

(Originally written for and presented to the WFS Symposium held in London, England, April 24, 1984 upon completion of the World Fertility Survey, this article was not published at that time. Hence, I chose this topic when invited by Dr William Foege, Distinguished Professor of Public Health, School of Public Health, Emory University, Atlanta, Georgia to contribute a chapter for his forthcoming book, Great Moments in Public Health.)

WORLD FERTILITY SURVEY:

Origin and Development of the WFS

By

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Invited "to contribute a chapter relating a moment or episode of excitement, promise, accomplishment ... to convey the ferment of the field", I recalled my WFS experience: The sudden thrilling realization of a definitive solution to a challenging professional problem, occurring at day's end, June 10, 1971, while sitting with my feet on my desk in Rosslyn, VA, gazing out over the Potomac River to the Washington Monuments. The sudden realization that we could and should develop a "World Fertility Survey", triggered a momentous, decades-long, \$156 million USAID-supported enterprise, "the largest international social science research project ever undertaken."

Because of its medical roots and public health focus, epidemiology is not ordinarily listed as one of the "Social Sciences". But, in fact, repetitive experience in the investigation and control of disease outbreaks provides ideal training for analyzing and solving not only public health problems narrowly defined, but a wider range of non-medical social problems, including poverty and welfare dependency. Epidemiology is everlastingly concerned with the population denominator of each study, and analysis and action on world population dynamics and fertility are a very natural extension of epidemiology and public health training and experience.

Launching the global USAID population/family planning assistance program for the less developed world during the 1960s(1), we soon became aware of the abysmal lack of dependable measures of births and deaths in the less developed countries. Seeking knowledge of the basic demand for birth control in the LDC's, we began doing cluster sample surveys in poorest countries -- ascertaining by direct questioning of women in villages, slum streets, and maternity wards (with the help of interpreters), their age, parity, number of living children, and desire or lack of desire for additional children. The mosaic of such cluster survey findings from India, Bangladesh, Thailand, Indonesia, Philippines, Uganda, and Tanzania, soon convinced me that roughly one-half of fecund women in the LDCs did not then want additional offspring. These cluster survey findings and knowledge gained from previous epidemiological and public health experience enabled me to publish an enduring statement of "AIDS Family Planning Program Strategy"(2).

In developed countries, birth and death rates are the ordinary product of the routine registration of births and deaths by local, State and national health departments. Attempting to strengthen registration of vital events in the LDCs, USAID in 1969 provided support for a vital registration POPLAB program at Chapel Hill, NC, directed by Dr Forrest Linder, aimed at the measurement and analysis of population changes in the LDCs by

improvement of their registration of vital events. The design of this program fostered capacity building by supporting population laboratories in several developing countries. Early work in this program focused on use of dual record systems for improvement of the registration of vital events. But it soon became evident that the POPLAB program was largely an academic exercise which could not provide the timely increase in fertility and contraceptive prevalence measurement urgently needed for guidance of family planning programs. Notwithstanding the utility of cluster sample surveys in formulating population program strategy, they were of little help in convincing officials, academicians and economists of the large unmet demand for family planning services in the developing world; nor for definitive measurement of family planning program progress. As USAID-support for family planning programs rapidly burgeoned beyond \$100 million annually, we urgently needed truly adequate measurement of program results -- which largely came from the program of nationally-representative sample surveys reported to the WFS Symposium in London, April 24, 1984.

Ravenholt Presentation to the WFS Symposium:

THE RICH HARVEST of uniquely comparable demographic and epidemiological data now available in hundreds of World Fertility Survey (WFS) publications used by tens of thousands of government officials, academicians and students throughout the world and the presence here today of so many of the world's most distinguished demographers and statisticians bear witness that this global enterprise has succeeded in a measure to match our fondest dreams.

Today widely recognized as "the largest international social science research project ever undertaken," the World Fertility Survey succeeded because of a confluence of essential determinants: (1) An urgent need existed for great improvement in world fertility data for guidance of burgeoning international population program assistance and the family planning programs of many nations; (2) The U. S. Agency for International Development (USAID) and the United Nations Fund for Population Activities (UNFPA), recognizing the critical need for improved data, marshalled resources sufficient to match the WFS vision and sustained this momentous endeavor during a dozen years; (3) Sir Maurice Kendall, followed by Milos Macura, Dirk van de Kaa, and Halvor Gille, provided outstanding leadership for the WFS; (4) A multi-talented WFS staff in London, The Hague, and in the field, inspired, mobilized and supported national survey leaders and cadres in nearly half the countries of the world while developing improved survey instruments and methods and analyzing and publishing the collected data; (5) National survey leaders, in a remarkable demonstration of international cooperation, contributed their national data to the WFS pool and facilitated international comparisons never before possible.

Now it is WFS harvest time. And in the interest of leaving an accurate historical record of the origin and development of the World Fertility Survey, destined to be an enduring landmark of successful international technical cooperation, I take this auspicious opportunity to dispel the notion of another virgin birth -- implied by the omission of conceptive and gestational history from several earlier accounts of WFS development (3-6), by describing germinative events recalled by those of us present at the creation of the World Fertility Survey.

Origin of the World Fertility Survey

With the passage of the Title X Amendment to the Foreign Assistance Act, November 14, 1967, earmarking \$35 million for "Programs Relating to Population Growth," the United States Congress created a greatly

strengthened basis for rapid development of meaningful population program assistance (1). With annual increases in earmarked funds: FY 1969 (\$50 million), FY 1970 (\$75 million), FY 1971 (\$100 million), FY 1972 (\$125 million), AID's small population program staff -- ranging from an initial half dozen to about 100 in the mid-1970s -- were maximally occupied with the creation of many new projects (7). Early action centered upon projects aimed at providing funding, technical assistance and contraceptives to family planning programs in many less developed countries (LDCs) by means of bilateral arrangements and with the help of international organizations. Full use was made of existing relevant organizations: The Pathfinder Fund, the International Planned Parenthood Federation, the Population Council, etc.; and new organizations were created as needed to accomplish many global tasks: United Nations Fund for Population Activities (UNFPA), Family Planning International Assistance (FPIA), the Johns Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO), the International Project of the Association for Voluntary Sterilization (IPAVS), the International Fertility Research Program (IFRP), the Population Information Program (PIP), etc. (7).

Also, many research projects were launched, with initial emphasis upon biomedical research aimed at improving fertility control technology (\$30 million in 1968-71)(7). This was done for the reason that much greater overall program efficiency would be obtained if technological improvements occurred earlier rather than later in the course of the population program. And although many research studies of fertility and fertility control behavior were also funded (7), these yielded little improvement in population data and understanding during the years 1968-71. Rather, in the absence of adequate data, additional funds for social science research mainly increased argumentation about fertility levels, trends and determinants.

Nevertheless, when it became known that the Congress was increasing AID's population budget from \$100 million in FY 1971 to \$125 million in FY 1972, Technical Assistance Bureau leaders, in a preliminary discussion of FY 1972 population budget plans on June 10, 1971, urged that additional social science research initiatives be funded during the coming fiscal year. Later that afternoon, as I sat with my feet upon my desk in Rosslyn, Virginia, reflecting upon what new social science research initiatives the Office of Population, USAID, might best undertake during FY 1972, I asked myself the question: "In the whole field of social science research, what studies have proved truly useful for guidance of population and family planning programs?" Then, suddenly, it came to mind that if we had sound data from national surveys of fertility and fertility control behavior in many developing countries, analogous to the data from the quinquennial U.S. surveys of "Growth of American Families," a vast improvement would be achieved in our knowledge of fertility levels and trends and the varying effectiveness of family planning programs in the developing world.

