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Report of the Demographic and Behavioral Sciences Branch Population Centers Review

Demographic and Behavioral Sciences Branch
Center for Population Research
National Institute of Child Health and Development
National Institutes of Health

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Acknowledgements

This report summarizes the results of a comprehensive review of the Population Research Centers Program of the Demographic and Behavioral Sciences Branch, NICHD. This review depended on a large number of individuals for its success. The Branch gratefully acknowledges the contributions of our expert consultants, David Featherman, Eugene Hammel, Linda Martin, James McCarthy, Robert Michael, and Kristin Moore, who gathered extensive information and provided thoughtful advice on the future course of the program. Carolyn Makinson of the Mellon Foundation provided invaluable advice on designing the review. We are grateful to Mona Rowe, Baldwin Wong and Wilson King of the NICHD Office of Science Policy, Analysis and Communication and to Darlene Levenson of the Referral and Program Analysis Branch for providing oversight for the review and developing statistical information on the Centers Program. DBSB staff members Beth Clark, Michelle Hindin, Minh Phan, Rickie Searle, and Tracy Springer contributed significantly to managing the logistics of conducting the review and preparing the report. We received valuable advice and support in developing an implementation plan from the leadership of NICHD, including Duane Alexander, Scott Andres, Yvonne Maddox, Susan Streufert, and Diane Watson. Finally, we are grateful to The NIH Office of Science Policy, Division of Evaluations, which provided partial support for the review from NIH 1% Evaluation Funds.

BACKGROUND/ GOALS OF THE PROGRAM

The mission of the Demographic and Behavioral Sciences Branch (DBSB) of the National Institute of Child Health and Human Development (NICHD) is to foster research on the processes that determine population size, growth, composition and distribution, and on the determinants and consequences of those processes. This mission translates into a research portfolio that includes a strong focus on the demographic processes of fertility, mortality and migration and at their broad interrelationships with larger biomedical, social, economic and cultural processes. Areas of supported research include fertility and family planning, HIV and sexually transmitted disease, family and household demography, mortality and health, and population composition, change, and movement.

The Branch maintains a network of Population Research Centers that provide core support for projects relevant to the DBSB mission at leading universities and research centers throughout the United States. The goals of the Centers Program include the following:

- To contribute to an advanced understanding of population structure and change.
- To foster a research environment that facilitates interdisciplinary collaboration among population scientists.
- To build a national network of centers that will encourage interaction among population scientists and foster innovative, high-quality research.

DBSB supports most centers through the Center Core Grant (P30) mechanism, which supports core services for existing research projects at individual institutions. To qualify for a P30 grant, an institution is required to have a minimum of three NIH or NSF grants relevant to the goals of the DBSB program. It is also required to propose at least three "cores" each of which serves at least three NIH/NSF grants during each year of centers funding as well as other research projects deemed to have scientific merit and relevance to the mission of DBSB. Typically, core services in centers of population research focus on the provision of administrative support, computing services, information or data services, statistical consulting, and, more recently, geographic information systems. By organizing services to be shared by a large set of projects, cores produce economies of scale that are essential to a central goal of the P30 mechanism: enhancing the quality, productivity and cost-effectiveness of R01 and other externally supported research projects.

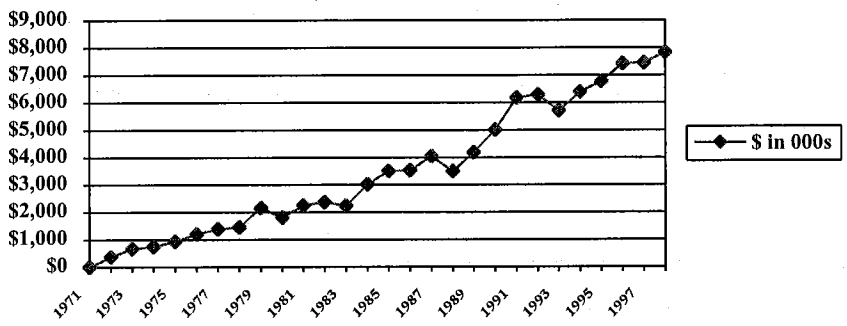
DBSB also provides center support through the Specialized Research Center Grant (P50), which provides funding for research projects as well as core services. The P50 is designed to contribute to the integration and coordination of population research by funding interrelated projects in topical areas relevant to the DBSB mission.

A center grant provides a commitment of five years of support, which is renewable in five-year increments. Each year DBSB issues a Request for Applications (RFA) which invites both competing continuation and new center grant applications. Current guidelines for the P30 and P50 programs are available at
http://www.nichd.nih.gov/funding/dsr_p30_guide.htm and
http://www.nichd.nih.gov/funding/dsr_p50_guide.htm#intro respectively; a recent RFA inviting applications for center support is located at

http://grants.nih.gov/grants/guide/rfa-files/RFA-HD-99-011.html.

