

THE TEACHING OF STATISTICS AND DEMOGRAPHY IN CENTRAL AMERICA

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INTRODUCTION

This article deals mainly with the finding of a survey made by the writer, in different agencies, educational as well as governmental, regarding the present status of teaching and research in statistics and demography in the countries of the Central American Isthmus. This kind of objective information, which would permit an evaluation of our present situation in the above-mentioned fields, was deeply needed from the very moment the Central American universities—as part of their plan directed and oriented by the well-known CSUCA (Consejo Superior Universitario Centro Americano) (Higher Central American University Council) which has as its aims the unification and channeling of higher education—designated the Institute of Statistics of the University of Costa Rica as the regional agency for statistical teaching and investigation in this area. The kind invitation of the Milbank Memorial Fund to the director of this Institute to participate in its conference and to describe the teaching of statistics and demography in Central America offers the opportunity to make the above-mentioned evaluation.

Perhaps the reader wonders why it is necessary to gather data through a survey in order to have a clearer picture of what is happening in this

group of five countries of such geographical proximity and of such similarity in ethnic and economic characteristics that they should have a profound knowledge of one another. Actually, in the past, knowledge of our neighbors has not been very profound. It is only during the past few years that the countries of Central America have come to know and understand each other.

TEACHING ASPECTS OF STATISTICS AND DEMOGRAPHY IN CENTRAL AMERICA

Since this paper reports the results of a survey, and attempts only to give information of a strictly descriptive nature, we shall begin by describing briefly the situation in each of the five countries. To follow some order, we shall go from north to south and, therefore, shall discuss Guatemala first.

In the Republic of Guatemala, as in the other countries of Central America and Panama, with the exception of Costa Rica, no academic degree denoting specialization in the study of statistics is granted. As a part of the professional training in the university, courses in this subject are offered. Specifically, courses in statistics are given at the University of San Carlos of Guatemala in the Faculties of Economic Sciences, Medical Sciences, and Engineering. The number of courses is possibly greater in the first of these. Thus, they offer courses in General Statistics, using as textbooks and reference material the works of Croxton and Cowden, and in Statistical Methods Applied to Economy and Business, using "Statistical Methods," by F. C. Mills, "Fundamentals in Statistics," by Netter and Wasserman, and special notes prepared by the Guatemalan professors, Jorge Arias B. and Max Ruano A. In Economic Statistics essentially the same textbooks are used, especially those by Croxton and Cowden and by Mills.

Specifically, the above-mentioned are the two basic courses which the Faculty of Economics offers in statistics. However, as part of other subjects, instruction in other statistical techniques is given. Thus, there are lectures on sampling in relation to market research in the course on business organization and administration. Basic principles of linear programming are an integral part of the courses in applied mathematics.

As to demographic aspects, only a general insight is offered, also as part of courses in statistics. According to information which I have

obtained from Guatemalan friends, courses in general statistics are offered in some secondary schools or those of a similar level, such as the polytechnic and business schools.

It seems strange that a greater number of courses in statistics and demography at a more advanced level have not been developed in Guatemala, especially since this country has several specialists with good academic backgrounds in these fields. Two of them, for example, have had advanced studies at the Faculty of Statistical, Demographic and Actuarial Sciences in Rome, and Dr. Arias, Rector of the University of San Carlos, is well known for several of his publications in the field of demography. There are, moreover, Guatemalans of a new generation who have studied in Costa Rica and at the specialized centers in Chile. They are expected to take a more active part in the near future in teaching and applying the techniques they have learned.

The University of San Carlos does not give any specific certificate in statistics and, as can be concluded from the previous paragraphs, the economists, public accountants, auditors, and business managers are the people who have the closest contact, as part of their studies, with statistics and demography.

A questionnaire, which was answered by the General Bureau of Statistics of Guatemala, indicates that important demographic studies are to be conducted in that country, such as those concerning the birth rate, marriages, divorces, and mortality.

In the Republic of El Salvador, courses in statistics and demography are offered in the Faculties of Engineering, Medicine, and Economics at the National University, as well as in some vocational and technical institutions and schools at the intermediate level, which train accountants, nurses, and social workers.

