RESOURCE SUMMARY

Drug Control Program
Department of Health and Human Services
National Institutes of Health (NIH)[1]

(Dollars in Millions)

Resource Summary	FY 2022 Final	FY 2023 Enacted[2]	FY 2024 Request
Drug Resources by Function			
Research and Development: Prevention	$482.844	$498.487	$498.271
Research and Development: Harm Reduction	$183.813	$189.685	$190.193
Research and Development: Treatment	$903.515	$947.479	$946.678
Research and Development: Recovery	$99.340	$103.935	$104.443
Total, Drug Resources by Function	**$1,669.512**	**$1,739.586**	**$1,739.586**
Drug Resources by Decision Unit			
National Institute on Alcohol Effects and Alcohol-Associated Disorders (NIAAA)[3]			
Research and Development: Prevention	$63.990	$66.410	$66.410
Research and Development: Treatment	$9.453	$9.811	$9.811
National Institute on Drugs and Addiction (NIDA)[3]			
Research and Development: Prevention	$418.854	$432.077	$431.861
Research and Development: Harm Reduction	$183.813	$189.685	$190.193
Research and Development: Treatment	$894.062	$937.668	$936.867
Research and Development: Recovery	$99.340	$103.935	$104.443
Total, Drug Resources by Decision Unit	**$1,669.512**	**$1,739.586**	**$1,739.586**
Drug Resources Personnel Summary			
Total FTEs (direct only)	396	398	416
Drug Resources as a Percent of Budget			
Total Agency Discretionary Budget (Dollars in Billions)[4]	$43.727	$46.125	$46.400
Drug Resources Percentage	3.82%	3.77%	3.75%

[1] Numbers may not total due to rounding.
[2] FY 2023 Enacted level includes the effects of the FY 2023 HIV/AIDS transfer.
[3] The FY 2024 President's Budget proposes to rename the National Institute on Drug Abuse to the National Institute on Drugs and Addiction and to rename the National Institute on Alcohol Abuse and Alcoholism to the National Institute on Alcohol Effects and Alcohol-Associated Disorders.
[4] Excludes funding for Advanced Research Projects Agency for Health.

PROGRAM SUMMARY

MISSION

The National Institute on Drugs and Addiction (NIDA) and the National Institute on Alcohol Effects and Alcohol-Associated Disorders (NIAAA), 2 of the 27 Institutes and Centers of the National Institutes of Health (NIH), support research in pursuit of the objectives of the National Drug Control Strategy.[324]

NIDA is the lead federal agency supporting scientific research on drug use and its consequences. Its mission is to advance science on drug use and addiction and apply that knowledge to improve individual and public health. This includes basic and clinical research on drug use (including nicotine), addiction, and the underlying neurobiological, behavioral, and social mechanisms involved. NIDA also works to ensure the effective translation, implementation, and dissemination of scientific research findings to improve the prevention and treatment of substance use disorder (SUD) and overdose, and to enhance public awareness of addiction as a brain disorder.

NIAAA's mission is to generate and disseminate fundamental knowledge about the effects of alcohol on health and well-being, and apply that knowledge to improve diagnosis, prevention, and treatment of alcohol-related problems, including alcohol use disorder, across the lifespan. A major priority within NIAAA's mission is research on the prevention and treatment of underage drinking and its harmful consequences.

Alcohol misuse has profound effects on the health and well-being of individuals, families, and communities, costing the United States an estimated $249 billion per year. NIAAA is committed to reducing the burden of alcohol misuse for individuals at all stages of life and supports a diverse portfolio of research to accomplish this goal. Research areas include biological and behavioral mechanisms underlying alcohol misuse, alcohol use disorder (AUD), and alcohol-related health conditions; epidemiological assessments of patterns and trends in alcohol use; and the development and evaluation of interventions to identify, prevent, and treat alcohol misuse and its consequences, including among youth. NIAAA also supports efforts to translate research findings to improve prevention and treatment of alcohol-related problems and co-occurring conditions and to disseminate evidence-based information to health care providers, researchers, policy makers, and the public. These ongoing efforts have significantly broadened our understanding of alcohol misuse and AUD and have provided support for the integration of alcohol prevention and treatment services into mainstream health care.

METHODOLOGY

NIDA's entire budget is drug-related and classified as a part of the National Drug Control Budget.

