



第1次 國際行政統計協會會議 및
人口센서스 자료 이용에 관한 會議結果報告

International Association for Official Statistics
Conference and International Conference on Dis-
semination & Use of Census Data

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經濟企劃院 調查統計局
National Bureau of Statistics
Economic Planning Board

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I. 參席者 名單

金 景 中 經濟企劃院 統計計劃官

崔 鳳 鎬 經濟企劃院 調查統計局 統計事務官

II. 會議日程

1988.10. 4 - 10. 7 第 1 次國際行政統計協會 會議開催 (로마)

1988.10. 9 - 10.13 人口센서스 利用에 관한 會議開催 (카이로)

III. 第 1 次 國際行政統計協會 會議 概要

1. 國際行政統計協會 (**International Association for Official Statistics**)의 性格

- 國際行政統計協會 (IAOS)는 國際統計協會 (International Statistical Institute)의 5개 산하기관중 1기관임.
- 5개의 산하기관은 다음과 같음
 - International Association of Survey Statisticians
 - International Association for Official Statistics
 - International Association for Statistical Computing
 - International Association for Regional and Urban Statistics
 - Bernoulli Society for Mathematical Statistics and Probability

2. 第1次 IAOS 會議 開催

- 主 催
 - 國際行政統計協會 (IAOS)
 - 이태리 中央統計廳 (ISTAT)
- 日 字 : 1988.10.4 - 10.7 (4 日 間)
- 場 所 : 이태리 로마시 Aldrovandi Palace 호텔

3. 會議目的

同 會議는 各國政府가 公式的으로 公表하는 各種 統計의 生産과 利
用方案에 관한 諸般爭點의 論議가 目的임.

4. 討論議題

- 統計調査實施와 관련된 資料의 質的 問題
- 政府行政統計와 관련된 法的, 倫理的 問題
- 政府行政統計를 活用하는데 있어서 民間部門의 役割
- 國民計定作成에 대한 主要體系 比較
- 統計機關間의 經驗 및 知識의 相互 移轉問題
- 統計指數의 公式的, 非公式的 利用
- 政府行政統計의 生産 및 資料處理 關係

5 參席人員

- 主로 유럽 各國의 統計擔當機關에서 參席한 150 명 정도임

6. 參考事項

- 第2次 會議는 1990年에 中國 北京에서 開催될 예정임.

IV. 人口센서스 利用에 관한 會議 概要

1. 會議開催

- 主 催
 - 이집트 中央統計廳 (Central Agency for Public Mobilization and Statistics)
 - 美國 商務省 센서스局
 - 유엔統計處 (UN Statistical Office)
 - 國際統計協會 (International Statistical Institute)
- 日 字 : 1988.10. 9 - 10.13 (5일간)
- 場 所 : 이집트 카이로市 아랍연맹 빌딩

2. 會議目的

同 會議는 이태리 로마에서 開催된 國際行政 統計協會 會議의 副次的 (satellite)인 會議로서 人口센서스 資料의 普及 및 活用に 관한 論議가 目的임.

3. 參席人員

主로 아프리카 및 中東 各國의 統計擔當 機關에서 參席한 200명 정도임.

4. 討論議題

- 이집트 센서스의 사후조사 경험
- 기술협력증진 전망
- 정책 기획수립에 인구센서스 자료의 활용사례
- 자료이용자 지원 프로그램 설치방안
- 계획을 위한 센서스 자료를 기초로 한 인구추계
- 인구센서스 자료의 질적개선을 위한 방안
- 자료 활용성 제고를 위한 민간부문의 역할
- 1986년 이집트 센서스 자료배포 현황
- 자료의 한계성에 대한 홍보 방안
- 특수 인구집단 연구에 대한 인구센서스 자료의 활용
- 1990년 인구센서스 자료생산 계획
- 자료활용성 제고에 대한 신기법
- 그래픽의 효과적인 응용관계
- 통계분석 마이크로 컴퓨터 응용관계
- 인구분석 마이크로 컴퓨터 응용관계

V. 參考資料

1. 蒐集資料目錄

가. 제 1 차 국제행정 통계협회 회의

- 이태리의 통계현황 보고서
- 제 1 차 국제행정 통계협회 회의준비 보고서
- 큰나라에 있어서의 자료이용망 구축
- 국민계정 및 국제수지 균형체계 비교
- 통계정보 시스템에 있어서의 품질관리
- 건강관련 통계조사표 설계
- 설문서 설계 방법
- 이태리에서의 직업분류 개정의 어려움 및 문제점
- 이슬람종교 입장에서 본 통계학
- 나이지리아에서의 자료은행 설치와 관련된 문제점
- 헝가리에서의 소비자 물가지수의 활용
- 베트남에서의 통계활동
- 조사원의 어려운 점 및 문제점
- 가구면접조사에서의 응답오차
- 나이지리아에서의 통계조사 실시와 관련된 질적문제
- 선진국에서의 가구조사실시와 관련된 질적문제
- 목적에 맞는 조사표 설계

- 다양한 기준을 근거로한 조사표 설계
- 전화를 이용하여 조사한 가계지출 결과
- 현대사회에서의 교육훈련에 대한 몇가지 관찰
- 인구센서스 및 조사방법론 훈련
- 센서스 자료처리에 있어서의 직접자료 입력방식 (OMR)
- 정부행정 통계의 불일치
- 통계자료 제공과 관련된 문제

나. 人口센서스 活用に 관한 會議

- 1988 이집트 통계연감
- 1986 이집트 인구, 주택 및 사업체 센서스 보고서
- 인구통계 자료수집의 고찰 및 전망
- 개발계획 수립을 위한 인구센서스 자료의 활용
- 이집트 인구센서스 자료를 기초로한 이집트의 노동력구조 변화추이
- 여성연구를 위한 인구센서스 자료의 활용
- 어린아이와 여성층 연구를 위한 인구센서스 자료의 활용
- 미국의 1990년 인구센서스 자료생산 계획
- 미국의 자료이용자 지원 프로그램의 개발
- 핀란드에서의 1985년 센서스 자료의 배포
- 지역간 상호 자료배포를 통한 지역경제 개발의 효율성 증대
- 센서스 및 표본조사를 위한 마이크로 컴퓨터시스템 활용
- Cyprus에서의 통계국 자료처리 신기법

- 카이로 지역의 인구추계
- 센서스 자료의 품질 관리를 위한 팩키지 프로그램 활용
- 인구센서스 자료의 공공 부문에서의 이용
- 마이크로 컴퓨터를 활용한 소지역 자료의 검색
- 센서스 자료의 활용에 있어 민간부문의 역할
- 판매, 광고 전략에 있어 행세통계의 역할
- 센서스 자료의 활용에 있어 통계기관의 역할
- 인구 및 주택센서스 실시에 있어서의 기술적 협력
- 센서스 자료처리를 위한 자료직접 입력방식 (OMR)의 활용
- 기획 및 의사결정을 위한 센서스 자료의 활용 예 : 나이지리아
- 우간다에 있어서의 기획을 위한 센서스 자료의 활용 : 우간다
- 경제사회 개발계획을 위한 센서스 자료의 활용 예 : 헝가리

2. 主要

國	査 員 業務量	人口 1 人當 センサー費用	備 考
카 나	家口		人口漏落率 2.01% (1981年)
美		約 4.5불	人口漏落率 (1970年) 全體: 2.2% 白人: 1.5% 黑人: 7.6% 資料處理는 FOSDIC方法
日	家口	約 295엔	• OMR方式 채택 • 사후조사결과 순누락율이 0.41%로推定
中	1日 1명 面接	約 20센트	住民登録과 연계하여 實施되었음.
방글라데			• OMR方式 처음시도 • 센서스 實施日을 公休日로 指定 • 現住概念으로 調査
말레이시	~6家口		• OMR方式 채택 • 現住概念으로 調査
스리랑	家口		• 現住概念으로 調査 • 특히 1981.3.16일 오후 6시부터 자정까지 집에 있도록 요청하고 관공서등에서는 일찍 퇴근토록 조치
태	家口	約 12센트	

3. 이태리의 主要統計指標

이 태 리 의 주 요 통 계 지 표

지 표	단 위	1982	1986
총 인 구	천 명	56,742	57,291
면 적	km ²	-	301,277
평균수명	남 자	71.0	-
	여 자	77.7	-
인공유산수	천 건	234.6	197.3
영아사망율	천명당 (출생아)	10.3	7.7
6세이상인구중 문맹율	남자	%	2.2
	여자	%	3.9
실업율	남자	%	6.1
	여자	%	14.9
취업자 구성비		100.0	100.0
• 농 업		12.3	10.7
• 산 업		36.7	32.7
• 서어비스업		51.0	56.6
범죄발생율	십만명당	3452.2	3546.4
1인당 GNP (경상가격)	천리라	9,625	15,625
수입액 (경상가격)	십억리라	116,216	149,045
수출액 (경상가격)	"	99,231	145,323

지 표	단 위	1952	1986
주요상품생산량			
• Wheat	천 톤	1,081	1,928
• Rice	천 톤	517	2,445
• Sugar cane	천 톤	3,258	9,684
• Crude petroleum	천 톤	2,300	42,000
• Phosphate	천 톤	478	1,162
• TV sets	천 개	-	443
• Radios	천 개	-	180
• Fertilizers	천 톤	217	5,416
• Cement	천 톤	951	7,612
• Tyres	천 개	-	1,720
• Cotton yarn	천 톤	56	225
• Soap	천 톤	63	275
• Paper	천 톤	20	172
• Refrigerators	천 대	-	536
• Motor cars	천 대	-	19

자료출처 : 1) Central Agency for Public Mobilization & Statistics,
A Statistical Glimpse, 1987.

2) _____, Statistical Yearbook, 1988.

3) _____, 1986 Population, Housing and Establishment
Census, 1987.

4. 이집트의 主要統計指標

이 집 트 의 주 요 통 계 지 표

지 표	단 위	1960	1986
총 인 구	천명	26,085	48,205
인구밀도	1 km ² 당	733	1,170
시부인구비율	%	37.4	43.9
이슬람신자비율	%	92.6	94.1
년간 출생아수	천명	1,114	1,878
년간 사망자수	천명	438	468
년간 혼인수	천명	282	451
년간 이혼수	천명	65	82
형태별 주택수 (시부)			
• Apartment	천개		4612.2
• Villa	천개		19.8
• Rural house	천개		490.1
• Separate rooms	천개		674.0
• Marginal residential places	천개		63.0
형태별 주택수 (군부)			
• Apartment	천개		1079.6
• Villa	천개		9.4
• Rural house	천개		4149.7
• Separate rooms	천개		169.5
• Marginal residential places	천개		47.3

지 표	단 위	1952	1986
주요상품생산량			
Wheat	천 quintal	89,590	92,623
Corn	"	72,645	64,131
Grapes	"	111,058	116,287
Olives	"	31,400	18,994
전 력	백만 KWh	181,656	192,330
Cast iron	천 톤	12,259	11,839
Steel	천 톤	24,777	22,740
Cars	천 대	1,254	1,653

자료출처 : Central Statistical Institute, Introducing Italy, 1987.

주 기 : 1) 1988년 현재 1달러는 1,380 리라 정도임.

2) 1 quintal 은 100 kg임.

VI. 主要發表 報告書

1. 큰나라에 있어서의 資料利用 網구축
2. 國民計定 및 國際收支 均衡體系 比較
3. 設問書 設計方法
4. 이태리에서의 職業分類 改正의 어려움 및 問題點
5. 헝가리에서의 消費者物價指數의 活用
6. 調査員의 어려운점 및 問題點
7. 家口面接調査에서의 誤差問題
8. 나이지리아에서의 統計調査實施와 관련된 質的문제

9. 先進國에서의 家口調査實施와 관련된 質的문제
10. 目的에 적합한 調査票 設計
11. 여러基準에 따른 調査票 設計
12. 핀란드에서의 1985年 센서스資料의 配布現況
13. 公共部門에서의 人口센서스資料의 活用
14. 센서스資料의 活用に 있어 統計擔當機關의 役割
15. 헝가리에서의 經濟社會 開發計劃을 위한 센서스資料의 活用例
16. 人口센서스와 人口調査方法 訓練

1. 큰나라에 있어서의 資料利用網 구축

Building up a data-dissemination network in a large country

R. G. Flôres Jr

Centro de Informações e Dados do Rio de Janeiro and
Dep. de Economia, UFRJ; Brasil

ABSTRACT

This paper discusses the problems related to heavily using computer facilities for data dissemination in a large country. Apart from the institutional and quality gains, some questions remain open, as to adequate data pricing and marketing policies and the efficient data base organization.

RÉSUMÉ

Cet article discute des problèmes de divulgation statistique, a l'aide de l'ordinateur, dans un pays continental. Si bien qu'il y a des gains remarquables du côté institutionnel et de la qualité, quelques questions majeures restent, comme celles de la stratégie des prix et du marketing et de l'organisation efficace de la base des données.

Building up a data-dissemination network in a large country

R. G. Flôres Jr

CIDE and Dep. de Economia, UFRJ; Rio, Brasil

1. Introduction

The dissemination of statistical information in a country 8.5 million km² wide, where income and educational disparities are rather marked, presents some special difficulties. Cost and conflicting priorities are often foremost, demanding a continuous check of any plan together with a near optimal use of available resources and structures. During the first half of this decade a radical policy for the dissemination of official data was pursued in the Statistical Office, in opposition to the previous system, where great emphasis was on standard publications, leaving an enormous amount of data unused and unknown to the general/potential user.

The policy is heavily based in data transmission facilities and profits from the federative structure, its main points being summarized in the next section. After a short evaluation, some key problems and conclusions are discussed in a final section.

2. The strategy.

2.1. Background developments.

Taking advantage of some previous attempts, priority was diverted to the development of dissemination software that would directly access sub-data banks of the major data

base. Special programs were developed, allowing easy retrieval of data series, IBGE(1985), or quick definition of complex cross-tabulations. The systems were made compatible to available data transmission facilities.

2.2.The national statistical network.

By means of the above software a national network was established, linking to the main host in Rio, telex and telephone lines as well as data cables. Among the connected computers, some acted as focal points for other star networks. This architecture is explained in Flóres e Bevilaqua(1985) and it allowed coverage of all state capitals at an optimal cost. Although connection to the network was possible through a variety of ways, the main ones used direct cable linkages.

2.3.The institutional framework.

With the revival of federalism in the country, the idea was to use the federal, state and county hierarchy to manage and support the network. So, the Statistical Office would be responsible for the main link to each state; the state governments would administer the spread of the network and its extension to each of their counties, which, in turn, would take care of its uses inside their area. A multiplier effect is thus easily achieved, with costs shared in rather fair proportions.

2.4.Marketing measures.

2.4.1. Simple systems:

As any interested layman could easily access basic macro and regional data through a few elementary queries, this was made available, free, at the Office library in Rio and, later, in Sao Paulo, Carvalho et al.(1984); its extension to other important state libraries being planned. This measure had a considerable impact, providing a better knowledge, by the public, of the existing data and, creating more concern for its quality. A similar effect was attained by the system which opened the same kind of data to all telex owners.

2.4.2. Other media.

Standard publications, like the Statistical Yearbook or Census Tabulations, will always be important, having a place of their own. However, an effort was made to create a broader range of simpler printed products, so that information could reach a wider audience. Emphasis was put on the graphical display of information and on shorter but timelier releases of published data.

3. Evaluation.

The project started in 1983 and it took around one and a half year to achieve a first stage of completion.

Relation with all the local authorities and important civil servants (although helped by the Statistical Office regional centres) is slow and, many times, specially at the county level, official statistics-with some chronic backlogs-do not rank among the priorities. Even so, support

encountered at the state level can be considered quite encouraging, many links having been established.

The private sector used intensively the telex system and the free-access library room (sometimes dumping hundreds of pages of data) and was receptive to a pricing policy that did not come to be definitely implemented.

In the internal side, systems people were greatly stimulated by the results, and design and evaluation standards were significantly raised, Flores(1986). A special structure, directly linked to the Presidency of the Statistical Office and solely concerned with data dissemination, was also created.

4. Some remaining questions.

Although adequate pricing policies can be set up, we are still concerned with a fundamental issue - enhanced by the importance of users' education in a country like Brazil - that a free data policy should in some instances be used. Even if costs are assigned, should the cost function for each system encompass some of the data collection costs, all the development costs or only maintenance costs? These issues haven't been clarified yet.

From the software viewpoint, in spite of the improvements achieved, the data organization and definition of all data banks when, apart from the five year censuses, a few dozen enquiries are conducted annually, many in a monthly basis, is still a problem. Of course, time, subject and geographic level are some of the main divisors, but only

a continual effort, taking into account the perceived demand for each data set can point towards a clearer definition. Also, decentralisation of collection and editing procedures, strengthening the focal points, may help their keeping some data banks, lowering the dissemination burden of the central office, IBGE(1985).

The adaptation of marketing concepts to this context, although already in progress, is also an area where new developments should occur.

In spite of these problems, we undoubtedly vote for an open, multimedia data policy where increased use of data should always be foremost to any other consideration.

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2. 國民計定 및 國際收支 均衡體系 比較

COMPARISON OF THE MAIN AGGREGATES OF THE SYSTEM OF NATIONAL ACCOUNTS AND THE SYSTEM OF BALANCES OF NATIONAL ECONOMY

(Activities and experience of the Federal Statistical Office, Czechoslovakia)

J. Češka, Federal Statistical Office, Prague
Š. Schlosser, Federal Statistical Office, Prague

1. Introduction

Basic issues of the economic development on a global and/or national levels cannot be successfully analyzed or predicted without an appropriate use of basic economic production and consumption aggregates, encompassing among others Gross Domestic Product (GDP), Net Material Product (NMP) or National Income (NI) and Total Consumption of Population (TCP). Being the most important economic aggregates, they appear as endogenous variables in the econometric and other model studies, in intercountry comparisons and comparative statistical data analyses. They also serve as a basis for the derivation of other important aggregates and indicators.

In using these aggregates one should, of course, be aware of the fact that they function as component of higher discrete systems and therefore are not fully identical. While GDP is a production aggregate in the System of National Accounts (SNA) used in countries with market economies, the NMP plays a similar role in the System of Balances of National Economy (MPS) used in countries with centrally planned economies. The same applies to the so called "common aggregates" such as TCP.

Although the GDP, NMP and TCP are consequently considered aggregates of the same type and serve analogous purposes within their own systems, it naturally remains questionable whether or to what extent the pertinent categories of both systems are fully comparable and whether the conclusions drawn from the numerical calculations have an acceptable degree of reliability.

It is therefore evident that the study of the relationship between the SNA and the MPS is needed for every authoritative comparative analysis of the corresponding national aggregates of these two systems, for the adjustments that need to be made in their comparison and mutual conversion and for many other specific purposes as well. A great deal of attention is therefore focused on further improvement of the SNA — MPS comparisons and links, together with the revision of relevant international recommendation documents carried out under the auspices of the UN Statistical Commission and the Conference of European Statisticians.

The IAOS initiative to consider the issue of Comparisons of the main systems at its first conference should be highly appreciated.

It will provide, in our view, valuable assistance to countries concerned in their own work and in bilateral comparisons of SNA — MPS aggregates and further initiate national studies of this complex issue of intersystem comparisons and links.

2. Participation of the FSO in bilateral comparisons and comparative studies of basic economic aggregates

Bilateral comparisons and comparative studies of the SNA—MPS aggregates between European countries have been carried out either on the basis of cooperation agreements between national statistical offices of the countries concerned or under the auspices of the Conference of European Statisticians or other international bodies. The Czechoslovak Federal Statistical Office (FSO) has been involved in several international comparisons.

2.1 Comparison of the total consumption of population between Czechoslovakia and Finland

In 1986, the Central Statistical Office of Finland and the Federal Statistical Office of Czechoslovakia agreed to carry out a comparative study in the field of total consumption of population. The purpose of this study consists in analyzing the concept and the methodology of (i)

total consumption of material goods and services and non-material services of population, total income of population and, possibly, the GDP between two countries; (ii) subject-matter structure of the total consumption of population; and (iii) carrying out actual comparison of the relevant aggregates for the year 1985 in converting them from Czech crowns into Finnish marks (CSSR aggregates) and conversely (aggregates for Finland).

The programme of work covered the exchange of relevant methodological documents in use in Czechoslovakia and Finland and meetings of experts from both offices. This facilitated an insight into the respective types of statistical practice in this field, helped to identify the main differences in concepts and definitions of indicators which are subject to comparison, and also to consider an appropriate approach in carrying out the comparison, together with the methodological and analytical assessment of the results.

It is believed that what will be achieved by this specific statistical exercise will be used for the improvement of the comparison of both systems of national accounting, for the collection of extensive statistical material and the subsequent comparison between CSSR and Finland. As Finland is a participating country in ECP, the bilateral undertaking may also facilitate the linking up of the Czechoslovak statistical data should a similar comparison with other countries be sought in the future.

As it was already mentioned the agreed bilateral comparison involves countries with different systems of economies and thus with different systems of national accounting. While Finland applies SNA, Czechoslovakia uses the System of Balances of the National Economy (MPS). Thus in spite of the fact that the total consumption of the population and the total income of the population are "common aggregates" in SNA and MPS systems, for the purpose of their comparisons it is necessary to find an appropriate solution of the relevant conceptual, methodological and classification issues, incl. the setting up of rules governing the modification and adjustment procedure of the relevant indicators and their conversion from one system into the other.

The U.N. and CMEA standards and recommendations are used as a base by experts of both statistical offices in their present work. The results of the application of these standards on the specific conditions of each country have been taken into account in comparing concepts, definitions and methodology as carried out so far. Parallel studies on actual procedures used in the data collection, processing, classification and other treatment (adjustment) of data in MPS and SNA have also been undertaken.

The relevant statistical documents have been exchanged between the two statistical offices. The FSO made available namely methodology of the balance of non-material services and balance of the total income of population. The CSO of Finland provided statistics on the structure of the GDP used and on the whole domestic consumption by main consumption categories. Using these data the first experimental calculations were carried out and preliminary conclusions were formulated. It was concluded that there is a further need to clarify the content of the categories and consider the necessary transfers (reclassifications) among them in order to guarantee the desirable comparability.

The preliminary analysis of the 1985 data on the gross structure of the consumption showed that, for example, the ratio of the food, beverages and tobacco consumption in the whole consumption expenditures is more than 12 percentage points higher than in Finland. On the other hand the ratio of the consumption on housing and energy in Finland is 6.7 percentage points higher as compared with Czechoslovakia. This requires a clarification of the concept of gross rents and their imputation as far as owner-occupied housing is concerned.

