

BENEFITS OF TEAMWORK IN A MAIL SURVEY OF U.S. FIRMS ON PATENT PROTECTION: A COORDINATED METHODOLOGICAL APPROACH

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1. Introduction

Many surveys, and in particular, those sponsored by private companies and organizations, are designed by survey research professionals and implemented by survey research companies. One person, typically a senior member of a survey research firm, has authority for the entire project and directs the activities of all staff members engaged in that project. The project director and/or senior level analyst designs the questionnaire after studying background materials. The sponsor reviews the questionnaire and survey professionals pretest it. Finally, survey professionals, in consultation with the sponsor, make revisions to the questionnaire, analyze the data, and write the report.

The survey described in this paper diverges from the model of research conducted by professional researchers in two key respects. First, key project responsibilities, including project design and reporting, were assigned to generalists with no previous survey research experience, with guidance from experienced survey researchers and statisticians. Second, one person had overall responsibility for the project; however, project staff came from different units and reported to different managers. For these reasons, teamwork and consensus-building were critical to the success of the project.

Further, the project team responsible for the mail survey was relatively unique in its diversity and breadth. Specifically: (1) three generalists working in the area of international trade and finance were assigned full-time to the project; (2) a survey researcher provided questionnaire design, pretesting and analytic expertise; (3) a senior sampling statistician designed the sample; (4) an agency attorney provided legal insight; and, (5) agency managers reviewed the project at each stage.

The survey was conducted by the U.S. General Accounting Office (GAO), an agency of the U.S. Congress. In response to a congressional request, the survey addressed the experience of U.S. companies in obtaining patents and their views on international patent harmonization negotiations. Patent attorneys working for U.S. companies completed the survey. The survey is summarized in GAO's report entitled *Intellectual*

Property Rights: U.S. Companies' Patent Experiences in Japan (GAO/GGD-93-126, 1993). GAO testified on the survey on July 22, 1993, before the U.S. Senate Subcommittee on International Trade, Committee on Finance (GAO/T-GGD-93-36).

The success of the project achieved through teamwork was noteworthy. The team designed, pretested, revised and finalized the questionnaire, which dealt with complex technical issues, in less than two months. The response rate was 66% after the first mailing of the questionnaire and reached 87% after three mailings. This paper describes the organization of the GAO team and factors that built strong teamwork.

2. Overview of GAO Mail Survey Methodology

GAO conducts mail surveys using a research methodology similar to Dr. Don Dillman's "Total Design Method" (TDM) (John, 1990). The standard procedure for GAO mail surveys includes use of (1) personalized materials, including the cover letter and mailing label; (2) typeset or desktop published questionnaires; and, (3) up to two follow-up mailings of the questionnaire to obtain high response rates (GAO Policy/Procedures Manual, 1992, and GAO Transfer Paper 7, 1986). GAO pretests mail questionnaires in face-to-face settings with members of the sampled population. The agency has used reminder postcards and telephone reminders for some projects to help increase response rates.

Using an integrated "Total Design Method" for mail surveys has been shown to obtain high response rates (Dillman, 1991, 1984, and 1978). Indeed, GAO mail surveys to targeted populations using standard procedures similar to the TDM have usually obtained response rates from 70% to 80% (Featherston and Moy, 1988).

3. Teamwork at GAO

GAO Generalists and Specialists: Most studies at GAO are directed and implemented by generalists called "evaluators," who are assisted by research specialists. GAO generally assigns evaluators to a study, expecting them to conduct preliminary information gathering, define the study's objectives, and develop an appropriate methodology for answering the key questions.

Most GAO evaluators have a general familiarity

with technical areas such as survey research but are not trained as professional researchers. Evaluators usually hold bachelors or masters degrees, but few hold doctoral degrees or are trained as survey methodologists, sampling statisticians, or computer programmers. The strength of evaluators is in conducting investigative research involving unstructured interviews, developing consensus for the research within GAO, and reporting the results to the Congress.

GAO employs a variety of specialists with technical skills to complement the evaluator staff, including survey researchers, sampling statisticians, computer programmers, economists, lawyers, and social scientists. GAO research specialists working on surveys are typically social scientists and statisticians with advanced degrees who have experience in research methodology and survey research. They often begin working on a project involving a survey after background research has been conducted, and evaluators have decided that a survey is necessary to fulfill the project's goals.

Only a few GAO projects are directed by specialists; most are directed by evaluators with specialists providing assistance on an as-needed basis. For most projects, evaluators are primarily responsible for project planning, data collection, and reporting; specialists help design projects, take the lead in executing technical matters such as statistical sampling, questionnaire design, pretesting, and computer analysis, and technical comment on report drafts.

Consensus and teamwork between evaluators, specialists, and managers are essential to the success of each project. Obtaining the approval of several managers and reviewers in a timely way is a challenging task, which is facilitated by evaluators and specialists who are able to work together as a team and reach consensus on the research. Teamwork is particularly important in a survey research project that involves staff from several different offices within GAO, as in the project described in this paper.

GAO Teamwork in Implementing Mail Surveys: Evaluators usually draft an initial set of questions and a list of information needed for the questionnaire. A specialist experienced in survey research reviews the material and makes revisions as necessary to produce a draft questionnaire that conforms to accepted standards for GAO mail surveys.

A survey research specialist, working with one or more evaluators, pretests the mail questionnaire. First, the respondent completes the questionnaire in the presence of GAO staff. Second, GAO staff conduct a debriefing interview to determine the respondent's understanding of the questions and to identify potential problems in answering the questionnaire. GAO's "process pretesting" follows particular procedures and

has been successful in enhancing the quality of questionnaires (Featherston and Moy, 1988).

Up to a dozen pretest interviews may be conducted, with revisions made after each interview. (More pretests have been done for some projects.) Bringing different perspectives to the process of improving the questionnaire, both the specialists and evaluators help revise it. The final questionnaire is the result of the consensus among evaluators, specialists, and management.

Evaluators play a leading role in defining the population to be surveyed, based on their preliminary research on the project's objectives; however, a sampling statistician usually designs the sampling plan in consultation with the evaluators. Once a sample is drawn (names of organizations for a survey of organizations), evaluators are responsible for compiling respondent names and mailing addresses. Specialists produce the materials, such as cover letters and mailing labels; evaluators assemble the materials with assistance from specialists and temporary staff.

Specialists tabulate the questionnaire results using computer software such as SAS or SPSS and work closely with evaluators in analyzing the results. Specialists often prepare the section of the report describing the survey methodology. Evaluators take the lead in reporting the results in the form of oral briefings, written testimony, and written reports.

The Environment for Survey Research at GAO: The decision to conduct a survey frequently depends on the nature of the congressional request, the need for estimates of population characteristics, and the potential uses of the findings. In general, GAO tries to buttress the findings from surveys by supplementing them with another methodology, such as case file reviews or personal interviews. Unlike other federal agencies, which conduct regular surveys to measure trends, GAO surveys tend to be "one-time" in nature.

The subject matter investigated by the questionnaire, the mode of administration, and the sample size can be revised during a GAO project, depending on decisions made by evaluators, specialists, and GAO management. As part of the legislative branch, GAO is not subject to the federal Paperwork Reduction Act. Therefore, unlike executive branch agencies, GAO questionnaires and survey methods are not subject to approval by the Office of Management and Budget (OMB).

4. GAO's Japanese Patent Survey Project

Background: GAO was requested by Sen. John Rockefeller and Sen. Dennis DeConcini and former Sen. Lloyd Bentsen to review patent protection for U.S. products in Japan as compared with that in the United States and Europe. GAO also received a letter from

Rep. William Hughes and Rep. Carlos Moorhead, the Chairman and Ranking Minority Member of the House Judiciary Subcommittee on Intellectual Property and Judicial Administration, expressing interest in the project and requesting updates.

As a matter of background, patents are one of the primary forms of intellectual property rights in worldwide use. A patent is the grant of a property right issued by a national government for an invention. While the nature of patent rights varies from country to country, a patent typically gives an inventor the right to exclude others from commercially making, using, or selling the invention during the term of the patent.

Several U.S. firms have complained about problems that they encountered in obtaining and enforcing patents in Japan. U.S. company complaints were voiced at hearings held by the Senate Commerce Subcommittee on Foreign Commerce and Tourism in 1988 and 1989 chaired by Senator Rockefeller. In 1989, the U.S. Trade Representative placed Japan on a watchlist of countries with inadequate protection for intellectual property. Prior to the GAO study, no large-scale studies had been done comparing patent protection in the United States, Europe, and Japan, which are the three major patent systems in the world.

The United States has been involved in two sets of multilateral negotiations that may affect the protection of intellectual property rights in Japan. The Uruguay Round of multilateral trade negotiations in the General Agreement on Trade and Tariffs (GATT) includes Trade-Related Aspects of Intellectual Property (TRIPs) negotiations. The TRIPs negotiations are currently on hold. The United States also has been involved in negotiating a patent harmonization treaty through the World Intellectual Property Organization (WIPO), a United Nations agency based in Geneva. If ratified, the WIPO treaty could lead to significant changes in the Japanese patent system as well as those in the U.S. and other countries. These talks are in recess and may not reconvene until late 1993.

Objectives of Mail Survey: GAO conducted a mail survey to obtain information on U.S. firms' patent activity and experience in the United States, Europe, and Japan. The survey had four major objectives: (1) to determine companies' overall level of patent filing in the three jurisdictions; (2) to determine the strategies that may affect U.S. companies' patent experience in Japan; (3) to examine problems faced by U.S. companies in obtaining and enforcing patents in the United States, Europe, and Japan; and (4) to obtain companies' views on issues related to international patent harmonization efforts.

Background Research: GAO evaluators worked full-time on the patent project for about six months prior

to formulating the mail survey. During this time, the team conducted extensive background research and defined the population to be surveyed. Background research included a review of pertinent literature, interviews with U.S. and Japanese government officials, and in-depth face-to-face and telephone interviews with 58 U.S. companies.

Questionnaire Design and Pretesting: The first step toward designing the mail survey was drafting the questionnaire, which the evaluator team developed over a one month period. The second step involved the expertise of specialists who advised the team. The specialists emphasized the importance of focusing on only the key issues in a mail survey, limiting the number of questions, and thereby obtaining a higher response rate. Together they agreed that the team would decide on a limited number of objectives for the mail survey and revise the draft to focus on these objectives.

The evaluators revised the draft instrument in about one week. Working with a questionnaire specialist, the team made further revisions to obtain comparative views on companies' patent experiences in the United States, Japan, and Europe, and to modify the wording of questions. The team used WordPerfect 5.1 software to desktop publish the draft questionnaire.

Lastly, the questionnaire was pretested face-to-face at several companies. Each pretest involved a GAO evaluator and a GAO specialist meeting with a respondent (patent attorney) drawn from the actual sample. The pretest involved: (1) a brief summary of the purpose of the project and of the pretest; (2) the completion of the questionnaire by the respondent; and (3) a debriefing of the respondent to assess his/her understanding of the questions and to discuss the answers given. In one case, several corporate attorneys attended the pretest; they tended to "think aloud" in the process of answering the questions, and the debriefing process occurred as the questions were being answered. In a typical pretest, an individual attorney filled out the survey, asking for clarification when he/she felt a question was unclear, poorly worded, or difficult to answer. One indicator of difficulty in understanding a question was if the respondent paused for an unusually long period of time before filling it out; other indicators included if the respondent skipped a question, referred back to previous questions before answering an item, or crossed out an answer to revise the response.

