SPWG identified key thought leaders in the behavioral and social sciences external to the NIH to participate in a BSSR Strategic Planning Expert Panel (Appendix D).
- The OBSSR conducted public webinars that provided an overview of the OBSSR Strategic Plan, including specific priorities and objectives. Webinar participants provided feedback on ways to prioritize the strategies to achieve these objectives.
- The OBSSR Director presented an outline of the strategic plan to the NIH Council of Councils. The SPWG, Expert Panel, members of the BSSR-CC, and various professional organizations reviewed and provided input to a draft of the strategic plan.
- The NIH Director, Principal Deputy Director, and DPCPSI Director reviewed and approved a penultimate draft of the OBSSR Strategic Plan before finalization for public release.

Appendix C: Strategic Planning Working Group

Composed of senior behavioral and social scientists and leaders from across the NIH, the goal of the Strategic Planning Working Group was to advise the OBSSR during the comprehensive strategic planning effort and offer recommendations to coordinate and implement activities consistent with the strategic plan.

Wilson Compton, MD, MPE, Deputy Director, National Institute on Drug Abuse

Robert Croyle, PhD, Director, Division of Cancer Control and Population Sciences, National Cancer Institute

Lawrence Fine, MD, PhD, MPH, Chief, Clinical Applications and Prevention Branch, National Heart, Lung, and Blood Institute

James Griffin, PhD, Deputy Branch Chief, Child Development and Behavior Branch, *Eunice Kennedy Shriver* National Institute of Child Health and Human Development

Christine Hunter, PhD, ABPP, Director of Behavioral Research, National Institute of Diabetes and Digestive and Kidney Diseases

David Murray, PhD, Associate Director for Prevention and Director of the Office of Disease Prevention

Lisbeth Nielsen, PhD, Chief, Individual Processes Branch, Division of Behavioral and Social Research, National Institute on Aging

G. Stephane Philogene, PhD, Deputy Director, Office of Behavioral and Social Sciences Research, Division of Program Coordination, Planning and Strategic Initiatives, Office of the Director

Kevin Quinn, PhD, Director, Office of Science Policy, Planning, and Communications, National Institute of Mental Health

William T. Riley, PhD, Director, Office of Behavioral and Social Sciences Research, Division of Program Coordination, Planning and Strategic Initiatives, Office of the Director

Karyl Swartz, PhD, Director, Division of AIDS, Behavioral and Population Sciences, Center for Scientific Review

Appendix D: Strategic Planning

Expert Panel

Composed of key thought leaders, external to the NIH, in the behavioral and social sciences related to health, the Expert Panel provided important input to help shape the OBSSR's strategic directions. The Expert Panel included the following individuals:

BJ Casey, PhD, Director, Sackler Institute for Developmental Psychobiology, and Professor of Developmental Psychobiology, Weill Medical College of Cornell University

Fay Lomax Cook, PhD, Assistant Director, Directorate for Social, Behavioral, and Economic Sciences, National Science Foundation

Ana V. Diez Roux, MD, PhD, MPH, Distinguished University Professor of Epidemiology and Dean, Drexel University School of Public Health

Elissa Epel, PhD, Professor, Department of Psychiatry, University of California, San Francisco (UCSF); Director, Aging, Metabolism, and Emotions Lab, and Center for Obesity Assessment, Study, and Treatment; Associate Director, Center for Health and Community; Associate Director, UCSF Nutrition and Obesity Research Center

Sarah Gehlert, PhD, MSW, MA, E. Desmond Lee Professor of Racial and Ethnic Diversity, Brown School, and Professor, Department of Surgery, School of Medicine, Washington University in St. Louis; Co-Program Leader, Prevention and Control Program, Alvin J. Siteman Cancer Center; Co-Director, Transdisciplinary Center on Energetics and Cancer; Training Program Director, Program for the Elimination of Cancer Disparities; Co-Chair, Center for Community-Engaged Research

Shiriki Kumanyika, PhD, MPH, Emeritus Professor of Epidemiology, Department of Biostatistics and Epidemiology, University of Pennsylvania Perelman School of Medicine; President, American Public Health Association for 2015; Founder and Chair, African American Collaborative Obesity Research Network

Alan I. Leshner, PhD, Chief Executive Officer Emeritus, American Association for the Advancement of Science (Chair, OBSSR Strategic Planning Expert Panel)

