Drug abuse research : federal funding and future needs : report to the Chairman, Committee on Government Operations, House of Representatives / United States General Accounting Office.

GAO

United States General Accounting Office

Report to the Chairman, Committee on Government Operations, House of Representatives

January 1992

DRUG ABUSE RESEARCH

Federal Funding and Future Needs

GAO/PEMD-92-5

GAO

United States
General Accounting Office
Washington, D.C. 20548

Program Evaluation and
Methodology Division

B-246466

January 14, 1992

The Honorable John Conyers, Jr.
Chairman, Committee on Government Operations
House of Representatives

Dear Mr. Chairman:

At your request, we examined the federal investment in research on treatment, prevention, and the causes of drug abuse. As we agreed with your office, we reviewed extramural grant research in these areas, and others, at the National Institute on Drug Abuse in the Department of Health and Human Services and the Office of Justice Programs in the Department of Justice. These two agencies account for most of the research support in these areas.

In addition, we examined funding trends for other types of research and development, and we spoke with researchers and research users in the field about future needs. Our report contains a recommendation to the Congress regarding the place of research in national drug policy. We also recommend a special examination of the commitment to evaluation research to review the results of the sizable expenditures in the current national drug control effort.

As we agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time, we will send copies to interested parties and make copies available to others upon request.

If you have any questions or would like additional information, please call me at (202) 275-1854 or Robert York, Acting Director of Program Evaluation in Human Services Areas, at (202) 275-5885. Other major contributors to the report are listed in appendix V.

Sincerely yours,

Eleanor Chelimsky
Assistant Comptroller General

Executive Summary

Purpose

Drug abuse is a complex problem having wide impact on individuals, families, and communities. For government and others to respond with policies and programs that effectively prevent, deter, or treat drug abuse, they need to understand both the fundamental biological and social causes of drug abuse and the most effective ways to deal with them. The Chairman of the House Committee on Government Operations asked GAO to review federally-funded drug abuse research. Specifically, GAO (1) reviewed trends in funding federally-sponsored research on drug abuse compared with other trends in federal research support, (2) reviewed trends in funding different categories of drug abuse research, and (3) asked experts in the field about priority research questions regarding the causes, prevention, and treatment of drug abuse.

Background

The federal government has been the primary provider of funds for drug abuse research, principally through the National Institute on Drug Abuse (NIDA, established in 1974) in the Department of Health and Human Services (HHS) and also through the Office of Justice Programs (OJP) in the Department of Justice. To review extramural research grant funding, GAO used records from both agencies, data maintained by the National Institutes of Health (NIH), and published government documents. GAO did not include contract funding in its review. Data on trends in federal support for research in other areas provided perspective on drug abuse research. All funding trends are reported in constant 1982 dollars unless otherwise indicated and all years are fiscal years. GAO interviewed 30 experts, both researchers and users of research, to identify the key areas they believe should be studied to advance understanding of the causes, prevention, and treatment of drug abuse.

Results in Brief

Federal support from the two principal agencies for drug abuse research increased between 1980 and 1990 by over 200 percent (over 400 percent if funding related to acquired immunodeficiency syndrome (AIDS) is included). In contrast, outlays for national defense research and development (R&D) increased by 83 percent while nondefense R&D outlays declined by 5 percent in the decade. Drug abuse research funding grew rapidly between 1987 and 1990. Growth has continued steadily since 1983 at NIDA, the larger research program. OJP showed an irregular increase from 1981 to 1987, with no substantial increase since the surge in growth in 1987.

Of the three categories of drug abuse research funding GAO studied—causality, prevention, and treatment—NIDA has spent the most on treatment, followed by prevention and causality. Funding for treatment and prevention studies has increased substantially since 1987. For studying the causes of drug abuse, funding has remained tiny, never exceeding the $6 million reached in 1990. This is about one-tenth of 1 percent of the nation's drug control budget for that year.

OJP—the smaller drug abuse research funding source for the decade 1981-90 at $76.4 million compared to $784 million at NIDA—has spent as much on prevention studies as on causality and treatment studies combined. Trends in support for each of the three categories were irregular at OJP. Funding at OJP for other categories of drug abuse research has been much higher than for causality, prevention, and treatment over the course of the decade. The same was true at NIDA until recently.

Regarding needs for new research, expert researchers GAO spoke with agreed on the importance of further research on the psychological and social/environmental factors that lead to drug abuse.

Principal Findings

Research Funding at Major Agencies

GAO found two contrasting periods in drug abuse research support at the National Institute on Drug Abuse. The first decade, 1973-82, ended at a level 38 percent below 1973 in constant 1982 dollars. The second period, 1983-90, was one of consistent growth. The years 1987-90 saw such increased funding that over half of NIDA's total outlays for extramural grant research have occurred in those 4 years.

Priorities appear to have shifted so that causality, prevention, and treatment research now account for half the extramural grant funding, an increase of their share in recent years. Treatment research spending has grown the most and was, by 1990, much larger than the other two—double the amount for prevention research and nearly 10 times as large as causality research, which has always been relatively small and has not grown as a share of NIDA funding. As these research areas have grown in importance, the proportion of funding for other research, chiefly epidemiological, basic biomedical, and neurobehavioral studies, has decreased. In addition, GAO found social science approaches are now used in grants amounting to half of extramural grant research support.

GAO found that 26 percent of OJP's support for drug abuse research went to the three areas of causality, prevention, and treatment. Prevention research predominated, accounting for about as much as the combined spending for causality and treatment. The remaining 74 percent went chiefly to studies of drugs and crime and the evaluation of enforcement and judicial processes. This pattern has not changed in recent years.

Research Needs

GAO found that considerable agreement was expressed by researchers and research users interviewed on further needs in the study of the causes, prevention, and treatment of drug abuse. Consensus existed on the importance of studying the psychological and social/environmental factors which may contribute to the causes of drug abuse. Study of the effectiveness of prevention efforts and analysis of alternative prevention policies, including those of other countries, were identified as important priorities. For research on treatment, experts noted that needed work includes understanding more about stages in the treatment process, continued work on assessing treatment effectiveness, and developing new treatment approaches.

Recommendations

GAO is making two recommendations. The first is that the Congress review the place of research in national drug control policy. Research appears now to have a very modest role. In 1990, 4 percent of the total drug strategy spending was directed to research and development—building new knowledge and developing new technologies. Given the research needs identified by both researchers and research users, it seems timely to review whether the budget commitment to research is appropriate and to set broad priorities as to what directions it should take.

Second, GAO recommends that the Congress review whether evaluation research is being adequately conducted at the Office of National Drug Control Policy and the major executive agencies responsible for segments of the national drug control program. The large investment in action programs in the fight against drugs in the last few years offers an important opportunity to learn more about the feasibility of various drug control objectives and which tactics are working through program evaluation.

Agency Comments

At the request of the Committee, GAO did not obtain written agency comments. However, GAO presented separate briefings on the findings of this

study to officials from the relevant offices within NIDA and OJP. The officials confirmed the accuracy of the general funding trends shown in the data; other points raised in these briefings have been incorporated into the text.

Contents

Abbreviations

AIDS	Acquired immunodeficiency syndrome
ADAMHA	Alcohol, Drug Abuse, and Mental Health Administration
CRISP	Computer Retrieval of Information on Scientific Projects
GAO	General Accounting Office
GNP	Gross national product
HHS	Department of Health and Human Services
IMPAC	Information for Management, Planning, Analysis, and Coordination
LEAA	Law Enforcement Assistance Administration
NASS	NIDA Administrative Support System
NIAAA	National Institute on Alcohol Abuse and Alcoholism
NIDA	National Institute on Drug Abuse
NIH	National Institutes of Health
NIMH	National Institute of Mental Health
OJP	Office of Justice Programs
ONDCP	Office of National Drug Control Policy
OSAP	Office for Substance Abuse Prevention
OTI	Office for Treatment Improvement
PAL	Program Accountability Library
PHS	Public Health Service
R&D	Research and development

Introduction

Drug abuse is a complex problem having wide impact on individuals, families, communities, and the nation as a whole. The economic costs of drug abuse were estimated to be $58.3 billion for 1988 in a study at the University of California, San Francisco, Institute for Health and Aging (1990).[1] In the same year, the National Household Survey on Drug Abuse reported 27 million users of illicit drugs, and the Drug Abuse Warning Network estimated 7,000 drug-related deaths and 160,000 emergency room episodes in its 30 participating metropolitan areas. For the government to respond with policies that effectively prevent, deter, or treat drug abuse, we need to understand both the fundamental biological and social causes of drug abuse and the most effective ways to deal with them. Typically, such understanding can best be gained through the sustained effort of a balanced research program including basic inquiry and applied studies such as program evaluations.

The federal government has been the primary provider of funds for drug abuse research since at least 1973. State and local government funding is directed to alcohol and drug abuse services, not research. Private foundations support research but the amount is small compared to federal outlays. Health Affairs reported in 1990 that total foundation support for biomedical, social, and behavioral research on drug abuse over the 5-year period of 1983-87 was $2.3 million in current dollars, or about 1 percent of the $285 million in extramural research funding provided by the National Institute on Drug Abuse (NIDA) alone for the same time.

Objectives, Scope, and Methodology

The Chairman of the House Committee on Government Operations asked us to review federally-funded drug abuse research. The Committee was chiefly interested in research pertinent to reducing the demand for drugs, so we did not review research on supply-reduction topics such as crop eradication or detection and interdiction of smugglers. After consultation with Committee staff, we agreed to focus our review on extramural research grants in three major categories: causes, prevention, and treatment of drug abuse. We addressed the following questions in our study:

1. How do trends in funding for drug abuse research at the major agencies involved compare to other trends in federal research support?

[1]The study analyzed the economic costs of drug abuse separately from alcohol and mental illness. Costs include medical resources used for care, treatment, and rehabilitation; loss of earnings because of reduced or lost productivity by victims of crimes, incarceration, crime careers, and caregivers; crime enforcement; and pain and suffering measured by motor vehicle crashes and fires.

2. At the major agencies involved, what were trends in funding within various categories of drug abuse research from 1973 to 1990?

3. What research do experts in the field believe is needed to understand the causes, prevention, and treatment of drug abuse?