The debriefing underscored the difficulty of writing questions on technical issues that were meaningful to attorneys representing different business sectors, including chemicals, semiconductors, and biotechnology. Attorneys in certain sectors had their own preferred terminology, or "shorthand," to describe their concerns

with the patent process. Therefore, several pretests were necessary to develop questions that had common meaning and addressed the concerns of attorneys in each sector.

During the debriefing, the respondent discussed questions that he or she thought should be revised due to ambiguous or unclear wording. In a number of instances, the respondent suggested alternative language, some of which was directly incorporated into the questionnaire. In other instances, the debriefing identified underlying problems that led to changes in questions.

After each debriefing, the evaluator team and questionnaire specialist revised the questionnaire. Other modifications were made in consultation with the GAO attorney who worked on the project, and some changes were made in response to suggestions by U.S. government officials involved in worldwide patent harmonization negotiations. The questionnaire was finalized with the consensus of the project team and with approval from GAO management. The process of writing the questionnaire through its finalization took less than two months. The questionnaire is shown in the GAO report (GAO/GGD-93-126, 1993).

Defining the Population to be Surveyed: GAO surveyed companies that were top U.S. patent holders in three sectors -- chemicals, semiconductors, and biotechnology. These sectors were judgmentally selected by the evaluators because (1) patents were deemed to be of particular importance in these sectors; (2) U.S. and Japanese companies have a strong presence in these areas; and (3) these sectors are of varying maturity. The chemical sector is a mature industry; the semiconductor sector is of intermediate maturity; and the biotechnology sector is an emerging industry.

Because comparable information was not available on top patent holders in Japan, GAO surveyed companies that were top U.S. patent holders. The survey universe was restricted to for-profit companies, excluding universities or other non-profit organizations. The universe included only companies with U.S. addresses; however, it included a number of U.S. subsidiaries of foreign companies. U.S. subsidiaries were included when their patent filing activities were carried out separately from the parent company.

Sample Development: GAO evaluators compiled a list of companies from data maintained by the U.S. Patent and Trademark Office on companies that hold the largest number of U.S. patents in chemicals, semiconductors, and biotechnology. GAO evaluators then telephoned all companies in the sample to verify their eligibility. By telephone, evaluators eliminated additional non-profit organizations and companies that had gone out-of-business or were no longer filing patents

in the selected sectors. Subsidiaries whose parent company handled patent filing activities were identified and eliminated, as were firms that had been acquired by other companies in the universe. A total of 346 eligible companies were included in the sample.

Finally, the name and address of the chief patent counsel or the person in charge of overseas patent filing was identified by telephone prior to mailing the survey. Many companies in the sample were very large and had sizable patent departments, therefore, identification of the most appropriate individual respondent was crucial in obtaining a response to the mail survey and in having that response reflect the experiences and views of the company.

Cover Letter: A cover letter, drafted by evaluators with input from the specialist, accompanied each questionnaire. Each cover letter was personalized with the name and mailing address of the recipient. The cover letter described the purpose of the project, explained how results would be used, and assured recipients that responses would be kept confidential. Letters were signed on behalf of the division head in blue ink, to personalize the mailing. The draft cover letter was pretested with the questionnaire.

Mailing the Questionnaire: The first mailing was sent August 21, 1992. Following standard GAO practice, the questionnaire, cover letter, and a manila business reply envelope were mailed in a 9 x 12 manila outer envelope. Each questionnaire had a unique identification number on the upper right hand corner of page one so that returned surveys could be tracked. The return address was preprinted on the business reply envelope, as was the return address for the outer envelope. Mailing labels for the outer envelope were produced using a computer printer. Postage was metered. The mailout had a professional look designed to emphasize the importance of the survey.

Follow-ups: A reminder postcard, (which has been used successfully in other GAO mail survey projects) was sent to all recipients about two weeks after the survey was mailed. The postcard emphasized the importance of returning the survey, thanked recipients who already had returned the survey, and urged the others to complete it.

Prior to the second mailing of the questionnaire in November, attempts were made to telephone nonrespondents. The telephone calls served to (1) reiterate the importance of the survey; (2) emphasize why it was important to participate (e.g., "your opinion counts") and; (3) identify companies that had not received the mail questionnaire or did not recall receiving it. Many telephone conversations were with a secretary or assistant to the respondent. Nevertheless, the telephone reminders appeared to be successful in

helping increase response. Several nonrespondents completed and returned the questionnaire promptly. Others who said they did not receive the questionnaire subsequently returned it.

The questionnaire was remailed in November to companies that had not returned surveys, using the same procedures as the first mailing. The second mailing included a revised cover letter. This cover letter said that no reply had been received, briefly noted the importance of participation, and requested the recipient to return the survey. Like the first cover letter, the revised cover letter was personalized and signed in blue ink.

Three mailings of GAO mail surveys frequently have been used to increase the response rate. In early December after response to the second mailing tapered off, the questionnaire was resent to companies that still had not responded. The cover letter was revised again for the third mailing.

Editing, Coding, and Data Processing: Following written editing guidelines, developed jointly by the evaluators and the questionnaire specialist, the GAO evaluator staff edited all questionnaires that were returned. Inconsistencies were identified and corrected by both staff editing and machine editing. Little coding was necessary because open-ended questions were coded "1" if a written comment was given.

The data were keyentered and 100% verified by an outside contractor. After keyentry, about 10% of the cases were manually verified by GAO evaluators and the questionnaire specialist by comparing a printout of the data with the original questionnaire. Manual verification did not take much time because of the limited number of returned questionnaires. The data were analyzed on a mainframe computer using SAS, which was written by the questionnaire specialist and verified for accuracy by a technical specialist familiar with SAS.

Method of Analysis: Marginal frequencies for each question were tabulated when the response rate was 66%. The marginals were updated during the follow-up process. A written analysis plan specifying desired crosstabulations was prepared jointly by the evaluator team and the questionnaire specialist. The specialist ran the SAS programs and summarized the data. Results were discussed by the entire team, including evaluators, the questionnaire specialist, and the GAO attorney assigned to the project.

Detailed results were presented to GAO management and other GAO staff who review the reporting of results, including the GAO "Report Review" staff, GAO economists, and a GAO managing attorney. Feedback and suggestions from the management and reviewers were incorporated into the

analysis where appropriate.

In addition, GAO evaluators completed about 20 brief follow-up interviews by telephone to clarify various companies' responses. These responses were useful as a supplement to the analysis.

5. Response Rate to the GAO Patent Survey

The response rate to the first mailing of the GAO mail survey was 66%, which included responses received after the reminder postcard was sent, but prior to the second mailing of the questionnaire. The cumulative response rate increased to 82% after the second mailing and 87% after the third mailing. The 87% response rate represents 301 completed surveys received from 346 eligible companies.

Respondents were motivated to respond to the GAO survey because this posed an opportunity for them to influence policy. As an agency of Congress, GAO has a unique stature in this regard. Indeed, GAO's surveys typically obtain response rates of 70%-80%, which is far above the response rates typically obtained by other organizations. For example, a comprehensive review of response rates to surveys found an average rate of 47.3% to 389 mail surveys; the standard deviation of response rates was 19.6% (Yu and Cooper, 1983).

The first two paragraphs of the cover letter for the first mailing reinforced the importance of the survey and the potential for its use. They read as follows:

"The U.S. General Accounting Office (GAO), an independent agency of Congress, is reviewing patent protection for U.S. products in Japan as compared to that in Europe and the United States. Senators Lloyd Bentsen, John Rockefeller, IV, and Dennis DeConcini have requested that GAO examine the views and experiences of U.S. firms that file patents in these jurisdictions.

Your participation in this survey is vital. Congress will use the results of the survey to analyze current intellectual property rights issues and to help formulate legislation. Your responses will be treated confidentially."

A comparison can be made to the results of a similar mail survey on patent issues that was sent out by a private organization shortly before the GAO survey. The survey was sent to the chief patent counsel of all Fortune 500 companies, a sample which included many of the same companies as the GAO survey. Responses to the survey were anonymous. The survey obtained only a 5% response rate to its first and only mailing. It should be noted that the organization has obtained much higher response rates of 47% to 55% in other surveys of attorneys.

The 87% response rate to the GAO Patent Survey was somewhat higher than the 70-80% response rate

that is usual for GAO mail surveys. The higher GAO response rate to its mail survey of patent attorneys, in some measure, was due to more labor-intensive methods including telephoning all sampled organizations to identify the appropriate respondent and to follow-up on nonresponse. Telephone prenotification and telephone reminders are not part of the standard GAO mail survey design. In this project, a significant number of ineligible companies were identified through telephone calls to sampled companies prior to the first mailing.

Telephone prenotification is established as a technique that enhances response rates. For example, a recent meta-analysis of mail surveys found preliminary notification for studies conducted between 1976 and 1987 and follow-ups for institutional respondent groups to be significantly related to response rates (Yammarino, 1991).

In summary, the GAO Patent Survey benefitted from respondents' vested interest in participation, and from GAO's coordinated methodological approach. The project is a clear case of how GAO methods can be used successfully. Other GAO mail surveys use many similar methods: a teamwork approach, face-to-face pretesting, typeset quality questionnaires, personalized mailings, and multiple follow-ups. The patent survey is distinguished within GAO, however, because of the combination of team diversity, rapid project implementation, the use of telephone prenotification and reminders, and high response rate.

6. Concluding Thoughts About Team Approach

The Patent Survey is a good example of GAO teamwork from a diverse group including generalists, research specialists, statisticians, attorneys, and managers. This effort represents a case study of how generalists can work with specialists to conduct quality research. The survey dealt with complex substantive issues in a sound manner, was designed in a timely fashion, and achieved a high response rate.

In particular, the authors believe that the following contributed to the success of the GAO Patent Survey:

(1) The depth of background research before conducting the mail survey led to an understanding of complex issues that helped focus the inquiry.

(2) The face-to-face pretesting of the mail survey questionnaire resulted in revision of question wording. Clarification of the questions reduced the effort needed by the respondent to complete the questionnaire and improved the response rate.

(3) Telephone calls to identify the attorney in each company who should receive the mail questionnaire were critical to improving response rates. These calls also served to identify ineligible organizations and to alert the respondent to the survey.

(4) Successful management of the evaluator team resulted in strong project coordination and clearly defined responsibilities. Upper level management provided consistent support and made timely decisions.

(5) Less tangible, but also important, was the feeling of camaraderie that developed during the project. The staff made exceptional efforts under deadline pressure to work together and get the job done.

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DETERMINATION OF QUOTA CONCENTRATION AMONG PEANUT PRODUCERS USING THE USDA "SMART CARD" DATA SYSTEM

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The peanut program, like many other commodity programs, supports producer income by ensuring producers of a higher minimum market price than they would have received without government intervention. In other commodity programs, such as wheat and corn, funds for price supports come directly from the federal treasury. The peanut program, however, transfers the cost of its supports from the federal government to consumers² through the interaction of several mechanisms--price supports, marketing quotas, and import quotas. The federal government outlays for the peanut program are relatively low because consumers essentially support the program through higher prices for peanuts.

Although the program controls the price of all peanuts produced in the United State, the major beneficiaries of the program are peanut quota holders. Despite all the effort and resources directed toward supporting their income, very little is known about these quota holders. Specifically, it was not known how many producers actually control available quota or the size of their operations. During Farm Bill debates in the Congress, peanut producers testified that peanuts in the United States are grown on primarily small family farms.