I was immediately excited by the vision of what needed to be done and by the concept of creating a major project to undertake nationally representative sample surveys in many countries. I then met with Dr. J. Joseph Speidel, Chief, Research Division (AID/TA/POP/R), communicating to him my idea and enthusiasm for a "World Fertility Survey." Within the hour we had so named it and had sketched a plan for obtaining budgetary support. Within days (before the end of June), in an initial FY 1972 budget request to Joel Bernstein, Assistant Administrator, Technical Assistance Bureau, USAID, we requested \$2 million for a World Fertility Survey.

During ensuing weeks we discussed and promoted the concept of a World Fertility Survey with colleagues in USAID, Department of State, Population Crisis Committee, United Nations Fund for Population Activities (UNFPA), and with a number of outstanding demographer-statisticians -- seeking to enlist their support for this new enterprise. Dr. Forest Linder, a very able statistician with extensive national and international survey experience, and then a member of AID's Research Advisory Committee, became an early and enduring supporter of the W.F.S. (Appendix A). In early July, while on a shuttle flight from New York to Washington, (seeking to learn what I could from his extensive involvement with the U.S. quinquennial surveys) I discussed the proposed WFS project with Dr. Charles Westoft of Princeton. Although initially somewhat skeptical of the WFS concept he soon became strongly supportive and heavily involved with the WFS.

Meanwhile, because Speidel and I were greatly occupied with many other projects and activities (7), we delegated to Dr. Timothy Sprehe of the research staff particular responsibility for searching out the individuals and institutions that might best be co-opted for the WFS venture. For just a little while we contemplated placing the WFS project in the Population Division of the United Nations. But we soon realized that such placement would doom it to failure because the WFS project would then be subject to all the strictures of the U.N. system and would have to compete with other U.N. projects for funding within the general U.N. budget.

However, because of the sensitivities inherent in national surveys of fertility, and because the U.S. was then embroiled in the Viet Nam War, we realized the WFS must be created in partnership with the United Nations in a suitable international organization and with the headquarters preferably not located in the U.S. During August 1971, we obtained a tentative commitment from the UNFPA that it would participate as a partner with USAID in the funding and development of a WFS *, and identified the International Statistical Institute (ISI) as the most suitable institution to undertake the WFS project.

Fortuitously, the biennial conference of the ISI was held in Washington, D.C., during August 1971, so we could readily promote the idea of a joint WFS undertaking with ISI leaders during and immediately after the conference. Initial skepticism that USAID monies would actually be forthcoming for such a visionary and momentous international effort was converted to guarded optimism during the conference. Individual and collective discussions were held with Forrest Linder, Milos Macura, Petter Jakob Bjerve, Carmen Miro, Maurice Kendall, Bart Lunenberg, Conrad Taeuber, Morris Hansen and others between scientific sessions at the Shoreham Hotel, and led to a decision by the ISI Board on August 17, 1971, to explore the possibility of a joint WFS undertaking with USAID and UNFPA. The following day an ISI delegation of Petter-Jakob Bjerve (Chairman), Maurice Kendall, Forrest Linder, Milos Macura, Conrad Taeuber, Morris Hansen and Bart Lunenberg met with Ravenholt and staff in the Office of Population, USAID, Rosslyn, Virginia, for discussion of the proposed joint action.

At that meeting we again described the nature of the proposed WFS undertaking, explained the USAID research grant-making process, and outlined the initial actions required from ISI for development of a WFS project to be funded by USAID. It was agreed that AID/TA/POP/R staff would work closely with Bjerve, Lunenberg and others from ISI to develop

- *Because USAID provided \$14 million (50 percent) of the UNFPA's 1971 budget and \$29 million (90+ percent) of its 1972 budget, we had*

considerable powers of persuasion with the UNFPA at that time. And while USAID and UNFPA agreed to share the costs of the WFS equally, this meant that USAID ultimately supplied \$26 million directly to ISI/WFS plus approximately \$8 million indirectly through its contributions to the UNFPA budget.

a WFS research grant proposal which would then be submitted to USAID leadership and the Research Advisory Committee (RAC) for approval. It was also agreed that Ravenholt and Sprehe would visit ISI in Europe during the following month to advance joint planning for the WFS project. Because Petter-Jakob Bjerve, President of ISI, manifested considerable interest in the proposed WFS, Ravenholt and Sprehe visited him and Bart Lunenberg in Oslo that September.

Embryonic Development of the WFS, 1971-72

During the early 1970s, the Office of Population enjoyed considerable flexibility with respect to project formulation and could often choose whether to cast a new project as a technical assistance project, requiring less extensive review and approvals, or as a research project requiring extensive technical review and the approval of the Research Advisory Committee. Because the WFS would necessarily become a large, costly and protracted enterprise to accomplish the tasks envisioned, we decided to place it on the strongest possible foundation within AID by creating it as a research project. Hence, the fall months of 1971 and the winter months of 1972 were occupied with development of the WFS project proposal, with Sprehe communicating with many individuals and agencies and helping Bjerve/Lunenberg and others at ISI to develop the proposal needed to meet review and clearance requirements within AID. In November 1971, ISI organized a meeting of Petter-Jakob Bjerve, Milos Macura, Hans Verstege, Dirk van de Kaa, Bart Lunenberg and Timothy Sprehe at The Hague to prepare an outline of the project proposal to be submitted to USAID. Also, there were many turf issues that needed to be resolved. The International Union for the Scientific Study of Population (IUSSP) felt threatened by the action proposed and was not mollified until assured of its own participation in the WFS. Similarly, the U.N. Population Division and U.N. Statistical Office needed reassurance that the proposed action was in their best interests. The scope of work proposed for WFS in the Project Statement finally submitted to the RAC emphasized that:

"The WFS will assess the current state of knowledge regarding fertility/family planning."

"The WFS will assist governments in undertaking new surveys. The key elements in the new surveys are that they be: (a) nationally representative -- that is, they be based upon such sampling procedures and with data so collected as to justify scientific generalization to the entire nation; (b) internationally comparable -- that is, using such uniform procedures and questions to insure that results in one country can be compared with results from other countries; c) Scientific Sample Surveys -- that is, using the best modern techniques of survey research to assess fertility/family planning behavior."

"The most critical need for fertility/family planning studies exists in the less developed countries where population growth rates are most pressing and the resources for coping with the rates least available. Consequently, AID's support will be focused chiefly at involving thirty to forty key LDCs in the WFS." (8)

Because the groundwork had been well laid and Forrest Linder chaired the

RAC subcommittee considering the WFS proposal, all went smoothly when considered by the RAC on March 14, 1972, resulting in RAC approval of the WFS for AID funding. Thereupon, AID made a commitment to provide \$6,500,000 to WFS/ISI during the 5 years, 1972-76, of which an initial tranche of \$1,043,000 for the Development Phase was obligated May 31, 1972. The record of obligations made by USAID and the cash flows from all donors to WFS is presented in Table 1.

