

EFFECTING A SURVEY OF HOMES IN LATIN AMERICA

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They undertook a survey of the question. They did not hire metallurgists to examine samples, nor engineers to visit the site of construction. They took a public poll. Ten thousand people, guaranteed to represent every existing kind of brain, were asked the question: "Would you ride on the John Galt Line?" The answer, overwhelmingly, was: "No, sir-ree!"

Ayn Rand, Atlas Shrugged

SUMMARY

Anyone who tries to effect a survey of homes in Latin America will encounter many difficulties, including the deficiency of maps and census data, the lack of trained personnel, and unusual beliefs of the population.

For the organization which has limited finances and political power, this paper sets down rules and gives examples for obtaining the necessary elements and points out some unusual sources of survey inaccuracy and some pitfalls that threaten survey failure.

INTRODUCTION

This paper is concerned not with the mathematical details of a Latin American survey but treats the peripheral problems of survey work. In the author's experience, these problems are more important than the mathematical ones, which are straightforward. This paper is essentially (2) with its 17 maps and aerial photographs and 20 candid photographs deleted for lack of space. You can obtain a free copy by writing me at the address given in the list of references.

In general, I will be reporting my experiences in a clinical-nutritional survey of about 250 localities in which approximately 25,000 persons were given a complete medical and dental examination and had their diet studied. The field work was completed over a period of about two years and was carried out by the Guatemala based Institute of Nutrition of Central America and Panama (INCAP), where I was employed for nearly the entire duration. The work was essentially paid for by the U.S. Government through ICNND, which letters stood for Interdepartmental Committee on Nutrition in National Defense and which went around the world studying soldiers, who must be in good nutritional state to protect the world against communism. Later it was decided that this made the U.S.A. look like a warmongering nation and the "D" was changed from "Defense" to "Development", and civilians were studied also. Hence, the problem of goals may not have been clearly defined. More recently, the letters are OIR for

Office of International Research.

Although I will usually not explain how I solved the problem, I will point out the various difficulties, with the view that forewarned is forearmed. If I had to do it over again, in many cases I might proceed differently.

The largest survey that has ever been finished in Central America was performed by Sterling Products, which makes a popular analgesic, Mejoral. They have visited well over 50,000 dwellings, mostly in urban places, and could give a great deal of information on how it is done. The U.S. Public Health Service has done a health survey in Colombia and other places, and the ICNND and OIR have also completed surveys in Latin America.

GENERAL FACTS

There are many general facts that I have learned about Latin America, which may seem childish detail, but which may be the difference between infection or success in the field and approximate or exact data. Four such details are as follows:

1. The first time I ever slept with a mosquito net, I did not know that mosquitos will "bite" through the net. Since I am rather tall, I pressed my feet against the net at the end of the bed. When I awoke, I discovered that the soles of my feet were covered with bites, which drove me wild for about a week. Although in high malaria areas I took antimalarial drugs, such a large quantity of bites could have disastrous results. Will Dr. Jorge Cabrera spend the rest of his life on a diet of boiled eggs and milk because of intestinal amoebas?

2. When a Latin says that he is 19-years old, this may mean that he is 19-years old now or it may mean that he is only 18. Many people, when they complete their birthday, then assert that they are one year older than the birthday just completed. This will clearly not matter with adult data, but would cause great inaccuracy if two-year olds are classified sometimes as three-year olds.

3. Many Central American Indians believe that they have only a certain quantity of blood all their lives and so

refuse to give enough for a hemoglobin test because they "may have an accident in the future and will need all they now have."

4. One will find women breast feeding three-year olds, long after they ceased to have milk, because they believe they can't get pregnant if they are doing so, thus performing a method of birth control. In any health survey, the correct lactating status is very important, and as a matter of fact, because of the usual way of asking a woman's lactating state in Spanish, I have often seen lactation incorrectly recorded.

FOUR HURDLES

I will now mention four possible stumbling blocks which will face any serious survey in Latin America. If you don't think these items are important, I point out that an AYD sponsored survey of 10,000 homes in each Central American country, with the unlimited funds of the U.S.A. backing it up, has failed.

1. Politics. I was surprised to find that one office worker brought her baby to work and spent her day babysitting until I found that she was a relative of a high government official. I wondered why it was not possible to arrange a purchase of gasoline, but it was possible to obtain airline tickets until I found out who was an airline company owner.

We were more than a little worried when the country strongman told us that there were no nutritional problems in his country, since "we have the tallest building in Central America." Now Guatemala, which has the most serious nutritional problems of the isthmus, has the tallest building.

2. Thieves. One must be on continuous guard against thieves both because of the large number of them and because of the general inefficacy of the police. When a Mexican store attempted to rob me of thirty dollars, the police refused to come, saying that I must seek a lawyer and file suit. After I was robbed of some \$800 in clothing in Guatemala, the police failed to investigate although a formal complaint was made at police headquarters. The survey vehicle was broken into and personal effects taken in El Salvador, twelve maps and the results of three towns (which had to be revisited) were lost in Nicaragua, and a camera disappeared in Guatemala, to mention a few cases.

