

# ASIAN AND PACIFIC POPULATION FORUM

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## How Surveys Are Changing at the U.S. Bureau of the Census

*by Barbara Everitt Bryant*

*This article describes the survey activities of the U.S. Census Bureau and recent efforts by the bureau to move toward a more fully automated environment. Census Bureau surveys are the source of more than two-thirds of the data for U.S. national accounts and the source of the intercensal updates on how people and households in the United States are changing. An example of the bureau's new approaches to survey methodology is the Current Population Survey, which measures the nation's labor force activities and is the bureau's oldest and largest survey (71,000 households). The questionnaire for this survey has been redesigned to reflect changes that have occurred in the labor force itself over the past generation. It has also been redesigned to permit computer-assisted interviewing by telephone and in personal interviews conducted by interviewers using laptop computers. The Census Bureau is testing the new questionnaire now and plans to switch to it and computer-assisted interviewing early in 1994. Another major project is the redesign of samples used in all the Census Bureau's household surveys so that they reflect information obtained from the latest census. Eventually data obtained from all of the Census Bureau's surveys will be gathered and transmitted electronically as part of an envisioned computer-assisted information collection system.*

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## ASIAN AND PACIFIC POPULATION FORUM

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The *Asian and Pacific Population Forum*, published quarterly by the Program on Population of the East-West Center, contains articles on population issues affecting the Asia-Pacific region, book reviews, and news about population activities in the region. Single copies are free to individuals and organizations engaged in population-related work. All manuscripts are peer-reviewed. Readers are invited to submit articles, news items, reviews, and letters to: Editor, Asian and Pacific Population Forum, East-West Center, 1777 East-West Road, Honolulu, Hawaii 96848, U.S.A.

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THE EAST-WEST CENTER is a public, nonprofit education and research institution with an international board of governors. The U.S. Congress established the Center in Hawaii in 1960 with a mandate "to promote better relations and understanding between the United States and the nations of Asia and the Pacific through cooperative study, training, and research."

Some 2,000 scholars, government and business leaders, educators, journalists and other professionals annually work with the Center's staff on major Asia-Pacific issues. Current programs focus on environment, economic development, population, international relations, resources, and culture and communications. The Center provides scholarships to about 300 graduate students from the Asia-Pacific-U.S. region to study at the University of Hawaii and conducts faculty and curriculum development programs focusing on Asia and the Pacific for teachers from kindergarten through undergraduate levels. Since 1960 some 28,000 men and women from the region have participated in the Center's programs.

Officially known as the Center for Cultural and Technical Interchange Between East and West, Inc., the Center receives its principal funding from the U.S. Congress. Support also comes from more than 20 Asian and Pacific governments, private agencies and corporations and through the East-West Center Foundation.

The PROGRAM ON POPULATION conducts research and training activities in the population field, with emphasis on social and economic aspects of population in the Asia-Pacific region.

**A**S THE MAJOR survey research agency of the United States' decentralized federal statistical system, the Bureau of the Census conducts an extensive program of sample surveys, which is active in both the decennial census year and the nine years between censuses. The surveys are of two basic types, demographic surveys of households and economic surveys of business establishments. Household surveys are conducted by means of face-to-face interviews in the home, augmented by telephone interviews. Establishment surveys are done primarily by mail, often using telephone follow-up to non-respondents. Occasionally, special personal interview surveys are conducted at business establishments.

These surveys provide the major economic indicators released by the U.S. Department of Commerce, of which the Census Bureau is a part. They also provide the unemployment and employment data that are released by the Bureau of Labor Statistics and supply data on the incidence of crime, housing conditions, the health of the nation's people, and the country's economic well-being. Census Bureau surveys are the source of more than two-thirds of the data input for U.S. national accounts and the source of the intercensal updates on how people and households in the United States are changing.

The surveys are funded primarily by two sources. The first is appropriations to the Census Bureau by the U.S. Congress, which also funds the decennial census of population and housing and the censuses of manufacturing, retail trade, wholesale trade, service businesses, transportation, construction industries,

mineral industries, governments, and agriculture that are conducted every five years. The second source is other agencies and departments of the federal government.

The Census Bureau does research under contract for such other units of the federal government as the Bureau of Labor Statistics in the Department of Labor, the Department of Housing and Urban Development, the Department of Justice, the Department of Health and Human Services, the Department of Education, and the Department of Transportation. These agencies and departments reimburse the bureau for the costs of their surveys out of funds appropriated to them by Congress.

*In 1991 the Census Bureau conducted 182 separate surveys. Interviewing waves—that is, the number of times that the bureau sent interviewers to a sample of households, interviewed a sample of households or businesses by telephone, or mailed out a questionnaire to a sample of business establishments—totaled 682.*

In 1991 the Census Bureau conducted 182 separate surveys, of which 147 were paid for out of its congressional appropriation and 35 were reimbursed by other units of the federal government. Because some of these surveys were done on an annual basis, others quarterly, and still others monthly, the total number of waves of interviewing came to 682—which is the number of times that the bureau either sent interviewers to a sample of house-

holds, interviewed by telephone a sample of households or business establishments, or mailed out a questionnaire to a sample of establishments.

This article focuses on four areas in which the Census Bureau is changing its approach to surveys: (1) redesigning the questionnaire for the Current Population Survey to better reflect current labor force conditions; (2) redesigning the same questionnaire to gain advantages from computer-assisted interviewing; (3) redesigning the samples for household surveys to be used during the next decade, a task undertaken after every decennial census; and (4) progress in changing to a computer-assisted survey information collection (CASIC) system and developing a data management network for all Census Bureau surveys.

### **Redesigning the Current Population Survey Questionnaire to Reflect Labor Force Conditions Better**

The Current Population Survey, or CPS, which is equivalent to the labor force survey in many other countries, is the principal intercensal household survey and the largest and oldest of the approximately 50 ongoing demographic surveys that the Census Bureau conducts each year. Begun 52 years ago to make monthly estimates of employment, unemployment, and characteristics of the labor force, it is cosponsored by the Census Bureau and the Bureau of Labor Statistics.

With a sample size of 71,000 households, the survey is large enough for making employment

and unemployment estimates for the nation, the 11 largest states, and New York City and Los Angeles, the two largest cities. Each month's sample has eight parts that rotate on a schedule of four months in, eight months out, four months in, so that only 25% of households differ between consecutive months.

In addition to providing data for the Bureau of Labor Statistics' monthly report on employment and unemployment, the survey includes questions added in different months that provide the Census Bureau and other government agencies with quarterly updates on housing vacancies, biennial data on displaced workers who lost jobs during the past five years, and the annual demographic update for the nation, which includes such characteristics as income and poverty, work experience, migration, household composition, health insurance, alimony, child support of divorced and never-married mothers, fertility, school enrollment, tobacco use, voting, and voter registration. Although the supplementary questions change from time to time, the labor force questions have remained relatively unchanged for 25 years to maintain consistency and comparability in the unemployment rate, a major economic indicator.

Several years ago, however, the Census Bureau and the Department of Labor Statistics recognized that the questionnaire developed for the technology and labor conditions of a generation ago were no longer suitable. They embarked on a redesign effort to improve the measurement of labor force characteristics by reducing errors in the interaction between interviewers and respondents, by developing better defini-

tions of the characteristics being measured, and by depending less on answers volunteered by respondents. They also wanted to expand the labor force data available without burdening respondents with additional questionnaire length. Finally, since respondents are interviewed over a period of 16 months, they wanted to take advantage of this period to improve longitudinal measures (Rothgeb et al. 1992).

The questionnaire redesign had two objectives. The first was to make the questions measure contemporary labor force conditions more accurately. The second was to restructure the questionnaire to capitalize on the availability of computer-assisted interview technology, which allows for dependent interviewing—that is, using data collected in prior months' interviews as part of a current interview. Computer-assisted interviewing also allows for more complex questionnaire designs, with different sets of questions for different types of respondents.

The starting point for redesigning the questions was to learn more about the meanings that questions and their response categories had for respondents. These meanings could then be compared with the concept that researchers intended to measure and to what respondents were actually doing inside or outside the labor force. When the meaning that a question elicited from respondents did not match the concept that the Census Bureau and the Bureau of Labor Statistics intended to measure, this was evidence that alternative question wordings needed to be developed and tested.

The research on meanings, called cognitive research, was done using interviewer focus groups and respondent focus groups. Focus groups are small discussion groups of 10–12 persons. Other techniques included respondent debriefings, in-depth laboratory interviews, and a test of interviewers' knowledge of the concepts that the researchers intended to measure.

This cognitive research led to the development of alternative questions to be tested. The testing was done in two phases by means of computer-assisted telephone interviews of a representative national sample of households. In the first phase, two new versions of the questionnaire were tested over a four-month interviewing period, along with the existing questionnaire, which was used as a control. Afterward the interviews were evaluated. In the second phase a third version of the questionnaire, which combined the best of the first two alternatives, was tested against the existing questionnaire. Modifications of this third version then became the new questionnaire.

What are the new questions and how do they differ from the old? There have been many changes, but several examples will illustrate the kinds of changes that have been introduced.

**Actual hours of work last week.** The original questionnaire asks for this information in a single question. When respondents were probed extensively about their actual work patterns, it was found that the question did not fully capture the hours of those who worked at more than one job or the variations from week to week in the hours of

those who worked part time. The new questionnaire asks the respondent a series of short questions on the number of jobs held and whether the individual worked overtime or less than the usual time last week. Only after the series of questions has forced the respondent to make a mental review of the actual work that he or she has done over the past seven days is the question asked: "How many actual hours did you work last week?"

