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SABE - Survey on Health, Well-Being, and Aging in Latin America and the Caribbean, 2000

SABE Protocol

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Bibliographic Description

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Title: SABE - Survey on Health, Well-Being, and Aging in Latin America and the Caribbean, 2000

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Scope of Study

Summary: The Survey on Health, Well-Being, and Aging in Latin America and the Caribbean (Project SABE) was conducted during 1999 and 2000 to examine health conditions and functional limitations of persons aged 60 and older in the countries of Argentina, Barbados, Brazil, Chile, Cuba, Mexico, and Uruguay, with special focus on persons over 80 years of age. Project SABE was administered in the official language of each country: Spanish in Buenos Aires (Argentina), Mexico City (Mexico), Santiago (Chile), Havana (Cuba), and Montevideo (Uruguay), English in Bridgetown (Barbados), and Portuguese in Sao Paulo (Brazil). Goals of the project were to (a) Describe the health conditions of older adults (aged 60 and older with special focus on persons over 80) with regard to chronic and acute diseases, disability,

and physical and mental impairment, (b) Evaluate the extent to which older adults used and had access to health care services, including services that are outside the formal system (local healers, traditional medicine), (c) Evaluate the proportional contribution by principal sources of support -- relatives and family networks, public assistance, and private resources (income, assets) -- towards meeting the health-related needs of older adults, (d) Evaluate access to health insurance offered by private organizations, governmental institutions, and mixed systems, as well as the extent to which that insurance was actually used, (e) Analyze the differentials in the self-evaluation of health conditions, access to health care, and sources of support with regard to socioeconomic group, gender, and birth cohort, (f) Evaluate the relationships between strategic factors -- health-related behavior, occupational background, socioeconomic status, gender, and cohort -- and health conditions, according to the health evaluation at the time of the survey, and (g) Carry out comparative analyses in countries that share similar characteristics but that differ with regard to such factors as the role of family support, public assistance, access to health services, and health-related behavior and exposure to risk. Demographic variables include age, sex, race, level of education, birthplace, religion, ethnic group, marital status, and income. Also examined were cognitive status, health status, functional status, nutritional status, and use and accessibility of services. Available only on CD-ROM. Persons interested in receiving a copy of the SABE CD-ROM should email their request, including mailing information to: NACDA@icpsr.umich.edu.

Subject Terms: activities of daily living, aging, caregivers, diet, family relations, health care services, health status, life expectancy, life satisfaction, living arrangements, marriage rates, medical conditions, older adults, perceptions, quality of life

Geographic Coverage: Argentina, Barbados, Brazil, Chile, Cuba, Mexico, Uruguay

Time Period: 1999-2000

Date(s) of Data Collection: 1999-2000

Unit of Observation: individuals

Universe: Persons aged 60 and older residing in private households in Argentina, Barbados, Brazil, Chile, Cuba, Mexico, and Uruguay.

Data Type: survey data

Data Collection Notes: These data are provided as SPSS system files and Stata system files only.

Methodology

Sample: Multistage cluster

Data Source: personal interviews and self-enumerated questionnaires

Extent of Processing: CONCHK.PR/ MDATA.PR

Access and Availability

Extent of Collection: 7 data files + machine-readable documentation (PDF)

Restrictions: This data collection may not be used for any purpose other than statistical reporting and analysis. Use of these data to learn the identity of any person or establishment is prohibited. In preparing the data files for public archiving and distribution, the producers have removed direct identifiers and characteristics that might lead to identification of data subjects.

File Specifications

Part No.	*Part Name*	*File Structure*	*Case Count*	*Variable Count*	*LRECL*	*Records Per Case*
1	Argentina	rectangular	1,043	1,841	-	1
2	Barbados	rectangular	1,508	1,769	-	1
3	Brazil	rectangular	2,143	1,784	-	1
4	Chile	rectangular	1,301	1,674	-	1
5	Cuba	rectangular	1,905	2,272	-	1
6	Mexico	rectangular	1,876	1,893	-	1
7	Uruguay	rectangular	1,450	1,792	-	1

Protocol of the Multicenter Study: Health, Well-Being and Aging in Latin America and the Caribbean[1]

Alberto Palloni[2]

SPECIFIC AIMS

The proposed project will investigate the health conditions of the elderly within major urban areas in seven countries in Latin America and the Caribbean (Barbados, Brazil, Costa Rica, Cuba, Chile, Mexico and Uruguay) and in Puerto Rico. We propose fielding simultaneous and rigorously comparable cross sectional surveys to collect information that will be the first of its kind for Latin American countries and the Caribbean, and which will support much needed analyses and stimulate additional research in the area. The information thus collected will be useful to support description and analyses of health conditions about which we know little or nothing. However, since the information collected will not include characteristics of decedents, it will be of only partial use for the description and analyses involving relations between health conditions and survival. Thus, the proposed project cannot be an end in itself but should be viewed as the first stage of a three-stage process.

The *second stage* should consist of a follow-up interview of respondents who were administered the questionnaire in the first stage. Ideally, the follow-up should take place at least one year after the first, baseline interview. In the second stage we could obtain information on survival and institutionalization of respondents. In a *third stage* we will extend the panel-like study to a sample of the national population

Although in this document we refer only to the nature of the first stage, it should be kept in mind—and we will indicate so in appropriate places—that at least a subset of the proposed analyses and descriptions cannot be done with optimal accuracy without completion of the second stage.

The proposed project or first stage will consist of two separate set of activities. The *first set of activities* are devoted to the collection of basic information through strictly comparable cross-sectional surveys in random samples of the elderly population residing in urban areas selected for the study. In some but not all countries the survey information will be augmented with

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[1] This document highlights the most important points for discussion of the collaborative project on the health condition of older persons in Latin America and the Caribbean. It incorporates suggestions from the principal investigators in the participating countries as well as from the technical advisors acting as consultants to the project. The author gives special thanks to Cecilia Albala, Larry Bumpass, Ana Luisa Dávila, Rebecca de los Ríos, Gerda Fillenbaum, Roberto Ham, Al Hermalin, Martha Peláez, Jim Sweet, and Robert Wallace.

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interviewees' information retrieved from records kept at hospitals, clinics, and health care centers. The *second set of activities* is the organization, dissemination, and analysis of the information collected in the first stage.

The project is designed to produce information that will, at the very least, enable researchers to achieve the following goals:

a) Describe health conditions of the elderly (60+) with regard to chronic and acute conditions, disability, and physical and mental impairment and with special attention to those aged 80+. It is important to understand that the results will not be true measures of prevalence of illnesses but of perceived illnesses, except in those countries where perception is accompanied by actual screening or tests.

b) Evaluate elderly's access to and use of health care services, including those located outside the formal medical establishment (local healers, traditional medicine and *curanderos*), and the conditions under which individuals seek access to and receive services. These countries differ radically in terms of organization and administration of their health establishments and have experienced drastic changes in their health systems. It is therefore of particular relevance to us to study patterns of delivery of medical services to different social segments of the populations;

c) Assess the relative contribution of three sources of support toward the satisfaction of health related needs among the elderly, namely, family relations and networks, public assistance, and private resources (income, assets). Given recent profound reorganization in pension and welfare systems, these countries offer a unique opportunity to study disparities across and within social contexts in the availability of collective and private health plans and programs, and their influence on elderly's health status and access and use to health care;

d) An objective implicit in (c) that deserves separate consideration is the extent of access and use of health insurance issued by private organizations or by governmental or semi-governmental institutions;

e) We believe that these countries' recent experience in areas identified in (b) and (c) can be useful for developed countries that are undergoing analogous transformations in their health and retirement systems.

f) Analyze differentials in self-assessment of health conditions, declared access to health care, and sources of support particularly (but not exclusively) with respect to social class, gender and birth cohort;

g) Evaluate the relations between strategic factors, such as health related behavior, occupational history, socioeconomic conditions, gender, and cohort on health conditions as assessed by individuals at the time of the survey, and as reported for short recall periods before the survey;

h) Elaborate risk profiles that, in conjunction with models linking risk profiles to morbidity and mortality, could support the production of short-term forecasts of age-patterns of morbidity, disability, and physical and mental impairment as well as levels of mortality among the elderly. For instance, we will explore relations between self-assessments of recent or current chronic conditions and disability and functional impairments and we will estimate the influence of behavioral profiles on self-assessments of chronic conditions.

i) Perform comparative analyses across countries who share important characteristics but who differ in a number of factors, such as role of family support, public assistance, medical establishment, as well as in terms of health related behaviors and exposure to risk conditions.