Selected Agencies

We focused on the Departments of Health and Human Services (HHS) and Justice because they have been the two principal federal sponsors of the types of research of interest to the Committee. However, they have different degrees of involvement in drug research: drug abuse is the central focus of the mission of NIDA, while the Office of Justice Programs (OJP) primarily provides assistance to state and local governments for law enforcement and other criminal justice purposes and develops national criminal justice action programs. Thus, research of any kind is only a small part of its mission.

According to the White House Office of National Drug Control Policy (ONDCP), HHS' Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA) and the Department of Justice combine to account for over 85 percent of spending for pertinent research in recent years. Further, 92 percent of ADAMHA drug abuse research is at NIDA, and 83 percent of Justice research is at OJP. Thus, we focused this review on the federal agencies that provide the two largest sources of federal funds for drug abuse research, NIDA and OJP. (OJP is not a single unit responsible for research decisions in the same sense as NIDA is; the bureaus that make up OJP, such as the National Institute of Justice and the Bureau of Justice Statistics, have separate missions, functions, appropriations, and discretion over spending.)

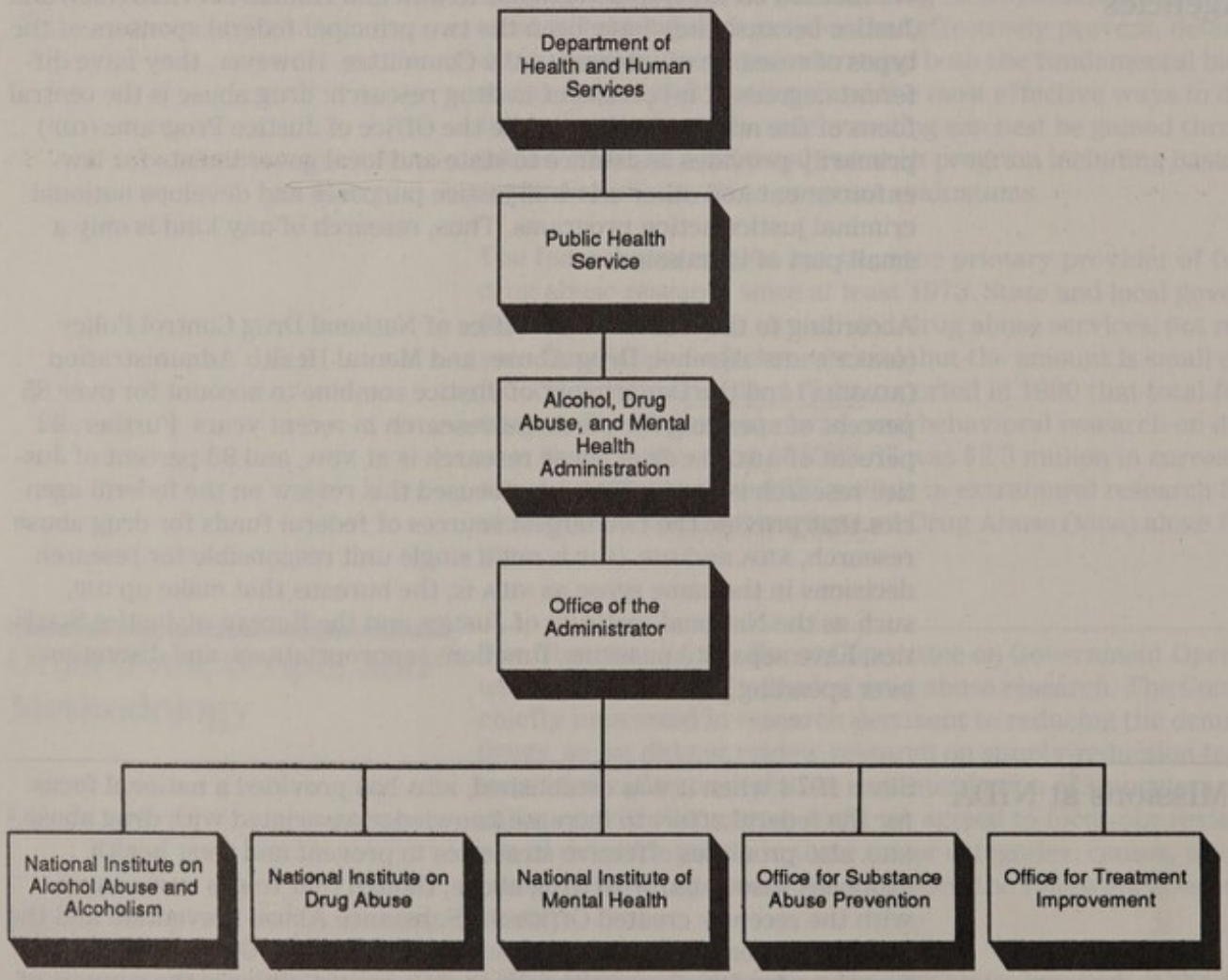
Research Missions at NIDA and OJP

Since 1974 when it was established, NIDA has provided a national focus for the federal effort to increase knowledge associated with drug abuse.[2] NIDA also promotes effective strategies to prevent and treat health problems associated with drug abuse, though that role is now shared with the recently created Office for Substance Abuse Prevention and the Office for Treatment Improvement. (See figure 1.1.) One of the main functions for NIDA in carrying out these responsibilities is the support of research on the biological, psychological, psychosocial, and epidemiological aspects of narcotic addiction and drug abuse. This is chiefly done by

[2]NIDA was established on May 14, 1974, as one of the three Institutes then within ADAMHA. We report drug abuse research funds at HHS that predate the formal establishment of NIDA.

extramural grants, though NIDA also supports its own intramural research programs such as the one at the Addiction Research Center in Baltimore.

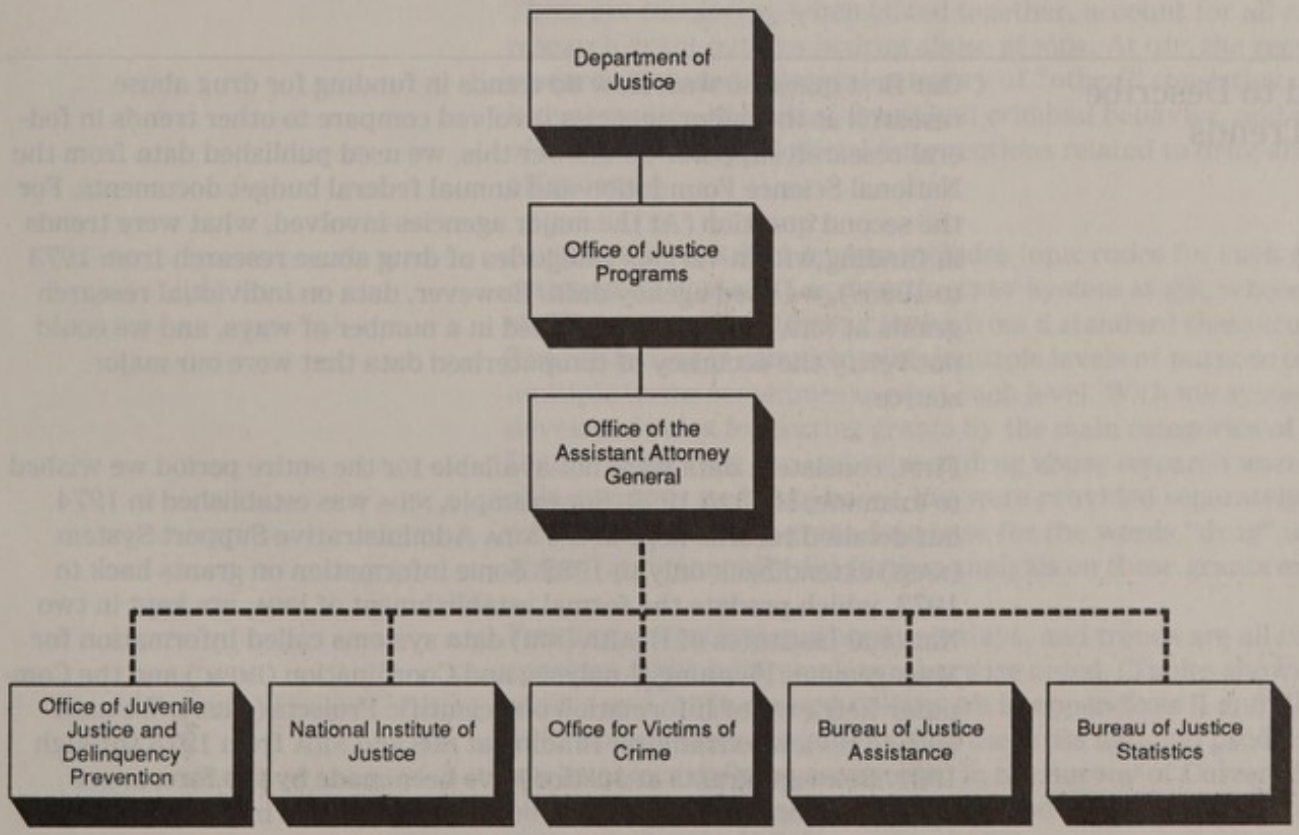
Figure 1.1: NIDA's Organizational Position Within HHS



The present Office of Justice Programs includes five bureaus and offices: Office of Juvenile Justice and Delinquency Prevention, National

Institute of Justice, Office for Victims of Crime, Bureau of Justice Assistance, and Bureau of Justice Statistics. Research on criminal justice matters is chiefly supported through grants and contracts awarded by the National Institute of Justice, including some pertaining to drug abuse, but other OJP units support research, making the office the second largest sponsor of pertinent research, overall. (See figure 1.2.) Research has also been supported by predecessor units such as the Law Enforcement Assistance Administration (1973-79), Office of Justice Assistance Research and Statistics (1980-84), and Office of Justice Assistance (1985).

Figure 1.2: OJP's Organizational Position Within Justice



-- Indicates general authority, policy coordination, and administrative support that the Assistant Attorney General provides to these offices.

