INTERNATIONAL STATISTICAL INSTITUTE INSTITUT INTERNATIONAL DE STATISTIQUE

International Association of Survey Statisticians

THE SURVEY STATISTICIAN

Association Internationale des Statisticiens D'Enquetes (AISE)

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Contents

Dear IASS Members:

In this issue you will find information on upcoming conferences co-sponsored by our organization. This April, the Conference on Survey Measurement and Process Quality will take place in Bristol, UK. Enclosed you will find registration information and I hope that as many IASS members as possible will participate. Next year, survey conferences will also be held in Hungary and the United States. Promoting and participating in such endeavours is one of the main charges of this organization.

One of our Council Members, Gösta Forsman, conducted an IASS membership survey. The highlights and some of the other results of this survey are presented in this issue. Our members have provided many useful suggestions regarding what membership services are desirable. A special Council Committee will outline the agenda for any changes in current services that will be required to accommodate for and respond to members' wishes as expressed in the survey.

On a different note, we are rapidly approaching the Beijing ISI Meeting. The IASS will continue sponsoring our own sessions, short courses, and workshops. Many of these activities are described in this issue.

I would like to thank all those members who have responded to and in other ways contributed to the success of the membership survey. Their time was well spent as the ideas and suggestions were excellent. The Council Members, the Editor of the Survey Statistician, and the Paris and Bordeaux staff also deserve a wholehearted thanks for their contributions and services throughout the year.

Finally, I would like to wish all IASS members a Happy New Year.

Lars Lyberg
President of IASS

News from the IASS Secretariat

Ann-Marie Vespa-Leyder

The IASS Secretariat is now located in Bordeaux, at the INSEE's Regional Direction of Aquitaine. All correspondence should be directed to Mme. Claude Olivier, Bureau 136, 33 rue de Saget, 33076 BORDEAUX Cedex, FRANCE.

The town of Bordeaux has a long and fascinating history. Burdigala was founded in the third century BC at the confluence of two small rivers: the Peugue and the Devèze. Its early inhabitants were Celtic tribes from the north of France. Modern Bordeaux has Roman ruins: the remainder of an arena and the Palais Gallien. Bordeaux was also home to the Dukes of Aquitaine and one of the most intriguing and dazzling figures in European history, Eleanor of Aquitaine, whose marriage to Henry Plantagent commenced a three-century union which did not dissolve until the Battle of Castillon.

Bordeaux later resumed its commercial ties to England and prospered economically. Bordeaux has always been associated with the Arts and is renown for its many museums, for instance, Musée d'Aquitaine, Museum of Fine Arts, Museum of Decorative Arts, Cape Musée d'Art Contemporain, etc.

The entire area is probably best known for its vineyards, first class restaurants, and local produce. The abundance and diversity of its agriculture have provided the basis for the emergence of great chefs and excellent dining. Bordeaux also has one of the oldest universities in France, with a current enrollment of some 60,000 students. The city has been diligent in maintaining a beneficial environment for the high technology firms in the area. Bordeaux is thought by many to be an excellent site for conferences and other such endeavours.

Announcement

50th Session of the International Statistical Institute

50eme Session de l'Institut International de Statistique

21-29 August, 1995
Beijing, China

National Organizing Committee for the 50th Session of the ISI
c/o State Statistical Bureau, 38 Yuetan Nanjie, Beijing 100826, China
Tel: (01) 3810051, (01) 3810965 Fax: (01) 3810035

The National Organizing Committee of the 50th Session of the International Statistical Institute has the pleasure to announce that, in accordance with the arrangement by the Government of the People's Republic of China and the International Statistical Institute (ISI), the 50th Session of the ISI will be held in Beijing, China from 21 to 29 August, 1995. The Session, like the previous sessions, aims at accelerating the progress of the statistical science, encouraging wider academic exchanges, and promoting the understanding, friendship and cooperation among statisticians of all countries.

Preparations for the 50th Session of the ISI are now in full swing. The Chinese Government has approved the establishment of the National Organizing Committee, and two subcommittees, namely the Executive Committee in charge of administrative and liaison affairs, and the Local Programme Committee that is responsible for the scientific programmes of the Session, have also been set up. Zhang Sai, Director-General of the State Statistical Bureau (SSB) of China and the President of the National Statistical Society of China (NSSC), has agreed to act as the Chairman of the National Organizing Committee. Vice chairmen of the Committee include:

Shao Zongming
Deputy Director-General of SSB (also as the Chairman of the Executive Committee)

Zhai Ligong
Deputy Director-General of SSB
Vice President of NSSC

Wu Hui
Senior Statistician of SSB (also as the Chairman of the Local Programme Committe)

Fan Guozhu
Director of Beijing Municipal Statistical Bureau

Cheng Ping
Director of the Institute of Systems Sciences

Topics for the invited paper meetings of the 50th Session have been finalized by the ISI Programme Co-ordination Committee at the 49th Session in Florence, and are given in the Appendix. Information concerning topics for contributed paper meetings on special topics as well as organizers of both invited and contributed paper meetings will be announced in the Bulletin 1, scheduled to be published and disseminated by the National Organizing Committee around mid 1995.

The Beijing International Convention Centre will be the venue for the 50th Session of the ISI. A new convention facility with 48 conference halls and meeting rooms and a total of 5,000 square metres of exhibition space, the Centre is equipped with modern convention facilities, including 8-language simultaneous interpretation system, audio-visual equipment, and telecommunications facilities, such as IDD telephones and facsimile machines.

The Chairman of the National Organizing Committee of the 50th ISI Session encourages all interested parties to partake in the dissemination of information about the upcoming 50th Session of the ISI. A sincere welcome is extended to all members of the ISI and all others who are interested in attending.

Appendix

List of topics for invited papers meetings of the 50th ISI session

1. Papers by special Invitation of the President
2. Statistics in China

Joint Meetings

3. IAOS/IASE/IASS: The Relative Role of Universities and Employers in the Training of Professional Statisticians
4. IAOS/IASC/IASS: Impacts of Increased Technology-Dependence on Collection and Computing of Statistics
5. IAOS/IASC/ISI: Computational and Methodological Challenges of Environmental Data
6. IASC/IASE: Networking Innovations and Resources: the Internet as Toolbox
7. IAOS/ISI: Statistics in the Service of Humanity
8. IASS/ISI: Auxiliary Information and Sampling Methods
9. Bernoulli/ISI: Applications of Statistical Methods in Industry

Meetings organized by the Bernoulli Society

10. Non-linear Time Series
11. Inference from Networks
12. Accurate Approximation in Parametric Models
13. Special Lectures in Probability
14. Markov Fields and Applications
15. Statistics of Extreme Values

Meetings organized by IASC

16. Integrating Statistical Software into Information Systems
17. Quality Assessment of Softwares (Software Metrics)
18. Neural Networks and Statistical Inference

Meetings organized by IASE

19. Teaching Statistics in Asia
20. Teaching Statistics in Geographical Courses and Links with GIS

Meetings organized by IASS

21. Panel Discussion: Practical Situation in Survey Design That are not Well Supported by Known Statistical Theory

22. Practical Responses to Differences in the Quality of Survey-Taking Across Populations
23. Market Research Surveys: Experiences and New Approaches
24. Changes in User Expectations About the Quality of Surveys Statistics in the Public and Private Sectors
25. Census and Survey Issues in Agriculture

Meetings organized by IAOS

26. Statistics in Education
27. Global Disability Statistics and Indicators: Developments of Methodology
28. Measuring Housing Need, Provision and Different Social and Demographic Structures with an Emphasis on Data for Local Authorities (SCORUS-organized meeting)

Meetings organized by ISI

29. Research in History of Statistics
30. Epidemic Modelling and its Relation to Data
31. One meeting to be organized jointly by the ISI Committee on the Promotion of Statistics in Life Statistics and the Biometrics Society

IASS programme of short courses

BEIJING, 18-21 AUGUST 1995

Chris Skinner, University of Southampton, U.K.

The International Association of Survey Statisticians (IASS) is sponsoring a programme of short courses to take place before the 50th Session of the International Statistical Institute. The courses will be led by international experts in their fields and will offer practitioners, researchers and students in statistics and survey methodology the opportunity to improve their skills and to discuss issues of common interest. The courses will be aimed especially at statisticians working with surveys in developing countries. All courses will be presented in English and participants should have the ability to work in this language.

The courses will be held in Beijing at The People's (Renmin) University, one of the foremost universities in China. The university is located in the west of Beijing, near the Summer Palace, a famous tourist spot. This location is convenient for shopping and for transport to other parts of Beijing. It is about eight kilometres or 15 minutes taxi ride from the International Convention Centre, at which the main ISI Session will take place. As participants, you may choose either to extend your stay in accommodation arranged for the ISI Session, or you may stay in local accommodation arranged specifically for these short courses.

Short courses

A. Workshop on Survey Sampling in Developing Countries

18-19 August, 1995, presented by:

Graham Kalton, Westat Inc, Rockville, MD, USA
Colm O'Muircheartaigh, London School of Economics, UK

The emphasis of the workshop will be on practical aspects of survey sampling in developing countries. Examples from demographic and household surveys and from agricultural surveys will be drawn upon. The participants should have experience in the planning, implementation, evaluation or analysis of surveys. The workshop will be of most benefit to those who are involved in survey practice in developing countries.

Topics to be covered will include:

1. frame construction;
2. sampling methods, including stratification, multi-stage sampling and area sampling;
3. maintaining control of sampling processes;
4. sampling weights and variance estimation.