The main uncertainty in the WFS equation at the time of the RAC review and approval was that the WFS Project Director had not yet been identified. Earlier, there was a consensus that Dr. Milos Macura, who was leaving his post as director of the U. N. Population Division, would be the best choice; but he was committed to return to his homeland, Yugoslavia. Then, following RAC approval of the WFS proposal, Sir Maurice Kendall was persuaded by ISI to accept the WFS directorship. Thereupon, we at AID felt as though we had filled an inside straight and heartily approved Sir Maurice for the role. Sir Maurice proved an excellent choice as Project Director. His combination of high intelligence, great statistical competence, and excellent relationships with a broad range of leading statisticians and demographers fitted him admirably for this demanding role. Furthermore, his appointment clinched the location of the WFS Professional Center in London -- the ideal site on numerous counts -- although the WFS Administrative Center was established at ISI headquarters in The Hague.

During the pre-project phase, January-June 1972, the ISI consulted extensively with other agencies and organizations, especially with USAID, the United Nations and the IUSSP. P.J. Bjerve and Bart Lunenberg, Director of the Permanent Office of ISI, visited the United States in January and June 1972 and corresponded with numerous relevant individuals and agencies. With a timely grant of \$54,000 from the UNFPA, a meeting of ISI consultants was convened in The Hague in March 1972 to discuss the proposed WFS programme; and following RAC approval of the WFS project, "ISI announced to its membership its intention to undertake the programme, and national statistical agencies were informed of the programme and their cooperation sought." (3)

Project Development Phase, 1972-74

With the convening of two ad hoc technical advisory meetings at The Hague in July 1972, the Project Development Phase got underway. The purpose of these technical advisory meetings was to examine in depth the feasibility and desirability of the WFS program and to comment on the scope and nature of the proposed program.

Although the effective date of Sir Maurice Kendall's appointment as Project Director was October 1, 1972, he contributed considerable time to WFS activities before that date. A first task was establishment of the WFS Professional Center in London. Various start-up problems were encountered, such as working out the details of cash flow from USAID and UNFPA. To assist WFS adaptation to USAID procedural and accounting requirements, Ms. Charlotte Ellis, AID/PHA/POP/R, was detailed to WFS London during several months. Also, Robert O'Brien and Gerald Gold of the AID/PHA Contract Office, then and during ensuing years, provided much vital and dependable assistance (9). In early 1973, the WFS office was established in Berniers Street, London. But these quarters soon proved inadequate for the rapidly growing staff and its activities, so in May 1974 WFS moved to 35-37 Grosvenor Gardens, London, which proved to be an excellent location. The Administrative Center of WFS was developed in the Permanent Office of the ISI in The Hague, where the Netherlands government agreed to expand the ISI accommodation at no cost to WFS. Detailed descriptions of WFS administrative arrangements,

procedures and regulations were devised, and staff and consultants employed, as presented in Reference 3.

The Program Steering Committee initially consisted of P. J. Bjerve, chairman, and representatives from key organizations: UNFPA, Halvor Gille and Nafis Sadik (alternate); U. N. Population Division, Leon Tabah and M. A. Badry or R. O. Carleton (alternates); U. N. Statistical Office, Simon Goldberg and William Seltzer (alternate); USAID, R. T. Ravenholt and James Brackett (alternate); IUSSP, Carmen Miro and M. Livi-Bacci or B. Remiche (alternate); plus four individual members: Mercedes Concepcion (Philippines), K. T. de Graft-Johnson (Ghana), Forrest Linder (U.S.A.) and Milos Macura (Yugoslavia).

The Technical Advisory Committee, consisting of individuals nominated by the ISI and IUSSP in consultation with each other, at its fifth meeting, October 1974, included: C. Chandrasekaran (chairman), J. C. Caldwell (Australia), P. Cantrelle (France), R. Chander (Malaysia), W. J. Dixon (U.S.A.), K. S. Gaisie (Ghana), D. V. Glass (U.K.), G. Johnson-Ascadi (U.S.A.), R. J. Harewood (Trinidad and Tobago), L. Kish (U.S.A.), W. P. Mauldin (U.S.A.), and C. A. Miro (Panama).

Thus, many of the world's most outstanding demographer-statisticians became engaged in the guidance, development and work of the WFS. The deliberations and decisions of the PSC and TAC are presented in reports of their periodic meetings and in annual WFS reports (10). Results of collaborative TAC-WFS staff work were presented to the PSC at semi-annual meetings -- with early discussions focusing upon survey methods, sampling and non-sampling errors, and questionnaire development. Therewith a key issue surfaced which roiled the USAID-WFS relationship to some extent during several years.

The Issue of Contraceptive Availability: Asking the Right Questions:

While recognizing the outstanding leadership provided WFS by Sir Maurice Kendall, the first Project Director, I nevertheless believe the historical record should contain an account of how we at USAID tussled with Sir Maurice and the staff at WFS on one key issue during the first several years of the project: The issue was whether WFS surveys would measure the varying availability of effective means of fertility control. I believed the WFS questionnaire should contain an adequate set of questions on the availability of each effective means of fertility control, whereas Sir Maurice Kendall, his staff, and the Technical Advisory Committee did not. Sir Maurice and many committee members were wary of becoming too closely identified with the family planning movement, a politically sensitive issue in many countries. But I, having originated the WFS to solve population program assistance data needs, was determined that WFS should indeed satisfy those needs, rather than becoming simply another survey of knowledge, attitudes, and practices (KAP) for academic purposes. Hence the issue.

Throughout my 14 years as director of AID's population program, I firmly believed that the varying availability of contraceptives and abortion services was ordinarily a powerful determinant of fertility control behavior and fertility. (11-16) And it seemed axiomatic to me that any serious attempt at measuring the absolute and relative strength of the multiple determinants of fertility must necessarily include adequate questions on all important determinants -- especially upon the availability of effective means of fertility control. Hence, at the first meeting of the Program Steering Committee at The Hague, January 1973, I urged Sir Maurice to include questions on availability of contraceptives in the core questionnaire then being developed, and he said he would carefully consider this matter. But the draft questionnaire submitted for PSC review at the second meeting, Vienna,

August 1973, omitted such questions. I reminded Sir Maurice of the omission, and he said he would give it further consideration. However, the questionnaires submitted for PSC review at Princeton, February 1974, again omitted the desired questions. I expressed my dissatisfaction with the questionnaire, but other matters took priority at that meeting.

Finally, by the time of the PSC meeting in London, May 1975, my patience was exhausted and I grasped the nettle firmly, as noted in the Minutes of that meeting:

"Dr. Ravenholt raised the issue of the absence from the core questionnaire of questions on the availability of contraceptives within a household. Since it was felt this brought into question the exact purpose of the WFS -- although present policy on questionnaire content was generally accepted -- Sir Maurice agreed that TAC should be asked to review this point. "Sir Maurice reported that since WFS was experiencing difficulties in getting some countries to adopt the Abortion Module, the WFS would like PSC views on the extent to which WFS should go in getting countries to adopt this module. Dr. Ravenholt expressed the opinion that USAID would be hesitant to fund a survey where all the effective means of fertility control were not being monitored. So long as there was a surplus of countries wishing to participate in the WFS, USAID would give priority to countries where the most value could be obtained for that money. WFS should be wary of undertaking surveys in countries which would not include the Abortion Module. The Project Director informed the PSC that WFS staff were given instructions, both verbal and written, to recommend the four modules given high priority by the TAC, but WFS would not like to feel they were forced to turn down a country on grounds that it would not include the Abortion Module.