In the Faculty of Economics, where perhaps the greatest emphasis is on statistical subjects, the courses offered are: General Statistics, with "General Applied Statistics," by Croxton and Cowden, as the textbook; Economic Statistics, based on the statistical notes prepared by Dr. Enrique Cansado of the CIEF (Centro Interamericano de Enseñanza de Estadística Económica y Financiera) (Inter-American Center of Economic and Financial Statistics) of Chile; Demographic Statistics, based on the textbook, "General Theory of Population," by Alfred Sauvy. The subjects covered in Demographic Statistics are: theories of population; natality; mortality; migration; mortality tables; general concepts of population projections; maximum and optimal population; demo-

graphic trends; and social and economic factors influencing the demographic processes. Teachers giving these courses are engineers or graduates of the Faculty of Economics, who have taken additional specialized courses in statistics abroad, particularly in Chile.

The National University of El Salvador does not offer a curriculum leading to a degree or certificate in statistics or demography and, as in Guatemala, the teaching of these subjects is only a part of the courses given to complete the requirements for degrees in other disciplines. In this connection, some basic principles in biostatistics and demography are also taught in a course on epidemiology in the School of Medicine.

The General Bureau of Statistics and the School of Economics point out the following demographic investigations as being of immediate importance for the country: review of demographic series; analysis of demographic trends; population projections; studies on population and education; studies on population and labor; studies on population and housing; analysis of migration trends, and studies for obtaining improvement in the vital statistics records.

Continuing southward, we shall now mention the replies to the questionnaires received from the Republic of Honduras. Here we have information furnished by the National Council of Economics, the autonomous University of Honduras, the General Bureau of Statistics and Census, and an alumnus of the Central American Course of Basic Statistics, held in Costa Rica during 1957–1958. In the institutions giving courses in statistics in Honduras, the courses are generally found in the following departments: the Faculty of Economic Sciences, the Faculty of Legal Sciences, the Faculty of Engineering, and in some institutes of secondary education.

In the institutions listed, the courses offered are the following: General Statistics, based on the textbook, "General Applied Statistics," by Croxton and Cowden; Economic Statistics, based on the textbook, "Statistics for Economists," by R. G. D. Allen; Statistical Methods, based on the textbook, "Elements of Statistics," by Andrés García Pérez; Principles of Linear Programming, a course including elements of this technique with special emphasis on the simplex method for solving systems of equations.

We notice first, in the case of Honduras, the absence of a formal course in demography, in spite of the fact that some principles of demography are taught in the courses on statistics, as previously indicated.

Those on the teaching staff in charge of statistical studies have had basic training in economics at the local university, in Mexico, and at the University of Panama, with postgraduate work at CIEF in Chile. Honduras has no institution giving a degree or certificate in statistics or demography. The specialists who have had additional training in statistics abroad (Chile, Costa Rica, Mexico), work mostly with programs of industrial investigations, concerning economic development, and, in general, economic matters.

It is to be noted that in Honduras there are over 20 individuals with additional training in statistics; two of them took courses at CELADE.

Among the subjects of demographic research, in which the agencies consulted in Honduras have shown greatest interest, are the following: omissions in the birth and death records; the improvement of internal and external migration statistics; the implementation of the death certificate; infant morbidity and mortality; preparation of life tables.

The situation in Nicaragua is somewhat similar to that in the three countries already discussed. Courses in statistics in Nicaragua are offered only by the Faculty of Economic Sciences of the National University. The relatively large group of subjects offered includes a course in General Statistics, based on the notes prepared by Dr. Enrique Cansado of Chile; a course in Economic Statistics, following the "Notes of Economic Statistics," prepared by the Institute of Statistics at the University of Costa Rica in 1959. Also, courses in Mathematical Statistics, Econometry, and Linear Programming are given, based, respectively, on the textbooks of Yule and Kendall, Klein and Samuelson, and Dorfman and Solow. As can be seen, in these respects Nicaragua leads several other countries of the Isthmus. Paradoxically, there is no formal course in demography or biostatistics, although its Faculty of Medicine does touch on some subjects related to these disciplines.