B. Workshop on Establishment/Enterprise Surveys in Developing and Transition Countries

20-21 August, 1995, presented by

Brenda Cox, Mathematica Policy Research Inc, Princeton NJ, USA
Michael Colledge, Australian Bureau of Statistics, Belconnen, ACT, Australia
K P Srinath, Statistics Canada, Ottawa, Ontario, Canada

A national programme of regular annual or monthly/quarterly business surveys is essential to monitor economic activity. This workshop will focus on the design and implementation of such surveys. The methods presented will be accompanied by practical examples. This course will appeal to participants who may be involved in developing and implementing business surveys in countries with developing and transitional economies.

Topics to be covered will include:

1. unique features of establishment/enterprise surveys;
2. construction and maintenance of business frames;
3. sampling methods including sample rotation, sampling of births, removal of deaths and methods for handling frame changes;
4. edit and imputation;
5. estimation including variance estimation;
6. sampling and use of administrative records for improving the quality of estimates of economic variables.

C. Variance Estimation in Complex Surveys

20-21 August, 1995, presented by

Wayne Fuller, Iowa State University, Ames, IA, USA
Kirk Wolter, National Opinion Research Centre, Chicago, IL, U S A
F Jay Breidt, Iowa State University, Ames, IA, USA

The purpose of this course is to provide training in variance estimation in complex surveys for survey statisticians, especially for those from developing countries.

The course will cover methods of estimating variances for statistics such as means, proportions, ratios, regression coefficients and statistics arising in the analysis of two-way contingency tables. The use of the program PC-CARP for computing variances of statistics from complex sample designs on a personal computer will be demonstrated, and instruction will be given in the use of the program. About one half of the course will be devoted to methodological considerations and one half to instruction in the use of PC-CARP.

The course text, a copy of which will be provided as part of the registration fee, is:
K M Wolter (1985). Introduction to Variance Estimation. Springer-Verlag, New York, USA.

Organizing committee

Chris Skinner, IASS Scientific Secretary
Yuan Wei, The People's University of China
Yongjin Jin, The People's University of China

Time schedule

Friday	18 August, 1995 (full day)	A	
Saturday	19 August, 1995 (full day)	A	
Sunday	20 August, 1995 (full day)	B	C
Monday	21 August, 1995 (a. m. only)	B	C

Participants may attend either course A followed by B, or course A followed by C or else any single course alone.

Registration

Registration fees are as follows:

	Developing Countries	Developed Countries	Students
One course	300	400	150
Two courses	400	500	250

All prices are quoted in US dollars.

To register, please contact by 1 May, 1995:

Professor C J Skinner
IASS Scientific Secretary
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University of Southampton
SOUTHAMPTON SO17 1BJ
United Kingdom
Fax: 44 1703 593846
e-mail c.j.skinner@southampton.ac.uk.

Announcement

InterCASIC '96
International Conference on Computer-Assisted Survey
Information Collection

Planning is underway for the next in the series of focused conferences on issues of survey methodology. The conference will deal with the highly topical issue of computer-assisted survey information collection (CASIC), and is tentatively scheduled for November 1996, at a site in the south-western United States (possibly San Antonio). This conference will allow us to look back at past accomplishments in the automation of survey data collection and related processes, and to focus attention on future research and development needs in this field. CASIC is defined broadly to include not only computer-assisted interviewing (CATI and CAPI) and other data collection methods (touchtone data entry, voice recognition entry, electronic data interchange, etc.) but more generally the application of computer technology to the entire process of collection, capture and preparation of survey data.

This conference hopes to follow the excellent tradition set by the previous conferences in this series, on Panel Surveys, Telephone Surveys, Measurement Errors, and Establishment Surveys, and the forthcoming conference in Bristol on Survey Measurement and Process Quality. It is planned to produce a monograph from invited papers representing the state of the art in the field of CASIC research and development. In addition to the monograph papers, presentations and demonstrations of new and innovative applications of technology to survey information collection will be encouraged, as will research findings on the effect of CASIC on the data collection process and the quality of data. Although this conference will be held in the United States, participation from the international survey research community is strongly encouraged.

Please consider this announcement advanced warning to mark your calendars and begin planning research activities for presentation at the conference. Further details about the conference will be forthcoming as soon as site arrangements are final and a call for invited and contributed papers will follow shortly. InterCASIC '96 is being organized by Mick Couper, Chair; Reg Baker; Jelke Bethlehem; Cynthia Clark; Bill Connett; Lee Decker; Tony Manners; Jean Martin; Bill Nicholls; and Jim O'Reilly. Please contact Mick Couper by e-mail for further details (MCOUPER@SURVEY.UMD.EDU).

Preliminary Announcement

The Statistics Department at the Budapest University of Economic Sciences is seeking the input and opinion of the international statistical community regarding the potential interest in a future conference on the problems and experiences of sample surveys in the transition countries (e.g., imperfect frames, nonresponse, field work strategies, etc.). This conference would be held under the auspices of the International Association of Survey Statisticians, the Budapest University of Economic Sciences (BUES), the Hungarian Statistical Association, and the Hungarian Central Statistical Office September 2-4, 1996. The site would be at the BUES main office in Budapest. The program would consist of a small number of invited papers and several contributed paper sessions. The language of the conference will be English, with no translation provided.

Financial sponsors are being sought to support the participation of survey statisticians from the transition countries.

All interested parties are encouraged to contact the Chair at the address below at their soonest convenience. Suggestions for topics and potential contributors are welcome. The organizing committee would appreciate all assistance in the dissemination of this announcement.

László Vita, Conference Chair, Professor of Statistics, Budapest University of Economic Sciences, H-1828 Budapest 5 P.O.B. 49; Tel and Fax: +36 1 217 6118; E-mail: vita@ursus.bke.hu.

Announcement

On the occasion of the XI International Statistical Seminar, EUSTAT organized two courses in 1993. The corresponding publications are available:

I. "Methodology of the Experimental Research", Professor Dr Roger Phan Tan Luu, Director of the Laboratory for the Experimental Research Methodology, L P R A I Marseille, Professor at Aix Marseille University III. France.

II. "Structural Equation Modelling with LISREL", Professor Dr Karl G Jöreskog, Author of LISREL and PRELIS Statistical Models, Professor of Multivariant Statistical Analysis at the University of Uppsala (Sweden).

On the occasion of the XII International Statistical Seminar, EUSTAT organized two seminars for October and November 1994.

I. "Statistical-Econometrical Methods for the Analysis of the Economic Situation". Professor Antoni Espasa. Econometric Professor, University Carlos III, Madrid, October 24, 25 and 26, 1994.

Contents:

Statistical-econometrical models of basic interest for the analysis of the economic situation.

I Introduction: Grounds and aims of the situation analysis.

II Statistical-econometrical models. Univariant models.

III Econometrical models.

Extraction of level and growth signals in order to highlight the essential aspects of an economic phenomenon.

IV The techniques for the extraction of signals in order to characterize the essential aspects of an economic phenomenon.

V Growth rates and the underlying speed of an economic phenomenon.

Methodology for the analysis of the economic situation. Concrete applications.

VI Methodology to do an analysis of the economic situation.

VII Analysis of the industrial activity (based on univariant models).

VIII Analysis of inflation (based on models with indicators).

IX Applications of econometrical models in the situation analysis.

X Global analysis of the economic situation.

II "Employment and Unemployment Statistics in the European Community", Professors: Barnard Grais, EUROSTAT consultant. He has worked in INSEE and in OECD; Hubert Charlier, Head of the Population, Migration, Employment and Unemployment Section in EUROSTAT; and André Persenaire, Technician in charge of statistics on employment and unemployment at EUROSTAT.
November 28, 29 and 30, 1994.

Contents:

1. The international definition of the active population, employment, unemployment and underemployment.
   - 1.1 The characteristics of the international definition.
   - 1.2 The interpretation of the international definition for its application at a European level.
   - 1.3 Must the international definition be revised?
2. The Community inquiry on the labour force.
   - 2.1 The inquiry methods used in the different countries that belong to the European Community.
   - 2.2 How should we progress towards better harmonization?
3. The employment market in the European Community: Disparities and evolution.

For further information, Please contact Anjeles Iztueta Azkue, EUSTAT-Basque Statistics Institute, Dato 14-16, 01005 Vitoria-Gasteiz, Spain.

The IASS membership survey

Gösta Forsman, University of Linköping, Sweden

During the ISI meeting in Florence, the IASS Council decided to carry out an IASS membership survey. The survey was conducted during spring and summer 1994. The objective was to obtain the members' views on the value of services currently offered by IASS as well as the kinds of services IASS members would like to have offered in the future. A decline in the number of members in recent years was one of the main reasons for conducting the survey. In this article, we present highlights from the survey.

The survey was conducted under the restraints of a modest budget by students at the University of Linköping, Sweden under supervision of Gösta Forsman, who is a council member. During the planning stage, several IASS board members were consulted, including Lars Lyberg, Graham Kalton, Kirk Wolter, Fred Smith, Chris Skinner, Nanjamma Chinappa, Dennis Trewin, Alvaro Gonzalez Villalobos and Adam Marton as well as our Paris staff Alain Charraud and Ann-Marie Vespa-Leyder. Questionnaires from membership surveys of other associations, collected by Denise Lievesley, were very useful when the questionnaire was designed. Important help in questionnaire design was also provided by Daniel Kasprzyk and Kerry Gruber at the U S National Center for Education Statistics in Washington, D C. The IASS office in Paris provided labels and membership lists for the field work.