**Working without pay in a family business.** The research on focus groups and respondent interviews showed that persons who work in a family business without pay often do not report that they work because they receive no wages. Their contribution to the business is not directly reflected in income to themselves. New questions identify family businesses and capture the work hours of all members of the family who worked in the business within the past seven days.

### **Redesigning the CPS Questionnaire for Computer-Assisted Interviewing**

When the Current Population Survey questionnaire was last redesigned 25 years ago, computer-assisted interviewing did not exist. Thus the questionnaire's design was limited to the degree of complexity that an interviewer could handle using a printed questionnaire form and recording responses on it. The Census Bureau has used computer-assisted telephone interviewing, called CATI, for many CPS interviews conducted after the initial in-

household interview, but the same questionnaire that had been used for paper and pencil interviewing was simply programmed for CATI.

Redesigning the questionnaire for computer-assisted technology can take advantage of that technology in two ways. First, as already mentioned, information obtained in prior interviews can be referred to and used in subsequent ones (dependent interviewing). Second, it is possible to design much more complex questionnaires, with branching to various sets of questions according to the answer to a prior question.

For example, in the redesigned version of the CPS the interviewer confirms whether a respondent identified as a retiree during a previous interview continues to be retired. If so, that respondent is skipped over the questions on labor force participation to questions appropriate for retirees. The interview is shorter for the respondent and easier to manage for the interviewer.

Another example of the advantages of CATI concerns job classification. The Census Bureau and the Bureau of Labor Statistics suspected that the old questionnaire was showing more changes of occupation and industry for respondents from month to month than was probably occurring. The in-depth cognitive interviewing and focus groups confirmed this suspicion. The respondent—or another member of the household reporting for the respondent—often describes the same job in different ways at different times. Coders were coding these responses as different industries and occupations when, in fact, the subject person remained in the same job.

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*The Census Bureau and the Bureau of Labor Statistics suspected that the questionnaire used for the Current Population Survey was showing more changes of occupation and industry for respondents than was probably occurring. In-depth cognitive interviews and focus groups confirmed this suspicion. Now interviewers call up on a computer screen the respondents' previous answers to employment questions and ask whether there have been changes.*

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Now the interviewer calls up on the computer screen the employer and job reported in the previous interview, then asks whether the respondent is still working at that job for the same employer. According to whether the answer is yes or no, the computerized questionnaire branches to one or another set of follow-up questions.

### **Redesigning Household Samples**

After each decennial census the Census Bureau redesigns the samples to be used for all its household surveys so that they reflect the updated population and household distribution. The frame from which these samples are selected is currently the 1990 census address file. This address file is a computerized list of 102 million household addresses, each coded geographically to its census block, tract, community, voting district, county, and state.

Sample selection is done in two

stages. The first is the selection of primary sampling units for all household surveys. These primary sampling units are composed of counties or groups of contiguous counties selected from the 3,141 counties throughout the country. The second stage is the selection of clusters of addresses within the sample counties. These addresses become the interview sites for the various demographic surveys.

Redesigning the samples is a complex undertaking that requires extensive coordination. Several factors complicate this effort, including requirements imposed on the process from outside. Four requirements are especially important.

The first requirement is that a sufficient number of sample housing units be selected to last the entire decade for each of the approximately 50 demographic surveys that the Census Bureau conducts. The CPS, the largest demographic survey, requires 18 panels of approximately 70,000 housing units each to provide data for the entire decade. Each sample housing unit in this survey will have an interview conducted eight times over a 16-month period. The National Crime Survey requires six panels of 10,000 households each, which are interviewed every six months for three years. As each panel rotates out of the sample, it is replaced by new households. The Survey of Income and Program Participation, a longitudinal survey, uses a continuous series of national panels of 12,000–20,000 housing units that require an interview every four months for two and one-half years. This survey also uses some oversampling of low-income households.

Another requirement involves personnel management. The Census Bureau has a field force of approximately 3,500 interviewers, one or more of whom must be assigned to each primary sampling unit. It is desirable to retain as many as possible of the experienced interviewers who worked in the primary sampling units of the prior decade's samples. Samples need to be planned to be geographically efficient to minimize interviewer travel and give each interviewer a sufficiently steady flow of work to make employment with the Census Bureau attractive.

A third requirement is that sample redesign have sufficient flexibility to permit changes in the size of particular surveys during the decade and to allow for the addition of new surveys not included in the original redesign.

Finally, the Census Bureau tries to assure that no housing unit is selected for more than one survey during the decade.

Although redesign involves selection of housing units for all surveys for the entire decade, each sample is updated continuously with data on new construction and demolitions. For this purpose the Census Bureau relies in part on data collected as part of its Survey of Construction.

### **Moving Labor Force Data Electronically**

The Census Bureau has begun an 18-month program in which half of the sample selected for the Current Population Survey will be interviewed with the new questionnaire and the other half with the old one. The purpose is to measure the

effects that the new questionnaire, combined with the shift to 100% computer-assisted interviewing, will have on the key economic indicator, the unemployment rate. From January 1994 onward, the CPS will be switched completely to the new questionnaire and computer-assisted interviewing.

Interviewers all over the nation will receive their assigned cases and the questionnaire transmitted from headquarters via computer modem, whether they are working with laptop computers from respondents' homes for computer-assisted personal interviewing or working at one of the Census Bureau's two computer-assisted telephone interviewing facilities. At the end of each day's work, they will transmit their completed interviews, their hours of work, and their travel expenses via modem. Interview assignments can be transferred electronically from the CATI facilities to an individual interviewer for personal interview follow-up if an interview cannot be completed by telephone. After data gathered in the interviews are processed at the Census Bureau, the data base for each month's survey will be shared for use and further analysis by the Census Bureau and the Bureau of Labor Statistics.

### Progress in Changing to Computer-Assisted Survey Information Collection

The U.S. Census Bureau has historically been in the forefront of automation in its survey activities. Herman Hollerith was a Census Bureau employee before he designed the electric tabulating machines that used his specially

designed punch cards for tabulating the 1890 census. The company he founded to produce the cards and tabulating machinery became part of IBM. The Census Bureau had the first nonmilitary computer, UNIVAC I, delivered in time to finish the tabulation of the 1950 census. For the 1960 census the Census Bureau pioneered the design of optical readers that enter data directly from microfilmed questionnaires to computer tape. For the 1990 census it developed, in cooperation with the U.S. Geological Survey, a digital data-base mapping system called TIGER, which contains information about every block, street, river, and railroad in the nation. This system produced 9 million maps used in conducting the 1990 census.

Nevertheless, the Census Bureau has been slow in moving to computer-assisted interviewing. CATI technology was developed in the private sector in the early 1970s by Chilton Research, a large market and survey research firm. The technology's use expanded rapidly in the private sector, and by the mid-1980s CATI, combined with random-digit-dial selection of probability samples of telephone numbers, was the dominant methodology used for market research surveys and political polling. During the latter half of the 1970s, the major U.S. academic survey research organizations shifted to CATI for many of their surveys.

The entry of the academic survey centers spawned a great deal of research on the differences between in-person and telephone interviews, the adaptation of questioning techniques for telephone use, the development of new software, and the methodology of CATI. Software for



SANDRA E. WARD

*THEN: Howard Hogan, chief of the Undercount Research Staff, U.S. Bureau of the Census, examines a Hollerith Tabulating Machine at the museum of the Statistics Bureau of Japan during the Fourteenth Population Census Conference in Tokyo, May 1992. The machine, a precursor of the electronic computer, was first used to tabulate the U.S. census of 1890. Its inventor was Herman Hollerith, a U.S. Census Bureau employee who founded a company that eventually became the International Business Machines Corporation (IBM).*

CATI proliferated as interviewing facilities shifted from large mainframe computers driving terminals to minicomputer hosts and to networked microcomputers.

Although the Census Bureau first tested CATI in 1977, it did not open a telephone interviewing center to conduct CATI interviews for its household surveys until 1985. By 1986 the bureau's business division also had developed its own CATI system for following up non-

responses to mailed business surveys. The same business CATI system included related functions for mail preparation, data entry, analyst review, and tabulation of business survey data. The household CATI system and the business CATI system were developed independently. Neither their software nor their hardware was compatible.

In 1986 the Census Bureau began its first tests of computer-assisted personal interviewing, or CAPI, using laptop computers. Although the bureau had actively explored computer-assisted data collection, developed and tested software, and used it in a limited way, by 1991 it was apparent that the organization had fallen behind not only the private and academic sectors in the United States, but the statistical agencies of other nations as well. Furthermore, the Census Bureau was not exploring such newer computer-assisted technologies as touchtone data entry, voice recognition entry, or computerized self-administered questionnaires. In short, the bureau was behind the curve in computer automation and in need of a coordinated effort to address these problems (Nicholls 1992).

The situation changed in December 1990 with the appointment of a CASIC (computer-assisted survey information collection) manager and the appointment by that manager of three groups of advisors. The first group, the Policy Advisory Group, comprised division chiefs from each of the Census Bureau's departments, or directorates. The second, called the CASIC Software Panel, included experts temporarily recruited as consultants from academic survey organizations, private-sector survey



*NOW: Staff at the U.S. Census Bureau watch a demonstration of a questionnaire on the laptop computers currently in use for the Current Population Survey of the U.S. labor force.*

organizations, other federal agencies, and the statistical bureaus of Canada, Great Britain, and the Netherlands. All of these experts were from organizations that were either using CASIC technology for household or business-establishment surveys or were planning to do so. The third group was the CASIC Methodology Panel, which included experts temporarily recruited from the same types of organizations as the Software Panel.