The comparison between Czechoslovakia and Finland on the basis of 1985 GDP data and its main components for Finland with modifications in calculations of items applied in ICP(ECP) is also aimed at possible linking of data in case of comparisons with other countries. In view of this an effort will be concentrated on adjustments of data for Czechoslovakia to the structure and composition comparable with the calculations prepared by Finnish experts. These adjustments will contribute to the better comparability of the structures of comparison although one should take into account that they are influenced by price relations. In order to reach an acceptable level of comparison (coverage, prices) the corresponding proposals have been elaborated. They will serve for an identification and comparison of the individual categories of TCP and the purchasing power parity between Czech crown and the currency unit of Finland.

It appears that before the 1985 TCP data for Czechoslovakia are evaluated in Finnish marks and the latter comparison of GDP, it is necessary to clarify a certain number of methodological and subject matter issues. They cover namely the consideration of the preliminary calculations and data on domestic consumption of population for CSSR converted into the structure of the Finnish data used in ECP from the point of view of classification and calculation procedures, consideration of the methodological issues relevant to the scope of consumption such as relation between the output in health care sector and the health care services consumption of population, recreation and cultural services rendered at a reduced price; treatment of a cheaper fare, treatment of the consumption covered by enterprises against production costs or from other resources, contributions of non-profit organizations or their rendering services free of charge; the methodological issues of valuation of some consumption items require similar consideration. For example, own account consumption of agricultural products - degree of processing, housing costs, consumption of the services of insurance companies and betting shops. Issues of the composition of some items and the corresponding representative goods and services, for example meals at school, contributions of the members of housing cooperatives, repair of watches and jewelry, collection of data on the consumption of non-residents.

The preparation of relevant working papers are under way at the FSO in order to determine Purchasing Power Parities using a direct method or through the selection of representative items and their relevant prices. They will be reported to the CSO of Finland.

It is expected that the comparative study containing data, analytical part and methodological description will be finalized in 1989.

2.2 Comparison of concepts, definitions and methodology of total consumption of population between Austria and Czechoslovakia

In 1986, the Federal Statistical Office of Czechoslovakia and the Austrian Statistical Office agreed to carry out a bilateral comparison of selected indicators in the field of social and demographic statistics. The relevant study prepared in the course of 1986–1987 was issued in June 1987.

The agreement on cooperation between the Austrian and Czechoslovak Statistical Offices also contained a project aiming at a bilateral comparison of concepts, definitions and methodology used in statistics of TCP (material goods, material and non-material services) for Czechoslovakia and Austria.

The work on this project started and progressed after the completion of the first comparative study. It consisted in the exchange of the relevant methodological and numerical calculation documents between both offices and in the meeting of experts, held in spring 1988. From preliminary studies it was concluded that the conceptual considerations should be based on U.N. and the CMEA recommended methodological documents and the conceptual framework for intersystem comparisons. The actual comparisons of concepts, definitions and methodology should then be carried out in view of the application of these standards to the conditions and specificity of both countries.

Through this undertaking the Czechoslovak experts will know more about the concrete process of statistical data collection, processing, classification and other treatment of data applied in SNA, which is considered very useful. Better knowledge of the methodology will indisputably contribute to improved understanding of the content and the interrelation of data. Being also a significant prerequisite for possible quantitative intercountry comparison of the relevant indicators, it may give some impetus for the improvement of procedures used in the Czechoslovak national accounting, namely in respect of their improved adaptation to this adjustments and flexibility that need to be made for their international comparisons.

In view of the exceptional role played by Austria in ICP frame work for the European region where she was a "bridge" country between two participating groups of European countries and undertook the role of base country for the Group II, and thus gathered a great volume of information and experience, the experts of both statistical offices considered also the cooperation in the field of comparison of concepts and definitions and actual figures on GDP and its components.

Both groups of experts expressed strong interest in such comparison. It was agreed that the reference to ICP (ECP Group II) work and also SNA with the appropriate applications on Czechoslovak conditions would be considered most useful for any further steps in this respect.

Bearing in mind an exploratory character of such comparative study which will require a thorough consideration of all issues of application of this methodology and the elaboration of the needed documents (for example a sufficiently complete totality of representative items for all goods and services) no strict self-commitment has as yet been expressed in this direction. However an agreement was reached that within the overall ICP context priority would be given to the comparative study of the TCP aggregate. For this purpose the Czechoslovak and Austrian experts discussed methodological issues of this aggregate, scope, data requirements and their collection, classifications used, valuation of some components etc. First statistical data were also mutually provided. In view of our own resources we assume that the TCP comparative study may be prepared in the period 1989—1990.

2.3 Participation of Czechoslovakia in international comparison of basis indicators of the CMEA member countries and Yugoslavia

Czechoslovakia, the same as other Eastern countries, participates regularly in international comparisons of the basic indicators on the development of national economy (in value terms) of the CMEA member countries. The experience obtained from the international comparisons carried out in 1973, 1978 and 1983 is used in the preparation of the 1988 data comparison aiming at further improvement of the methodology and better comparability of indicators.

The programme and organizational procedure of this comparison which was approved by the CMEA Permanent Commission for Statistics in 1986 cover a comparison of a considerable number of indicators in value terms in two groups of indicators. The indicators in the first group will be subject to a standard comparison procedure, the indicators included in the 2nd group will be compared on an experimental basis.

The purpose of this comparative study is to collect valuable statistical material and comparable key value indicators for comparative macroanalysis in the field of the level of economic development, structural changes, well-being of the population and in other areas. Common methodological approach (reconciliation of methodology), i.e. determining the concepts and the definitions of the compared indicators, which are converted into standard currency system will be used.

The definition of the indicators, classifications, nomenclatures and other methodological instructions will be included in the relevant methodological documents. Price index method will be applied as the main method of comparison. It will require detailed information on prices of considerable number of the exactly specified (same) goods and services - representative items. The prices of these representative items will serve for the calculation of price indices. These indices will be used for the conversion of data on values in the conversion groups into prices of the USSR and conversely (vice versa). In some cases, for example in comparing agricultural production, direct methods of price conversion will be used.

Comparison will be carried out according to the pattern "the given country - USSR" in which the indicators for the USSR will be converted through price indices into prices of other CMEA countries and, conversely indicators of other countries into the USSR prices.

It is expected that specific issues and work involved in the comparison will be considered and carried out in individual years. The whole document with the results of these comparisons will be prepared to be considered at the session of the CMEA Standing Commission on Co-operation in Statistics in 1990.

Although this comparative study does not cover countries with different system of economies and is not precisely an intersystem comparison, it is appropriate to mention it. It represents a totality of complex international comparison works, in which our experts will acquire further necessary experience.

Conclusions

Contemporary trends in the growing international collaboration and international statistical comparisons are closely connected with efforts directed to the general improvement of Czechoslovak official statistics.

There are growing demands for statistical reports and analysis with the relevant international comparisons, for bilateral and multilateral comparative studies of the selected indicators and aggregates, incl. those used in both systems (SNA—MPS). New requirements arise for the experimental calculations of GDP in addition to the MPS aggregates for Czechoslovakia. An increasing proportion of the activities of the relevant FSO statistical divisions is devoted to this work area.

Bilateral cooperation with the statistical agencies of other countries were agreed on aiming at the elaboration of comparative studies of the requested aggregates. This is greatly appreciated by our experts.

As these activities enable to share the experience and acquire increased degree of knowledge and suggestions for further elaboration and improvement of the relevant fields of statistics, they are greatly appreciated by our experts. In addition, the mutual calculations of GDP, NMP and other indicators in terms of actual figures represent without any doubt one of the most positive contributions to the studies of comparisons and links between the SNA and MPS and their relevant aggregates. Czechoslovakia has not yet participated in the "UN International Comparison Project" (ICP) or in the "Comparison within the ICP framework for the European region (ECP)", but expressed an official interest in participation in connection with a new Phase VI which is being prepared.

The participation and also the experimental calculation of GDP for Czechoslovakia, which is planned to be carried out in the future, will necessitate (require) further elaboration (refinement) of the relevant methodology, finding a solution to many complex subject-matter issues, for example in setting up the goods and services categories representatives, in price statistics, elaboration of detailed procedure a method used, collection of considerable amount of statistics, their analysis and numerical calculations. A very complex issue is one of finding out an adequate solution in the field of price comparisons due to the existing system of the price areas in Czechoslovakia and also between monetary (currency) units. Some of these problems are rather of a non-statistical character and their satisfactory solution requires close collaboration with experts from other fields (departments).

The above mentioned problems represent challenging tasks for our MPS experts and future development will show to what extent they will be successful in solving them.

3. 設問書設計方法

Designing the questionnaire as a tool of communication

Linda Laura Sabbadini - ISTAT
Via C. Balbo 16 - Roma

1. Communication for measurement purposes

In survey planning, the questionnaire design phase takes place after the problem has been studied in depth and the relative goals, reference population, survey and sampling techniques and data processing methods and tools have been specified.

In statistical surveys the questionnaire design phase is a crucial one and requires great technical competence, experience and creativity. Its difficulty and delicacy is due to the particular nature of the questionnaire as such.

The questionnaire is in fact at the same time a measurement tool and a potential source of response and no-response measurement errors. It is a measurement tool because its function is to collect data on the survey's quantitative and qualitative variables through the questions asked, which constitute the measurement vehicle. It is a potential source of both response and no-response measurement errors, because an inappropriately formulated question can lead to distortion in the respondent's answer (if not complying with social norms, for instance); or because the same question may be interpreted differently by different individuals (thus impairing the measurement data's standardisation); or because questions that make excessively heavy demands on memory, or embarrassing questions, may not be answered at all.

Since the problem of measurement standardisation is of fundamental importance for all statisticians, it is necessary to ensure that the questionnaire, measurement tool and a potential source of nonsampling errors, becomes an important part of the non-sampling error prevention programme.

Many stratagems can be used for this purpose, but we think there is one crucial and strategic point on which attention should be focused.

To be an efficient measurement tool a questionnaire must be designed an adequate tool for complex communication.

2. Why is it complex communication tool?

Through the questionnaire and its layout, messages are transmitted to various interlocutors: first of all to the respondents, who must provide the answers; secondly, to the interviewers (if any), who are the intermediaries between the researcher and the respondents; and thirdly, to the operators who enter the data for processing. At all three levels the risk of non-sampling errors is considerable. The problem in the questionnaire design phase is to prevent such errors arising, and this entails considering the questionnaire as a complex communication

tool involving communication expressed at all three of the above levels with no confusion or overlapping.

The question to be asked is how such communication has been effected to date, and to what extent we have successfully communicated the intended message. Although progress has been made, but questionnaires are often cold, bureaucratic and, at times, rather like income tax return forms, which gives the recipients a negative image of the agency responsible for the survey. And if this is how the questionnaire appears, the respondent's reaction (if the questionnaire is to be compiled directly by the respondent) will tend to be negative. Hasty replies, boredom and distraction will increase, and answer motivation will decrease: it thus becomes far more difficult to obtain the respondents' involvement and participation.

This is also true of questionnaires used by an interviewer. This aspect is frequently underestimated, because it is thought that an interviewer should be so used to giving questionnaires that he or she no longer needs questionnaires to be carefully worded and laid out. But habit and routine are features that should be eliminated from interviewing work. Each survey should be greeted as something entirely new, each questionnaire should be presented as an attractive guide to the interview. The leeway for reformulating questions at the interviewer's discretion must be reduced to a minimum, without turning the questionnaire into a straitjacket for the interviewer. The interviewer must receive clear messages from the questionnaire (instructions), and must be given a tool that fosters the respondents' involvement and participation, and is easy and pleasant to read, so that the interviewer can feel easy and natural in his relations with the respondents, without seeming to be an interrogator. The simultaneous existence of instruction booklets cannot be considered as a substitute or compensate for the often confusing messages that the interviewers receive from questionnaires.

Likewise, the problem of automatic data entry operators must also be considered. The codes' design and position on the questionnaire must be planned so as to make the data entry operator's job easier and minimise the likelihood of errors occurring during this phase. Three communication levels must be thus coexist and be synthesised in the questionnaire, each with its specific target. The first level is of determinant importance, and is the most delicate part of the researcher's job: to guarantee effective communication with the respondents. But even if the first communication level is handled correctly, shortcomings in the second can still spoil the results of the researcher's work. Communication between the researcher and the respondent can break down or be distorted as a result of poor communication between the researcher and the interviewer. And the same applies with regard to the third level. For this reason the problem of communication must be considered in terms of overall strategy, but in order to achieve this goal it is necessary to have a clear grasp of the communication components involved, and what steps must be taken

to turn the questionnaire into a good communication tool.

3. Communication components

In communication for measurement purposes, what variables affect communication and can thus, a posteriori, constitute the grid used to measure such communication?

Here are some of the most important ones: 1) Semantic features, 2) Phrasing, 3) Sequence, 4) Psychological features, 5) Memory, 6) Interviewers' instructions, 7) Graphics.

They are not listed in order of rank. Each of these feature is important in its own right, but is also part of a whole. The lack of an adequate solution for even one of them can distort communication with the respondent and prejudice the success of the questionnaire. Let us examine them one by one.

Semantic features: this means the words used. Questions must be expressed in a vocabulary that everybody can understand, and with no ambiguous wording. If this is not the case, the respondent may not understand exactly what he is being asked, and be unable to reply appropriately.

Phrasing: this means how sentences are constructed. Whether a question is long or short, is made up of many or few clauses, and is self-explanatory or otherwise - all these features affect the communication process because they make the message the researcher sends to the respondent more or less ambiguous or readily comprehensible.

Sequence: this involves the ability to find the best position for each question. Placing a question before another can influence the reply to the second question, and putting a question in the wrong place can confuse the respondent, or even produce a hostile reaction towards the questionnaire as a whole. The degree of fluency of a questionnaire influences the effectiveness of communication with the respondent.

Psychological features: it should be noted that questions can be formulated in such a manner that they induce a particular answer (thus distorting communication) and in any case there are some embarrassing subjects on which the respondent is likely to try to give an untruthful answer.

Memory is also mentioned, to draw attention to the fact that respondents remember or forget in a selective manner, and information may be omitted or the time of an event may be erroneously recalled (telescoping), as a result of poor communication between the researcher and the respondent.

Training for interviewers is essential, because the interviewer is the intermediary between the researcher and the respondent, and must be enabled to relay communication competently between the researcher and the respondent without distorting or blocking it.

Lastly, we must consider the questionnaire's layout. This feature has received little attention to date, but a new approach must be adopted. Graphic layout means assuring combining the two or three communication levels involved in the best possible way. Graphics can make a questionnaire bureaucratic or attractive, confusing or clear

in its messages to its various interlocutors, difficult or easy to fill in. Graphics are the tool we can use to rationalise and at the same time draw attention to the various communication levels involved. It is not only a matter of colour, illustration, spacing and printing type, but something more: effectively directing communication to and at the various levels involved.

4. Experimenting with a new approach

We need questionnaires with effective wording and graphic design, questionnaires written in every-day language that can establish a "rapport" with their respondents and ensure their involvement and participation. Communications experts know what this means, for instance when they create an advertising message with a specific target, for instance to persuade people to buy a certain product. We too should try to make use of their techniques to stimulate involvement and participation on the part of both interviewers and respondents. The problem of communication can only be solved through an appropriate approach which takes into account the various aspects mentioned above. It is certainly no easy task, but instead a highly complex one, which we are now handling as best we can although often without all the tools and skills it would require. ISTAT is currently equipped with a survey techniques manual, part of which is devoted to questionnaire design, discussing various aspects of language, sequence, graphic layout, etc. and proposing a series of technical solutions for these problems. This is only the first step. The next step should be the experimental introduction of a new way of designing questionnaires, with a team composed of specialists in various fields, including communications experts, so that communications techniques can be used as well.

Statisticians contribution must be used to best advantage alongside those of the others. In this way he or she will assume a synthesis role, making the most of his and others professionalities.

And thus the problem will be, no longer and not only how to communicate in order to measure, but how to measure communication.

SUMMARY

The questionnaire is both a measurement tool and a potential source of measurement error. The statistician's aim is to make it become an important part of the nonsampling error prevention programme. The proposition presented here is that in order to construct a questionnaire that is an efficient measurement tool it must be designed an adequate tool for complex communication. Through the questionnaire messages are sent to various interlocutors: firstly to the respondents, secondly to the interviewers, and thirdly to the operators who enter the data for automatic processing. The questionnaire must communicate at all three levels without any confusion or overlapping between them. A communication strategy must therefore be adopted. To do so it is necessary to identify the communication components involved: semantic features, phrasing, questions sequence, psychological features, memory, instructions to interviewers, graphics. New approaches must also be developed to ensure the communication strategy's effectiveness: the statistician must no longer be considered a "factotum", part psychologist, part sociologist, part communications expert, and the emphasis must instead be on teamwork with the inclusion of communications experts. This approach should enable us to apply and perfect communication techniques in designing questionnaires, and to produce a questionnaire that is a truly adequate communication and measurement tool.

RESUME

Le questionnaire est un instrument de mesure et une source potentielle d'erreurs de mesure. L'objectif du statisticien est de faire en sorte qu'il puisse devenir une partie importante du programme de prévention d'erreurs ne ressortissant pas de l'échantillon. La thèse ici présentée consiste à vérifier que, pour construire un questionnaire qui soit un instrument de mesure efficace, il faut le concevoir comme un instrument de communication complexe. En effet, par le truchement du questionnaire, on lance des signaux à différents interlocuteurs: d'abord aux interviewés, ensuite aux intervieweurs, enfin aux opérateurs préposés à l'enregistrement automatique des données. La communication doit s'exprimer dans l'ensemble des trois niveaux, sans que ceux-ci se confondent ni se superposent. Il faut, donc, adopter une stratégie de communication. Pour cela il faut repérer les éléments constituant la communication: les aspects sémantiques, l'expression, la séquence des questions, les aspects psychologiques, la mémoire, les instructions pour les intervieweurs, la graphique. Il faut aussi déceler de nouvelles directions pour que la stratégie de communication soit efficace: dépasser l'image du statisticien "factotum", un peu psychologue, un peu sociologue, un peu expert de communication; valoriser le travail d'équipe avec la présence d'experts de communication. Il s'agit là de choix qui pourraient nous permettre d'appliquer et d'expérimenter les techniques de communication dans le domaine de la conception du questionnaire, et d'en construire un qui soit un instrument de communication et de mesure à la hauteur.

4. 이태리에서의 職業分類 改正의 어려움 및 問題點

**Difficulties and problems in revising the classification
of occupations in Italy**

RICCI LAURA

Istat - via Balbo 16 - 00100 Roma

The Italian Central Statistics Institute began working quite some time ago on the revision of the national classification system for occupations and professions, with a view to its application in the coming censuses during the 1990s. The importance of this work is generally recognised, given the considerable changes that have occurred in job structure and quality, especially since the end of the 70's.

The preparatory work for this revision consisted of an analysis of the current state of work on the classification of occupations, at both national and international levels.

At national level, as well as analysing the classifications used by other public bodies, criticisms of the Istat classification system were also carefully examined.

These criticisms, in addition to the failure to bring some occupational categories up to date, chiefly concern the fact that the classification system was based principally on the classification criterion of the branch of economic activity involved and on detailed break-downs of industrial occupations. It was in fact an appropriate tool for comprehension of a labour market still in the throes of the industrial development phase and characterised by new employment opportunities deriving from the development of one or another specific branch of activity rather than actual changes in the occupational structure.

During the 90s the more mobile and fluctuating labour market will require higher and more specific occupational skills and will undoubtedly be characterised, as is in fact already the case, by the increased incidence of occupations in the services sector.

It will therefore be indispensable for the new classification system to be based on a more detailed analysis of skill levels and tertiary sector occupations as to compared to those in industry.

At international level, the importance of the work that is being performed by the International Labour Office in connection with the International Standard Classification of Occupations was immediately apparent. This year the ILO presented the final ISCO-88 scheme.

Of course ILO does not oblige the member nations to adopt its scheme of classification, but requests the convertibility of the national schemes into ISCO-88 and presents the latter as a model for those nations who are engaged in revising their own classifications. Italy is in fact precisely in this situation.

Analysis of the preparatory works for ISCO-88 and its final structure revealed the following main points:

- 1) ILO made use of the most recent international experiences regarding this topic;
- 2) it dealt with and clarified all the problems underlying such classification and explicitly defined the criteria on which the scheme's structure was based, and in particular the skill level, related to the **depth** of knowledge and understanding and the **degree** of dexterity and experience required, and the skill specialisation, related to the **type** of knowledge, understanding, dexterity and experience needed to perform the tasks and duties of an occupation;
- 3) in the composition of the four classification levels, it took the users' most impellent requirements into account (in particular as regards the intermediate level of approximately 30 items).

For all these reasons after having analysed and approved the basic criteria of ISCO-88, Istat decided to adopt it at national level, modifying it only as strictly necessary.

The decision to adopt the ISCO-88 structure is, however, only a first step in the work of revising the national classification system. In fact ISCO details occupations only at a level appropriate for international comparison purposes (its most disaggregated level contains less than 400 items).

It is now necessary to study in what manner the multitude of Italian elementary occupations can be fitted into this scheme, and in practice to verify its effective adaptability to the national situation's requirements.

In the light of these considerations Istat has set up a Committee for the revision of the occupation classification system, calling upon the collaboration of University experts and specialists from bodies concerned with such classification.

The Committee must formulate a classification system applicable at national level, as a model for all bodies and organizations that possess and handle data on occupations. The coordination and harmonisation of all knowledge on the phenomena pertinent to the world of work and employment in fact requires the adoption of a uniform classification model that will ensure the comparability of all sources, whether they be concerned with guidance, training, job placement or other aspects.

As regards the technical problems involved, the Committee must first of all tackle those relative to updating the alphabetical list of occupations.

Istat, which in 1961 adopted a classification system developed through a massive joint project with the Ministry of Labour, in fact only partially amended it on the occasion of the 1971 census, and left it unchanged in 1981. And the Dictionary of Occupations, drawn up by the Ministry of Labour in 1966, has not yet been updated either.

The updating and revision work entailed will therefore be both demanding and complex, referring as it does to a time-span of twenty years,

during which considerable changes have occurred.

It will also be necessary to cope with terminological and lexical problems, both in listing the basic occupations and in formulating the various groupings, to ensure that the similarity criteria on the basis of which several elementary occupations are grouped together is clearly apparent. For instance, the distinction between "professionals" and "technicians", and between "craftmen" and "operative men" must be clearly reflected in the terminology of all the relative subgroups, so as to avoid misunderstandings.