The prevention and treatment components of NIAAA's underage drinking research program are classified as a part of the National Drug Control Budget. Underage drinking research is defined

[324] The FY 2024 President's Budget proposes to rename the National Institute on Drug Abuse to the National Institute on Drugs and Addiction and to rename the National Institute on Alcohol Abuse and Alcoholism to the National Institute on Alcohol Effects and Alcohol-Associated Disorders.

as research that focuses on alcohol use by youth (individuals under the legal drinking age of 21), as well as the negative consequences of underage alcohol use (e.g., alcohol-related injuries, impact on adolescent development including on the developing brain, and risk for AUD). It includes basic biological and behavioral research, epidemiological research, screening studies, the development and testing of preventive and treatment interventions, and efforts to disseminate evidence-based information. NIAAA's methodology for developing estimates for the drug control budget is a two-step process. First, NIAAA identifies its underage drinking projects using NIH's automated, electronic text mining system for research, condition, and disease categorization. Once these projects are verified as underage drinking projects, NIAAA conducts a manual review of the project listing and codes each verified project as relevant to prevention or treatment.

BUDGET SUMMARY

The FY 2024 Request for drug-related activities at NIH is $1,739.6 million ($1,663.4 million for NIDA and $76.2 million for NIAAA), unchanged from the FY 2023 Enacted Level.

National Institute on Drugs and Addiction
FY 2024 Request: $1,663.4 million
(flat to the FY 2023 Enacted Level)

In 2021, fatal overdoses claimed nearly 107,000 Americans, a devastating record driven in part by the synthetic opioid fentanyl, which was involved in more than two-thirds of overdose deaths.[325] There are effective treatments for SUD that could have prevented many of these deaths—but of the 40 million people who had SUD that year, only about 6 percent received such treatments.[326] These data speak to the persistent need to improve and disseminate evidence-based interventions for SUD, overdose, and related harms. To that end, in the coming years, NIDA will strengthen its research investments in prevention, treatment, harm reduction, and recovery services related to substance use, in alignment with the priorities of the Office of National Drug Control Policy and with additional funding made available through the NIH HEAL Initiative®.

In the prevention area, NIDA will continue working to understand risk and protective factors for substance misuse and SUD, which will enable more targeted and effective prevention programs. Research shows that adverse early childhood experiences are associated with early substance misuse, which may in turn alter brain development in ways that increase the risk of SUD in adulthood.[327] Yet, much remains to be learned about how a vast constellation of early-life experiences, combined with a person's genetic makeup, affects vulnerability to SUD and other psychiatric disorders. Led by NIDA, NIAAA, and the National Cancer Institute, the Adolescent Brain Cognitive Development (ABCD) Study is collecting brain imaging, genetic, and environmental data from more than 12,000 children aged 9-10 and following them through adulthood to help fill this knowledge gap. With funding from the HEAL Initiative®, the HEALthy Brain and Child Development (HBCD) Study, will complement the ABCD study by following brain development in thousands of children from birth through their first decade of life.

In the treatment area, it is critical to improve the reach of existing evidence-based treatments for SUD, such as medications for opioid use disorder (MOUD), which can reduce opioid craving, use, and risk of overdose. As is the case with SUD treatment generally, MOUD are vastly under-prescribed, especially among people of color.[328] NIDA-funded research has helped identify barriers to MOUD—such as lack of integration between primary care and specialized addiction services—and is investigating approaches to overcome them and improve MOUD access. At the same time, saving lives from overdose will also require novel medications. MOUD may be less

[325] cdc.gov/nchs/products/databriefs/db457.htm; cdc.gov/nchs/pressroom/nchs_press_releases/2022/202205.htm
[326] samhsa.gov/data/report/2021-nsduh-annual-national-report
[327] pubmed.ncbi.nlm.nih.gov/29690790/
[328] pubmed.ncbi.nlm.nih.gov/31066881/; cdc.gov/mmwr/volumes/71/wr/mm7129e2.htm

effective in treating addiction to fentanyl (which is 50 times stronger than heroin)[329] and are ineffective against stimulants, which have become implicated in more overdose deaths in recent years.[15] For this reason, NIDA continues to support development of novel treatments, including long-acting drug formulations, neuromodulation therapies, immunotherapies, and sequestrants designed to stop drugs from entering the brain.

NIDA also prioritizes research in harm reduction, which aims to reduce the risk of overdose and other drug-related harms—including transmission of HIV and hepatitis C virus, and risk of infections that can damage the heart. Harm reduction approaches such as syringe service programs (SSP) and distribution of the opioid overdose reversal agent naloxone have been shown to reduce morbidity and mortality from substance use.[330] Yet, because most harm reduction studies have focused on urban areas hit hard by the opioid crisis, there is a need to investigate these approaches in rural areas and to target unique harms from stimulants.

Finally, given that addiction is a chronic, relapsing disorder, NIDA is prioritizing research to identify best practices in addiction recovery and relapse prevention. There are a variety of recovery service models—including peer-based mutual aid groups, recovery housing, and youth programs—but there is little evidence regarding which kind of program works best for different people. Moreover, many such programs focus on short-term medical treatments and may lack support for participants to receive long-term MOUD.[331] In 2020, NIDA established recovery research networks program to develop tools, resources, and training to grow this area of research. With additional support from the HEAL Initiative®, this program has expanded and is testing new and existing recovery models through clinical trials.