Each panel member spent two one-week periods listening to presentations on the Census Bureau's operations, interviewing individuals in the demographic and economic programs, and taking part in field interviews. Each prepared a report answering key questions and presenting his or her findings, conclusions, and recommendations.

Each gave an oral report at a meeting of the Census Bureau's executive staff and afterward submitted the written report.

*Two panels of outside experts have provided the Census Bureau with a critical benchmark review of its current status and made recommendations for moving toward a totally automated environment. To a person they supported the development of computer-assisted survey information collection.*

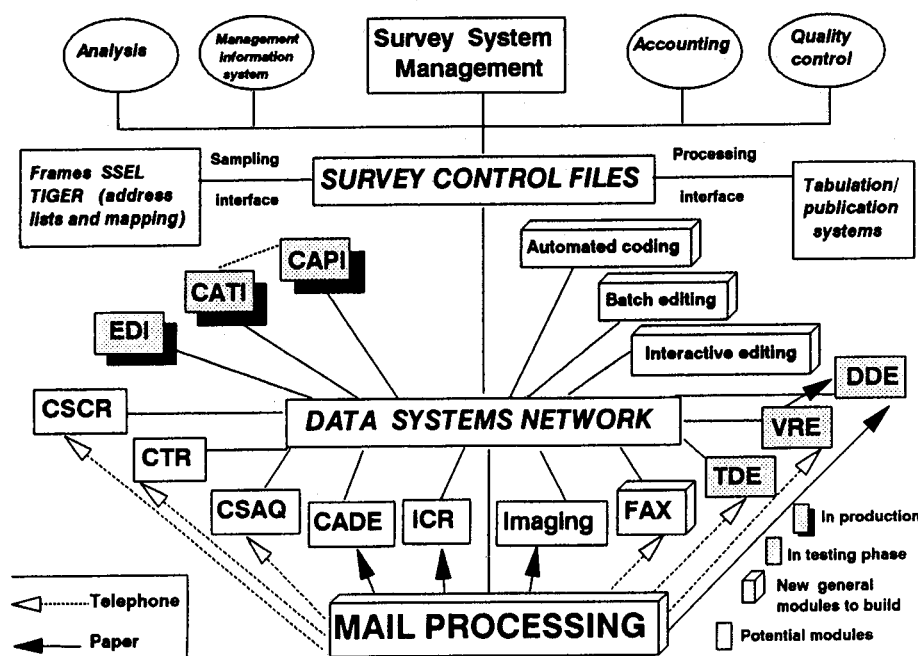
Convening the panels of outside experts was an outstanding success. They provided benchmarking for the Census Bureau, giving it a criti-



cal review of its current status, what others were doing and what it should do, broadening the bureau's perspective of what was happening in other agencies and the state of computer technology. To a person they supported CASIC for its qual-

ity, timeliness, cost containment, and management efficiency. The experts' recommendations evidenced large areas of agreement among panel members on how the Census Bureau should move toward a totally automated environment.

**Figure 1. The Census Bureau's envisioned computer-assisted survey information collection (CASIC) system**



- SSEL — Standard Statistical Establishment List
- TIGER — Topologically Integrated Geographic Encoding and Reference System
- CAPI — Computer-Assisted Personal Interviewing
- CATI — Computer-Assisted Telephone Interviewing
- EDI — Electronic Data Interchange
- CSCR — Computer Service Company Reporting
- CTR — Cable Television Reporting
- CSAQ — Computer Self-Administered Questionnaire
- CADE — Computer-Assisted Data Entry
- ICR — Image Character Recognition
- TDE — Touchtone Data Entry
- VRE — Voice Recognition Entry
- DDE — Direct Data Entry

In discussions with the executive staff and the CASIC Policy Advisory Group, the CASIC staff used these recommendations to develop the vision for a CASIC environment, modeled in Figure 1. The vision is far broader than a system for data collection. It represents a total data management system and a network for all Census Bureau surveys.

It incorporates direct data entry and automated coding. Although these activities are already computerized at the Census Bureau, plans call for a more general module for automated coding to be developed.

Computer-assisted telephone and personal interviewing will be part of the system. The National Health Interview Survey is scheduled to move to CATI in January 1993, using software provided by its sponsor, the National Center for Health Statistics. By 1994, data collection for the Census Bureau's largest survey, the Current Population Survey, will be totally automated, using software developed by the bureau.

Meanwhile the Census Bureau is working with a provider of software to examine how well this software meets Census Bureau needs and assessing a second system. Both the Software Panel and the Methodology Panel advised the bureau against continuing to put its resources into developing its own software. Instead, the bureau will adapt an off-the-shelf modular system to its needs, focusing its resources on developing modules for which the bureau has unique requirements. The Census Bureau plans to adopt a system within the next several months, in time for the redesign of the Survey of Income and Program Participation, a



bureau-sponsored survey on sources of income and utilization of federal income-support programs. All household surveys will be moved successively to the same system so that the Census Bureau need support only one system.

The software system will have both form-based displays, in which the forms seen on computer screens match those mailed to enterprises for business surveys, and sequential question formats like those used for household surveys. Respondents will be able to return their survey forms by mail or fax, or telephone their responses to an operator who will be looking at the same form on a terminal screen.

The Census Bureau is now testing touchtone data entry (TDE) for such economic surveys as Advance Retail Sales and New Construction, for which respondents need report only a few numbers each month.

Electronic data interchange (EDI), the direct transfer of information from the respondent's computer to the Census Bureau computer via tape or modem, began in January 1991 for import and export data to Canada. Beginning in 1993 the largest U.S. retailers, those with hundreds of stores, will respond to the economic census of retail trade by EDI.

The Census Bureau has a long way to go to fulfill its vision of computer-assisted survey information collection. We plan to reach it step by step, one module at a time. It will take most of the next decade to achieve. In some sense it is a goal whose completion will always lie ahead because technology will always be moving on.

## The Census Bureau's Envisioned CASIC System

The Census Bureau's envisioned computer-assisted survey information collection (CASIC) system, diagrammed in Figure 1, comprises an integrated set of modular technologies and procedures to support the collection, capture, and cleaning of data for most bureau surveys and censuses. Figure 1 shows the relationship among the various modules.

The survey control files contain information from the sampling frame and provide the data needed to manage data-collection operations: survey system management, analyses, management information, accounting, and quality control. The survey control files also provide the interface between data collection and the tabulation and publication systems.

The data systems network includes modules for CASIC technologies for data collection, capture, and cleaning. Modules such as computer-assisted telephone interviewing, computer-assisted personal interviewing, and electronic data interchange are in production for several major surveys. Touchtone (telephone) data entry and voice recognition entry modules are being tested, while other modules, such as computer self-administered questionnaires and imaging, are being assessed as potential CASIC tools. Both administrative data and survey data flow to and from these modules and to the survey control files as needed to support all survey operations.

The mail-processing technologies will standardize one integral part of the total system, which accommodates a wide variety of response and processing options.

## ACKNOWLEDGMENTS

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## Activities

### More Experiences from the 1990 Census Round: Indonesia and Mongolia

*The last issue of the Asian and Pacific Population Forum (Vol. 6, No. 2: 47-52) contained a report on the Fourteenth Population Census Conference, a meeting of census officials from 23 Asian and Pacific countries that took place in Tokyo last May. The following two items are based on papers presented at that conference by representatives from the statistics bureaus of Indonesia and Mongolia.*

#### 1990 Census Registers Drop in Indonesia's Population Growth Rate

Between 1980 and 1990, Indonesia's population, the fifth largest in the world, grew by 31.9 million to 179.4 million, reflecting the difficulty of putting brakes on a large and young population. Nevertheless, Indonesia has made progress in slowing its average annual growth rate, which fell from 2.32% to 1.98% over the decade. The decline is attributed to two factors, according to Azwar Rasjid, director-general of the Central Bureau of Statistics: rising age at marriage among women, and increasing use of contraception by women of reproductive age.

The Indonesian census was conducted in two stages between 15 September and 31 October 1990. The first stage consisted of a complete enumeration of all buildings and persons. The second, using a more detailed questionnaire, collected information on a variety of topics from a 5% sample of the population. Rasjid's report to the Fourteenth Census Conference was based on a 10% subsample of the 5% sample.

The 1980-90 intercensal growth

rate fell in every region of the country except Kalimantan, where in-migration from Java caused population growth to rise. The island of Java had the smallest population growth over the decade, 1.66% per year, owing to its comparatively low total fertility rate of 2.68 children per woman and net out-migration to other regions. But a disproportionate share of the population, 60%, continues to live on Java. Within Java, the capital province of Jakarta had a growth rate averaging 2.47% per year. Jakarta's growth rate has declined over the past 20 years as a result of outward settlement of the population to West Java and regencies around the capital.

Indonesia continues to have a young population, with the proportion of children under age 15 at 36.5% (down from 40.9% at the 1980 census). A hopeful sign is that fertility declined more rapidly in the five years preceding the 1990 census than earlier, as is evidenced by a smaller proportion of children in the 0-4 age group than in the 5-9 age group. This trend is documented by the 1985 Population Intercensal Survey and the 1990 census.