Definition of Research

We limited our review to basic and applied extramural research grants that were subject to formal grant review processes at both NIDA and OJP. These grants are the traditional way in which the federal government funds scientific inquiry. We did not review contract research since NIDA's automated files did not permit adequate categorization of contract research. Data bases are maintained on contracts; however, the recoding of all contracts to match the coding system used by NIDA for extramural grant research was beyond the range of this study. Neither do we report contract research at OJP as no data are available before 1983, and where data are available, they are too limited to permit comparisons with NIDA. While contracted research is an important component in federal support for studies of drug abuse, most research is funded by extramural research grants. NIDA officials estimated that 17 percent of NIDA's total extramural research was contracted in 1990.

Data Used to Describe Funding Trends

Our first question was: How do trends in funding for drug abuse research at the major agencies involved compare to other trends in federal research support? To answer this, we used published data from the National Science Foundation and annual federal budget documents. For the second question (At the major agencies involved, what were trends in funding within various categories of drug abuse research from 1973 to 1990?), we used agency data. However, data on individual research grants at NIDA and OJP were limited in a number of ways, and we could not verify the accuracy of computerized data that were our major source.

First, consistent data were not available for the entire period we wished to examine, 1973 to 1990. For example, NIDA was established in 1974, but detailed records kept in the NIDA Administrative Support System (NASS) extend back only to 1982. Some information on grants back to 1973, which predate the formal establishment of NIDA, are kept in two National Institutes of Health (NIH) data systems called Information for Management, Planning, Analysis, and Coordination (IMPAC) and the Computer Retrieval of Information on Scientific Projects (CRISP). We used both to review extramural funding at HHS and NIDA from 1973 through 1981. Relevant grants at Justice have been made by the forerunner agencies of OJP since the 1970s, but automated data in OJP's system, the Program Accountability Library (PAL), only cover grants completely since 1983.

Second, some of NIDA's grant coding categories that would have been useful in our analyses (such as methodology and techniques and discipline of study) could not be used in many instances. The reason is that while the information system is designed to permit analyses of such detail, categories like "miscellaneous" and "not defined" are overused during the coding process.

Categories Used for Analysis

The Committee's request to examine trends in funding for research in the three broad areas of causality, prevention, and treatment of drug abuse drove our approach. A description of the research categories is provided in appendix I. In examining the full range of topics of research supported by NIDA, we noted several others that were significant, including epidemiology, basic biomedical, and neurobehavioral studies. These six categories, when added together, account for all extramural research grant outlays in drug abuse at NIDA. At OJP, the remainder of research included a general category of "other," consisting of epidemiological studies, studies of drugs and criminal behavior, and evaluations of enforcement and judicial interventions related to drug-abusing offenders.

At NIDA, the NASS data system includes topic codes for each grant assigned by NIDA staff as does the CRISP system at NIH, whose trained staff use scientific indexing terms from a standard thesaurus for coding. The NIH coding is complex, with multiple levels of purpose coded and multiple terms sometimes used at each level. With NIH systems staff, we developed rules for sorting grants by the main categories of interest. Details of funding for AIDS-related drug abuse research were not available on automated data bases, but were provided separately by NIDA. At OJP, we searched the grant data base for the words "drug" and "drug abuse" and manually did further analysis on those grants extracted.

Funding obligations, authority, outlays, and trends are all reported in constant 1982 dollars unless otherwise noted. (Tables showing spending at NIDA and OJP in current dollars are in appendixes II and III.) Constant 1982 dollars were computed using the gross national product (GNP) implicit price deflator as reported in the Survey of Current Business in 1990 and 1991. The standard base period used to express constant-dollar GNP by the U.S. Department of Commerce at the time we analyzed

the data for this report was 1982. All years referred to are fiscal years unless otherwise stated.[3]

Expert Telephone Interviews

Our third question was: What research do experts in the field believe is needed to understand the causes, prevention, and treatment of drug abuse? To answer this, we contacted 30 researchers from the social, biological, and criminal justice disciplines with varied views on the theoretical and methodological approaches for understanding drug abuse. We also included public policy experts as well as research users from the education and treatment communities who are aware of the gaps in knowledge that must be considered in designing and implementing prevention and treatment efforts. We asked them to identify, prioritize, and discuss the most important current research questions about drug abuse in the areas of causality, prevention, and treatment.

We identified the 30 experts using several sources. We reviewed literature and recent lists of national conference presenters to identify frequently cited individuals. We requested nominations of experts from ONDCP. We identified several schoolteachers engaged in drug prevention efforts. After completing a preliminary list of more than 80 experts, we asked two individuals especially knowledgeable about drug research to review the list. After receiving their comments, we selected 30 individuals balanced by discipline (biomedical and social sciences) and interests. We contacted the 30 identified experts by mail to request a telephone interview. We had a 100-percent affirmative response to our request and completed all interviews. A list of the experts is in appendix IV.

We gave each expert a 30- to 45-minute standard telephone interview, including the following questions:

- What are the most critical research questions in the areas of drug abuse origins, treatment, and prevention?
- What is currently the most promising work that addresses these critical research questions?
- To what extent are the critical questions, and the most promising work on them, receiving funding?

[3]The federal government changed the start of its fiscal year from July 1 to October 1 beginning in fiscal year 1977. Figures for the transition quarter, July 1-September 30, 1976, are included in figures for 1977.

- What is the optimal sequencing of priority implementation to maximize the effective development and utility of drug abuse research findings?

Responses were aggregated and coded for analysis. Only the first question received a high consensus of expert opinion, which is reported here. While we have discussed only those research priorities that were frequently mentioned (25 times or more) by the experts we interviewed, we ranked and outlined the identified research issues as achieving high, medium, and lower priorities to indicate the relative importance of each issue to the experts we interviewed. Coding of grant topics at NIDA is not detailed enough to permit us to analyze the degree to which current funding matches the indicated priorities of our respondents.

We conducted our work between March 1990 and August 1991 in accordance with generally accepted government auditing standards.

Study Limitations and Strengths

Analyzing research using grant data bases has inherent limitations, since no detailed information on study procedures or outcomes is included. Thus, we had no basis for drawing conclusions on the quality of the research. The agency data we could use were further limited in their detail and consistency across time. While a project can have multiple topics or purposes, in its own data system, NIDA assigns each to only one primary category. The CRISP data system at NIH includes multiple primary topics and purposes in its coding, but as it was not clear how to allocate a project's overall cost to various purposes, we chose to categorize each study as having only one major topic. There are conceptual difficulties, too, in the basic categories we attempted to use in response to the Committee's interest. For example, many researchers consider studies of the biological and psychosocial causes of drug abuse to be critical prevention studies as well.

OJP lacked complete computerized data covering their projects from 1973 to 1981. We have relied on published reports as well as figures provided by OJP officials. Those sources often lacked details such as topic codes, so we were, therefore, unable to describe fully the kinds of research performed by OJP before 1983.

Finally, in agreement with the Committee, we did not review research on alcohol abuse.

The principal strength of our review is the successful identification of trends in funding different drug abuse research categories over time.

This involved a major effort to locate data sources and all pertinent work in the target agencies and an extensive review of agency manipulation of file data to enhance consistency and comparability across time and data systems. Another important contribution is the compilation of experts' views of research needs, which can serve as a useful indicator to agencies as they establish upcoming research priorities.

Organization of the Report

The first three chapters answer the three evaluation questions in order. Chapter 2 provides comparisons of drug research funding with other topics of research. Chapter 3 gives details of funding trends for drug abuse research at NIDA and OJP. Chapter 4 discusses the needed research identified by experts. Also, the chapter shows the balance of outlays between the social and biomedical sciences from 1976 through 1990. The final chapter provides two general recommendations for the Congress to consider about the role of research and evaluation in the national drug control program.

Federal Funding for Extramural Research Between 1980 and 1990

To provide perspective on the drug abuse research funding history to be presented in the next chapter, we compared it to funding for research (or the broader category of research and development):

- at other major federal departments and agencies,
- in selected budget functions, and
- at other components in the two major agencies we reviewed.

We also compared funding for research and other activities in the National Drug Control Strategy—Budget Summaries.

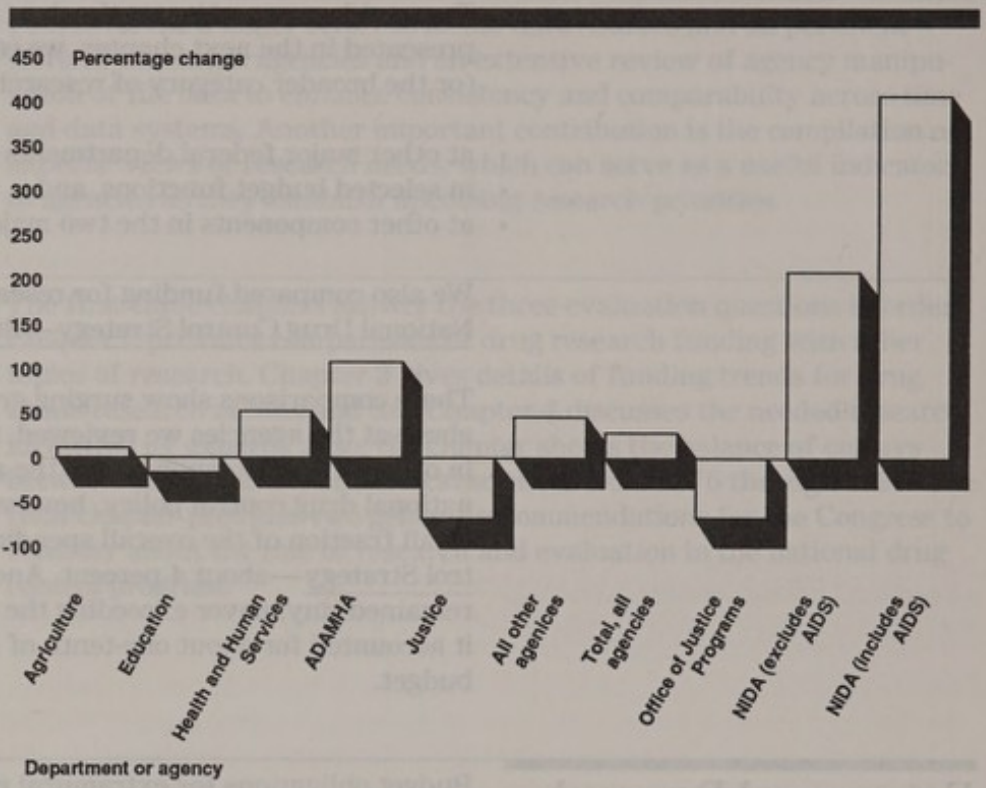
These comparisons show surging growth in support for research on drug abuse at the agencies we reviewed, much greater than in other areas and in other related components of the agencies. Research as one strategy of national drug control policy, however, continues to command only a small fraction of the overall spending included in the National Drug Control Strategy—about 4 percent. And research on causality alone has remained tiny, never exceeding the $6 million reached in 1990. In 1990, it accounted for about one-tenth of 1 percent of the total drug control budget.