Another problem to be tackled will concern the verification at national level of some of the classification structure's technical characteristics, such as the statistical balancing between the various items, the clarity and exhaustiveness of the same and the internal consistency of the classification criteria.

SUMMARY

The Italian Central Institute of Statistics has decided, for the coming censuses in the 1990s, to adopt the occupation classification scheme proposed by the ILO and known as ISCO-88.

However, its implementation at national level poses a series of technical and methodological problems that must be dealt with and solved in a short time, so as to provide an up-to-date tool for the various analyses and forecasts concerning the development of the Italian labour market with a view to the important commitments facing us in these decades.

RESUME'

L'Istituto Centrale di Statistica Italiano a décidé d'adopter, pour les prochains recensements des années '90, le projet de classement des professions proposé par ILO et portant la dénomination de ISCO-88.

Sa réalisation à niveau national entraîne pourtant une série de problèmes sur le plan de la technique et de la méthodologie qui devront être abordés et résolus en peu de temps, afin d'assurer un moyen tout à fait à jour pour les différentes analyses et prévisions sur les développements du marché du travail italien en vue des importantes échéances qui vont se présenter dans cette fin de siècle.

5. 헝가리에서의 消費者物價指數의 活用

Type title of paper here
Official and non-official uses of the consumer price
index in Hungary

Type authors' name and address here
Dr. István Csahók; Bp., 1024 Keleti Károly u. 5. HUNGARY

OFFICIAL AND NON-OFFICIAL USES OF THE CONSUMER PRICE INDEX IN HUNGARY

Contributed paper

A well-known and often debated category of statistical index systems which, in case of many years' increase of the price level stands in the centre of interest, is the consumer price index, or the change of the consumer price index calculated in different periods and cross sections.

The consumer price index itself, like other price indices, is an important category of both statistical science and practice. One of its characteristics is that in consequence of the properties of the observed phenomena (i.e. the increases in price) its development also bears information concerning the general situation and equilibrium position of the economy. In the majority of cases, modest variations of the consumer price index assume an equilibrium position while large-scale variations of consumer prices (mainly the increases in price) generally reflects economic disequilibrium. (The character and the qualification of this equilibrium problem is naturally a different question.)

Consumer price indices calculated by different formulae on bases of data obtained by means of different observation techniques reflect the variations of prices of commodities and services to be consumed. Finally, the consumer price index is a fundamental statistical measure of the real value of population income, of the purchasing power of money as well as of the real value of consumption. Practically, it plays the deflator's role in estimating the volume of incomes and consumption as well as the changes in the latter.

In this short contribution methodological problems of calculation of price indices, formulae, basic data and observation techniques are not touched upon. All these problems are known to experts, both from the literature and the practice. The solution of the problems has, according to different aspects, many variants. Nevertheless, the following has to be taken into consideration: it is highly important for the price index to reflect, as well as it can, price variations in an objective and reliable manner, the method of calculation being of secondary importance.

Our attention should be concentrated on outlining the main fields of using consumer price indices in Hungary.

In this respect the official use of the consumer price index is the largest sphere and which is connected with the economic management system, the preparation and making of decisions. By way of introduction it has to be stressed that in Hungary price indices are calculated only by a single institution, the Central Statistical Office. In doing this, the Statistical Office uses internationally accepted methodological apparatus, but taking into consideration at the same time the domestic peculiarities of the consumption and the stratification of the Hungarian population.

The official uses of the consumer price index are manifold. In this respect, the Central Statistical Office, the calculator of the price index stands first on the list.

The main fields of usage in this respect are the following:

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Type authors' name and address here
Dr. István Csahók, Bp., 1024 Keleti Károly u. 5. HUNGARY

- systematic observation of consumer price variations, their publication in statistical reports, and in the media;
- the uses of consumer price indices in various statistical computations and analyses (in calculating the national income and the consumption of the population in comparative prices; in measuring the living standard of different population groups; in calculating the changes in real wages and real income; in the analysis of price movements as well as of purchasing power of money, etc.).

Another important field of using the consumer price index is the planning of the national economy. Within the frames of this latter, the price index is taken into consideration as the deflator in the planning of the real value of the consumption of the population (i.e. the real value of money incomes and the global consumption determined by it) on the one hand, and in the planning of the supply and demand side of the gross domestic product, on the other, with the purpose of assuring equilibrium position. In an other respect the price index may be adjusted centrally in order to achieve designed equilibrium - by way of planned changes in prices.

Similarly, to the official usage sphere belongs the consideration of the real (or in certain cases the expected) consumer price index in the planning of the annual state budget or in the course of its execution, when decisions are being prepared which concern the population, as for instance in the case of tax increases or decreases.

The consideration of the price index in different financial sectors may be regarded as partly official, and from another point of view, as partly non-official. In this respect, to some degree similarly to its role played in the planning and compilation of the state budget, the consumer price index may serve as a starting point

- of the determination of the real value (or its movements), of population incomes and expenditures (purchasing power of the population), savings, bonds and insurance premia;
- in the analysis of the saving propensity of the population;
- in defining the level of the real interest with the purpose of influencing savings;
- in the indexation necessitated by different forms of money incomes and savings, mainly in the case of substantial inflation.

The consumer price index (or its variation) plays an important role in the preparation of political and economic decisions influencing the living standard (increasing or indexation of pensions and rents). This field of usage, since it is a question of governmental and policy decisions, has to be ranked among the official usages.

The main fields of official usage as mentioned above refer to the direct usage of the consumer price index in the context given, since the calculations, analyses or decisions take place with the direct consideration of the consumer price index (or its variations).

Nevertheless, the official usage of the consumer price index may have an indirect form. When in analyses and official decisions-making the consumer price index does not constitute a highly important starting point, its indirect role still cannot be neglected. (A given decision, for instance tax increases or consumer price supports are not explicitly determined by the

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variation of the consumer price index, but in order to avoid critical points, price indices cannot be neglected during the decision-making process.)

In the case of Hungary, as it can be seen from the examples enumerated, in the official uses of consumer price indices prevail. It is due mainly to the economic and institutional system. The field of non-official uses is narrower than this, but it is more heterogeneous and probably more expanding at the same time.

Among the non-official users of the consumer price index the trade-unions and different federations may be mentioned (as for instance the Society of Large Families) which represent the interests of their members. Consumer price indices are used in the work of these organisations, namely in the following fields: in the preparatory work of decision making, viz. giving expert opinion or exerting criticism on problems of living standard and social policy, as calculated for different groups of population. Consequently, the consumer price index calculated in the Central Statistical Office sometimes does not fully comply or simply cannot comply with the special demands that have emerged (for instance, it is not sure that the price index refers to the same groups which are investigated by federations); on the other hand the method used in the index calculation can be the subject of criticism (for instance from the point of view of representativity of the commodities chosen or from the aspect of the weighting system). Demands of this kind raise the question of continuous updating of the consumer price index which, in the long run, may contribute to the quality of the index. Requirements of index computation to be performed by various institutions as well as a demand of comparison of various price indices may also emerge. In our opinion, the concentration of the price index calculation at the Statistical Office is a feasible and reasonable solution of the question in Hungary, since within the pale of reason all objective propositions are taken into continuous consideration in the calculation work. (This aim is served among others - by the consultative advisory body dealing with the elaboration and improvement of methodological problems. The members of this organisation are delegated by political organs, federations and scientific institutes.)

Among the cases of non-official usage may be ranked the uses of the consumer price index in various analyses, research, forecasts, estimations, model building and compilation of literature and background material, etc. made by independent institutions. The above-named fields of usage may ultimately contribute to the better understanding of and orientation in the economy, or may contribute to alternative approaches and the encouragement of further research.

A particular form of non-official use of the consumer price index can be met in formal and popular education. In the case of the former, the acquirement of special knowledge of index calculation and usage is aimed at, while in popular education - in the interest of the promotion of general educational level - the acquirement of knowledge on particular features of the consumer price indices may be desired.

Finally, the comparison of the official and non-official uses of the consumer price index points to the fact that in spite of its manifold uses, according to the peculiarities of the consumer price index, the sphere of official uses are also considerable, and one can reckon even with the

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expansion of these, and which may contribute to the methodological improvement of the calculation of price indices.

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Type authors' name and address here
Dr. István Csahók; Bp., 1024 Keleti Károly u. 5. HUNGARY

OFFICIAL AND NON-OFFICIAL USES OF THE CONSUMER PRICE INDEX IN HUNGARY

Summary

The present contribution deals with the official and non-official usage possibilities of consumer price indices in Hungary. It does not concern methodological problems: neither the calculation of the indices nor the formulae of the latter, etc. It deals only with certain aspects of usage.

Consumer price indices are calculated in Hungary at the Central Statistical Office, and the usages of the index are manifold. Within the application possibilities, the fields of direct and indirect official uses may be separated while the non-official use of the consumer price index is also considerable.

Main fields of the official uses of the consumer price index are as follows:

- various statistical calculations
- calculations concerning the planning of the national economy
- planning of the state-budget
- certain fields of the financial sector of the economy.

These fields of official usage generally mean the direct use of the consumer price indices while in the case of indirect use the consideration of the consumer price index is by no means a primary starting point. But at given decisions (as for instance in decisions concerning the increase in taxes) they are considered, too.

The main fields of the non-official use of consumer price indices in Hungary are the following:

- the activity of trade-unions and various federations
- research activities
- formal and popular education.

In Hungary the official usage of the price index is the most significant, but the non-official use has to be reckoned with, on account of its expanding tendency.

6. 調査員の 어려운점 및 問題點

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Personal Interview: Problems and difficulties found by the interviewers
Type authors' name and address here
CONIGLIO Rosalia
C.so XXII Marzo N. 63 - 20129 MILANO -

Statistic data regarding a certain phenomenon can be collected by resorting to "personal interviews". This could result to be more or less structured according to the professional level of the enumerator. A certain structuring of the questionnaire is in any case necessary so that the statistic data can be used by the researcher. The interviewer's education is as fundamental as his training. In fact it is not sufficient enough to indicate how the enumerator should ask the questions or solve the problems which might come up, he should also be trained to have an interviewer's mentality. The training phase is when the enumerators meet those that, within a regional or provincial context, are responsible for the trend or the research and they place themselves as a link between the enumerator and researcher. The above mentioned persons who are responsible must deal with the training in a more analytic and detailed manner. Many interviewers have shown the desire to make their experience directly available to the researcher when making out the questionnaire.

The army of Italian enumerators is made up of men as well as women with an age that varies from 18 to 65. They usually possess a high school diploma, are employed, unemployed or retired. The city in charge of carrying out the statistic research on families (Consumptions, Labor Forces, Multipurpose, etc.) in the first place seek interviewers among city employees (librarians, local policemen, etc.). If the above mentioned employees are not available, the city will commission the interviews to outside personnel, such as for example, the unemployed, students, persons who have retired. The Statistics Office of a big city like Milan, has a team of interviewers (city employees and not) who have reached a certain preparation and competence. This does not mean that things do not differ from Region to Region. In the small and medium size Lombardy cities it is often the local policemen who become enumerators and the possibility to present themselves to the families dressed in a uniform make their chore easier.

The city employees who work at the counters are well known by a good part of the population and have no difficulty in becoming friendly with the persons to be interviewed.

Unfortunately the fact that the interviewer and the person being interviewed already know each other may induce the first to skip some questions to which he thinks he already knows the answer and the latter to not answer sincerely to questions that might seem to be strictly personal. In some cases the interview may actually take place in the City Hall rather than in the home of the person being interviewed.

The first contact before the interview takes place is done through a letter which the city sends to the families extracted, in which the interviewer's visit is announced. This letter makes the enumerator's job easier and the enumerator must be supplied with an identity card.

Some cities enclose still another letter to this, signed by the Mayor, specifying the name of the interviewer or indicating the phone number of the Office responsible for the research.

Many families turn to the city to have more information or, sometimes, to refuse to collaborate. Some enumerators, especially women, contact the families directly by phone to set the day and time of the visit. However, the majority prefer to not give the persons to be interviewed the chance to refuse the interview. In fact it is easier to refuse a person by phone than when he is present. The phone is definitely used to set an appointment when the enumerator has gone to the family more than once and has found nobody home.

The entire household with all its members present is needed for the interview and therefore the interviewers choose the evening hours to present themselves to the families, sure to find more than one member at home and thus avoiding that only one member of the family supplies the information for everybody else. In case the interviews are impossible to do in the evenings, then the enumerator will try to schedule them during the day, probably only finding the housewife. She can supply the information for all the members of the household, on the condition that the enumerator specifies this in the questionnaire, therefore allowing the researcher to keep this in account when examining the answers.

Elderly persons that usually make up about 30% of the families to be interviewed, are easier to find at home, although the difficulty of being accepted in the home remains, as in the other cases. Elderly persons receive specific instructions from their children to not let any stranger into the house; and besides this they are convinced that their opinion can be of no interest in a statistical research. The excuse most often used by the person to be interviewed is that he doesn't have any time available, even though it is often the person being interviewed that wastes time chatting with the enumerator during the interview.

This happens mostly with elderly persons who rarely have the opportunity to speak with younger persons and waste time telling them their own business. Sometimes an interview becomes a chance to speak against the authorities (State, City, etc.). This aspect influences the interview in a negative manner when the persons being interviewed has no trust in the State and thinks that the results of the interview will be used only for political reasons. In fact the questions most frequently asked are: "What does the City want from me? What does the State want?". Unfortunately some enumerators have to deal with rude and offensive persons who have no manners in dealing with the interviewer.

Then there are those who, even though they are interested in the research being carried out, courteously answer the questions asked but keep strictly to these questions without establishing any kind of dialogue with the interviewer and accepting the interview passively.

Usually the enumerator first studies the questionnaire carefully before actually carrying out the interview and he meets with his other colleagues to clear any possible doubts or uncertain interpretations.

It is best that the interviewer be familiar with the questionnaire. Even though he might know the structure of the questionnaire well, he must ask the questions in the same order and in the same words as they are written.

In current research on families (FLL, Consumptions, Multipurpose, etc.) the possible answers have already been written and the enumerator has to only put a cross on the corresponding answer or answers. The possible answers are listed only for those who have difficulty in answering the questions and when the answer is "I don't know", the interviewer tries to go into the subject so as to overcome the uncertainty of the person being interviewed. The biggest drawback of this type of situation is that the enumerator might influence the answers, with his behavior, perhaps incorrectly interpreting them or actually supplying the answers to the person being interviewed.

This help is necessary however when the cultural level of the person being interviewed is very low and he has difficulty in understanding the questions. In the suburbs the enumerator often speaks in the local dialect, especially with elderly persons. The fact that the interviewer and the person being interviewed know each other makes the latter feel more at ease. In small towns, if the enumerator is a city employee and therefore well known to many, the number of interviews refused or cancelled are very low in many cases. Aside from the fact that the person being interviewed and the interviewer might already know each other, the latter must always ask the questions in the same tone, thus avoiding to feel embarrassed when reading the questions considered strictly "personal". A possible reticence in answering certain questions could ruin the cordial tone of the interview as well as the willingness of the person being interviewed. It is very important that the enumerator learns how to face certain delicate situations which could easily occur. It would be best if the particularly personal questions were inserted in a questionnaire to be filled out by the person being interviewed himself.

It might occur that the enumerator returns to the same family more than one without ever finding anyone at home. In these cases he may proceed to temporarily substitute that absent family if the research being carried out involves consumptions or FLL. In the multipurpose research, substitutions are not allowed and it is preferred that the information be lost rather than use the information of a family that does not have the same habits and perhaps characteristics of that to be substituted, thus avoiding the risk of distorting the results. The impossibility of substituting a family economically penalizes the enumerator, who in any case had had to waste time returning to that same house more than once. At the same time though the above prohibition avoids that the enumerators desist before a first refusal or the first time they don't find anyone home, as they cannot resort to "easy substitutions".

There are various expedients which the enumerator may use to communicate with the person being interviewed. However he must be able to understand the reasons which could influence the reactions that the person being interviewed might feel towards him. Therefore experience and intuition are not enough, the enumerator must live the role and try to guide the conversation into the right direction.

The important thing is that he tries to foresee the possible reactions of the person being interviewed and therefore knows what to expect.

It is very important, in consideration of the complexity of the current researches being carried out, that the interviewer be suitably trained so as to become a true professional on the subject.

7. 家口面接調査에서의 誤差問題

The problem of proxy responses in household surveys

Vittoria Buratta - ISTAT - Rep. Studi
Via Cesare Balbo, 16
ROMA

Survey data are subject to various kinds of errors. We may divide them into two broad categories: sampling and non-sampling errors. In the latter category we find the so-called "response errors", which occur when the true value of the response is not equal to the value recorded in the questionnaire.

There are several potential sources of these errors, such as: inadequate questionnaire, inadequate training of the interviewer, interviewer behaviour, respondent failure, proxy responses and so on. This paper will deal with the last of these problems, which occurs when the person who answers the question is not the one to which the questionnaire refers.

This situation occurs frequently since usually not all the household members are present when the interviewers call. Frequently, groups which are responded for are working people and students who are likely to be absent from home in the morning hours when interviews are conducted. IN ISTAT surveys the percentage of proxies is about 40%. In the following prospect, we have set out some examples of data taken from several surveys:

Chart 1. Percentage of proxy responses

Family behaviour 1984	Health 1983	Work Force July 1985	Work Force Oct. 85
52.2	37.5	38.9	39.0

In a few particular surveys, such as for example "Family behaviour survey" (1984) and the ongoing "multipurpose survey" interviewers are instructed to interview preferably housewives, on the assumption that they are the best eligible respondents for all the members of the household, as far as specific survey topics are concerned. Generally, however, they are instructed to interview any household member unless they feel that a particular person is unable to provide accurate responses.

It is necessary to clarify that a unique decision rule establishing the acceptability of proxy interviews cannot be given as this depends strictly on the subject-matter of the survey and on the nature of individual questions contained in the questionnaire.

It may moreover be necessary to carry out a carefully thought out experiment design for each survey, in order to evaluate the proxy effect and consequently a valid criterion relating to the relevant decision. Thanks to the data available, though, we may examine the

configuration of the phenomenon as regards both the structural characteristics of respondents and also the number of interviews that proxy respondents give, that is to say the concentration of proxies.

In the following study we will focus our attention on the "Health Survey" (1983) since the question concerning information relating to the proxy respondent was the most rich and complete. It must be said, moreover, that the phenomenon is fairly stable with regard both to the percentage of proxy responses and the social and economic characteristics of proxy respondents.

From the analysis of these structural characteristics, based on a two-way comparison of respondent characteristics and the corresponding characteristics of the individual for whom he/she is responding, we can see a marked tendency for the household head or spouse to answer for all the other members of the family and to respond for each other. Wives respond for husbands and vice-versa and one of them responds on behalf of the children, parents or other relatives.

With regard to sex, there is a clear asymmetry in behaviour patterns. We may in fact observe a wide majority of women responding for men, whilst in more than half the cases we find a woman responding on behalf of another woman.

This is an element to be taken into due account whenever there are sub-sections in the survey questionnaire devoted exclusively to one of the two sexes, as may be the case from time to time.

There is no correspondence between the educational status of the non-respondent and the same characteristics of his/her proxy respondent. In the majority of cases respondents have a low to average level of education.

From the comparison of the occupational status of the two groups, it emerges that employed and householders respond for students, unemployed persons and others, and there is also an interchanging of roles between them.

The problem of concentration

In this section we will examine the second aspect outlined above in order to study how heavy the respondent's burden is when it comes to giving proxy responses, of rather how many interviews they answer.

This is an issue of considerable importance if we consider that in designing questionnaires one of the major topics is that of keeping questionnaires as brief as possible in order to avoid tiring, boring or overtaxing respondents. It is clear that this effort would be wasted if and when individuals have to answer not only their own interview, but also another two or three interviews, or maybe even more.

We may go on to consider the interactions that this will have with other issues of questionnaire design: besides the length of the questionnaire, after the initial question the respondent will already know, for example, the sequence of the questions. If the specific order had been designed on the basis of psychological problems with the aim of soliciting any particular information, this entire effort will turn out to be useless. In a similar way, if there are any probing questions, these will be ineffective. Furthermore, if the choice of reference periods of the questions had been selected in order to avoid too many changes in the recall period, we must consider that these changes will be multiplied by two, three or even more, thus resulting in many more changes than those planned at the time of preparing the questionnaire.

With reference to this problem we may distinguish the two following aspects: the concentration of proxy responses on individuals and the dynamic effect of this phenomenon when the size of the family increases.

Chart. 2. Respondents per number of interviews answered and family size

Interviews answered	FAMILY SIZE						Total
	1	2	3	4	5	>=6	
0	0	4183	10182	15615	7353	4449	41782
1	5588	6983	5112	5793	2765	1656	27888
2	0	3752	2450	1145	347	149	7843
3	0	0	3616	2024	414	152	6206
4	0	0	0	3273	673	169	4115
5	0	0	0	0	980	235	1215
6 or more	0	0	0	0	0	442	442
Total	5588	14918	21360	27850	12523	7252	89491

From the above chart we may already make an initial observation: the number of proxy respondents, who are individuals answering more than one interview, increases in proportion to a rise both in the number of interviews and the size of the family.

This trend leads us to believe that in the event of inability or absence of more than one member of the household, only one of those present takes upon himself/herself the task of answering all the remaining interviews.

This tendency is also supported by the fact that, in families with more than two members, the percentage of proxy respondents who reply on behalf of all the other members of the family is always appreciably higher than the others.

The increment in proxy interviews in relation to increase in family size is significant. The percentage of non-respondents rises from 28% in families with two members to 61% in families with 6 or more members.

Proxy interviews reach their absolute maximum in families with 4 members, which alone account for 37% of all proxies. As regards the number of interviews given, a rather alarming situation is indicated

by the overall data: over half the interviews come from persons who have replied to three or more questionnaires. The average number of interviews given is 3.08. This problem is a serious one, regardless of the reasons why substitution of respondents occurs, and as such must be paid the fullest attention. Although proxy interviews will, in most cases, prove to be an inevitable expedient for family survey purposes, careful attention must be paid to the consideration that the number of individuals who in actual fact undergo only a single interview is a small minority of the total and, consequently, the greatest attention must be paid to all the various aspects which, for one reason or another, interact with each other in determining the quality of the replies given in proxy interviews and above all when there is a high concentration of interviews on a single respondent.