The proportion of young, single women has risen rapidly during the past two decades. The percentage single in the 25-29 age group rose from 10.7% to 19.5% in urban areas between 1971 and 1990 and from 3.8% to 7.1% in rural areas over the same period. During the most recent intercensal period alone, the singulate mean age at marriage increased from 21.8 to 23.5 among urban women and from 19.4 to 20.5 among rural women. As many studies have shown, delayed marriage plays an important role in bringing down fertility. (See, for example, "The Conflicting Effects of Delayed Marriage and Declining Divorce Rates on Cumulative Fertility in Indonesia" by James A. Palmore and Masri Singarimbun in *APPF*, Vol. 6, No. 1.)

*Indonesia's population growth rate fell from an annual average of 2.32% to 1.98% during the 1980s, and over the past two decades the total fertility rate fell from 5.6 to 3.3 children per woman. The decline is attributed to delayed marriage by increasing proportions of women and to an increasing proportion of women (50% by 1991) who use contraception.*

Comparison of the 1971 and 1990 censuses reveals that Indonesia's total fertility rate has been falling steadily during the past two decades, from 5.6 children per wom-

an in the period 1967–70 to 3.3 children in 1986–89. (The total fertility rate required for population replacement without growth is approximately 2.1 children.) Even more important than delayed marriage in causing the fertility decline, according to Rasjid, has been the increased percentage of women using family planning methods—48% in 1987, according to the National Indonesian Contraceptive Prevalence Survey, and 50% in 1991, according to the Indonesian Demographic and Health Survey. Fertility continues to be highest in the 20–24 age group.

Education, especially female education, is also known to be associated with lower fertility levels. Indonesian educational attainment showed improvement as measured by three indicators over the intercensal period—literacy, school attendance, and completed level of education. The literacy rate at ages 10 and above rose from 71.1% in 1980 to 84.1% in 1990, and for the first time the female rate equaled that of males. The gap in school attendance between males and females narrowed in every age group, the percentage of females even exceeding that of males in the 7–12 age group (91.7% and 91.4%, respectively). But males were still more likely than females to be attending school beyond the primary level. The third indicator, the percentage of the population that has completed each level of education, also showed improvement, rising from 29.2% to 35.9% for primary school completion and from 5.9% to 11.8% for senior high school completion. Separate figures for each sex were not reported.

The Indonesian census gathered

information on economic activity that took place during the week before the enumeration. It showed that the population contained 135.3 million persons of ages 10 and over (30.9 million more than counted by the 1980 census), of whom 74.4 million were in the labor force, 72.0 million were employed, and 2.4 million were looking for work. The proportion of the population in the labor force rose during the intercensal period, from 50.2% to 55%.

The age pattern of labor force participation was similar for both sexes: low at younger ages and increasing with age, reaching a peak in the 40s (see Figure 1). Among the youngest (10–14) age group, female labor force participation was lower in 1990 than in 1980, reflecting the greater proportion of girls in school. But the census recorded a general rise in female labor force

participation during the 1980s, which Rasjid characterized as “encouraging because it shows an increased participation of women in the economic development process.”

Although agriculture is still Indonesia's major occupational sector, the proportion of the labor force working as farmers has been steadily declining in recent years, from 60.9% in 1971 to 49.5% in 1990. The next two largest occupational groups in 1990 were production and transport equipment operators, representing 22.2% of the 1990 work force, and sales personnel, at 14.6%.

Readers interested in obtaining more information about Indonesia's 1990 population census results may write to: Central Bureau of Statistics, Jalan Dr. Sutomo 8, Jakarta, Indonesia.

**Figure 1. Male and female labor force participation rates (%), by age: Indonesia, 1990**



## Planners Are Using Results from the 1989 Mongolian Census to Address the Nation's Economic Problems

In 1990 Mongolia changed its political leadership and began a drastic revision of its political, economic, and social ideology. Transforming its economy from a closed, centrally controlled system to one that is market-oriented and integrated into the world economy has not been easy, according to Badamcedengiin Tsend-Ayush, chairman of the State Statistical Office of Mongolia, and Ricardo F. Neupert, chief technical adviser to Mongolia from the United Nations Population Fund (UNFPA) and the United Nations Department of Economic and Social Development, in a report to the Fourteenth Population Census Conference. Mongolians have been suffering from an economic crisis characterized by high unemployment, inflation, shortages of food and consumer goods, and a drastic decline in their living standard.

Having reliable statistical information is essential for overcoming the crisis and continuing Mongolia's economic and social transformation, stated Tsend-Ayush and Neupert. "The design of a realistic, efficient, and just price policy, the adoption of measures toward an equilibrium between demand and supply of goods and services, and, in general, government and private decision-making processes require a substantial amount of information not only on the economic situation . . . but also on population trends."

Mongolia has a fairly well-developed system of population

data collection, the authors reported. Seven population censuses have been conducted between 1935 and 1989, and a civil registration and vital statistics system has been in existence since 1951. The State Statistical Office (SSO), an autonomous government agency responsible for the collection and analysis of economic and social statistics, has developed an efficient population data network.

In response to Mongolia's economic problems, the SSO has begun giving increased attention to three activities: the production of accurate post-census population estimates, studies of past demographic trends and current demographic indicators, and the dissemination of demographic information to other agencies. For these purposes the 1989 census is one of the most important sources of data and is likely to remain so for several years.

**Post-census population estimates.** Accurate post-census population estimates are needed for the equitable distribution of scarce resources, such as food, among Mongolia's 18 *aimaks* (provinces) and four major cities. Population figures collected at the end of 1991 by the SSO from the *aimaks'* civil registration system were higher than expected—2.26 million, as compared with the figure of 2.15 million obtained by calculating the number of deaths and births since the January 1989 census. Two explanations for the difference suggested themselves: either the registration in the *aimaks* was more complete in 1991 than in previous years, or the *aimaks* were inflating their totals to qualify for more resources.

In an effort to determine the cause of the discrepancy, with help from the UNFPA the SSO in early 1992 evaluated the completeness of the 1989 census enumeration so as to establish a base population. It used the consistent correction method developed by staff of the Program on Population, East-West Center, combined with indirect techniques of fertility and mortality estimation. The SSO found the census to have undercounted the population by approximately 6.5%, a higher percentage than earlier estimates had indicated. When the adjusted census figure was used to estimate the size of the 1991 population, the result suggested that *aimaks* were not inflating their populations; rather, some under-registration of *aimak* residents was still occurring.

*Mongolia's State Statistical Office was directing its efforts in early 1992 toward obtaining accurate estimates of the population by age and sex at the aimak (provincial) level. These estimates were needed to evaluate registration figures used for the allocation of food, improve the vital statistics system, and draw electoral districts for the July 1992 elections, which would determine the political future of the country.*

The SSO has been directing its efforts toward obtaining accurate estimates of the 1991 population by age and sex at the *aimak* level. "These estimates are essential to evaluate the figures obtained by

registration and to improve our vital statistics system," stated the authors of the report, who emphasized the estimates' practical importance in determining the allocation of food.

A second reason why accurate estimates have been so important is that general elections were planned for July 1992 that would determine the political future of Mongolia. The electoral districts were to be defined on the basis of the population 18 years of age and older living in given areas.

**Demographic studies.** The new government is revising the former administration's pronatalist policies. Although a new policy has not yet been formally adopted, couples are being encouraged to delay child-bearing until age 20, to space their births, and not to have more than three or four children. Barriers to the importation and distribution of contraceptives have been removed, and abortion was legalized in 1990.

The SSO has used vital registration and census data to establish reliable mortality and fertility trends for the past 20 years. Mongolian mortality, especially infant mortality, has declined substantially during this century; but the decline slowed during the 1980s despite the expansion of health facilities to remote regions of the country, and it is feared that the current economic crisis may impede further improvement in mortality rates over the short term. Fertility began a significant and sustained decline in the mid-1980s. Total fertility is now about 4.5 children, whereas the desired number of children is three.

Net rural-to-urban migration has existed for several decades, but without the urban explosion ex-

perienced by many developing countries. The government's policy of regulating the spatial distribution of population to coincide with its development objectives has apparently succeeded. The new administration has relaxed the restrictions on foreign travel for Mongolian citizens, and since 1991 workers have been able to work abroad for specified periods under collective labor contracts; most have gone to republics of the former Soviet Union.

"The future population profile of Mongolia will certainly be different from that which one may have foreseen a couple of years ago," stated Tsend-Ayush and Neupert. The adoption of a market economy, they added, is likely to have major demographic consequences for fertility, migration, and population distribution. The SSO plans therefore to update its population projections at frequent intervals and to devote a large effort to analyzing regional trends.

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The 1989 census included a special survey on fertility, which was directed to 60,000 women of reproductive age. The questionnaire included questions about desired family size, attitudes toward child-

bearing, and social and economic characteristics of respondents. Unfortunately, this survey did not include items on birth histories. However, analysis of the survey data has provided useful information about the fertility decline that is under way in Mongolia.

One obstacle to demographic analysis in Mongolia has been the inability to download mainframe computer data to microcomputers. The SSO expected to acquire data-processing equipment by the middle of 1992 that would permit access to the census data base by microcomputers.

**Dissemination and technical support.** In the past the SSO has concentrated on producing descriptive statistics and has neglected the analysis and dissemination of census data. Mongolia's recent political and economic changes have created an unprecedented demand for demographic and socioeconomic data. In response to the demand, the SSO is establishing a service unit for data users that will create microcomputer-readable census files and make them available to government agencies and organizations, produce special tabulations at users' request, and provide technical support to users of census data both on an individual basis and through short seminars. The unit will also make information from vital registration available to its users. One objective of the unit is to prevent the needless duplication of data-collection efforts.