In this study we analyzed the concentration of U.S. peanut quota among peanut producers using the U.S. Department of Agriculture's (USDA) "smart card" data system. This system is part of the extensive administrative apparatus necessary to administer and monitor a program which controls the marketing of all peanuts in the United States. Such monitoring is necessary to assure that only peanut quota holders receive the high peanut support price and that producers do not sell more quota peanuts than allotted.

Our analysis revealed, for the first time, that the benefits of the peanut program are concentrated in the hands of a very small number of peanut producers operating large agri-businesses. We were able to

develop this information by gathering USDA data collected from peanut producers who routinely supply this information to USDA in order to continue receiving the benefits of the program.

This paper discusses the little known "smart card" file, its characteristics, the data it contains, problems encountered in using it and the results of our analysis. The first section of the paper provides background on how the peanut program operates. The second section describes the smart card, how it is used and the data it contains. The third section presents the results of our study and conclusions.

Operation of the U.S. Peanut Program

The U.S. peanut program was instituted through the passage of the Agricultural Adjustment Act of 1933. Under this legislation Congress introduced a number of programs aimed at supporting farm prices and incomes and controlling production for several "basic crops" including peanuts. The programs mandated by the 1933 act and its amendments were intended to be temporary; they were to be terminated as soon as the president declared an end to the national emergency. Sixty years later, the peanut program is still in effect and has evolved into a complex set of regulations which controls the marketing of all peanuts in the United States.

The peanut program is administered by USDA's Agricultural Stabilization and Conservation Service (ASCS). It consists of a two-tiered price support system. Under this system ASCS sets a support price (quota loan rate) for edible peanuts consumed domestically (quota peanuts) and a significantly lower support price (additional peanut loan rate) for peanuts grown in addition to the quota peanuts. These nonquota peanuts are called additional peanuts. Under the program anyone in the United States can grow peanuts. However, only those producers who have quota are guaranteed the higher support price and are allowed to sell their quota peanuts on the domestic market. Those producers who grow additional peanuts (who in many cases may also be growing quota peanuts) are guaranteed only the lower additional peanut support

price. For the most part these additional peanuts must be exported or crushed for oil and meal.

In 1991, the price of peanuts sold domestically was almost twice the price of U.S. peanuts on the world market. The quota support price is based on the cost of producing peanuts in the United States. From 1982 through 1992, the average cost of production, as defined by USDA in setting the support price, was about \$463/ton -- close to the world market price. The quota support price, averaging \$697/ton, was 51 percent higher than the cost of production. This gap first appeared in 1982 when the support price was set at a level 41 percent above costs. This gap has been perpetuated by a cost escalator clause in the legislation which requires the quota support price to increase each year in response to increases in the cost of producing peanuts. The legislation however, does not require the quota support price to decrease if costs decrease. As a result, the margin between the support price and the average cost of production has increased steadily since 1982 and, in the absence of new legislation, is not expected to decline in the near future.

Quota peanut producers receive the higher quota support price for their peanuts, even if those peanuts have been damaged by weather, insects or disease and can not be sold commercially for human consumption. In addition, if quota producers are unable to harvest part of a crop, due to drought for example, the amount of their underplantings can be carried over to the next year and is not counted against that year's quota production.

Given the benefits described above, peanut producers are understandably enthusiastic about participating in the program. The government, however, limits the quantity of peanuts which can be marketed at the higher quota support price. Some form of quantity restriction is necessary to maintain the quota support price at its high level. Without these restrictions, the benefits of the program represented by the 51 percent margin between the quota support price and average costs of production, would make it attractive for new producers to enter the market and existing producers to expand production. This process would continue until the domestic market price equalled the marginal cost of production thus eliminating or "bidding away" the benefits of the program. The marketing quota restricts the amount of peanuts that producers may sell in the domestic market at the high support price, to the amount that USDA estimates consumers will buy at that price.

While the quota maintains the government support price it, in effect, gives the quota holders monopoly rights to the benefits of the program. Therefore, the quota is a tangible financial asset contributing to the quota holders personal wealth. Quota

can be rented, sold or passed on to the quota holder's estate.

The peanut quota is a marketing rather than a production quota. Therefore, producers may produce more than the quota amount. As described above, however, these additional peanuts generally can not enter marketing channels for domestic edible peanuts. Instead they must be exported as edible peanuts or crushed and sold as peanut oil or meal. Producers of additional peanuts can sell their peanuts for export at the world market price through direct contracts with exporters. Otherwise their peanuts can be placed under government loan in producer pools for the guaranteed minimum additional peanuts support price which is considerably lower than the quota support price. At the end of the year, peanuts left in the pool are crushed and sold for oil and meal at the prevailing prices on the oil and meal market.

In addition to the mechanisms described above, an import quota is also used to maintain the support price by preventing lower priced import peanuts from entering the domestic market. The import quota insulates the domestic market from world market signals and prevents declines in the high support price due to competitive imports.³

The USDA Peanut Smart Card

In order for the peanut program to work, USDA must administer, monitor, and police the national poundage quota system to make sure that producers do not market more than the amounts authorized. This requires information on the quantity and sale of both quota and nonquota peanuts. In order to market peanuts commercially in the United States, it is mandatory for producers to participate in the program. Compliance is enforced through strict sanctions against violators in the form of high fines, penalties, and forfeiture of quota rights.

USDA administers all federal commodity programs at the county level through its county offices. As is the case for all federal commodity programs, owners and operators of peanut farms in the U.S. must register their farms with USDA at the county office. Each farm is given an official number. In the peanut program, peanut poundage quota is allocated and assigned to individual farms generally based on previous production history.

To control the peanut poundage quota system, USDA issues identification and marketing cards to producers on each farm to keep track of each producer's share of quota peanuts. These cards are referred to as "smart cards". They are plastic cards similar in size and function to a credit card. The cards are imprinted with a computer micro-chip containing, farm identification

data including the USDA farm number, operator name, producer names, social security or IRS business ID numbers, and total quota assigned to the farm. Most importantly the card lists the percent share of quota each producer can market from that farm. Some farms can have more than one producer. However, the smart card does not list the owner of the farm if the owner is not also the producer actually engaged in farming. USDA has used the computerized smart cards since 1986 to replace the old cardboard system previously used.

No peanuts can be marketed in the United States without a marketing card issued by ASCS. Although ASCS allocates peanut quota to individual farms and records the allocated amount on the smart card, information on the cards is not complete until the producer registers all contracts for export peanuts with ASCS. Export contracts must be registered by September 15 -- basically after harvest begins. These contracts have to be registered because USDA must also police peanut export sales to ensure that only quota peanuts are used in the domestic edible market and that peanuts purchased for export are in fact exported.

Each time a producer brings a load of peanuts to a buying point, the card must be presented. The smart card is inserted into a computer terminal by the buyer and the transaction is recorded. The card carries a history of all peanut sales and transactions conducted on that farm during the crop year and maintains a running balance of remaining quota or additional contract amounts. At the end of the marketing season, a producer must return the marketing card to the USDA county office.

Although USDA devotes considerable resources to policing the peanut quota sales at the farm level, the agency knew little about how much a single producer or large agri-business was benefitting from the program. Because the peanut legislation requires that USDA only account for and allocate peanut quota by farm, the agency did not have an interest in determining or evaluating how much quota is controlled, through ownership and rental, by a single individual producer, agri-business, or corporation. Thus, USDA concentrated only at the county level in ensuring that the sales of quota on individual farms did not exceed the amount of quota allocated or assigned to that farm.

Testimony given before Congress by USDA officials and peanut producer associations during debate over the 1978, 1981, 1985 and 1990 farm bills stated that peanuts in the United States are grown primarily on small family farms of 25 acres or less. This gave the impression that the peanut program benefits were highly dispersed and in 1990 went to as many as 42,000 U.S. farmers. It is generally known and recognized in today's agricultural economy that commodity producers

in the United States combine numerous individual farms, through ownership and rental, to form larger and more efficient single corporations, partnerships and other business operations, ventures, and arrangements. Because one producer can control numerous farms and thus the quota assigned to those farms, through ownership and rental, we believed it was necessary to determine exactly how much of the national peanut quota was controlled by each producer. Such an analysis would show exactly who received the benefits of the peanut program.

USDA's smart card system provided the perfect vehicle to provide an unquestionably accurate depiction of who benefitted from the peanut program. The smart card system could not be questioned because: 1) No one can market peanuts in the United States without obtaining a peanut marketing card; 2) Smart cards are issued only to peanut producers by name and social security or business ID number showing the amount of quota authorized to be marketed from the farm; and 3) it is used by USDA as an internal control system to police and control the quota system for violations.

Neither USDA headquarters nor its county offices accounted for or compiled quota allocations and sales by producer or business. It was obvious, however, that the amount of quota controlled and sold by an individual producer business could be summed by social security or business ID number if one could obtain the smart card data files for each peanut growing county or state. We knew each USDA county office collected and maintained smart card data files for each farm in the county on computer tape, but we did not know if the tape was ever uploaded to a central location. To collect the tape files from over 358 counties nationwide would have been much more expensive and time consuming than if the files were centralized in one location.

Sometimes government agencies such as USDA are so big that the employees and managers of the programs do not know themselves what data are available or where they are located. The U.S. peanut program was a case in point. Neither the peanut program director or his deputy could tell us if the county peanut data was centralized because, according to them, they had never used it and did not have a need to look beyond the individual farm basis. They did state that if it was centralized it would probably be physically located in Kansas city. As it turned out, Kansas City Missouri is the location of USDA's primary computer operations center named "The Office of Information Resources Management" (OIRM). This office has nothing to do with the peanut program except to capture and store computer data files generated by the peanut and other commodity programs run by USDA. Apparently, at some time in the past, OIRM circulated

an agency master list of computer files to all USDA offices serviced by OIRM. For some reason, someone checked off a box requesting OIRM to upload the smart card image file from all the county offices. After extensive investigation, interviewing, and data grubbing, we found that the 1988 crop year data was available and OIRM was getting ready to upload the 1991 data.