The Center Core Grant (P30) Program was launched in 1971. The first awards for demographic centers were awarded in 1972 for a total cost of $370,000. The first awards for the Specialized Research Center Grant (P50) Program were made in 1976. The Centers Program now includes 12 centers (11 P30's and 1 P50). Four of the current centers have been funded since before 1974, four were first funded between 1975-79, one was first funded during the 1980's, and four centers have been funded only during the 1990's. One institution was supported briefly between 1976-1980 and one other institution briefly lost its funding and subsequently competed successfully to regain center status. The growth in the number of centers has been accompanied by a parallel increase in the DBSB centers budget to the current level of $7.8 million in total costs for 1998.

Figure 1
Centers Funding: 1971- 1998



When the P30 and P50 mechanisms were first introduced, there were no limits on the numbers of centers and center applications were accepted throughout the year. In order to control growth, a new competitive system was initiated in 1990. An annual RFA advertises a competition for a fixed number of "center slots" and the funds to support these slots. The RFA invites both incumbent centers and non-funded institutions to compete for center support each year.

THE CENTERS PROGRAM TODAY

A statistical portrait of the twelve currently funded centers was developed as a starting point for this review. The data presented below provide a composite view of the centers program today. Individual descriptions of the funded centers are available in a document posted on the web at http://silk.nih.gov/silk/dbsb/centers.htm.

Funded centers have actively sought, and successfully competed for, NICHD research grant funding. Although there is no one ideal measure of research productivity and quality, it is instructive to examine the number of research applications that centers submit to NIH and their success in winning funding. Three sets of institutions are compared: those with NICHD-funded population research centers (NICHD-funded centers); those that have significant programs of population research but do not receive NICHD center funding (non-NICHD-funded centers); and all other institutions.

NICHD-funded centers have submitted more research applications to NICHD than non-NICHD-funded centers since 1980: an average of 4.4 per year compared with 1.4 among non-NICHD-funded centers[1] and 0.2 among all other institutions. Current NICHD-funded centers have also enjoyed higher success rates than other institutions. Since 1980, 35% of research grant applications from current centers were funded[2], compared with 28% of applications from non-center institutions with population research programs, and 14% among all other institutions. Some non-funded centers were as or more successful than funded centers, although they submitted fewer applications and received fewer grants.

Table 1
Average Applications per Year and Annual Success Rate for Population Centers:

	Average Applications Submitted per year	Average Annual Success Rate
NICHD-funded Centers	4.4	35%
Non-NICHD-funded Centers	1.4	28%
All other Institutions	0.2	14%

Data include applications 1980-1998.

The centers include researchers from a wide range of disciplines. Figure 1, below, provides a composite portrait of the interdisciplinary character of population centers. Sociology and Economics are the two most strongly represented fields. All of the centers include a number of sociologists, and all but one center include multiple economists. Other well-represented disciplines include Public Health, Medical Sciences, and Statistics. Individual centers include

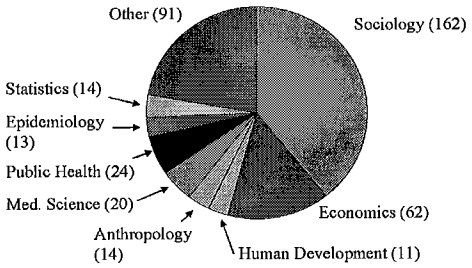
[1] These include the Alan Guttmacher Institute, Battelle, Bowling Green State University, Child Trends, Columbia University, Cornell University, Duke University, East-West Center, Family Health International, Florida State University, Georgetown University, Harvard University, National Bureau of Economic Research, Population Council, Population Reference Bureau, Research Triangle Institute, University of California at Berkeley, University of Colorado, University of Maryland, University of Southern California, University of Washington, Urban Institute.

[2] Average numbers of applications and success rates are higher if data for centers are limited to years in which centers were actually funded: 4.9 average applications submitted per year and an average success rate of 38%.

a wide range of additional researchers, in fields such as Human Development, Public Affairs, City Planning and Communications, to name a few.