The professional level of the faculty teaching the courses corresponds to that at CIEF in Chile. In fact, several of the professors have taken their advanced courses there.

Nicaragua also has several other graduates from Chile (CIEF) and from special courses in Costa Rica (Institute of Statistics) who work on statistical tasks in government offices. It is the opinion of the Planning Bureau of Nicaragua that there is an increasing demand for statisticians as a result of the new planning techniques.

Among the subjects of demographic research which the Planning Bureau of Nicaragua considers of greatest importance for the near fu-

ture are the following: studies of the economic structure and distribution of the population; studies of internal migration (permanent and seasonal); studies of family structure.

In Costa Rica, the teaching of the first courses in statistics and demography began with the creation of the Faculty of Economic and Social Sciences at the University of Costa Rica in 1943. Even before that date the initial study programs included courses in General Statistics, Economic Statistics, and Demographic Statistics at relatively elementary levels. Subsequently, specialization in statistics was specifically established as part of the course leading to the master's degree in economics, offered by the School of Economic Sciences. At present, in addition to the courses previously mentioned, as the result of more experience and better knowledge of the field, courses in mathematical statistics, based on the first edition of "Introduction to Mathematical Statistics," by P. Hoel, are offered, as well as courses in pure mathematics, actuarial calculus, and insurance.

In 1955, the so-called Branch of Statistics of the Faculty of Economic and Social Sciences had a series of profound changes in its structure, through the establishment of the Institute of Statistics. This was due to the initiative of a group of distinguished professors on the faculty, who added to the staff some Costa Rican students who had taken advanced studies in North American universities.

At the present time, the Institute leads in statistical teaching and investigation within the framework of the university. Through it, the Faculty of Economic and Social Sciences gives the certificate of Licenciante in Economic Sciences with specialization in statistics. The courses offered by the Institute at present are the following: General Statistics, covering aspects of descriptive statistics, basic ideas of calculus of probabilities, distributions of probabilities, and statistical inference; Statistics and Mathematics for Economists, including applications of mathematics to economy, as well as the study of normal, Poisson, and binomial distributions, hypothesis testing, correlation, and time series; Statistical Theory I and II, with work carried out at the level of the textbook, "Introduction to the Theory of Statistics," by A. Mood; Survey Design (sampling), based on the textbook, "Sampling Techniques," by W. G. Cochran; Experimental Design, at the level of the textbook, "Experimental Design," by W. G. Cochran and G. M. Cox; Econometry, based on the textbooks by L. Klein and G. Tintner.

Also, courses are given on Experimental Methods and Design, in the

Faculty of Agriculture, on Biostatistics in the Faculties of Medicine and Microbiology, and statistical programs are already planned in the Faculties of Pharmacy and Engineering.

In view of the nature of this article, courses in Demographic Statistics, given by the Faculty of Economic Sciences, and Biostatistics, which is part of the course in Preventive Medicine in the Faculty of Medicine, deserve a separate paragraph. At present, a one-semester course in demography, with four 45-minute sessions a week, is taught by a professor who is a graduate of our statistical branch and who has had two additional years of specialization at CELADE. In 1957, the course was entirely revised by Dr. Clotilde A. Bula, and one of her former students taught it for some years in accordance with her ideas.

The projected program for a course in demography is found in Appendix I. During the present year, Mr. Miguel Gómez, the professor, has introduced some variations and formulated the basic program which is presented in Appendix II.

As already stated, a course in biostatistics is also offered in the Department of Preventive Medicine. This course comprises a total of 48 lecture hours and is given by another of our graduates, who specialized in the subject at the University of Louisiana. The contents of the course is presented in Appendix III.

It should also be noted that in the country and at the university, there has been a certain feeling of uneasiness about demographic problems. This feeling has inspired several graduation theses and investigations, among which the following may be pointed out: "Internal Migrations of Costa Rica and Its Causes," by Lic. Wilburg Jiménez C.; "Some Characteristics of Costa Rican Population and Mortality Analysis as of 1930," by Lic. Gema García; "Population Projections of the Republic of Costa Rica for the years 1960-65 and 1970," by Lic. René Sánchez Bolanos; "Growth of University Student Population," by Lic. Mariano Ramírez.