Results of the Analysis

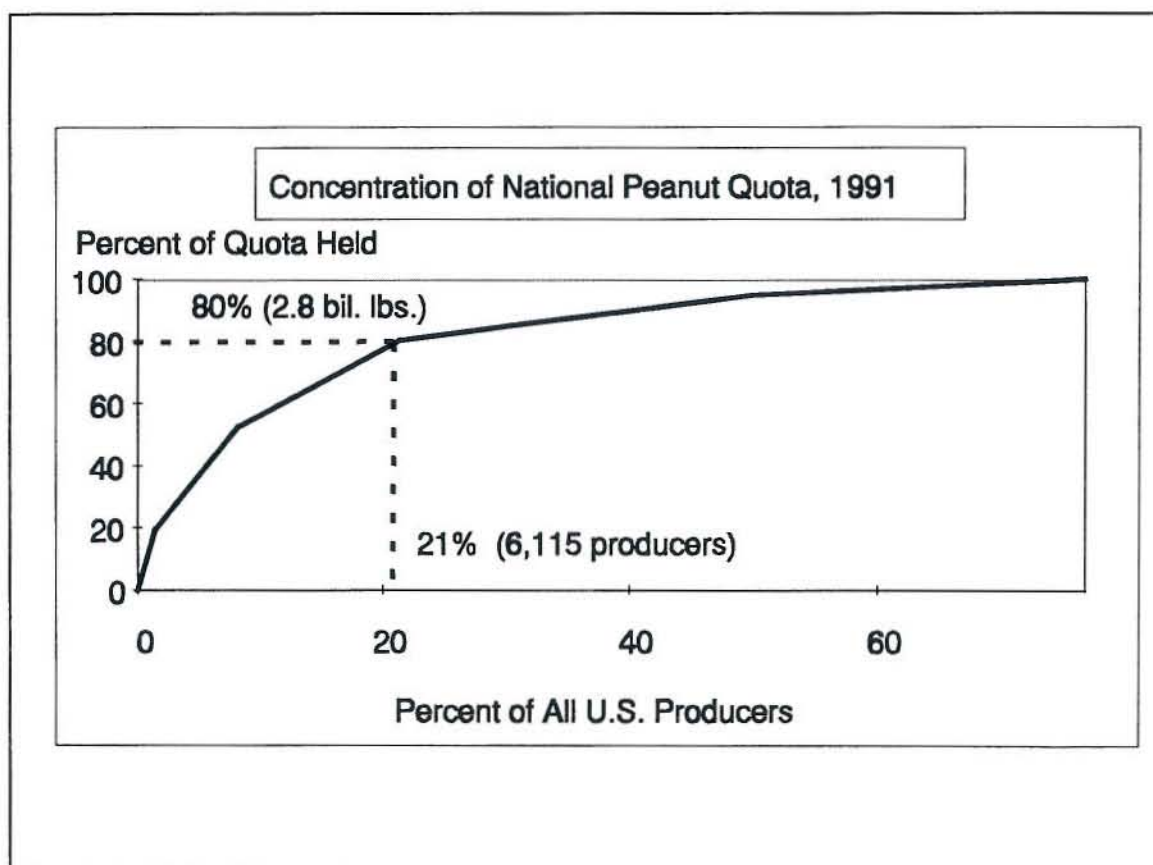
We used the data from the smart card files to determine how many producers controlled peanut quota and how much quota they controlled. This was done by sorting the file by producer identification number and then adding up the quantity of quota assigned to that producer on all the various farms from which the smart card data had been collected.

The results for 1991 are presented in the graph. It illustrates that peanut quota is concentrated in the hands of a relatively small number of producers. In 1991 there were 28,000 producers of both quota and nonquota peanuts. Of this total, 22,000 producers controlled peanut quota. About 6,000 producers (20 percent of all peanut producers) controlled about 2.8 billion pounds or about 80 percent of the total 3.5

billion pounds of quota available in 1991. This illustrates that most of the benefits of the program, in terms of potential gross income, go to only a few thousand producers. Although data on actual net income received by each quota peanut producer is not available, we can estimate the potential gross incomes of the 22,000 quota producers, assuming that quota production equalled the assigned quota and that producers sold their peanuts at the minimum support price of \$643/ton. We found, for example, the top 409 quota holders held between 1 to 18 million pounds of quota representing between \$320,000 to \$5,900,000.

Conclusions

Our study revealed, for the first time, that about 80 percent of the benefits of the peanut program are concentrated in the hands of a very small number of peanut producers (a little over 6,000) operating large agribusinesses. While it is not likely that we would have been able to elicit reliable information on the concentration of peanut quota through direct interview, we were able to extract highly accurate information collected by a third party, USDA, from producers who supplied the information in order to receive program benefits.



FOOTNOTES

1. The views expressed in this paper are the authors' and not necessarily those of the U.S. General Accounting Office.
2. Consumers in this case represent buyers at the first stage of production because we used "farmgate" level prices in our analysis.
3. This price decline depends on the extent to which imported peanuts can be substituted for domestically produced peanuts and peanut products.

GATHERING INFORMATION ON WILDERNESS AREA MANAGEMENT: THE PROBLEM OF CROSS JURISDICTIONAL ADMINISTRATION

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KEY WORDS: Questionnaire design, Forest Service, wilderness

The United States has a well established program for preserving land from development and motorized travel. On the federal level these lands are part of the National Wilderness Preservation System. These lands are administered by the U.S. Forest Service, the Bureau of Land Management, the National Park Service, and the Fish and Wildlife Administration. As of March, 1989 there were close to 91 million acres preserved as wilderness areas; 34.3 million in the 48 contiguous states (but federal wilderness areas are contained in only 42 of these states) and 56.5 million acres in Alaska.

The Forest Service, in the U.S. Department of Agriculture, is responsible for the administration of 32.5 million acres in the U.S.; 27 million in the contiguous states and 5.5 million in Alaska. This equals about 1 out of every 6 acres under Forest Service purview. The Forest Service received \$14.7 million for administering wilderness areas in fiscal 1989. This is up from \$7.7 million in 1985.

In early 1988 the U.S. General Accounting Office (GAO) received a letter from the Honorable Bruce Vento, Chairman of the Subcommittee on National Parks and Public Lands, House Committee on Interior and Insular Affairs. In the letter Congressman Vento expressed his belief that the Forest Service had been devoting only minimal resources to the management of wilderness areas. He therefore requested that GAO perform a review of the Forest Service's management of the wilderness areas it administers. He wanted the GAO to look into resource degradation in the wildernesses and Forest Service staffing and funding allocated to wilderness management.

In response to Congressman Vento's request GAO designed a study that used two primary methods. A team of GAO evaluators would personally visit 10 wilderness areas to examine the conditions on-site and to interview relevant Forest Service staff. It was also decided to mail a questionnaire to responsible officials to obtain a nationwide picture of conditions and

management practices in Forest Service wilderness areas.

GAO has had an extremely good track record with similar questionnaires going to similar respondent groups. Surveys of trail conditions and activity in National Forests and maintenance backlogs in National Parks had extremely high response rates and met the needs of their design quite well. The job staff felt that a questionnaire was an appropriate and efficacious method to gather the data needed to answer Chairman Vento's questions on a nation-wide scope. The design and implementation of this questionnaire is the focus of this paper.

I was the analyst that was assigned primary responsibility for the questionnaire. I worked with two GAO evaluators on the questionnaire as part of a team of 7 who carried out the review. The majority of the work was done between May and August, 1989.

The largest design consideration for the questionnaire was deciding on the unit of analysis. To determine the unit of analysis we had to look at how the Forest Service is organized and how wilderness areas fit into this organization. The National Forest system is first divided into regions. These are headed by a Regional Forester. Regions are then divided into National Forests, each managed by a Forest Supervisor. Finally, each forest is divided into Ranger Districts under a District Ranger. Wilderness areas were and are created with no concern for such divisions. They come about through Congressional legislation after review of roadless areas in the states. Because of their ad hoc boundaries, some wilderness areas cross district boundaries, some cross forest boundaries, and some even cross region boundaries. Yet some wilderness areas are so small that there can be two or more complete wilderness areas in one Ranger District, each with its own management needs.

Primary responsibility for the direct management of Forest Service wilderness areas is assigned to District Rangers, under the supervision of the Forest Supervisor. District Rangers are often assisted on the ground by Wilderness Rangers (the only Forest Service employees, other than District Rangers, with the title "Ranger"). Wilderness Rangers do most of the actual patrolling and work in the wilderness areas. The District Rangers, and their staffs, are responsible for measuring and controlling recreational use of wilderness areas; constructing and maintaining

¹The views expressed in this article are solely those of the author and do not represent the views of the U.S. government or the U.S. General Accounting Office.

trails, bridges, signs, and other facilities; administering livestock grazing permits; and the oversight of commercial users and permit holders, particularly outfitters and guides, on the wilderness areas.

I started the decision making process for the unit of analysis by talking with a number of Wilderness Rangers. I wanted to know their responsibilities, how widespread they were throughout the National Forest system, and their general impressions of wilderness area management. Other members of the team were talking with Forest Service headquarters staff and regional personnel. While in these discussions we learned that primary responsibility for management rested in the respective District Rangers, we also learned that the administration of small segments of wildernesses are sometimes left to adjoining Ranger Districts (Districts that contain much larger portions of the same wilderness area) to manage.

After discussing this information we decided that our unit of analysis would be the portion of the wilderness area that was contained in a Ranger district. This meant that one Ranger District could receive more than one questionnaire during the study if it was responsible for parts or all of more than one wilderness area. We also decided that the instruments would be addressed to the District Ranger. The district Ranger had the real responsibility for the management, and we knew that not all districts employed Wilderness Rangers.

A problem that we did not expect was that Forest Service Headquarters did have not a mailing list of Wilderness areas broken down by region. In fact they said that they did not even have a complete list of mailing addresses for all Ranger Districts in the National Forest system. We were told that most direct communication to the districts from headquarters took place by electronic mail. Other communication mostly took place via the Forest Supervisor's office. Headquarters did have a few addresses available. These were districts that completely contained a wilderness area within its boundaries. While headquarters did not have the mailing addresses for the others, they did have a list of the names of the Ranger Districts, the Wildernesses that were located within their boundaries, and the National Forests where the districts were located. Headquarters did have the addresses for the Supervisors of these forests.

With the information available, we realized that all our mailings would have to go through the Forest Supervisors' offices. To facilitate this process we created labels for the questionnaires that contained the Ranger District name, the wilderness area name and an identification number. We wrote cover letters to both the Forest Supervisor and the District Ranger. In the

letter to the Forest Supervisors we asked them to distribute the questionnaires to the identified districts. In the letter to the District Ranger we asked them to respond directly to us and not go through the Forest Supervisor. We mailed packets of questionnaires, with a cover letter to the District Ranger attached to each, and one cover letter to the Forest Superintendent. In this way we mailed instruments to the entire population of 587 Ranger districts responsible for wilderness area management.

We had one possible confounding factor in our research. Less than a year previously GAO had been asked to examine the state of the trail system in National Forests. To answer this request GAO mailed a questionnaire to Forest Supervisors asking about the conditions of the trails and activity on them. Some of this information was also asked in the wilderness questionnaire. We tried to make clear in the cover letters to the Forest Supervisor and District Ranger, and in the introduction to the wilderness area questionnaire that this was a new, separate request with a new, different instrument. As it turned out, the prior survey did not impinge on the current one at all.

We knew that in some cases that some districts did not take active management for a portion of a wilderness area and left it to a contiguous district. There was no way we could learn which districts did this before the mail out. We decided that if a district responded that they left it to another district we would count them as responding (for purposes of calculating response rate) but would not try to break out the answers from the district that did respond. We figured that while we would not have responses perfectly assigned to the official designated districts, the responses would be assigned to the districts that did the actual management activities.

As the decisions were being made before the mail out we were also undertaking pretesting of the instruments. GAO has found that thorough pretesting has been instrumental in obtaining extremely high response rates and has made it an integral part of the survey preparation process. Typically, for a mail questionnaire GAO travels to the location of the respondent and tries to replicate conditions that the respondent would face when they receive the instrument in the mail. The respondent answers all items in the questionnaire under the scrutiny of the GAO survey research analyst and an evaluator with subject matter expertise. Then the GAO personnel go over the answers with the respondent and discuss the thinking that led to the answers. This process usually takes one to three hours for each pretest.

For this instrument we pretested with 6 Ranger districts. We included three districts in the western U.S.

that manage only parts of a wilderness. Some of these were far from any population center. One was adjacent to the Denver-Boulder metropolitan area that has a very large outdoor oriented population. We also pretested with three eastern districts that completely enclosed small wilderness areas. In the pretests we usually talked with the District Ranger, their recreation specialist (the person responsible for such items as trails and campgrounds), and a Wilderness Ranger if one was employed by that district. We tried to have all people who would contribute to the responses to the instrument in attendance.