A particularly important aspect of the project is the study of the health conditions of the oldest-old (80+). Although, as is conventionally used, the concept of 'oldest-old' applies to those 85+, we will modify it to fit also the conditions of those who are 80+. To ensure that sufficient information for analysis is produced, all samples will contain an oversample of this age group. This is a necessary step since the age distribution of the elderly in most countries of the region slopes downward fairly rapidly.

An important feature of this study is that it is comparative in nature. This is justified on several grounds. First, socioeconomic, demographic, and political contexts vary drastically across countries in the region. Thus, to obtain complete and solid knowledge of the elderly's health conditions it is insufficient to focus on only one or two of them. The countries selected for study are representative of broad types of societies in terms of their combination of socioeconomic, demographic and political contexts. Second, the designs or schemes being followed in the region to deal with the problem of aging are extremely varied. It is relevant for policy purposes to assess the effects of these various designs if only to identify early on their weakness and strengths before they are adapted in toto in other countries. Finally, a comparative study, even if limited in nature, yields gains in power or robustness in the test of hypotheses. Although most analyses will be conducted in each country, and these will be the analyses to which we will give priority, it will be possible also to conduct analyses with pooled samples of outcomes where country may stand as a variable on its own right, with additive or interactive effects.

AGING IN LATIN AMERICA

The Momentum of Aging

The formal dynamic of fertility, mortality, and age structure implies that the trajectory of vital rates experienced by countries in Latin America over the past forty to fifty years will systematically and inexorably lead towards the aging of the population in the continent (Horiuchi and Preston, 1988; Kinsella, 1988; Martin and Kinsella, 1994). This heritage from past demographic trends cannot be tinkered with, halted, or modified in any way, except through unlikely sudden events or bizarre population policies. Like the momentum for natural growth, populations also contain a momentum for the natural growth of their elderly population (Schoen and Kim, 1997). The Latin American demographic experience of the past fifty years fixes lower bounds for the growth of this population of such magnitude that it should awaken immediate public concern. Future improvements in mortality will only make the situation more serious.

By the end of 1995 the proportion of the population older than 65 was near to or exceeded 10 percent, a level slightly below those already attained in Canada and the United States, in five countries of the region of interest, Argentina, Barbados, Cuba, Martinique and Uruguay. Most other countries in South and Central America and the Caribbean will attain or exceed such levels very soon, surely within the next ten or twenty years. Current projections indicate that for the year 2025, more than half of the countries in the continent will be well on their way toward

substantial aging of their age structure (PAHO, 1990b). Naturally, the demographic trajectory toward older age structures will appear to be more accelerated if we define the older population more inclusively and include, for example, those aged between 55 and 64 as well.

The aging of countries in the continent will not follow a unique, homogeneous course. Indeed, there will be substantial intercountry heterogeneity in the timing, levels, and patterns of the aging process. For the most part the timing and speed of past fertility declines will determine the timing and speed with which the aging of the age structure will occur. Thus, Brazil and Mexico will age later and in a more compressed period of time than Chile, Costa Rica, Uruguay and Argentina. Similarly, future changes in adult and old age mortality will shape the age distribution of the elderly, particularly the relative sizes of the youngest-old (65-84) and the oldest-old (85+), and thus determine one of the most central characteristics of the aging process.

Dearth of Information on Elderly's Health Status in Latin America

In a recent review of the health status of elders in Latin America the authors note with some frustration that "...the difficulties outlined in this paper associated with the aging of the population in the region are compounded by the lack of adequate information systems which could inform decision-makers on the best course of action for specific problems. This lack of 'quality data' also prevents the long-term evaluation of interventions: in the absence of baseline data measuring their impact, such interventions become fruitless exercises..." (Kalache and Coombes, 1995).

It is worrisome and paradoxical that whereas in the United States, Canada, Europe and even Asia, aging was anticipated and accompanied by a surge of research into the nature and consequences of the problems associated with it, particularly on the health dimension, nothing of the sort is occurring in Latin America. A recent publication of the United States National Academy of Sciences identifies about 25 surveys, completed or in course, designed to study various aspects of aging, and about half of them are dedicated to health (National Academy of Sciences, 1996). Similarly, Canada and most countries in Western Europe have fielded or are in the process of fielding numerous surveys which directly or indirectly retrieve information on health status of the elderly and other related aspects.

This lack of information is worrisome not just because Latin American countries will face problems associated with aging in the very short run, but because the combination of demographic regimes and social and political institutional contexts are likely to increase the magnitude of the problems, and to force their occurrence in a much more compressed period of time than ever before. The lack of information is also paradoxical for while funding for family planning continues unabated as levels of Total Fertility Rates uniformly dip below 3 children per mother or so, only scarce resources are flowing to investigate the aging consequences of the uniquely sudden and rapid fertility decline that family planning programs are partly responsible for.

Comparative studies on the health conditions of the elderly in Latin America simply do not exist. The only pertinent and most comprehensive data base ever assembled was produced through an intercountry study sponsored by PAHO (Pan American Health Organization, 1989a,b; 1990a,b)

However, the results of these studies are based on protocols that are not consistent across countries and that retrieve information on only the most elementary aspects of health status of

the elderly, necessary but insufficient to characterize thoroughly the health profile of the elderly. These studies cannot be used to evaluate and compare prevalence of important chronic illnesses or physical impairments typical among the elderly nor for improving our understanding of the kinds of medical and health care that the elderly require, actually demand, and effectively receive. Similarly, these data are of limited use to draw inferences about relations between behavioral aspects associated with risk profiles and health conditions or to carry out a comparisons to explain how country-specific factors increase (attenuate) the prevalence of physical or mental disability and disease.

The information on health status of the elderly or, for that matter, on any of the other dimensions of the aging process in Latin America, consists of small studies of local populations (Ramos, 1992; Veras, 1992; Contreras de Lehr, 1992; World Bank, 1989; Ebanks, 1986; Machado and Abreu, 1991; Gomez and Nugent, 1996), most of which are highly selected and unsuitable to draw inferences about current and prospective health status profiles.

The Need for a Comparative Data Collection Project

In the absence of adequate comparable information, collection of single country data sets is useful, whether or not the data sets resist tests of rigorous comparability. However, for scientific and policy purposes, it is preferable to invest resources in comparable data sets. As stated before, past demographic trends dictate that the experience of population aging in countries of Latin America will occur at sharply different speeds, and so will the societal and economic stressors generated by it. Similarly, each country has unique social, political, and cultural conditions that act as primary ingredients to an institutional context within which the resources to confront the problems of aging will be found. The nature and magnitude of the aging problem and of all its dimensions is determined by the interaction of these two factors, the demographic regime itself and the social, political and cultural context. If so, a comparative perspective for the study of any dimension of aging is not only useful but also necessary. The study of a single case is not without value—particularly for understanding the case itself—but it is hopelessly limited as a basis for making broad inferences or for drawing robust policy implications. Comparative studies have important return to scale and unique benefits relative to a set of unconnected single country studies.

A comparative data collection project about health status and conditions of the elderly is invaluable for scientific and policy purposes. Basic research into the aspects that determine health status and conditions among the elderly requires at the very minimum an assessment of the status and condition among current elderly cohorts. Ideally, the project should be longitudinal and should employ protocols already validated elsewhere to enhance comparability with the experience of other countries.

Similarly, the foundation of any health policy cannot be erected without an evaluation of current health status and health conditions, and an assessment of the relation between current status and conditions, on the one hand, and behavioral and social and economic determinants on the other. The latter is a crucial input for reliable and robust forecasts and projections of the short and medium run of the magnitude and nature of elderly's health demands.

Health as a Strategic Dimension in the Aging Process

The aging process has a sizeable impact on a number of dimensions that affect the normal functioning of societies, and the relative wellbeing not just of the elderly but also of the younger

populations. The most important among these dimensions are pension and retirement systems, composition of and patterns of participation in the labor force, family and household arrangements, inter-generational intra-family transfers, and health status and health conditions of the elderly (Preston and Martin, 1994; Martin and Kinsella, 1994). The relative importance of each one of these aspects is, of course, variable and dependent on peculiarities of the demographic regimes and the institutional idiosyncrasies of countries. But, as the experience in Europe and North America plainly illustrates, none of them is likely to be as paramount and influential as the health status and health conditions of the elderly. The gradual impairment of physical and mental health conditions that accompany the individual aging process (Olshansky et al., 1993; Fries, 1983; Singer and Manton, 1994), the resulting reduction in the expected years of active and healthy life expectancy (Crimmins et al., 1989; Manton, 1991; Jameson and Lopez, 1996), the reduction or complete cessation of participation in the labor market (Wise, 1996), and the increased dependency on income transfers from various public and private sources (Lee, 1995), all dictate that the growth of the elderly population should lead to mounting demand for health care and health services. Since the most relevant health conditions of older persons are chronic rather than acute and progressive rather than regressive (Manton and Stallard, 1994), this demand can also entail steep escalation of health care costs. As the case of the United States, England and most Western European countries attest, these costs can attain formidable magnitudes (Lee and Tuljapurkar; 1991; Aging in America, 1991). And, as the sad experience of Eastern European countries also shows, inability to confront these problems leads to rapid deterioration of the health status of the elderly and to the shocking loss of years of life expectancy (Mesle et al., 1996; Bobadilla et al., 1997).