Extramural Research Funding by Agency

Budget obligations for extramural research increased an average of 29 percent across the major departments and agencies of the federal government between 1980 and 1990.[1] Figure 2.1 and table 2.1 show the changes in obligations at NIDA and OJP compared to those at several other agencies. As can be seen in figure 2.1, Office of Justice Programs, to about the same degree as Justice overall, experienced a decline in extramural research. In contrast, in the same decade, NIDA experienced dramatic increases in budget obligations for extramural research—210 percent if AIDS-related research is excluded, and 408 percent when AIDS research is included. The NIDA rate of increase was significantly greater than that of its parent department, Health and Human Services, and nearly twice that for its parent agency, ADAMHA. The growth rate was eight times greater at NIDA than at all federal agencies combined.

[1]Figures for 1990 are estimates, except for NIDA, and are based on the Surveys of Science Resources Series of the National Science Foundation. Actual 1990 budget obligations were not available by the time we finished our work. Figures for NIDA were provided by their Planning and Financial Management Branch.

Figure 2.1: Change in Budget Obligations for Extramural Research by Selected Department and Agency, 1980 to 1990



Note: Percentages based on constant 1982 dollars.

Source: National Science Foundation, Federal Funds for Research and Development, detailed statistical tables by appropriate year; NIDA Planning and Financial Management Branch, "Obligation History."

Table 2.1: Selected Budget Obligations for Extramural Research, 1980 and 1990

Department or agency	1980	1990	Percent change
Agriculture	$207,156	$230,318	+ 11
Education	99,380	82,967	−17
Health and Human Services	3,014,967	4,594,200	+ 52
ADAMHA	198,635	412,716	+108
Justice	32,265	10,364	−68
All other agencies	5,900,247	6,614,212	+ 46
OJP	29,062	9,786	−67
NIDA (excludes AIDS)	49,034	151,970	+210
NIDA (includes AIDS)	49,034	249,008	+408
Total	**$9,579,780**	**$12,355,541**	**+ 29**

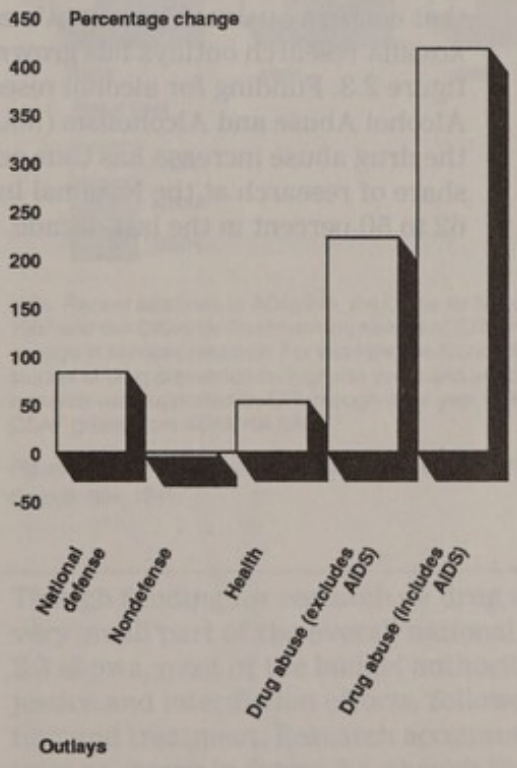
Note: In thousands of constant 1982 dollars. NIDA figures include AIDS demonstration grants.

Source: National Science Foundation, Federal Funds for Research and Development, detailed statistical tables by appropriate year; NIDA Planning and Financial Management Branch "Obligation History."

Drug Abuse Research Compared to Selected Functions

For analyzing pertinent spending trends from 1980 to 1990 in broad functional categories rather than by agency, there is only an aggregate data series that includes both research and development. This series, shown in figure 2.2, demonstrates the effects of the 1980's defense buildup in an almost-doubled defense R&D budget, while overall, nondefense R&D shrank 5 percent in constant dollars. Health R&D did sustain a 52-percent growth in the period, which suggests the decline in other nondefense R&D. Though small in absolute size compared to these other research categories, outlays for extramural research on drug abuse (NIDA and OJP combined) grew by 417 percent, including AIDS-related research, and 222 percent if AIDS-related research is excluded as shown in table 2.2.

Figure 2.2: Growth of Drug Abuse Extramural Research Compared to National Defense, Nondefense, and Health R&D, 1980 to 1990



Source: Budget of the U.S. Government, 1992 (Washington, D.C.: U.S. Government Printing Office: 1991), NIDA, and OJP.

Table 2.2: OJP and NIDA Extramural Drug Abuse Research Compared to R&D Outlays for Selected Functions, 1980 and 1990

R&D category	1980	1990	Percent change
National defense	$17,086.0	$31,328.0	+ 83
Nondefense	18,194.0	17,287.0	−5
Health	4,016.0	6,104.0	+ 52
Drug abuse			
Excluding AIDS	49.8	160.3	+222
Including AIDS	49.8	257.3	+417

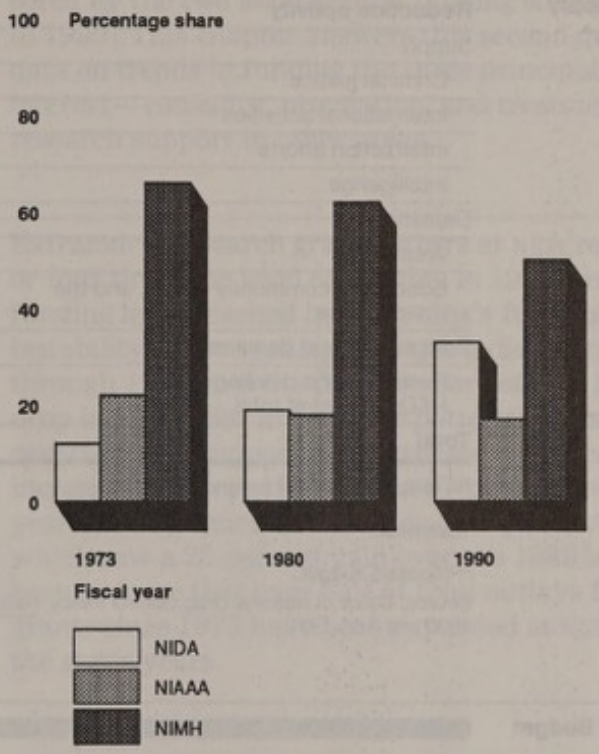
Note: In millions of constant 1982 dollars.

Source: Budget of the U.S. Government, 1992 (Washington, D.C.: U.S. Government Printing Office: 1991), NIDA, and OJP.

Research Funding Trends Within ADAMHA

Funding for extramural research on drug abuse has commanded a growing faction of the overall research effort on the diverse problems that concern ADAMHA. Since NIDA's establishment in 1974, its share of ADAMHA research outlays has grown from 12 to 33 percent, as shown in figure 2.3. Funding for alcohol research at the National Institute on Alcohol Abuse and Alcoholism (NIAAA) has been steady at 17-18 percent; the drug abuse increase has thus accompanied a relative decrease in the share of research at the National Institute of Mental Health (NIMH), from 62 to 50 percent in the last decade.

Figure 2.3: Institutes' Share of ADAMHA Extramural Research Outlays



Note: Recent additions to ADAMHA, the Office for Substance Abuse Prevention (OSAP) established in 1987 and the Office for Treatment Improvement (OTI) in 1990, are not research institutes but may engage in services research. For example, we found $47.83 million ($62.9 million current) in grants for studies of drug prevention for high-risk youth and pregnant women at OSAP in 1990. No extramural research was supported by OTI through fiscal year 1990. Figures for 1990 were adjusted by subtracting OSAP grants from ADAMHA totals.

Figures for NIDA, 1973, are HHS outlays in the year before NIDA was established.

Source: NIH, 1991.

Research as Part of the National Drug Control Strategy

Though funding for research on drug abuse has grown, R&D remains a very small part of the overall national drug control strategy. As table 2.3 shows, most of the budget authority in the drug war is for criminal justice and interdiction efforts, followed by action programs for prevention and treatment. Research accounts for only 4 percent of the overall total as shown in figure 2.4, though that share has risen slightly across the 3 years reported in the integrated drug budgets.