1. Survey Design

The sampling frame was the 1993 Membership Directory, which includes 1030 members. A systematic sample of 515 members was drawn. Data were collected via a mail questionnaire in English which consisted of 28 questions. A French version of the questionnaire could, unfortunately, not be provided for budget reasons. The first mailing was conducted at the end of March. A one-page reminder was mailed at the end of April and a second reminder (including a questionnaire) was mailed at the end of May.

2. Field Work

After two reminders, the field work resulted in a 58% response rate. This result seems poor, considering the presumably motivated population of study. It reflects, however, the difficulties in conducting an international survey. For example, it was not possible to enclose pre-stamped envelopes for return mail, or to make follow-up calls. Also mail systems work poorly in some countries and some respondents may not even have received the questionnaire. Because of the low response rate, the estimates presented in next section may be biased. In particular, the lack of a French questionnaire may also contribute to bias. We do not, however, speculate here on the magnitude or the direction of the nonresponse bias.

3. Results

In this section we present tables for selected items. Answers to the open-ended questions are summarized briefly and some examples of answers are given. The full lists of answers to the open questions provide a rich bank of ideas for IASS activities. Members interested in the full lists or in the tables not presented below can contact Gösta Forsman, MAI, University of Linköping, S-581 83 Linköping, Sweden.

3.1 Characteristics of IASS members

Table 1. Answers to Question 1: "What is your age?" and Question 2 "What is your sex?" in percent.

Age	Men	Women	Total
–25	0	0	0
25–34	5.5	4.8	5.4
35–44	22.1	45.2	25.4
45–54	34.4	26.2	33.2
55–64	22.5	16.7	21.7
65–	15.4	7.1	14.2
Total	99.9	100.0	99.9
n	253	42	295

There were more than 85% men in the sample and most of them were 45+. It was somewhat surprising that only 5.4% of the responding members were below 35 years old. Female members are generally younger than male members.

Table 2. Answers to Question 4: "What is your highest level of education?" in percent.

Doctorate	46.9
Masters	37.8
Bachelors	10.9
Associate	1.4
None of the above	3.1
Total	100.1
n	294

IASS seems to be an association for highly educated statisticians. Almost 50% of the respondents have a doctorate degree and more than a third have a masters degree. The response alternative "none of the above" includes country-specific levels of education.

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Table 3. Answers to Question 5: "What is your primary professional affiliation? (Mark one box only)" in percent.

Government, non-university	39.0
University	34.6
Private company	7.1
Self-employed	4.1
Retired	9.2
Other	6.1
Total	100.1
n	295

Most members (73.6%) work in government or at universities; 18 members (or 6.1%) in the sample have answered "other". Nine of them have specified that they have affiliations such as UNICEF, FAO, FN, WHO or that they are students. The remaining nine have marked more than one alternative.

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3.2 Attitudes to IASS

Table 4. Answers to Question 10: "Overall, how satisfied are you with the IASS?" in percent.

Very satisfied	15.2
Satisfied	69.9
Not so satisfied	14.2
Not satisfied at all	0.7
Total	100.0
n	289

The respondents were generally satisfied with the IASS.

3.3 Conferences and workshops

Table 5. Answers to Question 13: "How many ISI meetings have you attended?" in percent.

0	35.4
1	18.4
2	15.0
3	10.5
4	7.8
5 or more	12.9
Total	100.0
n	294

About 54% of the respondents have attended 0 or only 1 meeting.

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Table 6. Cross-tabulation of Question 15a: "How would you assess your chances of attending IASS-sponsored conferences outside your own country?" and Question 3: "In what part of the world do you live?" in percent.

	Europe	Asia	Africa	North Amer
Impossible	1.8	23.1	27.6	27.0
About so/so	45.9	53.8	27.6	54.1
Fairly large	37.6	10.3	20.7	13.5
Quite good	14.7	12.8	24.1	5.4
Total	100.0	100.0	100.0	100.0
n	109	39	29	74

	Latin Amer	Oceania	Total
Impossible	5.9	25.0	15.6
About so/so	58.8	65.0	49.3
Fairly large	17.6	5.0	22.6
Quite good	17.6	5.0	12.5
Total	99.9	100.0	100.0
n	17	20	288

Members from Europe and Africa seem to have the best chance of attending IASS-sponsored conferences abroad while members from Oceania, Asia and North America face problems. Geographic reasons seem to be important.

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Answers to Question 17 (open): "If you were asked to choose one topic for an IASS conference or workshop, what would it be?"

The most frequent topics deal with specific types of surveys, such as panel surveys, longitudinal surveys in developing and transition countries. Other suggestions deal with specific survey operations (in particular sampling), non-sampling errors and quality assessment. Examples of proposals are:

- Satellite imagery and statistics.
- Conferences in French for statisticians from French-speaking countries.
- Poverty monitoring.
- Harmonized international statistics based on national surveys.
- Coordination among statistical associations of various countries under IASS.
- Non-probability data collection.
- Survey of small cultural groups (Miero study).
- The impact of the information revolution on statistical surveys.
- TQM in statistics (data collection and processing).
- Survey statistician positions (status) in the survey team.
- Survey methods for informal economic activities.
- Real significance of survey sampling in the light of other services of uncertainty and variability.
- Survey as an optimal tool for decision making.
- Increased need for surveys in the statistical work of the transition countries.
- How sample surveys can be made more popular and user-friendly.
- Inexpensive survey methods.
- Quota sampling, sampling for marketing research.
- Spatial statistics.
- Surveys in big cities.
- Epidemiological surveys.
- Population census methods under political constraints.

The total list comprises 164 proposals.

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3.4 The Survey Statistician and IASS Newsletter

Table 7. Answers to Question 21: "What is your opinion of the current contents of The Survey Statistician?" in percent.

Excellent	1.7
Very good	17.5
Good	44.7
Fair	26.1
Not worthwhile	2.7
No opinion	1.7
Do not read the Survey Statistician	5.5
Total	99.9
n	291

A majority, near 64%, of the respondents answered Good, Very good or Excellent. On the other hand, more than one of four were more sceptical.

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Table 8. Answers to Question 22: "What parts of The Survey Statistician do you read?" Percentage of the total sample.

News about IASS	69.0
Invitations to seminars and courses	54.1
Questions and Answers	62.1
Country reports	47.9
Articles	57.6

(More than one response alternative could be marked in Question 22.)

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Answers to Question 23 (open): "What additional topics/sections could be included in The Survey Statistician?"

The most frequent suggestions concern articles on recent theoretical and technical developments. A second group of suggestions deal with reviews of books and software as well as bibliographies. Other suggestions are debate articles, non-technical news (e. g. about members) and descriptions of surveys. Further examples of the 102 suggestions are:

- More technical topics.
- Methodology, quiz, etc.

- More summary articles, where to look for information, annotated bibliographies.
- Simple reading of new topics.
- News on collaboration/consulting opportunities in other countries.
- News on IASS members and their countries.
- More short solicited articles on survey research projects topics.
- More news about members, book reviews, identification and listing of working papers.
- Conference reports.
- Expansion of Questions and Answers, more of it -it is really quite useful and informative.
- Setting up communication networks between survey statisticians around the world.
- Some articles for new and junior members.
- Novel class notes/classroom problems.

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Table 9. Answers to Question 25: "Have you noticed that there are two pages of IASS information in each issue of the ISI Newsletter?" in percent.

Yes	74.8
No	25.2
Total	100.0
n	278

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3.5 Future activities of the association

Answers to Question 24 (open). "If the IASS were to set up committees to investigate and report on particular issues what, in your opinion, would be the two most important issues?

Four groups of suggestions are frequent: (i) non-sampling error and quality issues, (ii) sampling, (iii) specific survey operations, and (iv) specific types of surveys. Other proposals include support of countries in transition and developing countries, teaching, standards and policy issues, and surveys conducted in the private sector. Among the 160 proposals were also:

- Pressures on technical standards from unqualified sources.
- Coordination of survey support to countries in transition and developing countries.
- Use of sampling survey results by media.
- Fostering better analysis of sample survey data.
- Confidentiality concerns among the public.
- Educational opportunities in survey methodology/statistics for persons in developing countries.
- International standardisation concepts.
- Writing statistical reports.
- Improving communication between survey methodologists - a network.

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Table 10. Answers to Question 26: "Is it a high priority for IASS to support survey statisticians in developing and transition countries?" in percent.

Yes	89.0
No	11.0
Total	100.0
n	273

The support for countries in transition and developing countries is very strong among the members. This is clear also from the open questions.

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Table 11. Answers to Question 27: "What do you think IASS should concentrate on in the future when it comes to membership services?" in percent.

Newsletter	54.0
Conference proceedings	35.1
Organizing conferences	52.5
Discounts on journals and books	34.8
n	276

(More than one response alternative could be marked in Question 27).

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Answers to Question 28 (open): "What other types of membership services would you like IASS to provide?"

The answers consist of 76 suggestions. They deal with various forms of workshops, financial support to activities, information of job opportunities and news on members. Some proposals are:

- Set up specialist group to exchange information on specific topics, e. g. disability surveys.
- Support for teaching in developing countries.
- Provide financial support for participating in conferences and seminars.

- Membership directory providing a listing of short term positions open in conduct of surveys in various countries.
- Student membership.
- Internet user group with electronic newsletter, etc.
- Send to the members once a year a document presenting in some detail case studies of applied sampling in different areas: business and marketing,
  public opinion, health, agriculture.
- French translation of conference proceedings, at least more French summaries.