When one is far from the principal city of the country, he will find that it is impossible to obtain replacements for stolen goods and equipment. An

object left unattended will not be left unstolen. Everything that has a top (hood, trunk, boxes, etc.) should have a lock and you should chain your suitcases to your car body and to the bed or the sink in your hotel room. I am acquainted with an unfortunate OAS official who lost her purse and her (official) passport because her suitcase was stolen from her El Salvador hotel room.

3. Manliness. Manliness, or in Spanish *machismo*, is very important at all social and economic levels, and can work for you as well as against you. Try taking an attractive girl with you when you enter a potentially difficult office. They will fall all over themselves getting together what she (you) wants. Remember, however, that the person with the highest position is the most manly. The one who actually does the work may be the least manly of all.

In Alianza, Honduras we came across a six-year old boy who had broken a leg. Unfortunately, it was Thursday and the visiting day of the town physician was Wednesday. Because the family was very poor, they could not afford to carry the child the 50 miles to Choluteca and were planning to have him wait for the doctor's visiting day. We tried to convince the father to put the boy into the jeep and we would carry them to the hospital in Tegucigalpa. He refused, saying that he could not afford it and would not beg charity, and would not be convinced that the service would be without charge. We were unable to get through to him until one of the nurses in the jeep told him, in an impatient tone, "Oh, put him in the jeep with an older brother who is more valiant than his father." With this, the father immediately put the boy into the jeep, climbed in himself, and we carried them to the Hospital San Miguel.

4. Misunderstandings. During the initial interview of the families of Tecapán, El Salvador, I was accompanying a Public Health nurse in the visits. We arrived at one home where the lady of the house refused to come to the door, declaring that she was very busy with the preparation of lunch. This was rather surprising, but since it was almost noon, we decided to return after lunch. At about two in the afternoon, we returned, but could not convince her to come to the door. We had almost decided to give up and take an alternative family, when the woman realized that she had been speaking with a Public Health nurse in uniform. She immediately came to the door, invited us in, and apologized profusely for not having invited us in before, explaining that she had thought I was a missionary who had come to try to change her religion.

Since we examined and weighed what each family ate, rumors spread that we were communists and would take from the rich to give to the poor. Many believed that the blood samples were for the soldiers in Vietnam. Usually, all such misunderstandings can be avoided by means of a talk with the town mayor, which will be discussed later.

THE INTERVIEWER

In the survey of Central America and Panama we had as interviewers both men and women, office workers, laboratory technicians, nurses, teachers, nurse supervisors, secretaries, social workers, and inspectors of sanitary facilities. Taking everything into consideration, I would summarize that there is no substitute for ability. By far, competence in the person outshines the sex or the current occupation. For political reasons I was forced to make use of a few inept individuals as interviewers.

Sex. In general, it is best that the interviewers be women. In our survey they had to ask the pregnancy/lactation state. These questions are best made by women, since men usually experience embarrassment and cause embarrassment with such inquiries. Many times one has to pry because she has not thought about it before, she believes it is bad luck to admit pregnancy, or she would really prefer not being pregnant.

Some people assert that men should never enter a Latin American home when the husband is away, because when he returns to find that a male has visited, he will get mad and be against the project. This is not exactly true because I have entered hundreds of Latin homes, when usually the husband was away, without the slightest problem during or after the visit. First of all, a man is rarely alone with the wife since there are always children, not only of the home but also of the neighbors, who want to hear what is being said, or there is a friend or relative present. Secondly, I usually wore a white robe, in which case I was not a man but a white robe. The truth probably is that the lady of the house is delighted to have a male in her home and get away with it.

Different. Without exception the interviewer should be attractive or at least not unattractive. Very fat people are to be avoided. The clothes should be neat and the hair should be arranged. In Latin America, the people like to see individuals who are different. Although I interviewed alone very little and usually entered homes with an interviewer, people realized I was

not a native. I could see that they were anxious to hear me say something to see if I could speak Spanish; I rarely disappointed them.

It has been suggested that when the interviewer is different, the person may have the tendency to lie, but I don't believe this. Any time it is suspected that incorrect information is being given, the interviewer can try asking one of the children, who don't yet know how to lie. When the person being interviewed sees that his answers may be reviewed by his children, he ceases to tell falsehoods.

Ability with maps. There are some people who cannot read the maps of the towns. A nurse and a secretary were completely unable to find the dwellings indicated for the survey. They regularly made errors of one or two blocks, rarely visited the correct place, and more than once made an error of over 10 blocks because of the inability to understand the difference between northeast and southeast. The sanitary inspectors were excellent with maps because they had a great deal of experience making plans of towns showing sanitary facilities. One can easily improvise a test for the home visitor by simply letting him go on his own in a town with the map. A written test probably could be made to test one's map reading ability.

Secrecy. Nurses have the tendency to be secretive. It is probably a result of their hospital work where they are afraid to tell the patient the whole story or any story since the doctor may get mad. On the other hand, teachers are accustomed to explaining and are able to distinguish those who are going to understand little (and should be told little) and those who are going to understand a lot (and should be told details of the survey). Social workers have the ability to explain and to convince difficult cases to participate.

Mistreatment. Some interviewers never learn that the people are doing both themselves and us a favor, but act haughty with the families. In Latin America it is often the habit to mistreat social inferiors (employees, servants, salespeople, street peddlers, etc.). One nurse insulted the lower class families and did not know what to say to the upper class ones. Once she screamed at an uneducated lady, "You just don't know how to answer questions." It is difficult to spot these people at first because they treat their "equals" with poise and grace.