Some other studies conducted by the General Bureau of Statistics also have been contributed. Mention should be made of the various works of Mr. Ricard Jiménez J.: "Accuracy in Birth Registration and Some Demographic Analyses of Costa Rica," published by the General Bureau of Statistics and Census in 1957; "Cause of the Numerical Difference between the Population Census of 1950 and Estimation for That Date in Costa Rica," *Journal of the Inter American Statistical Institute*, 1952; "Scheme of Demographic Evolution in Costa Rica: Review of

Studies and Statistics," General Bureau of Statistics and Census, 1961; "Marriage and Fecundity in Costa Rica," *Journal of the Inter American Statistical Institute*, June, 1961.

Under the direction of Professor Wilburg Jiménez C., "Some Demographic Characteristics of the San José Metropolitan Area," was published in 1961, by the General Bureau of Statistics and Census. The same professor, with another group of students in the demography course, wrote "Demographic Areas of Costa Rica," published by the General Bureau of Statistics and Census in 1959.

In 1957, 1958, and 1961, the concern about demography crystalized in the form of three national seminars conducted and co-ordinated by the General Bureau of Statistics and Census.

It is necessary to mention the need in Costa Rica for carrying out investigations to determine: the quality and accuracy of birth and death records; the characteristics of internal migrations (by means of surveys and analyses); figures on work forces, by studies like those of the Current Population Survey of the United States, and, finally, a study of fertility. It is perhaps appropriate to make additional comments regarding the above-mentioned points. Thus, for example, a study on internal migration, by Lic. Wilburg Jiménez C., based on the data of the 1950 Census is available; although valuable, this is essentially descriptive. What is now suggested is going deeper into the dynamics of the phenomenon itself, trying to show in explicit form the causes and effects within a certain level of details. The study of fertility is of special importance in Costa Rica, a country in which apparently contradictory factors coexist: a very high birth rate with a relatively high literacy index, for example.

It is quite possible that a fertility survey will be undertaken next year with the co-operation of CELADE and Cornell University, on the one hand, and the General Bureau of Statistics and Census and the Institute of Statistics of the University of Costa Rica, on the other. Such a survey could well be the nucleus of demographic investigation in Costa Rica, with projections towards the remaining five countries of Central America. Perhaps one of the first tasks of research to be carried out by this nucleus or unit of demographic investigation could be an exhaustive analysis of the recent population census.

A PROJECTED PROGRAM FOR A DEMOGRAPHY COURSE

I. Introduction

1. Importance of demographic studies; generalities on demographic compilation, analysis, and investigation
 - a. Compilation of demographic data: general statistics on population, statistics on labor, vital statistics, administrative statistics, sample compilations of demographic data
 - b. Analysis of demographic information: tabulation of data, statistical analysis, interpretation and presentation
 - c. Basic demographic investigations

II. Descriptive Demography

1. Definition and classification of demography, relation to other sciences
2. Demographic statistics; basic demographic data and their collection
 - a. Population census: early and recent censuses; planning of a population census; factors affecting the integrity and safety of census data; sampling applied to census tasks
 - b. Recording of vital facts: definition of vital facts; recorded characteristics; recording methods; history of civil recording; factors affecting the integrity and safety of records
 - c. Other sources of primary demographic information: sanitation and morbidity statistics; statistics on occupational diseases; statistics on internal and international migrations; statistics on labor
3. Population morphology
Population and its variations in time; measurement of population growth; variations in population growth rates; density; population center; population structure as to age and sex: determining factors (births, deaths, migrations); population distribution according to civil status, economic activity, race, education, etc.; urban and rural population
4. Population movement; the phenomena of movement and functions of the population
 - a. Births: records, omissions, possibilities of matching census data; relative natality measures; generic and specific rates; corrected and normalized rates; measure of fertility obtained: (1) from the census, (2) from population movement
 - b. Deaths: records, omissions, definitions; absolute and relative death frequencies; mortality rates; corrected and normalized rates; death ex-