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4. Some Concluding Remarks

A number of conclusions can be drawn from the survey results (including the results not presented above). Some of these conclusions are:

- When it comes to recruiting new members, there is a potential among young statisticians, among female statisticians, in certain regions such as eastern Europe, Latin America and Asia, and among statisticians working in the private sector.
- When it comes to membership services there is a need for regional meetings preferably conducted in the years between the ISI meetings.
- A majority of the members are satisfied with The Survey Statistician, but the publication can be improved in several ways.
- There is a strong interest among the members in helping IASS in its activities. In addition, a large number of proposals for committee work has been given by the members. Thus, we might expect an increasing number of members to be involved in IASS activities in the future.

The IASS council has organized a committee which will produce a number of proposals concerning membership services. The committee consists of Lars Lyberg, Fred Smith, Gösta Forsman, Alain Charraud and Ann-Marie Vespa-Leyder. The committee will present a report in the next issue of The Survey Statistician.

5th international workshop on household survey non-response

Geoffrey Hole, Statistics Canada

The 5th International Workshop on Household Survey Non-response was held at Statistics Canada, Ottawa, Ontario from 26 to 28 September 1994.

These International Workshops on Household Survey Non-response have been held annually since 1990. They resulted from an initiative of Robert Groves, Lars Lyberg and Robert Barnes. The first workshop was held in Stockholm and was hosted by Statistics Sweden. The goals for the workshop were to allow an informal exchange among active practitioners and researchers in the field in order to share findings and to advance a coordinated research agenda on non-response.

Subsequent meetings were hosted by the U S Bureau of the Census in Washington in 1991, by the Netherlands' Central Bureau of Statistics in Voorburg in 1992, and by the Office of Population Censuses and Surveys in Bath, UK in 1993. Delegates have largely been drawn from representatives of national statistical agencies with a leavening of academics and representatives of survey research organizations.

Over the years these Workshops have attracted more and more participants. In Stockholm there were 13 delegates and this has risen to 58 delegates from 14 countries in Ottawa. This growth in participation has increasingly challenged the organizers to preserve the informality and high level of participation and interchange that are hallmarks of these Workshops.

The research agendas established at previous workshops have encouraged cooperation among national statistical offices and have produced concrete results such as a study of the use of censuses to assess the characteristics of survey non-respondents. Comparative studies across statistical offices have also been conducted such as those on the use of advance letters in family expenditure surveys, imputation methods, and non-response adjustment.

The 5th Workshop began with a half-day Plenary Session during which Robert Barnes of the Office of Population Censuses and Surveys in the United Kingdom discussed non-response and

quality issues, Robert Groves, from the University of Michigan, U S A, addressed non-response in cross-sectional surveys, and finally, Graham Kalton, from Westat Inc, U S A, discussed non-response and non-response adjustments in panel surveys.

Clearly non-response issues are important to all survey-taking organizations. Achieving and maintaining high response rates in household surveys is essential if we are to preserve quality and to control costs. This much has been recognized perhaps since the beginnings of household surveys. But the pressures that make high response rates more difficult to maintain are certainly on the increase - heightened sensitivity about privacy, the proliferation of marketing activities in the guise of surveys, greater concern about security in communicating with strangers, smaller family sizes and more women in the labour force resulting in greater difficulties of establishing contact, advances in telephone technology such as call-screening, to mention only a few. At the same time, technology is opening up quite new approaches to data collection whose effect on response has to be carefully assessed and exploited in order to maintain the relevance of statistical programmes with declining budgets. These workshops provide the opportunity to find out how different agencies are coping with these pressures to maintain response rates and how they deal with non-response in processing the data.

Hence these workshops are primarily a forum for the presentation of recent research, developments and experience in all aspects of household surveys that touch on non-response - indeed, of research that is still in progress. Major themes for this year were: Collection; Response Research; and Non-response Error and Adjustment. They are reflected in the titles of the following 15 Workshop sessions.

1. Introduction - Structure of 5th Workshop and History of these Workshops
2. Census Match with Surveys to Study Non-response
3. National Experiences
4. Analysis of Non-response
5. Cognitive Research
6. Weighting for Non-response
7. Experiences in Longitudinal Surveys
8. Use of Incentives
9. Imputation and Post-stratification
10. Past Accomplishments and Future Research
11. Field Strategies
12. Reducing Non-response
13. Non-response Studies
14. Comparative Studies
15. Non-response Effects

A full report on this Workshop is available covering each session and providing a brief summary of each paper presented, salient points made in the discussion including the identification of needed research or co-operative work such as on comparative studies or preparation of guidelines, all of which might be done in advance of the next Workshop. A list of the 38 papers presented, copies of these papers and copies of the slides used in Sessions 1 and 10 are also available on request from either Lilli Japec, Dept of Research and Development, Statistics Sweden, S-115 81 Stockholm, Sweden, Tel 011-46-8-7834794, Fax 011-46-8-7834599, E-mail l.japec@scb.se or Geoffrey Hole, Statistics Canada, 15-0, R H Coats, Tunney's Pasture, Ottawa, Ontario, K1A 0T6 Canada, Tel 1-613-951-9811, Fax 1-613-951-0653, E-mail holegjc@statcan.ca.

One of the questions posed in Session 10 was whether the focus of future Workshops should continue to be on Non-response or whether it should be broadened to cover a Total Quality Measurement Cost Model (or equivalently a Total Variance/Cost Model). Examples of the reporting of co-operative work at this Workshop are the reports on the use of incentives, interpretation and evaluation of advance letters and the report on an international survey of Field-work Strategies. The need for more work on comparison of international non-response experiences was identified. There was interest in comparison of the results of census match studies in different countries. For longitudinal surveys more research is required to assess the effect of imputation on the estimates and to evaluate differences between respondents and non-respondents, so as to understand the causes of non-response and to obtain data on characteristics of non-respondents in order to devise better non-response adjustments.

Those interested in participating in the 6th International Workshop on Household Non-response to be held in Finland in the last week of

October 1995 should get in touch, early in 1995, with Kari Djerf, Statistical Methods, 3 A, Fin-00022, Statistics Finland, Helsinki, Finland, Tel 011-358-0-1734-3411, Fax 011-358-0-1734-2474, E-mail Kari.Djerf@Stat.fi.

What does cognitive psychology offer survey methodology?

Fred Conrad and Clyde Tucker, Bureau of Labor Statistics, U. S. A.

Cognitive psychology is the study of human information processing - such things as memory, language use, reasoning, and problem solving. It is a basic research field, though its findings and techniques have been applied to numerous areas involving complex information processing. The field advances by testing hypotheses in the laboratory: the data are behavioral measures of human subjects performing mentally engaging, experimental tasks. These fields include the design of software and hardware, the rehabilitation of patients with Alzheimer's disease, the redesign of air traffic control procedures, and the teaching of writing, geometry and computer programming. Practitioners in these fields have come to value the insight gained by analyzing the cognitive demands on their users, patients, controllers, students, etc.

As in these other areas, survey methodologists have come to appreciate that the quality of their statistical products depends on the way pertinent information is processed by human participants - respondents, data collectors, data reviewers and coders. By looking to cognitive psychology, survey researchers have added value to their own work in at least two ways. First, they have adapted certain methods from cognitive psychology to the pretesting of questionnaires. In particular, questionnaires are now routinely pretested by analyzing respondents' verbal reports on their thinking as they answer individual questions. Other techniques have also been applied directly to the production of survey data, but such "think aloud" methods are by far the most prevalent. Second, survey methodologists have conducted research that deepens their understanding of the cognitive sources of measurement error. For example, it has recently been demonstrated that the values on a response scale affect the size of respondents' estimates; such effects have been explained on theoretical (psychological) grounds and can be applied generally.

1. Pretesting

Psychologists ask subjects to think aloud as they perform certain tasks - often solving a problem - in order to identify the different types of information that subjects use and the order in which they use it. When survey methodologists pretest questionnaires with these techniques, they usually ask respondents to report their thinking immediately after answering a question. This is done to reduce any conflict between answering the question and thinking aloud, both of which are verbal processes. Because the response process is usually brief, respondents can remember their thinking, and report it.

By analyzing the content of verbal reports, it is possible to determine whether respondents found any of the individual words in the question confusing. In addition, verbal reports can make it clear what general process respondents have used to answer the question. For example, suppose a question concerns the number of alcoholic beverages consumed in a specific week. It is possible that the respondent may answer on the basis of a typical week rather than the week in question. Such an approach will be evident in the protocols and might lead to new instructions that discourage such response strategies. In general, think aloud methods are excellent for identifying problems, but do not always imply a solution. When possible solutions are developed, they too are tested with think aloud procedures. This may turn up other problems, so the procedure can continue for several cycles.

2. Understanding Measurement Error

In addition to practical techniques, such as think aloud methods, cognitive psychology provides a theoretical framework and research paradigm within which to explore the cognitive sources of measurement error. One example is the finding that response scale values affect the magnitude of frequency responses. In one study, more people reported low frequencies of television watching when the scale values ranged from "up to _ hour" to "more than 2_ hours" than when they ranged from "up to 2_ hours" to "more than 4_ hours". The authors' explanation was that respondents applied a principle of conversation which asserts that speakers provide only relevant information; respondents reasoned that the relevance of the particular scale values was that they provided distributional information about true television watching in the population. Lacking precise knowledge of their own television watching behavior, respondents interpreted the middle values to be typical and compared themselves to these values. Since these were lower in the first scale, more responses were low with the first scale.