Avoiding misunderstandings. A uniform should be worn. I suspect that the Tecapán, El Salvador incident could be typical. Many Latin American families are extremely bothered by the number of

Protestants who come to their doors preaching the gospel. In El Salvador I saw many little signs on homes saying, "We are Catholic", while in Costa Rica the signs say, "We are Catholic. We do not accept Protestant propaganda."

When the sanitary inspectors identified themselves as such, people were sometimes terrified that they were going to impose some tax or enforce the installation of some expensive sanitary facility, the latter especially when the dwelling was also commercial. In the U.S.A. the census taker can cause a similar qualm by asking who is the head of household because of state regulation of young parents. The problem is easily solved: don't say or ask too much.

Some interviewers told lies to gain family participation. Several promised free milk and medicines. One even promised a new health center. These lies not only come back to haunt you but also make you feel very sad. You must be on the lookout that randomness is maintained. Some interviewers seek out poor families because "they need it more", and because they cooperate more readily, thinking they will get something out of it.

You must be especially careful with border towns since almost everyone there is engaged in some form of smuggling. Many live there illegally because they crossed the border clandestinely. They must not think that you are going to give them away.

Since it was important that the family structure be identified correctly, interviewers should analyze various sample situations. Ask them how they would code a family in which there are two wives in the same home (which occurred) or how to code the situation in which the wife has become old and the husband has taken up with her daughter (which occurred).

Clever. Interviewers for city populations have to be clever since one finds educated people there who know how their names are spelled and can ask basic questions. The whole project can look very silly if the interviewer cannot answer satisfactorily. The statistician wants to be sure that the sample he selected is representative, not just those who are uneducated, and hopes for little nonparticipation, a measure of interviewer ability. Help prepare interviewers by trial questions like "Who is paying for all this?" or "Isn't this a communist survey?"

One very alert interviewer was told that the family had heard about INCAP. "INCAP likes to fatten up children to eat them." Although she was barred from entering the home by

the husband, menacing with his machete, she actually gained the participation of the family, by quick-witted appeal to their "common" religion.

HEALTH, HANDBOOK, AND INSURANCE

It is important that all survey workers have the usual vaccinations, including smallpox, polio, tetanus, diphtheria, BCG, typhoid, and yellow fever. Helpful will be (1) and (3). They should also take antimalarial pills. A complete medical examination should be made both before and after the work in the field and should include urine, blood, and stool samples.

Don't let them travel without adequate insurance. Once, INCAP found itself in the position of having to pay several hundred dollars to repair a crashed jeep, medical expenses, and prospective plastic surgery costs, because it had hesitated to get proper insurance. Of course, having insurance does not mean the insurance company will pay, and I speak from experience.

A handbook should be prepared that will include all important aspects of the work involved. It should include at least two completed examples of all the forms they will have to fill out as well as a sample explanation for the people visited. A complete set of codes to be used must be included. Explain why codes are necessary for the computer analysis of the data. Enclose a list of everything needed for work in the field plus a list of personal items they should have, like soap, toilet paper, etc. One person was worried on an air flight when the emergency exit said, "Cut along dotted line", and she didn't have a knife. They should carry their own water or at least carry water purification tablets.

Many people, including natives, are surprised to find that several places in Central America are cold, because of their altitudes. Water often freezes in Totonicapán, Guatemala. In Cerro Punta, Panama temperatures are so low that it was difficult to perform the clinical examination, since people had on undershirts, shirts, sweaters, and jackets, and did not want to take them off. Field workers should take adequate clothing.

Since we arrived in some towns to find that the map was of a different locality or did not even slightly resemble the place, it is necessary to explain how to make and prepare a map. You must include a table of random numbers and carefully explain it. Glue a sheet of important codes to the back of each worker's clipboard. Give him identification and, if possible, some kind of letter from an important government official. If he can carry a newspaper article about the survey, it will help

greatly, even if people can't read it.

FIRST VISIT TO THE TOWN

The importance of the first visit cannot be too heavily stressed. When I worked in the National Institute of Arthritis and Metabolic Diseases, a survey was planned of a small town in Kentucky. The people were told that the doctors were coming, but it was not adequately explained that only their necks would be examined for the presence or absence of goiter. Someone maliciously passed the word that all the women were going to receive pelvic examinations. When the physicians arrived, there was not a woman to be found. It was a complete failure. Later the town was revisited, but not until the town physician had visited each family and made the situation clear. The second trip was a success, because of all the precautions taken and explanations made.

If this can happen in the United States, the situation is even more sensitive in Latin America, where education levels are quite low. Occurrences similar to the Kentucky episode befell us in Santiago de la Frontera, El Salvador and elsewhere. You have to have someone in the town on your side, someone who is respected, who is fairly well educated, and whom the people of the town can find when they have a question about what will be done. Usually the town has a mayor and this is the person most suited for the explanation of what will be done in his town. If he is not in agreement, the survey runs a considerable risk of failure since he has the power to convince all the people to disappear on the day of the examination and he can convince them to lie to the dietitians and anthropologists. I have yet to see a mayor that was not at least passively in agreement, and usually he is delighted that he is the person selected to be the spokesman for the project.