Specific questions in the instrument were developed to meet the original needs of the requestor. We paid particular attention to his desire to obtain information on resource degradation, and Forest Service staffing and funding for wilderness management. For the first, we asked questions on impact on the wilderness from use by visitors and external forces, trail and bridge conditions, and fire impacts. To meet the second, we asked about staffing from the district, supervisor's office, and volunteers; roles and experience of volunteers; and training of wilderness management staff. To learn of funding we asked about dollars formally appropriated for wilderness activities and money for general programs (such as recreation or fire prevention) that were spent in the wilderness. We also asked the opinions of the District rangers on the adequacy of staffing and funding, and the uses additional funding might be used for.

Because of our prior experience with the Forest Service we were not especially worried about a poor response rate. Typically, we received responses from over 90 percent of those on our mailing lists. A concern we did have however, was that we had surveyed Forest Service on a number of occasions in the recent years. The burden of the prior surveys could easily lead a potential respondent to refrain from answering. To deal with this concern we used two basic strategies. In the cover letters and introduction to the instrument we made it clear that the information was for Congress. Chairman Vento was well known for both his concern for the wilderness system and his desire to improve its management and funding. We made sure that the potential respondents knew that the information they provided would be used for decision

making in Congress on questions directly relevant to wilderness management. We also accepted Forest Service headquarters' offer that they send an E-Mail message to the districts urging them to respond. While we did accept their offer, we made sure that the message sent did not suggest possible answers or ask for copies of the responses to be sent back to Forest Service headquarters. We had no indication or any reason to believe that this happened.

We also used well established mail follow-up techniques to improve our response rate. The initial mailing of the questionnaire packets to the Forest Supervisor's Offices occurred in March, 1989. In both April and May we sent another packet, again containing a copy of the questionnaire for each non-responding district, to the Forest Supervisors. The cover letters were changed to urge response with less explanation of GAO's goals. We concluded our data collection in June, 1989, after receiving questionnaires from 540 districts, a 92 percent response rate.

Based on the results of the survey and 10 site visits around the wilderness system we wrote a report that contained a number of recommendations to the Secretary of Agriculture (the ultimate leader of the Forest Service). These recommendations included developing a baseline inventory on conditions in each wilderness area and monitor changes from the baseline, evaluate the need for existing Forest Service administrative structures in wilderness areas, establish a uniform national policy on outfitter and guide structures and facilities in wilderness areas, and compile information on funding and staffing needs to manage individual wilderness areas to meet the objectives of the Wilderness Act of 1964.

Chairman Vento was very pleased with the report and found it to be an excellent piece of work that was full of useful information. In his keynote remarks for the 25th Anniversary celebration of the Wilderness Act the chairman made many references to the report and cited GAO findings and recommendations. In 1990 an increased appropriation for wilderness management was passed by Congress. The Forest Service has also acted to meet GAO's recommendations. As of January, 1993, only two recommendations remained open, but work on these recommendations was scheduled to continue through October, 1993.

WHO REFUSES? A MULTIVARIATE ANALYSIS OF NONRESPONDENTS TO A FEDERAL SURVEY OF TRANSIT USE

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KEY WORDS: Nonresponse

1. Introduction

Survey nonresponse is the failure to obtain a measure on every sample member. Nonresponse error is a function of the *extent* of nonresponse and the *difference* between omitted and measured sample members with respect to a survey's subject matter. The first of these factors--the extent or rate of nonresponse--is easily determined. Knowledge about the second factor is rare by comparison. We generally know little about how nonrespondents differ from respondents in ways that are relevant to survey content.

There is little doubt that the best way to minimize nonresponse error is to obtain information directly from nonrespondents. In most cases, however, this is impractical due to the difficulty of contacting and/or converting nonrespondents. Instead, most research on nonresponse has focused on how nonrespondents and respondents differ on a relatively small set of sociodemographic characteristics.

The findings from this literature vary considerably. There is some evidence that males are less likely to respond to survey requests than females (Smith, 1979; Groves and Fultz, 1985; Lindstrom, 1983). Yet, Brown and Bishop (1983) and DeMaio (1980) found no gender difference in response rates. Bensen, Booman, and Clark (1951) and DeMaio (1980) found no correlation between age and response rate, but others have reported evidence that nonresponse increases with age (Herzog and Rogers, 1988; Dohrenwend and Dohrenwend, 1968; Hawkins, 1975). Education, on the other hand, has been rather consistently found to be inversely related to nonresponse (Groves, 1989). That is, lower education groups are more likely to be nonrespondents.

Studies of the relationship of race to nonresponse provide perhaps the best illustration of the variability of findings in the nonresponse literature. Some research reveals lower nonresponse among blacks (O'Neil 1979; Hess and Pillai, 1962; Hawkins, 1975), though DeMaio (1980) reports no racial difference in nonresponse. Herzog and Rodgers (1981) found that whites are less likely to respond in general, but that blacks are less likely to respond at later stages of a panel survey.

Benus (1971) reported that blacks have higher nonresponse in an election survey but found no racial difference in an economic survey.

Perhaps it is unrealistic to expect a uniform nonrespondent profile to emerge from a wide range of survey research endeavors. After all, there are multiple causes of nonresponse--including social, political and economic factors, aspects of survey design, and interviewer characteristics--that interact with various respondent attributes. Obviously, these conditions vary across different surveys.

Accepting that some degree of variation in the research findings might be considered normative, there are two other problematic aspects of the nonresponse literature that are less easily dismissed. One is the paucity of studies that examine differences between respondents and nonrespondents using multivariate analysis techniques. As Groves (1989, p. 186) has observed, it is unfortunate that most of the nonresponse literature examines "individual attributes of nonrespondents, ignoring multivariate relationships." The second problem occurs when researchers depend on vague or proxy sources of data about nonrespondents. Consider, for instance, the practice of obtaining information on nonrespondents from census data tapes. Because such information is usually available on aggregate units only, attributions to individual nonrespondents are approximations at best. Moreover, census data are not rich in variety; they may be out of date (depending on when a study is conducted); and like most other survey data, census data are subject to various types of measurement error.

The nonresponse study reported in this paper avoids both of these problems. With respect to the overdependence on vague or proxy sources of data on nonrespondents, we make use of a source of data that provides detailed and current information on all members--respondents and nonrespondents alike--of a large and diverse population. With respect to the lack of multivariate analyses of nonresponse, we use logistic regression to estimate the odds of nonresponse associated with a wide variety of personal characteristics, each one net of all the others.

2. Data and Methods

In November 1990 Congress passed the Treasury, Postal Service and General Government Appropriations Act of 1991 which, in order to encourage the use of public transportation, permitted federal agencies to provide transit benefits to its employees. Eligible employees typically receive \$21 per month to help defray the cost of using mass transit to commute to work.

Early in 1993 the U.S. General Accounting Office (GAO) conducted a sample survey of federal employees randomly sampled from a subset of the Office of Personnel Management's (OPM) Central Personnel Data File (CPDF). A brief questionnaire, requiring about 10 minutes to complete, was mailed to 1,800 executive branch employees who work at agencies that make the benefit available. Approximately twenty percent of the eligible sample members failed to respond to the survey. OPM agreed to provide information from the CPDF on all sample members (on the condition that personal identifiers be removed).

The Central Personnel Data File, a system of individual records for most Federal civilian employees, is updated and edited for validity on a quarterly basis using data derived from personnel reports submitted to OPM. As of December, 1992 there were 21 million active records in the data base. We found that, at the end of 1992, there were approximately 80,000 employees working in agencies that were participating in the transit benefit program. From a total of 55 variables, we selected fourteen that we judged to be potentially important predictors of nonresponse. A number of the "core" and "socioeconomic" variables--so labeled in Table 1--are also found in previous nonresponse studies. In addition, there are other variables (such as occupational series, tenure, and supervisory position) that are related to income, age, race, and education, but that have not been examined together with these variables in previous research.

3. Results

A number of trends can be observed in the "% Nonresponse" column in Table 2. First we consider the core variables of race, gender, age, medical disability and veteran status. Next, we consider income, education and occupation--three classic socioeconomic variables. Finally, we examine nonresponse trends as observed across categories of important conditions of employment in Federal service.

Referring to Table 2, Hispanics and blacks appear to have higher nonresponse than whites, and the group of Asians, Alaskans, and American Indians have the lowest

nonresponse of any of the racial groups. There is virtually no response difference between males and females and veterans and nonveterans. There is a slightly larger amount of nonresponse in the group with a reported handicap. Table 2 also reveals a nonlinear relationship between age and nonresponse. The "thirtysomething" age group appears to have a higher amount of nonresponse than those younger and those older.

The relationship between income and nonresponse appears rather straightforward. As income increase, nonresponse decreases. Similarly, sample members with a college degree or more education appear to have a lower amount of nonresponse than those with less education. Occupational status also follows this trend, with lower status, blue collar workers showing a higher level of nonresponse than white collar Federal employees.

There are some interesting trends in the relationship between nonresponse and the job-related variables. Some are consistent with those observed among the core and socioeconomic variables and some are not. Curiously, the relationship observed between employment grade and nonresponse--higher grades generally have higher nonresponse than lower ones--is clearly inconsistent with the income, education, and occupation relationships. Supervisors and employees with 25 or more years of service appear to respond at higher levels than their comparison groups. The latter relationship notwithstanding, employees in an initial probationary period have a slightly higher response rate. So too do Federal employees who work inside the District of Columbia. (If this is confirmed in the multivariate analysis, this may be due to greater visibility of the Federal Transit Benefit program within DC than in the SMAs outside of DC.) Finally, a very clear difference exists between intermittent employees (who have no prearranged work schedule) and part-time and full-time employees (who have prearranged work schedules).

Many, perhaps most, of the relationships described in the foregoing paragraphs make some sense intuitively. However, we do not know which are driven by "third," uncontrolled variables. For this reason, we turn next to the "Odds Ratio" column of Table 2 to examine the results of a logistic regression of a binary nonresponse variable (coded "1" for nonrespondents and "0" for respondents) on all of the personal characteristics. For any given variable, comparisons are relative to the omitted category, labeled "reference."

First we find that when comparing all other racial categories to whites (the reference category), only Hispanics are significantly different. The odds of nonresponse among Hispanics is 1.7 times greater than

among whites. No statistically significant response differences exist between males and females, veterans and nonveterans, or between those with a reported handicap and those without a reported handicap. (Recall that a small difference is observed in the bivariate approach.) The greater nonresponse of thirty to thirty-nine year olds observed in the bivariate approach is sustained in the multivariate analysis. The odds of nonresponse from a sample member in this age group, compared to a sample member nineteen to twenty-nine years old, is nearly 2 to 1. And yet, sample members forty years old or above are not significantly different from the youngest members of the sample.

Turning to the socioeconomic variables, we find that the only statistically significant relationship, controlling for the other variables, is between income and nonresponse. This relationship does appear to be linear, with the odds of nonresponse from sample members earning less than \$30,000 per year being over 2.5 times greater than those earning \$70,000 or more annually. (Note that the middle two income categories do not appear to be different from one another.)

Finally, examining the remainder of the odds ratios, we learn that of all the differences we observed in the job-related variables under the bivariate approach, only the GS-10 to GS-12 categories of the Grade variable have significantly lower nonresponse (odds of about .5 to 1), and intermittent employees have much higher nonresponse (odd of about 4 to 1). The relationships suggested using the bivariate approach involving supervisory position, tenure, length of service and geographic location are not sustained in the multivariate analysis.