Another piece of research that illustrates the insight provided by cognitive psychology concerns differences in how respondents produce self-reports and proxy reports. In one study, respondents were asked identical questions about themselves and their partner, and were asked to think aloud as they answered. Respondents mentioned aspects of specific events more often when answering questions about themselves than about their partner; when answering questions about their partner, they used general knowledge of their partner to estimate a response more often than when answering questions about themselves. Memory researchers distinguish between memory for specific events and general knowledge of the world which helps explain the results: people are more likely to remember events about themselves than someone else and to use remembered events to answer the questions when they are avilable. Because these different approaches may have different consequences for accuracy, it is important to understand when respondents use one approach or another.

A final example concerns people's use of categories. Cogntive psychologists have found that as people classify objects in their lives, for example, recognizing that both a Mazda Miata and a Honda Accord are instances of the category "car", they show a preference for categories at intermediate levels of abstraction. Survey researchers often require respondents to classify everyday objects, for example in reporting expenditures for particular product categories. In one study, experimenters presented subjects with a randomized list of products from various categories and then later asked them to report the frequency of products from specific categories. Some subjects were asked about intermediate level categories, e. g. "newspapers", "automobiles", and "cereal", while other subjects were asked about high level categories, e. g. "reading material", "vehicles" and "breakfast food". The subjects asked about high level categories seriously underestimated product frequencies. A study such as this points to the bias that can arise when researchers do not control category level.

3. Practical Aspects of Using Cognitive Psychology

Survey methodologists can take advantage of what cognitive psychologists have to offer in one of two ways. They can contract for their services on an as needed basis, or they can put psychologists in staff positions. The latter alternative will receive most of the attention here, but a few comments about the use of contractors are given first. Contract psychologists provide greater flexibility and do not tie up as many resources. On the other hand, more work on the part of the agency will be required up front, and the psychologist will need time to become acquainted with the organization and the problem. Furthermore, a contract psychologist probably will never have the organizational knowledge and employee trust which a staff member can develop.

The use of staff positions for psychologists means that you have to both find them and hire them. They may be reluctant to join an organization that has none, or very few, other psychologists. One selling point is that they will have the opportunity to test out theories and apply their knowledge in important, real-world situations. Other employees may be uncomfortable with or even resent these new colleagues, expecially if they had to give up positions or other resources to make room for the psychologists.

The psychologists will need facilities and equipment to do their work. These will include space for conducting experiments with individuals or small groups, video and audio equipment, specialized computer hardware and software, and library resources.

Other employees in the organization will have to direct the psychologists' activities. These individuals must not only have a broad understanding of the survey organization's goals and procedures, but they also must be able to see where the skills of cognitive psychologists can be of greatest use. They will have to serve as liaisons between the psychologists and the survey sponsors. The liaisons will be critical in helping the new employees adjust to the organization and helping the organization adjust to the psychologists as well. But innovation in any field usually is accompanied by some discomfort. In the end, hopefully both survey research and cognitive psychology will be strengthened from the effort.

The new Canadian labour force survey sample design -1994

M. P. Singh and J. G. Gambino, Statistics Canada

The Canadian Labour Force Survey (LFS) is the largest ongoing household survey conducted by Statistics Canada. It produces monthly labour market estimates and is a major source of population information at the national and provincial levels. In addition, estimates are produced for standard subprovincial regions and custom-defined small areas. Each month, almost 59,000 households are sampled using a stratified, multistage design. Each household stays in the sample for six consecutive months, and one-sixth of the sample is replaced each month. The LFS frame and sample are used for supplementary and special surveys to collect data on a variety of topics. Supplementary surveys use part of the LFS sample to collect additional information whereas special surveys select a separate set of dwellings from the LFS frame.

The Labour Force Survey is redesigned following every decennial census. The current redesign, following the 1991 census, encompassed four major projects: computer-assisted interviewing (CAI), the sample redesign, the questionnaire, and computer systems and software. First, following operations tests and a data quality test, computer-assisted interviewing was introduced over several months in late 1993 and early 1994. Second, the sample design, which is the main focus of this note, was updated and improved. Next, the questionnaire is being overhauled for the first time in twenty years. The proposed changes to the questionnaire include re-wording and reorganizing of the current questions as well as the addition of new content. Finally, the computer systems and software, some of which are no longer well-supported, are being replaced.

This short note presents an overview of the new design, highlighting differences from the old design. A detailed description of the old design is given in the publication Methodology of the Canadian Labour Force Survey 1984-1990, by Singh, Statistics Canada publication 71-526, 1990).

The goals of the current sample redesign were to update the old sampling frame which was based

on 1981 census counts, to adopt the latest census geography, to make the design a more flexible, general purpose vehicle for efficient use by other household surveys, and to exploit technological changes that have taken place in recent years. The major changes introduced in this redesign include a reduction in the complexity of the design, the adoption of a two-step sample allocation strategy and a change in cluster size in urban areas. The changes will benefit both the LFS and other household surveys that use either the LFS sample or the LFS frame.

1. Stratification

In previous LFS designs, each province was divided into Economic Regions (ER) and stratification took place within each region. In the new design, an additional set of regions, the Unemployment Insurance Regions (UIR), had to be dealt with as well. To handle this, strata in the new design were formed within the areas delineated by the intersections of the two sets of regional boundaries. As explained later, this had major implications for the sample allocation strategy.

To make the stratification robust over time and efficient for most household surveys, the LFS used 16 stratification variables in the last design. For the new design, additional stratification variables were used: mother tongue (English/French/other) was added, the breakdown of employment by industry was more detailed, and more weight was given to income.

Deeper stratification was used in rural areas, resulting in a larger number of strata. This will reduce the problems that occur when definitions of sub-provincial regions change and when handling special requests for estimates for small areas.

An innovation in the design is the formation of high income strata. In nine census metropolitan areas, these strata were formed by grouping together the EAs in each city that reported the highest average income in the 1991 Census. This was done to deal with the under-representation among sample respondents of high income households in LFS supplements such as the Survey of Consumer Finances. The new strata will provide better control of the number of high income households selected and allow the monitoring of nonresponse rates in these strata. Low income strata were also formed within the apartment frame in seven of the nine cities that have high income strata.

2. Sample Allocation

The Labour Force Survey has a sample of approximately 59,000 households per month. Of this total sample, 42,500 households are referred to as the core sample and the remaining 16,500 households are called the unemployment insurance (UI) sample. The core sample is allocated to produce reliable national and provincial estimates and the UI sample is used to ensure that the estimates produced by the LFS for UI regions attain or exceed pre-specified quality limits.

To deal with both the need to produce good provincial and national estimates and the need to meet UI requirements, the total sample was allocated in two steps. The two step process ensures that in the event that the UI sample, which is funded from a separate source, is dropped for some reason, the core sample will continue to serve the primary purpose of the LFS. In the first allocation step, the core sample in each province was allocated in proportion to the population in the different parts of the province. This ensures the quality of provincial estimates. Next, the 16,500 UI sample was allocated to UI regions according to need, without regard to provincial boundaries. As a result, if a UI region received a sufficiently large sample in the first step, then it did not receive any UI sample. Conversely, a sparsely populated UI region may not have received very much of the provincial core sample, in which case it would need some UI sample to improve the quality of its UIR estimates. One consequence of the approach to allocation used in the new design is that there has been a shift of sample into the cities.

3. Reduced Stages of Sampling

In the old Labour Force Survey, a three-stage design was used in most rural areas. The first stage consisted of groups of EAs. Usually, two such groups Awere selected in a stratum. Then EAs were sampled within the selected groups, and finally, dwellings were selected within these EAs. This three-stage approach was useful when most interviews were conducted in person since the first-stage unit, the group of EAs, corresponded roughly to one interviewer's assignment and was convenient for travel. Since five-sixths of interviews are now conducted by telephone, a simpler design was adopted in most parts of the country. In the new design, the grouping of EAs has been

eliminated in most cases. Now, the first stage involves the direct selection of EAs and is followed by the selection of dwellings.

In urban areas, as before, the first stage involves the selection of clusters. A cluster is a group of blocks or block faces. At the second stage, dwellings are selected within clusters. Because of the simplification in the rural design, the urban and rural designs are now essentially the same in that they both involve two stages of sampling. However, they still differ in the sampling method used for selecting first stage units. A random group method is used in urban areas to allow for easier updating of the frame in the event of uneven population growth.

4. Automation of Cluster Formation and Sampling

In urban areas, the formation of clusters was automated. In the past, this was a long, tedious manual operation. In the new design, the computer program formed clusters by combining census block faces. A typical urban cluster now contains 150 to 200 households, which is about triple the size of the clusters in the old design. The number of households selected within each urban cluster has doubled. The number of households selected within each cluster varies, with six selected in larger cities, eight in smaller cities and usually ten in EAs in rural areas. In urban areas, the smaller proportion of households selected in each cluster compared to the old design will improve the quality of estimates.

The automation of cluster formation has other benefits. Since the clusters formed in this way are digitized, the creation of cluster diagrams for interviewers has also been automated. Furthermore, it will be easier to update cluster sizes when data from the 1996 census of population become available. This will increase the feasibility of redesigning urban areas that have experienced major population change since the 1991 census.

5. Ongoing and Upcoming Projects

Major areas of activity during the next three years include work stemming from the new questionnaire and estimation-related developments.