NIDA's research efforts are organized into the following programmatic areas: Neuroscience and Behavior; Epidemiology, Services and Prevention Research; Therapeutics and Medical Consequences; the NIDA Clinical Trials Network; Translational Initiatives and Program Innovations; HEAL Initiative® programs; Intramural Research Program (IRP); and Research Management and Support (RMS). Dollars budgeted to the HEAL Initiative® for the purpose of opioid research are used to supplement base funding for opioid and pain research that are included within other NIDA program areas. Funding for the HEAL Initiative® in NIDA will remain equal to the FY 2023 level.

Division of Neuroscience and Behavior
FY 2024 Request: $534.0 million
($2.4 million below the FY 2023 Enacted Level)

NIDA's Division of Neuroscience and Behavior (DNB) supports research to understand the biological mechanisms that underlie drug use and addiction, and to inform the development of novel prevention and treatment strategies for SUD. This includes identifying the effects of illicit drugs on brain structure and function throughout the lifespan; and how genes, the environment, and other factors such as sex and gender influence the risk of SUD and its outcomes. DNB also

[329] pubmed.ncbi.nlm.nih.gov/36055727/
[330] pubmed.ncbi.nlm.nih.gov/34686281/; pubmed.ncbi.nlm.nih.gov/28061909/
[331] pubmed.ncbi.nlm.nih.gov/34700201/

supports research on drug pharmacology; non-pharmacological SUD treatments; data science; and technology that enables study of the living brain from cells to circuits to networks. With support from the HEAL Initiative® and NIDA and other NIH Institutes and Centers, DNB administers the HBCD Study, which will examine the neurologic, cognitive, social, and emotional development of about 7,500 children from the prenatal period to age 10. Before the study began recruiting families in late 2021, it had to address the challenges of conducting magnetic resonance imaging (MRI) with young children. One challenge was how to keep infants asleep and still during MRI, for which HBCD investigators developed an MRI-compatible crib that can rock infants to sleep and then position them in the MRI scanner without disturbing them. Investigators also surveyed families living near HBCD Study sites and found differences in potential barriers and incentives to their participation. For example, free childcare and playgroups during study visits were more incentivizing to Black respondents than white respondents. These data are helping investigators implement recruitment strategies that will ensure diverse participation in the study.[332]

DNB supported several recent studies that have found molecular and cellular targets for potential SUD therapies. One study explored the possibility that medications used to treat high blood pressure—called angiotensin-converting enzyme (ACE) inhibitors—might hold clues to treating addiction. The investigators found that in mice, ACE inhibitors stimulate certain natural opioids (endorphins) and counteract the addictive effects of fentanyl, suggesting the potential to redesign and repurpose them for treating SUD.[333] Other NIDA-funded research has produced evidence that cells called astrocytes play a protective role in addiction. Astrocytes surround neurons and can "vacuum up" the chemical signals that neurons release, providing a kind of circuit breaker. Recent studies show that astrocytes respond dynamically to opioid exposure by moving closer to synapses and turning up their vacuum power.[334] Therapeutics that boost these responses could help treat or prevent SUD.

DNB also supported an innovative new approach to screen massive virtual chemical libraries. Such libraries are a trove of potential therapeutics but screening them can be time- and cost-prohibitive. The new approach, called V-SYNTHES, starts by screening virtual chemical fragments for their likely engagement of a target (e.g., a receptor). Fragments that show the strongest engagement are pursued by adding modular pieces to them and screening them again in repeated cycles. The inventors of V-SYNTHES used it to screen a virtual library of some 11 billion compounds and identified 21 compounds that bind to brain cannabinoid receptors.[335]

Division of Epidemiology, Services, and Prevention Research
FY 2024 Request: $372.6 million
($1.7 million below the FY 2023 Enacted Level)

NIDA's Division of Epidemiology, Services, and Prevention Research (DESPR) supports research to understand and address the interactions between individuals and environments that contribute to drug use, addiction, and related health problems. DESPR supports a broad

[332] pubmed.ncbi.nlm.nih.gov/34242880
[333] pubmed.ncbi.nlm.nih.gov/35201898
[334] pubmed.ncbi.nlm.nih.gov/34888837; pubmed.ncbi.nlm.nih.gov/35947652
[335] pubmed.ncbi.nlm.nih.gov/34912117

portfolio that informs evidence-based strategies to support prevention, harm reduction, treatment, and recovery for people at risk or with SUDs. This includes two nationally representative studies—the Monitoring the Future (MTF) survey, which measures substance use and related attitudes among adolescents, and the Population Assessment of Tobacco and Health (PATH) Study, which focuses on tobacco use, attitudes, and health outcomes of people aged 12 and older.