For more information about Mongolia's 1989 census and the activities of the SSO, readers may write to: State Statistical Office, Ulan Bator, Mongolia. □

## Population Research and Education in Vietnam

*The following overview was provided by Pham Bich San, head of the Social Demography Section, Institute of Sociology, Vietnam. Readers interested in knowing more about the organizations and studies discussed here may contact Dr. San at the Institute of Sociology, 27 Tran Xuan Soan, Hanoi.*

Few population studies were conducted in Vietnam prior to the 1980s, for two main reasons: the nation's population problems were underestimated, and the level of demographic knowledge was poor. Demographic research was therefore confined to determining the crude birth rate, crude death rate, rate of population growth, and population density. The rates were estimated with a low degree of accuracy.

Major changes have taken place since the early 1980s, when for the first time Vietnamese cadres and researchers had the opportunity to participate in population training courses funded by the United Nations and other international organizations. Population studies have since become more common, attracting widespread attention, and have helped fill the demographic information gap in publications about Vietnam.

Five main groups are engaged in population research and education in Vietnam. The General Statistics Office and the Institute of Sociology conduct quantitative and qualitative demographic studies, respectively. The National Committee for Population and Family Planning, within the Ministry of Health, carries out studies of contraceptive methods, population policies, and the national family planning system. The Ministry of Education and the Institute of Pedagogical Sciences have responsibility for population education. Finally, various entities,

such as the Ministry of Labor Force, the Vietnam Women's Union, and the Youth Union, examine specific population issues relevant to their own functions.

This overview attempts to assess the data sources, data quality, and analysis underlying the studies issued by each of the five groups.

### General Statistics Office

As the governmental institution responsible for collecting and disseminating national statistics, the General Statistics Office (GSO) issues statistics on Vietnam's population derived each year from administrative sources, the decennial census conducted in the northern half of the country before 1975, and the two national censuses of 1979 and 1989. The GSO's statistical publications provide information on the population's size, distribution, crude birth and death rates, and, more recently, the total fertility rate. Except for the 1979 and 1989 censuses, which were more complete and accurate than previous enumerations, the main value of these publications lies in their description of changing demographic trends. In general, the vital rates reported by the GSO are thought to be lower than the actual rates.

### Institute of Sociology

Having identified population as one of its main research interests, the Institute of Sociology applies modern sociological techniques, in

particular the sample survey and the focus group for in-depth studies, to investigate demographic and social changes in Vietnam. Its general approach has been to analyze how social and economic conditions affect the norms and values that regulate reproductive behavior.

The role of government in population regulation is one subject of institute study. For decades the Vietnamese government's emphasis on centralized development has contributed to a decline in the crude death rate and to major changes in the social environment in which population processes have been regulated. Institute studies have focused on the health care service and family planning programs at the commune level. As Vietnam moves toward adopting a market economy, significant changes in the government's population and health-care policies are likely to occur that should have long-term demographic effects.

In March 1984 the Institute of Sociology fielded its first survey of family planning knowledge, attitudes, and practice (KAP) in a commune in Thai Binh Province, a locality with the highest population density in the Red River delta. Subsequent studies also concentrated on the commune level, the commune being the basic administrative unit for population management in rural areas. Variables studied included age-sex distributions, social norms and the value of children to parents, contraceptive knowledge and practice, attitudes toward children's education, and respondents' prospects for migration to urban areas. The most important conclusion drawn from these studies was that, without major social and eco-

conomic change, the government's family-size goal of two children per couple could not be achieved, despite an active family planning campaign.

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*Studies conducted in rural communes by the Institute of Sociology have examined social norms and the value of children to parents, contraceptive knowledge and practice, and prospects for migration to urban areas. The most important conclusion was that, without major social and economic changes, the government's goal of two children per couple could not be achieved, despite an active family planning campaign.*

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The Institute of Sociology and the Ministry of Labor have jointly conducted studies on migration aimed at assessing the government's resettlement strategies, in particular the effect of government-directed population movements to the New Economic Zones (NEZs) in the Central Highland. These studies indicate that although the age structures of the NEZs are more balanced than those of other rural areas, fertility and mortality levels are much higher. Insufficient investment in the NEZs has resulted in poor living conditions for the settlers, environmental degradation, and serious social conflicts. Not surprisingly, family planning campaigns in these zones have been ineffective. Rural-to-rural migration can therefore be considered only a temporary solution to the problem of rapid population growth.

To study changes in the Vietnamese family under the new conditions of a market economy, the Institute of Sociology recently conducted a national Family and Fertility Survey focusing on family characteristics, fertility, and socioeconomic conditions in rural areas. The survey was funded by the United Nations Population Fund (UNFPA). A sample of 1,195 households was drawn from the three main regions of the country, and from those households 820 ever-married women of reproductive age were selected for in-depth interviews. The study found that, despite a sizable proportion of nuclear families in rural areas, rural families remain overwhelmingly traditional.

Among younger women, fertility has declined, partly as a result of the low land-to-people ratio and also in response to the government's efforts to encourage social changes such as smaller families. Nevertheless, the government's role in reducing fertility levels has been less active than in many other developing countries, and a rapid fertility decline is unlikely.

The survey and focus-group data used by the Institute of Sociology are especially useful when combined with census data provided by the GSO. The main shortcoming of the institute's data is that they do not represent all localities of the country.

#### **Ministry of Health and National Committee for Population and Family Planning**

The Ministry of Health and the National Committee for Population and Family Planning have traditionally been responsible for population

and family planning programs in Vietnam. Their early studies focused on the biotechnology of contraceptive methods and abortion. As an agency concentrating on population issues, the National Committee has developed and expanded population studies throughout the country, especially since 1990, often working with other agencies such as the Ministry of Labor and the Institute for Protection of Mothers and the Newborn. These collaborative studies have focused on the use of the intrauterine device T-Cu 380A, on family planning information, education, and communication, and on family planning activities in the Red River delta.

In 1987 the National Committee conducted a sample survey of family health workers to measure their knowledge of and attitudes toward various contraceptive methods. The result was disappointing; except for IUDs, this group had little knowledge of contraceptive methods because of poor, and possibly biased, training. The study highlighted the importance of training at the grass-roots level, and the government has accordingly made changes in its training operations.

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*A 1987 survey by the National Committee for Population and Family Planning found that family health workers had little knowledge of contraceptive methods. The study highlighted the importance of training at the grass-roots level, and the government has accordingly made changes in its training operations.*

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Perhaps the National Committee's most important study was the 1988 Vietnamese Demographic and Health Survey (DHS), which was funded by the UNFPA and used the DHS methodology that has been applied in other countries, thus making its findings internationally comparable. With a sample size of 4,172 ever-married women, ages 15-49, the study found a high female singulate mean age at marriage (22.4 years in the North and 24.6 years in the South); a very low ratio of males to females, especially in the reproductive ages; a preference for moderately large families (the mean number of children preferred by currently married women was 2.64); and major differences between rural and urban areas in family-size preference.

A third set of studies, undertaken by the National Committee in 1990, was aimed at gathering data needed for the government's population and family planning programs during the planning periods of 1991-95 and 1996-2000 by forecasting future demographic changes. On the basis of its findings, the National Committee has set the following targets for the 1991-2000 decade: an annual decline of 0.6% in the crude birth rate and an annual decline of 0.1 child in the total fertility rate. The studies also revealed the need for greater integration of population concerns into the country's education, health care, and social security systems.

The National Committee's studies, which represent the first coordinated effort between that agency and other scientific institutions inside and outside Vietnam, have provided timely and scientific assistance to Vietnamese decision makers. Except

for a few published findings, however, most of the studies have resulted only in internal reports. Wider dissemination of the findings would benefit the demographic research community.

### **Ministry of Education and Institute of Pedagogical Sciences**

Population education in Vietnam has two targeted groups, the general public and students. Materials developed for the first group are abundant and range from cursory discussions of population issues to studies that provide a deeper understanding of population problems. These materials, which are prepared by the Institute for Pedagogical Sciences, emphasize the negative effects of rapid population growth on social and economic development, outline the government's population policies, and inform readers about family planning. Most are based on international studies and do not focus specifically on Vietnam. School texts and other materials developed by the Ministry of Education to teach population education in the schools have succeeded in creating favorable attitudes toward the government's family planning program among students. Further improvement of these materials is desirable, however.

### **Specialized institutions**

A variety of other institutions conduct studies in the population field, among them universities, colleges, and nonacademic organizations. Their activities include data analysis and sample surveys.

The Vietnam Women's Union has conducted KAP studies in many lo-

calities, using large sample sizes. Its studies have found women's knowledge of contraceptive methods to be very limited and often erroneous, and the proportion of users to be small. Studies on women's status, done as part of a 1988 UNFPA project, have provided important information about rural women's lives and suggested that, without fundamental improvements in their status, family planning campaigns aimed at women in rural areas are unlikely to have much effect.

The Center for Women's Studies at the National Center for Social Sciences has concentrated on the problems facing women in the course of the country's development. Its studies indicate a need for greater concern for women and increased efforts to reduce fertility.

The Center of Population and Labor Force studies rural migration and labor force issues. It has also investigated fertility levels and made population forecasts. Its summary reports are useful to those interested in Vietnam's population.