THE TALK WITH THE TOWN MAYOR

Almost all of the towns have a mayor (alcalde) although in Costa Rica he is the political chief (jefe político) and in Panama he is the corregidor. In Teustepe, Nicaragua the mayor lived in another town and did not have very regular office hours; in fact he did not come to town the day that I visited there. In Teustepe, we talked with the judge (juez) who was quite agreeable and gave us all the information we asked for, and, I am sure, was capable of helping us gain the confidence of the town. Other possibilities are the town doctor or nurse, the school teacher, or the richest looking person around.

I made a form for the visiting team to fill out at the original visit, a "Basic information of the locality" form. If you do not have such a form, you will find that many questions are not asked and the interview with the mayor or town leader is nothing more than an exchange of hot air.

THE BASIC INFORMATION OF THE LOCALITY FORM

This form's basic value is that it is orderly. Included on it are places for the interviewers to put their names and the person filling out the form has to put his name. This also is the case on each of the other forms. It makes a tremendous difference when the person has to sign his name because then he, and only he, is responsible for its completeness and accuracy, and he is being reminded of it. In one of the countries this system was not used and the consequences were a hundred almost worthless and costly to correct sheets. They should complete every form before leaving the home.

The time necessary to get there and the state of the road are important items of the form. You will find the system of roads in Central America quite bad and it would have to be known if the clinical team with all its equipment could get there. Some of the blood samples had to get to the capital city in less than four hours so that in some cases an airplane was needed and information about airfields is used. There are many airfields which are used for spraying crops.

Fiesta days of the community and nearby communities must be noted. Almost all towns have a week in which they celebrate a Saint, and it is hopeless to visit the place during this period, because no one is at home. Pay attention to national holidays also.

ADDRESSES

With the exception of certain parts of the principal cities, it is a problem to assign effective addresses to dwellings. Streets have no names indicated, homes carry no numbers for identification, blocks are generally poorly defined, and because the roads are owned by the government, and hence are "free", people may construct their homes smack in the middle of the street.

Typical city addresses are "From the church San Antonio $\frac{1}{2}$ block uptown", "From the funeral parlor La Corona 1 (block) toward the mountain $\frac{1}{2}$ uptown", "Avenue 15 de Septiembre", and even the very explicit "8th Street #1-69 zone 1". In more rural places the addresses may be "Main Street", "Cemetery Road", or more simply, "Street", and in one town I

found three streets called "Main Street" and four called "Cemetery Road".

In many places the term "vara" is used to measure distances. A vara is equivalent to 33 inches, a more practical length of stride than a yard, although persons rarely know the exact measure of this quantity. In Costa Rica a block is considered to measure 100 varas even if it actually measures 50 varas or 200 varas. Hence, we have the addresses "450 varas to the north of the store The Last Drink (450 varas al norte de la pulpería La Última Copa)" and "From the bakery La Concepción 325 varas to the north and 150 to the west." Don't let yourself be fooled by the habit of giving distances in time because a place five minutes away may be five minutes in car, on horseback, or on foot.

You won't get too far asking to what address they have their mail sent. One person replied after thinking some five seconds, "Well, I really don't receive mail." Another said, "Post office box 29." Another told me, "Mr. Juan Villaverde, Teustepe, Nicaragua. Everybody knows me here."

Actually, if one has to put an address on each family, the task is not impossible. Every town has a plaza and you should, as a rule, ignore the existing names of streets, since everyone else does, and call byways from north to south Streets and those from east to west Avenues. The plaza is bordered by First and Second Streets, and First and Second Avenues with Avenues 1, 3, 5, 7, etc. to the north and 2, 4, 6, 8, etc. to the south. It is thus possible to give an address as "Street 4 between Avenues 1 and 3." As a further identification, the malaria control number of the dwelling may be recorded, if it has not washed away. It may also happen that Public Works or the Department of Health has placed a useful number somewhere. In the city it is wise to place a number in each block as a further aid to giving addresses, like "Western side of block 3304."

FAMILIES WHICH DO NOT PARTICIPATE

Very few families did not want to participate in the clinical-nutritional survey. It is not possible to give very accurate statistics on the types of persons that don't collaborate since there are so few and because the reasons are usually a bit odd. In many of the towns all of the families that were asked to participate agreed to and often people stopped us on the street to ask us to include them or to ask why they were not invited.

One lady of a selected house did

not want to participate because she was mad at us for interrupting her soap opera on the radio, *La Esposa Infiel*. One refused to cooperate because she had a "fear of communists". I remember a case in which the husband and wife were not getting along well and she did not want to participate because he wanted to. She exclaimed that she was planning on leaving at any minute because he had other women and that she would probably not be around when the clinical team came. One lady said that she didn't like doctors.

Although I don't present proof, I would say that, in general, the people who don't want to take part are those that live on the outskirts of the town and have a fear of what is going on inside of it. Of course, it could be argued that the people that live on the outskirts of town fall into two classes: those families that are very poor and hence cannot afford a better lot closer to the center, and those families that are among the richest and live on the outskirts because they want to be near their lands. These relatively rich have a great fear that you are going to trick them out of what they have while the very poor are often uneducated, ignorant, and unsure of themselves.