MTF and PATH continue to add to our understanding of trends in substance use and their impact on health. For example, while past studies suggested that most teens reduce drug use as they enter adulthood, MTF recently found that teens with symptoms of severe SUD were likely to experience such symptoms in adulthood. The PATH Study recently analyzed use of e-cigarettes (e-cigs) and health outcomes among adults and found that for smokers of conventional cigarettes who have no intention to stop, e-cigs may help them reduce their smoking or quit over time. However, consistent with other research, PATH has also found that compared to smokers and never-smokers, e-cig users have an intermediate risk of short-term respiratory problems such as wheezing and cough.[336] The long-term health risks of e-cig use remain unknown.

DESPR also supports research examining the efficacy and implementation of harm reduction efforts, including reducing the risk of HIV and Hepatitis C Virus (HCV) infection associated with injection drug use. SSPs provide sterile syringes, HIV and HCV testing, and linkage to treatment for these conditions and for SUD but have a limited capacity to reach rural areas. To address this gap, NIDA-funded researchers developed a system wherein SSPs use telehealth to connect patients to an HIV specialist. In a pilot study, 35 people received antiretroviral therapy through this intervention, and of those, nearly 80 percent had clinically suppressed HIV levels at 6 months.[337] A large trial of this intervention is now underway.

Additionally, DESPR supports the ABCD Study, which is following children from ages 9-10 to adulthood to identify risk factors for SUD. Recently, the study explored differences in brain structure associated with alcohol use disorder (AUD), which were long theorized to be caused by alcohol toxicity. But the investigators found that among children never exposed to alcohol, those with genetic risk factors for AUD were likely to have the brain differences previously only seen in adults with AUD. Thus, rather than being a consequence of AUD, those differences could predispose people to AUD and could help inform preventive strategies.[338] Another analysis from the ABCD Study found that children whose mothers had used cannabis after the first 5-6 weeks of pregnancy were more likely to have social, behavioral, and attentional problems at age 11-12.[339] This adds to the evidence that cannabis use during pregnancy can adversely affect prenatal development, with impacts for the child's health many years into the future. In addition to its focus on early-life substance exposures and SUD risk factors, the ABCD Study has led to broader advances in understanding child health, including the impact of the COVID-19 pandemic on children's mental health and the importance of sleep in brain development.[340]

[336] pubmed.ncbi.nlm.nih.gov/34962556; pubmed.ncbi.nlm.nih.gov/34304335
[337] pubmed.ncbi.nlm.nih.gov/34781096
[338] pubmed.ncbi.nlm.nih.gov/34092032
[339] pubmed.ncbi.nlm.nih.gov/36094599
[340] pubmed.ncbi.nlm.nih.gov/35090817; pubmed.ncbi.nlm.nih.gov/35914537

Division of Therapeutics and Medical Consequences
FY 2024 Request: $129.3 million
($0.6 million below the FY 2023 Enacted Level)

NIDA's Division of Therapeutics and Medical Consequences (DTMC) supports research to evaluate the safety and efficacy of pharmacotherapies, behavioral interventions, and medical devices to prevent and treat SUDs and drug overdose. This work spans all phases of medical product development including synthesis and preclinical evaluation of potential therapeutics, clinical trial design and execution, and preparing regulatory submissions.

DTMC supports the development of new medications for SUD, as well as the repurposing of drugs currently used to treat other conditions. For example, among people recovering from OUD, sleep disturbances are often part of withdrawal and can increase the risk of relapse. But taking common sleep aids like sedatives could further increase the risk of relapse and overdose. Thus, DTMC supports research on unique sleep medications that target orexins, proteins in the brain that help promote wakefulness and modulate dopamine-producing brain cells, which drive the rewarding effects of drugs. Preliminary results show that an orexin receptor blocker, suvorexant, reduces withdrawal and improves sleep for people with OUD.[341]

Among current studies on behavioral interventions is a project to improve treatment for chronic pain and depression associated with OUD. These conditions affect 40-60 percent of people with OUD and can increase the risk of opioid misuse if not treated.[342] Researchers are developing an approach in which primary care providers and behavioral health specialists will collaborate to treat such patients.

Funding from the NIH HEAL Initiative® has enabled NIDA to expand its medication development portfolio, including support for research on new types of MOUD. For example, clinical trials are testing subcutaneous implants of extended-release naltrexone that are designed to last for months. Oral extended release levomethadone is also being evaluated as a safer, more accessible alternative to methadone. DTMC also supports development of novel biologics to treat SUD, such as monoclonal antibodies designed to neutralize drugs before they reach the brain. DTMC also supports research on neuromodulation therapies to correct the activity of brain circuits involved in addiction. For example, a current trial is evaluating the feasibility of treating OUD with deep brain stimulation, which is FDA-approved for Parkinson's disease and severe epilepsy.