4. Discussion

Under conditions of statistical control, almost all of the bivariate differences between respondents and nonrespondents turned out to be more apparent than real. Among the core variables of race, gender, age, medical disability and veteran status, the only significant differences in nonresponse are between Hispanics as compared to whites and employees in their thirties as compared to employees in their twenties. Contrary to other nonresponse studies, no black vs. white differences are observed, gender differences are not observed, and there is no difference between the oldest and youngest respondents. It is unlikely that handicap or veteran status has been examined before. We found no relationship between these factors and participation in the survey.

Among the socioeconomic variables of income, education and occupational status, *it is one's level of*

income rather than years of educational attainment or blue collar versus white collar status that matters. We found an inverse relationship between income and nonresponse; that is, as income increases nonresponse decreases. The difference is not insubstantial. Compared to employees earning \$70,000 and more, those earning less than \$70,000 had at least twice the odds of not responding and those earning less than \$30,000 had two and one-half times greater odds of nonresponse.

Studies of nonresponse using household survey data typically report a direct relationship between income and nonresponse. The opposite finding reported here invites speculation about why, in household surveys, nonresponse increases with income, whereas in an employee survey nonresponse decreases with income. We surmise that when a survey is conducted in a household two response barriers increase with income. One of these barriers is *noncontact*. People with higher income spend more time away from home, whether at work or engaged in various leisure activities to which their greater resources give them access. The other household survey response barrier, we believe, is simply *refusing* to be interviewed. Because of the connection between time and money, people with greater earning power are likely to generalize the higher value of their time to non-workplace contexts. Thus, viewing the time they spend at home as more valuable, the psychological cost of giving an interview is greater for higher income respondents.

One might expect that similar dynamics operate at the workplace, thereby driving a direct relationship between income and nonresponse in an employee survey. However, the fact that we found a robust negative relationship between income and nonresponse in the present study suggests otherwise. We thus hypothesize a more powerful dynamic, working in the opposite direction to that discussed above. We maintain that, in the workplace, the more alienated workers are, the less likely they are to participate in a survey. We need merely observe, then, that employees paid less for their labor are more alienated from their labor than are those who are paid more. Because lower income respondents are more alienated from their labor, they are also more likely to fail to respond to an employee survey.

The strength of the relationship between income and nonresponse seems to account, at least in part, for the bivariate associations between the job-related variables and nonresponse. Net of income, neither being in an initial one or two year probationary period, nor being a supervisor, nor length of federal service is significantly related to nonresponse.

Curiously, GS-10 through GS-12 level employees have only about half the odds of failing to respond as employees at the GS-15 level. We do not have a satisfactory explanation for this outcome. It may be due to interactions among the variables, which we did not test.

In contrast to many previous investigations of nonresponse, this study employs individual rather than aggregate level data. These data are maintained, validated and updated on a regular basis by the Office of Personnel Management. The data analyzed in this study were current as of one month prior to the date the survey went into the field. Another advantage afforded by OPM's Central Personnel Data File is the relatively rich variety of information available at the level of the individual. We have been able to examine relationships among a wide range of individual level variables and nonresponse, rather than depend on data on only a few demographic variables.

A limitation of this study is its primary focus on occupational data. Ideally, a study of nonresponse would employ indicators of the full range of factors hypothesized to cause individuals to fail to participate in a survey. For such purposes, additional measures of respondents' social milieu, psychological predisposition, and immediate environment at the time of the survey request are needed. It is also desirable to understand how study design, interviewer characteristics, and the interaction between the interviewer and respondent affect nonresponse.

Note: The authors are Social Science Analysts in the Resources, Community and Economic Development Division of the U.S. General Accounting Office. All statements in this paper are the authors' and do not necessarily represent the position of the U.S. General Accounting Office.

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Table 1. Personal Characteristics

Core Variables

Race	(1 = American Indian, Alaskan Native, Asian or Pacific Islander; 2 = Black, not of Hispanic Origin; 3 = Hispanic; 4 = White, not of Hispanic Origin)
Gender	(1 = Male; 2 = Female)
Medical Disabilities	(1 = A physical or mental handicap; 2 = No handicap identified)
Veteran Status	(1 = Veteran status; 2 = No veteran status)
Age	(1 = 60+; 2 = 50 - 59; 3 = 40 - 49; 4 = 30 - 39; 5 = 19 - 29)

Socioeconomic Variables

Income	(1 = < \$30,000; 2 = \$30,000 - 49,999; 3 = \$50,000 - 69,999; 4 = \$70,000+)
Education	(1 = High school degree or terminal occupational program or less; 2 = Some college; 3 = Bachelor's degree and higher)
Occupational Series	(1 = Blue Collar Occupational Codes; 2 = White Collar Occupational Codes)

Job-related variables

Supervisory Position	(1 = Supervisor, Manager, Leader; 2 = All other positions)
Grade	(1 = GS0 - GS7; 2 = GS8 - GS9; 3 = GS10 - GS11; 4 = GS12; 5 = GS13; 6 = GS14; 7 = GS15+)
Tenure (RIF code)	(1 = In probationary period; 2 = Completed or didn't serve probationary period)
Work Schedule	(1 = Intermittent employee, no prearranged schedule; 2 = Part-time; 3 = Full-time)
Length of Service	(1 = < 5 years; 2 = 5 - 14 years; 3 = 15 - 24 years; 4 = 25 - 51 years)
Geographic Location	(1 = Does not work within Washington, D.C.; 2 = Does work within Washington, D.C.)

Table 2. Personal Characteristics, Percent Nonresponse, and Odds Ratios

VARIABLES	CATEGORIES	n	% NONRESPONSE	ODDS RATIO
CORE VARIABLES				
Race	Asian	49	14.3	.59
	Black	351	25.9	1.2
	Hispanic	54	29.6	1.7*
	White	1022	19.7	reference
Gender	Male	814	21.5	1.2
	Female	662	21.2	reference
Age	60 and over	113	19.5	1.2
	50 - 59	296	17.6	1.0
	40 - 49	530	21.9	1.3
	30 - 39	350	26.0	1.9***
	19 - 29	187	18.2	reference
Medical Disabilities	Handicap	52	23.1	1.2
	No handicap	1424	21.3	reference
Veteran Status	Veteran	305	21.6	1.0
	Not a veteran	1171	21.3	reference
SOCIOECONOMIC VARIABLES				
Income	Less than \$30,000	442	26.8	2.6**
	\$30,000 - 49,999	467	21.8	2.0*
	\$50,000 - 69,999	360	19.2	1.9*
	\$70,000 and over	227	13.7	reference
Education	High school or less	352	23.3	.80
	Some college	314	24.8	1.0
	Bachelor's degree plus	809	19.2	reference
Occupational Status	Blue collar	58	34.5	1.5
	White collar	1418	20.8	reference
JOB-RELATED VARIABLES				
Supervisory Position	Supervisor, etc.	368	17.7	1.0
	All others	1108	22.6	reference
Grade	GS0 - GS7	160	14.4	.82
	GS8 - GS9	220	20.9	.81
	GS10 - GS11	188	14.9	.46**
	GS12	150	16.0	.54**
	GS13	143	25.9	.91
	GS14	318	25.5	.80
	GS15 and over	297	25.6	reference
Tenure (RIF code)	In probationary period	222	18.9	.79
	Completed probation	1254	21.8	reference
Work Schedule	Intermittent	23	56.5	4.1***
	Part-time, Full-time	1452	20.8	reference
Length of Service	Less than 5 years	253	21.3	.81
	5 - 14 years	456	21.5	.69
	15 - 24 years	475	22.7	.99
	25 - 51 years	292	18.8	reference
Geographic Location	Outside D.C.	478	24.3	1.1
	Inside D.C.	998	19.9	reference

* p < .10 ** p < .05 *** p < .01

COLLECTING MALPRACTICE INSURANCE AND CLAIMS INFORMATION FROM HEALTH CENTERS

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KEY WORDS: Questionnaire, nonrespondent
interview, health

INTRODUCTION

Community and migrant health centers provide prevention-oriented primary care to medically disadvantaged and underserved populations located throughout the United States and its territories. Essentially, this care includes diagnostic laboratory and radiology services, emergency medical services, preventive dental care, and physician services. In addition, some centers provide mental health services and ambulatory surgical care.

To assist the centers in providing services to those in medically underserved areas, the centers are awarded grants through sections 330 (Community Health Centers) and 329 (Migrant Health Centers) of the Public Health Service Act. Although the grant funds are usually not the only source of funding, these funds are essential to the centers' operation.

As with other health care providers, the centers have been experiencing rising health care costs, especially those costs associated with medical malpractice insurance. Anecdotal evidence and information from past studies indicate that centers are paying high premiums for medical malpractice insurance, especially considering centers' limited claims experience. This has resulted in reduced services and people in need having to search for these limited services. An Institute of Medicine survey found that in 1988, nearly half of the centers had restricted or eliminated services--especially obstetric services--because of increasing malpractice insurance costs.

As the populations with the greatest need for health care--the poor, pregnant women, the HIV-infected, and the uninsured--continue to grow, the centers are concerned that these populations may be denied necessary services. In an attempt to solve this dilemma, the centers have asked the Congress to assist them in reducing or eliminating their rising malpractice insurance costs.

ROLE OF THE GAO

In response to these centers' concerns, the Congress requested in 1991 that the U. S. General Accounting Office (GAO), an investigative arm of the Congress, assess the availability and cost of center medical malpractice insurance. In addition, the Congress asked GAO to conduct a study identifying alternative methods of medical malpractice insurance coverage that would help the centers obtain malpractice insurance at a lower cost. These methods include (1) the federal government's assuming liability under the Federal Tort Claims Act, (2) the centers' establishing a risk-retention group for self insurance, and (3) the centers' purchasing insurance through a national risk-purchasing group.

SURVEY DESIGN

Since we had, in an earlier report, identified that center-specific medical malpractice claims information was outdated and incomplete, we knew that all 520 individual centers (located in the United States) would need to be surveyed and relevant claims and insurance information would need to be collected. Due to the magnitude and complexity of the data, as well as our limited resources, we felt the data could only be collected using a mail questionnaire (instrument.)¹

As we began initial survey planning, we learned that the Department of Health and Human Services (HHS),² as well as GAO, was very concerned about the centers' malpractice insurance situation and was about to begin its own data collection effort. After some coordination, both agencies agreed that we would design the questionnaire, with HHS assistance, and the data would be available to HHS once our report was released.

The questionnaire would provide us and HHS with descriptive information about each center's malpractice insurance situation. However, assessing each of the three methods for lowering malpractice insurance costs and constructing appropriate models required expertise in the highly specialized area of the medical malpractice insurance market. For this portion of the study, we contracted with an actuarial consultant³ to analyze information from the questionnaire and develop cost and savings estimates.

Background

In conducting mail surveys, we apply many of the techniques that make up the Total Design Method (TDM) (Dillman, 1978). TDM is an example of a systems approach that applies various techniques in a way that influences the potential respondent and increases the likelihood of a high response rate. Using the theory of social exchange, the TDM approach (1) focuses on why people respond to questionnaires and (2) guides researchers through designing and implementing a mail questionnaire, accentuating every detail that might affect the potential respondent's behavior.

Some techniques, including those applied in TDM, have been identified consistently as reasons why people return questionnaires. These techniques include sending pre-survey notification letters, personalizing correspondence, having a topic that is salient to the respondent, identifying government sponsorship, using special postage, and conducting follow-up mailings (Dillman et al, 1984; Heberlein and Baumgartner, 1978, 1984; Fox, Crask, and Kim, 1988; and Nederoff, 1988). Researchers have not always agreed on which technique or combination of techniques most influence whether a respondent completes the questionnaire. They do agree, however, that every technique must be carried out with thought and attention to detail. Only then will the techniques make a difference.