SUMMARY

In the framework of household surveys, "proxy" replies, namely those provided by a member of a family nucleus on behalf of another member who is absent or unable to reply directly, represent one of the possible factors generating "response errors", that is to say errors which occur when the value recorded by the questionnaire does not coincide with the "true" value of the response.

The distortion produced in the results due to insufficient or scarce information relating to the individual replaced is known as the "proxy effect". As well as the authentic proxy effect, interview of this type also produce other consequences which are not easy for the researcher to assess or control: excessive fatigue on the part of the interviewee, boredom and monotony. It should be considered that sometimes the same individual is in fact subjected to three or four interviews, or even more. This second aspect covering the concentration of questions, and thence the extra work-load which some individuals have to bear, forms the subject-matter of this study and also provides an analysis of a number of structural characteristics of the individuals replying with reference to the characteristics of the individuals on whose behalf they are replying.

RESUME'

Dans le domaine des enquêtes menées parmi les ménages, les réponses "pour compte", c'est-à-dire celles données par le membre d'une famille au lieu d'un autre membre qui est absent ou qui n'est pas en mesure de répondre directement, représentent un des facteurs susceptibles de produire des "fautes dans les réponses", à savoir les fautes qui arrivent lorsque la valeur enregistrée sur le questionnaire ne concorde pas avec la valeur "réelle" de la réponse.

La déformation qui se produit dans les résultats à cause de l'information fautive ou insuffisante par rapport à l'individu remplacé est connue comme "effet subrogation". Ainsi que le véritable effet subrogation, même les entrevues de cette sorte donnent lieu à d'autres conséquences, dont l'observation ou l'évaluation ne sont pas faciles pour le meneur de la recherche: excès de fatigue de la part de la personne soumise à l'interview, ennui et monotonie. Il faut tenir compte que parfois le même individu est en effet assujéti à trois ou quatre interviews, ou bien plus encore. Ce deuxième aspect concernant la concentration des questions, d'où le surmenage que certains individus doivent supporter, fait l'objet primaire de cette étude, en fournissant aussi bien une analyse de plusieurs caractéristiques structurelles des personnes qui donnent les réponses, vis-à-vis des caractéristiques des sujets pour compte desquels elles répondent.

8. 나이지리아에서의 統計調查實施와 관련된 質的問题

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1ST INTERNATIONAL ASSOCIATION OF OFFICIAL STATISTICS CONFERENCE
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QUALITY PROBLEMS CONNECTED WITH FIELD DATA COLLECTION IN A
 DEVELOPING COUNTRY: Nigerian Experience

- C. F. ADEGBULUGBE, Research and Statistical Standards
 Unit, Federal Office of Statistics (FOS), Lagos, Nigeria

1. Introduction

The FOS is the Federal Government central Agency charged with the responsibility of gathering data on various aspect of life in the country including, to some extent demographic and population information which form the main activities of a different agency. The FOS performs its statutory duties through three main survey data gathering systems: The National Integrated Survey of Households (NISH), the National Integrated Survey of Establishments (NISE) and the Local Government Information system (LGIS) programmes.

The NISH programme is a system of surveys under which all household based surveys are conducted. Such Surveys include the Rural Agricultural Sample Survey (RASS) and the Health and Nutritional Status Survey (HANSS) etc. The NISE programme on the otherhand is an establishment based system of surveys, examples of these being the survey of Industrial establishments, Transport survey, Building and Construction Survey, etc.

The LGIS system is designed to mainly collect administrative and other infrastructural type data at the Local Government Level.

The survey/data generation methodologies in use under each of the above systems are given in the next section, as background to a fuller appreciation of the data collection problems and the attendant issues of data quality.

2. Survey/Data Generation Methodology

The FOS has a network of field-offices in all 21 states including Abuja Federal Capital Territory of the Federation. The primary function of each of these field offices is to ensure smooth and efficient data collection machinery for all FOS surveys in the states.

The other issues of survey design, like the sample design, the questionnaire design are also broadly dealt with under each system. For instance the NISH system operates a master sample design based on a

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2-phase, 2-stage replicated probability proportional to size (PPS) selection. Enumeration Areas (EAs), created for the conduct of the 1973 population Census in Nigeria constituted the first stage units and Housing Units (H.U.s) within those EAs were second stage units. Most of FOS establishment surveys since they relate more to the medium and large establishments are conducted on Census basis (100% coverage is aimed at). It is only recently that small and household based establishments are being covered on sample basis.

3. Problem Issues on Data Quality

The quality of the data coming from any survey can be said to be majorly influenced by the following three factors: (i) the prevailing circumstances in the population, (ii) Survey procedure adopted and (iii) Data processing mode. The rest of this paper deals with (i) and (ii) as it relates to field data collection in a developing country. Nigeria's experience of some field data collection problems that has bearing on the quality of data and some strategies adopted in dealing with such problems.

The presentation here is again, on the broad outline of survey system types and the sources of these problems.

(a) Household Based Surveys

(i) Coverage on Listing: Errors (problems)

- + Most household surveys are EA based and listing of household (now housing units) within sample EAs carried out. One of the identifying information on a household is the name of the head of the household usually obtained during the listing exercise. With the problems of similarity of names, especially in the northern states of the country, and the deliberate tendencies of some respondents to give fictitious names, usually to avoid further contact, enumerators sometimes find it difficult to locate sample hhs leading to increase in non-response rate due to for instance, not-located or moved-away. The current practice to reduce this problem is to use Housing Unit (H.U) as our second-stage unit. The H.U. is broadly defined as the floor space or set of rooms occupied by at least one hh. These are then serially numbered with adequate sketches on the listing booklet. An analysis of the present level of non-response rate is being carried out for comparison with the earlier rate

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- + The frame of EAs used in sampling was created in 1973 and certainly require/up-dating. Meanwhile the problems of vanished boundaries, overgrown EAs and sectoral (urban/rural) allocations of localities have to be contended with.
- + There is also the issue of accessibility to some households/hh member especially in the muslim communities of the country. The issue of purdah comes to mind here where access to the hh wives or hh structures is impossible by male members of the enumerator force. The available resource in terms of manpower and fund etc are grossly inadequate to allow deployment of female enumerators to such communities and these are large in number. The other issue of accessibility relates to the geographical location of the EAs (i.e. riverine and mountainous regions).
- + Listing of hh member/(also livestock holdings) simple as it may be, can be problematic in a largely illiterate community especially when all hh members would not be available at the time of listing. Usual practice to reduce this problem is to ask for the total number first (with possible breakdown by sex) and then ask respondents to give the names of each member.
- + Under-reporting by enumerators, given the level of manpower and fund availability for supervision and quality check exercises, is a major source of quality problems for most surveys especially RASS where under-reporting of farms is considered a serious problem.
- + Community boundary disputes in and around study EAs disrupt, survey data collection, sometimes to total stoppage, in such EAs.

(ii) Questionnaire Content Errors

The kind of questions and the form in which they are asked on the questionnaire has some effect on the quality of data collected. The experience in this regard relate to the following:

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- + In certain communities/parts of the country it is taboo for wives to mention or call their husband by name or even answer questions relating to their husband's occupations, so that in such situation the issue of using the wife as the next responsible adult within the hh. is met with all sorts of difficulties and errors.
- + The quality of reported ages is an area of concern especially in a country with very high illiteracy rate. Among some older members of certain community an individuals age is a non-issue, they think it is impossible to know how old a person is, even ages of children, where no birth certificates are available are not usually remembered with acceptable accuracy. The practice, in a bid to reduce the error, is to try and link the reported probable age with some historical events (national, community or local events) in the hope that the respondent might be assisted to move closer the appropriate age.
- + Income data is another difficult area in which for various reasons like, tax-evasion, false impression of economic well-being, the quality of collected data are of serious concern.

(b) Establishment Based Surveys

Most establishment based surveys conducted so far have been on the medium and large establishments. These surveys have been on census basis, that is 100% of all listed establishments are covered. It is only recently that attempts are being made to cover the small-scale and household enter prises

- + The main experience in the area of data quality on this category of surveys has been that associated with the problem of non-response, although efforts are continuously being made to reduce level of non-response, a detailed study of the non-responding establishments is yet to be made.
- + Poor or lack of adequate record-keeping by the establishments another problem on data quality

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(c) Local Government Information System

As mentioned earlier, this is the component of FOS survey infrastructure that collect administrative type data in each local Government Area of the country. The range of data collected relate to essential day-to-day administrative data of each LGA. Some of the problems of data quality here relate :

- + Inaccuracy and lack of uniformity in design of the forms used for collection of information at the LGAS.
- + falsification of certain category of information e.g. registration of births etc.
- + Incompleteness or break in certain series in the collected data.

In conclusion, I have attempted in this paper to highlight FOS (a developing country's) experience in the area of data collection, the problems of data quality that it had had to deal with and some of the procedural solutions so far adopted. Attempt was also made to indicate current areas of research in data collection with a view to improving data quality.

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SUMMARY

The usual statistical setting in a developing country and data collection survey infrastructures were examined. The range of survey and the category of data item that are collected was also discussed.

The various socio-economic and cultural circumstance prevalent in certain communities during data collection and their effects on the quality of data collected were briefly explained and solutions tried so far indicated in some case.

It was also mention that certain data quality problems were of serious concern requireing further research. These areas of research are listed and brief indications of the procedures to be adopted in the their conduct suggest.

RESUME

La situation habituelle de la statistique et des infrastructures d'enquête pour la collection des données dans les pays en voie de développement sont considérées. La gamme d'enquêtes et catégorie de données que l'on recueille sont aussi discutées.

Les circonstances socio-economiques et culturelles qui prévoient dans certaines communautés au cours de recueillement des données et leurs effets sur la qualité des données recueilli sont brièvement expliqué et des solutions essayé jusqu'ici sont indiqués dans quelques cas.

On, aussi, évoque que certaines problèmes à l'égard de qualité de données sont très sérieuses qu'ils demandent recherches supplémentaires.

9. 先進國에서의 家口調査實施와 관련된 質的 問題

QUALITY PROBLEMS IN HOUSEHOLD SURVEYS IN A
STATISTICALLY MORE DEVELOPED COUNTRY

Üdön Éltető

Hungarian Central Statistical Office, Budapest

Professor Kiregyera convincingly outlined the enormous difficulties encountered by the statistical services of many developing countries when carrying out data collections among the population in the frame of censuses or sample surveys. It is hoped that quite a number of developing countries will benefit from the NHSCP project of the UN and will be able to establish or to improve gradually their own survey capability. It should be kept in mind, however, that some of the problems mentioned in Professor Kiregyera's paper are connected not so much with defects in the survey capability of a country but rather - in a number of cases - with the economic development and cultural traditions.

But it would be misleading to believe that quality problems connected with data collection from the population are "privilege" of developing countries only. Hungary e.g. can be considered statistically developed.

The Hungarian Central Statistical Office was established more than 120 years ago. Hungarian statisticians have contributed and are contributing in many fields to the development of statistical methodology and we do not have to be ashamed of the results of our statistical activity both from theoretical as well as from practical aspects.

Nevertheless, we are aware of the fact that certain data collected from households in sample surveys are not exempt from quality problems. Generally, these problems do not arise from deficiencies in the sampling design or in the coverage, nor from the ineffective work of the interviewers. As a matter of fact, since 1976 an organization operates within the Hungarian Central Statistical Office, the so called Unified System of Household Surveys (USHS). This means first of all a master sample serving as sampling frame for all actual samples of the household surveys carried out by the CSO in a period of ten years (from one census to the next one). This master sample consists of census enumeration districts selected, in the majority of cases, in two stages, the settlements being the first stage units. The list of addresses in the sample districts is yearly updated by adding to the list the newly built dwellings and delating those which ceased to exist. Moreover, an appropriate number of additional districts of new housing colonies is attached annually to the sampling frame, thus in each year the sampling frame adequately represents the stock of addresses of private households in the country. A further essential element of the system consists of a network of well trained and experienced interviewers who are permanent employees of the CSO and generally resides in the same settlement where they work. Their field work is organized and supervised by a separate unit of the country directorates of the CSO. The advantages of such a permanent field organization are pointed

out also by Professor Kiregyera.

The main problem we have to face to when collecting data from households and which affects the quality of the data obtained - not only in Hungary, but generally in other statistically more developed countries too - is the attitude of the population concerning statistical surveys. In the last 10-15 years we experienced a decline in the willingness of the population to cooperate in household surveys. Recently this can primarily be attributed to the stagnation or rather the decline of the level of living, to the country's economic problems and as a consequence to the fact that most people do not really have confidence in that statistical surveys can considerably contribute to the improvement of their living conditions.

Naturally, the rate of non-response and especially that of the refusals varies according to the nature of the survey, the type of settlement the composition of the household, etc. There is a tendency of higher refusal rates e.g. in greater towns and especially in the capital, in the case of single person households, or when the survey investigates delicate questions, such as the income or expenditures of the household or when it imposes considerable burden to the respondents (e.g. household budget or time budget surveys, long-lasting interviews, etc.). The data below illustrate these tendencies as well as the aforementioned increase in the non-response rates in the recent years. Refusal and total non-response rates experienced in three regular household surveys carried out within the frame of the USHS are presented:

- i/ survey on basic social-demographic data carried out biannually (in the even calendar years) on about 16 thousand addresses, where no so called delicate questions are put to the respondents;
- ii/ income survey carried out quinquennially since 1963 on 16-20 thousand addresses, where households are questioned detailedly about their incomes from all possible sources in the reference year;
- iii/ household budget survey carried out also biannually (in the odd calendar years), in the course of which households are requested to keep recording their incomes and daily expenditures during two monthes.

Survey on basic social-demographic data

	Rate of					
	refusals		other failures ^{a/}		total non-response	
	in per cent of the originally selected addresses					
	1986	1988	1986	1988	1986	1988
Budapest	5,0	8,2	8,2	10,6	13,2	18,8
Other settlements	1,7	3,2	9,0	10,4	10,7	13,6
Country total	2,2	3,9	8,9	10,4	11,1	14,3

a/ Empty dwellings, permanent absence, serious illness, etc.

Income survey

	Rate of					
	refusals		other failures		total non-response	
	in per cent of the originally selected addresses					
	1983	1988	1983	1988	1983	1988
Budapest	5,8	8,7	7,9	13,4	13,7	22,1
Other settlements	1,6	4,6	7,1	11,4	8,7	16,0
Country total	2,2	5,2	7,2	11,7	9,4	16,9

Household budget survey

	Proportion of co-operating households out of the originally selected ones /in p.c./					
	Households		All house-holds	Households		All house-holds
	with	without		with	without	
	active earner		active earner			
	1985		1987			
Budapest	65,0	62,5	64,2	64,2	57,2	62,2
Country towns	78,6	74,1	77,6	75,9	70,2	74,6
Villages	83,9	79,7	82,6	83,0	77,0	81,2
Country total	79,5	75,5	78,4	77,8	72,0	76,2

	Proportion of refusals in per cent of total non-response					
	Households		All house-holds	Households		All house-holds
	with	without		with	without	
	active earner		active earner			
	1985		1987			
Budapest	53	36	48	58	51	55
Country towns	57	34	49	56	43	52
Villages	53	38	47	66	41	58
Country total	55	36	48	60	45	55

Before drawing some conclusions from the figures above it must be noted that

- temporary not-at-homes do not result in non-response, because the interviewers within the period of the survey, call on the selected addresses as many times as necessary to find somebody at home;
- in the household budget survey not addresses, but households are selected from a list of households stratified by social strata and size. Moreover, in this survey, in contrast to other household surveys, we apply a substitution procedure, i.e. if a selected household, for some reason, fails to participate in the survey, it is replaced by an other one selected from the same census district the same social strata and of the same size. This procedure assures that the structure of the sample - at least in respect of a few essential characteristics - is not affected by the non-response. According to the opinion of the interviewers even the income level of the replaced households does not differ much from that of the substitutes.

As it can be seen from the data above, the refusal rates are not yet too high, e.g. in our recent income survey it amounted to 5 p.c. only: Nevertheless, there is a clear tendency of their increase and therefore we have to face and handle somehow the problem unless we want to take the risk of getting biased survey results. Without striving at completeness a few methods are mentioned below aiming at reducing or at least estimating the possible biasing effect of non-response as well as of underreporting or misreporting of data on behalf of the co-operating households.

First of all it must be mentioned that the samples of all surveys within the frame of the USHS are not proportionate, hence a weighting procedure is applied in the data processing. The weight are generally determined as the ratio of the total number of inhabited /not empty/ dwellings in a given stratum to the number of dwellings actually observed in the same stratum. As the sampling fractions differ primarily according to the type and size of the settlements, the weighting procedure eliminates those biases that would occur on account of the differences in the non-response rates or in the extent of underreporting /e.g. incomes or certain elements of incomes/ among the strata. It is clear, naturally, that only a part of the possible biases is eliminated by the weighting procedure.

In certain cases external information are available, such as e.g. the distribution of the population according to sex and age by counties from the population register and if the unit of the observation in the survey is the person and not the household /e.g. labor force, health surveys, time budget survey, etc./, the biases caused by differences in the non-response rates between sexes and among age groups or counties, resp. can be eliminated through stratification after selection according to these variables.

Another type of external information consists in relevant macro-statistical data such as the income of the population by sources in a given year, total expenditures of the population

on various items of consumption or average earning of employees by economic branches, etc. In our income surveys e.g. in the case of certain elements of income for which reliable and detailed macro-statistical data are available, the observed data are corrected through a microsimulation type procedure eliminating thus the underestimation of these income elements caused by non-response or underreporting. But even if no correction is made a comparison of survey results with relevant macro-statistical data gives useful information about the quality of the collected data. In our publications, in addition to figures relating to sampling errors, we inform the users, whenever possible, about the results of such comparisons between micro- and macro-statistical data.

Reinterviewing a subsample of households can be a further method of getting informed about the quality of the collected data. It has been long used in population censuses in many countries and recently in household surveys, too. It is clear, however, that reinterviews increase considerably the cost of a survey and beside, they can not be applied in all types of surveys. There is no sense e.g. in making reinterviews in surveys like the family budget survey or time budget survey. In other surveys they may result in high refusal rate /e.g. income survey/. In opinion or attitude surveys, on the other hand, reinterviews, or their comparison with the original interviews to be more exact, may usefully indicate the reliability of the results. We just now apply this method in our recent prestige survey.

If a government organization or agency wants to get information about the economic, social, cultural or health conditions or the opinion of the population, it can't dispense with data obtained from household surveys because in many circumstances these mean the only source of the required information. But to be able to avoid drawing misleading, erroneous inferences from the results of these surveys, they must be organized with great care to assure the proper quality of the collected data. Although there are several well proved methods to improve or at least to estimate the quality of data, the optimal feasible methods clearly depend on the country's economic and statistical development and other conditions, but even within a country on the type of the survey, too.

The HCSO is aware of the importance of the proper quality of the data collected in household surveys and makes continuous and manysided efforts to solve the problems arising in this respect.

ABSTRACT

In many statistically more developed countries the main factor affecting the quality of data collected from households is the reluctance of the population to co-operate in statistical surveys. The discussant's paper shortly outlines some problems and the recent situation in this respect in Hungary mentioning some methods as well for eliminating or at least decreasing the biasing effect of non-response or underreporting.

10. 目的에 적합한 調査票 設計

Questionnaires for Official Statistics - Fitting Design to Purpose

Carrol Benner Kindel
726 Ninth Street, S.E.
Washington, D. C.

Abstract

National governments need accurate and reliable data for policy-making purposes, for national planning and for directing ongoing governmental functions. For each data need, a group of data providers (respondents) and the data sources can be identified. Respondents can be national officials, multinational companies, school administrators, medical professionals, householders, and so forth. In supplying data, respondents use a variety of data sources, from existing paper files, computer banks and networks, to their own knowledge and opinions. Respondents may need to perform calculations, compile and summarize data, use definitions which are unique to the particular data collection, recall events that occurred in the distant past or provide opinions.

These competing requirements and conditions complicate the collection of uniform, consistent, accurate and reliable data. Therefore the design of the data collection questionnaire (or form) is critical to the quality and usefulness of the final statistics.

This paper provides insights into good forms design by: (1.) describing design standards that are in use for official forms, and (2.) providing examples of designs that have worked well for differing purposes and respondents.

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Introduction

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These competing requirements and conditions complicate the collection of uniform, consistent, accurate and reliable data. Therefore, the design of the data collection questionnaire (or form) is critical to the quality and usefulness of the final statistics.

Good forms design:

- Encourages reporting through a clear arrangement (format) of questions or data items,
- Facilitates accurate reporting by providing definitions and instructions and eliminating bias in question wording and sequence,
- Minimizes the costs of the data collection by considering the knowledge of the respondents, the sources of data to be used, and the data processing requirements, and
- Builds cooperation between the data requestor and the respondent which may carry over into other programs.

The purpose of this paper is to provide insights into good forms design by: (1.) describing design standards that are in use for official forms; and (2.) providing examples of designs that have worked well for differing purposes and respondents.

Forms Design Standards

Forms design policy for official United States government forms is contained in the handbook, Forms Analysis and Design, published in 1980 by the General Services Administration, and in various publications of the U.S. Office of Management and the Budget. In addition to these national standards, two federal agencies, The National Center for Education Statistics and the Energy Information Administration, have published their own standards, tailoring the national standards to meet special needs.

A summary of the requirements of these standards is provided below:

1. Analyze the need for the form and the process into which the form is intended to fit. Ask whether the data need could be satisfied by existing forms. Fewer, more efficient, multiple purpose forms are better than many individual forms. Analyze each element of data to be collected to ensure that it contributes to the purpose of the collection effort and is not duplicative.
2. Choose the most effective design option for the purpose of the form. Consider the respondent, the conditions under which the form will be completed, and the data processing requirements. The format and sequence of questions must be logical. Related items should be grouped together. The construction, paper and ink used on the form must be suited to its use. The format must facilitate both completion by the respondent and data processing. Data processing codes must be incorporated into the format, but in a way that is not distracting.

3. Use effective wording. Data requestors must use words that are familiar to the respondent and must word questions carefully so that they mean the same to all respondents. This includes using the right number of words, not too many or too few, and not using terms that could be emotional or bias the respondents' answers.

4. Provide clear instructions. Supply all definitions that might be needed. Instructions should contain information on how to complete the form, the purpose of the form, and the identification of the data requestor. It is important that instructions for individual data items be located near the applicable item. This applies also in the case of forms for use in personal or telephone interviews.