"Dr. (Carmen) Miro agreed with Dr. Ravenholt's point on the importance of abortion information. Since PSC had agreed to amend Question 231 of the core questionnaire, this would, to a certain extent, solve the problem. The approach, however, should be to show the survey directors the resultant large flaw in the data if the Abortion Module were omitted. Sir Maurice thought the methods of validating abortion should be a separate field of inquiry."

In fact, the PSC meeting in London, May 1975, proved to be the turning point on this key issue. By then the WFS had gained some momentum and was ready to undertake its main tasks, but the USAID population budgets had been cut: 1972 (\$125 million), 1973 (\$112.5 million), 1974 (\$110 million), 1975 (\$103 million). We had suffered these budget cuts after refusing to provide a grant of several million dollars to a Louisiana constituent of Congressman Otto Passman, then long-time chairman of the House Appropriations Subcommittee on Foreign Assistance. The cuts came at a time of burgeoning family planning programs in many developing countries and an inescapable need for USAID to fuel them adequately with huge supplies of contraceptives and other support. Hence, when I made it clear to Sir Maurice, other WFS staff and the PSC at the May meeting that USAID would fund only national surveys which included adequate questions on the availability of the effective means of fertility control, they realized I was in earnest. In fact, with the budget crunch upon us, the WFS budget would be cut if I simply ceased battling for WFS within AID. Logic and persuasion had failed, but those present finally understood that continued high level support for WFS would not be forthcoming unless the questionnaire was modified as repeatedly suggested. In a follow-up letter to Sir Maurice, July 28, 1975, I wrote:

"Dear Maurice,

"At both the (November) 1974 and May 1975 meetings of the Program

Steering Committee, I spoke of the need for the WFS questionnaire to be so structured that it would ascertain the availability of each means of fertility control.

"There is a significant body of literature demonstrating that the greater or lesser availability of each means of fertility control is a powerful determinant of its utilization and its contribution to fertility control. For example, many studies of utilization of health care facilities have demonstrated that such utilization falls off precipitously the farther the person lives from the facility. Additionally, this Office is currently doing a number of pilot studies to measure the impact of household distribution and availability of non-clinical contraceptives (oral contraceptives and condoms). Initial results demonstrate a very substantial and rapid increase in utilization of such contraceptives following their delivery into households.

Jim Brackett has informed me that you are now drafting a series of items on availability which are to be added to the Core Questionnaire and/or the Family Planning Module. According to Jim, these questions will focus on: household supplies of contraceptives, source of family planning services in the last 12 months, source of most recent family planning services, distance between household and nearest source of family planning services. "I am encouraged by the news of these additions to your questionnaire and would like very much to review these items when they become available. With Best Regards.R.T.R."

In July 1975, WFS recruited G. Rodriguez and assigned to him particular responsibility for development of a questionnaire with appropriate questions aimed at measuring the availability of the effective means of fertility control--a task he executed expeditiously and well. (17,19)

Why did WFS, the TAC, and other members of the PSC resist so strongly the inclusion of questions on availability of contraceptives in the WFS questionnaire? To some extent their aversion was simply to the complexification and extra work the availability questions entailed. But a likely unspoken reason was that WFS staff and committee members who believed and argued that economic status and related factors were the prime determinants of fertility, intuitively recognized that if data on differential availability of contraceptives and abortion services were collected, such data might well demonstrate that availability of effective contraceptives and abortion services was a more powerful determinant of fertility than usual economic circumstances -- and their preferred hypothesis would suffer by comparison. Indeed, that was what happened: as soon as the findings of a half dozen surveys utilizing questions on availability of contraceptives became available, the powerful role of contraceptive availability in determining fertility control behavior and fertility became inescapably apparent. (13-23). Thus the WFS broke new ground and converted KAP surveys to KAAP surveys -- Knowledge, Attitudes, Availability, and Practices. AID's insistence on having its way on the availability issue and on a number of management issues was no doubt disconcerting to WFS staff, but was essential for keeping WFS on course toward chosen goals which justified such heavy expenditures for "social science research."

During 1972, USAID under the leadership of Administrator John Hannah and Deputy Administrator Maurice Williams reorganized to give greater strength to population program assistance. Until that time (since 1966), I had directed the Office of Population in the Technical Assistance Bureau. Each geographic bureau, however, had a population program staff; and much time and energy were consumed in trying to persuade geographic bureau population staffs to permit and support Office of Population initiatives in "their" continents. But with the creation of the

Population and Humanitarian Assistance Bureau in mid-1972, all population personnel in AID/Washington were assigned to the Office of Population under my direction -- thereby doubling the AID/PHA/POP staff to about 100 and enabling us to take action more directly, rapidly and effectively to ensure adequate contraceptive supplies throughout the developing world and to develop projects directly with country missions. This enabled us to create many operations research projects, aimed at strengthening delivery of contraceptives and contraceptive services to villages and households in rural areas (14-16). To clarify and balance workloads, a number of projects were exchanged among PHA/POP divisions -- with Timothy Sprehe and the WFS moving from the Research Division (J. Joseph Speidel, Chief) to the Demographic Division (James Brackett, Chief). Thereafter, Brackett assumed considerable responsibility for the support of WFS.

It is noteworthy that James Brackett, an intensely capable demographer who had joined my staff in 1967, was not initially fully sympathetic to the central importance of family planning services in changing fertility. But along the way, especially after assuming divisional responsibility for the WFS, he became fully convinced of the crucial importance of the availability of family planning services. (18, 20, 22) Sprehe, on the other hand, a Catholic sociologist by training, was unsympathetic to the concept of contraceptive availability as a prime determinant of fertility. He continued as AID/PHA/POP/D Project Monitor of WFS until mid-1974 when he was detailed to London via the U.S. Bureau of the Census to strengthen WFS administrative practices in London. At WFS he provided valuable administrative assistance to Sir Maurice but also aggravated WFS resistance to the questionnaire modifications needed to measure the availability of family planning services. In fact, it was not until after Sprehe departed WFS in 1975 to return to the U. S. Bureau of the Census that WFS tested questions on availability of contraceptives. (17)

In 1974, as Sprehe was leaving for London, Brackett recruited a very able young demographer, Richard Cornelius, as Project Monitor for the WFS -- a task he has fulfilled with distinction until the present time. (22, 23)

During the Development Phase, 1972-74, Sir Maurice Kendall and the nuclear staff he recruited began to function as an effective unit; many administrative, structural and functional problems were resolved; standard data collection methods and instruments were devised and tested in several countries; communications were established with hundreds of relevant individuals and organizations; and much pertinent information was disseminated throughout the world. Thus, by 1974, WFS had created "great expectations" in the demographic world, the fulfillment of which became a continual challenge during the following decade.