Questionnaire Design

Once we decided that a mail questionnaire was the appropriate method for our survey, we began focusing on the tasks that would require our highest priority. We knew that these data were essential to our survey. Since three previous attempts to collect the centers' malpractice insurance and experience data had resulted in low response rates,⁴ we had to design a questionnaire that the centers would be willing to answer and return to us if we were to be successful.

The issue of saliency was key to this effort. The centers and associations lobbied the Congress heavily to provide some type of malpractice insurance assistance to the centers, saying that the cost of medical malpractice insurance was ridiculously high, relative to the actual low number of claims. We believed that because of the saliency of this issue, we would obtain a high response rate: The centers would (1) be eager to get some malpractice insurance relief and (2) see our questionnaire as an appropriate mechanism to get action.

As with any salient issue, there is the potential to get a negative reaction from the respondents. For this survey, we were concerned that centers with a high number of claims might not respond because the survey results would reflect poorly on the claim history for all the centers.

While saliency of an issue provides an incentive for a respondent to complete a questionnaire, the respondent must also provide reliable and consistent information. To ensure that the information meets these requirements, the writing of questions becomes an important aspect of questionnaire design. Emphasis must be placed on (1) asking questions that will get the desired information, (2) determining the most appropriate structure of the questions, open-ended versus closed-ended, and (3) using words that are easy to understand.

We spent a large portion of time designing our questions to be clear, concise, and balanced. Since most of our questions asked for factual and behavioral information, we wanted to ensure that we would obtain comparable information from each center. If the questions were to be interpreted uniformly, we could not afford to use vague or unfamiliar language, despite the complexity of the topics. For instance, in asking about claims brought against the center, we needed to define when an action against the center is considered a claim rather than a complaint. In addition, when focusing on policy provisions, each general term had to be defined and operationalized into its simplest meaning.

After reviewing questionnaires that were used in previous surveys, we felt that the length and complexity of these instruments may have been one of the reasons for their low response rates. The length of our questionnaire was restricted to only asking questions that were essential to our analysis of the centers' policies and experience with claims. In addition, we worked with our actuary to focus on key information needed for her analysis and to make adjustments to minimize the burden on the respondents. We coordinated our efforts with HHS to determine what information the agency could provide rather than asking the centers for it. In addition, early in the questionnaire design phase, we worked with directors from two centers to learn about information that would be difficult for the centers to provide.

Format and Content:

The format of our questionnaire consisted of three individual questionnaire booklets. We believed that the

three booklets would be helpful to the respondent and would not be as cumbersome as one lengthy questionnaire. In addition, if more than one person was involved in completing the questionnaire, the separate booklets might ease the process. We also wanted the centers to complete a separate claim form for each claim filed during a 6-year time period and a separate policy form for each policy the center paid for during 1991. Therefore, we provided 6 blank claim forms and 15 blank policy forms. To differentiate these blank forms from the rest of the questionnaire booklets, we printed them in a different color.

Each booklet focused on specific topics. In the first booklet, we asked for information related to the center's section 330 and 329 grants and revenues. In addition, we asked about the center's medical malpractice insurance coverage for their health care professionals--physicians, dentists, and mid-level professionals. In the second booklet, we asked about medical malpractice claims that had been filed against the center since 1986. In the third booklet, we asked about the center's medical malpractice insurance premiums and policies.

Cover Design:

Once we had a preliminary draft of the questionnaire booklets, we began designing a cover for the overall questionnaire. Since the cover is the first thing the respondent sees, we used a pocket folder as our cover. We wanted the questionnaire, consisting of three booklets in one packet, to be presented as one questionnaire under the general title of "Medical Malpractice Insurance Costs and Claims." We were concerned that if the respondent initially saw three booklets and did not read the cover letter, he or she might immediately toss everything into the trash. We hoped that the respondent would be curious enough about the folder to read the cover letter.

Cover Letter:

The cover letter is critical to the success of this type of data collection effort; it is the key to the completion of the questionnaire. Serving as our ambassador to the respondent, this letter must clearly explain the purpose of the survey, convince the respondent the survey is warranted, emphasize the importance of information that only the respondent can provide, and describe what the respondent must do. Without providing this valuable information, the researcher may not obtain that ultimate goal--completion of the questionnaire by the respondent.

The first priority of our cover letter was to establish credibility. We wanted the tone to be concise and informative, as well as persuasive, but not mandatory. We began by briefly describing what the Congress had asked us to do. We also emphasized that we were part of an independent agency and that the results of our study would be reported to the Congress. In addition, we identified the type of information we needed. While the issue of medical malpractice insurance assistance was important to the centers, they knew very little had resulted from previous questionnaire studies, by other organizations, requesting similar information. We hoped to establish trust with the respondents, assuring them that GAO was a legitimate organization that would provide the Congress with accurate information, a first step toward change.

In an attempt to persuade center respondents to read each questionnaire booklet before they made a quick decision that our questionnaire packet would be too burdensome to complete, we briefly described, in our cover letter, the contents of each questionnaire booklet. In addition, we explained that we had worked with center directors to determine the availability of the information requested and the amount of time that might be necessary to complete the questionnaire. In return for the centers helping us complete our study, we stated that we would send a copy of our report once completed. Again, we wanted to show the respondent that he or she was important and that the results of his or her efforts in completing this questionnaire would be presented in our report.

We limited our cover letter to 1 typed page, emphasizing consideration of the respondent's time as well as our appreciation of his or her effort in completing the questionnaire. As recommended in Dillman's TDM, we personalized the letter, using an individualized salutation and a blue-ink signature to emphasize that this was not a form letter. We also thanked the respondent and provided the name and phone number of a GAO staff person he or she could contact if necessary.

Through these efforts, we tried to convince the respondent that completing the questionnaire was most important.

Pretesting

At GAO, pretesting a questionnaire is an essential step in the questionnaire design process. Some researchers in other organizations spend a minimal amount of time

pretesting due to the associated costs--time and staff. GAO, however, will spend as much time as possible to perfect a questionnaire in order to obtain quality results. In part, this is because the results of our studies play an important role in determining national policies.

We conducted our pretests using, what we call, cognitive process pretesting, that is, face-to-face interviews with respondents who would be recipients of the questionnaire. We pretested with officials at eight centers located in four states. These centers were selected according to (1) the amount of their section 330 and 329 grant funding (small versus large grants), (2) types of services provided (primary only versus primary care and surgical care, including obstetrical care), (3) location of patients being served (urban versus rural), and (4) number of clinics that were supported by the section 330 and 329 grants (single versus multiple). We were interested in visiting centers that would give us a clear picture of the different types of centers that would be responding to our questionnaire.

During the pretest, we observed how the respondents completed the questionnaire to determine how well it worked. Specifically, we observed (1) how much time was needed to complete the questionnaire, (2) whether questions were answered from memory or whether files were used, (3) what nonverbal behavior and body language occurred while answering specific questions, (4) which questions were left unanswered or answered incorrectly, and (5) whether instructions and formatting seemed easy to follow.

As soon as the respondents completed the questionnaire, we held a debriefing session with each respondent. During this session, we discussed his or her answers and our observations. From these sessions, we learned how the respondents felt about specific questions and if they were understandable, relevant, objective, unbiased, and nonthreatening. In addition, we encouraged each respondent to be critical and asked for his or her help in identifying any problems encountered.

This session also proved extremely helpful in identifying terms that needed to be defined. For example, for policies that provided "tail" coverage,⁵ we assumed that the respondent would be familiar with the term because a policy would actually include the term as an indicator for the appropriate information. During the pretests, we learned that some policies did not use tail coverage even though coverage for the term was provided. Another term that proved to be difficult to understand was "excess" coverage. The respondents indicated that they understood the term and responded to the question, but

their responses indicated that each respondent interpreted the term differently from each other and from us.

Through our pretesting, we learned which questions respondents found burdensome to answer. Because some centers did not automate any of their records, respondents needed to review individual records in order to answer our questions on malpractice insurance coverage of the center's health care professionals. During the pretest, we were asking for information about the coverage for all health care staff employed by the center. Because answering this could be burdensome, depending on the size of the center's staff, we revised our questions on coverage of health care staff, after consulting with our actuary, to include only physicians, dentists, and midlevels--physician assistants, nurse practitioners, and nurse midwives.

Another series of questions respondents found burdensome were those asking for policy information. During our first pretest, we found that the 3 years of policy information we were asking the center to provide, although available, would place a tremendous burden on the respondent. At one center, we learned that to provide this information, the center would need to complete about 50 forms for each year requested. Although the respondent was willing to provide the information, we felt that making such a request of the centers seemed unreasonable given the heavy demands on the centers' staff. Thus, we reduced the number of years requested to only one.

Pretesting at the centers gave us the opportunity to observe the centers' day-to-day activities. We observed directors operating under tight time constraints; responding to urgent requests from their staff, patients, and board of directors; functioning in office spaces of varying sizes; and using manual, as well as automated, techniques to collect and maintain clinic information. Through these observations, we got a clear indication of the problems some directors might experience in completing our questionnaire. In addition, we could appreciate the need for a limited number of questions that were concise and easy to understand. As a result of our pretesting efforts, we were able to revise our questionnaire addressing the concerns and problems the respondents identified.

Initial and Follow-up Mailings

While researchers pay considerable attention to the questionnaire and cover letter, the initial and follow-up

mailing should also receive attention. Throughout the mailing process, communication with the respondent must (1) convey how important the respondent is to the researcher and (2) convince the respondent to complete the questionnaire.

Initial:

The main focus of the initial mailing was to prepare a mailing package (that is, a mailing envelope containing the cover letter, questionnaire packet, and a return envelope) that the respondent would open. To accomplish this, we did the following: We spent time verifying the names and addresses of the centers. We assembled the packages so that the cover letter would be the first item encountered when opening the envelope and that the package include a preaddressed, postage-paid return envelope. In addition, we decided that our mailing date should not coincide with the deadlines for preparing HHS reports and annual financial statements that might interfere with the centers' completing our questionnaire. This decision was based on (1) information obtained from the center directors during the pretests and (2) HHS identification of key dates for annual staffing, financial reports, and the grant submission process. Then, once the package was assembled, we mailed it, using first-class postage.

Follow-up:

Our first follow-up usually occurs shortly after the initial mailing date. But for this survey, the first follow-up took place about 5 weeks after the initial mailing. During the first few weeks after our initial mailing, we received numerous telephone calls from the centers requesting additional time to complete the questionnaire. Therefore, we extended the return date and delayed our follow-up mailing.

For this first follow-up, we sent a letter to each center that had not returned a completed questionnaire. We reminded the center that the study was still ongoing and encouraged a reply. As with the initial mailing, this follow-up prompted the centers to call and ask for an extension. Since many of these centers had to get claim information from their insurance brokers, which usually takes about 4 to 6 weeks, we were encouraged that the centers would respond.

For our second follow-up, about 6 weeks after the first, we mailed a complete package, via federal express, to each center that had not been in contact with us. We

felt that the contents of a federal express package would be perceived as an important document; therefore, the center would open the package and review the contents. In addition, to get the center to read the follow-up letter, we used blue paper rather than the white paper used in previous mailings. We thought that the difference in color might get the respondent's attention.

About 1 week after the second follow-up, we sent a letter to those centers that had not returned a questionnaire but had contacted us earlier asking for an extension. The purpose of this letter was to remind the centers about completing the questionnaire and, if they were experiencing any difficulties, encouraging them to contact us for assistance. This letter resulted in quite a few inquiries for help.