5. Test for feasibility. Forms should be tested for feasibility prior to administration under the conditions that will exist during the actual administration. Forms should also be reviewed by persons who will participate in the study. Tests should be conducted on a large enough sample so that problems can be identified.

Examples of Designs

The remainder of this paper provides examples of designs that have worked. A discussion of each is also provided.

1a. Method: Personal interview

Respondent: One person in each sample household

Data Source: Respondent's knowledge

Purpose: To collect monthly employment statistics for the nation

Discussion: Questions are to be read as worded on the form. Interviewer follows arrows and "skip instructions" appropriately located on the form. Answers are marked by blackening the circles for processing by optical scanning equipment. "Interviewer Check Items" provide additional instructions for the interviewer. Interviewers using this form are extensively trained, as the print is small and the page may appear confusing to one not familiar with it.

<p>18. LINE NUMBER</p> <hr/> <p>19. What was ... doing most of LAST WEEK -</p> <ul style="list-style-type: none"> Working <input type="radio"/> Keeping house <input checked="" type="radio"/> Going to school <input type="radio"/> or something else? <input type="radio"/> <p>Working (Skip to 20A) ...WK <input type="radio"/></p> <p>With a job but not at work ...J <input type="radio"/></p> <p>Looking for work ...LK <input type="radio"/></p> <p>Keeping house ...H <input type="radio"/></p> <p>Going to school ...S <input type="radio"/></p> <p>Unable to work (Skip to 24) ...U <input type="radio"/></p> <p>Retired ...R <input type="radio"/></p> <p>Other (Specify) ...OT <input type="radio"/></p>	<p>20. Did ... do any work at all LAST WEEK, not counting work around the house? (Note: If farm or business operator in hh., ask about unpaid work.)</p> <p>Yes <input type="radio"/> No <input type="radio"/> (Go to 21)</p> <p>20A. How many hours did ... work LAST WEEK at all jobs?</p> <table border="0"> <tr><td>0</td><td><input type="radio"/></td></tr> <tr><td>1</td><td><input type="radio"/></td></tr> <tr><td>2</td><td><input type="radio"/></td></tr> <tr><td>3</td><td><input type="radio"/></td></tr> <tr><td>4</td><td><input type="radio"/></td></tr> <tr><td>5</td><td><input type="radio"/></td></tr> </table> <p>20B. INTERVIEWER CHECK ITEM</p> <p>49+ <input type="radio"/> (Skip to item 23)</p> <p>1-34 <input type="radio"/> (Go to 20C)</p> <p>35-48 <input type="radio"/> (Go to 20D)</p>	0	<input type="radio"/>	1	<input type="radio"/>	2	<input type="radio"/>	3	<input type="radio"/>	4	<input type="radio"/>	5	<input type="radio"/>	<p>21. (If J in 19, skip to 21A.) Did ... have a job or business from which he/she was temporarily absent or on layoff LAST WEEK?</p> <p>Yes <input type="radio"/> No <input type="radio"/> (Go to 22)</p> <p>21A. Why was ... absent from work LAST WEEK?</p> <ul style="list-style-type: none"> Own illness ... <input type="radio"/> On vacation ... <input type="radio"/> Bad weather ... <input checked="" type="radio"/> Labor dispute ... <input type="radio"/> New job to begin within 30 days <input type="radio"/> (Skip to 22B and 22C2) Temporary layoff (Under 30 days) <input type="radio"/> Indefinite layoff (30 days or more) <input type="radio"/> (Skip ...) 	<p>22. (If LK in 19, Skip to 22A.) Has ... been looking for work during the past 4 weeks?</p> <p>Yes <input type="radio"/> No <input type="radio"/> (Go to 24)</p> <p>22A. What has ... been doing in the last 4 weeks to find work? (Mark all methods used; do not read list.)</p> <ul style="list-style-type: none"> Checked pub. employ. agency <input type="radio"/> with- pvt. employ. agency <input type="radio"/> employer directly ... <input type="radio"/> friends or relatives ... <input type="radio"/> Placed or answered ads ... <input type="radio"/> Nothing (Skip to 24) ... <input type="radio"/> Other (Specify in notes, e.g., JTPA, union or prof. register, etc.) ... <input type="radio"/> <p>22B. At the time ... started looking for work, was it because he/she lost or quit a job or was there some other reason?</p> <ul style="list-style-type: none"> • Lost job ... <input type="radio"/> • Quit job ... <input type="radio"/> • Left school ... <input type="radio"/> • Wanted temporary work ... <input type="radio"/>
0	<input type="radio"/>														
1	<input type="radio"/>														
2	<input type="radio"/>														
3	<input type="radio"/>														
4	<input type="radio"/>														
5	<input type="radio"/>														

1b. Method: Computer Assisted Telephone Interviewing (CATI)

Respondent: See 1a.
Data Source: See 1a.
Purpose: See 1a.

Discussion: A subset of the data described above is collected in alternate months using CATI. CATI has the potential for reducing interviewer error, minimizing data loss, and saving processing time. This method does not use a form, as such. Instead, a series of prompts appear sequentially on the computer screen to tell the interviewer which questions to ask. Data edits are programmed to run automatically as the interview progresses so that errors can be corrected immediately.

2a. Method: Mail - completed by the respondent

Respondent: Oil refinery personnel
Data Source: Company records
Purpose: To collect monthly statistics on crude oil refining

Discussion: This is an example of a "matrix" design in which the "questions" are short captions and use of space is maximized in a straightforward arrangement. Form is spaced for handwritten completion. Shading indicates that the item need not be completed. Terms are defined in an instructions booklet, separate from the form.

3 Refinery Operations (Thousand Barrels)

Item Description	Product Code	Stocks Beginning of Month	Receipts During Month	Inputs During Month	Production During Month
Residual Fuel Oil, TOTAL	511				
0 to 0.30% sulfur (incl.)	508				
0.31% to 1.00% sulfur (incl.)	509				
Over 1.00% sulfur	510				
Lubricating Oils	854				
Asphalt and Road Oil	931				

2b. Method: Electronic data transfer

Respondent: See 2a.
Data Source: See 2a.
Purpose: See 2a.

Discussion: Respondents have the option of submitting the same data as described above electronically. This option offers the potential for reducing the reporting burden on the respondents, minimizing loss of data, and saving processing time. A microcomputer diskette is mailed to the respondents containing the data entry screens in the same format as the form described in 2a., plus electronic and form instructions, and twenty-six months of the respondent's previously reported data (for automatic editing at the time of data entry).

3. Method: Mail - Preprinted for verification by respondent
 Respondent: Electric utility company personnel
 Data Source: Company records
 Purpose: To collect monthly information on typical electric bills
 Discussion: Form is a computer printout which is sent to respondents containing information from their latest submission. Respondents hand correct the information, as necessary. Since the data do not change often, providing this means of verification avoids duplication of effort. Form is self-explanatory with instructions printed on the form.

PLEASE SIGN AND RETURN ORIGINAL COPY OF THIS SHEET BY					
(a)	(b)	(c)	(d)	(e)	(f)
Community Code	Communities of 2,500 Population and More Served Under the Same Rates	Comp. Code	Number of Residential Customers Served (Complete Only if Comp. Code Is Present)	Population*	Year
AB0034008	Smithville			25,158	88
CD1256890	Jonesville	2	102,000	178,220	88

4. Method: Mail - completed by the respondent
 Respondent: Elementary and secondary school teachers
 Data Source: Respondent's knowledge
 Purpose: To collect periodic data on teacher supply and demand
 Discussion: This is an example of attitude questions asked in an official questionnaire, in this case to help determine what teachers like and dislike about their profession. The form is arranged to reduce data keying errors by formatting the codes along one line. Format is simple, easy to complete. All alternatives are listed for each choice to minimize biasing the answers.

SECTION 5 - PERCEPTIONS AND ATTITUDES TOWARD TEACHING

29. Do you agree or disagree with each of the following statements?

a. Teachers in this school are evaluated fairly.	238	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Somewhat disagree <input type="checkbox"/> Strongly disagree
b. The school head lets staff members know what is expected of them.	239	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Somewhat disagree <input type="checkbox"/> Strongly disagree
c. The school administration's behavior toward the staff is supportive and encouraging.	240	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Somewhat disagree <input type="checkbox"/> Strongly disagree
d. I am satisfied with my teaching salary.	241	<input type="checkbox"/> Strongly agree <input type="checkbox"/> Somewhat agree <input type="checkbox"/> Somewhat disagree <input type="checkbox"/> Strongly disagree

11. 여러基準에 따른 調査票 設計

QUESTIONNAIRE DESIGN FOR THE CONCEPTS BASED ON VARIOUS CRITERIA

E. Emel Sözer

Abstract. The aim of this study is to develop questionnaire for the concepts based on various criteria. To attain this end we proposed to use elementary definition set technique. This technique is developed and introduced for the definitions of the concepts based on various criteria. For such concepts questions should be asked related to each criteria. After criteria sets are formed elementary definition sets can be obtained.

1. Introduction

The aim of this study is to develop questionnaire for the concepts based on various criteria. To attain this end we proposed to use elementary definition set technique. Indeed this technique is developed for the labour force status concepts statistics (Sözer et al 1982, 1984, 1985, 1987). However it can be generalized for the concepts based on various criteria.

2. Elementary Definition Set Technique

When collecting and tabulating data, complete and concrete definitions of the subject matter are needed. In order to have concrete and complete definitions for the concepts based on some criteria, the following necessary steps should be taken: i) Determination of criteria, ii) Formation of criteria sets, iii) Formation of elementary definition sets and iv) Making of definitions.

In order to get a clearer understanding of the definition sets it is better to work on a concept which is based on two criteria only. Suppose that we are collecting data by interview

from individuals (each individual denoted by x), and they constitute the universe X , (that is $x \in X$).

i) Determination of criteria: As the first step a study on the definitions of the concept, definitions of the opposing concept and the definitions of the other related concepts in the field of study should be carried out to determine the criteria forming the concept.

Let us assume that there are two criteria, A and B , for the concept in question.

ii) Formation of criteria sets : Criteria sets are defined for each criteria. For example, suppose that for each criteria there are two levels or two outcomes, such as yes or no. For such a case the criteria sets are A_1, A_2, B_1 , and B_2 are formed. Each individual x will be in the set A_1 or in the set A_2 , and either in the set B_1 or in the set B_2 .

iii) Formation of elementary definition sets : Elementary definition sets are obtained by taking one criteria set from each criteria and taking their intersections. For our example each individual x , when examined according to the two criteria will belong to one and only one of the following elementary definition sets :

- | | |
|-------------------|-------------------|
| 1. $A_1 \cap B_1$ | 3. $A_2 \cap B_1$ |
| 2. $A_1 \cap B_2$ | 4. $A_2 \cap B_2$ |

iv) Making of definitions : New sets, which we called " definition sets ", can be derived by taking finite unions of the elementary definition sets. If we suppose no prior relation between the criteria A and B , we may suppose all the elementary definition sets are nonempty, and in that case the number of definition sets will be

$$\binom{4}{1} + \binom{4}{2} + \binom{4}{3} + \binom{4}{4} = 15 \quad \text{or} \quad 2^4 - 1 = 15.$$

That is, there are 15 distinct definition sets in this example. Some of them are,

$$A_1 \cap B_1, A_2 \cap B_1, (A_1 \cap B_1) \cup (A_1 \cap B_2) = A_1$$

$$(A_1 \cap B_1) \cup (A_2 \cap B_2), (A_1 \cap B_2) \cup (A_2 \cap B_2) = B_2$$

$$(A_1 \cap B_1) \cup (A_1 \cap B_2) \cup (A_2 \cap B_1) \cup (A_2 \cap B_2) = X.$$

In general, when the number of elementary definition sets is n then the number of definition sets obtained by taking unions is $2^n - 1$. These definition sets represent all possible definable situations. If the classification of data is made according to the elementary definition sets, and since the elementary definition sets partition the universe, in order to find out the number of individuals satisfying one particular definition, it is enough to sum up the cardinal numbers of the elementary definition sets which constitute that particular definition set.

3. Data Collection and Questionnaire Design

For each criteria at least one question should be asked. Because criteria differentiate the concept in question with others. Usually this is the case in data collection, but it's been achieved by trial and error method by statisticians. Now elementary definition set technique leads and enforces us to ask questions according to the criteria.

During coding usually criteria sets are formed. By taking one criteria set for each criteria and taking their intersections elementary definition sets are obtained. Elementary definition sets' figures should be final figures we should have in published statistics. Because there is a transition from the cardinal number of the elementary definition sets to the cardinal number of the definition sets, but there is not reverse transition.

If it is possible to write a concept by using elementary definition sets then one can have all necessary technical knowledge related to data collection of this particular concept.

The elementary definition set technique fullfills the gaps statisticians encountered during data collection.

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Hacettepe University
Faculty of Science
Department of Statistics
06532 Beytepe-Ankara
TURKEY

12. 핀란드에서의 1985年 센서스資料의 配布現況

Conference on Dissemination and Use of Census Data
9-14 October 1988, Cairo

Aarno Laihonon (x)

DISSEMINATING DATA FROM THE FINNISH CENSUS OF 1985

1.
Introduction

Finland has carried out a modern population and housing census in 1950, 1960, 1970 and 1980, and a mid-decade census in 1975 and 1985. The latest census of 1985 was carried out within extremely tight budget constraints imposed on the Central Statistical Office by the Ministry of Finance. These constraints included the obligation to cover one-third of the direct costs of the census through the sale of census results. This naturally affected the dissemination program of the census. The tight budget constraints also affected the production of census data. New cost-saving methods had to be used.

2.
A general outline of the 1985 census

As regards the cost frame, the direct costs of the 1980 census were about 80 million marks (about 17 million US dollars), while the cost of the previous mid-decade census of 1975 was about 26 million marks, in 1986 prices. The total cost of the 1985 census was not to exceed 18 million marks.

The central point of departure for the planning of system solutions for the November 1985 census was to minimize the amount of manual work in census data collection and processing.

In the first place, data collection was minimized by making extensive use of registers and administrative records in the gathering of basic census data. In the main, this was made possible by the comprehensive, high-quality population registration, taxation and social security systems characteristic of all the Nordic countries. The use of registers and administrative records in population and housing censuses has been increasing steadily since the 1970 census. This development has been aided by the fact that many registers and administrative records use the same personal identifiers.

(x) The author is the Acting Chief of the Person
Statistics Department of the CSO of Finland.

A significant improvement in the register situation in Finland was marked by the establishment of a Register of Buildings and Dwellings on the basis of the 1980 population and housing census. The register helped greatly to reduce the cost of the latest census. It is maintained in connection with the Central Population Register and provides links between persons and dwellings. No questions on housing were therefore needed on the 1985 census form.

Only one questionnaire was used in the November 1985 census. It only gathered data on employment. The Central Population Register was used as the mailing list for the population of working age. The questionnaires were mailed out by the Central Statistical Office (CSO) and were returned by mail to the CSO. No local census organization was used. Another special feature of the census was that the census form was preprinted, not only with the respondent's name and address, but also, for about half the population, with his or her workplace according to the 1980 census and occupational title as obtained from the Central Population Register. The persons obligated to respond only had to report any changes or errors that had occurred in this information.

The census forms went directly to data entry, which was carried out as key entry. Of course, only changes and additions on the forms had to be keyed. In this way, complete "pictures" of the census forms were transformed into a machine-readable form before any other processing operations were performed. Extensive batch mode checking and correcting operations could now be carried out on the census form data, leaving only about 10% of the forms to be checked and corrected manually with the help of terminals. Next, workplace and occupation data were coded, automatically. In this way, the number of forms requiring manual processing was reduced drastically in all stages of processing. This helped reduce the total cost of the census and enabled preliminary publication of the most essential census data as early as December 1986.

In the final phase of data collection, register data were also used for imputing the census form data of non-respondents. This made it possible to reach a satisfactory - 98.6% - total coverage of the central data of the census form. It also contributed to the low level of regional variation in the coverage, even though the census was carried out as a direct mail-out-mail-back operation with-

out any local census organization and with only one reminder sent to non-respondents. Register imputations of questionnaire data were tried for about 139,000 persons (3.7% of the population of working age), 84,000 of whom had not responded, the rest being persons with incomplete responses.

The periodic labour force survey, whose survey week coincided with the census week, and the 1985 household survey were used as evaluation studies for the census. The evaluation studies show that the overall data quality of the 1985 census is far superior to that of the previous mid-decade census of 1975. The quality of employment data is in part slightly inferior to the quality of the employment data of the 1980 census.

3. Dissemination of the census data

The data of earlier censuses had mainly been disseminated by publishing them in a set of volumes in the Official Statistics of Finland series. Now the focus shifted from general publications to table packages designed for the use of municipalities, local governments and their organizations, which constitute the principal users of census data.

3.1. Preliminary statistics

To serve the general data needs, two preliminary publications were released in the autumn of 1986, the one on housing and the other on the economic activity of the population. The housing publication contained the following tables on household-dwelling units:

1. Number of persons and level of housing
2. Number of persons and number of rooms in dwelling
3. Number of persons by floor space of dwelling.

The publication on the economic activity of the population contained the following three tables:

1. Population by type of activity, age and sex
2. Employed labour force by industry (ISIC 1), age and sex
3. Employed labour force by occupational status and industry (ISIC 2-3).

The tables of both publications were prepared according to the whole country, provinces (12) and regional planning districts (20).

The tables of the preliminary publications were also prepared according to local government areas and were distributed to local governments and regional planning organizations. In addition, a set of preliminary tables was distributed through the CSO's general-purpose regional database FINREGION.

3.2. Table packages for local governments

The focus of the dissemination program was on the production of table packages according to local government areas (LGA). There was the Local Government Package, which contained 66 LGA tables for each of the 461 local government areas, and the Small Area Package, which contained 30 small area tables for about 15,000 small areas delineated by the local governments themselves. The packages were planned in co-operation with local government users, who participated in the design work through a working group set up by the CSO.

The Local Government Package was delivered in a binder which also included descriptions of the concepts and definitions used, remarks on the comparability of the data with previous census data and notes on individual tables. The contents of the binder were divided into the following eight sections:

1. Introduction
2. Concepts and definitions
3. List of tables
4. Population and labour force
5. Workplaces and commuting
6. Families and household-dwelling units
7. Housing conditions
8. Dwellings

Small area tables were delivered to the users as computer printouts (XEROX 9700 laser printer) and, on request, on diskettes or on magnetic tapes.

In the statutory provisions concerning the census, special prices were set for the table packages because of the CSO's obligation to cover one-third of the direct costs of the census through the sale of census results. The price of a package to a local

government was established on the basis of the size of the population, the price of a Local Government Package being one mark (about 0.2 US dollars) per resident and the combined price of a Local Government Package and a Small Area Package 1.8 marks per resident. The prices thus established were several times as high on average as the prices of the corresponding packages of the previous census.

As the package prices were deeply resented, the sale of the packages posed a major challenge to the CSO. Buying a package was, of course, voluntary, but, on the other hand, it was the only way for a local government to obtain detailed census statistics. There was a serious danger of a buying boycott, but by working through the regional planning organizations, in whose interest it was to obtain the census data of all their member local governments, and by mounting an intensive campaign, the CSO succeeded in selling all local governments a Local Government Package. Most local governments bought Small Area Packages as well. The revenue from the packages amounted to 8.5 million marks.

Of the most important census data, the CSO also prepared a package of tables based on a grid of map squares measuring 500 meters by 500 meters. The price of this package was 0.25 marks per resident. As the package was very similar to the Small Area Package, it was only purchased by some regional planning organizations.

The majority of the final LGA and small area tables were delivered before the end of September 1987, with the last few tables delivered at the end of 1987. The core of the final tables were also transferred, for general distribution, into the FINREGION database.

3.3. Other chargeable services

Besides the specially priced packages described in the previous chapter also 'normally' priced chargeable services were produced from the census files in order to satisfy the special needs of the users. In these services the prices are set to cover the additional costs of the operations requested by the customer as well as the cost of dissemination.

The chargeable service activities of the census were organized as a special census sub-programme. The accumulated sales of these services were estimated to reach 3 million marks in the end of 1988. In the end of August 1988 the realized sales were a. 1.7 million marks, which is less than expected. This is mainly due to a lag in the finalization of some of the census files.

3.4.

Final publications

The final publication program was reduced to five publications: 1. Summary tables by municipality, 2. Economic activity of the population, 3. Households and families, 4. Housing conditions, and 5. Buildings and dwellings. These publications were released in August/September 1988.

4.

Conclusions

Even though this arrangement of dissemination was dictated by budget constraints, it generated new experiences and ideas which should be considered when the dissemination program of the next census is planned. The general shift of emphasis from the traditional publication programme towards more user oriented products and services will continue.

13. 公共部門에서의 人口센서스資料의 活用

CAIRO INTERNATIONAL CONFERENCE ON DISSEMINATION AND USE OF CENSUS DATA
Cairo, Egypt, 9-13 October, 1988

PUBLIC USES OF POPULATION CENSUS DATA

by

Sirageldin H. Suliman *
Technical Adviser on Demographic Statistics,
Statistical Office
United Nations

* The views expressed in this paper are those of the author and are not necessarily those of the United Nations.

A. INTRODUCTION

The population census provides a comprehensive source of statistical information for economic and social development planning and related activities. Moreover, it is the primary source for establishing computerized statistical data base to serve continuing national and regional needs for a number of economic demographic and social indicators and updating them during the inter-censal period.

B. PUBLIC USES OF POPULATION CENSUS DATA

In this paper we will deal briefly with the public uses of census data. In practice it is very difficult to differentiate between what is public and what is private. For the purpose of this paper, we will consider the use by the Government, Research Institutes and Universities as public and others are considered private.

The main objective of population census is to provide the essential data to governmental policy-making, planning and administration. Data are also collected to describe and assess the country's economic social and demographic characteristics and assist in putting sound policies and programmes for the development of the society. We deal with some important data collected generally and their uses in most censuses of the developing countries.

B.1 Measurement of total population in a country and its subdivisions:

One of the important results of the census is to get the total population of the country at a specific time. This type of information is necessary for the following uses:

i) The per capita income of the country

The total income is divided by the population will give us an indication about socio-economic standard in the country. This indicator is usually composed over time and compared with indicators of other countries.

ii) The population density per square kilometer or mile can also be obtained using the total population. This could be compared over time and with densities of other countries. Comparison of indicators of different parts of the country can be made and used also to measure changes over time.