Implementation Phase, 1974-83

Following pilot surveys in Fiji, Colombia, the United Kingdom and Zaire during early 1974, modifications were made in survey methods and instruments; and the implementation phase was gotten underway with country surveys in Malaysia and Korea. Thereafter, WFS surveys were undertaken in 39 additional developing countries: Bangladesh, Pakistan, Sri Lanka, Thailand, Dominican Republic, Guyana, Jamaica and Panama in 1975; Indonesia, Nepal, Colombia, Costa Rica, Mexico, and Jordan in 1976; Venezuela, Kenya, Lesotho, Iran, Haiti, Paraguay, Peru and Trinidad and Tobago in 1977; Cameroon, Senegal, Sudan, Tunisia, Philippines, Syria, and Turkey in 1978; Ghana, Portugal, Ecuador, and Yemen in 1979; Ivory Coast and Egypt in 1980; and Benin, Mauritania, Morocco and Nigeria in 1981. "Associate" WFS surveys were undertaken in

Hong Kong, and Guadeloupe-Martinique in 1976 and in 20 developed countries: Belgium, Bulgaria, Czechoslovakia, Denmark, Finland, France, Hungary, Israel, Italy, Japan, Netherlands, Norway, Poland, Romania, Spain, Sweden, Switzerland, United Kingdom, United States and Yugoslavia during the years 1974-81.

Following the PSC meeting in London, May 1975, WFS finally moved to develop and test questions on contraceptive availability. "Recognizing the urgency of settling this matter before too many country surveys had been completed, the WFS organized a crash program of field tests."(17) "During 1975 changes were made in the Family Planning Module and the Community Variables Module, and the Abortion Module was given higher priority." And during the early months of 1976 modified questionnaires were tested in three countries, using three languages other than English, with the results reported to the TAC that July, as detailed by Rodriguez(17). Thereafter, the questions on contraceptive availability presented in Figure 1 were extensively used.

But the reluctance of WFS to move quickly in 1974 and 1975 to develop and implement surveys including questions on availability of contraceptives, and the sluggish pace of WFS results during 1975 and 1976, led to our decision in 1976 to launch a Contraceptive Prevalence Survey (CPS), under the auspices of the U.S. Centers for Disease Control, Atlanta, Georgia, aimed more specifically and directly at obtaining the data on availability and use of contraceptives urgently needed for guidance of population and family planning programs. And, building upon WFS experience, many CPS surveys were expeditiously done during ensuing years, often with complementary results. (Figure 2)(21) Readers interested in detailed accounts of the many other challenging problems encountered and overcome by WFS during the developmental and implementation phases of WFS should consult relevant WFS publications. (24)

Findings of WFS Surveys

Salient findings from WFS surveys are presented in Country Reports and in hundreds of WFS publications (24); and only a few highlights will be presented and commented upon here.

Altogether, the WFS experience has demonstrated the feasibility of the WFS project, as proposed in 1971. Overcoming the many obstacles posed by great distances, diverse languages and customs, nationalistic sensitivities, low levels of education and living, and the need for extraordinary levels of coordination and cooperation among the many organizations and countries involved, the WFS succeeded in producing uniquely comparable data which now provide a much improved view and understanding of fertility and fertility related behavior patterns in the developing world. The phenomenon of rapidly decreasing fertility during the 1970s, in virtually every developing country where effective means of fertility control were made readily available, has been amply confirmed. (Figure 2, Appendix B). (20-23) Great unmet need and demand for family planning services throughout the developing world has been documented by WFS surveys: they have ascertained the proportion of women wanting no more children (Figure 3), showing a minority of women with three children wanting additional children, and many women in the LDC's preferring two, one or no children. (18)

Early in my 14-year tenure as director of AID's population program*, by means of cluster surveys of women in maternity centers and villages in India, Thailand, Indonesia, Philippines, Viet Nam and Tanzania, I validated my intuitive understanding that large proportions of women in developing countries did not want additional children. These cluster surveys showed that even among the poorest and illiterate populations approximately one-half of fecund women of reproductive age did not then

want additional children. In addition, many women wanted to control the timing of desired births.

From such surveys it was also apparent that "the child survival hypothesis of fertility control motivation is mainly a tattered and intellectually barren plaything of academicians. In the real world of grinding poverty, illiterate peasant women who have lost more than half their offspring are intensely aware that another child will likely mean another death--of the newborn, of an earlier child, or of the mother herself. And these women often resort to heroic self-sacrifice to protect their family's health by abortions performed under the most abysmal conditions." (25) This view of the reactions of desperately poor women to child loss was riveted in my thinking by family planning program experiences. For example, when visiting the Howrah District slums near Calcutta in 1970, I queried 50+ women assembled in a slum street, all of whom were using oral contraceptives, concerning the number of children each woman had and the number each had lost: 1 child?, 2 children?, 3 children?; and found that many of these contracepting women had lost multiple children--even as many as 5. But more formal fertility and child mortality data, such as provided by WFS findings, have been useful in persuading others.

Vigorous family planning programs have demonstrated that the oft-cited obstacles of poverty, illiteracy and high child mortality rates are not insuperable obstacles to rapid acceptance of family planning services when contraceptives are made readily available in villages and households. But many researchers have been reluctant to accept such evidence from family planning programs. Now WFS data have confirmed that the great differences in family planning program progress by country and continent are closely linked to differences in contraceptive availability/use and consequent fertility levels. The unique comparability of WFS data from many countries, relative to family planning program configuration, has provided definitive answers to a number of long-standing questions -- such as why the usual lesser use of contraceptives by rural populations. As shown in Figure 4, in countries such as Indonesia and Korea, where family planning programs have altered urban-rural differences in contraceptive availability, they have also altered differences in contraceptive use. WFS and CPS surveys have documented the rapid adoption of new fertility control technologies wherever made available; especially the emergence of voluntary sterilization as the leading means of fertility control in many countries.

WFS mortality data, constructed from household rosters and birth histories, have provided the best comparative view of infant and child mortality ever attained for many developing countries(26). These WFS mortality data have demonstrated that many of the national infant mortality rates officially reported to the World Health Organization have been grossly erroneous - with many WFS infant mortality rates being more than double the previously-used official rates, which were guestimates based on inadequate data, or politically-modified official rates.

Discussion

Success does have many parents! And many present here today take just pride in their vital contributions to the WFS. Fortunately, the nature of many such contributions by WFS staff, consultants and national survey leaders are evident in hundreds of WFS publications (24); not so the contributions made by many employees of USAID and the UNFPA, without whose support WFS could not have flourished.

Drs. Halvor Gille and Nafis Sadik, vital participants throughout, were ably assisted by Edison Wibmer and Paul Micou at UNFPA. Here, in alphabetical order, is a list of USAID colleagues whose contributions along the way were essential for WFS success: E. Randall Backlund, Joel Bernstein, Willard Boynton, James Brackett, Sam Butterfield, Mimi Burch, Richard Cornelius, Harriett Crowley, Charlotte Ellis, Mary Fowler, Gerald Gold, John Hannah, Henry Hendler, Jarold Kieffer, Ken Levick, Robert O'Brien, Fred Pinkham, Jane Shallcross, J. Joseph Speidel, Timothy Sprehe and Maurice Williams. Of these, Brackett, Cornelius, Ravenholt, Speidel, and Sprehe were most involved.