Response Rate

As a result of all these efforts, we received a response rate of 73 percent. From our initial mailing, we obtained a 40 percent response rate. After our first follow-up, our response rate increased to 59 percent and after the second it reached 73 percent.

Nonrespondents:

Although our goal was to obtain at least an 80 percent response rate, about 27 percent of the centers did not respond. To establish whether any systematic difference existed between those who responded and those who did not, that is, nonresponse bias, we conducted a structured telephone interview of a random sample of the nonresponding centers. The results of these interviews allowed us to make statistical estimates about the nonrespondents.

First, we identified the information that was essential to our analysis, such as the number of medical malpractice insurance policies purchased, malpractice premiums paid on these policies, and the number of claims filed. Then, we identified questions in the mail questionnaire that were used to collect this information. Unlike the questions in a mail questionnaire, questions in a telephone questionnaire require the respondent to hear and comprehend each word without any assistance from visual cues. With this in mind, we modified the questions in the mail questionnaire--without changing the meaning of any questions--so that they could be asked over the telephone. A comparison of the nonrespondent sample to the respondents did not show substantial differences in their distributions on the three

key variables--number of policies, number of claims, and amount of premiums.

CONCLUSION

By satisfying the needs of the respondents while focusing on the quality of the data we needed to collect, we designed a questionnaire that the respondents were willing to complete. The preparation and implementation for each step of the survey--questionnaire design, mail, and follow-up process--collectively achieved a 73 percent response rate. Throughout this survey, we used various techniques to encourage a high response. Using Dillman's TDM, we attempted to build respondent trust, minimize respondent burden, and maximize the importance of the respondent. The key to our success was (1) establishing trust and respect for the respondent and (2) the saliency of the issue--medical malpractice insurance assistance to the centers.

Our first contribution as a result of this survey came in November 1992. The Department of Justice contacted GAO about our study of the community and migrant health centers' medical malpractice insurance costs and claims. Due to enactment of Public Law 102-501--the Federally Supported Health Centers Assistance Act of 1992--in October of 1992, the federal government extended Federal Tort Claims Act (FTCA) coverage, assuming liability for medical malpractice claims against all the centers for a 3-year period.⁶ Since the Department of Justice was responsible for developing cost estimates for 1993, 1994, and 1995, Justice asked us for our assistance in getting information about the malpractice claims the centers had been experiencing. Although our study was not completed at the time, we had completed our data collection. On the basis of our preliminary analysis, we were able to provide Justice with claim-specific information.

¹The best method to obtain this information would be to visit each center and review the appropriate records. However, this would be expensive, especially because of the large number of centers dispersed throughout the United States.

²The Bureau of Primary Health Care, part of the Health Resources and Services Administration in HHS's Public Health Service, administers the grant programs for the centers.

³GAO contracted with Tillinghast--an international consulting and actuarial firm located in Atlanta, Georgia.

⁴The first survey was conducted by the National Association of Community Health Centers (NACHC) in September 1986. This study attempted to quantify the medical malpractice claims experience of the centers (41 percent response rate). In October 1986, NACHC retained Tillinghast in Los Angeles, California to study risk-financing alternatives for the centers (18 percent response rate). Then, in 1988, the Institute of Medicine conducted a study of medical malpractice related to the delivery of obstetrical care (37 percent response rate).

⁵A center purchases an insurance policy to cover claims filed after a claims-made policy has expired.

⁶Upon the passage of this law, the original objectives of the study were redefined. The primary objective focused on assessing the cost implications of this FTCA coverage.

Surveying Federal Agencies for the U.S. Congress: A Synthesis

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KEY WORDS: Survey research, GAO

Some people think of the General Accounting Office as an organization wholly dedicated to "bean counting." For them, the GAO logo invokes images of green shades, sleeve garters and adding machines. But over the years the General Accounting Office has become much more than a voucher checker and financial auditor. As the presentations in this session on "Surveying Federal Agencies for the U.S. Congress" show, the GAO does a good deal more than its name implies.

Since its creation as an independent congressional agency in 1921, the GAO has evolved from an auditing and accounting "office" to a multifaceted organization that employs a variety of analytic methodologies to investigate a vast array of topics and issue areas. The Budget and Accounting Act of 1921 established the GAO's authority to "audit federal agencies and to report directly to the Congress on all matters related to the receipt, disbursement, and use of public money" (GAO Policy Manual, p. 1.1-1). It wasn't until the late 1960's that the scope of the GAO's work was broadened significantly when it received a statutory requirement to investigate the efficiency of the administration of various poverty programs--among them the Job Corps and Head Start. In the early seventies, subsequent GAO-specific legislation endorsed and expanded the GAO's program evaluation role. In the widely distributed *Government Auditing Standards* (1988, p. G-10) the Comptroller General defines program evaluation as "the application of systematic methods to the assessment of program conceptualization, implementation, and effectiveness." Over time, the GAO has gradually gotten into the business of testifying and reporting on the extent to which Federal programs and activities *actually* perform as they are *intended* to perform (see also Trask, 1991, p. 64).

With minor exceptions, the scope of the General Accounting Office's program evaluation work is limited only by the activities of the Federal government. Clearly, the papers presented in this session--on national forests, peanut production, patent protection, mass transit use, and medical malpractice insurance--illustrate this diversity. And in their evaluations of diverse issue areas, GAO staff apply a variety of methodological approaches, including case studies, survey research,

evaluation synthesis, and experimental and quasi-experimental designs (see GAO Policy Manual, 1992, pp. 10.2-1ff.).

This brief overview has three main points. First, the GAO is responsible for evaluating whether public money is spent legally *and* whether it is spent wisely; that is, in a way that accomplishes intended outcomes. Second, the GAO is responsible for evaluating a vast array of federal programs and activities. And third, the agency employs a variety of analytic techniques in its program evaluation work.

The GAO tends to manage this diversity by assigning "generalist evaluators," who often work in multiple issue areas across their careers, to lead the regular influx of jobs. To provide specialized technical assistance on a variety of jobs, the agency employs individuals with advanced training in various disciplines and methodologies.

The paper by Kenneth John and his colleagues aptly describes various features of the working relationship between generalists and specialists engaged in a survey research project in GAO's General Government Division. They stress two key ways in which survey research at the GAO differs from survey research conducted at most private companies and organizations and, I would add, at most universities as well. The first difference is that preliminary inquiry, study design and reporting are primarily the responsibility of the generalist. While the specialist may advise on study design and result reporting, his or her primary responsibility is in seeing that surveys are conducted in accordance with scientific standards. The second difference concerns an elevated need for teamwork and consensus-building in order to produce a quality product in a timely and organized fashion. John and his colleagues explain that teamwork at the GAO is critical, given that project staff come from different units and report to different managers.

Far from being unique to the General Accounting Office, these two key features--division of labor and teamwork--are integral to the successful operation of almost all organizations. However, the range of issues the GAO investigates and the political significance of GAO's work place a particularly high premium on dividing responsibilities between generalists and specialists and on fostering teamwork between them. In this regard, the difference between survey research at

the GAO and survey research at various private and nongovernmental organizations is one of degree rather than contrast.

The papers by Bachman, Sullivan, and John et. al reinforce the view that careful preliminary inquiry (involving literature reviews and fieldwork) followed by painstaking pretesting of the questionnaire are among the critical components of successful surveys. They explain that GAO survey specialists work on multiple jobs at once and thus cannot be expected to acquire the subject-matter knowledge that is a critical prerequisite for developing valid and reliable measures. Similarly, while generalists acquire some level of subject-matter expertise, they are not expected to be highly knowledgeable of the science, craft and nuance involved in writing survey questions and designing questionnaires. Moreover, no one, generalist nor specialist, can wholly anticipate the myriad conditions, exceptions and unforeseen consequences encountered when they go into the field with a pretest instrument.

In the survey research community, the General Accounting Office is noted for the priority it gives to the pretesting of survey questionnaires. Generalists and specialists typically join together to conduct in-person pretests with carefully selected respondents. They travel to diverse geographic locations to test the questionnaire with various agency officials and other potential respondents. For example, Sullivan describes four different selection criteria she and her colleagues used to choose pretest respondents from eight community and migrant health centers in four states. Similarly, Bachman recounts his pretests with six ranger districts, half in the western part of the country and half in the east.

The opportunity for generalists and specialists to jointly observe respondents answering their questionnaire, to observe the considerable amount of effort and, at times, exasperation questionnaires can evoke, is critical to the development of a measurement instrument of high quality. Collaborative pretests provide reality checks and opportunities to modify and retest alternatives. Pretests facilitate consensus building: a key aspect of survey research at the General Accounting Office. It is very likely that the GAO's emphasis on pretesting helps minimize respondent burden and contributes to the agency's relatively high response rates.

Of course, even with careful pretesting and coordinated teamwork, survey research is subject to a number of limitations. The papers in this session illustrate how the GAO uses complementary analytic techniques and its access to agency records to shore up some of these shortcomings. For instance, when survey findings lack detail and nuance, case studies and in-

depth interviewing are used to fill-in important gaps. This was done in the wilderness area management study described by Bachman and the patent protection study described by John et al. This is noteworthy because, to the best of my knowledge, one does not commonly find quantitative and qualitative methods used in tandem in a great many other organizations.

Because GAO evaluation teams generally have access to agency documents and records, they can at times sidestep survey methods and thereby avoid some of the concerns about the validity of data obtained through self-reporting measurement techniques. An instance of this is provided in the paper by Bray and her colleagues, who were able to investigate U.S. peanut quota concentration without having to rely on what the peanut producers might tell them. Issues of recall aside, it was feared that peanut farmers' self-interest would lead to downwardly biased estimates. Instead, the GAO team capitalized on the Department of Agriculture's "smart card" system which electronically records transactions each time a producer brings peanuts to market. As Bray points out, their analysis revealed a much higher concentration of peanut quota than what was communicated to the Congress by the farmers who provided testimony. Since a survey of farmers was not done, however, it is impossible to assess the extent to which a random sample or census of self-reports would have missed the true mark.

Lee and Ervin's nonresponse analysis is another example of how the GAO attempts to fill in gaps left by survey methodology. Access to OPM's Centralized Personnel Data File provides a rare opportunity to assess, in a multivariate framework, whether and to what extent survey nonparticipants differ from participants on a host of individual level variables.

In closing, it should be said that the papers presented in this session on surveying federal agencies for the U.S. Congress tend to emphasize rather ideal circumstances in which generalists and specialists work together on survey projects. There are, of course, situations in which conditions are less than ideal. For example, generalists and specialists may effectively *divide* various survey responsibilities without adequately *coordinating* their individual efforts. I can think of no single facet of survey research in which this situation is more problematic than in the development of the survey questionnaire. Valid and reliable measurement is borne, at least in part, of the interaction between subject matter knowledge and survey research expertise. When these two elements are divided between generalists and specialists, as they typically are at the GAO, the two must interact. They cannot simply be added together. This is why a questionnaire rarely works well when one

party writes the survey content and the other makes it conform to a certain style. Even though measurement continues to be as much an art and a craft as a science, I fear that much of the concern about the precision of estimates, or even about the rate of respondents' participation, will be for naught if measurement instruments are biased.

Note: The author is a Social Science Analyst in the Resources, Community and Economic Development Division of the U.S. General Accounting Office. All statements in this paper are the author's and do not necessarily represent the position of the U.S. General Accounting Office.

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