B.2 Measurement of level of living and of progress in economic and social development:

Many useful indicators for assessing the level of living of a population can be obtained using population census data. However, some of these indicators need additional data which should be obtained through other sources of data. A clear-cut example in this respect is the consumption of calories per capita. Information regarding consumption statistics has to be provided from other sources.

Further there are level of living indicators which are based wholly on census data: These are:

- (a) The adult literacy rate;
- (b) The proportion of unemployed persons in the total labour force;
- (c) School attendance ratios;
- (d) The ratio of males engaged in agricultural activities to the total male labour force and so on.

B.3 Assessment of present and future housing requirements for the society:

In addition to data collected about individuals, censuses collect and tabulate data by households and housing conditions. Data on the number of households, size and composition are considered important in planning utilities, household appliances and other consumer goods and services. The population census can provide many essential items about the households. Some of the data are by-product of questions related to individual members of the household. If a housing census is taken simultaneously with the population census, it will be possible to get more information for the housing requirement planning.

In addition the demand for housing is influenced by many demographic factors such as:

- (a) Size of new cohorts arriving at marriageable age;
- (b) Fertility and size of the family;
- (c) Age at first marriage;
- (d) Economic security of the aged;
- (e) Rural - Urban migration; and so on.

The census data answer questions of where to build new housing units and the balancing of housing facilities in urban and rural areas.

B.4 Study of educational problems and planning future educational programmes:

- i) Illiteracy eradication,
 - (a) One of the educational problems of the developing countries is the presence of the high illiteracy rates in the societies. Census data could be used to plan to have full enrollment of all eligible population at the primary level. This is the most effective way because there is no meaning in eradication of illiteracy of some of the population while more

numbers are joining illiterate population by not finding places in regular education. This is very clear in places of high fertility and low childhood mortality.

(b) Adult education plans 10 - 50 years old.

In order to reduce the effect of illiteracy from the society by planning to eradicate the illiteracy of the population between the ages of 10 to 50. The population census data could be utilized in planning for this activity in a manageable way.

ii) Present educational situation:

The analysis of educational situations and planning to improve them using the population census data may be divided into the following parts:

(a) The estimation of number of persons eligible to receive education at each level of education. The census data are important in order to estimate the number of persons to receive education at the primary, intermediate and higher levels. The census data give the proportion of school age children actually attending school and what is needed in different areas and to what extent in order to attain full enrollment is practically attainable.

(b) The supply of educated persons needed to fulfil various economic and social goals.

It is essential to plan for supply of educated persons to sustain socio-economic development. This aim is a matter of particular concern in the developing countries which are attempting to plan their economic future. It is important to forecast the demand for educated persons ahead in time, because of the time that the process of education requires. Examples are engineers, doctors, university professors, etc.

(c) Estimation of the needs for additional school buildings, school rooms and teachers.

The census data are useful in planning and estimating the supplementary school facilities required to increase the proportion receiving some form of schooling. This requires a comparison of the number of children of school age with the number enrolled in the school system. It should be noted that the planning in urban areas is different than planning for such facilities in rural areas (density and distance are important factors in such planning).

B.5 Manpower studies:

This can be divided into two main parts:

- (a) The population census is the major source of information on the economic activities of the total population. It is advisable that the census takes should adopt clear cut definitions regarding employed, unemployed, labour force and gainful occupation.

Cross-tabulation of economically active population by age, sex, education and residence is an important element in economic analysis and economic planning. The minimum age to enter labour force is, also, important for comparison over time and between countries of the region.

- (b) Studies of composition of the economically active population with regard to occupation, industry and status, and measurement and analysis of unemployment and underemployment.

Economically active population need to be classified by industry and occupation. The population census provides planners with such classifications which are very useful in evaluating the present situation and in planning for the future.

The population census also can provide planners on the employment status of workers. This will help in identifying how many are unpaid family workers, how many are own-account workers...etc. Classification of data by occupation, industry, education, age and sex are very important elements for socio-economic planning and analysis of the present situation.

B.6 Studies of population distribution:

- i) Internal migration

Internal migration is one of the problems facing the developing world these days. Information can be obtained from direct questions on migration such as place of birth, of usual residence and duration of stay. Direct questions have the advantage of offering the possibility of delineating migration flows more sharply while also making possible cross-tabulations with various demographic, social and economic characteristics.

Some useful measures can be obtained from the census without a direct inquiry. These can be summed under three headings:

- (a) Estimates of net migration for individual places: such estimates are sometimes obtained by using census data and vital statistics in combination or by using survival ratio methods.

(b) Estimates of migration streams:

This can be derived from place of birth data and present place of usual residence.

(c) Characteristics of migrants: Migrants usually differ from the general population in important demographic, social and economic characteristics. It is important to study not only the volume of migrants but, also, the explanation of why migration is growing as it is. Additional inquiries may be required to determine the reasons of out-migration and in-migration within the country.

ii) Population distribution:

The major change in the population distribution in developing countries has been the increased concentration in large cities, principally as results of internal migration. In order to cope with the problem of this rapid urbanization the Government are undertaking urban planning and rural development schemes. The population census data give the basic demographic information as an aid in the formulation and implementation of these programmes. It is the population census which gives a picture population distribution by regions, towns and villages and enables the authorities to diagnose and analyse the problems of over crowding and areas of inadequate housing.

B.7 Measurement of Population change:

It is possible to get estimates fertility and mortality from the data collected at the censuses. These can be obtained from direct questions which are included in the census questionnaires. Indirect techniques were also available to provide estimates. Estimates of fertility and mortality differences among regions could be obtained.

The internal migration rates could also be estimated. Once these estimates are obtained it becomes possible to arrive at a reliable rate of natural growth of population for regions.

B.8 Population Projections:

The population census data are very useful in estimating the future population of the country and its regions. These include:

- (a) Total population projections for the five year or ten year national plans by age groups,
- (b) Population projections for school-going population,
- (c) Economically active population for the total country as well as for the regions,

(d) Projections regarding households and families.

It could be concluded that the usefulness of population census could hardly be over-stated, the census not only provides information on the size and characteristics of the population, but also helps in the estimation of the components of population change in countries lacking other sources of data on fertility, mortality and migration.

B.9 Other uses:

In addition to the above-mentioned uses of the population census, it is useful for the following purposes:

- (a) A frame for inter-censal surveys.
- (b) Demarcation of constituencies and the allocation of representations on legislative bodies.

As noted above, one of the vital uses of census data is in demarcation of constituencies and the allocation of representation on government bodies. Detailed information on the geographical distribution of the population is very important for this purpose. Certain aspects of the legal or administrative status of territorial divisions may also depend on the size of this population.

In conclusion, we may underscore that the population census provides a wealth of data fundamental to effective planning and action programmes. But the potential contribution of the population census could be fully realized only if governments prepare effective plans for and carry out all phases of census operations, including analysis and evaluation of the final results.

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14. 센서스資料의 活用に 있어 統計擔當機關의 役割

CAIRO INTERNATIONAL CONFERENCE ON DISSEMINATION AND USE OF CENSUS DATA

Cairo, Egypt, 9-13 October, 1988

**ROLE OF STATISTICAL AGENCIES IN PUBLICATION AND DISSEMINATION OF
CENSUS DATA**

by

K.S. Gnanasekaran and K.S. Seetharam *

United Nations

* The authors are staff members of the United Nations. The views expressed in this paper are those of the authors and are not necessarily those of the United Nations.

1. The publication, dissemination, analysis and use of census data constitute the third and critical phase of census programme. The other two phases are a) the pre-censal phase of planning, organization, cartography, questionnaire design, preparation of census training manuals, etc., and b) the censal phase including the field work, enumeration, verification of questionnaires, etc. The value of census depends significantly on the role played by statistical/census offices in respect to the above-mentioned work including, in an increasing number of instances, the conduct of a post-enumeration survey to evaluate quality and completeness of census coverage.

I. ROLE IN PUBLICATION

2. In practice, this role, i.e., publication and dissemination designed to meet data needs is found difficult and challenging, given the limited resources and technical capability of statistical/census offices of the many developing countries. Further, the role is compounded by the heterogeneous nature of uses for which census data are urgently demanded in developing countries in the absence of other reliable and comprehensive sources of statistics in the demographic field. In the context, the role of statistical/census offices should be to strike a balance between what the national census can best provide in light of an assessment of data quality and what is demanded of it by a variety of users. For instance, the census office should examine whether the single year age data are of sufficient quality to publish and disseminate to the users. Moreover, it is also important to determine whether such detailed breakdown by single years of age is of reasonable quality at sub-national level, say, province or district particularly if the total population is small. This role of statistical/census offices raises the question concerning research and analysis of census data. From the point of data publication and dissemination, apart from the timeliness and comprehensiveness, the quality of data is vital. Adequate research and analysis should therefore be commissioned by the statistical/census offices in this area and the users must be clearly cautioned about the nature and limitation of data published or provided on an ad hoc basis.

3. Returning to the fine balance referred to earlier between demand for and dissemination of data, census is eminently suited to provide benchmark data at national and subnational levels on the population size and selected characteristics which in turn serve to monitor trends and changes in population. The statistical/census office should design the census publication programme to meet such basic and priority needs. Traditionally, hard copy census reports have formed part of the publication and data dissemination policy of statistical/census offices. They are likely to remain the most important medium for meeting basic user needs. As regards these publication many countries still lack the facilities required for efficient printing. Time is also lost in many countries between making available the computer tabulations and publishing as these may not be print-ready tabulations and/or there may not be facility for offset printing. Rapid changes are occurring in the technologies available to overcome those difficulties. The national statistical services should adopt steadily these changes to improve timeliness and dissemination.

Provisional Population Counts

4. In most countries, the statistical/census offices issue early the first report which presents provisional counts. These counts are, produced manually and are obtained from the field control forms completed by the enumerators and supervisors. Despite obvious limitations, provisional counts are found very useful and provide in advance users with the current total population to calculate other socio-economic indicators including per capita income, density, etc. The statistical/census office should continue this role in respect of the 1990 censuses.

5. Total population figures, even when not classified by sex or other characteristics, can be presented by graphs to enhance their usefulness to the public. For example, population distribution maps exhibit improved visual presentation. For urban areas, in particular, maps can also be used to highlight changes occurring in enumeration areas since the last census. This kind of information can be extremely useful to policy makers who wish to identify areas of growth to plan for the provision of essential services such as roads, power and water.

More detailed reports

6. The generation of census reports should be considered at an early planning stage as an integral part of an overall census strategy. While it is common practice to plan a number of reports, it is essential that each serve a specific purpose. Where more than one report is considered necessary, their relationship and structure will depend upon several factors. The more decentralized is government, for example, the more useful it would be to produce regional as well as national reports. The more sophisticated and specialized the demand for topical data, e.g., migration, employment, etc., the stronger will be the case for including analysis and interpretation with the report.

Advanced tables and publications

7. Census processing is always long and involved. Many countries face that the official census report will be issued too late to serve many important needs, and will therefore value steps to ensure that the most important users have access to data at an early stage. One way is to produce and publish advance and sample tabulations. A policy to generate these tables should be considered at an early planning stage and be incorporated into the census publication strategy.

8. The possibilities for providing users with advance reports generally involve the use of sampling. Essentially there are two ways in which samples are used to speed release. Firstly, where sampling has been used in fieldwork to collect more detailed information, priority can be given to the processing of those sample forms to provide advance tabulations. Many countries have followed this practice. Secondly, sample processing can be used. In this approach a fixed proportion of schedules are selected in a scientific way, for priority processing.

9. The use of sampling to produce advance publications is now widespread. Advantages are that users are provided with data faster and, often, savings in cost can result. But there are also disadvantages to be considered. Serious disadvantages are that: a) production of sample results may reduce the perceived importance of full processing which in some cases has led to abandonment or serious delay in further processing; b) sample results are restricted geographically and do not provide the same detailed spatial data as the full results; and (c) sampling errors are introduced. Nevertheless, though this list of disadvantages may seem long, the advantage to the user probably dominates. Almost certainly in the larger countries, and very likely even in the smaller ones, the 1990's will see an increased use by the statistical/census offices of sampling with censuses.

Special reports

10. In addition to advance publications, the statistical/census offices should focus upon special populations and also include other topics for extensive treatment in the form of monographs. Areas of special concern would be selected on the basis of national needs and development policies and could include, for example, problems of housing, unemployment, fertility, migration or estimates of future population.

II. ROLE IN DISSEMINATION

11. Publication alone will not facilitate the use of data. Dissemination plays a very important role. The statistical/census offices face a number of issues related to data dissemination. To whom the data should be disseminated? How? Who is responsible for it?

12. Establishment of close co-operation between the statistical agencies and the primary users is very important as the identification of primary users answers, in part, the first question. The primary users of census data in most countries are the planners and policy makers at the national, sectoral and sub-national levels. Universities and research institutions also demand a large body of data. In addition, census data are needed for market research and are often demanded by the general public. It is impossible to disseminate all needed data to all users. While the primary users such as planners, policy-makers are provided the basic data on a systematic and routine basis in time, others will have to be informed of the availability of the data so that they are aware of what is available.

13. Establishment of data bases and/or the development of net working are steps in the right direction to place the information within easy access of the users. Though this may be difficult to do for many developing countries, steps can be initiated towards this goal.

14. Establishment of regional population centres with the responsibility for dissemination can contribute significantly to the dissemination of data. This of course requires considerable organization, staffing, training, and budgetary allocation. Another important link for the use of data is to enhance the knowledge of the user with regard to the prospects and limitations of the data.

15. Moreover, recognizing that population and housing censuses will constitute the primary source of data on population dynamics, education, employment and other key of variables, and that the national statistical agencies have a major role in the timely publication and dissemination of data to users, the following roles are suggested for consideration and implementation by the national statistical agencies to bridge the gap between the information collected in a census and the extent of use to which it is put.

16. First, the role should include taking steps to ensure the adoption of new technologies in data processing and dissemination. This will call for an effective organization of staff training for the operation and maintenance of these equipments. In addition, every effort should also be made to make print-ready tabulations and for off-set printing which can significantly reduce the timelag in publications as well as avoid errors during transposing.

17. Second, keeping in view the emerging technological developments, particularly the proliferation of personal computers to the desk tops of many users and of the statistical and demographic software packages, the statistical/census offices should take into consideration dissemination of data in non-conventional forms such as disks, tapes, etc.

18. Third, national statistical agencies should not remain passive bystanders once the data are published. Reaching out to the users is important. Effective advertisement of products (data) is needed. To this end, development of data dissemination programme should receive the attention of the statistical agencies. Finally, a programme of training of the users is also called for as there seems to be a lack of trained personnel in many countries who are able to make effective use of data in planning. Technical assistance organizations as well as donor agencies should be contacted to obtain the needed support.

III. CONCLUSION

19. Over the past census decade(s), a number of important developments have taken place both in technology and user demand and as a result, the role has been gradually changing and becoming more efficient. The developments include the availability and increased resort to alternative media for preparing and disseminating data to the users, e.g., census tapes. Further, modern technology has enabled the integration of data processing and printing which permitted, for example, photo-offset printing directly from computer printouts. The role of statistical/census offices in the context of the 1990 censuses would increasingly be influenced by these technological developments and national capabilities to introduce them effectively. Admittedly, these developments have improved the timeliness, quality and comprehensive data that can be made available to users and more importantly, eliminated the drudgery and errors in typing and printing of detailed census tabulations.

20. Census tapes are often based on a sample of records. This practice has limited the quality and/or availability of the disaggregated data and raised questions of confidentiality. The role of the statistical/census offices should be circumspect and be judiciously exercised in dissemination of data through magnetic tapes and other such means.

21. In this regard, summary tapes present less problems, but advance tabulations and ad hoc user demands for data on tapes, carry with it the risk of violating census confidentiality. A number of statistical/census offices have instituted rigid procedures like requiring the users to indicate the purpose for which data are requested or mandating that the special tabulations/tapes be used only for the purpose specified at the time of request. Other procedures included that the users undertake to use data for statistical and research purposes only. Also, safeguards were introduced in the form of limiting access to data processing and preparation of tapes to a selected number of staff, the erasing of the identification of individual records and so on.

22. The above-mentioned issues of privacy and confidentiality are spreading widely and perhaps rapidly across the world. The statistical/census offices in developing countries should pay continued and particular attention to these issues while at the same time taking full advantage of new technology in publication and dissemination of census data.

15. 헝가리에서의 經濟社會 開發計劃을 위한
센서스資料의 活用例

dr. Vera Nyitrai
(HUNGARY)

The use of the censuses in economic and
social planning

The experience of recent decades prove that in economically developed countries - irrespectively of their economic and social system - the role of long-term and particularly of medium-term (for 3-5 years) planning is increasing. On the other hand, to plan, to forecast processes is possible only on the basis of sufficiently detailed information. Though in these days the information producers of some European countries are attempting at replacing the population and housing censuses with surveys based on administrative registers, though up to now no real breakthrough indicates that success has been achieved in this respect. Consequently, there remains the method which is well-known to all of us and practiced for many decades: to carry out population censuses every 10 years (in some countries more frequently), complemented by a sample survey between two population censuses regarding the more important census data on one hand and groups of questions which are actual at the given moment and make complete the census data, on the other, this is also the Hungarian practice at present. The aim of this paper is to give a short summary of it.

I. The general relationship between censuses (population and microcensuses) and planning

In the Hungarian practice the socio-economic development of the country is determined primarily by medium-term (five-year) plans. Their task is to work out the concrete social objectives in harmony with the distribution of basic resources as well as to include the partial processes of the economy in a corresponding system of linkage. The five-year plans lay down the rate and

size of the development of the society and of the economy basically in the form of balance-like interrelationships. This balance-outlook regards the various major divisions of the economy, their output and input, on the basis of the relationships of the input-output balance and, besides, it plans also the most significant social factors of economic development. Planning the interaction of economic and social processes has come up as a new task in Hungarian planning.

Long-term (for 15-20 years) planning has been part and parcel of the Hungarian planning practice for a relatively longer period. The primary concern of long-term planning is already to forecast processes and tendencies with fewer numerical details and relying more on the main tendencies of the processes and on their interactions.

At present, in Hungary a new direction of long-term planning is the 15-year plan rolled on every year or every two years, the forms of which are now being worked out by experts.

Population and microcensuses carried out during recent decades have significantly contributed to build in the social factors' in the planning system. These surveys have been used traditionally at that stage of planning when the laying of the foundations of the plans and the mapping of past events were carried out. A great advantage of population censuses that in Hungary they have been repeated for the past more than one hundred years with a more or less regular periodicity of ten years. Further, the population census is the only population survey which is full-scope and, consequently, it can provide data even with regard to the smallest settlement, whereas microcensuses well complement the population censuses both in time (as usual the survey takes place in the

middle of the decade) as well as with regard to the census programme because they make it possible to significantly broaden the scope of questions included in the traditional population censuses.

Traditional population census subjects may be broadened also - and this is relatively new in the Hungarian practice - by dividing into two the population census survey itself, into a basic and a sample survey, by which the basic survey assures the full-scope character and the sample survey makes it possible to broaden the traditional population census programme. (This method was used for the first time at the 1970 population census-taking in whose framework 25 per cent of the population were asked for more detailed data. It is intended to perform in a similar way the 1990 population census when 20 per cent of the population will be asked to give data according to a broader programme.)

In the course of planning population census data are used with regard to the following subject matters:

- population, household and family composition,
- education,
- employment,
- class and stratum stratification,
- housing.

A significant help in the process of planning that the study of data regarding the above subject matters can be performed in a complex way - by taking into consideration together the social stratification and the regional characteristics within the country. Especially well can be used the population census data in the field of regional planning because regarding the above subject matters sufficiently detailed data by settlements can be obtained only from the data base of the population census.

At the same time the results of population census make it possible to compare long time series only within certain limitations because the methodology, used to carry out the population censuses, is always adjusted to the information demands of the respective period and their contents may change over 10 years. Namely, the population census is always based upon the extensive demands of the users and not only upon the demands on the part of planning. An example to characterize the methodological differences: the two most recent population censuses (1970 and 1989) were based on the resident population, while the earlier population censuses detailed the present population. Transformations carried out in order to ensure comparability consequently corrected only the total population whereas regarding its composition planners had to put up with experts' evaluations. Another problem is the scarcity of data broken down by settlements because it is difficult to link up the data already stored in regional aggregates. At the same time planning would require no rigid regional aggregates but a division of agglomerations, districts of attraction, types of settlements, resort areas, special areas, areas showing a similar behaviour from the point of view of their demographic characteristics, which could be changed at will (depending on the requirements put forward by the problems on the agenda at a given time). As a rule these demands can be met on the basis of local additional sample surveys and estimations.

From the long time series of regional, county and intracounty data by types of settlements the trends of perspective development can well be updated. For this purpose several further processings would be needed to make it possible that the major population census data have to be modified according to the changes of regional division, administrative status and terminology used by the different censuses. In the past this was not feasible. In the future our country progresses toward the decentralization of government responsibility and decision-making beginning from political decision-making through

the tax-system to the financing of development-operational costs. This is why the significance of data bases having regionally detailed information and of regional forecasts worked out on their basis is growing. This consideration will be validated regarding the further development of the interrelated system of population census data bases harmonized also with other data bases.

The programme of the microcensuses, particularly that of the 1984 microcensus make it possible for social planning to study further subject matters, such as:

- the health status of the population,
- the extent of the use of third-level education in the economy,
- the commuting habits of active earners,
- the situation of the elderly and the factors having an impact on it,
- daytime children's care,
- the plans of households and families with regard to change housing,
- the frequency of changes of occupations and employers between 1980 and 1984,
- the survey of work performed besides the main job (of additional activities).

However, microcensuses and sample surveys in general are - because of the limitations of the representative sample - already less applicable for the purposes of detailed regional and, respectively, over-time analysis.

According to their time of reference national economy plans are long, medium and short-term. In view of the fact that in Hungary population censuses are traditionally carried out with a critical moment on the 1st of January of the years ending in 0, the census results can find only limited application as basic data for medium-term national economy planning, because the five-year planning cycle begins

one year after the census (in the years ending in 1) and by this time full-scope data are not yet available. In order to make some basic data applicable already at the final stage of medium-term planning a sample covering 2 per cent of the population is selected from the full-scope data stock of the population censuses with the help of which the Hungarian Central Statistical Office publishes the most important data already in the year of the population censuses. Long-term planning relies on the data of the population and housing censuses also in its details and can particularly well use the several decade long time series of the population censuses.