It is difficult to get men to come to the clinical examination because they have to work. The 75 cents that they will receive for a day's work is extremely important to the family. A survey should pay the men their salary to encourage them to come, especially if it is essential that men be examined. In Nicaragua it is common that if a person works from Monday through Saturday without missing a day, he is paid also for Sunday. Therefore, if he goes to the clinical examination on say Wednesday, he not only is not paid for Wednesday but also is not paid for Sunday. It would be a great sacrifice on his part to attend an examination and lose two days' pay for doing so. A letter to his employer will help.

It is a good idea to give the families something as an encouragement to participate. We made a Polaroid photograph of each family, which was appreciated tremendously. You would be amazed at the effect of a plastic bowl, powdered milk, or vitamins. In Honduras we were able to give away toothbrushes and toothpaste that had been presented to us by the manufacturer. Teeth were pulled free.

It has been suggested that in the United States the people who want to participate in health surveys are those in good health, who want to demonstrate that they are healthy. This does not apply to rural Latin America, since few

are really healthy, although one would expect this to happen with Latin Americans who are fortunate enough to receive medical care.

In the city the reasons for refusing to participate are somewhat different. One well-off family in San Pedro Sula, Honduras said that they didn't need any medical examination since they "could afford to go to the United States if there were a medical problem." In the city one may have to appeal to the higher instincts or to the education of the individual. In Guatemala City a lady of the house said that they didn't want a medical examination because her husband was a physician. We called her husband at work and he came home immediately to talk with us. He was very agreeable and the entire family participated. There are a lot of "new rich" who, as the Spanish expression goes, "still have the stain of eating plantains" and retain or acquire certain antisocial ideas that flag their economic status. In any case, don't hesitate to call a person's physician, relative, or friend to ask aid in clarifying the requirements of your survey.

I have seen several families that believed that the clinical examination would be gratuitous but were afraid that afterwards they would be told that they were sick and should buy medicines, for which they had no money. Without exception, these people were eventually convinced to participate because, the truth is, they are very interested in their health.

The majority of families that don't collaborate are very poor and lacking in education. The extremely poor think that they are receiving a handout and because they are proud and don't want people to think and don't want to feel that they are begging, they refuse to participate. On the other hand, in Panama we found people who proudly boasted that they didn't need doctors because they visited a healer (curandero), when necessary.

AVAILABLE MAPS

The basic map is that of the Cartography Section of the Department of Statistics and Census. These maps have a good basis since they were made from aerial photographs, and at least the scale is correct. Many times the map will say, "Made 1965 from aerial photographs" and one is glad to have a map up to date, then reads further to find, "...taken in 1954". Sometimes due to flood or because the original photograph was in a bad state, the map has not been accurate in the field, but some 80% are correct as far as divisions of blocks are concerned. Because some of the aerial photographs of Buenos Aires,

Nicaragua were unsatisfactory, half of the map was a neighboring town, Pueblo Nuevo, without pointing this out. One would not realize this until he went to the place.

These maps are usually available for all cabeceras, or county seats, and often for other localities that are of importance like Siuna, Nicaragua, which is a mining center. There is an original in the Department of Census and one must make a heliographic copy with special paper. The obtaining of copies may be traumatic and will be described later.

The other basic map is that of SNEM (National Service for the Eradication of Malaria). SNEM goes everywhere that a malaria carrying mosquito goes. These maps, in general, are quite good and exist for many more places than those of Census. The census map of Corn Island, Nicaragua showed only 79 dwellings while that of SNEM had 289. Use of the malaria control map saved at least two days' work in the field!

In Nicaragua, SNEM recognizes 5007 localities which, unfortunately, are only those which have a malaria problem. Many places, like Totonicapán, Guatemala, do not have a malaria problem because of their high altitudes, and hence their low temperatures. Others, like Cabo Gracias a Dios, Nicaragua, are at sea level, but do not have a malaria problem since a strong wind, originating from the sea, washes the town, and a mosquito cannot reach it, even crawling on all fours. In other cases, like the department of Darién, Panama, a malaria control worker was stopped by six naked Indians who asked, "Where are you going, and why?" When he responded he was sent to kill the mosquitos that cause malaria, he was told, "You may not pass", and he did not. There have been similar incidents in San Blas, Panama, but during some malaria emergencies, the military has accompanied SNEM.

It is a fact, but I offer no statistics on the subject, that the malaria people find about 10% more dwellings than the census people. A SNEM official told me that it was because the census was taken by irresponsible high school students, by the town drunk, or by the unemployable, and that Census simply did not visit all the homes. On the other hand, a Census official told me that SNEM is paid by the number of dwellings, since they go from house to house spraying, and naturally find more dwellings than there really are.

From my own personal experience, I would say that there is a good bit of truth in the both, but point out that SNEM has interest in all buildings while Census is mainly interested in homes. In warm climates the kitchen is often a separate building because it is hot, and

the family is trying to avoid heat as much as possible. In this case, the census map may or may not have the kitchen structure shown, because it is generally small and may not show in aerial photographs; the census figures will not count the kitchen as a home, and SNEM will list it as a building. This double counting of homes has been a problem, but there is no way to avoid it except to visit the town.

