

## **ADMINISTRATION**

### **Planning and Organization**

The initial planning for the 1991 Census of Population and Housing began during the summer of 1988 with the preparation of the Statistics Department's budget for 1989/90. A census planning framework was drawn up and a general review of the 1980 Census experience was initiated under the direction of the Census Planning Team (CPT) which included the following persons:

- Mr. Donald Scott - Census Superintendent
- Mr. Keith Stanton - Senior Research Statistician
- Ms. Janet Smith - Senior Statistician (Censuses and Surveys)
- Mrs. Melinda Williams - Demographic Statistician
- Mr. Kenneth R. Scott - Census Officer
- Mr. Steven Holdipp - Statistical Officer (Computer Operations & Programming)

The Census Superintendent's responsibilities generally included the formation of policy, organization of the Census operation, liaising with the Regional Census Coordinating Committee as well as the U.S. Bureau of the Census and the compilation of the census report. The remaining members of the CPT were responsible for the general operation of the census programme: questionnaire design, development of all training manuals, computer programming and testing, and the recruitment and training of office support staff and temporary field staff.

Following the review process, the Census Superintendent and the Senior Statistician for Censuses and Surveys attended several meetings held under the auspices of the Regional Census Coordinating Committee which had the responsibility of overseeing the 1990 census round in the Caribbean.

At these meetings member countries agreed upon a common core of questions that would guarantee intra-regional comparability of basic data items. At the same time, however, each country was free to explore additional areas of inquiry that might be unique to its own requirements.

Since the 1970 Census, Bermuda has made use of the optical mark reading (OMR) document, which greatly decreased processing time and enhanced the accuracy of the collected data. Initially, the cost of this technology had been too prohibitive to allow many member countries to acquire it individually. Over time, however, the technology has become less costly, and Bermuda's Ministry of Finance approved a recommendation from the Census Superintendent to purchase scanning equipment. This decision allowed the Census Office to put into place all the necessary components which would allow for complete processing of the Census results in Bermuda.

Another of the strategies adopted by the Statistics Department was to develop a core of part-time staff with the basic experience of conducting major household surveys and censuses. In addition, to every extent possible the Department's clerical staff were involved in all operational phases of household surveys and censuses such as training, enumeration, editing and coding. This strategy assisted the department in being able to call on experienced personnel as needed.

The following is a brief description of the various pre-enumeration activities leading up to the general field operations. They are: mapping, creation of administrative areas, recruitment and training, publicity, and arrangements for special areas.

### **Mapping**

A basic organizational task in any census is the preparation of census district maps which are necessary in order for the enumerators to identify their assigned areas. Additionally, the map assists the supervisors in checking the progress of the enumerators in the field.

Given the enormity of the mapping exercise, preparation must begin well in advance of sending enumerators into the field. The task of preparing these maps was the responsibility of the Census Officer

and Technical Officer. Base maps were provided by the Ordnance Survey Division of the Works and Engineering Department.

The Census Office essentially used the same census districts as in 1980. However, there were changes during the intercensal period such as new roads and street names and the pre-designation of building numbers. As a consequence of these changes, the boundary descriptions corresponding to the 241 census districts had to be made current. This involved making on-site inspections to determine whether or not changes made to the Ordnance Survey maps were actually visible on the ground.

In addition, since the 1980 Census, a considerable number of census districts had grown significantly in terms of the number of dwelling units and in some cases doubled in size, thereby making it virtually impossible for one enumerator to complete comfortably the required work within the specified time period. The priority, therefore, was to sub-divide each census district that was affected. This effectively increased the original number of census districts from 241 to 323.

Census base maps first were photocopied from Ordnance Survey master sheets. The census district boundaries were then highlighted and census district identification numbers were placed on each map. Four copies of these were prepared for each census district - one to be used by the enumerator, the second by the supervisor, the third by office staff and the final copy as a reserve.

### **Creation of Administrative Areas**

The next stage of the organizational activity is the creation of an administrative structure. This is crucial to any census and ensures the smooth running of an exercise this large. Therefore, to assist in the administration of the Census, the island was divided into 9 regions and 65 supervisory areas. These supervisory areas consisted of not less than four and no more than six census districts per supervisor. To facilitate the enumeration of special areas, such as group dwellings and institutions, an overlay of Eastern, Central and Western zones was created. The Eastern zone included all parishes east of Pembroke; the Central zone included all of Pembroke; and the Western zone included all parishes west of Pembroke.

### **Recruitment and Training**

One of the more intensive aspects of the pre-enumeration planning activity is the recruitment and training process. Approximately 500 temporary staff were needed to carry out the census exercise. These included 30 Trainers, 9 Regional Supervisors, 75 Area Supervisors, 323 Enumerators and a reserve pool of 50 enumerators. The Census Office received more than 1,000 applications for the temporary census posts.