As far as regional (in the Hungarian practice "council"^{a/}) planning is concerned it can use also all data regarding traditional population census subjects which present a basis for the perspective development of the various regions, counties and settlements. Data by settlements may originate also from other sources, i.e. from council statistics, from environment protection statistics, from yearly and current housing statistics etc, but such complex data combinations which can be compiled from the population census results cannot be assured by any other data collection. For council planning particularly valuable are those compilations of data which present the planners a picture about the composition of the housing stock, the population's demographic distribution, stratification conditions and the latter's changes in a particular settlement. For regional planning data combinations by intra settlement enumeration districts are also very useful. Enumeration district data are especially

a/ The attributive noun "council" originates from the fact that in the Hungarian national public administration the regional equivalents of the country-level government are urban, village and county councils.

well applicable in laying the foundations of the settlement development programmes of greater urban areas because they make it possible to assess the socio-occupational composition and the housing conditions of the populations of the various parts of cities and towns.

For medium-term planning mostly usable are the data of microcensuses taken around the middle of a decade. For example, the most important data of the microcensus with the critical moment on the 1st of October, 1984 were published in early April 1985 and the publication containing the more important detailed combinations of data was issued around the middle of 1985 (in a very short time indeed, as compared with the international practice). Subsequently, the results were published, in rather great detail, in different volumes by subjects. Thus, the results of the microcensus were already partly available by the last stage of the elaboration of the seventh five-year plan and, consequently, their partial use for medium-term planning was ensured, while the data which were published later could be used in the work of long-term planning.

For short-term (yearly) planning the data of population surveys and among them the data of population censuses and microcensuses can be used to a lesser extent. With regard to some traditionally population census subjects - for example housing, occupation, education - data can be obtained also from other sources. It is particularly the data collected in the framework of the current statistics of enterprises and institutions which are suitable to provide the basic data for short-term national economy planning. Naturally, these sources cannot replace the population census data as far as their details are concerned but they are sufficient for yearly planning which in Hungary concerns only a relatively small number of indicators.

II. Subject matters with regard to which population census and microcensus results can be used mostly in national economy planning

Population, household and family composition

The basic demographic indicators represent a starting data base for planning. It is especially true for regional planning because in planning the population's demand and supply, council development projects and in assuring their financing the population numbers of the respective areas are serving as departing data. The place of residence and the place of the actual stay of persons surveyed are always important elements of the statistical observation of the population. Accordingly, it is possible to determine, with regard to every area and settlement, the number of the present, permanent, provisional and resident populations. The concern begins when one wants to determine the populations category which planning should take into consideration. Planning regarding the economy as a whole, regional planning and the ever growing social planning have different requirements in this respect. For example, in great urban areas for the planning of some fields of supply it is necessary to determine the number of the daytime population and the same applies to the resort population in resort areas.

At present the processing of the population census results is performed, in general, with regard to the resident population which better reflects every day situations and it is accepted to use this population category also as the basis for planning. In those settlements where industry is significant, employment possibilities are more numerous and the choice is greater the number of the resident population is superior to that of the permanent population. At the same time, in actual fact, it is the permanent population (the permanence of the place of

inhabitation) which expresses people's personal relationship with their place of inhabitation and the way to register this indicator is also the most reliable.

The discussion in the international practice is always the most vivid concerning use of the categories of the permanent and, respectively, resident populations and it is not by chance. Namely, the contents of these statistical notions have a great significance from the point of view of general, regional and distribution policy. By accepting the resident population as the basis of planning greater settlements are given priority which villages and backward areas are disadvantaged. Moreover, this method of planning, by distributing development resources on this basis not only takes into consideration established population formation tendencies but even strengthens them.

From the point of view of planning the age and sex structures of the population are of considerable importance. In view of the fact that they are basic demographic criteria the data of them are to be found in the data base of every population census and consequently it is this subject matter with regard to which the most detailed time series are available. For regional planning it is important that updated population census results correctly reflect the nursery and kindergarten-age populations, the generations attending primary school, the young who want to have their first flat, the working age population, the generations requiring different forms of social care etc. in a particular area. As far as the last category is concerned the importance of those of pensionable age - and among them of those who still carry on some additional activity, earning occupation as well as of those who can already care for themselves with difficulty or, because of their very old age especially over 80, are right unable to provide for themselves - is increasing. In planning it

is necessary to take into consideration the formation of this stratum needing social help and population censuses as well as microcensuses provide a reliable basis for that.

One of the permanent subject matters of population censuses are questions regarding people's mother tongue through the answers to which it is possible to draw conclusions with regard to the population number of the national minorities living in the country. In Hungary belonging to a nationality is established on the basis of the mother tongue which - naturally - people designate according to their free will.

Among the permanent questions of the broadened programmes of population censuses and microcensuses are those regarding the children of the woman surveyed on the basis of the answers to which it is possible to study the changes in the fertility of females over the past decades as well as social factors influencing fertility behaviours. The analysis of data on fertility provides significant help for the long-term forecasts of population reproduction.

The study of the population's family relations belongs to the subject matter of demography. A great advantage of population surveys - and of them of population censuses and microcensuses - is that they can provide a picture about the system of family relations, about the cohabitation of families consisting of several generations, about the organization of households. (Data surveys of enterprises and institutions can fix only the marital status of the employers in legal terms but on the basis of their data it is impossible to determine the actual situation in the family of a particular person. For example, it is impossible to establish relationships which people may have as cohabiting partners, parents, children, grandparents, subtenants, tenants etc.)

In the course of the study of social processes there is an ever growing demand to analyze the composition of the population by different criteria not only by individuals but also in the system of family relationships. It is especially important to analyze the housing conditions of the families because the evaluation of the housing stock without the investigation of the socio-occupational composition and the lifestyles of the families living in it is of less use for planning. The household-family surveys of population censuses and microcensuses are also suitable to present the most important changes having taken place since the earlier surveys. In planning good use can be made also of data which make it possible to forecast the number and proportion of the population living alone. It is to be noted here that the proportion of cohabiting partners living together without having legally married is growing also in Hungary. It is especially often encountered among the divorced that they do not remarry but prefer this looser form of relationship. Every statistician knows that due to these movements the realistic accounting of families and households becomes more difficult.

Educational attainment

The usability of data on educational attainment in national economy planning is greatly impacted by the fact that until the realization of some educational policy target several planning cycles are necessary. (For example, if during a particular planning cycle an increase in the school-age population is to be reconed with, the corresponding teachers' training has to be started much earlier.) On the basis of the population number forecast it is possible to draw conclusions with regard to the number of those of school-age and of those who will continue their studies and on this basis it is possible to assess future needs in schoolrooms, educational equipment, teachers, funds for education. In this field it is possible and even

necessary to qualify in planning how far the demographic changes reflect lasting tendencies and how far they are only of a provisional character. In the Hungarian practice the number of children born has been strongly oscillating for already several decades, its curve is full with ups and downs. It is obvious that neither the educational personnel nor the network of institutions can be planned for the peaks, even countries richer than Hungary cannot afford it. Consequently, a provisional increase in the number has to be met primarily by provisional solutions which, however, have to be planned. For this purpose the data base is provided jointly by current demographic statistics and population censuses.

The data of those having different educational attainments show the extent to which the targets of the previous planning cycle have been realized. (For example, to what extent compulsory school attendance is being realized in today's Hungary.) It is possible to point out the social and economic groups to which those who do not complete now the eight grades of the primary school belong and the impact of their family and housing conditions on their lacking primary education. In perspective, it is possible to reckon with the size of that stratum which - because of various reasons - do not comply with their obligation to attend school at the prescribed age and whose education will incumb upon governmental institutions later (within the framework of adults' education).

In the preparation of national economy planning the study of the differentiation by specialities and professions within the different levels of education is of considerable importance. This makes it possible to plan the number of specialists with different level qualifications according to the requirements of the national economy, in close harmony with the expected demand on labour and with the latter's professional composition.

To some extent the so-called congruency studies performed in the course of the population censuses belong to this last theme. These studies investigate into the harmony between the already acquired third-level educational attainments and the actual occupations by specialities and professions. In general, population censuses approach this problem from two sides: on the one hand, questions are put regarding the subjective evaluation of the persons surveyed about the usability of their diplomas (subjective congruency) and, on the other hand, it is established what diplomas correspond to what occupations and it is on this basis that the extent of use is decided upon (objective congruency). These studies provide a picture about the extent to which the formerly planned specialists' effective have occupied that place in society which should be their due on the basis of their diplomas and also about the strata whose diplomas have become "superfluous". From these data it is possible to establish the specialities of which there is overeducation or the occupations corresponding to third-level educational attainments which people with the corresponding diplomas do not think worthwhile of pursuing and all this may give points of reference for further planning.

Employment

It is especially characteristic of the subject matter of the employment of the population that planning can rely on two kinds of data sources: on the one hand, on the yearly labour statistical data collections (which are uniform in the different branches) and, on the other hand, on population surveys and - among them - on population censuses performed every ten years and on microcensuses carried out between two population censuses and on the data of the socio-demographic sample surveys conducted regularly, every two years. The data from the above sources processed in several combinations make it possible to perform in depth

analyses but, besides, they have also to meet the information requirements of labour force planning.

On the basis of the current labour statistical data - considering also the changes in the age-structure of the population - it is possible to study the formation of the sources and use of the labour force with a yearly frequency regarding the national economy as a whole and generally twice within one decade on the level of the counties. Besides, it is possible to monitor the most important changes having taken place in the number, occupational and branch etc. distribution of active earners. The respective data are primarily published in the labour force balances compiled every year and containing information regarding the economy as a whole as well as in publications issued from time to time on the labour force situation and on the formation in daily commuting in the counties. Though the above national and county level publications provide information of basic importance for labour planning their use - due to the lack of several data combinations or to the latter's insufficient details - is limited. They provide help primarily for the elaboration of medium-term labour plans partly because their actual data make it possible to analyze the labour flows during the previous planning cycle and to measure the fulfilment of objectives set by the previous plan and partly because they provide the indispensable basic information for planning regarding the basic categories (for example, regarding the composition of active earners by the divisions of the national economy, major groups of activities and occupations, staff groups, assignment).

When studying economic phenomena, changes in demographic processes and labour flows and disclosing the interrelationships between them labour planning relies also on the data of population surveys, of which the wide data combinations of the population censuses are, by far, of

the greatest importance. The use of the information obtained from population censuses is especially very important in the course of the elaboration of the perspective employment policy concept, in long-term labour planning, in the perspective planning of the structure of the labour force as well as in the course of the elaboration of the forecasts worked out in their framework.

Information regarding economic activity, employer, place of work is traditionally one of the most important subject matters of the Hungarian population census programme.

These questions serve as indispensable points of reference when working out forecasts regarding various subject matters within the framework of employment forecasting.

Among others, for example:

- the detailed data of the population's economic activity by age-groups serve as a basis of the elaboration of the forecast of the economic activity level;
- for the forecasting of the professional structure it is indispensable to have the data of the spheres of work occupied compared with the qualifications obtained (in the case of those of manual occupations, with the professions learnt) as well as other kinds of occupational and educational data combinations, eventually by age-groups;
- for the forecasting of the changes in the social structure it is indispensable to rely on the detailed population census data combinations which present the socio-occupational composition and, respectively, the distribution by classes and strata of the population, of which, of the active earners.

The wider programme of the microcensus, besides providing more fresh information than that of the population census with regard to the more important data combinations for the elaborations of labour plans - by making it possible to observe processes and tendencies appearing within the decade for a shorter period as well as by providing information not available from other sources - greatly contributes also to the analytical work.

Housing conditions

Housing censuses performed every ten years together with the population censuses find a profitable use in planning. In the course of the housing census all inhabited and uninhabited dwellings as well as all other places and building serving for human inhabitation are surveyed. On the basis of this all-embracing survey an exact picture is received about the housing stock in the country and about the changes in it since the former housing census. As these data are available also on the level of the smallest regional units, i.e. on the level of the enumeration districts it is possible to observe the regional changes in the housing stock and, if necessary, to study the structural changes in the housing stock of any settlement. This latter possibility may provide one of the important underlying arguments for the development of mainly the great cities and, first of all, of Budapest, the capital.

Though the population census data publications detail primarily the data of inhabited dwellings, the study of uninhabited dwellings is also of great importance from the point of view of discovering the resources of housing management. As the survey of the dwellings and that of the persons living in them are performed simultaneously it is possible to exactly identify the dwellings whose sizes do not meet the needs of those living in them. In spite of the

fact that to express real housing requirements numerically is a rather complex task, the knowledge of the population census data indicating the scarcity of housing may be a useful tool in the hands of those who nevertheless try to get to grips with it. Such unsatisfied housing requirements are signalled, for example, when several households or several families live together in dwellings having a small area or few rooms or when in these small dwellings several generations are forced to live together.

In the course of the surveys the major characteristics of the equipment of the dwellings are also registered. The data obtained this way provide indispensable information about the housing conditions in which the population live, on the one hand, and well reflect the levels of development of the regions and settlements of the country as well as the respective differences, on the other. The data of the housing census can be used for the research and analytical studies necessary for planning also in various particular fields. The most important of such fields are, for example, the housing stock, in state and, respectively, personal ownership, the quality of the stock of tenement dwellings, the composition of the latter's dwellers, the situation of housing colonies, the housing conditions of particular social groups, the number and composition of those without dwellings of their own.

Besides the full-scope surveys also other types of more detailed data collections are rendered possible by the microcensuses. Such data collections regard for example the dwellers' subjective judgements about and the satisfaction with their housing conditions as well as their opinions concerning their possibilities to change their dwellings. Besides, in the course of the last 1984 microcensus it was possible to survey also the maintenance and renovation works carried out in order to protect the substance

of dwellings, the amount of rents, contributions to collective costs, credit reimbursement instalments and also the number of summer residences in the ownership of the dwellers serving for the purpose of their recreation.

Demographic forecasts

Probably the Hungarian situation is rather peculiar from the point of view of the preparation of the demographic forecasts for long-term planning by the Demographic Research Institute of the Hungarian Statistical Office, i.e. by an institute belonging to the latter's sphere of competence. In my opinion a very great advantage of this state of affairs lies in the fact that by this the forecasts are closely based on the actual demographic data. The Institute and the departments of the Hungarian Central Statistical Office dealing with demography are cooperating in the elaboration of various demographic forecast combinations by sex, age-groups and also by other characteristics.

The demographic forecasts are far from being worked out only for 15 to 20 years but also for a longer outlook, so for example, the last forecast covers the period until 2030.

Forecasts are prepared in different versions, demographic forecasts in 6 versions are frequent. The various versions are based on varying possible numbers of birth, death-rates and on their combinations.

In my opinion, in the field of demographic forecasts international relations are not yet intensive enough and the reliance on the possible exchange of experience is not sufficient.

III. New tendencies regarding the relationship between national economy planning and the censuses (population and microcensuses)

- The experience of the past has proved that for a well-founded planning the number of phenomena and their details to be analyzed and forecast is significantly superior to that ultimately appearing in planning documents. Formerly, in the course of planning the stages of analysis and forecasting and, respectively, of the compilation of the plan were separated in a rather characteristic way. In the future this separation will constantly disappearing. This means that the data bases of population censuses and microcensuses have to meet the demands of analysis and forecasting on an increasing scale while their relationship with the formal plan decreases.
- Owing to the development of computer technology the results of the last two population censuses were not only published in volume series but are also available on machine data-carriers and so demands on the part of planning on unpublished data combinations - in any details and groupings, including also the regional breakdown - can be met at any time. It is our intention to follow this practice also in respect of the 1990 population census.
- In view of the fact that since 1980 the data base of the state population register has already had the most fundamental statistical data, sample surveys - which complete these data and, respectively, give more attention to partial subjects considering the requirements of planning - become more and more important.

- It is appropriate to attain that the population census survey - besides status-analysis - provide a growing amount of information about the changes and processes since the former population census in population, employment and housing. The accelerating rates of the changes taking place in the economic environment justify a more extensive use of microcensuses in regional planning. In this regard it is necessary to make efforts in order that the scope of information by regions broaden further and that the surveys follow the actual questions of regional planning.

- Finally, it is also an important consideration that population and housing censuses and microcensuses be closely related to other population sample surveys and public opinion polls. This consideration requires the development of a coordinated data base one of whose elements is an initiative, which is new in the Hungarian practice. Some months ago an agreement was reached with the Austral Space Time Research Institute by which it is the data of the 1980 Hungarian population census which will be processed for the first time (and with an experimental character) on CD-ROM laser disks in a way that the data be simply retrievable by IBM PC. The processing will include many kinds of combinations and probably also map-versions. It is hoped for that the data of the 1990 population census will also be processed and put into circulation in this joint way. By this our intention is to make use of the most up-to-date facilities in the field of Hungarian demography.

This Conference provides a good opportunity for the exchange of experiences. I do not think that the Hungarian practice - which I have summed up briefly - is the best in the world, we are ready to learn from those who are before us and ready to disclose our achievements as well as the problems encountered in the course of their full realization.

ENCLOSURE

THE PROGRAMME OF THE 1970-1990^{1/} POPULATION CENSUSES
AND OF THE 1984 MICROCENSUS

Questions	1970		1980	1984 (2%)		1990		
	basic	sample survey (25%)	basic	basic	additional	basic	occupation and education-related ^{a/}	sample survey (20%)
questionnaires								
GEOGRAPHIC CHARACTERISTICS OF PERSONS								
Place of survey	X	X	X	X	X	X	-	X
Presence	X	X	X	-	-	-	-	-
Place of stay of those absent	X	X	+	-	-	-	-	-
Permanent residence	X	X	X	X	-	X	X	X
Provisional domicile residence								
- the place thereof	X	X	X	+	-	X	X	X
- date of moving there	+	X	-	X	-	-	-	X
- the cause thereof	X	X	-	X	-	-	-	X
- the frequency of going home	-	X	-	X	-	-	-	-
Place of birth	-	X	-	X	-	-	-	X
Permanent residence at the time of the previous population census	-	X	-	X	-	-	-	X
Previous permanent residence								
- the place thereof	-	X	-	X	-	-	-	X
- year of moving	-	X	-	X	-	-	-	X
DEMOGRAPHIC CHARACTERISTICS OF PERSONS								
Name	X	X	X	X	X	X	X	X
Personal identification number	-	-	X	X	X	X	X	X
Sex	X	X	X	+	+	+	+	+
Household status	X	X	-	-	-	+	-	+
Family status	+	+	X	X	-	X	-	X
Date of birth	X	X	X	+	+	+	+	+
Marital status	X	X	X	X	+	X	-	X
Mother tongue	X	X	X	-	-	X	-	X
Languages spoken besides mother tongue	-	X	X	-	-	X	-	X
Nationality	-	-	X	-	-	X	-	X
EDUCATIONAL CHARACTERISTICS OF PERSONS								
Educational attainment	X	X	X	X	-	X ^{b/}	X	X ^{b/}
- type of school	X	X	X	X	-	X ^{b/}	-	X ^{b/}
- grade	X	X	X	X	-	X ^{b/}	-	X ^{b/}
Certificate of maturity examination								
- the type thereof	X	X	X ^{c/}	X	-	-	X	X ^{c/}
- the character thereof	X	X	X ^{c/}	X	-	-	X	X ^{c/}
- the speciality thereof	-	X	X ^{c/}	X	-	-	X	X ^{c/}
- the year of obtaining thereof	-	X	X ^{c/}	X	-	-	X	X ^{c/}
Third-level educational attainment (diploma, certificate of final examination)								
- name of the educational establishment	X	X	X	X	-	-	X	X ^{c/}
- faculty, speciality, branch	X	X	X	X	-	-	X	X ^{c/}
- year of obtaining thereof	-	X	X	X	-	-	X	X ^{c/}
- relationship with the occupation								
- objective	-	-	+	+	-	-	+	-
- subjective	-	X	-	X	-	-	-	X ^{a/}

1/ The 1990 data on the basis of the 1988 pilot survey in the county of Nógrád.