There are maps of the Sanitary Inspectors of the Ministry of Public Health who have the responsibility of checking on the health standards of toilets and sewer facilities. The problem is that the map is invariably in the town or somewhere in the field, and you must go looking for it. You had better try to locate the inspector first with a telegram or some other way, because he has a wide territory to cover, in general. You can find maps in the Institute of Cartography (not Census), which has aerial photographs if you know how to use them, Public Works, Public Roads, Institute of Homes, the Municipality, and any organization that has made surveys in the country, like ROCAP, ICMRT, MARU, and INCAP.

There is considerable quality variation in the SNEM maps since they are made by people who have as first interest the killing of mosquitoes and are amateurs at map making. In one town the malaria map showed the cemetery in the south when it was actually in the north and showed the church on the east side when it was actually in the west. In another map, half was correctly made but, for the other half, north and south were interchanged with the result that the second part had to be read from the back side of the paper. In another town which did not have a census map, the selection of the homes for the survey was made in the office with the SNEM map, but when we reached the town, we could not locate the church or any home as indicated on the map and were forced to make another map on the spot. On the other hand, the SNEM maps have generally been revised several times and are at least as dependable as those of Census.

SELECTION OF THE TOWNS AND HOMES

The main problem is that there is a serious lack of appropriate maps. With the exception of Costa Rica, there are few maps of the rural areas that indicate homes, although the various Institutes of Cartography have numerous rural topographical maps. Furthermore, few of the towns have census maps except cabeceras. It is difficult to get population figures for noncabeceras since the figures are not generally published. In each of the countries there are about 250 cabeceras (e.g. 170 in

Honduras) although there are approximately 9000 populated localities (e.g. 8595 in Panama). On the other hand, the census figures for cabeceras are often not very precise due to the fact that the boundary of the town is never accurately defined and often depends on opinion or, at other times, on whether or not the family has running water.

In some census maps, for instance that of San Rafael del Norte, Nicaragua, there is not a single home shown and, in this case, the census sectors had not been recorded, so that it was known how many dwellings there were in a sector, but not where the sector was. There is no malaria map of San Rafael del Norte.

In some towns, as was the case several times in El Salvador, there seemed to be only a block from the center of town to a certain house, but as it turned out, the home was in effect miles away because there was a mountain, a ravine, or jungle separating the town square and the dwelling. Locating homes in San Pedro Ayampuc, Guatemala, a mountain village built on and around several mountain peaks, would be a tremendous struggle.

If, in the United States, one wanted to know the number of houses in a community, he would drive to the place and count them. It would take him three days to arrive at San Juan del Norte, Nicaragua, which is a cabecera; he would travel first over the huge and dangerous Lake Nicaragua, and then by small boat would cross the shark infested river Río San Juan. He must take his camping equipment because there is not a home that can or will accept him. He must carry everything he needs to live and fight off disease. If he runs out of food, money cannot always buy it. There is often no telegraph, no type of airport, and it can be expected that any mail may be lost.

In general, it would be practically impossible to have a successful survey in which all localities of the country could have been in the sample, because of map and transportation reasons. Usually, a survey would include only cabeceras, with the hope that there is little difference between cabeceras and noncabeceras. While I allowed myself to be convinced of this at the beginning of the survey because of time and expense requirements, I later pressed for more verification of this point, and now am extremely skeptical. Our survey considered separately the large towns by studying the most industrial and rapidly growing city in each of the countries.

The preparation of the maps for work in the field was generally made by combining both the census and the malaria maps of the locality. In some blocks, SNEM found more dwellings than were indicated on the census map. In such case, the larger number is assumed

correct, and the selected dwelling is, for example, "the third", where the starting point and direction are indicated. In the blocks in which there are the same number of dwellings on both maps, or more shown on the census map, the very home selected is circled. When a dwelling was vacant, destroyed, or otherwise, the interviewer was directed to visit the following home in the same block. One should prepare all he can in the office, because revision in the field is difficult, because of the lack of transient accommodations, and because it is desirable to be in the town as short a time as possible in order to avoid infections.

TO OBTAIN THE MAPS

The SNEM maps are the easiest to obtain because these people have great pride in what they do and are eager to gain more recognition. Almost all of the maps are size 8" x 10" and nearly all of the offices have a Thermofax machine for making copies. If you need several copies, you should carry your own Thermofax paper (about six cents a sheet) because there is no budget for giving it away.

For copies of census maps, you can expect to supply the heliographic paper and the ammonia that is used or have the work done by a private firm. Private firms charge about eight cents per square foot of copy, although some may run three times that much. Thus, a sizable job done by a commercial concern will be expensive. The paper comes in 50 yds x 42" rolls and, depending on the country or the store, costs from \$10.50 to \$25 for the type imported from the United States and from \$7.75 to \$15 for the type made in Costa Rica, if you can find it. There are ten-yard rolls to be found, but I never located them except in Guatemala and Costa Rica where they cost \$4.50 and \$3.00 for the United States and Costa Rican types, respectively. In Honduras I found only the American type although it was stated that they usually have both. The ammonia ranges from \$1.75 a gallon to about four times that much, depending on the country and the store, and a gallon is enough to process about 100 yards of paper.