Table 2.3: National Drug Control Strategy: Budget Authority for Supply and Demand Reduction Activities[a]

Reduction activity	1989	1990	1991[b]	1992[c]
Supply				
Criminal justice	$2,682	$4,238	$4,368	$4,995
International activities	304	500	647	779
Interdiction efforts	1,467	1,752	2,023	2,109
Intelligence	53	65	108	114
Demand				
Treatment	888	1,279	1,499	1,655
Education, community action, and the workplace	677	1,217	1,442	1,515
Both supply and demand				
Research and development	231	328	435	488
R&D percent of total	3.6%	3.5%	4.1%	4.2%
Total	**$6,302**	**$9,379**	**$10,522**	**$11,655**

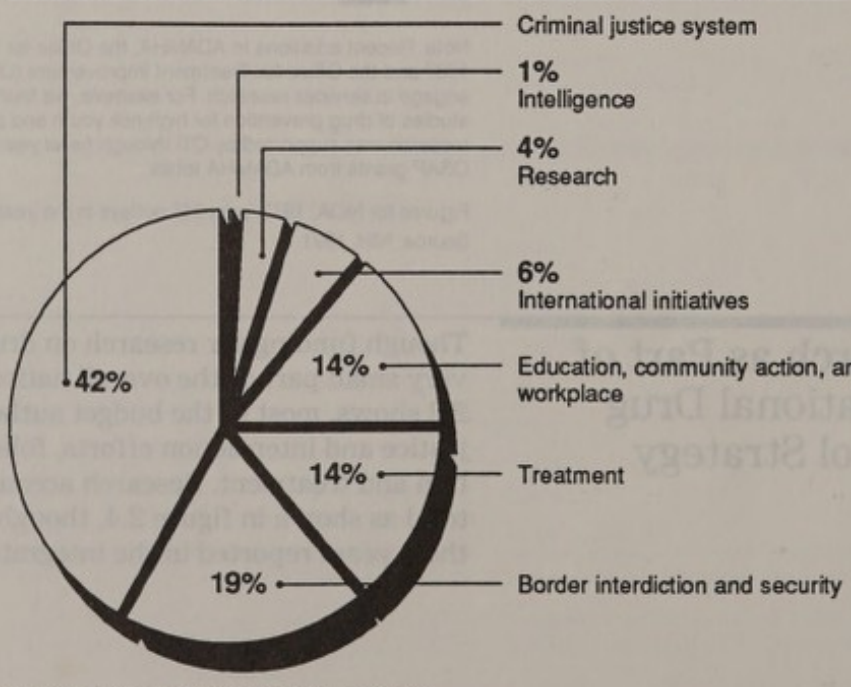
[a]In millions of current dollars.

[b]Estimate.

[c]Proposed budget.

Source: Office of National Drug Control Policy, National Drug Control Strategy—Budget Summary, Jan. 1990 and Feb. 1991.

Figure 2.4: National Drug Control Budget Authority, Fiscal Year 1991



Source: Office of National Drug Control Policy.

Chapter 3

Drug Abuse Research at NIDA and OJP

What have been the major emphases in the drug abuse research sponsored by the two main federal funding sources, NIDA and OJP, from 1973 to 1990? This chapter answers this second question in our review, with data on trends in funding the three principal research areas of interest—causality, prevention, and treatment—and on trends for research support in other areas.

Overall Funding of Extramural Research at NIDA

Extramural research grant outlays at NIDA reached $197 million in 1990, or four times the level of funding in 1973, and seven times the lowest funding level reached in 1982. NIDA's funding history was marked by instability, as percentage changes indicate in table 3.1, from year to year through 1981, and the first 10 years of NIDA history ended with a sharp drop in 1982.[1] But in 1983 the pattern of unstable research funding reversed, and support has increased each year since. The most notable increases began in 1987 with a 67-percent increase over the previous year and continued with higher outlays for research through 1990, which saw a 25-percent gain over the 1989 level. Recent increases have been so large that over half of total outlays for extramural research grants since 1973 have been expended at NIDA in the 4 years 1987-90—the surge years.

[1] A table of NIDA's funding history, in current dollars, is provided in appendix II.

Table 3.1: Total Extramural Grant Research at NIDA[a]

	Treatment		Prevention		Causality		Other[b]		Total	
Fiscal year	Outlay	Change	Outlay	Change	Outlay	Change	Outlay	Change	Outlay	Change
1973	$5.39	[c]	0	[c]	[d]	[c]	$40.79	[c]	$46.18	[c]
1974	4.60	−15%	0	[c]	[d]	[c]	34.48	−16%	39.08	−15%
1975	9.71	111	$2.09	[c]	$3.14	[c]	27.06	−22	41.99	7
1976	7.34	−24	0	[c]	2.77	−12%	26.52	−2	36.63	−13
1977	10.25	40	0	[c]	3.17	14	22.71	−14	36.13	−1
1978	8.48	−17	0	[c]	3.11	−2	25.19	11	36.78	2
1979	9.53	12	0.42	[c]	2.74	−12	27.14	8	39.82	8
1980	6.53	−31	0.42	0	2.69	−2	30.78	13	40.41	1
1981	6.40	−2	0.41	−2%	2.66	−1	30.47	−1	39.94	−1
1982	2.33	−63	1.07	161	2.14	−20	22.92	−25	28.47	−29
1983	2.88	21	1.33	24	1.79	−16	25.26	10	31.22	10
1984	5.19	80	3.13	135	2.13	19	29.29	16	39.74	27
1985	5.21	−1	4.21	35	4.08	92	33.66	15	47.17	19
1986	6.03	16	5.32	26	3.20	−22	36.31	8	50.86	8
1987	12.29	104	13.67	157	3.13	−2	55.75	54	84.84	67
1988	16.67	36	28.15	106	3.09	−1	59.40	7	107.32	26
1989	45.34	172	29.42	5	4.98	61	77.79	31	157.53	47
1990	60.52	33	32.95	12	6.33	27	97.22	25	197.02	25
Total	**$224.69**		**$122.59**		**$51.15**		**$702.74**		**$1,101.13**	
Cumulative	20.4%		11.1%		4.6%		63.8%			

[a]Outlays in millions of constant 1982 dollars, including AIDS-related funding. (Detail may not add to 100 percent because of rounding.)

[b]Includes epidemiology, basic biomedical, and neurobehavioral research.

[c]Not applicable.

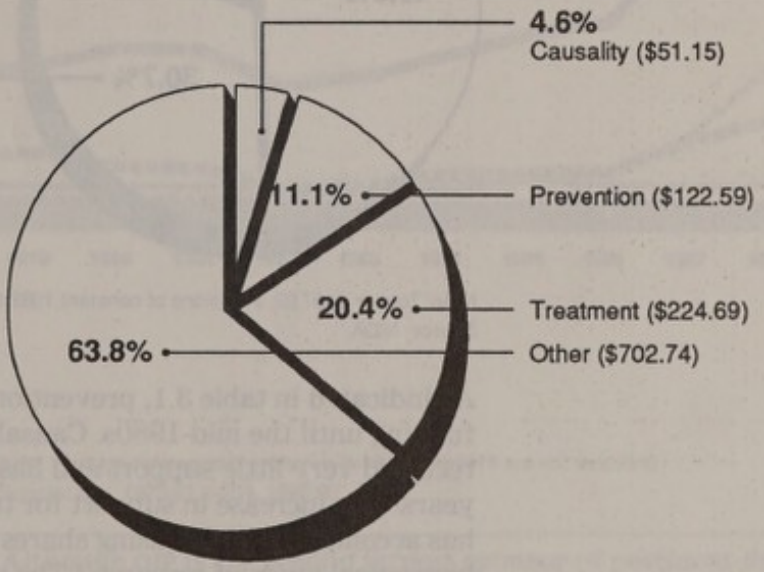
[d]Not available.

Source: NIH, 1973-81; NIDA, 1982-90.

Causality, Prevention, Treatment, and Other Research at NIDA

The three focal categories, though historically receiving a total of only about 36 percent of NIDA's extramural grant support as shown in figure 3.1, have grown in the surge years to the extent that they accounted for 50 percent of overall research funding in the last 2 years we reviewed, 1989 and 1990. Figure 3.2 shows the percentage shares for each category of research grants in 1990. Treatment research has grown the most and dwarfs the other two areas—now about twice as large as prevention and nearly 10 times as large as causality research.[2]

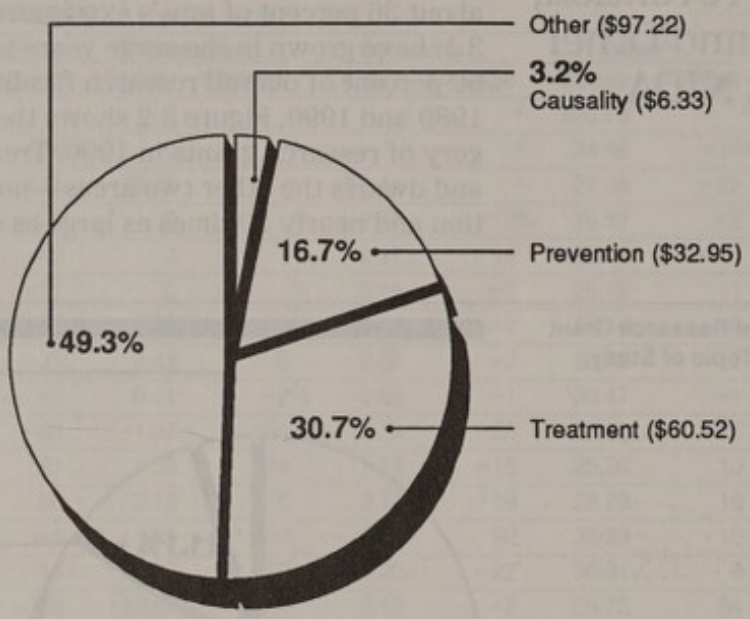
Figure 3.1: Extramural Research Grant Funding at NIDA, by Topic of Study, 1973-90



Note: Total=$1,101.13, in millions of constant 1982 dollars.
Source: NIH, 1973-81; NIDA, 1982-90.

[2]For more discussion of NIDA's extramural research on treatment, see Drug Abuse: Research on Treatment May Not Address Current Needs (GAO/HRD-91-114, Sept. 12, 1990).