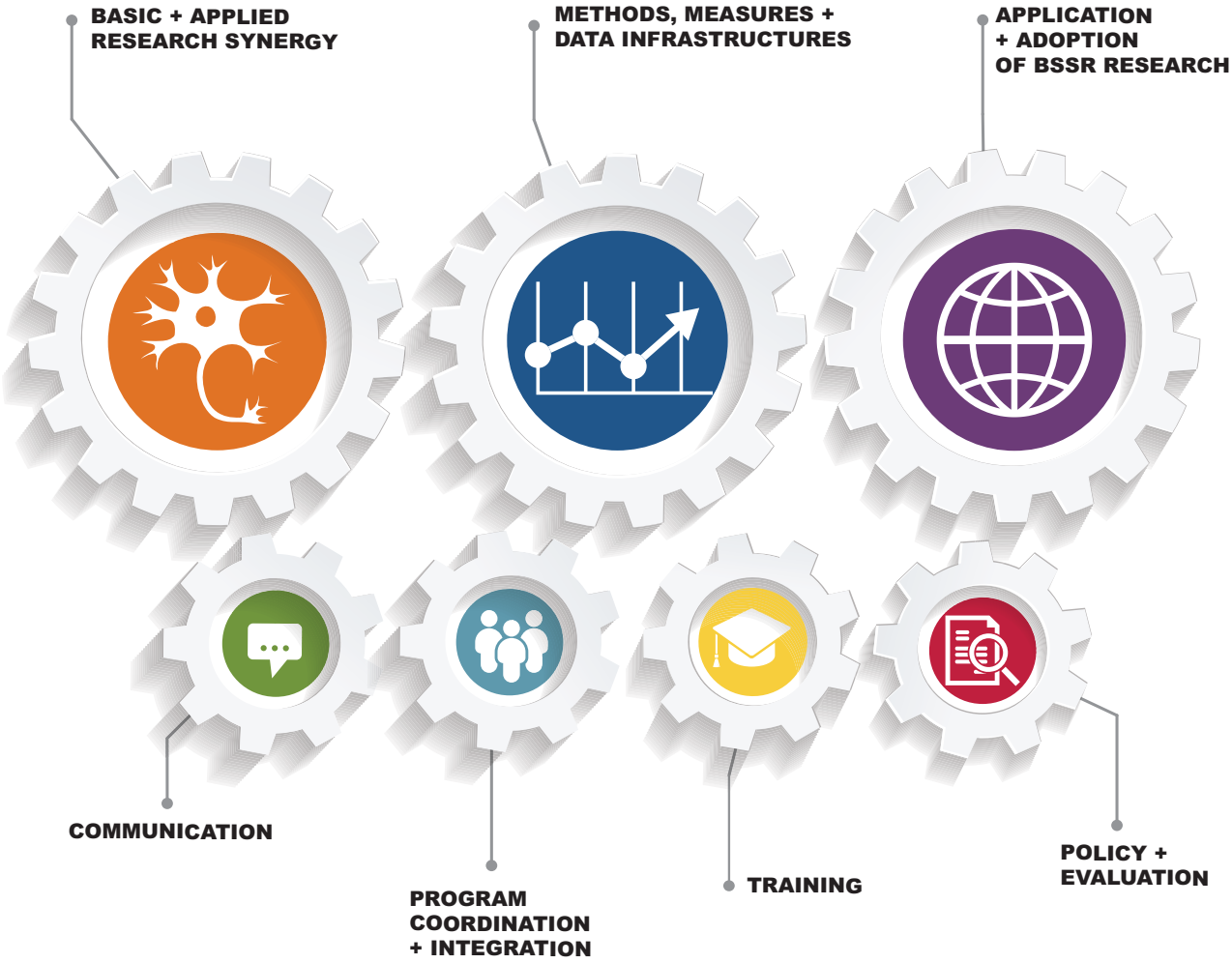
David Mohr, PhD, Professor in Departments of Preventive Medicine, Psychiatry, and Medical Social Science, Northwestern University Feinberg School of Medicine; Director, Center for Behavioral Intervention Technologies

Tracy Orleans, PhD, Senior Scientist, Robert Wood Johnson Foundation

Ken A. Resnicow, PhD, Irwin M. Rosenstock Collegiate Professor, Health Behavior and Health Education, School of Public Health, University of Michigan (UM) School of Public Health; Director of Health Disparities Research, UM Cancer Center; senior leader, UM Center for Health Communications Research

James F. Sallis, PhD, Chief and Distinguished Professor, Division of Behavioral Medicine, Family and Preventative Medicine, University of California, San Diego; Adjunct Professor, Department of Psychology, San Diego State University; Co-Director, International Physical Activity and the Environment Network

SCIENTIFIC PRIORITIES



FOUNDATIONAL PROCESSES