Center for Clinical Trials Network
FY 2024 Request: $40.8 million
($0.2 million below the FY 2023 Enacted Level)

The NIDA Clinical Trials Network (CTN) provides a collaborative framework for healthcare providers, researchers, and patients to conduct clinical trials on the safety and efficacy of SUD interventions. The CTN includes 16 research nodes across the country and more than 240 community-anchored treatment programs. This unique structure enables the CTN to investigate

[341] pubmed.ncbi.nlm.nih.gov/35731889
[342] pubmed.ncbi.nlm.nih.gov/12746360; pubmed.ncbi.nlm.nih.gov/28476267

behavioral, pharmacological, and integrated therapies across diverse settings and populations, and to develop implementation strategies that help bring research results into practice. Active protocols focus on a variety of areas, including primary prevention of SUD; increasing patient access and adherence to medications for OUD (MOUD), especially in rural and underserved populations; evaluating potential medications for stimulant use disorder; and addressing stigma and other barriers to SUD treatment. Some examples are highlighted below.

Among the 2.5 million people who had OUD in 2020, only 11.2 percent received MOUD, such as methadone, buprenorphine, or naltrexone.[343] Because people with OUD often receive acute care for overdose or other conditions in the emergency department, this presents an opportunity for starting MOUD treatment. A CTN study found that providing high-dose buprenorphine during emergency care was safe for patients with OUD who did not respond well to low doses—an approach that may help such patients control cravings and withdrawal and engage in follow-up care.[344]

The CTN is exploring many other approaches to expand patients' access to MOUD. For example, because most people visit their community pharmacist more often than they see their doctor, the CTN tested a physician-pharmacist collaborative model of care. In that study, about 70 adults with OUD were transitioned from physician management of buprenorphine to management by their pharmacy. Among the 90 percent of patients who completed the study, 95 percent adhered to buprenorphine treatment.[345] The CTN is studying the potential for community pharmacies to provide other MOUD types and to conduct OUD screening and referrals.

The CTN also recently explored the association between OUD and depression, and how patients with both conditions respond to MOUD. In a study of nearly 600 patients with OUD, nearly half had depression when they started MOUD. After four weeks, two-thirds of those patients improved in their depression, but those with severe depression were less likely to improve.[346] The findings suggest that patients with OUD should be screened for depression and that when depression does not improve after MOUD, additional therapies may be needed.

Office of Translational Initiatives and Program Innovations
FY 2024 Request: $42.7 million
($0.2 million below the FY 2023 Enacted Level)

NIDA's Office of Translational Initiatives and Program Innovations (OTIPI) translates discoveries in addiction research into candidate health applications. OTIPI supports translational research through NIDA's Small Business Innovation Research/Technology Transfer (SBIR/STTR) programs, as well as Challenge competitions. OTIPI also develops training programs that help scientists move their discoveries from the lab to the real world.

[343] www.samhsa.gov/data/report/2020-nsduh-annual-national-report
[344] pubmed.ncbi.nlm.nih.gov/34264326
[345] pubmed.ncbi.nlm.nih.gov/33428284
[346] pubmed.ncbi.nlm.nih.gov/35452194

OTIPI supports innovative addiction research and therapeutics development by startup companies. For example, recognizing the therapeutic potential of psychedelic drugs such as psilocybin, in FY 2023, NIDA announced a new program to support small businesses to develop psychedelic-based therapies for SUD. In the telehealth field, NIDA has funded online systems that connect people to addiction treatment and related services. This includes apps to deliver interventions such as cognitive behavioral therapy, enable people to manage MOUD through virtual care, and maintain 24/7 engagement with recovery and relapse prevention services.

Through OTIPI, NIDA also funds new technologies to measure community substance use patterns through wastewater monitoring. This includes funding for Biobot, which uses an algorithm to select sewer access sites (manholes) that will best represent community substance use, then deploys a robotic device inside each manhole to collect samples, and tests for opioids and other drugs in those samples using standard laboratory methods. During the COVID-19 pandemic, Biobot technology was also used to test community levels of SARS-CoV-2 in wastewater, including in a collaboration with the NIH Rapid Acceleration of Diagnostics–Underserved Populations (RADx-UP) program.[347] NIDA also funds development of lab-on-a-chip technology that was recently shown to detect opioids in wastewater with similar sensitivity to standard methods. This platform holds potential for rapid, cost-effective measurement, without the need to take samples to a lab for processing.[348]