Figure 3.2: Extramural Research Grant Funding at NIDA, by Topic of Study, 1990

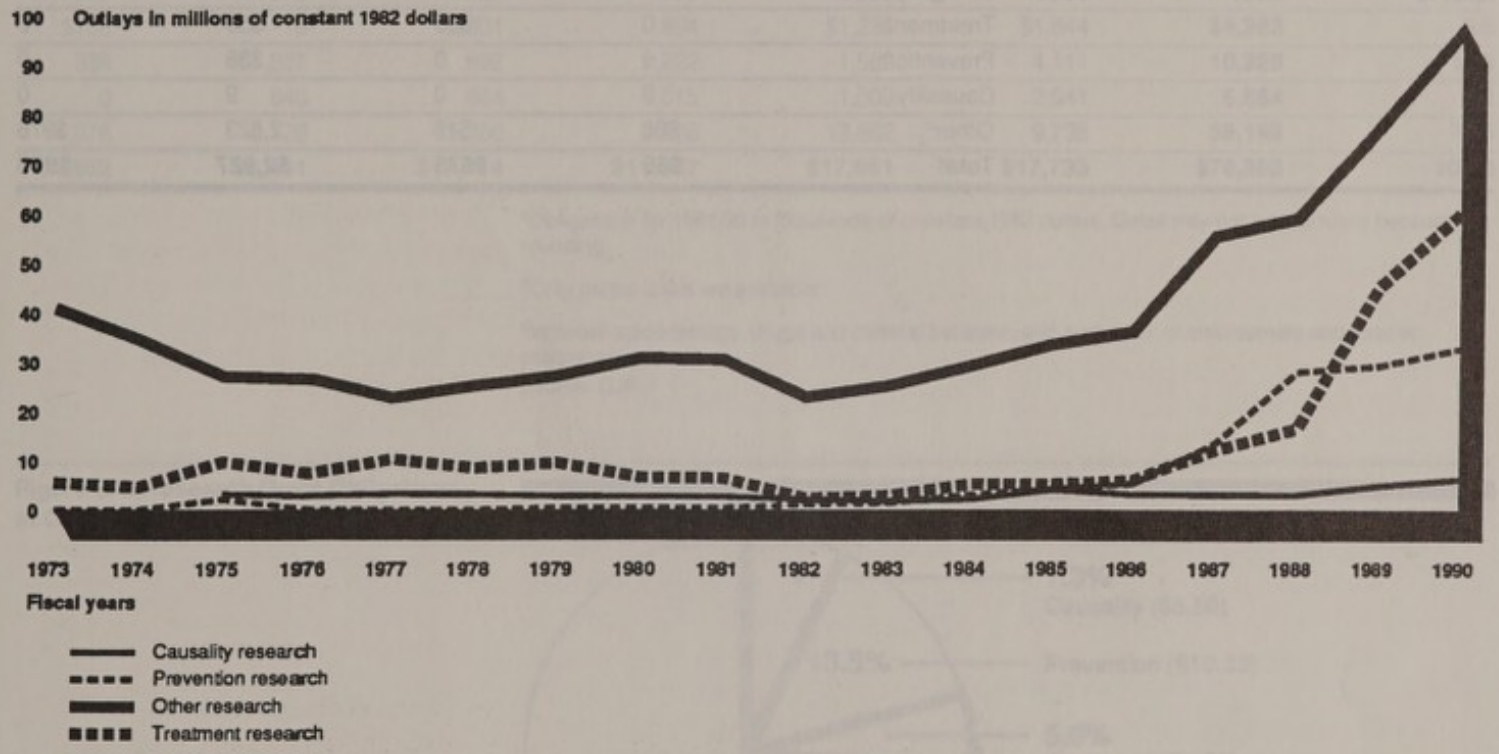


Note: Total = $197.02, in millions of constant 1982 dollars.
Source: NIDA.

As indicated in table 3.1, prevention research received little or no funding until the mid-1980s. Causality research has consistently received very little support and has not grown much during the surge years. The increase in support for treatment and prevention research has accompanied decreasing shares for other research—particularly biomedical kinds of research.[3] The share of funds for other research was over 70 percent in the mid-1980s but stands in recent years, as just mentioned, at about 50 percent. While figures 3.1 and 3.2 show the shift in funding shares at the start and end of this decade, figure 3.3 shows the year-by-year trends since NIDA's beginning in 1973.

[3]The categories that make up the "other" column in table 3.1, epidemiology, basic biomedical, and neurobehavioral research, combine for a decrease in share of research funds. Epidemiological studies alone, however, grew in the surge years.

Figure 3.3: Overall Funding in Causality, Prevention, Treatment, and Other Extramural Research at NIDA



Note: Outlays for causality research in 1973 and 1974 are not available.
Source: NIH, 1973-81; NIDA, 1982-90.

Overall Funding of Extramural Research at OJP

Although OJP is the second largest sponsor of pertinent drug abuse research, the scale of support is much smaller than at NIDA. For the 10-year period 1981-90, where acceptable data were available, we could locate only a total of $76.4 million of extramural grant support, most in the last 4 years we studied—1987-90. (See table 3.2.)[4] Of that total, 26 percent went to the three focal categories of treatment, prevention, and causality, as shown in figure 3.4. The majority, 74 percent, went to other areas of research, chiefly studies of drugs and crime and the evaluation of enforcement and judicial processes. This pattern of distribution has not changed in recent years.

[4]A table of OJP's funding history, in current dollars, is presented in appendix III.

Table 3.2: Total Extramural Grant Research on Drug Abuse at OJP[a]

Research category	1981[b]	1982[b]	1983	1984
Treatment	0	$60	$58	0
Prevention	0	0	338	0
Causality	0	0	9	0
Other[c]	$66	515	2,523	$976
Total	**$66**	**$575**	**$2,927**	**$976**

1985	1986	1987	1988	1989	1990	Total	Percent of total
$188	0	$801	$94	$1,238	$1,844	**$4,283**	5.6
388	$1,827	892	1,222	1,552	4,111	**10,329**	13.5
0	846	664	1,015	1,009	2,041	**5,584**	7.3
1,376	2,728	15,356	9,056	13,862	9,738	**56,196**	73.6
$1,952	**$5,401**	**$17,714**	**$11,387**	**$17,661**	**$17,733**	**$76,393**	**100.0**

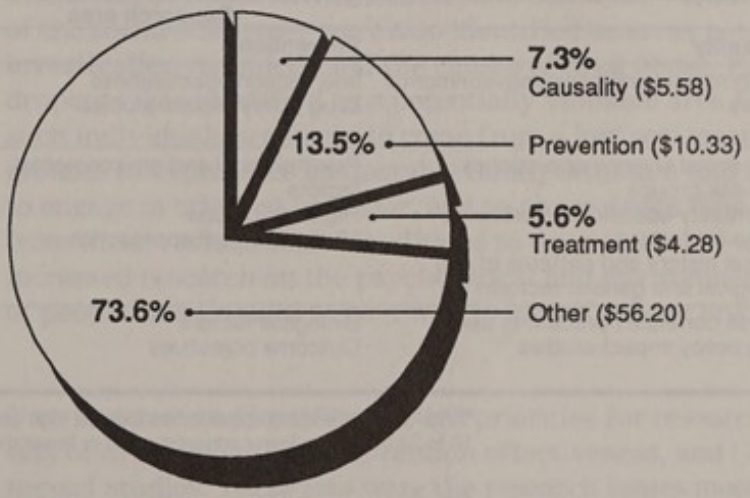
[a]Obligations for 1981-90 in thousands of constant 1982 dollars. Detail may not add to totals because of rounding.

[b]Only partial totals are available.

[c]Includes epidemiology, drugs and criminal behavior, and evaluation of enforcement and judicial processes.

Source: OJP.

Figure 3.4: Research Grant Obligations at OJP, by Topic of Study, 1981-90



Note: Total = $76.39, in millions of constant 1982 dollars.

Source: OJP.

Research Needs and Approaches

The 30 drug abuse researchers and research users we interviewed to answer our third question about critical research priorities in the areas of causality, prevention, and treatment research provided a wide variety of perspectives. The responses are outlined in table 4.1. Nevertheless, we found high consensus on the importance of six research needs. (We defined high consensus as 25 mentions or more of an issue by the 30 experts we interviewed.) In causality research, one issue dominated the responses: the need for more study of the psychological and social/environmental factors leading to drug abuse. In prevention, two key issues emerged: the effectiveness of prevention strategies and drug policy impact studies. Treatment research evoked a broader set of concerns, but the experts showed high consensus on three topics: stages of the treatment process, intervention effectiveness, and the study of various treatment approaches.

Table 4.1: Expert Views on Research Areas by Topic and Priority Level[a]

	Research area		
Consensus	**Causality**	**Prevention**	**Treatment**
High	Psychological and social/environmental factors	Intervention effectiveness Drug policy impact studies	Stages in the treatment process Intervention effectiveness Treatment approaches
Medium	More social science approaches High-risk groups Community-specific environments Economic factors Natural history and patterns of use Biological and genetic factors	Psychological and environmental factors High-risk groups Methodological approaches	High-risk groups Methodological approaches Resource allocation Social-environmental context
Lower	Overall correlates predicting use Drug policy impact studies	Biological factors Outcome objectives	Drug policy impact studies Staff issues Treatment-seeking by abusers

[a]Priority levels were determined as follows: high consensus, 25 or more mentions; medium consensus, 10 to 24 mentions; lower consensus, 10 or fewer mentions.

We discuss the research areas of high consensus for each of the categories below and close the chapter with a discussion of the balance of research approaches between the biomedical and social sciences at NIDA.

Critical Research on the Causality of Drug Abuse: Psychological and Social/Environmental Factors

Understanding the causes of drug abuse is directly linked to the development of effective prevention and treatment strategies. Of the three categories we reviewed, only causality research showed a single research area of critical need: the study of psychological and social/environmental factors in understanding the causes of drug abuse.

The experts we interviewed identified the need to study psychological and social/environmental factors by a 2-to-1 margin over any of the medium priority items mentioned and better than 5 to 1 over the lower priority research issues identified. Particular research areas within this category include a better understanding of drug abuse over the life cycle of individuals, learning more about the development of protective factors that shield individuals from drug abuse, and the role of the neighborhood and community, as well as family, in the development of drug-abusing behavior.

The effect of social norms, beliefs, and attitudes—traditional domains of the social sciences—were also identified as areas needing further investigation to understand the causes of drug abuse. Focusing on school dropouts was identified as a potentially valuable area for research, as such individuals are likely to come from a low socioeconomic background, to experience an unstable family situation and unemployment, to engage in criminal behavior, and to abuse drugs. The causal links from these various social conditions to drug abuse are unclear, but increased research on the psychological and environmental backgrounds of people was thought to be a way to identify those links.

Critical Research on the Prevention of Drug Abuse

Two issues were identified as high priorities for research on the prevention of drug abuse: (1) intervention effectiveness, and (2) drug policy impact studies. These two were the research issues most mentioned by our respondents by a ratio of 3 to 1 (for intervention effectiveness) and 2 to 1 (for drug policy analysis) over the medium priority levels indicated for other other research issues in prevention.