You can have serious problems in getting the census maps and must expect to pay at least one-half more in paper than it actually took to make the maps. Requiring excess paper is almost universal. In one country there are special procedures with the Director of the Census Section before maps can be made and when final approval is obtained, one must then try to arrange with his relative in the Cartography Section to have the maps made. In this case, I was told that it would be weeks before they

could produce the copies, but if I paid, a person could make them after working hours. I paid and was amused that the maps were made during working hours.

I am ashamed of that little payoff, since if you have to bribe someone, you haven't done a good job. The next time I asked them for maps, there was no difficulty since I worked through the Director of the Department of Census. It is an excellent idea, if the work is fairly large, always to contact the Director, since, in general, he (or she, in Panama) is a person of competence and honesty. All communications with him should, of course, be only in Spanish.

One of the most difficult times I had in getting census maps was brought about because of a U.S. Census Bureau advisor. His situation was ludicrous. Although he had been in Central America over two years, he was unable to speak Spanish fluently, while he essentially directed an office of over 40 people during data tabulation. He directed the staff by telling his secretary in English what he wanted, and then she, in a condescending manner (since she was the only English-Spanish person in the department), directed the work. She, because she spoke only English to Americans, and a Mexican railway ticket seller who had overcharged me twenty pesos were the only two people I have encountered in Spanish speaking countries that did not "understand" my Spanish. This American official took an immediate dislike to me when he found that I had more in common with his employees than he did.

THE LARGE CITIES

The large cities may prove to be a serious problem since the number of dwellings by block is not usually known. However, census figures are always available for sectors, which have the size of some six or seven blocks, although there are certain exceptions and at times the figures are in error. There may be 300 or more homes in a sector, and you would find it almost impossible to locate the 125th family. You will discover comunas, where behind a single door live 20 or 30 families. Usually there are no nameplates so you must knock on the door to see how many families live there.

It is usually best to select a block inside the sector either at random or by the approximation that each block has the same number of dwellings. The dwelling could be chosen by one of the following three methods: first, one could go to the block chosen, count the number of dwellings, and randomly select one of them; second, one could divide the perimeter of the block into say 20 parts, select a number between 1 and 20, and go to the approximate location correspond-

ing to the number selected; third, one could say that the block will have at least 10 dwellings, and select a number between 1 and 10, and go to this home or always select, for example, the fourth home in the block. The third method lacks some degree of randomness, but is easy to explain and satisfactory for many purposes.

One economic researcher selects a block at random, then visits the houses numbered 2, 5, 8, 11, until the block is exhausted, or the researcher. He then continues to select blocks at random until he has the total number of families desired. This is clearly not perfectly random, but suffices for him. The El Salvador Department of Census did a work force survey in San Salvador by a random selection of blocks and the random selection of a dwelling in the block. They did not take advantage of their own data, since they ignored the fact that some blocks have more dwellings than others.

SPECIAL GROUPS

There are two special groups in Central America and Panama which have no equivalences in the United States. These are the workers on plantations and police or police-military. For example, in Fincas de Sánchez, Costa Rica, one plantation had more than 75 dwellings which all belonged to the plantation owner. These housed a large group of people, and the families were of extraordinary size. Several of the dwellings were empty because they were not needed until the crops were to be harvested. It is best to visit to see how many homes are vacant, if possible.

The military are an interesting group and are very different from country to country. Since it is better to join the army than to starve, one finds 12-year old soldiers. In Costa Rica there are no soldiers and the police are people who have homes and live like civilians when not on duty. On the other hand, the police of Nicaragua are soldiers who live as soldiers. In Nicaragua and the other countries, except Costa Rica, there are soldiers in small numbers, like one or two, and up to ten in almost each town for purposes of keeping the peace. They generally live in the military quarters and if you want to study them, you must go to the government building that is both their office and their home. Completely random selection of soldiers is difficult, if not impossible, since for security reasons they refuse to divulge information as to the numbers and locations of troops.

KEEPING THE DATA CLEAN

When I learned that X rays were made to determine bone growth in child-

ren and bone density in adults, I asked if pregnant women were also included. I was told that women were always given a lead apron. In the field I found that this was not the case, and in fact no one was ever given the apron, although it was always carried. No one could tell me if the equipment was collimated, but a head physician (who had said that all women used the lead apron) informed me that it was a low level machine so didn't really matter. I'll bet if it were his pregnant wife being X-rayed, she would get a lead apron.

With this hint that I was being lied to, I was angry, and began looking for other operations that were not what they were supposed to be. I didn't have to look far. The medical duplicates (two physicians examine the same patient) were being done with collaboration, and at times either the original or the duplicate was changed to obtain uniformity. I forced a showdown to distinguish between duplicates to train and improve the quality of the data, and duplicates for the computation of standard errors.

For some time I tried to get the dentist to do duplicates with his assistant, but he could not see the need and would not be convinced to do so, partly because of the lack of time. After five days of my insistence, he did two duplicates, and handed them to me with a bored look. I skimmed the pages and, for one person, pointed out that he had found 6 more cavities and a gum disorder more than his assistant. He sought out the people, had a training session with them, and from then on duplicates were done without complaint, with a corresponding improvement in the data.