- pectancy (probability) life table; life table constants and functions; use of the life table
- c. Formation, structure, and dissolution of families: marriage, divorce, and legal separation records; marriage rate; generic and specific marriage rates; age at termination of marriage by death or divorce; divorce and separation rates; population apportionment: by various types of occupations, according to number of children and number of old people; size and composition of families; demographic factors affecting family structure
 - d. Morbidity: records; recording errors; morbidity rates: incidental and prevalent; rates of fetal deaths; measures of inability due to disease or work hazards; morbidity characteristics and trends
 - e. Migrations: record of internal and international migrations; methods for measuring and evaluating migratory movements; gross and net migration; gross and specific migration rates; characteristics of migrations; problem of urbanization
 - f. Active population: methods for measuring activity and unemployment; definition and measure of labor force; its composition by sex, age, and other characteristics; industrial and occupational classification; measurement of employment and unemployment; generic and specific rates; rates of application and access opportunities, separation, and dismissals

III. Demographic Investigation

1. The method and some problems of demographic investigation
 - a. The methods in demography: (1) method of concordance; (2) differential method; (3) method of concomitant variations
 - b. Some problems of demographic investigation: (1) problem of masculinity in births; (2) statistical measurement of prenatal mortality; (3) basic cause of birth decrease; (4) laws of mortality and normal life span
2. Population development
 - a. Experimental demography
 - b. Methods for estimating population growth: various techniques for intercensal and postcensal estimations; extrapolation of migratory movements; forecasts
 - c. Review of population theories: basic quantitative population theories: (1) geometric (Malthus), (2) logistic (Verhulst), (3) periodic (Darwin), (4) cyclic (Gini)
3. Investigation by sampling; estimations and surveys

Use of sampling theory in demographic research; efficiency of sampling methods; planning of demographic research by sampling; practical cases of research by sampling

IV. Interrelationship of Demographic, Economic, and Social Phenomena

1. Static relations

Interpretation of relationships between: a. natality and mortality; b. infant natality and mortality; c. natality and mortality and the percentage of urban and rural population; d. principal causes of death and structure by population ages; e. infant mortality and sanitation; f. mortality and per capita national income; g. marriage rates and occupation

2. Dynamic relationships

Interpretation of relationships between: a. population growth and natality and mortality; b. population growth and production; supply and demand, and unemployment; c. population growth and capitalization; d. concept of optimum population; e. biologic resources and population growth; f. mineral resources and living standard, etc.

Historic narration of several countries and their development: United States, France, and the Central American republics; demographic aspects of the principal economic and social problems in the Central American countries

3. Demo-econometric concepts

Cost and yield (one performance) of man in relation to age; rearing and adult cost in relation to mortality; economically active mean life expectancy

APPENDIX II

PRESENT PROGRAM OF DEMOGRAPHIC STATISTICS

I. Demography

1. Definition
2. Object
3. Importance
4. Methods used
5. Relation to other sciences

II. Population Growth

1. Brief history of world population growth
2. Theories regarding population
 - a. Population in ancient and medieval times
 - b. Mercantilistic theories regarding population
 - c. Malthusian theory

- d. From the standpoint of the classic, socialist, and Marxist economists
- e. Biological theories
- f. Cultural theories
- g. Economic interpretation proposed by Coontz

III. World Demographic Situation and Outlook

- 1. Modern population growth
- 2. Demographic transition
- 3. Demographic evolution in the underdeveloped countries
- 4. Classification of countries according to the level of their natality and mortality gross rates
- 5. Situation in Costa Rica

IV. Sources of Demographic Data

- 1. Generalities
- 2. Population census
 - a. Importance and usefulness of the population census
 - b. Definition and characteristics
 - c. Phases of a population census
 - d. De facto and de jure censuses
 - e. Questionnaire or census forms
 - f. Investigation topics in a population census
- 3. Vital statistics
 - a. Vital facts and their recording in time
 - b. System for collecting the vital facts in Costa Rica
 - c. Basic documents utilized in the collection of vital facts
 - d. Errors affecting vital statistics, and their influence
- 4. Possibilities of applying sampling in census and in investigations on vital facts