Equity and the Health Conditions of the Elderly

The health problem associated with the growth of the older population involves important equity issues. First of all, there will be class differentials since members of different social classes will experience sharply different health profiles as a consequence of both past and prospective differentials in exposure, resistance and recovery rates. Similarly, the ability to access and use comprehensive and high quality health care will differ substantially across social strata. Unless properly addresses, the aging process in these societies will result in sharp increases in inequalities in the quality of life and well being of members of different classes.

Second, there will be *gender differentials* since males and females experience different mortality regimes and are affected by significantly different health problems (Kalache and Coobes, 1995; Kinsella, 1994). Moreover, since women have had a history of lower levels of labor force participation, their access to sources if income and to health care and services when they age will be substantially different than for men. Unless family support makes up for the shortfall, women's well being at very old ages, when the majority is widowed, is likely to deteriorate.

Finally, the growth of the older population will be accompanied by significant *cohort differentials***.** First, members of different cohorts were exposed in the past to different regimes of diseases, behaviors, and health care during their youths. As is well known, past exposure to diseases, behavioral practices and health care at earlier ages all affect subsequent health condition (Barker and Martyn, 1992; Elo and Preston, 1995). Second, to the extent that the nature of the labor force participation and educational achievement influence individuals' ability

to secure access to assets and income, younger and older cohorts will experience important differentials in their capacity to summon means and resources to maintain good levels of health.

To understand the nature and magnitude of the health problems, to evaluate the seriousness of inequities in elderly's health conditions, to identify the social institutions that will bear the costs, and to ensure that policies implemented in the future translate into acceptable levels of well-being without erosion of equity standards, it is important to evaluate the health status of those who are elders now and, equally, important of those who will become elders in the near future.

RESEARCH METHODS

Restatement of Research Objectives

The proposed project has two primary goals:

a) to collect information on the health status and health conditions of older people living in urban areas in several Latin American and Caribbean countries that represent a broad spectrum of demographic regimes and institutional contexts;

b) to evaluate cohort, gender, and socioeconomic differentials with regard to health status, access to and utilization of health care.

The study also has several secondary goals:

a) to assess factors influencing how elderly individuals allocate various sources of income and resources to defray costs of health care (public assistance programs, private insurance accounts, returns to assets etc.);

b) to evaluate the degree to which elderly individuals utilize family assistance of various types (income, in kind, companionship) to cope with health problems;

c) to construct risk profiles based on information about health conditions in the recent past and at the time of the survey, and on information about behavioral patters, occupational histories, and socioeconomic conditions; iv) to produce mortality and morbidity short-term forecasts. In all cases, special attention will be given to the oldest-old (those aged 80+).

The proposed project is the first of a three-stage research process which we envision as a tool to provide sufficient information to characterize health status profiles of the elderly to the extent permitted by health self-assessments. In this first stage we will focus on samples of elderly living in one central urban area only. We envision a second stage in which a follow-up interview with at least a one-year lag is administered to the survivors interviewed in the first stage or close relatives of decedents. Finally, in a third stage, we will expand the study to the national level by replicating the panel-like study in a sample of the national population.

Thus, an important goal of the research proposed here must be to test protocols that will constitute the basis for the second and third stage. After the first stage of the project is completed we will have knowledge about current health status (as revealed in self-assessments) and conditions of the elderly; we will evaluate the relations between self-assessed health status and risk profiles and, albeit at the expense of some strong assumptions, we will use the latter to forecast mortality and health status; finally, we will gain experience with instruments and protocols that may prove useful in a second a third stages of the project.

Instruments of Data Collection

[To avoid confusions in what follows, we use Y to refer to the minimum age of those who are the target of study. In most countries, Y=60. In some, however, Y=55. In some parts of the document, we use directly age 60 instead of Y. This, of course, only applies to countries where Y=60.]

To achieve these goals we propose the utilization of a *primary instrument* of data collection, a survey of target individuals, their spouses (if present), and a randomly selected sibling (if present and residing in the same urban area as the target individual). This instrument should be applied in all selected metropolitan areas and should contain a core of comparable items which is outlined later on in this document. *At a minimum* each country will administer *long interviews* to target individuals and a *short interviews* to their spouses. In countries where budgetary constraints permit, the *long interview* will also be applied to spouses and selected siblings. The long interview consists of three basic modules (socio-demographic, health status, and health services) and the short interviews consist of a subset of questions pertaining to the long questionnaire. Although each country is invited to add to the questionnaire optional modules, at a minimum all countries will administer a questionnaire containing the three modules referred to here.

In all countries the primary instrument will include not just an interview with three modules but also two additional elements:

a) a protocol for measuring height, weight, skinfold, several body circumferences, and grip strength. All these measures will be useful to construct indicators to approximately assess nutritional status of the elderly;

b) a handful of simple tests to assess physical limitations.

In all countries we will include an ad-hoc sample of institutionalized individuals to ensure that health self-assessment is also retrieved for individuals who are likely to be older and experiencing the most severe chronic conditions.

We propose the application of several optional instruments or procedures to be used in countries where the corresponding protocols are feasible and can be implemented at relatively low costs. These are as follows:

Long Interviews (and Measurement Protocols) for Spouses and Selected Siblings

This consists of administering the long interview to the targets' of spouses as well as to selected siblings. The purpose of this is to obtain information to partially understand the relative role of shared factors and individual behavioral factors in the determinant of health status.

Record Linkage

This consists of establishing a linkage of individuals' survey records to more comprehensive medical records belonging to institutions providing medical care. The record linkage is seen as an operation that will enable us to retrieve detailed information on medical conditions, treatments and their approximate costs. In addition, a record linkage will enable us to built histories of conditions and, therefore, longitudinal information that can provide a dynamic view of infirmities and ailments. A subset of all countries participating in the project will implement this data collection procedure (Cuba, Costa Rica, Brazil, and Uruguay).

Partial Screening

The third optional instrument is the administration of screening for hypertension, high sugar levels, and cholesterol to the target and their spouses and siblings. Screening for thee conditions may serve to confirm and complement the description of health conditions inferred from self-assessments.

Expansion of Sample

A fourth optional instrument is the extension of the sample to selected rural areas and/or to individuals younger than 60, perhaps as young as 50 or 55.

In Table 1 we summarize and classify procedures according to whether they are optional or part of the core of the project, that is, all countries must apply them.

We now describe in more detail some of the procedures included in the core and the optional part of the project.

Core

Interviews

The workhorse of our data collection effort will be a survey of urban samples of elderly population. For reasons that are of policy relevance, we will define the target population as all those older than 60 years (in Uruguay and other countries, the survey may also include those older than 55) rather than, as is conventional, older than 65 years. The content of the survey will follow in its broad outlines two similar surveys used with great success in the United States, the Health and Retirement Survey (HRS) and the Longitudinal Survey of Care of the Aged (LSCA), and in Taiwan (University of Michigan Research Report, 1989). The proposed survey, however, will contain features to make it suitable for the social, cultural, and health contexts prevailing in Latin America. The data collection effort associated with the survey will focus on five dimensions:

a) self-assessment of chronic and acute illnesses;
b) self-assessment of physical and mental impairments and disability;
c) limited history of principal chronic conditions;
d) access to and use of health care; and finally,
e) extent and nature of family and kin support directly and indirectly associated with health conditions of the elderly.

The long survey will contain detailed questions of three main modules: socio-demographic, health conditions, and health services. The short survey (for administration to the target's spouse) will collect information on basic demographic characteristics, a minimum set of questions on health self-assessment, and some basic information on access to and use of health services.

The collected information should be sufficient to establish a preliminary profile of health status and conditions among the elderly in the selected urban areas. In addition, however, it alone or in combination with the record linkage (see below) should enable us to carry out analyses, albeit limited, to identify health status determinants. By collecting limited histories or retrospective information about chronic (or acute) conditions and by eliciting past and current

behavioral patterns, we should be in a position to perform limited analyses linking dynamically behaviors, risk profiles and health status, and to test relevant hypotheses and conjectures. Among these there are some at the forefront of the biodemography of aging which are of relevance to us such as those regarding the relative contribution of exposure to environmental conditions, behavioral patterns, and inherited traits in the production of acute and chronic conditions. It is with a view toward an evaluation of the relative contribution of these factors to observed health status conditions that we are proposing data collection for a target, the spouse, and a sibling rather than for a target individual only. The information thus collected can be used to test hypotheses regarding the relative influence of genetic endowments, shared environments, and individual characteristics. Examples of possible analyses are given in Table 1.