Figure 2

Disciplines Represented In Centers



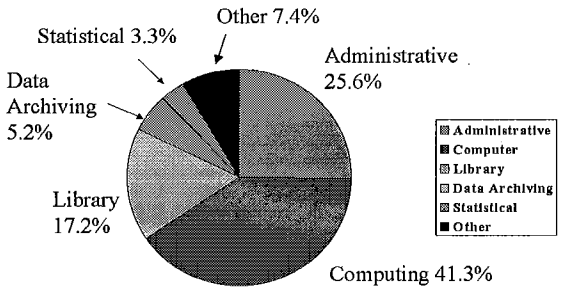
Centers have built an interconnected network of population scientists. NICHD convenes regular meetings of population center directors to discuss common issues. Presently, these are held once a year at the annual meeting of the Population Association of America, the main professional association for population researcher in the U.S. Prior to 1998, a second center directors meeting was held each fall. This has been discontinued, as NICHD now participates in the annual fall meeting of the Association of Population Centers (APC). The APC was founded at the initiative of population centers to coordinate and link NICHD-funded as well as non-funded centers and has been successful in providing a forum for the discussion of concerns common to population scientists.

Centers use P30 funds to provide shared core services in support of substantial research programs. Figure 3 shows the use of center funds by core in 1998, aggregated across the eleven P30 centers. The largest share of funds (40%) goes to computing cores, reflecting the centrality of computing to demographic research and the cost of personnel to support high quality computing environments. Administrative cores, which typically provide center direction, help with the preparation of grant applications, and provide editorial and conference support, consume the next greatest share of funds (25%). Library cores receive 17% of center funds. Data archiving, statistical, geographic information system, and other cores represent a smaller portion of total direct costs because not all centers include such activities.

In 1998, these core services supported 32 individual research projects in the average center. Approximately half of the supported projects are funded through NIH; 23% were funded through NICHD and 22% by the National Institute of Aging (NIA). Forty-nine percent were funded through non-NIH sources, including the National Science Foundation, other federal agencies, and a host of private foundations.

Figure 3

Centers Funding by Core, 1998

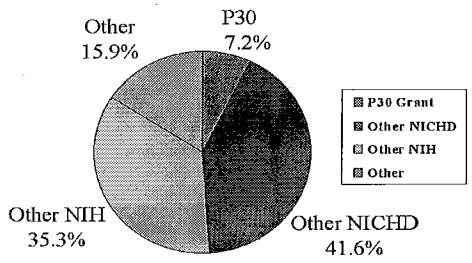


Note: Direct costs for P30 centers are shown.

Center funding is successful in leveraging substantial additional funds for population research. Overall, approximately 93% of center funds (including funds for research and infrastructure support) derive from sources other than the P30 grant. The vast majority of these funds are research grant funds; however, all centers also obtain support for infrastructure from their own institutions, and many also from other public and private sources. The chart below shows that, for the seven centers for which data were available, 7.2% of total direct cost center support comes from P30 funds.

Figure 4

Sources of Center Support



Composite of 7 P30 Centers at last competitive application, 94-98

WHY AND HOW THE REVIEW WAS CONDUCTED

The goal of this review of the Demographic and Behavioral Sciences Branch (DBSB) Population Research Centers Program was to assess how the Centers Program is meeting the needs of population research today, and whether, in light of the changing technologies, scientific needs and opportunities, and institutional contexts of the discipline, there are different ways of structuring and competing the program to better serve the future of the science. The review was not intended to assess the merit or productivity of specific centers. Rather, the goal was to evaluate the way in which NICHD has shaped the program over the last few decades through program guidelines and administrative actions and to explore strategies for the future.

DBSB recruited a group of six scientists to assist the Branch in conducting the evaluation: David Featherman (University of Michigan), Eugene Hammel (University of California-Berkeley), Jim McCarthy (Columbia University), Linda Martin (The Population Council), Bob Michael (University of Chicago) and Kristin Moore (Child Trends, Inc.). Two of these consultants were affiliated with institutions receiving NICHD center support; four were not. These consultants reviewed data summarizing the fiscal and scientific scope of the Centers Program as it exists today; interviewed key constituencies concerning the existing and potential functions of infrastructure support in the population sciences; reviewed comments received by the Branch regarding the Centers Program; and reviewed information on alternative models of structuring infrastructure support programs in the behavioral and social sciences. A request for comments was posted on the Branch web-page, each of the six consultants spoke with colleagues in the field, and NIH provided historical data about the grant submissions and funding histories of both NICHD-funded and non-funded population centers. A full list of individuals who provided input for this process is included at the end of this report (See Appendix). Based on these data, the consultants assisted the Branch in developing recommendations for adapting and changing the program to meet future scientific needs.

In these dialogues, the following issues were discussed:

- How do centers advance population research?
- What infrastructure support is needed to support emerging opportunities and scientific directions in population research?
- How can an institutionally-based infrastructure program be designed to benefit investigators conducting relevant research outside funded institutions?
- How does and should center support interface with the NICHD mission for training in population research?
- How does and should the NICHD Centers Program interface with the program at the NIA, other Centers Programs, and individually established centers within institutions?