In conclusion, although a welter of demographic studies has proliferated in Vietnam during the past decade, it is often difficult to discover them and to identify those of greatest value. In designing new studies, researchers need to choose their methodologies carefully, and their findings must be given wide dissemination. Closer cooperation is needed among institutions and organizations working in the population field. One possibility is to have all population studies, except for research done by academic institutions, coordinated by the National Committee for Population and Family Planning. □

## Reviews and Publications Noted

***Beyond the Limits: Confronting Global Collapse, Envisioning a Sustainable Future*** by Donella H. Meadows, Dennis L. Meadows, and Jørgen Randers. Post Mills, Vt.: Chelsea Green Publishing Company, 1992. xx, 300 pp., US \$19.95. ISBN 0-930031-55-5 (hardcover). Available from Chelsea Green Publishing Company, P.O. Box 130, Post Mills, VT 05058-0130.

Twenty years ago *The Limits to Growth* (Donella H. Meadows et al., New York: Universe Books, 1972) warned of a sudden and uncontrollable collapse of the world's industry and population within the next 100 years. This crash would occur because of continued growth in the number of human beings and in human material well-being, which would exhaust resources and poison nature's life-support systems.

Reanalysis by three of the same authors, using essentially the same computer "systems model" for projections, confirms their initial warning in this sequel, *Beyond the Limits*. Whereas the first book provoked vigorous and often bitter attacks by establishment technocrats, there will probably be few tenable arguments raised against this reconfirmation. Gross, obvious, and persuasive evidence continues to accumulate that the world has too many people too aggressively exploiting its resources.

*Beyond the Limits* carefully documents and explains the consequences of exponential growth as "overshoot" (Chapter 2). The mathematics of a positive feedback in the world population-economic system, wherein growth begets

growth, leads not only to exorbitant consumption but also to terminal increments of growth so large that finite limits of resources are far exceeded before corrective actions can hope to have effect. This time, however, the authors serve up the gloom and doom sauced generously with a brave hope that a "sustainable" society can be found plausible and made possible through "visioning, networking, truth-telling, learning, and loving" (pp. 224-236).

Their computer scenarios show "... a great variety of future paths. They include various kinds of collapse, and also smooth transitions to more or less sustainable states. They do not include continuous growth. The choices are to bring the burden of human activities upon the earth down to a sustainable level through human choice, human technology, and human organization, or to let nature force the reduction through lack of food, energy, or materials, or an increasingly unsound environment" (p. 12). The smart money will be on nature if the requirements for sustainability are actually those postulated about human nature in this book. The most striking feature of the authors' desired sustainable world is essentially total equity, voluntarily provided by the affluent.

Their recommended scenario calls for the world "to aim for an average industrial output per capita of \$350 per person per year" (p. 194). But this \$350 will be enough because by the year 2050 society will have greatly reduced the industrial output that must now

be devoted to war, corruption, growth of industrial capital, pollution, and resource extraction. Through "perfect birth control effectiveness" (p. 198) starting in 1995, the world's population will have leveled off at just under 8 billion.

Since the authors' term "industrial output per capita" represents an undetailed mixture of consumer goods, capital equipment, and investment (p. 34), it is difficult to compare it with other measures of economic well-being. The *World Development Report 1992* (World Bank), in its table on basic indicators, gives a world average gross national product per capita of \$4,200, about 40% of which is industrial (\$1,700). The comparable industrial product figure for a U.S. citizen is about \$8,700, all in 1990 US dollars. Thus, world average persons in the sustainable future will have only about one-fifth the material well-being of their grandparents, and Americans, only one-twenty-fifth, if universal equity is achieved.

The prescribed rapidity and magnitude of such a revolution in lifestyle suggest, to this reviewer, its inevitable failure. Other scenarios offered by the authors show that neither delaying the transition nor aiming for a higher material standard of living will prevent collapse. Narrow is the gate for any possible transition to sustainability.

Another problem that I have with the authors' guidelines is that the information required about natural systems is far beyond the current capabilities of ecological under-

standing and monitoring. We are admonished to learn more about local and planetary sources and sinks, inform others promptly about environmental conditions, forecast stress of the environment, harvest renewable resources only at their regeneration rates, and use all resources with maximum efficiency (p. 214).

As evidence of the difficulty of that challenge, a June 1992 conference at the World Bank, arranged by the United Nations University and others, addressed the "Definition and Measurement of Sustainability: The Biophysical Foundation." The conclusion reached by conference participants was that for various reasons—the nonlinearity of ecosystem response to stress, natural variability (low signal-to-noise ratio), ignorance of important cause-effect relationships in the environment, and sampling and analytical errors under field conditions—it will be extremely difficult to make the concept of sustainability operational. If the world opts to move toward sustainability, it will be without adequate scientific information or predictive power.

As for the likelihood that the more affluent will voluntarily equalize the distribution of material well-being, Lynton Keith Caldwell reminds us (in his latest book, *Between Two Worlds*, Cambridge University Press, 1992) that the famous 1987 Brundtland Commission report opened with the phrase "The Earth is one but the world is not" (p. 55). Caldwell goes on to state: "Relatively few people yet see the earth as an object of concern, respect and responsibility. . . . Many contemporary values, attitudes, and institutions militate against interna-

tional altruism. As widely interpreted today, human rights, economic interests, and national sovereignty would be factors in opposition. The cooperative task would require behavior that humans find most difficult: collective self-discipline in a common effort" (pp. 55, 173).

These reality checks—implausibility of equity, inertia in human affairs, lack of understanding of ecosystems, and deep-rooted materialism—must be combined with the quite believable warning scenarios of *Beyond the Limits*. Then, unfortunately, the alternative of collapse seems much surer than the hope of starting, in 1995, the multiple revolutions in science, technology, fertility control, and human behavior needed for sustainability. A prudent and urgent next task for serious futurologists would be to help plan how best to cope with widespread suffering on an impoverished earth and in an inequitable world. That grim scenario is shown by this book to be probable but is not addressed.

—Richard A. Carpenter  
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East-West Center

#### ALSO NOTED

**The Environment and Population Growth: Decade for Action** by Cynthia P. Green. Baltimore: Population Information Program, The Johns Hopkins University, May 1992. Population Reports, Series M, No. 10. 31 pp. (paper). Free to developing countries; in developed countries, US \$2 each for multiple copies. Available from Population Information Program, The Johns Hopkins University, 527 St. Paul Place, Baltimore, MD 21202, U.S.A.; fax (410) 659-6266.

This report argues that the combination of rapid population growth and increasing consumption threatens the world's environment in the following ways: Each additional person places an incremental demand on the earth's resources. That demand is multiplied to varying degrees by the person's affluence and by the environmental impact of technologies involved in producing what that person consumes. The current rapid pace of population growth leaves little time to promote environmental safeguards and introduce new technologies that would permit sustainable economic growth. The steadily increasing burden of population growth can eventually overload natural systems, causing their collapse.

According to author Cynthia Green (p. 6), the developed countries, containing less than one-fourth of the world's population, are consuming roughly three-fourths of its raw materials and energy, producing three-fourths of its solid waste, and generating about 55% of the atmospheric gases blamed for global warming. The rising aspirations of poorer countries are threatened by growing resource scarcity and increasingly serious environmental damage.

Actions taken during the next decade to curb population growth and address such pressing environmental problems as water and air pollution, mounting solid wastes, soil degradation, loss of nonrenewable mineral resources, deforestation, and ozone depletion will determine the quality of life on the planet for generations, Green asserts. "Adopting the principle of sustainable development requires a fundamental change in thinking. The data used for

decision-making must reflect the true costs of resource depletion and pollution as they affect future generations rather than just the short-term costs and profits of depleting income-producing resources." (p. 4)

The report urges that environmental and population issues be given top priority and sustained political commitment by policymakers. Other recommended initiatives include increasing policymakers' knowledge about environmental problems, building public support for population and environmental programs, and undertaking a wide range of urgently needed programs to address the problems described in the report.

The text is augmented by tables, graphs, illustrations and examples, and an extensive bibliography. Supplementing the report is a poster-size wall chart that lists population and environmental indicators for 130 countries by region.

**Family Planning and Child Survival Programs as Assessed in 1991** by John A. Ross, W. Parker Mauldin, Steven R. Green, and E. Romana Cooke. New York: The Population Council, 1992. vi, 182 pp. (paper). ISBN 0-87834-066-1. Available from The Population Council, One Dag Hammarskjöld Plaza, New York, NY 10017, U.S.A. Requests for single complimentary copies should be addressed to Ms. Peggy Knoll.

Continuing the tradition of the Population Council's periodic factbook, *Population and Family Planning Programs*, this volume presents comparative statistical information dating from the mid-1980s on the demographic and social settings, eligible populations and prevalence of contraceptive use,

family planning programs, and maternal care and child survival programs of all countries having more than 1 million inhabitants. The data, which come from responses to a Population Council questionnaire and from the work of other agencies, are presented in table format.

The authors report (p. 1), that "between the mid-1960s and the present, 17 countries have had fertility declines of more than 50 percent, and an additional 31 countries have had declines exceeding 25 percent. Declines are widespread in East Asia and Latin America, are moderately widespread in South and Southeast Asia and in North Africa and the Middle East, and have barely begun in sub-Saharan Africa." They note that whereas the total fertility rate (TFR) in the developing world averaged about 6.1 children per woman in the mid-1960s, by the late 1980s it had fallen to 3.9. With an additional decline of 1.8 children per woman, the TFR would reach replacement level.

The number of contraceptive users among married women of reproductive age in developing countries has grown from 220 million in 1980 to 380 million in 1990, with sterilization (170 million) being the most prevalent method. The regions with the greatest contraceptive prevalence (East Asia and Latin America) are those in which fertility is now lowest.