Since the U.S.A. was footing the bill, there were American physicians assigned to the work. Unfortunately, American physicians both are used to making diagnoses before there are any clinical signs and have never seen many nutritional disorders, like streaked fingernails. (Streaked fingernails should not be confused with white spots in fingernails, but appear as light and dark arcs.) After I had finished with my work at reception, I reviewed the clinical forms. One American physician was finding many type 1 goiters and streaked fingernails. I stood behind him, not for very long, and after he recorded goiter and streaked fingernails on a case, I examined the person (although I am not a physician, I have attended several training sessions and felt several goiters) and said that this was not a goiter and the person did not have streaked fingernails. A conference resulted, and I was proved correct, with the resulting improvement in the data.

DISASTERS

You must expect disasters and plan for their occurrences. Work had begun in El Salvador when a serious earthquake, which destroyed numerous bridges and drastically upset the usual pattern of life, caused us to give up the project for several months and return to Guatemala. One driver died in an off-duty accident. Of the interviewers who made original contact with the families in the field, one broke a leg, a (very attractive) one received two four-inch facial scars, one caught chicken pox, one intestinal amoebas, and two were robbed. One physician dropped out for health reasons. An emergency aircraft landing was necessary. Floods occurred twice. On about 6 occasions, the town was reached by the interviewers but could not be reached by the medical team because of rising rivers or rain-damaged roads.

COMPUTER SUPPORT

If you are interested in computer support or require computer usage either to plan or to analyze your survey, you will be pleased to know that there are several computers in Central America. On the other hand, IBM of Guatemala is not IBM of the U.S.A. For example, when the University of San Carlos received Guatemala's first IBM 1620 computer, it did not occur to the company that the computer's typewriter would need paper, so none was available. The University engineer in charge of the project looked all over Guatemala for paper which would be suitable, since it was troublesome to keep inserting 8½" x 11" sheets. He tried rolls of paper towels, but they did not work well, although you could then dry your hands with old printout. Finally, he discovered that Tropical Radio has paper in rolls, tearing off a piece for each telegram. The last time I went to the University, he had inserted a Tropical Radio roll into the typewriter, backwards of course, and was managing fine, except that the roll was just a little short of being wide enough. Fortunately, many of his programs were written for Tropical Radio paper.

CONCLUDING REMARKS

The most enjoyable aspect about working in Latin America is that the people are very pleasant and willing to cooperate. There is always someone (wife, children, or old folks) in the home when it is visited except in some 3% of the cases. On the other hand, since men must work, you will not find an adult male until late afternoon or nightfall unless he is old, ill, or the husband is away. A Latin child of 10 is often more mature and responsible than an American child of 16, and both

can and will give excellent answers to questions. You will not have to set aside an extra day to get people to cooperate or because a family was not at home on the first day.

The American statistician for a large health survey in Colombia once stated that his survey did not experience "any of the difficulties" of the clinical-nutritional survey in which I worked, and that he incurred "97% response". The naive individual would probably think the Colombia survey's statistician both very fortunate and very successful. To me, however, it points out that he just didn't know what was going on at the nitty gritty level. With some Central American Indians, which are culturally similar to Colombian Indians, there was only 40% response while an 80% response could be considered good for adult males. While I would not be impressed by 97% saying they would participate, a 97% response to a physical examination is an impossibility in Latin America.

Although the field work for the INCAP survey was completed in May 1967, there is as yet no published account of the results.

ACKNOWLEDGMENTS

This work was in no way supported or approved by the Institute of Nutrition of Central America and Panama (INCAP) or by any branch or office of the United States Federal Government. Although experiences narrated in this paper took place while the author was employed as a statistician with INCAP, the entire article was adapted from personal papers, letters, acquaintances, and memory, while he was employed at New York University.

The author wishes to thank his wife Edna, who accompanied him on many trying trips throughout Central America. For example, we awakened in Juticalpa, Honduras to find that a rat had disposed of the breakfast breads we had in our room and to observe that we were covered by bites from bedbugs. Although her left breast was bitten by bedbugs so many times that it turned blue, she maintained her good humor at being referred to as "the girl with the blue boob".

Special thanks to Berta Mendizábal, Carlos Martínez, Aníbal Avila, Carlos Sandoval, Emma Guadalupe Jacobo, Carlota López de Cardona, Mariano A. Pinto Magaña, Olga and Máxima, who couldn't do the work but taught me much, Orlando Danilo Sota, who, to mention one of many feats, managed to bring our Land Rover safely to a halt when a brake cylinder broke and left us without means of stopping. With only a small wrench and a nail head he was able to seal off the cylinder so that we could continue on our way, although the wheels pulled to

one side, when braking, to be sure. José Trinidad Fiallos, Roberto Hernán Rosales, Agosto Aguilar, Francisca Mejía Romero, Angela María David, Raúl Castillo Borge, Enrique Lanzas Balladares, Victor Pou, Julio Guzmán, Felipe Arellano, Gladys Pineda, Olivia Miranda, Mery Morales, Teresa Anglada, René Sánchez Bolanos, Ana Isabel Montoya Monge, Ana Estela Arias Flores, Luisa E. Quesada, Francisco Sibauste, Hernández Quiros, Paco Rivera, who risked his life destroying mosquitoes and making maps until he lost his job for political reasons after 12 years, Eddie Chen Solé, Indalecio Valdés, students of CENADAL, and many others. Que Dios los guarde a todos.

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