After the information was gathered and evaluated, recommendations were developed. The DBSB staff is translating these into action steps for NICHD, detailing mechanisms and policies consistent with the broader policies of the NICHD.

FINDINGS AND RECOMMENDATIONS

Two central themes emerged from the oral and written comments received from population researchers and in discussions with the consultant panel. One was that the Centers Program has been highly successful in supporting and advancing population research; the other was that changes in the way the Centers Program is structured and competed are necessary to ensure that the program will be able to respond to the needs of population research in the future. The suggestions of the consultants were directed toward the goal of improving the flexibility of the Centers Program without undermining its existing strengths. NICHD staff has moved to implement changes to the Centers Program in the same spirit. Below we have outlined key recommendations resulting from the review process and summarize the comments and findings of the review relevant to each.

Recommendation 1. NICHD should continue its infrastructure support for programs of population research. The amount of resources committed to the Centers Program is appropriate and should be continued, with allowances for inflation.

Researchers who contributed to the Centers Program review frequently commented on the success of the program over its 28-year history in fostering the growth of population research; increasing productivity of investigators; creating high-quality intellectual environments for research; and stimulating interdisciplinary and innovative research. Suggested changes were seen as ways to build on this success, to bring the benefits of centers to more population researchers, and to bring more high-quality researchers from other disciplines into population research.

Fostering the growth of the field. Researchers in both center and non-center institutions agreed that the Centers Program has had a large impact on population research. The program "...gave an opportunity for major population centers to build their programs toward excellence and ...collectively gave a boost to population research as a legitimate and valuable knowledge-generating enterprise." By providing institutional homes for population research, the program has given increased visibility and identity to the field. NIH support for population centers leveraged additional support for population research from universities, foundations, and other government agencies. Centers "are not only more likely to be successful in constructing successful RO1 and equivalent proposals for federal funding, but also more likely to attract private monies."

Centers have contributed to the development of the field in other ways as well. They have provided rich research environments for the training of new generations of population scientists. They have provided the homes for large-scale projects that have had broad impact on population research, such as the National Survey of Families and Households, the Add Health Study, the Indonesian and Malaysian Family Life Surveys, and more. Data sets from these and other population-based studies have been disseminated and supported through center institutions. Centers have taken lead roles in the development and application of new methodologies for population research, such as methods for multilevel analysis and spatial analysis.

Increasing productivity. Researchers commented that center support increases productivity because it "frees researchers from administrative burdens, allowing them to focus wholly on

developing their ideas." "The strengths of a center...include dedicated staff, speed, efficiency, customized services, access to specialized resources not available through normal university support channels, and the opportunity for researchers to spend time on their research which they (or their graduate students) would otherwise have had to devote to administrative details." These services, such as grant preparation, data retrieval assistance, and computer and statistical support, are invaluable to population center researchers and "speed the attainment of research goals." Some of the most striking comments came from researchers who had worked both in and out of funded centers. For example, one person noted, "I have been gratified and amazed at the increase in my productivity as a result of having access to the... population center." Another individual commented that, "these collective resources enable us to produce much more than we could do individually or in loose collaboration, and allow us to provide high levels of professional and public service."

Creating high quality intellectual environments. Researchers valued the opportunities for collaboration with colleagues, the centers' ability to attract high-quality researchers (and thus high-quality students), and the ease with which research could be conducted at a center institution. As one individual stated, "the center provides a focus point [that] gathers researchers from diverse disciplines into a single entity which is greater than the sum of its parts, creating a fertile environment for collaborative effort."

Stimulating interdisciplinary and innovative research. Some respondents indicated that the Centers Program has encouraged innovative and interdisciplinary research. One person wrote, "Our center...uses resources to... enhance collaborative efforts among multiple investigators, sometimes from different disciplines, to tackle large and difficult problems." Another person believed that the Centers Program "encouraged stretching the boundaries of traditional research."

While some felt that centers already engage in interdisciplinary work, many wanted greater freedom to pursue opportunities for interdisciplinary and multidisciplinary research. One individual told us, "Especially in some centers, there is an unfortunate emphasis on doing research thought in advance to be 'fundable', thus discouraging wider intellectual exploration and diversity of research." The emphasis on the number of funded projects in the evaluation of centers was seen as stifling more innovative research. Despite these frustrations with the current system, researchers warned that although the potential scientific rewards of interdisciplinary research were great, "to restrict and force" such approaches would be ill-advised, since much important work that advances population research is done within disciplines.

Recommendation 2. The Centers Program should increase its flexibility to assure that it continues to meet the evolving infrastructure needs of cutting edge population research. The program should be modified to provide flexibility with respect to the ways in which center funds may be used to advance population research and the researchers who could benefit from center funding.