Intervention Effectiveness

Those interviewed cited three study topics of high interest in this area: the effectiveness of school interventions, the effectiveness of community interventions, and the recruitment into and participation of family members in prevention programs. The expert group cited the need for research on early intervention efforts, techniques for developing resistance skills, and the identification of prevention methods for different age groups.

Drug Policy Impact Studies

In this second area of prevention research, experts indicated the need for studies of alternative messages that are used (or could be) in the media and by drug prevention programs. A variety of messages are currently used, including the "Just Say No" campaign and resistance-building messages such as television advertisements produced by the Partnership for a Drug-Free America that use shock techniques. Their effects are not clear, and in the experts' opinion, it will be useful to study which messages have the greatest impact for particular high-risk groups. For example, experts voiced concern that messages portraying actual drugs or drug-related paraphernalia could increase the craving for drugs among addicts regardless of the shock level of the associated message.

The expert groups also believed U.S. prevention work could benefit from studying other nations' perspectives on drug policy and alternative strategies currently in use elsewhere, particularly in Western Europe. Understanding the applicability of other nations' strategies, in turn, will require the study of cultural differences in beliefs and behaviors. How changes in social attitudes affect both drug use and policy is also an area identified for further research.

The effect of accessibility of drugs on drug abuse is a prevention research issue that falls into the category of drug policy analysis. Current federal policy is to decrease accessibility and availability through intensive interdiction efforts. Without adequate research, we cannot determine whether or not current federal policy has had a significant impact on drug abuse.

Along with the need for more systematic and scientific studies to measure the impact of current policies, experts also identified the need for more prospective studies to make better predictions of the impact of alternative policies.

Critical Research on the Treatment of Drug Abuse

We received the most general and broad set of responses from the experts on treatment issues, but we found they clustered in three areas: (1) stages in the treatment process, (2) intervention effectiveness, and (3) treatment approaches.[1]

[1]Some gaps in knowledge and research needs were identified in the area of treatment research in an earlier GAO report: Drug Abuse: Research on Treatment May Not Address Current Needs (GAO/HRD-90-114, Sept. 12, 1990, pp. 15-18).

Stages in the Treatment Process

Stages in the treatment process include two areas of particular current concern for drug abuse research: first, matching clients to appropriate treatment programs; and second, retention of drug abusers throughout a given treatment regimen, which is directly related to preventing relapse.

Other areas of research needed to understand the stages of the treatment process are the often-repeated cycles in which people seek, enter, and leave treatment programs and the social factors associated with positive treatment outcomes for various groups.

Intervention Effectiveness

"What works?" remains a critical question about the treatment programs being delivered to drug abusers, even though there is evidence that treatment does work.[2] The experts' responses indicate a global concern for continued study of the effectiveness of all treatment. Certain facts are known, such as that the longer one is in treatment, the higher the probability of success. But this appears true across most treatment approaches. Thus, there is much to learn about what components of various treatments are the most effective and for whom.

Another area of research identified is the study of the remission of drug abuse—both in the treatment setting and spontaneously. Some drug abusers are known to have spontaneous remission; that is, to stop using drugs without any treatment intervention whatsoever. More knowledge on remission may be useful in improving current treatment practices. Developing better and more standard measures for establishing the results of treatment has also been identified as important in understanding treatment effectiveness.

Treatment Approaches

Biological, sociological, and psychological knowledge yield a variety of theories and methods for drug treatment, some linked to specific drugs. For instance, a heroin addict may be given a medication treatment such as methadone to stop the use of heroin. No medications are currently approved, however, for widespread treatment of cocaine abuse; individuals will most often receive a psychotherapeutic form of treatment.[3] Therapeutic residential communities, outpatient programs, detoxification programs, and others provide different treatment approaches for

[2]See, for instance, Dean R. Gerstein and Henrick J. Harwood, eds., Treating Drug Problems (Washington, D.C.: National Academy Press, 1990).

[3]Clinical research using medications shows promise, but large-scale effectiveness has not been established.

the same drug abuse problem. Experts suggested more work on developing medications to alleviate withdrawal symptoms for drugs other than heroin and a closer look at the particular treatment elements of an approach as opposed to doing more global evaluations of entire treatment approaches. Some advocate the theory that alleviating the withdrawal symptoms makes the probability of success through treatment regimes such as psychological interventions and behavioral therapies much greater. This is an example of hybrid treatment approaches being developed from particular elements of different approaches.

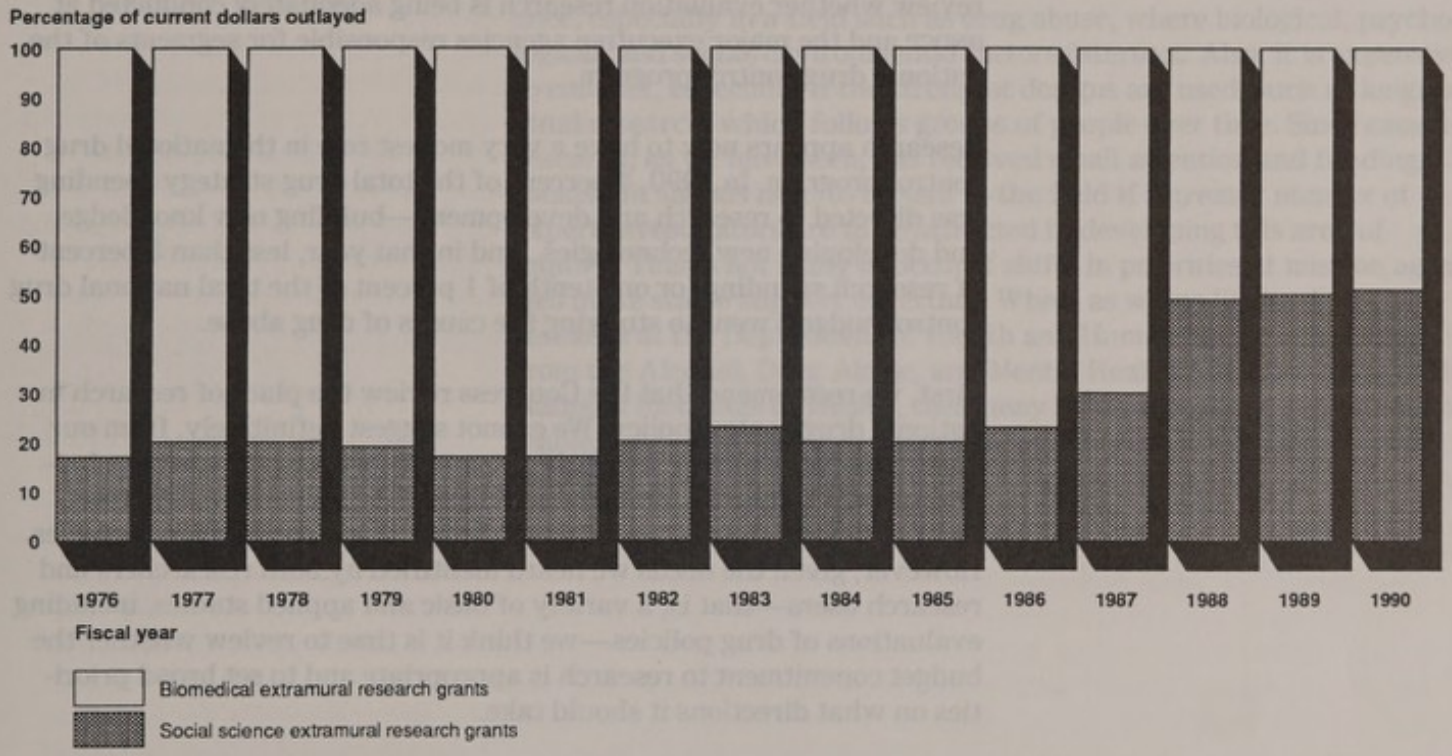
Balance of Approaches: The Social and Biomedical Sciences

Most of the research questions identified as currently critical to furthering knowledge of causes, prevention, and treatment of drug abuse (with some exceptions in the treatment research area) reflect repeated references by the experts for more social scientific studies. To provide a perspective on the role of the social sciences in the funding of extramural research at the National Institute on Drug Abuse, figure 4.1 shows the division of outlays, in current dollars, between social and biomedical approaches in extramural research grants from 1976 to 1990.[4] Through 1986, the social sciences received less than 25 percent of the funds for extramural grant research on drug abuse. That balance began reversing in 1987, when 30 percent of extramural grant research funding went to the social sciences and grew to 51 percent in 1990. Funding of social scientific studies doubled between 1988 and 1990 compared to the trend observed between 1976 and 1986.

The data do not permit us to determine if the increases in social science support may be explained by increases in AIDS-related research funding between 1986 and 1990. (To understand the origins of AIDS transmission in risky drug and sexual behaviors, expanded social science research is called for to lay a foundation for prevention efforts to curb the epidemic). Thus, the percentages we report may reflect an increase in support for social science approaches to AIDS-related drug abuse behaviors rather than a general increase of support for social science studies of drug abuse.

[4]We relied on an extensive set of terms developed by NIH staff to search for social-behavioral studies. These terms included psychiatric and psychobiological studies.

Figure 4.1: NIDA Extramural Research Grant Outlays in the Social and Biomedical Sciences, 1976-90



Source: NIH.

Chapter 5

Conclusions and Recommendations

We make two recommendations: (1) that the Congress review the place of research in national drug control policy, and (2) that the Congress review whether evaluation research is being adequately conducted at ONDCP and the major executive agencies responsible for segments of the national drug control program.

Research appears now to have a very modest role in the national drug control program. In 1990, 4 percent of the total drug strategy spending was directed to research and development—building new knowledge and developing new technologies. And in that year, less than 3 percent of research spending (or one-tenth of 1 percent of the total national drug control budget) went to studying the causes of drug abuse.

First, we recommend that the Congress review the place of research in national drug control policy. We cannot suggest definitively, from our data, what level of investment in research is proper and what the balance should be among topics such as causality, prevention, and treatment or among approaches such as biological and social science studies. However, given the needs we heard identified by both researchers and research users—that is, a variety of basic and applied studies, including evaluations of drug policies—we think it is time to review whether the budget commitment to research is appropriate and to set broad priorities on what directions it should take.