The new questionnaire: Because of the major changes to the questionnaire that have been proposed, a clear indication of the effect of these changes on the estimates will be needed. If the magnitude of the effect is significant, it will be necessary to adjust the historical labour force time series. To assess the effect of the changes, a parallel run of the survey in which a large number of households will receive the new questionnaire is planned for 1996. Due to cost constraints, a traditional parallel run involving the selection of a large sample of non-LFS households is not possible. Instead, a part of the monthly LFS sample will be used, resulting in a temporary reduction in the number of households used for producing published monthly estimates. The current plan is to administer the new questionnaire to about twenty percent of the LFS sample for a little over one year. Although the estimates published based on the ongoing LFS during this period will suffer somewhat, especially for smaller subprovincial regions, the benefits of adopting the new questionnaire are sufficiently great that it is generally agreed that the short-term sacrifice is worthwhile.

6. Estimation

The estimation methods used by household surveys are being reviewed. A new estimator that extends the regression-based approach currently being used for the monthly published estimates is being studied. It improves estimates for the current month by exploiting the common sample from previous months. A new small area estimation system is being written. It will incorporate the small area estimator currently in use and add the option to use other estimators. Finally, the jackknife variance estimator used by the LFS and several other household surveys is being incorporated into Statistics Canada's Generalized Estimation System.

Progress in the design of respondent-friendly self-administered questionnaires

Don A Dillman, Washington State University and The U.S. Bureau of the Census

For too long the design of government self-administered surveys has ignored the needs of the respondent, with negative consequences for both measurement and nonresponse error. There are at least three reasons. First, self-administered surveys have often been viewed as subject to the same design principles as interview questionnaires. As a result little attention has been given to questionnaire layout.

Second, some surveyors have viewed self-administered questionnaires as a "form" which should be made to look short, with the practical consequence that designers often cram questions together to fit as few pages as possible. One result was reliance on difficult formats, e. g. matrices, whereby respondents were required to match rows of questions with columns in which answers were to be placed. An example was the 1990 U S decennial census form which placed questions in left-hand columns to be answered for person listed at the head of each column. Contributing to this tendency was the belief that increasing the number of pages, even if no additional questions were asked, would decrease response.

A third reason was the desire to produce questionnaires whose answers could be tabulated by optical scanning equipment, with the frequent result that technology requirements dominated all other design considerations. Such decisions included allowing the location of answer choice boxes to be determined by space requirements between boxes rather than where they should have been located from the standpoint of possible measurement error. Another consequence was placing important directions in left-over places on the questionnaire page where answer spaces could not be conveniently located. Still, another undesirable result was the use of certain "drop-out inks" which, even when printed at full intensity, were difficult for respondents to see, and therefore did a poor job of guiding respondents to place answers in the appropriate places.

The reason for using these special inks in the first place is that when exposed to a colored light filter, they can be made to "disappear" thus facilitating the optic scanning of respondent answers.

Until recently, survey methodologists have failed to counter these arguments effectively. For example, the increased work in cognitive psychology, which has brought much needed attention to the effects of question order, category order and other aspects of question presentation, has focused almost exclusively on interview as opposed to self-administered questionnaires. A compelling case was not made that self-administered questionnaires were sensitive to these design issues. That situation is now changing.

Recent research brings into question whether lengthening a questionnaire to make it easier for respondents will decrease response. Converting the one page (10-1/2" x 28) optically scannable 1990 U S census form into an eight page (8-1/2" x 11") respondent-friendly booklet actually improved mailback completion rates from 63.4 to 66.8% in a 1992 test census (Dillman et al, 1993). The same transformation of the 20 page long census form into a 28 page respondent-friendly booklet improved completion rates in a test census from 51.8 to 55.9% (Dillman et al, 1994).

Improvements in optical scanning and imaging technologies are making it possible to produce machine readable questionnaires that allow greater flexibility of design. In addition improvements in questionnaire design equipment, printing equipment, and the range of drop-out and other inks, provide new possibilities for development of respondent-friendly questionnaires.

Research is needed on how to utilize these possibilities to improve questionnaire design. In particular there is a need to bridge a mostly untraversed gap between survey methodology and graphical design. One such attempt has been made in a paper by Jenkins and Dillman (1993). It is argued there that survey methodologists need to draw from both cognitive psychology, often used for designing interview questionnaires and motivational psychology, which has only sparingly been used to identify ways of improving survey response. They identify and illustrate 20 principles for designing questionnares as follows (The paper and illustrations are available from the authors at the Social and Economic Sciences Research Center, 133 Wilson Hall, Washington State University, Pullman,Washington 99164-4014, Telephone 509/335-1511, Fax 509/335-0116):

1. Present information in a format that respondents are accustomed to reading.
2. Present only the most relevant information using graphical design features and composition.
3. Pique respondents' interest early in the questionnaire.
4. Dominantly feature questions over additional explanatory information.
5. Include in each question all of the relevant information necessary for respondents to answer it, rather than specifying information in a subsequent instruction.
6. Vertically align the questions and response categories.
7. If incorporating needed information into the question makes it too complicated to understand, then provide accompanying instructions at the place where they are needed.
8. Use single-task formats rather than multi-task formats.
9. Use single-question formats rather than matrix-question formats.
10. Make headings and instructions at the top of the page more prominent than those in the middle of the page.
11. Provide directions in a natural reading format and use graphical design features to make the directions more salient.
12. Use graphical design techniques to establish a clear path through the questionnaire for the respondent to follow.
13. Avoid using the same design feature to request different respondent actions.
14. Use variability in design features judiciously.
15. Visually emphasize information the respondent needs to see and de-emphasize information which the respondent does not need to see.
16. Use graphical layout of questions on the page to distinguish among different types of question structures; maintain consistency within types.
17. Provide descriptive captions either above, beneath, or to the right of blank answer spaces and use appropriate signs or symbols whenever numbers are requested.
18. Use dominant graphical markings to provide the most important information needed by the respondents to guide them through the answering process.
19. Avoid the separation of questions through the use of lines and rectangles in favor of an open format.
20. Structure and organize the questionnaire in such a way that it, first makes sense to respondents and, second avoids leaving the choices of the order in which questions get answered up to the respondent.

In a subsequent paper to be presented at the International Conference on Measurement and Process Quality, (Jenkins and Dillman 1995), the theoretical basis of these principles is developed further. The process of questionnaire design is divided into two aspects, "information organization" or the choice and order of words, and the use of "navigational guides" to define and motivate respondents to follow a particularly navigational path through the questionnaire as they perceive, comprehend and respond to questions.

Concepts essential for defining that navigational path draw heavily from research on visual perception, a literature not typically utilized by survey methodologists. Important concepts from this literature which can help us understand how questionnaires are perceived and comprehended by respondents, include pre-attentive processing, pattern recognition, bottom-up vs top-down processing, eye movement patterns, figure vs ground distinctions, the law of Pragnantz and other visual laws of similarity, proximity and closure. They provide important new tools for understanding what happens when respondents view a questionnaire and begin to decide whether and how to respond. An accessible and very readable overview of these concepts and their place in theories of vision is provided by Crick (1994).

Much remains to be learned about how to best design self-administered questionnaires. Principles like those outlined here, and the theoretical concepts that they are based on need to be empirically tested if we are to succeed in developing questionnaires that minimize both measurement and nonresponse error.

1. References

Crick F, 1994. The Astonishing Hypotheses: The Scientific Search for Soul.
Charles Scribner & Sons, New York.

Dillman D A , Sinclair M and Clark J R, 1993. Effects of Questionnaire Lenght, Respondent-Friendly Design, and a Difficult Question on Response Rates for Occupant-Addressed Census Mail Surveys. Public Opinion Quarterly 57, 289-304.

Dillman D A, Treat J B and Clark J R, 1994. The Influence of 13 Design Factors on Response Rates to Census Surveys. Annual Research Conference Proceedings, U S Bureau of the Census, Washington D C.

Jenkins C R and Dillman D A, 1993. Combining Cognitive and Motivational Research Perspectives for the Design of Respondent-Friendly Self-Administered Questionnaires. Paper presented at the annual meetings of the American Association for Public Opinion Research, St Charles, Illinois, May 20-23.

Jenkings C R and Dillman D A, 1995. Toward a Theory of Self-Administered Questionnaire Design. Paper prepared for presentation at the International Measurement and Process Quality Conference, Bristol, England, April 1-4.

Announcement

U.S. Census Bureau's 1995 Annual Research Conference

The U.S. Census Bureau's 1995 Annual Research Conference (ARC 1995) will be held March 19–23, 1995 at the Key Bridge Marriott in Arlington, Virginia, U.S.A. only 5 miles from National Airport and two blocks from Metro. ARC 1995 will comprise a mix of topics such as address registers, determining census content, census questionnaire response research, defining households, ethnicity, sampling in census taking, small area estimation, measuring international trade, data quality in longitudinal surveys, agriculture, and census evaluation. For further information contact Ms. Maxine Anderson-Brown, ARC Conference Coordinator, Office of the Director, Bureau of the Census, Washington, DC 20233, (301) 763-1150.

Country reports

Central America and Panama

(from David J. Fitch)

The 10th National Census of Population and the 5th of Housing was conducted April 17-30, 1994 in Guatemala. The previous census was conducted in 1981 during the height of the war, so the results of the present census should be much more accurate. The results are eagerly awaited and are expected to be available early in 1995. Some preliminary results, only available to the government, will be released shortly. One number that will be of much interest to many is the percentage of people who classify themselves as indigenous, or as they more often say, "Naturales". Often it is said that half or more of the people of Guatemala are indigenous. We will have an official figure shortly.