Researchers reported that several of the current features of the Centers Program created obstacles to innovative and interdisciplinary research. These included the requirement for a minimum of three cores, the structure of the new program development cores, and the cost accounting principles that make core resources available only to funded projects. They cited

the need for a smoother, more flexible system that meets their existing needs while allowing them to use funds for a broader range of activities.

Basic infrastructure support now forms the core of the centers' support and praise for the benefits of structural supports flowed freely. The program should retain a strong emphasis on the provision of basic infrastructure support (e.g., computing, information technology, administration, statistical consulting, and geographic information systems). However, the nature of this support should adapt quickly to changing technologies to assure optimum cost-efficiency and to serve the cutting-edge needs of the field.

Many individuals commented on center support for library services. Some wrote to praise the usefulness of trained data librarians: "It is not efficient for a ... researcher to search for data [when] librarians know how to find data, work with agencies, work with multiple data sets, can track trends in storage development..." Some suggested that with the increase in technology library services would soon become outdated and old-fashioned, while others countered that they "still can't get many materials on-line" and can't rely on a more general university library which may resort to retrieving materials through a time-consuming inter-library loan. Another comment pointed out that many on-line materials may not be maintained long-term, whereas hard copies are reliably there when you need them.

These diverse comments suggest that the potential for streamlining and updating library services clearly exists and that centers need the flexibility to adopt new technology while retaining "traditional" library services while they are still needed and utilized. In reviewing these findings, the consultants advised that centers should be encouraged to move toward the provision of information services that link investigators with sources of information and make optimal use of electronic technology. Centers should also consider combining these services where possible with data dissemination and database management. Centers should begin shifting resources away from duplicative and cost-inefficient library services and hard-copy collections when more streamlined technology is available.

While all agreed that infrastructure support was important, many of the comments suggested that incentives were needed for centers to stay "cutting-edge." There was considerable concern that an over-emphasis on traditional infrastructure support could lead to the ossification of center programs and block the use of funds for more innovative goals. Many believed that increased flexibility would foster more innovative, creative approaches to demographic and population research.

One such approach was the development of *seed money programs*. Under the current program, up to 10% of funds can be used for "new program development" only after an external peer or administrative review. In practice, few centers have been able to take advantage of this option. As one person pointed out, "a key drawback...is the difficulty in quickly providing support (e.g , funding for pilot projects) in emerging areas of population research." This inability to use funds flexibly for activities that foster the development of new ideas and approaches and new collaborations was seen as a critical weakness. In addition, respondents felt that centers should be able to use funds for the *dissemination of data and information*. These activities help support population research by enhancing the impact and accessibility of research and data for other scientists, practitioners, policy-makers, and the public.

This theme of a need for increased flexibility was heard throughout the review process, although many of the same comments included caveats that NICHD avoid "sinkholes" and ensure that centers were held accountable for using funds wisely.

Another central theme was the need for centers to be able to *extend center resources beyond the traditional institutional barriers*, to use center resources to reach out to scientists who are engaged in work relevant to the center's goals. Current center guidelines that link center resources to a set of already-funded projects inhibit the building of bridges to individuals and institutions who might help to develop innovative approaches and interdisciplinary perspectives on complex problems. One person said, "I would like to see encouragement for using infrastructural resources ...to team with scholars in other disciplines to tackle population problems in innovative ways – sort of encouraging 'thinking outside the demographic box.'"

Funds could be used to develop ties with other centers of population research, both within and outside the US, for the purpose of developing collaborative research programs. There were many creative ideas for "virtual centers" that would take advantage of the increasing ability of technology to link non-geographically proximate researchers. "A 'virtual center' could include Ph.D. alumni at non-center institutions as well as small groups of population scholars in non-demography institutes at other locations." Such centers could also be regionally focused, or focused around an important research topic. However, most informants felt that geographic proximity was still an important element in a center's success. They wanted the flexibility to form linkages when these could directly advance research, but felt that this flexibility must be used wisely and perhaps sparingly.

A related idea involved allowing "services such as the library and data centers ... [to] serve as a resource for population researchers outside the institution in which the center is located. For example, this could mean serving as a regional resource for population data or information services..." Some felt that the current design of the Centers Program actually discouraged centers from serving the "broader public beyond their own institution, or even region." Several people suggested that working paper collections and datasets should be posted to center web pages and to be made readily available for reading and downloading.