Table 1: Summary and Classification of Procedures (Core or Optional)

	CLASSIFICATION	
Procedure	**Core**	**Optional**
A. Metropolitan Sample		
Long Interview Targets	x	--
Three basic modules	x	--
Optional modules	--	x
Short Interview Spouses	x	--
Nutritional Assessment	x	--
Physical Limitations	x	--
Long Interview Spouses	--	x
Long Interview Sibling	--	x
Record Linkage	--	x
Partial Screening	--	x
Inclusion of 50-59	--	x
B. Sample Selected Rural Area		
Long Interview Targets	--	x
Short Interview Spouses	--	x
Nutritional Assessment	--	x
Assessment of physical limitations	--	x
Long Interview Spouses	--	x
Long Interview Sibling	--	x
Record Linkage	--	x
Partial Screening	--	x
Inclusion of 50-59	--	x

Nutritional Assessment

We will complement the survey with measurement of nutritional status of the elderly using assessment of biomass with a combination on anthropological measurement (height, weight, grip strength, skinfold, waist and hip assessment, and calf circumference). We will also apply indirect techniques that will enable us to transform measures easily accessible (such as height per weight

and grip strength) into indirect estimates of total body water (Albala et al, 1997). The combination of basic measurement and indirect procedures avoids interpretational problems associated with the former when used on the elderly population.

Each country can exercise discretion in the application of these instruments but should at least apply the minimum measures listed below:

a) height; standing height or, if standing height is problematic due to postural problems, knee height or, alternatively, arm span;
b) weight;
c) skinfold thickness (subscapular; triceps);
d) grip strength;
e) mid-upper arm circumference;
f) calf circumference;
g) waist and hip circumference.

Assessment of Physical Limitations

We will apply a handful of very simple operations to assess the existence of physical limitations. These will be applied during interview by the interviewers. They include the following:

a) standing on one foot
b) bending and crouching
c) walking
d) getting up and sitting down with no help

Optional

Partial Screening

Health self-assessment will generally be useful but it is even more so when at least some dimensions of health self-assessment are corroborated with screening. We suggest that a complementary set of procedures be applied to detect high levels of cholesterol, anomalies in blood sugar and high blood pressure. In most cases, the screening will be reliable only if measurements are averaged over several screening sessions (repeated measurement). If done properly, one can correlate screening results and self-assessment to validate the latter.

Record Linkage

We propose that a second instrument of data collection be utilized in tandem with the survey. This consists of a record linkage whereby individuals interviewed in the survey (target, spouse or sibling) are traced through administrative records of hospitals or other medical care facilities that provide health services. To implement this instrument of data collection we need to go through two stages. *First*, we identify individuals in the sample who have received in (or out) patient services within a pre-defined period of time before the interview (the ‘target record’). A window of a 6 or 12 months will be adequate for this purpose, but if additional cases are desired the window of time will be augmented.

*Second***,** after securing appropriate authorization, we will gain access to records of the medical facility providing the services. This can be done through a variety of means, one of which is an interview, through phone or through a mail questionnaire, of the primary physicians or health specialists in charge of the record target record. A second possibility is to access medical records of the target record through trained personnel belonging to the health care facility either directly or through a phone interview or mail questionnaire administered to these personnel.

A record linkage of this nature will provide more precise information on the health conditions affecting the target record, the initial and final diagnostic, nature of prognosis, and details about medical treatment. Consideration of treatment is of pivotal importance to evaluate medical costs associated with key medical conditions such as osteoporosis, heart disease, arthritis, diabetes, etc...Longitudinal information embedded in each record can also be used to estimate relatively sophisticated compartment models about transitions across multiple health states.

Furthermore, a record linkage at this initial stage could be utilized later, in a second stage of the project, for a panel-like study where target records (and possibly corresponding control cases) are followed up for a period of time to gather additional prospective and retrospective information about health conditions, exposure, behaviors, and medical treatment.

Ideally, the record linkage should be defined for the entire sample but, if considerations related to costs or to privacy concerns so dictate, it is reasonable to consider the possibility of doing a record linkage on a smaller sub-sample. An alternative procedure is to only choose target records corresponding to a particular diagnostic or set of conditions from among the entire population of target records. This is a useful strategy if one desires to model or monitor the nature and costs of a subset of health conditions.

Other procedures and protocols could probably be applied as well—requiring medical examination and laboratory tests—but will require considerably more funding that what we are contemplating at this time. It is advisable to defer utilization of such protocols to the second or even third stage of the project.

Sampling Spouses and Siblings for Long Interviews

There are important advantages for the analysis of health conditions to be obtained when one studies individuals sharing environments or at least partially genetic endowments. The analysis of the resulting information can control for confounding factors that otherwise cause multiple problems. Although to control for genetic environments one would ideally sample twins, the next best possibility is to sample siblings Spouses, on the other hand, are the best possible choice if our goal is to sample individuals who share common environments but not genetic conditions.

In some countries long interviews will be administered to targets, their spouses and siblings.

Sampling Frames and Sampling Stages: General Case

The discussion that follows suggests guidelines to follow in the sampling design in each country participating in the comparative study. While maximizing opportunities to establish comparability across countries, the principles set forth below depend on the type of preexisting sampling frames, and are sufficiently flexible to permit accommodation of conditions that are idiosyncratic to each country. Two assumptions underlie the guidelines of the sampling frame.

First, 'elderly' population is a concept which we will use to refer to the population older than an age Y where Y will be specific for each country. In some countries Y will be the conventional age of 60 whereas in others Y will correspond to the less conventional age of 50 or 55.

Second, we assume that there are two important factors that need to be taken into account in the sampling design because of their influence on outcomes of interest:

- geographic areas where there is concentration of elderly population are potentially different in terms of health conditions and in the ways in which elderly people behave and are supported by others;
- areas belonging to different socioeconomic conditions are associated with different health outcomes, behaviors and services.

Stratification by age and measures of socioeconomic status is suggested since it is very likely that health conditions that are the target of the study are highly correlated with socioeconomic factors as well as with the density of elderly population.

In all countries participating in the comparative project there are pre-existing sampling frames that can be utilized to design a sample of elderly population. Irrespective of pre-existing sampling frame, the sampling scheme discussed below suggests a *multistage stratified clustered design*. This design is cost-efficient and maximizes easiness of implementation.

Although there are many possible scenarios, we will discuss only one, the case when a sample frame is available from either a recent survey or census.

We assume we have available and accessible a sampling frame for the target city from a recent survey or census. We also assume that such frame provides a listing or geographic map of neighborhoods ('blocks', *vecindarios*, *segmentos censales* or other unit composed of a set of households) consisting of groups of households or *viviendas*. We call these SU or sampling units.

Definition of Sampling Units

The *first stage* in the sampling process is to identify large aggregations within the city (*municipios*, *condados*, or other subdivisions) and to select those that fall within what is considered the 'larger' metropolitan area, excluding aggregations that may be of a semi-rural character, or those that largely consist of residences used by inhabitants of the metropolitan area as second or summer residences. In addition, one could eliminate aggregations that are too distant from the urban center and too sparsely populated but whose population is, for all purposes, comparable to that of other aggregations that are closer to the urban center and are more densely populated.

As a result of this first stage we will identify a set of aggregations consisting of SU's, all of which are eligible for selection into the sample. The set of SU consists of the target population of SU's and it is these set of clusters that we will manipulate to draw the sample of elderly.

Let SU(i) denote the ith such unit or cluster. By definition each of the SU(i) belongs to an aggregation that remains after the selection process in the first stage. Assume that there are i=1,...k of them and that K denotes the set of labels for all clusters of this type. Thus, the population of SU's that constitutes the target metropolitan area can be divided into sets of SU(i), {SU(i): i □ K } where K is the set of indexes for the clusters. We assume also that we can access basic demographic information about such units or clusters. Of particular importance for the project are variables such as

(a) income of the head of the household;

(b) measures of education of the head of the household, and

(c) measures of the age distribution.

Factors (a) and (b) are normally used as indicators of socioeconomic conditions. However, each country may already have developed or determined other factors that function equally well and are preferable because they are believed to be measured more reliably. In order to be flexible, each country should replace income and education of the head with factors considered to be better indicators of socioeconomic condition. In what follows we will continue using income and education as examples only. On the other hand, there should be no differences across countries in terms of the demographic factor, namely age. These are considered reliable and are routinely available in censuses and surveys.