V. Population Composition

- 1. Importance of studying population composition
- 2. Composition by age and sex
- 3. Composition by status
- 4. Composition by economic characteristics
- 5. Composition by degree of instruction

VI. Population Distribution by Space

- 1. Determining factors and consequences of population distribution
- 2. Urban-rural population classification and differentials existing in such regard

VII. Mortality

1. Nature, factors, and tendencies
2. Measurement of mortality: gross and specific rates
3. Mortality by sex and age: characteristics and trends
4. Life tables: characteristics and importance
5. Infant mortality: measurement, characteristics, and importance as indicator of standard of living

VIII. Fecundity

1. Nature, factors, and tendencies
2. Measurement of fecundity: principal difficulties; gross or general rates and specific rates
3. Gross and net reproduction rates: their limitations and the need for other forms of measuring fecundity
4. Differential fecundity

IX. Migration

1. General characteristics; international migration and internal migration
2. Causes and consequences of migratory movements
3. Measurement
4. Urban-rural migration; effects on economic development

X. Population Projections

1. Generalities
2. Methods utilized
3. Formulation of hypothesis in the method of components
4. Utilization of population projections

XI. Economically Active Population

1. Definition of economically active population
2. Participation in activity by age and sex
3. Participation by urban and rural areas
4. Trends of participation in activity

XII. Demographic Politics

1. What is demographic politics?
2. Is demographic politics necessary?
3. Examples of applying demographic politics: Puerto Rico, Japan, etc.

APPENDIX III

THE COURSE IN BIOSTATISTICS OFFERED IN THE DEPARTMENT OF PREVENTIVE MEDICINE, SCHOOL OF MEDICINE, UNIVERSITY OF COSTA RICA

Concept of biostatistics; statistics and the scientific method;
statistics in problems of planning and analysis of experiments;
statistics and problems of public health

Types of statistical variables; distributions of frequencies

Graphic representation: histogram, frequency polygon, bar charts, charts for
time series

Semilogarithmic charts

Weighted and unweighted averages

Median and mode

Vital statistics; the birth certificate

The death certificate

Rates of birth, death, and morbidity

Notification of communicable diseases

Tests of reliability; variances and the standard deviation

The standard error

Statistical inference; probabilities

The normal distribution

Distribution of the mean; test of hypothesis utilizing the normal distribution

Test of hypothesis with the binomial distribution

Design of experiments; distribution by "Student's" t

Distribution of Chi Square

Regression and correlation

SUMMARY

This article is based on a survey carried out in educational institutions and other agencies in the five Central American countries.

It presents a general description, so far as it has been possible to arrive at one from the answers obtained, of the current situation regarding the teaching of statistics and demography. Through it one may grasp a view of the whole and some knowledge of specific topics, although no effort at great depth is intended.

To summarize, the teaching in these disciplines appears to be at the same level in all the Central American countries involved in the study, except Costa Rica. In the four remaining countries what is commonly taught are the traditional courses on statistics: general statistics and economic statistics, based on textbooks which should have been replaced by more recent ones. Only in Costa Rica and El Salvador are formal courses in demography offered. In the other countries, demographic subjects are covered only as part of the courses on statistics. With respect to demographic investigations to be carried out, most of the countries agree on the need of undertaking studies on internal migration, birth and death records, labor, and fertility.

DISCUSSION

Dr. John D. Durand: When we consider the implications of the facts that are brought out in Dr. Romero's paper about the teaching of statistics and demography in Central America and also the information given there about the development of demographic research in this area, I think we need to bear in mind the population figures. The 1960 population estimates for the five Central American countries together with Panama come to an aggregate of only 12 million people, the equivalent of one middle-sized country like Colombia or Peru. The smallness of the population is certainly a handicap to specialized activities such as demographic studies. In the circumstances, it is remarkable how much has been accomplished in this field in Costa Rica. Some pooling of resources and centralized co-operation are most advantageous in a situation of this kind.