Not only are there opportunities to extend resources to population researchers outside of centers, but centers could be more effectively utilized to attract partners for interdisciplinary work. Researchers want to be innovative and want to be working on the "interdisciplinary edges" of the field. One comment stated that the Centers Program may have "succeeded too well in strengthening demography at its core but at the expense of its edges." Centers should have the flexibility to extend center resources to investigators who are not currently funded to conduct research relevant to the mission of the program, but whose involvement in the center can be reasonably expected to serve the goals of the Centers Program. For example, resources could be shared with a scientist whose expertise was needed to create an interdisciplinary team for a study of a complex social problem. "If innovation is the goal, then getting a group of people from different perspectives will generate more innovation than having people all trained according to the same model doing the research."

Encouraging such innovation "has the potential for greatly increasing the boundaries of the field," but again the DBSB was warned about the potential damage that could be done by

forcing and enforcing such activities. The Branch was repeatedly told that it should give centers the freedom to create these alliances, but that enforcement would inhibit creativity and innovation.

According to researchers, "bringing in young demographers is important." Many called for a "stronger, more explicit link between center support and graduate training." Currently, training programs are supported through a separate mechanism and center guidelines tend to discourage the involvement of trainees in center activities. Centers should have the flexibility to extend center resources to trainees, although tuition and stipends would not be appropriate expenditures under the Centers Program. However, centers could elect to provide seed money to faculty for use by advanced trainees in mentored research projects, or allow trainee use of common center-supported computing and information systems.

Recommendation 3. The Centers Program should be expanded to include a broader range of centers in terms of size and scope so that smaller "centers of excellence" can benefit from center support.

There was great support for a larger range in the size of centers. Many people felt that there needed to be some way of providing infrastructure support for smaller centers, as well as the current large-scale programs. The limited number of centers funded under the current system frustrated many of our people, including the person who wrote, "most of the moderate-sized [centers that are members of the Association of Population Centers] and all of the smaller ones operate on a shoe-string budget, yet manage to produce significant levels of population research. With an infusion of some base funding, many of these centers could develop into considerably stronger ones." Many advocates of these changes suggested a "value-added" argument: providing modest support to smaller centers could produce relatively greater increments in productive research than the same funds directed at already well-funded, large centers.

Others were "concerned about the merit of 'growing small centers' where only a few researchers and/or research projects are presented as justification for support. There was some sentiment that a portion of the huge success of centers could be attributed to the large size of the centers, "population centers have been at the forefront of ... changes, and the continuing expansion of research means that they will be called upon to do more, not less, in future decades. This circumstance argues... for maintaining centers of sufficiently large size and capacity to adequately reflect the range and scope of scholarship in demography and population studies." Others suggested that "a greater number of centers with smaller budgets would diffuse talent, which would not be as good for graduate students." One solution often suggested was to initiate a two-tiered system which included both large centers and some small centers so that the value of a range of centers could be recognized and their research fostered.

To achieve the optimal distribution of resources in support of infrastructure for population research, the consultants advised that the program should move towards a system in which the size is controlled by budgetary allocations rather than the number of centers that can be supported. This will open the door for small centers of excellence to compete for modest center awards that could have very large relative payoffs. The increased competition from

small centers is likely to create pressure on more generously funded centers to improve cost-efficiency in order to remain competitive.

Recommendation 4. Modify program guidelines and review criteria to reduce administrative burdens, promote a level playing field for competition, and assure appropriate evaluation of center success.

The bureaucratic demands most often cited were those connected with the application process. The application process should be streamlined to reduce the bureaucratic burden that could decrease center productivity during the review process. Many pointed out that centers spent large amounts of time and energy "gearing up" for a centers review and felt that such efforts were wasteful and took away from productive activities. "I've always found the quantitative use table to be frustrating... attempting to quantify the percentage of resources in each core that goes to each approved project... strikes me as a fairly artificial exercise." People often pointed out that seemingly simple requests take "a surprising amount of time and effort to prepare."

The Centers Program should strive towards leveling the playing field for all centers by eliminating the current caps on requested awards. In the event that caps are retained, the same absolute cap should apply to all centers, regardless of funding history. There was strong sentiment against "sunset rules" that set limits on the time an institution can retain an NICHD-funded center. Rather, NICHD should structure the competitive process and guidelines to assure maximal cost-efficiency and the ability to eliminate weak centers.

Although many individuals believed that the collective orientation of centers combined with an individual grant emphasis "ensures that researchers do not rest on their laurels," they stressed the need for evaluating centers on the basis of their success in demonstrating innovation and productivity. They felt that evaluation criteria should reflect, first and foremost, the scientific goals of the program. Other criteria, such as the size of the funded research portfolio and the nature and quality of core services, should be assessed only in the context of an applicant center's actual and potential contributions to advancing population research.

Some suggested that reviewers evaluate the impact of a center's work not only within the field of demography, but also in relation to broader audiences (e.g., scientific and policy communities and the general public) reachable through dissemination activities. Other criteria cited as relevant for evaluating centers included the ability to leverage other funds with center support (e.g., from universities, foundations, and other research funders), and the cost effectiveness of center resources vis-a-vis its research productivity and impact.