OTIPI also supports development of technology to reduce prescription drug diversion, including by healthcare workers. While rates of such diversion are unknown, most hospitals attempt to reduce diversion by using automated drug dispensing cabinets with monthly audits to detect anomalous dispensing. Unfortunately, those systems are slow and prone to error and manipulation. To develop a more effective system, NIDA-funded scientists developed artificial intelligence-powered software that monitors automated dispensing cabinets and employee time clocks to detect potential diversion in real time. The researchers have tested their system against a historical dataset of about 28 million drug transactions including 22 known diversions; it detected all of them, at an average 160 days faster than the time taken for actual discovery.[349]

Finally, OTIPI has coordinated several recent Challenge competitions to take on complex problems in addiction science by seeking innovative solutions from the public, in addition to the scientific community. For example, the "Start an SUD Startup" Challenge invited competitors to propose a startup venture focused on a novel product or approach to address drug addiction. Winning proposals, announced in January 2022, included apps to connect recovery support specialists to clients and peers; portable devices and wearables to detect fentanyl and other substances; and neuromodulation therapy combining music and tactile stimulation. Each winning team received $10,000 and entrepreneurial mentorship, with the goal that some will form startups that can compete successfully for SBIR or STTR funding. Other recent Challenges focused on development of product prototypes to combat drug craving and novel postmortem toxicology tools to improve investigation of suspected drug overdose deaths.

[347] pubmed.ncbi.nlm.nih.gov/34863144
[348] pubmed.ncbi.nlm.nih.gov/34863144
[349] pubmed.ncbi.nlm.nih.gov/35136913

NIH HEAL Initiative®
FY 2024 Request: $355.3 million[350]
(flat compared with the FY 2023 Enacted Level)

NIDA coordinates several innovative HEAL Initiative® programs that are developing and testing evidence-based interventions for opioid misuse and overdose in diverse populations and settings. For example, The HEALing Communities Study is testing an integrated model of evidence-based care to reduce overdose deaths in 67 communities hit hard by the opioid crisis. The study has three core components: (1) a menu of evidence-based practices (EBPs) designed to increase the use of MOUD, widen distribution of naloxone, and reduce high-risk opioid prescribing; (2) community engagement to select the EBPs and strategies that best meet each community's needs; and (3) communications to address stigma about OUD and disseminate EBPs.[351]

The Justice Community Opioid Innovation Network (JCOIN) is studying approaches to improve evidence-based treatment for people with OUD in justice settings, including prisons and jails. It is estimated that half of incarcerated individuals have an SUD and that only about one in four receive any SUD treatment.[352] Recent JCOIN studies show that ensuring access to MOUD in prisons and jails could significantly reduce overdose deaths and recidivism among incarcerated people in the years following their release.[353] Ongoing JCOIN studies are evaluating strategies to help recently incarcerated people find and engage in SUD treatment in their communities.[354]

A new harm reduction research network will develop, test, and implement strategies to prevent overdose, transmission of HIV and HCV, and other harms associated with drug use. The network includes a coordinating center and nine projects focused on a variety of strategies and outcomes, including delivery of harm reduction services during emergency care, via mobile vans for hard-to-reach patients, and in combination with peer-based contingency management.

Another new program, HEAL Data2Action (HD2A), is supporting research to help health systems build real-time data analytics capacity to identify and address service gaps in prevention and treatment of OUD, recovery support, and harm reduction. HD2A currently funds projects focused on areas such as clinical decision support for chronic pain, improving overdose fatality review, stabilizing people at risk for overdose through linkage to MOUD treatment, and improving MOUD access and treatment retention through coordinated care and safe take-home methadone dosing. HD2A also assists researchers with data infrastructure, implementation of evidence-based solutions to service gaps, and long-term sustainability of these solutions.

Intramural Research Program
FY 2024 Request: $113.8 million
($2.5 million above the FY 2023 Enacted Level)

[350] Includes funding for RMS to support the HEAL Initiative.
[351] pubmed.ncbi.nlm.nih.gov/33248391
[352] nap.nationalacademies.org/read/25310/chapter/6; pubmed.ncbi.nlm.nih.gov/34304335
[353] pubmed.ncbi.nlm.nih.gov/32712165; pubmed.ncbi.nlm.nih.gov/35063323
[354] pubmed.ncbi.nlm.nih.gov/33531212

The NIDA Intramural Research Program (IRP) conducts state-of-the-art basic, preclinical, and clinical research to inform strategies for prevention and treatment of SUD and related health outcomes. The IRP portfolio includes research to elucidate the mechanisms underlying development of SUDs, evaluate potential new therapies, and identify and characterize emerging drugs such as synthetic opioids, stimulants, and cannabinoids.