Second, we recommend that the Congress review whether evaluation research is being adequately conducted at ONDCP and the major executive agencies responsible for segments of the national drug control program. The large investment in action programs in the fight against drugs in the last few years offers an important opportunity through program evaluation to learn more about the feasibility of various drug control objectives and which tactics are working. The Congress needs to be assured that we are going to learn all we can from the current initiatives. We did not review evaluation research spending in detail; however, the small resources for R&D of all kinds in national drug policy suggest that no substantial sums have been made available for program evaluation. If further review finds areas where programs are not sufficiently being evaluated, the oversight committee can recommend to the various authorizing and appropriating committees the needed corrective actions, such as mandated studies or evaluation set-asides.

Especially in the study of causes, cumulative work, over time, will be needed. Causal research is one of the more difficult challenges for science, especially in a field such as drug abuse, where biological, psychological, and social/environmental factors intersect. Also, it is expensive to conduct, especially if the strongest designs are used, such as longitudinal research, which follows groups of people over time. Since causal research, as we have seen, has received small attention and funding, consistent signals need to be sent to the field if a greater number of expert investigators are to be attracted to developing this area of inquiry. This is not likely to occur if shifts in priorities at mission agencies make stable support uncertain. When, as seems likely, drug research at the Department of Health and Human Services is shifted from the Alcohol, Drug Abuse, and Mental Health Administration to the National Institutes of Health, there may be an opportunity to establish stable, long-term, expanded support for studying the causes of drug abuse.

Description of Research on Drug Abuse

Causality Research

The study of causality seeks to provide an understanding of the behavioral, social/environmental, and biological causes of drug abuse. Research in this area includes investigations of the mechanisms involved in the acquisition, maintenance, and extinction of drug-seeking behavior, psychological dependence, addiction and relapse, as well as the influence of societal factors such as poverty, social deprivation, and environmental conditions in the abuse of drugs. Biomedical investigations look to the genetic vulnerability of individuals to drug abuse as well as other physical factors to identify how individuals may be predisposed to abuse drugs. Ideally, the results of causality research lead to more effective prevention and treatment approaches as they are based on more sound understandings of the underlying mechanisms causing abuse.

Prevention Research

Prevention research uses results from studies to design, develop, and test strategies to prevent the start and progression of drug abuse. The targets of such efforts can be the individual, family, peer groups, and the community. The emphasis currently is to find out how, and under what conditions, drug abuse can be prevented among each of the subpopulations in society. Work focuses on identifying the individual and environmental risk factors associated with drug abuse. These include studies of the biological, psychological, and behavioral risks as well as familial and social risks. Measuring the effectiveness of new programs and continuing assessments of established programs is also a component of prevention research.

Treatment Research

Treatment research seeks to understand and effectively treat the full range of drug abuse associated with a growing list of abused substances. Most of the current behavioral treatments are based on developments made for treating opiate dependence and are being adapted to deal with other abusable substances and their negative impacts on public health. New pharmacological therapies are also in development following successful models of methadone treatment in heroin addicts. Current research is focusing on the ideal matching of patients to treatment, the development of pharmacological agents to treat cocaine abuse, and the prevention of relapse. Measuring the effectiveness of the primary treatment approaches—methadone maintenance, residential communities, detoxification, and outpatient drug programs—is also a topic of interest in current research.

Acquired immunodeficiency syndrome (AIDS) has had a dramatic impact on drug abuse treatment. To contain the spread of the AIDS virus, attention has focused on those who abuse drugs by injection. Intravenous drug abusers are a primary risk group for the spread of the human immunodeficiency virus, and the chief mechanism of infection in this group is the sharing of needles. Sexual contact with infected intravenous drug abusers or their sexual partners is a major risk factor for the spread of AIDS to the non-drug-abusing population. Thus, the study of effective treatment methods for intravenous drug abusers is an important current research topic.

"Other" Research at NIDA

After we looked at NIDA research in the three categories of causality, prevention, and treatment, we examined the other types of research, which appeared to include two general areas: (1) epidemiology, and (2) basic biomedical and neurobehavioral studies.

Epidemiology in drug abuse research is the study of the incidence, prevalence, and consequences on the population at large and among subpopulations of drug abusers. Such studies range from large-scale national surveys to community-focused studies and investigations. Field investigations have looked at particular problems in small areas and communities. Examples include attempts to understand the "ice" and "crystal" outbreaks in Hawaii, investigations of Dilaudid-related overdose deaths in the District of Columbia, and other drug-related problems unique to individual rural and metropolitan areas.

The findings from epidemiological studies cut across virtually all categories of our review. Epidemiological research is important in the design of effective prevention strategies because it helps to identify the risk factors associated with the causality of drug abuse. Findings are also important in understanding the need to increase or reduce treatment and in focusing treatment on needed modalities in a given community. The research helps to identify more "popular" drugs of use and abuse at any given time. In the 1960s and 1970s, heroin was the principal drug of abuse in the nation. In the 1970s and early 1980s, marijuana, cocaine, and hallucinogens were more frequently used. In the mid-1980s, cocaine and crack use increased. Knowing which drugs are currently abused helps drive all areas of research as well as government policy responses to drug abuse. Epidemiology describes what is going on with drug abuse, but doesn't explain why.

Basic biomedical research consists of studies that seek to build basic knowledge of biochemical and cellular structures. Such studies contribute to understanding the physiological processes and effects of drugs through laboratory, animal, and human experiments. Neurobehavioral approaches seek to understand the molecular and anatomical bases of drug action in the brain as well as determine the corresponding behavioral effects in animals and humans. Most of this research is conducted in highly controlled laboratory settings. Findings from this research may be further explored in more applied research in clinical settings.

"Other" Research at OJP

We included OJP's Bureau of Justice Assistance and Bureau of Justice Statistics in our review of extramural grant research to capture the wide range of epidemiology studies that include drug abuse to create the category of "other" research at the Office of Justice Programs. Work such as the Drug Use Forecasting study and other data-gathering efforts help explain characteristics associated with drug abuse and are important to drug abuse research as a whole.

We also included research on the interrelationship between drugs and criminal behavior in the "other" category. Such research addresses the theoretical links between drug use and crime. Finally, we included research grant outlays for enforcement and judicial impact studies related to the abuse of drugs and for evaluation research in the "other" category.

Total Extramural Grant Research at NIDA[a]

Fiscal year	Treatment	Prevention	Causality	Other[b]	Total
1973	$2.67	0	[c]	$20.19	**$22.85**
1974	2.48	0	[c]	18.62	**21.10**
1975	5.76	$1.24	$1.86	16.05	**24.90**
1976	4.63	0	1.75	16.73	**23.12**
1977	6.90	0	2.13	15.28	**24.31**
1978	6.12	0	2.25	18.18	**26.56**
1979	7.49	0.33	2.15	21.33	**31.30**
1980	5.60	0.36	2.30	26.38	**34.64**
1981	6.02	0.39	2.50	28.63	**37.54**
1982	2.34	1.07	2.14	22.92	**28.47**
1983	2.96	1.38	1.85	26.24	**32.43**
1984	5.60	3.37	2.29	31.55	**42.80**
1985	5.78	4.67	4.53	37.33	**52.31**
1986	6.86	6.05	3.64	41.32	**57.88**
1987	14.42	16.05	3.68	65.45	**99.60**
1988	20.22	34.14	3.75	72.06	**130.17**
1989	57.27	37.15	6.29	98.25	**198.97**
1990	79.59	43.32	8.32	127.85	**259.08**
Total	**$242.60**	**$149.46**	**$51.42**	**$704.36**	**$1,147.84**

[a]Outlays in millions of current dollars; includes AIDS funding.

[b]Includes epidemiology, basic biomedical, and neurobehavioral research.

[c]Not available.

Source: NIH, 1973-81; NIDA, 1982-90.

Total Extramural Grant Research on Drug Abuse at OJP[a]

Research area	1981[b]	1982[b]	1983	1984	1985	1986	1987	1988	1989	1990
Treatment	0	$60.0	$60.0	0	$208.4	0	$940.5	$114.1	$1,563.5	$2,425.3
Prevention	0	0	351.0	0	430.2	$2,078.6	1,047.3	1,482.3	1,960.6	5,405.4
Causality	0	0	9.1	0	0	963.3	779.9	1,230.7	1,274.7	2,683.3
Other[c]	$62.5	514.6	2,621.5	$1,051.5	1,526.2	3,104.6	18,028.0	10,985.0	17,507.4	12,805.3
Total[d]	**$62.5**	**$574.6**	**$3,041.6**	**$1,051.5**	**$2,164.8**	**$6,146.5**	**$20,795.7**	**$13,812.1**	**$22,306.2**	**$23,319.3**

[a]Obligations in thousands of current dollars.

[b]Only partial totals are available.

[c]Includes epidemiology, drugs and criminal behavior, and evaluation of enforcement and judicial processes.

[d]Detail may not add to totals because of rounding.

Source: OJP.

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Appendix V

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Glossary

Applied Research	Research performed to gain knowledge or understanding necessary for determining the means by which a recognized and specific need may be met.
Basic Research	Research performed to gain fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications toward processes or products in mind.
Budget Authority	Legal authority to enter into obligations that will result in outlays of federal government funds. Budget authority is most commonly granted in the form of appropriations.
Budget Obligations	The amounts of orders placed, contracts awarded, services received, and similar transactions during a given period, regardless of when authority to incur such obligations was provided and when the future payment of money is required.
Budget Outlays	The amounts of checks issued and cash payments made during a given period, regardless of when budget authority was provided or the funds were obligated.
Constant Dollars	The actual prices of a previous year or the average of actual prices of a previous period of years. The gross national product implicit price deflator used in this report is calculated by the U.S. Department of Commerce and compares the prices of all goods and services produced in the United States to prices in 1982.
Demonstration Research	Activity that is intended to prove or to test whether a technology or method does, in fact, work. Can be considered either research or development.
Drug Abuse	Regular or compulsive use of illicit drugs.

Extramural Research	Research performed by organizations outside the federal sector that perform with federal funds under contract, grant, or cooperative agreement.
Research	Systematic study directed toward fuller scientific knowledge or understanding of the subject studied.

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