Stratification

The *second stage* consists of stratifying SU's according to (a) income of head, (b) education of head, and (c) age distribution. Stratification of population subunits prior to sampling them is sometimes considered necessary in order to be able to identify strata of sub-population units that are of interest to the researcher but which contain relatively lower number of effective units. In such cases, sampling units from the entire population disregarding small representation of some strata, will result in a small number of subunits belonging to strata of interest to the investigator. This will complicate or make impossible the task of drawing inferences about individuals belonging to such strata. Generally speaking, we can say that in order to study the elderly we need to stratify sub-population units to ensure the following: a) that we will be able to include a sufficient number of elderly from subunits characterized by high (low) socioeconomic status and b) that we will be able to include a sufficient number of elderly from subunits characterized by high(low) concentration of elderly. In what follows, we will use income and education as indicators of socioeconomic strata.

We will distinguish three levels of income: high, medium and low. To determine cutting points associated with the strata we suggest to calculate the 33rd and 66th percentiles of the distribution of median incomes for heads by SU's: those SU's where the median income falls below the 33rd quartile are classified as low income; those whose median income is between the 33rd and 66th percentile are classified in the medium strata; and, finally, those whose median income above the 66th percentile belong in the high strata.

The strata corresponding to education will be based on the distribution of SU's by proportion of heads who completed at least primary education. Allocation of SU's to strata proceeds as before: low education SU's are all those who fall below the 33rd percentile of the distribution of heads by primary education; those SU's that fall between the 33rd and 66 percentile are considered of intermediate education; the remaining are high education SU's

We will distinguish three strata according to the shape of the age distributions. The age categories we will consider are two: above Y and below Y, where Y will be either 60 or 55 depend ending on the country. We will construct three strata according to the proportion of individuals falling in each of the categories. The first strata will be composed of SU's that have a proportion of their population in the age group Y+ that is below the 33rd percentile; the second strata will be composed of all SU's where the proportion of population in the age group Y+ is between the 33rd and 66th percentile. The remaining SU's, those with a very old population, will

be composed of all SU's where the proportion of aging individuals (above age Y) is above the 66th percentile.

In this example there will be a total of 27 strata, some of which will have very few clusters in it since they are empirically unlikely: for example the combination of high income and low education is unlikely as is the combination of low income and high education. Similarly, the effective number clusters in high income, high education strata may be very small. Or, finally, the effective number of clusters in strata with very elderly population may also be small. We recommend oversampling clusters belonging to these strata. In particular, we should oversample from strata that are considered to have an old population. Each country should decide what should be the oversample factor for these SU's; these will depend on how rare these SU's are in the total population. If, on the other hand, it is considered that SU's with an older or very high status population are either not rare or not special in any way, there is no need to oversample.

Even with the stratification suggested, the SU's within each strata are unlikely to be homogeneous with respect to the size of the elderly population. To circumvent this problem we will proceed as follows: once the desired number of SU from each strata is calculated (with or without oversampling of particular strata) we will select SU's within a strata in such a way that the probability of selection of any SU's *within* a strata is proportional to the size distribution of the elderly population (proportion above age Y) within the strata. Thus, if an SU contains 60 percent of the elderly population (proportion above age Y) in a particular strata, such SU should be selected within the strata with a probability of.60. The total number of SU's selected should be of the order of 10 percent of all SU's included in the universe and the number of SU's from each strata should be proportional to their share of the total population aged Y and above.

Selection of Households

It is beneficial for the comparability of the project to follow a unique procedure to select households once the SU's from the strata are chosen. This procedure is designed for the case when no listing of households within an SU is readily available to the investigator or when one is available but needs updating. We assume that an approximate map of the SU is available.

The procedure consists of an in-the-field-screening of households to produce a listing of existing households within the scanned area. After the listing of existing households is completed, one will have a complete enumeration of the households in the cluster. At this point the most efficient procedure is to preselect 1 out of S households and determine in the field whether there is *at least one elderly person or target individuals*. If none is found, the interviewer proceeds to the next preselected household. S is an arbitrary integer number. In each cluster SU(i) the screening of households continues until one identifies a total of $n_{su(i)}$ target individuals. The number $n_{su(i)}$ must ensure that the number of elderly people selected from each cluster is proportional to their relative contribution to the total elderly population in the set of clusters selected within a given strata. Thus, $n_{su(i)}$ must be determined as int(n*h(i)) where n is the total sample size and h(i) is the fraction of the total elderly population in sampling unit SU(i). If, after a first screening of households, the total number of interviews is lower than $n_{su(i)}$, then the screening is re-started from the same point but changing the value of S until the sampling quota for the SU is achieved.

Remarks

It is important to understand what is meant by identification of an elderly respondent. The interviewer will ask an adult person in the household if there are any persons who reside in the household who are older than Y, even if they are not there at the time, or who would be residents if it were not for health problems. If the older persons are there at the time, the interviewer selects the target respondent according to the rules proposed below. If they are not there, there are several possibilities:

- *They are institutionalized:* In this case the interviewer MUST get the address of the institution where the individual can be found. In addition, a proxy has to be selected at the time the institution's address is requested. The proxy will be asked certain questions about the institutionalization and could be needed if the target individual is not able to respond to the questionnaire;
- *They are hospitalized:* In this case the interviewer must arrange to have the interview in the hospital or after the target returns to the household, or choose a proxy if interview with target individual is considered to be difficult or impossible before a relatively short period of time after contact with household is made. The waiting time for interview must not exceed the length of time allocated to complete the field operations;
- *They are temporarily out*: in this case the interviewer must arrange an interview at a time when the target person can be found. We suggest that a maximum of three attempts be used to locate the older person. These attempts must be evenly spread over the total maximum period allocated for identification of respondents unless there are particular reasons to locate them at the end of the period (for example, the elderly is on vacations elsewhere).

Selection of Respondents

In households where only one individual older than Y is found, selection is not problematic. In those cases where there is more than one individual older than 60, we will use a Kish table (or number) to choose one and only one person for interview. It is important that this be appropriately documented in order to make sure that households are assigned proper weights according to the number of eligible elders they contribute to the sample. In all countries we must also identify the spouse of the target individual to administer the short interview. This short interview is very important and care should be taken to locate the spouse if she/he is still surviving. If the spouse is not available at the time of interview, we proceed in exactly the same manner as described above for the target.

In some countries we will also include a sibling of the target. To identify the random sibling, the interviewer must proceed to first list all surviving siblings of the target person in order of age and then choose only those older than Y. Using a table of random numbers, the interviewer selects one sibling among those older than Y and queries for his/her address. If the chosen sibling does lives in the urban area being investigated, the interviewer will query the interviewee for an address. If the chosen sibling does not live in the urban area under study, the interviewer should proceed to select a second sibling from the list of those older than Y using the same table of random numbers. This continues until an eligible sibling is found or until the list of siblings older than Y is exhausted, whichever comes first.

Sampling Frames and Sampling Stages: A Special Case

If the pre-existing sample frame corresponds to a fertility survey, we will proceed as indicated above. As shown in the case of the study of the elderly in Taiwan (University of Michigan Population Studies Center, 1989), these sample frames can be adapted to provide a useful sampling frames for the elderly population. In all these countries where such frames exist there will be readily identified primary sampling units (PSU) consisting of geographic areas containing households. That is, under this scenario there is a pre-existing set of clusters over whose selection we will have no input or influence whatsoever. The following must be the minimal information known for each PSU: (a) size of the population of women aged 15-49 and (b) indexes of socioeconomic conditions.

To implement a procedure analogous to that described above, we only need to estimate the size of the elderly population in each PSU. If an estimate of the size of such population in the PSU is independently available (from the master sampling frame utilized for the fertility survey), one can then apply principles and stages as in Case I described above. If such estimates are not available, we need to estimate the size of the target population in each PSU. The simplest procedure is to assume that the distribution of size of the population 15-49 is the same as that of the population of elderly. This assumption worked well in the above-mentioned study of Taiwan. Another procedure is to rely on the most recent census and on estimates of the relation between the size of the population 15-49 and the elderly population while controlling for other conditions. From a sample of micro data from an older census—perhaps the same census that was used to determine the sampling frame for the survey—one can obtain information at relatively low levels of aggregation (city, county). One can then estimate the relation between the population aged Y+ and other characteristics, including the population aged 15-49, also available for the PSU's. Suppose we choose to use data on cities, j=1,...r. A simple, but not necessarily the best, relation to estimate is a linear one:

$$P_j(y) = \alpha + \beta P_j(15\text{-}49) + \gamma 1_j + \varepsilon_j$$

where $P_j(y)$ is the population aged Y+ in city j, $P_j(15\text{-}49)$ is the population aged 15-49 in city j, 1_j is an index of socioeconomic condition in city and ε_j is an error term. The parameters α, β, and γ describe the relation (linear) between the variables of interest at the level of cities and for the time period covered by the census. In order to determine the size of the population older than Y in any primary sampling unit we simply use the relation (1) using the values for the independent variables that are found for each PSU and neglecting the error term.