A confluence of favorable factors at USAID during the early seventies was essential for the WFS launch and early development. The stepwise earmarking by the U.S. Congress of increased funds for the population program provided a favorable climate for innovative enterprises. New undertakings require special nurturing during early years before they can compete with older established programs. Three persons were especially crucial to the Title X earmarking by the Congress: General William H. Draper, Jr., National Chairman of the Population Crisis Committee (PCC), Dr. Phyllis Piotrow, Executive Director, PCC, and Senator J. William Fulbright, Chairman of the Senate Foreign Relations Committee, whose support was steadfast. Bipartisan support came from influential members of both the Senate and the House of Representatives -- including Jonathan Bingham, Clifford Case, Joseph Clark, Paul Findlay, Donald Fraser, Ernest Gruening, Wayne Hayes, Hubert Humphrey, Daniel Inouye, Jacob Javitts, Thomas Morgan, Charles Percy, James Scheuer, Robert Taft, Jr., Joseph Tydings, and Ralph Yarborough.

By 1971 we had developed in the Office of Population a strong nucleus of talented and superbly dedicated personnel, able and willing to work long hours with esprit to develop vital new projects; and we had already gained much experience in new project development (7) -- a more difficult task than simply adding resources to existing projects. Dr John Hannah, Administrator, Maurice Williams, Deputy Administrator, and Joel Bernstein, Assistant Administrator were all able technocrats, willing to support visionary new enterprises. During the late 1960s and early 1970s, Presidents Lyndon Johnson, Richard Nixon and Gerald Ford were generally supportive of the USAID population program. However, with the defeat of Senator William Fulbright in 1974 and the negative earmarking of population program funding ceilings by Congressman Otto Passman -- FY 1974 (\$112.5 million), FY 1975 (\$110 million), and FY 1976 (\$103 million) -- AID's population program entered a difficult phase, made additionally difficult by President Jimmy Carter's appointment in 1977 of several adversaries of the population program to key positions in USAID. Hence, it would have been difficult if not impossible to have successfully launched the WFS later than 1973. As it was, we had great difficulty sustaining the funding of WFS during the lean years of 1974-76. Again, the enduring partnership with the UNFPA gave needed solidity to WFS support on many occasions.

The many generic contributions of USAID to the WFS -- the original idea, initial project development, selection of ISI as the host institution, enlistment of UNFPA participation, key components of the data collection instruments, the bulk of the funding, etc. -- have until now remained largely obscure. This was in accord with AID's deliberate strategy of maintaining a low profile to enable WFS and ISI to develop a strong independent image and to minimize the U.S. presence when WFS was negotiating support of national surveys in politically sensitive countries. The outstanding success of WFS indicates the wisdom of that approach.

Conclusion

The WFS-pioneered concept and practice of a world survey consisting of many national surveys linked by a central organization providing standardized methods, financial and technical assistance, collation and analysis of pooled data, with publication and dissemination of comparative findings has succeeded outstandingly.

The WFS has transformed the LDC fertility and family planning results field from a data poor to a data rich condition. Many vital findings have been put to immediate use for policy modification and program guidance. Many more insights will be gleaned from accumulated data through additional second stage and third stage analyses. And WFS surveys done during the 1970s will serve as templates and baselines for follow-on surveys done during succeeding decades.

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Table 1

FINANCIAL CONTRIBUTIONS TO THE WFS
By Year and Donor (in thousands of dollars)

YEAR	USAID		UNFPA	UKODA	OTHER	TOTAL
	Obligations	Cash-Flow	Cash-Flow	Cash-Flow	Cash-Flow	Cash-Flow
1972	1043	150				150
1973		245	520			765
1974	1000	1048	1173		15	2236
1975	1182	1050	1961			3011
1976	2235	1400	1670			3070
1977	2855	1610	1787		41	3438
1978	4900	3055	2289			5344
1979	3300	2750	2460		25	5235
1980	3787	4805	2153	98	66	7122
1981	3537	2815	2351	138	19	5323
1982	1160	2875	1656	713	75	5319
1983	1520	2445	1657	643 *	40	4785
1984		2077	944	164 *	51	3236
Totals	26325	26325	20621 **	1756	332	49034

• Estimated annual distribution

** Includes \$5,512,359 direct support to country surveys. Does not include \$54,222 support for conferences in 1972.

Other: Japan \$15,000, IDRC (Canada) \$128,000, IBRD \$118,000, USNAS \$16,000, Population Council \$12,000, Population Research Center \$6,000, Pathfinder Fund \$6,000, Rockefeller Foundation \$3,000, W&F Hewlett Foundation \$25,000, RTI \$3,000.

Appendix A

INTERNATIONAL INSTITUTE FOR VITAL REGISTRATION AND STATISTICS
University of North Carolina, Chapel Hill, NC

Dear Rei:

14 June 1978

In response to your letter of May 8, I have checked my memory and files about the sequence of events and the people involved in the early discussions about the World Fertility Survey. Following is a brief listing of points. This list is certainly very incomplete, as a number of people were involved and I know only the sequence of events with which I was directly concerned.

1. The involvement of the International Statistical Institute in the WFS relates to the historical evolution of ISI itself.
2. In its earlier stages, ISI (it is over 90 years old) was very much an organization of national official statisticians -- developing international statistical standards and promoting the progress of national statistics.
3. After World War II, these functions were taken over largely by the UN Statistical Commission. ISI then changed more to a purely professional society of academic statisticians, - and its program was largely holding biennial worldwide meetings of statisticians -- and publishing the predominantly theoretical papers that were presented at these meetings.
4. With increasing costs for printing, etc., the ISI Bureau (Board of Directors) began to wonder if ISI could survive with such a restricted role.
5. In the mid-60s, ISI appointed a Reappraisal Committee of four members. Kendall was Chairman. The Committee issued its report in July 1968. Its main recommendation was, "We strongly recommend that an attempt be made to restore the Institute to the position it once had, of being the natural focus of international statistical work and the natural body to which recourse would be had by all bodies for authoritative work in the international domain."
6. The report also listed nine steps to help achieve this goal, one of which was, "Funding of research projects and advisory services." As subjects of possible research, the Committee listed a wide range of topics, including, "...birth control and abortion...."
7. The Reappraisal Committee proposal regarding research was considered to be its most novel recommendation, and, as a follow-up, Prof. William Cochran, Harvard Professor of Statistics and then President of ISI, appointed a small committee to look into the feasibility of the research idea and the possible types of ISI anticipation. This Committee was called the Stuart Committee. Stuart is with the London School of Economics.
8. Presumably, as a result of some of the discussions of this Committee, Prof. Cochran wrote me on February 11, 1971 soliciting any ideas I might have on research work in population that might be undertaken by ISI.
9. I was out of the country when Cochran wrote, but I acknowledged his letter on March 16, 1971 and Cochran wrote me again on March 29, 1971 giving me more information about the thinking of the Stuart Committee.
10. A month later, April 28, 1971, I wrote a long letter to Cochran and listed eight areas in which I thought ISI might carry on projects related to population. None of these resembled the WFS. In this letter, I also raised some questions about whether ISI was Interested in problem-oriented research, what kind of funds it could accept, etc. I also said, "In Washington last week, I talked to some officials from NIH and AID. They are willing to listen to ideas."
11. It happened that in August 1971 ISI would have its big conference in Washington. Consequently, the Stuart Committee would meet then, and on July 10, 1971 Cochran invited me to sit in with them to discuss further the suggestion made in my letter of April 28. I could not get to Washington in time for the scheduled date of that meeting, so I never met with the Committee.
12. Sometime around July 1971 (I do not have a fix on the exact date), you and I were talking and you told me that you had the idea of a worldwide fertility survey, and you asked me if I knew of any institution that would be capable of carrying on such a major project. I do not know how you arrived at the concept of a6TFS, but I think you said you wanted something analogous to the Growth of the American Family studies. In any event, here was a very fortuitous coincidence. You were looking for a possible contractor for a major project, and ISI was looking for a major project to get involved with.