IRP scientists led a recent study to better understand brain mechanisms of reward and reinforcement, which are disrupted in addiction.[355] The scientists used MRI to examine brain activity in mice given rewards for pressing a lever, and in people as they watched TikTok videos associated with binge-watching. By initially focusing on a brain region called the prefrontal cortex (PFC), which has previously been implicated in addiction, they found that the PFC is part of a positive feedback circuit that is activated by reinforcing stimuli. The findings could help guide future use of neuromodulation therapies to adjust the brain circuitry underlying addiction.

The Neuroimaging Core contributed to another study with implications for neuromodulation therapies. This study investigated why accidental brain lesions (e.g., from a stroke) sometimes cause smokers to quit.[356] Previously, such lesions have been found in many brain regions, and none were consistently associated with smoking cessation. By mapping the lesions for their connectivity to other brain areas, the study identified a brain circuit that, when damaged, is associated with reduced addiction to nicotine and alcohol. This circuit, which includes parts of the PFC, could be an ideal target for neuromodulation.

Other IRP scientists are conducting innovative research on dopamine signaling develop potential new medications for SUD. While drugs that block the function of dopamine D3 receptors offer the potential to treat SUD, they also have adverse effects on the heart. The scientists, who helped solve the structure of the D3 receptor 10 years ago, have used that structure to design new more selective compounds. They have found that two such compounds reduce craving for opioids and cocaine in rodent models of addiction without cardiotoxicity.[357]

Research Management and Support
FY 2024 Request: $74.8 million[358]
($2.6 million above the FY 2023 Enacted Level)

NIDA Research Management and Support (RMS) activities provide administrative, budgetary, logistical, and scientific support in the review, award, and monitoring of research grants, training awards, and research and development contracts. Staff supported by NIDA's RMS budget also coordinate training and career development programs to sustain a talented, diverse workforce of addiction scientists. Other RMS functions include strategic planning, coordination, dissemination of latest research findings and funding opportunities, program evaluation, regulatory compliance, international coordination, and liaison with other Federal agencies, Congress, and the public. RMS staff also play key roles in coordinating NIDA's involvement in the NIH HEAL® Initiative and in managing HEAL-supported research. In addition to the infrastructure required

[355] pubmed.ncbi.nlm.nih.gov/35296648
[356] pubmed.ncbi.nlm.nih.gov/35697842
[357] pubmed.ncbi.nlm.nih.gov/27508895; pubmed.ncbi.nlm.nih.gov/30555159; pubmed.ncbi.nlm.nih.gov/31562201
[358] Excludes funding for RMS to support the HEAL Initiative.

to support research and training, NIDA strives to provide evidence-based resources and educational materials about substance use and addiction. To this end, the RMS portfolio incorporates education and outreach activities to inform public health policy, and to provide the public with timely, accessible, trustworthy information about substance use research in English and Spanish. In addition, NIDA's RMS portfolio includes the NIDAMED initiative, which is aimed at engaging and educating clinicians in the latest addiction science.

National Institute on Alcohol Effects and Alcohol-Associated Disorders
FY 2024 Request: $76.2 million
(unchanged from the FY 2023 Enacted Level)

Although the rate of underage drinking in the United States has declined over the past several decades, alcohol remains the most widely used substance among youth. Binge drinking[359] and high intensity drinking[360] among young people remain significant concerns. These drinking patterns are particularly troubling as they increase risks for poor academic performance, alcohol-related blackouts, injuries, overdoses, sexual assault, unsafe sexual behavior, alcohol use disorder (AUD), and other detrimental consequences. NIAAA supports a broad range of basic, translational, and clinical research to improve our understanding of the impact of alcohol exposure on adolescent health and to improve interventions for alcohol-related problems among youth in community and healthcare settings. NIAAA also disseminates information about evidence-based interventions through the development of resources for the public.

Basic research is key to informing the development of innovative prevention and treatment strategies for underage drinking. A key initiative within NIAAA's adolescent brain research portfolio is the National Consortium on Alcohol and Neurodevelopment in Adolescence (NCANDA), a longitudinal study of approximately 800 youth ages 12-21 to identify brain characteristics that may predict alcohol misuse or occur because of adolescent alcohol exposure. Data from NCANDA, for example, has demonstrated that adolescent binge drinking is associated with accelerated decline of gray matter volume in the brain, with the most significant effects observed in the frontal regions. Gray matter, which consists primarily of neuron cell bodies, is important in normal, daily functioning, including controlling movement, seeing, hearing, forming memories, and regulating emotions. Frontal regions are important for executive functioning, such as performing complex tasks and decision-making.