Once P(y) is estimated for each PSU contained in the sampling frame from the fertility survey, we can apply the same procedures described above for Case I using PSU's instead of clusters as the entities C(i)'s and the information on income and education of household heads available from the PSU's.

Special Considerations

More than One Target per Household

It is possible that a particular household contains more than one person aged Y+. We recommend that in all cases a target be chosen (together with a the spouse) following Kish's procedure. Interviewers must record (a) that a selection took place and (b) the number of persons aged Y+ who were eligible for interview among which a target was chosen (including spouses). *This*

information must be used to ensure that households with multiple elderly are assigned proper weights.

In the unlikely case that the household is really a group quarters for the elderly, the interviewer should enumerate the number of elderly individuals and select as one target (and the spouse) much as if the household unit were a normal residence.

Rationale: In some surveys of the elderly, the principle that one should select all elderly living in the household has been applied. This has some advantages (sampling is easier and less costly to complete since less households have to be visited; one can identify group quarters where elderly are being cared for) but we believe that there is an important disadvantage, namely, conditions among elderly living in the same household will be correlated and, therefore, the effective sample size will be less than what one actually obtains. Analysis of clustered data has some advantages but requires cumbersome procedures, some of which are of unknown robustness and definitely not very useful with small sample sizes. For this reason we suggest to select one elderly per household.

A special case occurs when what is seen from the outside as one single household turns out to be several households. In this case, the interviewer must select one and only one household but note the existence of the others. This will be useful to update the household roster and to select units in case a new screening process becomes necessary.

Oversampling of Individuals Older than 80

We must oversample the population aged 80+ to permit analysis of conditions that are rare precisely because they only occur within this segment of the elderly population. This is because the age distribution of the elderly population slopes down too steeply and proportional representation would not yield enough numbers for analyses. The oversampling factor should of the order of 2 to 3 to ensure sufficient numbers given the age distribution of the population older than say 60. We illustrate calculations in the case when Y=60 and we only oversample those aged 80+. With a sample of 1,500 individuals aged 60+ we expect no more than 150 will be aged 80+ (based on a stable population with a life expectancy of 65 and a rate of increase of 1.5 per 1,000 per year). Using oversampling factors of 2 to 3 we will target a total of about 375 individuals aged 80+ or about 125 *additional* (extra) interviews. In the pilot project, where the sample size will be of the order of 300 individuals, the expected number of individuals older than 80 is about 30. Using the same oversampling factor suggested above (2.5) we will end up with 75 individuals older than 80 or 45 additional interviews.

To ensure the oversampling of the population older than 80 we should proceed as follows:

- carry out interviews as suggested before without taking into account the age distribution of the population interviewed. Assume that the target sample size is N and that N interviews are completed;
- in a second stage we return to the field and repeat operations but searching for a predetermined number of additional targets all of which are older than 80; we continue these operations until the target number of population 80+ is interviewed.

Oversampling of MEN Older than 80

Just as the steep slope of the age distribution forces oversampling of the elderly above age 80, sex differentials in mortality over age 50 or so, will force us to oversample males in every age

group. In order to calculate precise oversampling factors, these should be estimated by age and should depend on the mortality levels of each country. We recombed to obtain age-specific male-to-female ratios ${}_nR_x$ from the latest survey or census and to calculate the oversampling factor as $({}_nR_x)^{-1}$.The index *x* refers to 60, 65, 70, 75, 80 and 85. The value of *n* is always 5 except when x=85.

Age Misstatement

It is well known that in Latin America, age declaration in general and among the elderly in particular, leaves much to be desired. Age overstatement is very common among those older than 60 or 65 and it would appear that it increases much more rapidly than age itself. To safeguard against this possibility, we will follow a checking procedure formulated below:

- ascertain age of the individual by requesting age and date of birth;
- check declared age and date of birth against a document that may contain one or the other; the interviewer must request such document from the interviewee;
- *check declared age and data of birth with other members of the household.

In order to estimate the extent of age misreporting in the sample, we will draw a small sample among those interviewed (10 or 15 percent of the original sample) and request from them thorough documentation about their age or date of birth.

Oversampling Factors

Due to the need for double oversampling justified in (e.2) and (e.3), total oversampling factors will be product of two separate oversampling factors. Thus, males in the age group 80-84 will be oversample with a factor equal to $2.50*({}_5R_{80})^{-1}$. As we show below, this will result in the need to sample between 1.12 and 1.45 more individuals than what is considered a minimum sample size.

Refusals, Absent Targets, and Screening Failures

The main interview will be administered when

(i) a household where a target resides is identified and the target is found in the household;

(ii) the target accepts to be interviewed; and

(iii)the target successfully passes a screening test confirming minimum ability to respond to questions in a reliable manner.

At each one of these three stages we may lose cases. First, if the target is not found in the household, one must ensure repeated visits at appropriate hours to successfully carry out the face-to-face interview. In general, the interviewers must arrive to residences at times where the suitability of the interview is maximized. It is very important to note the reason for absence of the target person. If an absence is due to illness and the individual is temporary institutionalized, interviewers must trace targets through either repeated visits or through visits to health care facility where he/she is to be found. For cases of longer-term institutionalization (see below).

Second, if the target is found but he/she refuses to be interviewed we must ensure that adequate persuasion is used at all stages, perhaps through the visit of properly identified medical personnel. If despite this and other efforts refusal continues, we should not replace the subject but simply note it as a refusal and record as much information about it as possible. This will be useful for applying statistical corrections for selection procedures.

Alternatively, a replacement for the refusal can be used but with the replacement case appropriately flagged to allow analyses of data excluding the replacement case and ensuring comparability across countries. As long as adequate flagging accompanies replacement of target refusals, countries are free to follow any of the two alternatives mentioned above.

According to recent experience in some of these countries, we should expect a refusal rate of.15 or less. It is of paramount importance that the project be advertised through broad public information channels (radio, newspapers, TV, neighborhood associations, clinics, hospitals, etc...) to ensure maximum participation.

A very different problem is created by those who, having accepted to be interviewed, fail the cognitive test. In this case the interviewer must secure the collaboration of a proxy to respond to some parts of the questionnaire. The proxy should be (in order of priority) the spouse, an adult sibling or child, other adult who confirms to know the target well. It is important that the screening test be administered to the proxy as well. If no proxy is successfully identified, the interviewer should note as many characteristics of the target as possible and proceed to flag the case so that later one can identify it. No replacement strategy is recommended here.

Institutionalized Population

The sample of the elderly population drawn according to the foregoing guidelines will be representative of the non-institutionalized population. This may turn out to be a very selected segment of the elderly population and could lead to distorted estimates of quantities of interest. In an effort to minimize the magnitude of selection biases we suggest that in each country a procedure be put in place to identify the institutionalized population and some of its characteristics.

Before discussing our suggestions we need to define what we consider as institutionalized population: an elderly person is considered to be institutionalized if he/she resides on a permanent basis (more than six months a year spending nights and having meals) in a housing unit where he/she and possibly others like him or her are cared for by personnel who receive payment for such services and whose main line of work is located in such housing units. This definition can include what we conventionally have in mind when we speak of institutions, but also includes group living quarters where one or more elderly live under the care of one or more persons. It excludes arrangements where an elderly is cared for a relative in his/her house or where several elderly people spend the day in a house but return to sleep to a residence.

Although there are a number of procedures that can be utilized to detect institutionalized population, each depending on the amount and quality of information about institutions available in each country, we will recommend to follow MINIMALLY a single procedure to ensure strict comparability across countries. The procedure we suggest correspond to the case when there is no a priori information on institutions or where the information that exists is unreliable and incomplete. It consists of the two following stages.

Stage 1

The first question the interviewer must ask in a household is whether or not there is any household resident Y years or older. Irrespective of the answer, the second question should be whether or not there is a person older than Y who lives or is taken care of in an institution (permanently or on a temporary basis, including daily care) and who otherwise would be present

in the household. If the answer is positive, the interviewer should request identification and address of the institution. We will call these institutions of Type A.