13. When I got to Washington (August 1971), I told Cochran of your idea and he set up a small meeting of ISI people at the Shoreham Hotel. About six people were there: Cochran, Lunenberg, Bjerve, myself and maybe two or three others. I told them about the AID Population Program and about your idea, and said that I could probably arrange a meeting with you if ISI wanted to explore the idea further. They did.
14. Then sometime in August 1971 during the ISI Conference you and I set up a meeting in your office -- I am not sure who all was there -- Lunenberg, Bjerve, you and I. I do not know if anyone else from AID or ISI was there or not. Possibly several others, but I am not sure. You elaborated on your ideas for a WFS and the ISI group expressed substantial interest. No firm conclusions were reached. All the ideas were still loosely formed. None of the rules of the game were yet formulated and ISI was not really sure at this stage that it could so drastically change its character and move from an academy to an active research agency.
15. After these August 1971 meetings, I assume that ISI officials were busily consulting among themselves on what they could and should do. My file next shows that on November 4, 1971 I got a letter from Lunenberg asking me if I could stop in The Hague on my way to Iran to discuss WFS. Apparently I was in The Hague November 24-27, 1971, but I have no recollection of just what aspects of the WFS we discussed. Bart's letter of November 4, 1971 did say that Dr. Macura had agreed in principle to be Project Director if the technical headquarters could be in Belgrade. So it was obvious that plans were moving ahead quickly.
16. The next major event was a meeting of consultants to ISI to discuss the WFS. This was held in The Hague March 25-29, 1972. Participants were Barry Davies, Parker Mauldin, Som, Taeuber, Sprehe, Goudswaard, van der Kaa, Lunenberg, Verstege. I was chairman. The consultant group discussed many aspects of what WFS could be like, identified the permanent committees (PSC, TAC, RCC), made up lists of possible committee members and future consultants, drafted a future ISI/WFS work schedule, and suggested that two ad hoc technical advisory meetings be convened in July. Milos Macura was to be invited to be chairman of both these ad hoc advisory groups.
17. About this time, I believe ISI got a planning grant from AID or UNFPA to finance the ad hoc meetings and other early work on the WFS.
18. Shortly after the March 1972 meeting of consultants, it became apparent that Macura would not be available to be Project Director and this set off a wide search for a suitable substitute. I was informally asked if I would be available. I was not. Macura suggested Nora Powell. She was not ready yet to leave the UN. Barrie Davies was consulted. He could not yet leave ECE. Taeuber was very active in this search. A number of names were considered.
19. Also during this period, ISI was soliciting many of its members' views on the project. Most were supportive; some of the French were skeptical.
20. The first ad hoc meeting was held in The Hague, July 11-14, 1972. This meeting was to consider "...the aims of the WFS, the central core subjects and additional related subjects and current methodology and methodological innovations." About 29 people attended. Macura was chairman. Prior to this meeting, it was discovered to everyone's surprise that " Maurice Kendall had been persuaded to take over the role of Project Director. He expected to assume this position on October 1, 1972 (pending AID approval), but he was available to attend this ad hoc meeting as a representative of ISI.
21. In his introductory remarks at this meeting, Macura said, Not less than 50 to 60 persons have been actively involved in the preliminary WFS discussions and correspondence.
22. The second ad hoc meeting was held in The Hague July 18-21 1972. This meeting was to consider the organization of the survey, selection and training of personnel, sampling, field organization, data processing and quality control. About 26 persons attended. There was some overlap, but these were different people than were in the first ad hoc meeting. Macura was chairman; Kendall was there. I was at both meetings.
23. All during late 1971 and 1972 there was a great diversity of activity. The Census Bureau was busily making some preliminary studies of past surveys. There was a great effort by the Census to help ISI prepare an Administrative Manual--a prerequisite to an AID grant. Speidel and Sprehe had prepared a memorandum to RIGC on the issues related to WFS (January 21, 1972). A proposal was submitted to RAC at its meeting on March 13-14, 1972. I was chairman of the RAC Subcommittee which reviewed and approved the project.
24. On May 31, 1972, AID approved a grant of \$1,043,000 for a two-year developmental period. You will know more about the early history of the AID involvement than anyone else. I do not know the details of the negotiations with UNFPA.
25. The first meeting of the WFS Program Steering Committee was in The Hague, January 22-23, 1973 Since you were there, you know all about it from there on!

Sincerely, Forrest Linder, President

Appendix B
The New York Times
Tuesday, 15 July 1980

World Fertility in Rapid Decline, According to Vast New Study

By Youssef M. Ibrahim

A major worldwide survey of 400,000 women in 61 countries shows that the population explosion that has plagued much of the world is easing. Fertility and birthrates in third world countries and in the developed nations have significantly diminished in the past decade, the survey concluded.

In fact, new styles of living and changing morality have diminished fertility levels throughout Europe so drastically that they are pushing birth rates below the level at which existing populations are replaced, and falling rates have prompted several alarmed countries to reverse the trend.

In the United States, the fertility rate has dropped from its peak of 3.5 children per woman in the late 1950's to 1.8 during the last decade. Despite the drop, however, the large number of young people resulting from the previously high rate means that the country's current population of 222.5 million can be expected to double in 99 years.

Worldwide, the pattern was found to have been partly influenced by a growing preference for smaller families in Asia and Latin America, widening use of contraceptives everywhere and the global advent of modernization and urbanization.

"The decline is well-established, affects an important part of the world's population and is rapid," Dr Leon Tabah, director of the Population Division of the United Nations, told some 600 specialists on the subject from 83 countries who gathered here last week.

The experts met for a five-day conference to assess the first returns of the World Fertility Survey, a multinational endeavor begun in 1972 and recognized as the largest social science research project ever launched. It was carried out under the supervision of the International Statistical Institute, with researchers in 41 developing and 20 developed countries.

Among other things, the massive survey has found that more couples are marrying later and using a variety of contraceptive methods to delay birth, and that increasing numbers of working women are restraining childbirth. The study also found that a new and better educated generation of nearly a billion young people - emerging in the next decade with a more reserved attitude toward marriage and conception - will give the new trend greater momentum. In addition, in a reversal of previously ambivalent policies, most governments in the third world now support programs of family planning to slow population growth.

In Europe, however, the trend can have major economic and industrial implications, according to experts at the meeting. Among other things, the shrinking populations are likely to face serious labor shortages, while those who are in the labor forces, diminishing at increasing rates, will have to bear a larger tax burden to support the growing numbers of retired.

"The whole system which traditionally worked in favor of fertility has collapsed," said Milos Macura of Yugoslavia, project director of the survey and formerly director of the Population Division at the United Nations. "The Industrial Revolution, individualism, consumerism - in both Western and Eastern Europe and regardless of the political system of government - are sweeping away traditional pressures that favored the family."