The plan that is mentioned in Dr. Romero's paper for co-operation among the Central American universities, aimed at unification and

channelization of higher education, is certainly a step in the right direction. As I understand the idea, each university in the region is to have one or more fields of specialization, for which students are to be drawn from all countries in the region. The University of Costa Rica, with its Institute of Statistics, has been selected as the regional center for teaching and research in statistics, and it is most encouraging from our point of view to see how demography is being emphasized as a part of the teaching program there.

In the final paragraph of his paper, Dr. Romero suggests that the project for a field study of fertility in Costa Rica being planned in collaboration with CELADE might be the initial basis for a nucleus of demographic research in Costa Rica, with projections toward other Central American countries. I think he is referring here to the proposal which the University and the Government of Costa Rica have made to the United Nations for establishing a Central American Demographic Research Center. I should like to say a few words about this proposal and the steps which are being taken to put it into effect.

It is proposed that the Center be established within the Institute of Statistics at the University of Costa Rica, with the co-operation of the Costa Rican Government and the United Nations. It would have a small staff of demographers, supplied partly by the Institute of Statistics and partly by the United Nations. It would also have the benefit of the co-operation of the staff of the Central Statistical Office of the Government of Costa Rica. Its main function would be research on the demography of the Central American countries and Panama. It is intended also to examine the possibilities of co-operation with demographic research workers and institutions in the Caribbean area and in Mexico.

Although teaching of regular courses in demography is not foreseen as a part of the program of this Center, provision would be made for internships, so a number of persons with suitable backgrounds from countries within the region could come to the Center and gain knowledge and experience in research methods and research problems by working there under the supervision of the staff. The interns could also attend the courses in demography and related fields that are offered and will be offered at the University of Costa Rica.

In addition, it is hoped some funds can be obtained as a part of the budget of this Center for the expenses of more mature research workers from countries in the region, who would like to come to the Center from time to time to undertake projects of research on their own, in associa-

tion with the Center's staff and using the Center's facilities. Funds would also be provided to make it possible for members of the Center's staff to travel within the region, as consultants to institutions and agencies and individuals in the various countries that are engaged in or interested in demographic studies. The research program, and especially the training of interns, would be closely co-ordinated with the programs of CELADE.

This proposal has been endorsed by several intergovernmental bodies—the Central American Economic Integration Committee, the Economic Commission for Latin America, and the United Nations Population Commission. We hope that we can obtain finances from the United Nations Special Fund for the operation of this Center as well as for the continuation of CELADE. We hope to obtain these finances for a period of several years beginning in 1964, and negotiations with the governments concerned are being pursued at present to this end.

In the meantime, since it does take time to develop Special Fund projects, we hope a small beginning can be made within the next few months with existing resources, and we are now exploring the possibilities of arranging that.

As Dr. Romero suggests in his paper, it is expected that much of the research work of the Center during the next few years would consist of analytical studies of the results of recent population censuses of countries within the region. The topics and the contents of such studies would, of course, have to be determined in consultation with the interested agencies of the governments of the countries concerned, and there would have to be collaboration with the statistical services and the other governmental agencies of these countries in the execution of the studies.

There have been some expressions here of fear of the dangers of governmental interference in research in demography in Latin America and elsewhere. To this I would say that, in my view, governments of less developed countries today have not only a legitimate interest in, but an essential concern with, research in demography and other social sciences. They require research carefully carried out to provide a sound basis for decisions of policy and for the development of their action programs. I think it would be difficult to dispute that the governments have a legitimate cause for efforts to encourage the development of research in the universities in their countries, on questions which are of major national concern. They also have justification and need to con-

tribute to the finances of such research projects, to support research institutions, and to establish new institutions where the existing ones do not have the necessary facilities and strength to carry out research of fundamental national importance.

I do not think there is necessarily any problem, in such governmental support of research, of interference with academic liberty and with the independence of scientists, so long as the governments make no effort to restrict the freedom of research in the institutions concerned.

For the Central American Demographic Center, it has been considered as a possibility that a program might be drawn up, in some degree standardized for the Central American region, of census monographs to be carried out at the Center with the co-operation of the agencies and institutions in the countries concerned, including possibly some monographs of regional scope as well as monographs on various census topics for a particular country.

In conclusion, I should like to express an opinion about the longer range future of this project and its relation to CELADE.