Recruitment and training was carried out in three stages: stage one included recruitment and training of Trainers; stage two included recruitment and training of Area Supervisors; and, finally stage three involved the recruitment and training of Enumerators.

A new feature of the 1991 Census training process was the use of trainers to train the supervisors and the enumerators. This differed from the 1980 training procedure in which the supervisors trained the enumerators. It was recognized that a person who demonstrated good supervisory skills might not qualify necessarily to be a trainer. Therefore thirty trainers, many with previous census and teaching experience, were recruited, trained and selected after 46 hours of rigorous training by census planning team members with expert assistance and guidance provided by Dr. Sonja Sinclair - Assistant Regional Census Coordinator. This training took place at Government Personnel Services Department's training unit at Global House from the 25th February through to the 8th March, 1991; after which trainers began the task of training supervisory and enumerator staff. Census planning team members were on hand to observe the training and to assist and give general support to the trainers.

The second stage of the recruitment and training involved area and regional supervisors. This training for 75 potential supervisors took place at the Global House training unit from 18th March to the 5th April, 1991.

The third and final stage of the recruitment and training process shifted to the Stonington Beach Campus of the Bermuda College, where over 500 trainees went through an intensive week of training (three-hour evening sessions from Monday to Friday, plus an all-day session on Saturday). This final training cycle was completed between 29th April and 10th May, 1991. In addition, a further 50 enumerator trainees were recruited and trained and placed on stand-by as a guard against the expected ten per cent drop-out rate amongst enumerators. As Census Day neared, trainers made their final assessments and recommendations for the selection of enumerators to the Census Office. Before the deployment of hundreds of enumerators into the field, area supervisors needed to learn the boundaries of their assigned census districts. This was to ensure that supervisors could identify and point out the census districts and their boundaries to enumerators. This aspect of the orientation process for supervisors was accomplished over a period of three to five weeks giving supervisors ample time to systematically traverse their assigned areas and to become familiar with them.

### **Publicity**

The publicity campaign was co-ordinated through the Government Information Services Department. The theme selected for the 1991 Census was "Bermuda's Future Counts on You". The aim was to sensitize the Bermuda populace to the importance of gathering information in order to plan for the future. The campaign included press briefings, newspaper advertisements and selected radio spots at peak times leading up to the enumeration period. This was overlaid with television advertisements by well known public figures voicing support for the census during the height of the enumeration in May and June, 1991. In addition, the General Post Office assisted with the delivery of a blanket mail-out of census material on the eve of the enumeration period.

### **Special Areas**

Prior to the enumeration period, it is important that special arrangements be made to enumerate or record the number of persons living in the following situations: institutions and group dwellings; hotels; those on ships and yachts; and military personnel attached to foreign bases but living off-base.

Persons living in institutions and those in group dwellings were enumerated by special area enumerators who reported to a regional supervisor.

For persons living in institutions such as prisons, public and mental hospitals, nursing homes, reformatories and similar institutions, only limited information was required. In the cases of persons residing in group dwellings, however, such as hostels for nurses, and police barracks, dormitories for hotel staff and boarding houses the entire questionnaire except the Housing section was administered.

Visitors residing in hotels and guest houses were enumerated by the management in response to a letter sent by the Census Office asking for a head count as of Census Day, May 20, 1991. The enumeration of armed forces personnel and their dependants living on base as well as any visiting military personnel was carried out by the commanding officers of all three military bases. This information was also forwarded to the Census Office. Information concerning persons on ships and yachts was obtained from shipping agents, and HM Customs' St. George's Yacht Reporting Centre.

### **Enumeration**

The 1991 Census enumeration was conducted on a post-census day basis and in contrast to the pre-census day enumeration of 1980, it commenced the day immediately following census day. Thus on May 21, 1991 some 323 enumerators began visiting households seeking demographic, social and economic information as required by the Census Act 1950.

With the exception of special enumeration areas, the average number of enumerators per area supervisor was five. In those supervisory areas with denser populations, the number of enumerators per supervisor was as low as four. In the sparsely populated areas it was as high as six. The workload

per enumerator varied from as low as 20 to over 110 dwellings and from 50 to over 250 persons. As much as practical, less experienced enumerators were assigned the smaller districts.

To the extent that it was possible, enumerators were assigned census districts outside of their immediate neighbourhoods. This assignment method was also designed to allay any fears on the part of householders of divulging their personal information to an enumerator who might be well known to them.

Towards the end of the enumeration it was quite evident to planning team members that the response to the census was excellent. The closing date for the enumeration was June 15, 1991 at which time more than 22,000 households had been enumerated. There were few instances where householders could not be contacted at their homes and outright refusals were minimal. Immediately preceding the close of the enumeration, supervisors and a few more experienced enumerators spent two to three weeks in the field clearing up the call-backs and refusals.