If the answer is negative, the interviewer should proceed to ask a third question, namely, whether there is a relative (irrespective of kinship) or acquaintance of the head or spouse of the head who is taken care in an institution, regardless of what their residence would be if they were not institutionalized. These institutions are of Type B.

Stage 2

Individuals in institutions of Type A can be interviewed in the corresponding institutions directly or via proxy and will constitute the necessary complement to convert the sample interviewed into a representative sample of the elderly, including the institutionalized and non-institutionalized.

In addition, however, combining lists A and B should result in reasonable sample frame *for the institutionalized population identifiable from household information.* We suggest that from the listing of institutions A and B a sample be drawn, say a 10 percent sample. We will then visit the selected institutions and proceed to inquire about the size of the elderly population in each of them. We will then draw a sample of individuals from each institution which is proportional to the size of the institutionalized population in each of them, and proceed to interview them. Given the sample sizes that we are suggesting (about 1,500, see below) and the conservative assumption that no more than 5 percent of the elderly population is institutionalized, we suggest that the sample size of the institutionalized be no more than 60 individuals. In the case of the pilot study we suggest no more than 30 institutionalized persons (this number is more than 5 percent and represents an oversample to ensure that there are enough institutionalized elderly to calculate meaningful parameters).

The sample of the institutionalized population is very important for the study and should be carefully drawn. If needed and resources are available, an oversample of resident of institutionalized population should be drawn.

a) It is important to note that this procedure is affected by two shortcomings:

b) It is not valid if residents of institutions are disproportionately drawn from a population of individuals who are not represented in a random sample of households in the city. This may occur if part of the institutionalized population is institutionalized precisely because they have no close family member to take care of them; and,

c) It is not valid if, for whatever reasons, household members but particularly those facing the respondent's first set of questions, conceal the existence of external care for elderly. This may occur when institutionalization of elderly is stigmatized.

If in any particular country these shortcomings are deemed to be insurmountable, we suggest to follow an alternative procedure. This consists of compiling a list of institutions directly by contacting government agencies or private agencies which could have knowledge about the identification of these institutions or by contacting directly those included in lists that are easy to access.

It is of extreme importance to make sure that proxies are selected as soon as institutionalized individual is chosen. Whether the latter is identified after interviewing a household or as part of the sample of individuals chosen from institutions, we will need to select proxies for two reasons: a) the elderly individuals are more likely to be unable to proceed with the interview and

b) we will need information about reasons for institutionalization from members of the household where the elderly would otherwise reside if he/she were not institutionalized. Those who care for the institutionalized person are more likely to know better the conditions of the elderly and so we recommend them as proxies. However, three questions included in the questionnaire may require tracing a relative of the elderly since they are probing o matters that are more likely to be known by a relative than by an individual unrelated to the target elderly.

Considerations about Sampling Size

By and large, sample technicians conventionally calculate desirable or even optimal sample sizes assuming that the user wants to estimate a single population parameter. In so doing account is taken of the sampling design to estimate corresponding standard errors and to provide an idea of the accuracy of estimation.

In this study we are not only interested in estimating a set of single parameters. Our interest is to estimate parameters measuring the relation between several variables within the context of relatively complicated model representations (multi-state hazard models, multi-state probit models, sequential logistic or probit models). Within this complicated, model-driven context, the sample requirements to carry out estimation with a sufficient amount of power are much more stringent than when estimating a single parameter.

Our calculations suggest that for medical conditions with a level of prevalence of around.10 one cannot proceed to estimate relatively simple models (two-state hazard model, logit and probit models) with a sample of less than 1,500 individuals. Therefore, we suggest that *a minimum sample size* be around 1,500 and that this be the size *before oversampling is taken into account.* In some areas, a minimum requirement will be samples that exceed 1,500 individuals even if no complicated analysis is carried out. In these cases, the sample size should be correspondingly larger. In the other cases, larger samples should be drawn if resources permit.

Two important points should be noted. First, given an estimated non-response of around.15 (including outright rejections and individuals not located, neither of which is replaced), the actual number of potential household targets contacted should be at least 1,500*1.17 or 1,755. Second, this sample size of 1,500 *does not include* oversampling of males, and of males and female who are older than 80. The illustration below should be used as a guide for calculation of the effective sample size.

Illustrative Calculations

We assume that the minimum desired sample size is 1,500. We perform calculations on two different populations, one relatively young and one relatively old. In the illustration in Tables 2 and 3, we do not account for additional cases needed to offset non-response.

The first two columns are the numbers of males and females in each group that one would observe given proportional representation. That is, these two columns are the age-sex distributions that reflect the ones in the total population. The column labeled SR refers to the male-to-female ratio. The next two columns represent what would be observed if the age groups 80+ were adjusted by an oversampling equal to 2.50. Finally, the last two columns represent the number of males and females that will be observed in the sample after we apply oversampling factors to compensate for excess male mortality. In this illustration the oversampling factors were applied to the age groups 75+. Note that the total effective sample sizes are 1,673 in the

case of a younger population and 2,170 in the case of the younger one. Thus the effective number of households that need to be contacted is between 1,968 and 2,552 (these are the values mentioned above, 1,673 and 2,170, inflated by 1.18, the value needed to compensate for non response.)

Table 2: Population of the Country Observed as Relatively Young

Age Group	Observed		Total	SR	After Oversample I		After Oversample II	
	M	F			M	F	M	F
60-64	282	343	825	.82	282	343	282	343
65-69	201	250	450	.80	200	250	200	250
70-74	107	143	250	.75	107	143	107	143
75-79	41	59	100	.70	41	59	59	59
80-84	20	30	50	.66	50	75	75	75
85+	9	16	25	.56	23	40	40	40
Total	**1500**				**1613**		**673**	

Table 3: Population of the Country Observed as Relatively Old

Age Group	Observed		Total	SR	After Oversample I		After Oversample II	
	M	F			M	F	M	F
60-64	191	234	425	.82	191	234	191	234
65-69	167	208	375	.80	167	208	167	208
70-74	129	171	300	.75	129	171	129	171
75-79	103	147	250	.70	103	147	147	147
80-84	59	91	150	.66	148	228	228	228
85+	36	64	100	.56	90	160	160	160
Total	**1500**				**1886**		**2170**	

An Important Note

Since in different countries the population older than 60 attains very different magnitudes, the minimum effective sample size recommended here will represent different sampling fractions of the total population older than 60. When such sampling fraction is considered to be too small (associated standard errors of single parameters are undesirably large), the minimum effective sampling size recommended here should be inflated by a factor larger than unity to obtain a more desired sampling fraction.

By way of comparison, the following are the sample sizes of other health-related surveys of the elderly:

Table 4: Sample Sizes of Other Health-Related Surveys of the Elderly

Survey	N	Age Interval	Comments
AHEAD (US)	7,500	(aged 70+)	Actually interviewed.
HRS(US)	12,600	(aged 51-61)	Actually interviewed.
LSOA(US)	7,541	(aged 70+)	Actually interviewed.
NLTCS(US)	7,000	(aged 65+?)	(Actually interviewed; includes a sample of 400 to 500 aged 95+.)
PAHO(Costa Rica)	1,440	(aged 60+)	(Actual number interviewed to get desired sample size of 1,210.)
PAHO(Argentina)	3,529	(aged 60+)	(Actual number interviewed to get desired sample size of 3,000.)
1989 SHLSE(Taiwan)	4,049	(aged 60+)	(Actual number interviewed.)

THE PILOT STUDY

General Considerations about the Nature of the Pilot

We suggest that the sample size for the pilot be of the order of 200 target individuals plus the oversampling of elderly who are older than 80 and of males older than 75. As calculated before the oversampling factors associated with oversampling of oldest-old and of males above age 75 should be between 1.11 and 1.45. These will produce samples of between 222 and 290 individuals. If, in addition, we assume that we need to account for estimated non-response using an inflating factor equal to 1.17, we obtain sample sizes between 260 and 339.

In addition, we suggest that, if institutionalized populations are identified, a sample of about 30 to 40 be extracted (representing oversampling factors between 1.5 to 2.0). Thus the effective sample size for the pilot will be between 300 and 360 individuals.

There are two general ways of approaching the pilot test: (a) to interview sequentially a small but changing batch of potential respondents, regardless of sampling plan, and (b) to interview only once a group of potential respondents that are a mini-sample of the larger sample.

The former procedure has been used in many important surveys and enables investigators to implement a process of checks and corrections. Interviewers proceed to interview a few individuals at a time (say 10 or 20); in each batch they identify potential problems that are then corrected before the next batch of interviews take place. There are many appealing features of this procedure. One can, for example, target certain types of problematic respondents or problematic items, difficulties are progressively identified and fixed until an optimum way of phrasing a question is found. Its main drawback is that it is very time consuming and it is really designed to only check the robustness of questions and other questionnaire items. It is simply not suitable to test other instruments that may be implemented with or along the main survey.