Infant mortality has declined nearly everywhere, overall by 43% between the late 1960s and the late 1980s. But regional declines vary widely, from 73% in East Asia (mainly China) to 34% in sub-Saharan Africa. Within Asia, the

sharpest declines occurred in Singapore (72%), Thailand (71%), and Malaysia (62%). Current levels of infant mortality also show considerable diversity.

Between 1983 and 1988, overall maternity mortality in the developing world declined by 7%, from 450 to 420 maternal deaths per year per 100,000 births, and in Asia it fell by 10%. A sharp disparity is still found between the maternal mortality rates of the more developed countries (26 pregnancy-related deaths per year per 100,000 births) and the less developed countries (320 deaths). Maternal mortality ranges from a high of 570 in South Asia to a low of 120 in East Asia.

**Mathematical Population Studies: An International Journal of Mathematical Demography.** Published quarterly by Gordon and Breach Science Publishers. Coordinating Editor: Marc Artzrouni, Department of Mathematical Sciences, Loyola University, New Orleans, LA 70118, U.S.A. ECU 132.00 (US \$126.00) per year. Available from Gordon and Breach Science Publishers S.A., c/o STBS Ltd., P.O. Box 90, Reading, Berkshire RG1 8JL, U.K., or P.O. Box 786, Cooper Station, New York, NY 10276, U.S.A.

According to the publisher, *Mathematical Population Studies* serves as a forum for the exchange of views between researchers in academia, international organizations, research institutes, and statistical offices throughout the world. Contributors include mathematicians, demographers, (bio)statisticians, sociologists, economists, biologists, actuaries, geographers, and others who are interested from their particular vantage point in the mathe-

matical formulation of population-related questions. Each issue contains abstracts of related articles, abstracts in French, software announcements, and book reviews.

## CENSUS REPORTS

**Census of India 1991. Series-1 India. Paper 3 of 1991, Provisional Population Totals: Workers and Their Distribution** by Amulya Ratna Nanda. New Delhi: Registrar General and Census Commissioner, India. viii, 590 pp. Paper. Available from Registrar General and Census Commissioner, India, Ministry of Home Affairs, Government of India, 2/A Mansingh Road, New Delhi-110011, India.

This is the third and last volume in the series of provisional 1991 census totals for India as a whole. (Papers 1 and 2 were annotated in *APPE*, Vol. 4, No. 4, and Vol. 5, Nos. 2-3, respectively.) It focuses on workers—both those defined as main workers, who are classified by four broad types of economic activity (cultivators, agricultural laborers, household industry workers, and other workers), and marginal workers. Main workers are those who worked in some economic activity for the major part of the year preceding the census, whereas marginal workers are those who worked for less than six months during the year.

The volume presents 10 provisional tables and an analysis of the composition of the Indian work force. Maps and charts illustrate the analysis.

To be sure that the economic activity of unpaid workers, particularly of women and children, was counted in the census, the 1991 census questionnaire specifically

mentioned "unpaid work on farm or in family enterprise" when asking respondents if they had worked. Census enumerators were instructed to ask probing questions about work done at any time during the previous year, especially in the case of women, and posters supplied by the United Nations Development Fund for Women, emphasizing the importance of recording women's work, were widely distributed prior to the census.

The 1991 census also attempted to gauge the number of new entrants to the labor force by including in the questionnaire a question for nonworkers about whether they were seeking work and, if so, whether they had ever worked before.

The provisional number of workers in India's population of 836.6 million was 314.9 million, or 37.6% of the total, of whom 71% were male and 29% female, 79% rural and 21% urban. The work participation rate was 51.5% for males and 22.7% for females. It was higher in rural areas (40.1%) than in urban areas (30.4%), especially among females.

The total work participation rate has been rising since 1971, but the rise has not been uniform. Among males there has been a slight decline, whereas the rate for women has risen by more than 3 percentage points over the last decade alone. (Part of the increase among females may be due to the greater effort to count female workers.) Most of the increase has also occurred in rural areas. Tamil Nadu registered the highest rate of work participation (57.0%) and Sikkim the highest female participation rate (52.7%) in 1991.

Among the working population, 9.4% were marginal workers. About 85% of the marginal workers were female.

India's work force is still predominantly agricultural. Of the 285.4 million main workers in 1991, 38.7% were cultivators and 26.1% were agricultural laborers. Another 3.6% worked in household industries. All other job categories combined accounted for only one-third of main workers.

Final work force tabulations from the 1991 census will include distributions of workers by age, educational level, migration, and other variables.

**SUPERMAP 2.** Issued by the Department of Statistics, New Zealand, 1992. Available from Information Consultancy Group, Department of Statistics, 70 Symonds Street, Private Bag 92003, Auckland, New Zealand (Fax: 0-9-379 0859).

SUPERMAP 2 is a data base containing summary data from the 1991 Census of Population and Dwellings and some variables from the 1981 and 1986 censuses, available on a CD-ROM disk that can be used on a personal computer having the WINDOWS environment. It can be used to create tables, maps, and graphs of population characteristics for any area of the country, including areas as small as a small city block. Among its features are map overlays showing major topographical features such as rivers and lakes, roads, and railways, and detailed street maps for Auckland, Wellington, and Christchurch.

The census data include age, ethnic origin, education, marital status, industry, occupation, income, work status, unemployed, hours worked,

household size, household income, tenure, rent paid, and families.

SUPERMAP 2 is available on a regional basis and for an annual fee, the amount ranging from NZ \$2,200 for Lower North Island to \$4,000 for all of New Zealand. Hardware requirements for the IBM environment are 286 or more megabytes of core memory, 2 megabytes of random-access memory (RAM), 3 megabytes of disk space, a color monitor, WINDOWS 3 software, a mouse, and a CD-ROM reader. For the Macintosh environment they are at least a Mac Plus computer, 2 megabytes of RAM, 3 megabytes of disk space, a color monitor, a mouse, and a CD-ROM reader.

#### FOREIGN-LANGUAGE MATERIALS

*The Forum welcomes information about and review copies and English-language summaries of population materials in local languages of the Asian and Pacific region.*

**Exploration of Opportunities to Promote Condom Use in Brothels to Prevent the Spread of AIDS** by Yothin Sawaengdee and Pimonpan Isarabhakdi. In Thai with an English-language summary. Bangkok: Institute for Population and Social Research, Mahidol University, 1990. viii, 104 pp. (paper). ISBN 974-586-870-1, IPSR Publication No. 144. Available from Institute for Population and Social Research, Mahidol University, 25/25 Phuthamonthon 4 Road, Salaya, Nakornchaisri, Nakhon Pathom 73170, Thailand.

This monograph reports on a 1990 focus-group study of 61 low-income prostitutes, their clients, and the proprietors of the brothels where the prostitutes worked. The human im-

munodeficiency virus (HIV), which causes the fatal acquired immune deficiency syndrome (AIDS), is known to be spreading rapidly among low-income prostitutes in Thailand, particularly in Chiang Mai, the capital of the Northern Region, where 40% of such commercial sex workers were reported to be infected with the virus as of June 1989. Regular condom use by persons who have multiple sex partners can prevent the spread of HIV. The study, which was conducted over a three-month period in a district town in Chiang Mai Province and a seaside district in Choburi Province, was designed to identify the obstacles to condom use in brothels and to suggest strategies for overcoming those obstacles.

The study found that many of the low-income prostitutes and their clients did not regard unprotected sex as particularly hazardous. Some prostitutes thought that HIV could be prevented by personal cleanliness or cured with antibiotics; others who wished to protect themselves from sexually transmitted diseases had little power to insist on condom use if their clients were opposed to it. Some brothel proprietors discouraged condom use because it prolonged each sexual encounter, thus reducing client turnover and income.

The researchers concluded that a broad-based educational approach that targeted prostitutes, their clients, and brothel managers and proprietors was needed to establish a policy of regular condom use in Thai brothels. For prostitutes, the educational message should encourage hope for a desirable future and hence a reason to stay healthy; for clients, the message should

stress facts about HIV transmission and advice on preventing it.

"Mama-sans," older women who work, often as managers, in the brothels and are respected by the younger prostitutes, should be targeted for a leadership role in promoting a policy of regular condom use. Brothel proprietors should be encouraged to band together in requiring condom use by all their clientele.

Finally, although prostitution is illegal in Thailand, the researchers concluded that "educational strategies that are pursued in the brothel setting are not likely to succeed unless the government removes barriers to trust and collaboration. [We] were favorably impressed by the number of brothels that were operated by educated married couples. These establishments can easily be recruited into the anti-AIDS campaign through an approach of mutual trust and understanding." (p. xxiv)

**Newsletter of Social Sciences Research on AIDS.** Published quarterly by the Institute for Population and Social Research, Mahidol University. In Thai. Available for the cost of postage from Institute for Population and Social Research, Mahidol University, 25/25 Phuthamonthon 4 Road, Salaya, Nakornchaisri, Nakhon Pathom 73170, Thailand.

This four-page quarterly newsletter reports on AIDS-related research both in Thailand and abroad. Issues include useful tips on funding sources and grant application procedures. The newsletter is intended for Thai researchers, academicians, policymakers, and interested persons in both government and non-governmental organizations. □

## Announcements

### **Twenty-Fourth Summer Seminar on Population Is Planned for 1993**

The Program on Population is accepting applications for the Twenty-Fourth Summer Seminar on Population, to be held in Honolulu and in Japan from 1 June to 6 July 1993. The Summer Seminar, held annually since 1970, provides an opportunity for professionals in population-related fields to share and expand their knowledge of population and its relation to social and economic change.