In addition, an advertisement was placed in the newspapers informing the public that the general field enumeration had ended, and requested householders who were not enumerated to contact the Census Office between 22nd and 26th July, 1991. As a result some 35 households responded, and were enumerated by Census Office staff.

### **Remuneration**

Payments for the training and enumeration were as follows: Trainers were paid a flat rate of \$1,200 for roughly 60 hours of work between March and April; and, Regional and Area Supervisors were paid a flat rate of \$2,000 and \$1,500, respectively. This flat fee was inclusive of attendance at training sessions. Enumerators were paid a training fee of \$210 (if all sessions were attended), and \$15 per completed questionnaire. Since the average size of a census district was between 60-70 dwelling units, an enumerator could expect to earn about \$1,000. Payments for enumerators ranged from \$500 to as much as \$2,000 for the few enumerators with census districts in excess of 100 dwelling units.

### **Problems**

A census is a massive and complex undertaking and one is never completed without a few problems. The singular major crisis was the postponement of the proposed 1990 Census of Population and Housing scheduled for October 15, 1990; the legal framework was not put in place as a result of an administrative oversight. This was a disappointment for Census Planning Team members and Statistics Department staff who had been working toward the original target date. A new Census date of May 20, 1991 was set, and during the interim period, planning team members completed all the necessary changes to documents and systems caused by the postponement.

One other major problem which occurred prior to the enumeration was that a person or persons unknown, representing themselves as census enumerators, visited several households requesting personal information. This had the potential of undermining the entire census effort. However, the Census Office quickly allayed any public fears by immediately dispatching a news release informing the public that the enumeration process had not yet begun and that anyone representing themselves as enumerators would be required to produce the necessary official identification.

Although there were other minor problems, these were quickly resolved either by Census Team members or by supervisors in the field.

### **Post-Enumeration**

The post-enumeration phase covers the period immediately following the enumeration. This involves the compilation of summary data from the visitation records, the editing and coding of raw data, computer scanning, analysis, and dissemination of the results.

Training of the editors and coders was handled by Mrs. Melinda Williams of the Census Planning

Team. In addition, Mrs. Williams supervised the entire editing and coding operation with assistance from the Technical Officer, Mrs. Penny Simmons. Coding and editing was carried out by 11 coders including four members of the Statistics Department's staff. This phase was completed on schedule thanks to the outstanding effort by coding staff and their supervisor.

The initial handling of the census data involved the sorting, labelling, packaging and storage of census returns. This was to ensure an orderly flow of documents from the storage area to the Census Office. This initial preparation began in July, 1991. At the same time the Census Office began selecting field staff who were prepared to do further training in the editing and coding of census questionnaires.

The processing of the 1991 Census questionnaires involved eight major steps:

- i) manual edit of more than 22,000 census booklets for completeness and consistency;
- ii) manual entry of codes for household type, occupational training, job type, and economic sector of employment;
- iii) computerized scanning of census booklets;
- iv) initial computer edits;
- v) preliminary tabulations;
- vi) evaluation of tabulated output;
- vii) final computer edit; and,
- viii) final tabulations.

The manual edit involved a systematic search through each census booklet for multiple marks, damage and omissions of key data such as age and sex. Next followed the manual entry of codes for household type, job training, occupation and industry. This process required that the editing and coding staff have a thorough working knowledge of occupational and industrial classification codes and some background knowledge of Bermuda's business activity and the various types of industries that characterize the economy.

The next phase was the computerized scanning of the census questionnaires. During the summer of 1990, the Census Office installed (in-house) an optical mark reader, the OPSCAN-10 manufactured by National Computer Systems (NCS) of Minnesota, United States of America. The OPSCAN-10 is computer driven with on-board diagnostic and editing tools. At full speed it is capable of scanning 5,500 double-sided sheets per hour. More than 325,000 sheets were scanned in the capture of Bermuda's census data. When the editing, coding and scanning were complete, the documents were placed in the Government Archives for permanent storage.

Steps four to eight of the processing phase included the initial computer edits, the production of preliminary tabulations, the evaluation of tabular outputs, and the production of the final tabulations. The editing and tabulations were carried out with The Integrated Microcomputer Processing System (IMPS), a software package developed by the United States Bureau of the Census. The core elements of IMPS include:

- CENTS, tabulates and prints statistical tables
- QUICKTAB, basic frequency distributions and two-way cross-tabulations
- CONCOR, computer edit program.

The IMPS modules noted above are capable of processing up to 250,000 records per hour; a standard application on the Bermuda census file requires no more than 60 seconds.

### **The Budget**

The cost of the 1991 Census of Population and Housing was approximately \$1.2 million spread over a three-year period. Over fifty per cent of that was allocated to the temporary workforce of some 500 persons: trainers, supervisors, enumerators, editors and coders. The balance of the census budget was allocated to cover the cost of supplies and equipment; printing of questionnaires and supporting documents; publicity; processing; and printing of Census reports.