Finally, many of the respondents questioned the practice of having center competitions every year. Competitions for one or two center "slots", or a limited set-aside of funds, can discourage competition from non-NICHD-funded centers, especially when the competing incumbent centers are large and well-established. The consultants suggested that we consider reducing the frequency of center competitions to increase the number of centers competing at any one time.

Recommendation 5. Explore new mechanisms for supporting a revitalized infrastructure program featuring increased flexibility, reduced administrative burdens, and broader access to and competition for infrastructure support.

The P30 mechanism has important limitations for responding efficiently to the rapidly evolving needs of population research. The mechanism creates incentives for institutions to maintain large core facilities that tie up resources over long periods of time. It provides little flexibility for institutions to adapt quickly to changing research environments and newly emerging scientific challenges and opportunities. It tends to concentrate resources in a relatively small number of institutions, reducing access of small research programs to much-needed infrastructure support. Despite the valuable contributions of the P30 and P50 mechanisms to the development of population research over the past three decades, this review clearly points to the need for a new, more flexible mechanism to meet future infrastructure requirements. This mechanism should provide for continuity with the P30/P50 programs but also effectively respond to the needs identified in Recommendations 2, 3 and 4 above.

Recommendation 6. Improve coordination with the National Institute on Aging Centers Program

Many individuals highlighted the need for collaboration between NIA and NICHD centers. They pointed out that "the life course stages are inextricably intertwined" and suggested that "it is not clear how distinct the NIA centers are from the NICHD centers." Others were concerned that lack of coordination could actually be harmful because of likely "competition over the few demographers working in this area" and the "emergence of a zero-sum game with NIA gains coming at the expense of NICHD." There were many calls for NICHD staff to explore with NIA the potential for a joint Centers Program, or, should that prove impossible, steps that could be taken to increase the seamlessness of the interface between the two programs and to equalize the burden of infrastructure support.

IMPLEMENTATION

DBSB has explored potential new mechanisms for supporting a revitalized Centers Program, and has identified the R24 "Infrastructure Grant" as a flexible mechanism for achieving the changes to the program recommended above while permitting continuity in those features of the program central to its success. We envision that the DBSB's use of P30 and P50 mechanisms to provide for the infrastructure needs of the field will be phased out over time in favor of the R24 mechanism.

The infrastructure grant has many of the characteristics of the traditional center grant mechanisms and could be used to continue the same set of center activities that P30 grants now support. Both the R24 and the traditional center grant mechanisms provide infrastructure to support a portfolio of research in an institution. The infrastructure grant, however, goes beyond the traditional center grant to allow centers to aggressively pursue scientific opportunities that appear at the boundary between traditional population research and allied fields and to facilitate partnerships among center personnel and collaborators in other institutions and between the center as an institution and complementary institutions around the world. The infrastructure grant would also replace the cost accounting approach found in the traditional center grant with a streamlined format that would allow Center Directors to commit center resources to support portfolios of existing projects through traditional core facilities, enlarge the research base within the center and establish research partnerships with individuals and/or institutions outside of the center.

Eligibility for a R24 infrastructure grant will depend on the existence of a center or some other administrative unit that has been created by the applicant institution to co-ordinate population research across the institution. The center must have a multi-disciplinary focus, a mandate to produce substantial research externalities, a defined governance structure, and at least three researchers actively engaged in work primarily related to the funding mission of DBSB.

Applicants would predicate their request for infrastructure support on: 1) enhancing the quality and quantity of research for its base of active researchers and may request support for post-doctoral fellows and graduate students working on their own original research; 2) developmental objectives of the center as it seeks to enlarge and/or improve its research capability; and 3) direct support for research projects. Applicants would be free to propose any mix of the above-mentioned predicates to support the request subject to the terms outlined in the RFA announcing the competition. The terms of the RFA may constrain the dollar amount that could be devoted to types of infrastructure and/or specify specific research topics for research projects.

Applicants would be able to request support for elements including: 1) Research Support Cores – these cores would be similar to those found in traditional P30 grants; 2) Developmental Infrastructure – this would allow for seed grants, faculty development, technological specialists to lay the foundation for new cores, and/ or workshops to plan or refine substantive work within the center; 3) Translational Cores – these cores would provide support for public use access to large scale data collection projects housed in the Center, and/or outreach efforts to elucidate the clinical or public policy implications of work on-going within the center; 4) Co-operative infrastructure – this would support research

partnerships involving center personnel and colleagues in other institutions, and/or joint ventures with other institutions to provide research services to center researchers; and 5) Research Projects – these would be similar to R01 projects.