continued

Questions	1970		1980	1984 (2%)		1990		
	basic	sample survey (25%)	basic	basic	additional	basic	occupation and education-related	sample survey (20%)
questionnaires								
School attendance								
- yes or no	X	X	-	-	-	-	-	X
- type of school, grade	-	X	-	-	-	-	-	X
- speciality	-	X	-	-	-	-	-	X
- place of school	-	X	-	-	-	-	-	-
- the manner of going to school	-	X	-	-	-	-	-	-
- the duration of going to school	-	X	-	-	-	-	-	-
Vocational training school	+	+	+	-	-	-	-	X
- grade	-	X	-	-	-	-	-	X
- profession	-	X	-	-	-	-	-	-
Skilled worker's certificate								
- year of obtaining thereof	X	X	X	X	-	-	X	X
- duration of obtaining thereof	X	X	-	X	-	-	-	-
Qualification in manual occupation								
- the name of the occupation	-	X	X	+	-	-	X	X
- the way of obtaining thereof	-	X	X	+	-	-	-	X
- the year of obtaining thereof	-	X	X	X	-	-	X	X
- the duration of obtaining thereof	-	X	-	-	-	-	-	-
Qualification in nonmanual occupation	-	X	-	+	-	-	X	-
ECONOMIC CHARACTERISTIC OF PERSONS								
Economic activity	X	X	X	X	-	X	-	X
In the case of those who do not work								
- the character of dependence	X	X	X	X	-	X	-	X
- the time of last activity	X	X	-	X	-	-	-	X
- the duration of activity in the course of the previous year	X	X	X	-	-	-	-	X ^{d/}
- the cause of giving up the activity	-	X	-	X	-	-	-	-
The supporter's name, occupation, employment relationship, employer	X	X	X	X	-	-	-	X
Occupation	X	X	X	X	-	-	X	X
Occupational status in employment								
- status in employment	X	X	X	X	-	-	X	X
- socio-economic status	X	X	X	X	-	-	X	X
National economy division								
- the employer's designation	X	X	X	X	-	-	X	X
- designation of the place of work	X	X	X	X	-	-	X	X
- address of the place of work	X	X	X	X	-	-	X	X
Duration of going to work	-	-	-	-	-	-	-	X
- the manner thereof	-	X	-	X	-	-	-	X
Social sector	+	+	+	+	-	+	+	+
Working hours	-	X	-	-	-	-	-	-
Income	-	-	-	+	-	-	-	-

continued

Questions	1970		1980	1984 (2%)		1990		
	basic	sample survey (25%)	basic	basic	addi-tional	basic	occu-pation and edu-cation-related	sample survey (20%)
	questionnaires							
Before being on pension, retiring								
- last occupation	X	X	X	X	-	-	-	X
- last status in employment	X	X	X	X	-	-	-	X
- employer, place of work	X	X	X	X	-	-	-	X
Besides receiving pension								
- present occupation	-	X	X	-	-	-	-	X
- present employer	-	X	X	-	-	-	-	X
Agricultural activity								
- duration of thereof	X	X	X ^{d/}	X ^{d/}	-	-	-	X ^{d/}
- field of thereof	X	X	-	-	-	-	-	-
Auxiliary activity	-	X	-	X	-	-	-	X
- employer, status in employment ...	-	-	-	-	-	-	-	-
Previous occupation								
- the first occupation	-	X	-	X	-	-	-	-
- the year of exercising the first occupation	-	X	-	X	-	-	-	-
- at the time of the previous population census	-	X	-	X	-	-	-	-
FERTILITY CHARACTERISTICS OF PERSONS								
Year(s) of marrying(s)	-	X	X	-	X	X	-	X
Cessation(s) of marriage(s)								
- year(s) thereof	-	X	-	-	X	-	-	X
- cause thereof	-	X	-	-	X	-	-	X
The duration of separations within the marriage	-	X	-	-	X	-	-	X
Cohabitation outside marriage	-	X	-	-	X	-	-	X
Number of children								
- total number of children	-	X	-	-	X	-	-	X
- of them, liveborn	X	X	X	-	X	X	-	X
- of them, stillborn	-	X	-	-	X	-	-	X
- of them, living	-	X	-	-	X	-	-	X
- of them, dead	-	X	-	-	X	-	-	X
- of them, living together with the mother	-	X	-	-	X	-	-	X
Data of the children born (one by one)..								
Husband/wife								
- his/her year of birth	+	+	+	+	-	+	-	+
- his/her occupation	+	+	+	+	-	+	-	+
CHARACTERISTICS OF BUILDINGS CONTAINING DWELLINGS								
Destination	X	X	X	X	-	X	-	X
Character of ownership	+	+	+	-	-	-	-	-
Height	X	X	+	+	-	+	-	+
Walling	X	X	+	+	-	+	-	+
Foundation	X	X	+	+	-	+	-	+
Roofing	-	X	-	-	-	-	-	-

continued

Questions	1970		1980	1984 (2%)		1990		
	basic	sample survey (25%)	basic	basic	additional	basic	occupation and education-related	sample survey (20%)
	questionnaires							
Renovation	-							
- the character thereof	-	X	-	-	-	-	-	-
- the year thereof	-	X	-	-	-	-	-	-
Year of construction	+	+	+	+	-	+	-	+
Equipment								
- elevator	-	-	-	X	-	-	-	X
Number of dwellings in the residential building	X	X	+	+	-	+	-	+
Number of dwellers living in the building	+	+	+	+	-	+	-	+
CHARACTERISTICS OF DWELLINGS								
Destination	X	X	X	X	-	+	-	+
Character of ownership	X	X	X	X	-	X	-	X
Right of use	X	X	X	X	-	X	-	X
Exposure	X	X	X	X	-	+	-	+
Number of places								
- room	X	X	X	X	-	X	-	X
- half room (small room)	X	X	X	+	-	X	-	X
- kitchen	X	X	X	X	-	X	-	X
- kitchenette	X	X	X	X	-	X	-	X
- larder	X	X	-	-	-	-	-	X
- bathroom	X	X	X	X	-	X	-	X
- wash-basin alcove (shower)	X	X						
- entrance-hall	X	X	X ^{f/}	-	-	-	-	X
- other places	X	X	X ^{f/}	X	-	-	-	X
- summer kitchen	X	X	-	-	-	X	-	X
Floor space by rooms and places	-	X	X	X	-	-	-	X
Flooring of rooms and kitchens	-	X	-	-	-	-	-	-
Number of rooms with beaten earth flooring	X	-	X	X	-	-	-	X
Equipment								
- electric lighting	X	X	X	X	-	-	-	X
- water supply	X	X	X	X	-	X	-	X
- place of faucet	X	X						
- outer water supply								
- the manner thereof	X	X	X	-	-	-	-	-
- the distance thereof	X	X	-	-	-	-	-	-
- gas supply	X	X	X	X	-	X	-	X
- type of toilet	X	X	X	X	-	X	-	X
- the place thereof	X	X	X	X	-	X	-	X
- the use thereof	X	X	-	-	-	-	-	-
- sewage disposal	X	X	X	X	-	X	-	X
- refuse disposal	X	X	X	X	-	-	-	X
Construction, dwelling-extension, transformation	-	X	-	X	-	-	-	X
Introduction of public utilities	-	X	-	X	-	-	-	X

continued

Questions	1970		1980	1984 (2%)		1990		
	basic	sample survey (25%)	basic	basic	addi-tional	basic	occu-pation and edu-cation-related	sample survey (20%)
	questionnaires							
Heating	-	X	X	X	-	X	-	X
Hot water supply	-	X	-	X	-	X	-	X
Fireplace used for cooking	-	X	-	-	-	-	-	-
Consumer durables	-	X	-	-	-	-	-	X
Telephone	-	X	-	-	-	-	-	X
Built-in kitchen furniture	-	X	-	-	-	-	-	-
Built-in wardrobes	-	X	-	-	-	-	-	-
Garage	-	-	-	-	-	-	-	X
Rent	-	-	-	X	-	-	-	X
Summer (vacationing) house, weekend house								
- the character thereof	-	X	X ^{f/}	X	-	-	-	X
- the place thereof	-	X	X ^{f/}	X	-	-	-	X
Number of dwellers in the dwelling	X	X	X	+	-	+	-	+
The dweller of the longest standing in the dwelling	-	X	-	-	-	-	-	-
Enumeration of households living in the dwelling and their rights to use the dwelling	X	X	X	X	-	X	-	X
Number of households living in the dwelling	+	+	X	X	-	X	-	X
Plans and reasons regarding the changing of dwelling	-	-	-	+	-	-	-	-
Institutional households ^{f/}								
- number of rooms for living and for collective use	X	X	X	X	-	X	-	X

x/ question asked directly

+/ criteria which can be established by processing the answers to other questions

a/ only with regard to active earners and persons receiving child-care allowance and child-care pay

b/ only with regard to first-level educational attainment

c/ only in case of third-level educational attainment

d/ only from agricultural helping family-members (from seasonal workers)

e/ asked separately, if not surveyed together with the supporter

f/ on a separate questionnaire

16. 人口센서스와 人口調査方法 訓練

TRAINING ON POPULATION CENSUS AND SURVEY METHODOLOGY

Prepared for presentation at the First Conference,
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by

Kenneth R. Bryson
International Statistical Programs Center
U.S. Bureau of the Census

INTRODUCTION

The following formula has been suggested for a measure of the usefulness of a population census (ISPC, 1969; see also United Nations Statistical Office, 1982):

$$\sqrt[3]{\text{ADEQUACY} \times \text{ACCURACY} \times \text{TIMELINESS}} = \text{CENSUS UTILITY INDEX (CUI)}$$

The Census Utility Index is the geometric mean of three factors:

- (1) Adequacy: the degree to which the data satisfies the informational requirements of the data users.
- (2) Accuracy: the closeness of the data collected to their true values.
- (3) Timeliness: availability of processed and disseminated data at appropriate times in the census or survey schedule.

In order to provide adequate, accurate data in a timely manner, a statistical organization must have considerable organizational and technical capabilities. There are three approaches to improving the capabilities of the survey staff. The first is experience, or the trial-and-error method. The survey organization naturally increases its capabilities in the process of doing successive rounds of a continuing survey program (or repeated one-time surveys) as the survey staff increase their knowledge and skills. But it does so at the expense of errors and inefficiencies in the work performed. The second way to improve capabilities is through technical assistance, in which the survey organization can import capabilities from a more developed survey organization. But technical assistance can be expensive, and it provides a temporary solution, not a permanent increase in organizational capability. If the ultimate goal is self-sufficient capability, then training is the best way to develop organizational capability.

Training on population census and survey methodology can improve each of these critical factors: adequacy, accuracy, and timeliness. In this discussion, I will first outline in some detail the major activities in conducting census and survey activities to show the skills and abilities needed. Then I will describe the major training methods that have been used to train statistics personnel from many countries at the International Statistical Programs Center training program in the United States. I will demonstrate how the different methods are combined to train individuals for different aspects of census and survey work. Finally, I will offer in conclusion some personal observations.

1. CAPABILITIES NEEDED FOR CENSUSES AND SURVEYS

Any discussion of training should begin with an understanding of what skills and abilities are needed for successful performance of the task for which training is proposed.

For censuses and surveys the major tasks to be accomplished are:

- (1) Formulate the overall census or survey plan,
- (2) Organize and manage large-scale field operations for the collection of data,
- (3) Process and tabulate the data, and
- (4) Evaluate the results and arrange for their wide dissemination and use.

There is a close correspondence between the four capabilities and the three utility factors:

Improving survey planning capabilities increases the adequacy of the data in satisfying the informational requirements of the data users.

Improving field operations and evaluation capabilities increases the accuracy of the data.

Improving data processing and dissemination capabilities increases the timeliness with which the results are made available to the users.

We have stated that training is needed to develop permanent organizational capabilities, and we have looked briefly at the capabilities that must be developed. Now, we may ask: How can we train statistical workers to develop these capabilities?

2. THE EVOLUTION OF TRAINING FOR POPULATION CENSUS AND SURVEY METHODOLOGY: A BRIEF HISTORY OF ISPC TRAINING TECHNIQUES

Census and survey methodology training programs have had a long history. Initially, however, these were training programs to prepare field and office staff for a specific national census or survey. It was not until 1946 that a program was established to share the experiences of a more developed country with countries at a lower level of statistical development.

Looking at the early history of international training on population census and survey methodology one learns how we went about building the capabilities needed by new census and survey organizations. It is especially instructive to look at the early history, from 1946 to 1966. At this point, the leaders in the field of census and survey training were making initial decisions about what instructional methods would work best. They were more likely than modern-day practitioners of the art of statistical training to write down their assumptions.

I will limit my historical summary further to the international training program of the U.S. Bureau of the Census. This is the oldest and largest program of its kind. Also, it is the one I know best, having been a member of its staff from 1974 to 1988.

In 1946, the U.S. Bureau of the Census established what later would be called the International Statistical Programs Center (ISPC). From the beginning, a major focus of the ISPC program has been training on population census and survey methodology.

A variety of teaching methods have been used in the ISPC training program. Classroom training is an important component of all ISPC programs past and present. However, in conformity with its mission to provide practical training which participants can use immediately upon returning to their countries, ISPC emphasizes learning by doing. A proverb I frequently share with our training participants emphasizes the value of the learning-by-doing approach:

If I hear, I forget.
If I read, I sleep.
If I see, I remember.
If I do, I know.

Learning by doing can be accomplished in different ways. Three of the methods which have been used by ISPC are on-the-job training, case study, and demonstration survey.

2.1. On-the-job training

2.1.1 The Census of the Americas program

The first major effort of the Bureau of the Census at international statistical training was providing providing practical training and technical assistance to Latin American census workers as part of the Census of the Americas Program.

Between 1947 and 1950, some 147 Latin American technicians were trained in census techniques in Washington. Their training consisted of:

- (1) Conference courses to give the trainees background information;
- (2) Seminars, laboratory exercises, and observation of work, in the Census Bureau and other agencies;
- (3) Formal courses at a college or university to supplement the seminars and conference courses.
- (4) Such field training and special research as required.

The Bureau of the Census training program combined classroom instruction with on-the-job training. Arrangements were made for trainees to work in

the various operating divisions with regular Census employees.

A report written at the time said: "This phase of the training is probably the most valuable part of the program and provides an excellent illustration of technical cooperation at work" (U.S. Bureau of the Census, 1954).

2.1.2 Advantages of on-the-job training

Participants and their sponsors like on-the-job training.

Training in a real work setting shows the trainee exactly how a task is accomplished.

Moreover, insofar as the goal of ISPC training is to transfer U.S. Census Bureau technologies to trainees from less developed countries, on-the-job training ensures that the trainees get the "state-of-the-art" and not a "tutorial" version of these technologies.

2.1.2 Disadvantages of on-the-job training

Unfortunately, authentic on-the-job training has serious limitations from the point of view of both trainee and trainer.

It frequently teaches imitation rather than reasoning, and imitation, even of successful work practices, is not always appropriate to the trainee's own work situation.

Also, many tasks are not highly visible: how does a trainee observe planning?

From point of view of the host agency, having an "apprentice" can, in many cases, seriously interfere with the work of a survey or census staff member, especially if the staff member is spending sufficient time with the "apprentice" to ensure a valuable training experience.

Despite the success of the on-the-job training method, the Bureau of the Census continued to search for improved ways of transferring skills and capabilities to census and survey trainees.

2.2. Case study method

In 1960, the Bureau of the Census developed the first case study to substitute for actual on-the-job training in census and survey methodology (Gura, 1966).

Frequently used in the United States to teach advanced business management skill (at the Harvard University Masters of Business Administration program, for example), case study techniques make it possible to present, realistically, the details of technical processes.

The lessons of the case study can be adapted to the situations of countries at different levels of development in more or less the same way that on-the-job training is adapted.

The case study model can be specifically designed to represent a developing country, however, while the on-the-job training site is usually a developed country statistical office.

In the case study approach, a fictitious country is created, with maps, a political and administrative structure, a population with believable socioeconomic characteristics, and a "typical" statistical office. The statistical agency is said to be in the process of planning a census or survey.

Based on United Nations principles and recommendations and the experiences of various countries, the case study presents conceptual and procedural guidelines. Then the guidelines are articulated as detailed, step-by-step instructions.

2.2.1 Florencia case study

"Florencia," the first case study, was limited in scope to the identification and solution of problems in processing a population and housing census.

The usefulness of the case study approach as a training method became quickly apparent, and more case studies were developed.

2.2.2 Atlantida case study

Developed in the early 1960s to model a household survey program in Latin American nations, the Atlantida case study was much more elaborate than the earlier model, Florencia. Rather than being limited to data processing aspects, the Atlantida case study considered all aspects of the design and implementation of a continuing, multi-subject household survey program:

- (1) Survey objectives and description of country
- (2) Content and design of household surveys
- (3) Population data controls
- (4) Sample design
- (5) Field operations
- (6) Distribution and receipt of materials
- (7) Editing and coding
- (8) Tabulation process
- (9) Review and analysis of data

Many regional Atlantida workshops, based on the Atlantida case study, were conducted both overseas and at the ISPC training center in Washington.

Based on this experience, ISPC suggested that developing countries organize their own national Atlantida workshops.

2.2.3 Advantages of the case study method

The advantages of the case study method are that it:

- (1) Encourages independent thinking and problem solving,
- (2) Addresses situations similar to those the trainees will face on the job,
- (3) Teaches a wide range of skills and gives trainees an appreciation of the survey process as a whole, rather than just an understanding of their own specialization, and
- (4) It does not interfere with ongoing work, since it has facilitators whose only job is training.

2.2.4 Disadvantages of the case study method

The case study materials and the workshop activities based on them are not really learning by doing. Reading, doing exercises, and discussing all are bookish activities which are unlike real work.

Adding project work to the Atlantida workshops helped, but it occurred to the ISPC staff that it would be ideal if trainees could carry out a real survey.

2.3. Demonstration survey

The first demonstration survey was carried out in the Summer of 1964 jointly by the Training Branch of ISPC and the Statistical Laboratory of Iowa State University . The original design has proven so successful that the nature of the demonstration survey has changed relatively little. Here is a description of the 1965 demonstration survey:

The program is designed to conduct the participants through all the stages of survey operations. Initial lectures will concern elementary statistical methods relating to sampling and some background information about the field of sample surveys. A problem will be carefully defined, the source of the information will be located, the type of information that can be collected will be ascertained, the schedule will be designed, and the most meaningful tabulations will be planned. Instructions for and training of the interviewers will be carried out, the field work planned, and some interviews will be taken. Editing and coding instructions will be written and carried out. The machine programming will be established, cards punched, and tabulations will be made. The format of the final report will be drafted. Estimates will be made and the sampling errors will be calculated.

The only difference between this and an actual survey will be that the subject matter will be relatively simple, the scope of the survey will be on a small scale, and an insufficient number of interviews will be taken to give valid totals. One important feature that will be demonstrated will be the way in which subject matter and processing staff need to work together to produce the most meaningful results, with the most efficient use of time, personnel, and funds. (Iowa State University, 1965.)

2.3.1 Advantages of the demonstration survey method

The demonstration survey is the culmination of the ISPC training program. Through planning and executing the demonstration survey, participants see their specialization in relationship to other specializations. All of their classroom and case study learning becomes real and significant. The importance of good maps is evident as they drive through the countryside; the difficulties inherent in data collection are very clear as they interview the local residents and record their answers.

2.3.2 Disadvantages of the demonstration survey method

One disadvantage of the demonstration survey method is that because it is a small-scale exercise, it does not give participants all of the experiences they would have with a full-scale survey or census.

A major pedagogical shortcoming of the demonstration survey is that it gives trainees in-depth experience with only one set of survey design and implementation options. They know a lot about the survey they design and carry out, but in their own country, things may have to be done differently. And, they see that demonstration survey itself might have turned out better if they had chosen different options, but they do not have the opportunity to try again.

The evaluation phase at the end of the demonstration survey minimizes this shortcoming by allowing participants to critique the demonstration survey that they have just conducted.

The major practical shortcoming of this approach is that it is expensive and it requires the full-time efforts of highly experienced survey trainers to guide the exercise.

3. HOW TRAINING BUILDS CAPABILITIES

Now that we have seen what training methods ISPC uses, let us see how the training builds the three major census and survey capabilities we discussed at the beginning of this paper. Each capability is built through a combination of the different training methods.

3.1. Survey planning

Participants in the all of the full-year ISPC curricula¹ have classroom instruction on design features common to all surveys and censuses: specification of objectives; consideration of budget and sample limitations; deciding which variables should be measured and how; and selection of methods for collecting and processing data.

Elective courses are available in more specific areas: budgeting, scheduling, and controlling of survey-census operations; design of tables and questionnaires; editing, coding, and imputation principles; and planning a mapping program.

Demographic Statistics participants use the case study approach to learn about population and housing census methodologies. They study selected portions of the Popstan Case Study for Population and Housing Censuses (ISPC, 1979) covering most major planning concerns for demographers.

The demonstration survey is the principal method used by ISPC to impart planning skills. During a 6-month period before the actual survey field operations, participants work part-time in the demonstration survey laboratory. Here, each participant has the opportunity to plan, schedule, organize, and control at least one significant phase of the survey preparations. Participants learn to plan by planning in a controlled environment where they receive feedback on their performance.

3.2. Field operations

Classroom instruction can provide a basic knowledge of census and survey field operations. It is more important that trainees know potential sources of error in data collection and how these errors can be reduced. All ISPC participants enroll in a course on control and evaluation of nonsampling errors. Approximately two-thirds of the class sessions are devoted to errors in the data collection stage. The NHSCP document on nonsampling error is an excellent text for such a course (United Nations, 1982a).

The demonstration survey gives participants experience in actually carrying out survey field operations. This experience is valuable for those who have been exclusively office workers in the past. This type of training also gives some experience in planning and controlling the implementation of data collection on a small scale. This gives trainees a good picture of the interrelationships of the various field and office operations. The small scale makes visible interactions that might be obscured in a large scale survey or census.

¹ In the current training year, ISPC offers specializations in Sampling and Statistical Methods, Food and Agricultural Statistics, Demographic Statistics, Economic Statistics, Computer Data Systems, Survey Methods, and Census and Survey Mapping.

3.3. Data processing

All participants in the ISPC training program receive some classroom instruction on data processing considerations in the design of censuses and surveys. They also discuss errors in the processing stage in the course on control and evaluation of nonsampling errors.

Participants in the Computer Data Systems specialization receive much more classroom instruction on various technical and managerial aspects of census and survey processing, including use of software packages developed by ISPC for processing censuses and surveys, and they learn data processing management for census and survey activities.

The demonstration survey gives Computer Data Systems participants a chance to practice their managerial and technical skills. They work with the samplers, survey statisticians, and subject matter specialists to prepare the questionnaire layout, control forms, coding system, table outlines, decision tables, flow charts, and quality control procedures. They also develop a data processing system including components for--

- Questionnaire check-in
- Data entry (using microcomputers)
- File creation and uploading (to a mainframe computer)
- Sorting and verification
- Control editing
- Range editing
- Consistency editing
- Generation of frequency distributions
- Error correction and file updating
- Sample weighting
- Tabulation

Participants in the Management Information Systems Degree Program generate and update a data base to provide task status reports to demonstration survey managers.

3.4. Data evaluation and dissemination

Participants in the ISPC training program receive classroom instruction on data evaluation in the courses on control and evaluation of nonsampling error; quality control in censuses and surveys; survey design and evaluation techniques; and evaluation of census data.

The evaluation phase of the demonstration survey allows them to apply what they have learned in the classroom. They write a demonstration survey evaluation report evaluating sampling and statistical support; mapping; field operations; questionnaire and table design; computer data systems; data processing; and management information systems.

Except for Demographic Statistics participants, who receive some case study exposure to data review and publication concerns in the "Popstan" case study, data dissemination receives relatively little attention in the ISPC training

program. However, special-purpose training programs on printing and reproduction are available for participants who want them.

4. SUMMARY AND NONCONCLUSION: QUESTIONS FOR OUR ANSWERS

Although technical capabilities can be imported through technical assistance programs or acquired through "trial and error" experiences over time, the most effective and ultimately the most inexpensive way for statistical organizations to build their capability and their self-sufficiency is through training.

As we have seen, different types of training and different combinations of training methods are needed for building each capability. I have shown how the international training program of the U.S. Bureau of the Census combines classroom instruction, case studies, demonstration surveys, and on-the-job training to create what we hope is a comprehensive training program for census and survey capability development. But this is only one answer to the training question.

Thirty years ago, when I was beginning my first year at college, the president of the college gave an address to the entering freshmen. In the intervening years, I have forgotten most of what he said to us on that occasion, but I remember one thing. He said, "Many of you have come to this institution to find answers to questions. If that is so, you probably will be disappointed. Our purpose here is not to answer your questions, but rather to question your answers."

If you take this paper, and my presentation to you today, as an answer to the question: How should we conduct training on population census and survey methodology? I am afraid you will be disappointed. My perspective has focused narrowly on my own experience in this field, and what I have learned from my colleagues whose experiences are similar.

If, on the other hand, you take what I have told you as a starting point for further questioning, I think you will find more value. I encourage you to be critical of the "ISPC solution" to the problems of training on population census and survey methodology.

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