The National Institute of Statistics, the agency responsible, began their mapping operation at the end of 1992 with the making of aerial photographs. Then maps were drawn for each municipio (county), and finally, detailed maps were prepared showing the location or dwelling units (DU's) for 99% of the country. The remaining war activities prevented 100% coverage. In 1981 detailed maps could not be prepared for about 20% of the country. With these maps

showing DU's, the whole of the country was divided into "sectores" each of about 120 DU's.

Prior to the census an experimental census was conducted in three municipios and a national awareness campaign was carried out. Over 14,000 interviewers and supervisors were employed in the census. There were some reported problems in Guatemala City with getting information from unrelated people living together in cheap quarters. As is usual here, rural people were very cooperative. Following the census a post enumeration survey was conducted.

Canada

(from G. J. Brackstone)

As of March 1994, Statistics Canada's Survey of Employment, Payroll and Hours (SEPH) is taking advantage of a new and important administrative data source for the small sized units. Two key variables (total payroll and employment) are available on a sampled basis from this administrative source. The availability of these administrative variables has had several effects on SEPH. First, the coverage has improved so that estimates will better reflect current economic conditions. Second, the total sample size required to collect other variables has been significantly reduced, thereby simultaneously reducing costs and respondent burden. This reduction has been possible because of the high correlation between the collected variables and the administrative variables. A sub-sample of the administrative sample is selected and all variables of interest are collected for this sub-sample through a survey. This sub-sample is used to model the collected variables on the administrative variables and thus obtain predicted values of the collected variables for the administrative sample. These two key variables will be available for all units starting in January 1995. It is planned to incorporate their full use into SEPH in January 1997. For further information, please contact Michael Hidiroglou, Business Survey Methods Division, Statistics Canada, Ottawa, Ontario, K1A OT6. Tel (613) 951-4767.

The National Longitudinal Survey of Children is being conducted by Statistics Canada on Behalf of Human Resources Development Canada. The main objective of the survey is to collect ongoing Information on children in Canada to be used for developing policy and to research the effect the child's environment and development at various stages in his/her life has on his/her later social attainment. The real interest is in following children from birth until later in their lives, but in order to speed up the availability of data, children aged 0 to 11 will be selected for the first collection and followed longitudinally. Cross sectional data will also be provided on various age groups by supplementing the longitudinal sample in subsequent collections. The sample size will be approximately 25,000 children aged 0 to 11 years of age. Data collection will first take place in December 1994 and January 1995. This survey will be partially integrated with Canada's National Population Health Survey, noted in Canada's country report of December 1993. More information on the survey can be obtained by contacting the survey manager, Gilles Montigny, Special Surveys Groups, Statistics Canada, Jean Talon Building, Ottawa, Ontario K1A 0T6. Tel (613) 951-9731.

Estonia

(from Imbi Traat)

After re-independence in 1991 there has been a remarkable increase in statistical activities in Estonia. The Estonian Statistical Society was created in 1992 and it has become a member of ISI. The same year the Statistical Office of Estonia (SOE) entered the EC/EFTA Statistical Co-operation Programme with the Baltic States to bring Estonian statistics into accordance with international standards and with the System of National accounts of the UN. Statistical information began to be regularly printed in a monthly bulletin - Estonian Statistics - which had not been published since 1940.

Budget cuts made it necessary to replace many censuses by sample surveys. Since 1993, regular sample surveys have been carried out in enterprise and trade statistics where stratified simple random sampling is used at present. Comparatively large sampling errors are caused by the lack of auxiliary information. The enterprise register which was created in 1990 is not perfect. It has been continuously improved - recently 45 000 units of the register were queried to update the information. In 1994 Estonia joined the research programme - Demography of Newly - created Enterprises - or-

ganized by EUROSTAT. In September 1994, the Living Conditions Survey with a sample of 5 000 households (and individuals) started in collaboration with SOE, Social Ministry and the Institute of Applied Social Sciences in Norway. The first results are expected by January 1995. A regular Labour Force Survey is under preparation. Estonian market and opinion research is mainly carried out through a private survey organization, EMOR, created in 1990. This organization conducts the Family Budget survey.

The need for, and interest in, better statistical knowledge has also increased. In spring 1993, Statistics Sweden delivered a five-week STAC (Statistics in Action) course in SOE. The same spring a course in survey sampling was given for the first time in the Mathematics Faculty of the University of Tartu (UT). Also for the first time, it was possible to graduate from UT as a Bachelor of Mathematical Statistics. The Institute of Mathematical Statistics of UT has given (1992) complementary courses for the staff of SOE. As of autumn 1994, these courses will be offered on a regular basis.

Finland

(from K.Djerf)

This country report discusses some recent developments in individual and household surveys carried out by two organizations: Statistics Finland and the Finnish Social Insurance Institution.

Among Statistics Finland's best know continuing surveys are the monthly Labour Force Survey, the annual Income Distribution Survey, and the Household Budget Survey, which is conducted every fifth year. Other important surveys, which are conducted at longer time intervals are, e.g., Time-Use Studies, the Survey of Living Conditions, and the Survey of Leisure Time Activities. These surveys will be revised in the near future for two main reasons: (1) practically all surveys will be conducted using computer assisted interviewing (either CAPI or CATI); (2) the formation of the European Economic Area increases the need for co-ordination in statistics production.

The Labour Force Survey (LFS) is, at present, a monthly survey which uses a rotating panel design. The sample size is about 12,000 and the size of the new panel is about 2,500 (rotation no. 1). So far the LFS has used a sample of individuals. However, harmonization with Eurostat's LFS requires increased data on households. At present, it appears that Statistics Finland will retain the monthly LFS and combine it with data on other household members on an annual or quarterly basis. In estimation, we want to extend the use of auxiliary register information which is expected to yield significant gains in precision.

The Household Budget Survey will now be conducted annually from 1994 on. Its sample size has been reduced from 12,000 to about 3,500. Although the precision of consumption estimates will be decreased, we will, on the other hand, gain precision in the estimates of consumption changes over time. We are also considering combining data from two or three years to be able to perform analyses as detailed as previously. These plans have a high feasibility as we have access to a great deal of register information which can be used to improve estimation.

We are also devoting a great deal of resources to decrease nonresponse bias in household surveys. Most often, we use reweighting, either model-based weighting or sample-based adjustment cell weighting. For further information on any of the above surveys, contact Mr. Kari Djerf, Statistical Methods, FIN-00022 Statistics Finland. Tel +358-0 1734 3411 or Fax +358-0 1734 2474.

The Social Insurance Institute of Finland (SII) conducts surveys on various topics of social security. Research is carried out in a separate research and development establishment founded in 1964. Questions related to social policy and health, and to functional and work capacity have been studied recently. These surveys include, for example, the Mini-Finland Health Survey, the National Occupational Health Care Survey, the Finnish Health Security Survey, and the National Unemployment Follow-Up Survey.

Some common features of these surveys are that they are multi-purpose surveys and use complex multi-stage sampling designs. The sample size of each survey is also large, ranging from 8,000 to 17,000 persons. Personal interviews, mail questionnaires, and clinical examinations and measurements are used to collect the data. Moreover, register data covering the whole population, maintained by the SII, Statistics Finland and other governmental organizations, are extensively used as auxiliary information in the sampling phase and as additional study data. For more information on

these and other SII surveys, please contact Dr. Risto Lehtonen, The Social Insurance Institution, P.O. Box 78, FIN 00381, Helsinki, Finland.

Hungary

(from L. Mihalyffy)

The Hungarian household surveys, integrated in the Unified System of Household Surveys (USIIS) since 1976, have multi-stage stratified probability samples using a Horvitz-Thompson type estimator. Adjustment of USIIS estimates for non-response became an issue at the beginning of the 1990s when the hardships of the transition period led to an increased reluctance to respond to the surveys of the Central Statistical Office.

Adjustment by updated census counts was first introduced in the Labour Force Survey (LFS) in 1992 in a rather straightforward way: estimated levels (or totals) in cells defined as cross-classes by sex, age-groups and some geographic breakdown were adjusted to the corresponding updated census counts. Though the method was a variant of a standard technique used in many countries, it implied difficulties when tabulating data for households, since, as the result of the adjustment, the members of a family usually received different sample weights or inflation factors. Although using the average of the members' weights for the household was a possible approach, a solution where each member of a household has the same adjusted weight seemed more advantageous. Thus after consulting experts from different countries, an iterative method was developed and adopted.

In the first step individual weights were adjusted to ensure agreement between weighted estimates and population totals for each adjustment group (e.g., sex by age-group by geographic area). In the second step an average of the adjusted weights was calculated for each household and assigned to each individual in the household. These two steps were repeated until convergence.

Experience with this method has proved quite satisfactory. In the case of the Ethnic Minorities Survey, e.g., where the number of sample households in geographic units (i.e., the capital city and the counties) ranged from 599 to 2,872, 40 iterations provided acceptable agreement with the population counts. A slight modification of the method ensures a proper positive lower bound for the adjusted weights.

For more information on this method, contact Laszlo Mihalyffy, Hungarian Central Statistical Office, Keleti K No 5-7, Budapest 1525, Hungary. Tel (361) 212-6897 and Fax (361) 212-6679.

Israel

(from Malka Kantorowitz)

To supplement information from the Israeli Time Use Survey (see Survey Statistician No 30) a Survey of High School Students' Activities was conducted by the Israeli CBS to examine their activities in greater depth. Students of each of the four high school grades were considered as a separate population and there was a need to obtain estimates with reasonable precision for quite a number of various sub-groups within each grade, although their population size varied considerably. To meet these requirements, a non-proportional sample was required.