The application would outline how the requested funds would be allocated and how the NICHD support would leverage and interact with all other forms of support sustaining the research activities of the center. Applicants would not be forced to propose any fixed number of infrastructure elements or keep the number constant over the grant period. Applicants would have great flexibility to rebudget funds in future years to modify and create infrastructure configurations to meet changing needs and conditions.

The quality of the scientific program and its impact on the field would be the central focus of the review. Individual components would be evaluated separately and judged according to how they contributed to productivity of the scientific program as it currently exists, how they would foster new scientific opportunities and how they would enhance the scientific impact of the center on the field.

DBSB plans to issue a Request for Applications detailing the guidelines of a revitalized Centers Program during the Spring, 2000. The first anticipated award date will be July 1, 2001. Significant work remains to develop the detailed specifications and operating procedures for the revitalized Centers Program. DBSB staff will continue to work with NICHD, NIA, and the population research community to meet the challenges set forth by our consultants and the many individual scientists who participated in the review.

APPENDIX

Individuals Contributing to the Review:
We would like to express our gratitude to the following individuals who either submitted written comments or were interviewed by members of the review committee:

Review Consultants:
David Featherman, University of Michigan
Eugene Hammel, University of California – Berkeley
James McCarthy, Columbia University
Linda Martin, The Population Council
Robert Michael, University of Chicago
Kristin Moore, Child Trends, Inc.

Comments received from:
Tonya Allen, Pennsylvania State University
George Alter, Indiana University
Bill Axinn, University of Michigan
Wendy Baldwin, National Institutes of Health
Jere Behrman, University of Pennsylvania
Nika Bereket, University of Michigan
Suzanne Bianchi, University of Maryland
David Blau, University of North Carolina, Chapel Hill
John Butler, University of Texas, Austin
Bill Butz , National Science Foundation
JJ Card, Sociometrics Corp.
Karen Carver, Pennsylvania State University
Andrew Cherlin, Johns Hopkins University
Amy Cox, RAND
Andy Davidson , Columbia University
Gordon De Jong, Pennsylvania State University
Sonalde Desai , University of Maryland
Peter Donaldson, Population Reference Bureau
Elizabeth Frankenberg, RAND
Bill Frey, University at Albany, SUNY
Judy L. Genshaft, University at Albany
Josh Goldstein, Princeton University
Ron Gray, Johns Hopkins University
Jeannie Brooks-Gunn, Columbia University
Myron Gutmann, University of Texas, Austin
Mark Hayward, Pennsylvania State University
Tom Health, University of North Carolina
Ken Hill, Johns Hopkins University
Charlie Hirschman, University of Washington
Jan Hoem , Stockholm University
John Hobcraft, London School of Economics
Dennis Hogan, Brown University
Joe Hotz, University of California, Los Angeles

Jim Jaccard, State University of New York, Albany
Carol Kaufman, Population Council
David Kertzer, Brown University
Helen Koo, Research Triangle Institute
Judith Kovenock, Carolina Population Center
David Lam, University of Michigan
Lindsay Chase Lansdale, University of Chicago
Ron Lee, University of California, Berkeley
Rose Li, National Institute of Aging
Dan Lichter, Pennsylvania State University
John Logan, University at Albany
Carolyn Makinson, Mellon Foundation
Linda Martin, Population Council
Karen Mason, The World Bank
Doug Massey , University of Pennsylvania
Jane Menken, University of Colorado, Boulder
Barbara Mensch , Population Council
Kristin Anderson Moore, Child Trends
Phil Morgan, Duke University
Charles Nam, Florida State University
Bill Parish, University of Chicago
Anne Pebley, University of California, Los Angeles
Jeff Peterson, University of Wisconsin
Deborah Phillips, National Academy of Sciences
Barry Popkin, University of North Carolina at Chapel Hill
Mary Powers, Fordham University
Sam Preston, University of Pennsylvania
Nancy Riley , Bowdoin College
Mark Rosenzweig, University of Pennsylvania
Steven Ruggles, University of Minnesota
Freya Sonenstein, The Urban Institute
Joe Speidel , Hewlett Foundation
Richard Suzman, National Institute on Aging
Marta Tienda, Princeton University
Elizabeth Thomson, University of Wisconsin-Madison
Terence Thornberry, University of Albany
Stew Tolnay , State University of New York, Albany
Barbara Torrey, National Academy of Sciences
James Trussell, Princeton University
Amy Tsui, University of North Carolina
Kenneth Wachter, University of California, Berkeley
Bob Willis, University of Michigan
Franklin Wilson, University of Wisconsin, Madison
Hal Winsborough, University of Wisconsin, Madison