The 1993 program begins at the East-West Center with four weeks of intensive workshops, each focusing on a current research topic. After the Honolulu portion of the program, the group will travel to Japan for a fifth week of lectures, discussions, and field trips under the cosponsorship of the Nihon University Population Research Institute of Tokyo, Japan.

Four workshops will be offered that will focus, respectively, on health care financing, geographic analysis of demographic change, secondary analysis of demographic and health survey data, and analytical tools for family planning. Ten to 15 participants will be selected for each workshop.

#### **Health Care Financing**

The objectives of this workshop are to introduce the participants to the fundamental principles of insurance theory, health economics, and health finance; to apply those principles to public policy issues affect-

ing health finance in developed and developing countries; to prepare country-specific background papers on health care systems and health finance in the Asia-Pacific region; to identify primary and secondary source data to support health finance research; and to prepare future collaborative research agendas on health finance involving workshop participants and East-West Center researchers. Coordinators: Gerard Russo, research associate, Program on Population, and Alejandro Herrin, professor of economics, University of the Philippines.

#### **Geographic Analysis of Demographic Change**

This workshop will focus on the use of geographically disaggregated data to examine policy issues and theoretical concerns about the spatial development of nations and the impacts of program effort on that spatial development. The goals of the workshop are to encourage clear documentation of national data files and the wide circulation of these files for analysis; to encourage comparability of data collection, coding, and even analysis; to link the producers and custodians of such data files with scholars within and outside the region interested in using them; to link all of these groups with the theoretical literature from human ecology and qualitative geography; and to train participants in the use of relevant computer technology, including PopMap and other software. Coordinators: Peter Xenos, research associate, Program on Population, and

Dudley Poston, professor and head of the Department of Sociology, Texas A&M University.

#### **Secondary Analysis of Demographic and Health Survey Data**

In this workshop, participants will work on in-depth analyses of data from Demographic and Health Surveys (DHS). Illustrative topics include marriage patterns and fertility; determinants of unmet need for contraception; projections of method mix for future family planning programs; determinants of infant mortality; correlates of childhood morbidity; health service utilization in relation to child morbidity and family planning use; and identifying which subgroups in a population are most affected by problems in health and family planning service delivery. Government, university, and other researchers who are responsible for analyzing DHS data are encouraged to apply. Coordinators: James A. Palmore, research associate, Program on Population, and John W. Molyneaux, consultant and post-doctoral fellow at the RAND Corporation.

#### **Analytical Tools for Family Planning: Policy Promotion, Program Implementation, and Financial Analysis**

The objective of this workshop is to familiarize participants with a variety of microcomputer-based models and presentations that are useful for family planning policy promotion, program implementation, and financial analysis. These tools can help program managers



project their future resource needs accurately and design strategies for using available resources efficiently; they can also help policymakers justify growing family planning budgets, mobilize sufficient resources to conduct their programs, and evaluate program performance. The workshop will consist mainly of laboratory sessions in which participants will gain hands-on experience in applying selected models to data from their own countries. The laboratory sessions will be augmented by formal presentations and discussions of the theoretical foundations of the models, data selection and preparation, and interpretation of the results. Priority will be given to applicants who are affiliated with government agencies, are familiar with basic microcomputer operations, have access to microcomputers in their workplace, and can assemble data needed for country-specific applications prior to their arrival. Coordinator: Dennis Chao, senior economist, Research Triangle Institute.

#### **Eligibility, Costs, and Application Procedures**

Applicants should be university graduates proficient in the English language and have had some training in the population field. Preference will be given to applicants holding appointments at universities or at other organizations or government agencies involved in research or planning, and to doctoral candidates whose dissertation research is directly related to one of the workshop topics.

The cost of the seminar, excluding airfare, is US \$2,654. This amount covers tuition, a mandatory

registration fee, dormitory housing, and a living allowance of US \$30 per day in Honolulu and an adjusted amount in Japan. Some full and partial scholarships will be awarded to applicants who are citizens or permanent residents of Asian and Pacific countries or the United States. Scholarships may also cover round-trip airfare by the most economical means. Because scholarship funds are limited, all applicants are encouraged to seek funding from their home organizations or governments or from outside funding agencies, or to provide for all or part of their costs by continuing current fellowships, grants, and contracts.

Detailed information about the seminar and application forms are available from:

Twenty-Fourth Summer Seminar  
on Population  
Program on Population  
EAST-WEST CENTER  
1777 East-West Road  
Honolulu, Hawaii 96848, U.S.A.

Telephone: (808) 944-7444  
Fax: (808) 944-7490  
Cable: EASWESCE HI VIA WUW  
Telex: (230) 989171 EWC UD  
Easylink: 62932956  
Bitnet: PI@EWC

In addition to completing an application form, applicants must submit a workshop statement that describes their relevant education, research, and work experience, and that indicates how participation in this seminar will benefit future work. Citizens and permanent residents of Bangladesh, Burma, India, Singapore, Tonga, and Western Samoa may not apply directly to the Program on Population but must apply through their respective

East-West Center country representatives.

The deadline for receipt of applications is 12 February 1993. Successful applicants will be announced by 15 March 1993.

#### **U.S. Census Bureau's International Statistical Programs Center Announces Workshop Training Program for 1993**

The International Statistical Programs Center of the U.S. Bureau of the Census will hold 10 workshops in Washington, D.C., between May and December 1993. The workshops are open to personnel of any organization involved in planning and conducting statistical programs. Two workshop series will be offered, one in computer technology and the other in management. A new workshop, Training for the 21st Century, has been designed for persons responsible for developing and implementing training, and another, Integrated Microcomputer Processing System (IMPS), will be offered in both French and Spanish, as well as in English.

The workshop titles, starting and ending dates, deadlines for nominations, and program fees are listed below. Except as noted, all workshops will be presented in English, and participants attending more than one workshop will receive a \$200 discount toward each workshop fee.

#### **Computer Technology Series**

Integrated Microcomputer Processing System (IMPS), in Spanish: 10 May to 18 June 1993, 1 April 1993 deadline for nominations, \$4,750 fee.

IMPS, in French: 13 September to 22 October 1993, 1 August 1993 deadline for nominations, \$4,750 fee.

IMPS, in English: 8 November to 17 December 1993, 15 October 1993 deadline for nominations, \$4,750 fee.

Local Area Networks: 12 to 23 July 1993, 1 June 1993 deadline for nominations, \$1,950 fee.

Advanced IMPS: 26 July to 6 August 1993, 1 June 1993 deadline for nominations, \$2,750 fee.

Software Tools for Data Dissemination: 9 to 20 August, 15 June 1993 deadline for nominations, \$1,950 fee.

### **Management Series**

Training for the 21st Century: 14 June to 2 July 1993, 1 May 1993 deadline for nominations, \$2,800 fee.

Human Resources Management in Statistical Organizations: 12 to 23 July 1993, 1 June 1993 deadline for nominations, \$1,950 fee.

Improving Organizational Effectiveness: 26 July to 13 August 1993, 1 June 1993 deadline for nominations, \$2,800 fee.

Managing Statistical Organizations for Total Quality: 16 to 27 August 1993, 1 July 1993 deadline for nominations, \$1,950 fee.

For more information contact:  
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### **Hong Kong and New Zealand Have New Government Statisticians**

From the Census and Statistics Department of Hong Kong comes word that Frederick Wing Huen Ho has succeeded retiring Benjamin Mok as commissioner for census and statistics. Mr. Ho joined the department in 1972 and held the position of deputy commissioner between 1988 and January 1992, when he assumed the commissioner post. Mr. Mok was commissioner between 1988 and December 1991.

In the New Zealand Department of Statistics, Len Cook has become the new government statistician, replacing Steven Kuzmicich, whose contract ended in late 1991. Reporting to Cook are three group managers: Ronald Welply, heading the Survey Management Group; Denis Trewin, in charge of the National and Regional Statistics Group, which is responsible for data analysis; and Geoffrey Smith, managing the Information Services Group, which disseminates and markets the department's statistical products and services.

### **Association for Voluntary Surgical Contraception Revises Mission, Programs, and Organization**

Looking toward the year 2000, the 50-year-old Association for Voluntary Surgical Contraception (AVSC), has expanded its mission and begun developing a strategic plan for making its programs, designed to help improve reproductive health in the United States and elsewhere in the world, more effective. The organiza-

tion, which is based in New York, will continue to work to make safe and voluntary sterilization services more available and more accessible to men and women. At the same time, it plans to apply its experience with voluntary sterilization to other methods of contraception that require medical procedures, such as Norplant, intrauterine devices, and injectables. In addition, it will increase its activities in training, family planning counseling, quality assurance, information and education, public affairs, and professional communication.

AVSC's governing board has appointed Hugo Hoogenboom, former executive director of AVSC, to the position of president. Two new vice presidential positions have been filled by Terrence W. Jezowski, formerly director of the International Programs Division and the recently appointed director of planning, and Amy Pollack, AVSC's medical director. The new Planning Division, headed by Jezowski, is expected to enable AVSC to move more rapidly into new programmatic areas and to improve the management of the organization's financial and human resources.

A new Field Operations Division is designed to provide support to the more than 40 country programs that AVSC manages through its field offices. Headed by Lynn Bakamjian, the division will implement AVSC's plan for greater decentralization of its operations to the field and will forge closer relationships between the organization's international and U.S. programs. AVSC's Asia Regional Office, located in Dhaka, Bangladesh, is directed by Nancy Piet-Pelon. □