Due to limited resources, this survey was exceptional in that the field work was carried out by the district directors and supervisors of the Social and Youth Education Division of the Ministry of Education, with the help of the headmasters and teachers of the sampled schools.

The simplest way of conducting the survey was to draw a cluster sample of classes and to ask the students of each sampled class to complete the survey questionnaire by themselves during school time, under the guidance of a teacher. In order to maintain strict confidentiality and to avoid response bias (prestige and other forms), special arrangements were made to prevent the teachers and the other field staff from having access to the questionnaires.

The sample had to be further clustered within schools. To minimize this for each sub-group within each grade, a special non-proportional two-stage sampling technique was used. In the first stage, within each stratum, a PPS sample of schools was drawn. The size of each school was determined so that in the second stage, only one class of each grade would be included in the sample in a sampled school, regardless of the number of classes in the school. Within each stratum, classes were sampled so that the ultimate selection probabilities were the same for all classes of the same grade, but not equal for classes of different grades.

Out of 560 classes of the sample, about 10% did not participate in the survey, primarily because the data collection started only two months before the school term ended. In addition, the average non-response rate of students (due to absentees and refusals) was 86%. Thus, the overall non-response rate was about 77%, so that the net sample was 12,300 students. To adjust for non-response, which varied considerably between different strata, a multi-stage weighting procedure was used.

Sampling variances were calculated for all the estimates in the survey publication. Since the design effects for different estimates were not similar, no simple rule could be established to summarize sampling errors with a satisfactory approximation. So all estimates were published together with their sampling errors. There is, nevertheless, a growing trend in the Israeli CBS to publish sampling errors together with the estimates, wherever possible. Furthermore, when estimates were presented for different sub-divisions into two sub-groups of the population, all significant differences were indicated. The reaction of the users to this was very positive, as they found that it facilitated interpretation of the survey results.

For further information, please contact Malka Kantorowitz, Central Bureau of Statistics, Hakirya-Romena, P O Box 13015, Jerusalem 91130, Israel. Fax: 972-2-553325 and Tel: 972-2-553447.

Japan

(from Y. Sakamoto)

The Research Committee for the study of the Japanese national character originated the study with the first nation-wide survey in 1953. Since then, a similar statistical survey has been conducted every five years, for a total of nine surveys.

Each survey has been carried out using face-to-face interviews with samples of 3,000 to 6,000 Japanese nationals, aged 20 and over. Samples were selected by a stratified three-stage probability sampling method. In the most recent survey, carried out in October 1993, out of the target sample size of 5,400, 3,738 were successfully interviewed, a completion rate of 69%.

In each survey, the questionnaire contained approximately 50 items, most of them being similar to those in previous surveys. However, since 1973 two different types of questionnaires have been used. One consists of items used in preceding surveys (referred to as 'K-type'), the other consists mainly of new items (referred to as 'M-type'). Each questionnaire was administered to one-half of the total number of respondents.

These two types of questionnaire were also used in the most recent survey. All the questions in the K-type questionnaire had previously appeared in the questionnaires of one or more of the previous surveys, most of them having been common to all surveys. The majority of questions in the M-type questionnaire, however, were developed after 1973. Some of those items were developed especially for the latest survey. These items were formulated for the following reasons: a) since over forty years has passed since the original questionnaire items were formulated, it was thought that the content of some of the questions might be outdated or no longer adequate; b) some of the questions and response categories proved to be unsatisfactory; c) revision of the questions was needed to facilitate future comparative studies with other nations.

Thus the latest survey has two major objectives. One is to clarify what aspects of people's ways of thinking have changed over the postwar forty years, based on responses to questions repeatedly asked over this period. The other is to investigate new aspects of opinion trends in Japan.

For further information on this survey, please contact Yosiyuki Sakamoto, The Institute of Statistical Mathematics, 4-6-7, Minami-Azabu, Minato-ku, Tokyo, 106 JAPAN (fax: 81-3-3446-1695, e-mail: sakamoto, @ism.ac.jp).

New Zealand

(from L Cook)

Maori are the indigenous people of New Zealand and their rights have been protected in a treaty signed in 1840, with the head of the then colonial power, Queen Victoria of Great Britain.

One hundred and fifty years since European government came to New Zealand, Maori society, and the economy in which Maori participate, continue to have distinctive characteristics of scope, development and impact.

Official statistics of this 14 percent of the New Zealand population provide measures critical to

comparing the conditions and development of Maori in New Zealand, and in many issues of rights drawn from the Treaty of Waitangi.

In co-operation and joint participation in the statistical endeavours by Statistics New Zealand, other public agencies, Maori bodies and Maori researchers can add significantly to the value of information in this area.

There are many issues where the independence of the Government Statistician, particularly with respect to methodology and release practices needs to recognize the distinct interests of Maori, as well as those of the government.

A forum of Maori, distinguished by their experience in the use of statistical data in the academic community, business or public policy, have agreed to meet regularly to advise the Government statistician on how to meet Maori needs, and to raise issues for attention by Statistics New Zealand or other statistical producers.

The role of the Maori Statistics Forum is to assist the Government Statistician in meeting the obligations of the Treaty of Waitangi and to develop and maintain a bicultural framework for official statistics in New Zealand by: advising on cultural and ethical issues involved in the collection and use of statistical data; advising on consultation with iwi (or tribes); assisting with the identification of statistical projects that are of particular concern to Maori, including improvement and development of data collected by all other government departments relating to matters concerning Maori interests; advising on the priority to be given to projects aimed at improving the relevance of official statistics to Maori; advising on ways in which Statistics New Zealand and iwi might co-operate to meet the needs of iwi for information; and raising with the Government Statistician issues of concern to Maori relating to the collection, analysis, usage, and dissemination of statistical data.

Key initiatives have included: A Maori scholarship programme has been established and the first scholarship awarded; Proposals were developed and accepted by government for the 1996 Census to have a bilingual (Maori/English) questionnaire for Maori; An ethnic Health Statistics Working Group was established by Statistics New Zealand to address the growing concern amongst users about the inadequancies in ethnic health statistics; and a draft report on the demographic, social and economic situation of Maori in New Zealand was prepared. The report which is based primarily on information from the 1991 Population Census discusses trends in population structures and processes, changes in family structures, the labour force and education. The report will be published in 1994.

Peru

(from Leonor Laguna)

The Ministry of Labour started an Employment Levels Survey in 1965 with the technical assistance of the University of Michigan. Since then the survey has been carried out once a year in the Lima metropolitan area. From time to time, the survey was conducted in other Peruian cities as well. By July of this year the survey was conducted in 13 of the largest cities in Peru.

The target population consists of household members aged 14 and over, working or looking for work during the survey week. The sample size was 2000 housing units in Lima, 1200 for other large cities, and 1000 for cities with lower population density.

The sampling design was two-stage, self-weighting, with implicit stratification of PSU's, according to socioeconomic level. PSU's are clusters of city blocks containing about 100 housing units.

In addition to this survey, the Ministry also conducts a Wages and Salary Survey in each semester of the year. The universe consists of private enterprises with 10 workers or more in the Lima metropolitan area. The sampling design is stratified two-stage; stratification is by enterprise activity and average salary level. The PSU's are the enterprises and the ultimate sampling units are the workers. The size of the sample is 600 enterprises and 6000 workers. An Employment Variation Survey of the manufacture, trade and service sectors is also conducted on the basis of a census of enterprises with 100 workers or more. The information is collected monthly through the postal service.

For more information contact: Luis Leiva G, Director Nacional Empleo y Formacion Profesional, Ministerio de Trabajo, Lima-11, Peru.

The Instituto Nacional de Estaditica e Informatica (INEI) has undertaken an Income and Expenditure Survey in the Lima Metropolitan

Area and the 24 most important cities of Peru. They are collecting information on characteristics of the housing units and of the households and their members, such as education, health, employment, migration, income and expenditure on food and other goods. The reference period for food expenditure is 7 days. The sampling design is two-stage - the PSU's are clusters of about 120 housing units with clusters of 8 dwellings as second stage units. The PSU's were selected systematically pps, the measure of size being the number of dwellings they contained according to the 1993 census. One cluster of 8 housing units was selected systematically with each selected PSU. Data were collected from October 1993 to September 1994 with an independent sample for each quarter of the year.

For more information contact: Felix Murillo, Jefe INEI, 28 de Julio 1056, Lima-01, Peru. Fax: 51-14-333591.

Basque country – Spain

(from A. Iztueta Azkue)

Developing a Statistical Dissemination Databank has been a primary target of EUROSTAT in recent years. For that reason, having analyzed the potential needs of our users and the existing experiences of other Statistics Institutes in this matter, we have chosen the PC.AXIS software developed by Statistics Sweden.

HEDAPEN, the Statistical Dissemination Databank of the Basque Statistics Institute is based on PC.AXIS and in 1994 the following statistical data sets will be included in this system:

1. The Input-Output tables of the Autonomous Community of the Basque Country 1980, 1985 and 1990.
2. The Databank of Geographical Statistical Indicators 1994 of the Autonomous Community of the Basque Country.
3. A Survey on Time Use of the Autonomous Community of the Basque Country.
4. The Databank on Education Statistics in the Autonomous Community of the Basque Country.

At the end of 1993, the parliament of the Basque Country approved the four-year Official Statistics Plan of the Basque Country for 1993-96, with a total of 117 statistical operations covering the geographical area of the Autonomous Community of the Basque Country.

For more details about this report, please contact Anjeles Iztueta Azkue, EUROSTAT-Basque Statistics Institute, Dato 14-16, 01005 Vitoria-Gasteiz, Spain.