The change affects European countries in different degrees. In Western Europe the worst situation is that in West Germany, where the average number of births is down to 1.4 per woman, with 2.2 the minimum needed to maintain a steady population.

Other Western European countries falling below the replacement level include Austria, Belgium, Britain, Denmark, Finland, France, Italy, the Netherlands, Norway, Sweden and Switzerland.

In Eastern Europe, the depopulation phenomenon, although not as widespread, appears to be intensifying. While only Eastern Germany falls below replacement level, with an average fertility rate of 1.8 per woman, Czechoslovakia, Hungary, Poland and Roumania are at or close to the replacement level.

Scientists cautioned, however, that the emerging trend offers no near-term relief from the population explosion, since the legacy of past fertility rates will continue to

push the numbers up for years to come. According to projections, the earth's population will increase to six billion by the end of this decade, representing a 50 percent increase over the 1978 total. The explosion may stop in the third quarter of the next century, when the planet is expected to have 11 billion people.

10 Countries Examined in Detail

In general, the survey found, the women who want smaller families are those who live in urban areas, have received a measure of education and have worked outside of their homes. A large and still unmet demand for family planning was found among a major segment of the women queried, and more than 30 percent said their last birth was unwanted.

Half of the women surveyed in all the developing countries we looked at said they don't want children", said German Rodriguez, a researcher with the survey staff. "Yet, half of those who said so are not using contraception, either because they have no access to them, or for reasons that range from social norms to apathy."

The use of contraceptives was found to be dependent on factors such as social and economic differentials, length of marriage and place of residence - whether in the country or city.

Dr. Nafis Sadik, assistant director of the United Nations Fund for Population Activities, looked at data from 10 countries in detail. In the Republic of Korea, which has an extensive family planning program, she said, contraceptives were widely used, and the place of residence made little difference.

In Pakistan and Jordan, by contrast, contraceptive use was four times greater in urban than in rural areas. Data on Jordan showed that the average uneducated woman had nine births, compared with only three for the minority with secondary education.

Researchers also found that in some cases a little bit of modernization can go the wrong way, sweeping aside social customs and taboos that naturally restrain childbirth, without replacing them with offsetting use of contraceptives. In Africa and some parts of Asia, for instance, breast-feeding has always acted as a natural method of contraception. The practice has been replaced by bottle-feeding, however, and women become pregnant more frequently.

In Kenya, whose average of eight births per woman gives it one of the higher fertility rates in the world, it was found that women with no schooling have a lower fertility rate than women with primary-school education. The latter, in many cases, have done away with prolonged breast-feeding and do not accept polygamy - a social tradition that leads to lower individual fertility rates. At the present rate, the country's population of 16 million will double in 20 years.

Religious Restraints Weakening

Religious restraints, which have acted as obstacles to the spread of family planning, also seem to be weakening in the face of population explosion in many countries.

Maria Henriques is a consultant in Brazil's Population and Demography Division of the Institute of Geography and Statistics. In her country, she said, the official position of the church is to fight against family planning. But, she added, "the lower tiers of the church hierarchy, like the village priests, don't go along with that. They are willing to confess women using oral contraceptives, although abortion is still out of the question.

AFTERWARD

Contraceptive Prevalence Surveys

During extensive epidemiological/public health experience, I became accustomed to making rapid investigative surveys to obtain data needed for solution of urgent infectious disease problems(27-29). In the glare of community publicity, one can ill-afford delays in epidemic diagnosis and control. But the WFS staff was dominated by demographer/statisticians more academically inclined; and in the mid-1970s, as WFS moved ponderously toward initial survey productivity, we at USAID decided to also launch a rapid-action Contraceptive Prevalence Survey project at the U.S. Centers for Disease Control in Atlanta, directed by Leo Morris, under a multi-purpose Participating Agency Service Agreement (PASA), which continues(34). A major CPS contract by USAID was also made with Westinghouse Public Applied Systems, Maryland, directed by Lawrence Smith, which operated from 1977 to 1985. These Contraceptive Prevalence Surveys (CPS) were national or regional probability sample surveys designed primarily for family

planning program evaluation and management; collecting information on the knowledge and use of contraception in relation to the desire for more children, availability of family planning services, choice of contraceptive method, and related variables.

Detailed descriptions of CPS surveys and findings have been published (30-31). CPS questionnaires were much shorter (20 pages) than those of the WFS (40 pages); and the brevity and narrower focus of the CPS questionnaires saved money and time at every stage. The total cost of the 41 WFS surveys was \$49 million, averaging \$1.2 million and 4 years per survey; whereas the total cost of the 43 CPS surveys was \$13 million, averaging \$305,000 and two years per survey. Despite the differences in WFS and CPS questionnaires and methods, sufficient commonality existed that a great number of useful comparisons of findings have been made. Analysis of contraceptive usage by age groups demonstrates the markedly different patterns of contraceptive use produced by programs emphasizing different methods of fertility control (Figure 4). The usual dominant role of country levels of contraceptive use in determining country fertility rates is shown in Figure 5.

Demographic and Health Surveys

As WFS and CPS were finishing in 1984-85, according to Richard Cornelius(32), project monitor at USAID's Office of Population during many years, the Demographic and Health Survey was created by combining desirable qualities of WFS and the CPS. Supported by USAID and administered by Macro International Inc., the DHS was initially directed by Bob Lapham. Core members of WFS joining DHS in 1985-86 were Martin Vaessen, Trevor Croft and Shea Rutstein. Upon the death of Robert Lapham in 1988, Martin Vaessen became the director. DHS also obtained the help of many ex-WFS personnel as consultants -- including John Cleland, Vijay Verma, German Rodriguez, John Hobcraft, Hedi Jemi, and Tom Pullum -- who helped transmit the WFS experience. Likewise, DHS received personnel and expertise from the CPS: Jerry Sullivan, Anne Cross, Ann Way, Sushil Kumar, Jeane Cushing, Mohamed Ayad, and John Novak. According to Vaessen(33), "The main difference between WFS and DHS was the clear survey production targets established in the DHS, vs the more nebulous targets in WFS. The DHS will have produced more than double the number of surveys in the same time period, 101 standard surveys in 14 years for \$94 million; vs. 41 surveys in 12 years. This in spite of the fact that, generally speaking, DHS surveys are far more extensive than WFS surveys in terms of content due to the addition of extensive maternal and child health information." The increased efficiency of DHS was facilitated by advanced computer technology and software specially developed by DHS.

The broader range of health questions asked in the DHS, the extent of DHS surveys, and the usual strong relationship between excess fertility and high infant and child mortality in many countries, is indicated in Table 2. World experience during recent decades has abundantly demonstrated that rapid action making effective means of birth control readily available in the less developed countries usually results in rapid reduction in birth and death rates and triggers economic and social development. Ordinarily, suddenly improved birth control is the "horse" needed to pull the LDC health/development "cart" efficiently forward.

MEASURE 1,2,3

In 1997, USAID funded a troika of DHS-follow-on projects. The first of these, Measure 1, budgeted at \$58 million for 5 years, funds Macro International Inc., directed by M. Vaessen, to continue its program of sample surveys on variables relating to population and health programs.