Another major program within NIAAA's portfolio on adolescent brain research is the Neurobiology of Adolescent Drinking in Adulthood (NADIA) consortium to examine, using animal models, the mechanisms by which adolescent drinking leads to changes in brain structure and function that persist into adulthood. NADIA researchers previously demonstrated that binge drinking produces epigenetic changes in the brain that can lead to increased anxiety and alcohol consumption in adulthood. In a new study, the researchers used CRISPR/dCas9 DNA editing techniques to reverse some of the binge drinking consequences in the brain, and the changes

[359] NIAAA defines binge drinking as a pattern of drinking that increases an individual's blood alcohol concentration to 0.08 percent or higher. This typically occurs after 4 drinks for women and 5 drinks for men – in about 2 hours. Research suggests that fewer drinks in the same timeframe result in the same blood alcohol concentration in youth.
[360] NIAAA defines high intensity drinking two or more times the gender-specific binge drinking thresholds.

were associated with reduced anxiety and alcohol consumption in adulthood. Although much work remains before any potential application in humans, the new findings underscore the long-lasting effects of early binge drinking on the brain and adds to the growing body of evidence demonstrating the potential utility of gene editing in addressing health and disease.

Prevention of underage drinking has long been one of NIAAA's top priorities. NIAAA's portfolio in this area includes studies to develop, evaluate, and implement evidence-based prevention programs for youth. These programs include individual-, family-, school-, community-, and environmental-level interventions for underage individuals. For college settings, NIAAA provides the College Alcohol Intervention Matrix (CollegeAIM), an online resource that rates over 60 evidence-based alcohol interventions in terms of effectiveness, cost, and other factors, allowing school officials to select among the many potential interventions to address harmful and underage student drinking. NIAAA supports research to better understand trends in alcohol use among college students to improve interventions based on that knowledge. For example, a recent NIAAA-funded study revealed changes in the social context and frequency of drinking during the first year of the pandemic among a large cohort of college students. Alcohol-related harms were different depending on the context, for example, whether they drank outside the home with others or drank at home alone. These data suggest future interventions could be tailored based on drinking context. NIAAA also supports research to address alcohol misuse among young adults in in the military, workforce, and other non-college settings. Interventions tailored for underserved populations is another important area within NIAAA's prevention research portfolio. For example, NIAAA-funded researchers recently demonstrated the effectiveness of the Qungasvik (Tools for Life) intervention as a universal suicide and alcohol prevention strategy for young people ages 12-18 living in rural Alaska Native communities. This study builds on a decades-long collaboration between NIAAA-supported researchers at the University of Alaska, Fairbanks, and the Yup'ik Alaskan Native community to examine how tapping into a community's culture can provide a cornerstone for youth alcohol and other substance misuse and suicide prevention efforts.

Increasing implementation of alcohol screening and brief intervention in primary care and developing evidence-based behavioral therapies to reduce underage drinking is another priority area for NIAAA. For example, NIAAA developed the Alcohol Screening and Brief Intervention for Youth: A Practitioner's Guide to assist pediatric and adolescent health practitioners in identifying patients at risk for underage drinking and associated problems. This screening resource has been validated among youth in pediatric emergency room settings, in school settings, in primary care settings (including among racially and ethnically diverse youth), and among youth with chronic health conditions. NIAAA also supports studies to evaluate the effectiveness of digital health technologies in improving access to and quality of interventions for adolescents. For example, a new NIAAA-supported study is assessing whether a centralized, telehealth version of alcohol screening, brief intervention, and referral to treatment can improve early identification and treatment of alcohol and comorbid mental health problems among adolescents at high risk for these conditions. The telehealth intervention will be delivered by a centralized behavioral health clinician accessible to pediatric primary care clinics in the study, and it will be compared to in-person alcohol screening and brief intervention, also delivered by a behavioral health clinician.

Equity

Equity is a vital consideration in NIDA and NIAAA efforts to support the objectives of the National Drug Control Strategy. Both NIDA and NIAAA support the NIH UNITE initiative that was established to identify and address structural racism within the NIH-supported and greater scientific community. Both Institutes are also part of NIH's broader efforts to advance health equity research by improving minority health, reducing health disparities, and removing barriers to advancing health disparities research as well as the agency's efforts to expand, sustain, and promote scientific workforce diversity.

NIAAA supports a range of efforts aimed at reducing health disparities and promoting health equity. One area of interest is the social determinants of health that influence the initiation of underage alcohol use. Underserved populations bear a greater burden of alcohol misuse and its adverse effects. Current studies are exploring factors that drive alcohol misuse—including sleep quality, adverse childhood experiences, and family or peer stress—among minority adolescent populations. Understanding the social and environmental factors that influence alcohol misuse can inform targeted prevention approaches. NIAAA also supports development of culturally adapted interventions to reduce underage drinking. For example, NIAAA-funded researchers have developed effective alcohol prevention, screening, and brief intervention approaches tailored to American Indian and Alaska Native youth.