As far as CELADE is concerned, I want to emphasize that we consider it indispensable to continue CELADE and to strengthen it as far as possible, and that we have no intention of diverting any share of its resources to the proposed new center in Central America. It has been pointed out that the present arrangements for financing CELADE will expire at the end of 1964. A very determined effort will be made to obtain the necessary funds for the continuation of CELADE beyond that time. As they say, the proof of the pudding is in the eating, and we think the work which is now being done by CELADE's trainees, including the one who is now with us in the Population Branch at United Nations Headquarters, amply justifies the money and effort invested in CELADE up to the present time, and indicates the usefulness of continuing this investment.

The research products of CELADE are an additional reason for our feeling proud that this is a United Nations institution. We hope that avenues of publication will soon be opened up so as to get the research reports widely and promptly distributed.

It has been said that CELADE's long-term objective should be to make itself superfluous. I shall be rash enough at this point to express an opinion which slightly differs from that given by Miss Miró. I do think that CELADE may aim to make itself superfluous eventually so far as basic training in demography is concerned, as the best way of

meeting this need in the long run will certainly be by providing courses in the universities of all countries in the region. But I am not so sure that CELADE's function as a region-wide center for research in demography will become superfluous in the foreseeable future. Without implying that the United Nations could go on supporting it indefinitely, I feel sure that there would be a permanent value in maintaining such a central institution where demographic studies of regional scope and common interest to many countries would continue and where research workers could meet and exchange experiences and work together on occasion. I feel the role of regional research institutions, not only in demography but also in the other sciences, should not necessarily be considered as temporary.

As to the Central American region, in view of its geographical compactness and relatively small population and the similarity of the problems which face the countries, it seems to me appropriate to envisage a long-continuing centralized function of training in demography as well as research. We hope that the realization of the present plans for the Central American Demographic Center may provide a firm foundation for this.

Dr. Roberto Pacheco A.: I should like to make just a few comments on Dr. Romero's paper. I think he presents a fairly complete picture of the situation of the Central American republics.

We have very few persons prepared at the different levels. Some have been prepared abroad, mainly in Chile, some in the United States and Europe. The program of studies in statistics in the Central American universities is about the same. Of course, Costa Rica is outstanding in this field. As has been said before, what is more important is that the Superior Council of Central American Universities has decided to make the Statistical Institute of Costa Rica the co-ordinating body for studies and research in this field. Furthermore, they will have assistance from the United Nations for a research center in demography for Central America. In this form we will have better teachers through a regional group and uniformity in the courses given in the schools we already have in the different countries.

We have many things in common that ought to be investigated. Much research can be done. In general the problems are the same, but in some particular countries they are more pressing.

It was said yesterday that the governments do not pay too much attention to national and international recommendations and that the

demographers and statisticians are underpaid, but I think in the near future the situation will change, because all of these countries are making social and economic plans for the next 10 years. Although the present plans are based on the statistics available, in the near future when evaluation would be made they will realize the need to obtain every year more accurate and comprehensive data. It is hoped that in this way, as they would be advisers to the executive branch of the government, their work would be more highly estimated and therefore they would be paid a higher salary.

At least the plans are well oriented. Let us hope that the programs of studies are equally well oriented. I personally feel very optimistic about the future.

Professor Romero G.: The only remark I have to make with regard to what has been said here about the situation on statistics and demography in Central America is that we do hope this project, to which I refer in my paper and to which Dr. Durand also referred in his comments, will really take place. We need a lot of research in our countries and we need a lot of research in our Institute. This project can provide an area of demography in which we feel we will be able to accomplish a good job not only for Costa Rica but for the other Central American countries.

With regard to the Institute of Statistics of the University of Costa Rica, I should say this Institute has been making a large effort during the last six years. It has been trying to survive without any help at all. Even so, in most of the other Latin American countries subjects as important as statistics are not taught at the level at which we claim to teach them in Costa Rica. We are trying now to improve this situation. We are trying to obtain foreign help for the teaching of statistics and trying to impress on the other schools and other scholars in the University of Costa Rica and the other Central American universities our points of view with regard to empirical research and the importance of research in teaching.