The second procedure is more time-effective and consists of only a one-shot process: the interview (and other instruments) is tested only once in a mini-sample of the total sample. The instruments are then fine-tuned and adjusted only once, and the main survey is fielded thereafter.

Due to time and budgetary constraints we suggest that the second procedure be followed in all countries participating in the comparative project.

Sample for the Pilot Study

Once the design of the final sample is completed, interviewers should canvass a sample of the selected neighborhoods in search of 200-300 target individuals, as if they were implementing the main survey. This means that the distribution of the 200-300 individuals by age, sex, and socioeconomic status must be identical to the distribution in the larger sample (including oversampling factors). Since this distribution depends on the conditions in each country, we cannot determine in advance one that could be valid for all countries. Instead, this distribution must be determined immediately after the characteristics of the sample have been identified.

It is of the utmost importance that the pilot (as well as the full survey) should be preceded by widespread publicity to elicit maximum cooperation from the population. We also recommend that individuals be encouraged to participate through a system of rewards to be distributed randomly. for example, we could offer rewards of $100 or $200 each to be allocated among the respondents. Is has been shown that these *loterías* are very useful devices to encourage participation and can be offered at much lower costs than making individual payments.

Main Checks to Include in the Pilot Study

The items reviewed below cover the most important areas within which the pilot test will contribute to the larger study. Some of these apply to all countries whereas others are relevant only if a country is implementing an optional module or procedure.

Assessment of Non-Response

The first check is to determine the fraction of non-response. During the pilot test all efforts should be applied to maximize the response rate. Prior publicity and monetary incentives are part of the effort. Special practices ought to be implemented to secure a good first contact with the potential interviewee and a high rate of participation after the first contact.

Application of Cognitive Tests

The pilot test should also be used to verify the utility of the cognitive test that will be used by interviewers to screen potential respondents. Although there are several options available we recommend the use if the Mini-Mental State Examination test, a copy of which will be submitted to each participant country. The basic elements of the Mini-Mental are include in the second module of the questionnaire.

The pilot will also serve to estimate roughly the proportion of individuals who will fail the test and who will need a proxy to respond to some parts of the main questionnaire. We recommend that the process of identifying and interviewing the proxy be tested as well to ascertain the difficulties involved in doing so.

Interviewing Proxies

When an interviewee does not successfully pass the cognitive test, it will be necessary to choose a proxy (see sampling guidelines for procedures to select proxy). The proxy will be interviewed only regarding certain modules in the questionnaire (see section on questionnaire). The pilot test should be a good opportunity to

(i) determine if the modules selected for proxy response are indeed properly selected;

(ii) determine the rate of success in finding proxies;

(iii) determine the rate of success in interviewing proxies once they have been found;

(iv) identify factors that may enhance the chances of identifying a good proxy.

Parts (c.1), (c.2) and (c.3) are required to estimate the rate of non-response. This estimate is to be used to calculate the extra number of individuals that need to be included in the sample to ensure a given sample size. Also, an important goal of the pilot test is to assess the factors that lead to non-response. In addition, to estimate the likely rate of non-response, interviewers should

(i) identify the characteristics associated with non-response;

(ii) identify as many characteristics of the target person and his/her household as possible;

(iii) identify the factors that could reduce non-response.

For example, would the company or visit by a person from the medical establishment help or hinder?

Measurement of Nutritional Status

An important part of our investigation is the measurement of nutritional status. This requires following a protocol to measure (a) weight, (b) height, (c) subscapular and triceps skinfold, (d) wrist diameter, (e) waist and hip diameter; (f) calf diameter, (g) arm span, (h) knee height, and (e) grip strength (dynamometry). These measurements require special equipment: (i) measuring tape; (ii) scale; (iii) calipers; (iv) dynamometer. These measurements should be obtained in all studies. Since they require special implementation, the pilot test should be used to verify that retrieving these measures can take place without major difficulties.

An important logistic issue regards the optimal way to retrieve measurements. It is clear that the interviewer should not do this and that the measurement should be part of the responsibility of a team of individuals different from the interviewer. It is recommended that measurement be carried out after the interview and only after the interviewer has obtained consent for the measurement process from the interviewee. Here again, care must be taken to assess the fraction of the population interviewed who consent to the measurement (and the likely conditions that increase motivation for acceptance).

Another important issue regards the application of instrumentation and calibration of instruments. In order to secure comparability and homogeneity of applications, the equipment will be purchased by PAHO and instructions for its administration and calibration will be provided by an individual associated with PAHO.

Assessment of Physical Limitations

A number of tests will be performed to evaluate sensory and physical limitations. These are used in other surveys of the elderly, have been validated elsewhere (including Hispanic populations), and are extremely useful and easy to apply.

a) We suggest the use of a test to assess ability to preserve balance (standing on one foot).

b) We also suggest a test to assess ability to walk and to sit down and stand without help.

The corresponding tests take very little time to apply, are revealing of limitations, and will establish a baseline for comparison with other countries. A description of their nature will be included in the appropriate place in the questionnaire.

The Questionnaire

The workhorse of a pilot is always the test of the questionnaire and the identification of problems encountered with the formulation of questions. It helps the task when interviewers keep a log where they describe exactly what the nature of the difficulties is.

The following procedures should be applied: We suggest that special care be used to test the questions regarding

a) physical limitations and impairments, including ADL and IADL;

b) existence and duration of chronic conditions.

Special Operations

The pilot test should also be used to verify the feasibility of certain operations that will be entertained by some but not all countries. These are described below.

Preparation for a Second Wave

As a check for increasing the feasibility of a second wave of interviews, we suggest that a question on availability of telephones be introduced. If this question is deemed useful it should be introduced in the main questionnaire.

Record Linkage

Whenever an individual acknowledges the existence of a health conditions that required medical attention within a given period before the interview, it will be possible to establish a potential link with the set of records maintained by the health facility that supposedly provided the services identified by the interviewee. The record linkage operation requires several stages:

(i) consent from the interviewee;

(ii) consent from the health facility;

(iii) identifiers to establish the linkages;

(iv) a procedure (and personnel) to record characteristics of the individuals recorded in the health facilities once the linkage is established.

It is likely that the main problem will be centered on (i) and (ii). The other two stages are easy to implement but perhaps with steep costs.

The advantages of doing a record linkage are formidable since they open the door toward information about conditions, diagnostics and timing of conditions and diagnostics that will enable us to perform analyses that are otherwise completely unfeasible.

Interviewing Spouses and Siblings

In some countries there will be great interest in interviewing spouses and siblings of a target individual. It is well known that many analytic problems can be solved only when information on spouses and siblings are available. In countries where the survey will also include spouses and

siblings the pilot test should implement the procedure for their proper identification and establish the difficulties inherent in the interviewing process. We underscore two important problems:

a) When a spouse is identified in the household, it is important to ensure that responses to the survey are provide so that there is little chance that responses by one spouse influence the responses of the other.

b) In many cases the selection of a sibling living in the same city will not be possible. It is important to estimate from the pilot test the fraction of all individuals who have eligible siblings but live elsewhere, outside the boundaries of the target urban place.

Screening

In countries where the screening protocol will be administered together with the interview, the pilot is an opportunity to test (a) screening devices, (b) easiness of application, (c) number of times a measurement must be taken to ensure reliable assessments, (d) calibration of time consumed by tests and their costs. It is important to check how much more invasive checks could be, what degree of participation would they elicit among the population, and the costs associated with them.

Identification of the Institutionalized Population

An important part of the pilot test is to evaluate the degree to which one can identify and reach the institutionalized population. The pilot test should deploy all efforts possible to follow both methods proposed above and to generate enough information so that a final decision about which of the two is optimal can be made. The following checks are indispensable:

a) Can a list of institutions be created from readily available information?

b) Do individuals in household show reticence to recognize the existence of institutionalized members of the family?

c) Can the institutions identified by individuals be easily reached and can individuals in them be interviewed without unduly long or complicated formalities?

The Pretest

The pretest is an opportunity to test the wording and delivery of questions to an interviewee. In our case, it should also be an opportunity for testing the feasibility and difficulties presented by the protocols to: screen respondents (cognitive tests), assess nutritional status, and evaluate physical limitations.

Members of the main investigating team should select a small sample of no more than 10 individuals, perhaps personally known to them, who resemble as much as possible those that will be included in the sample, e.g. older than 60, males and females. Include a few who are members of the oldest-old category and, if possible, some who are incapacitated due to some conditions, or even institutionalized. The idea is to first apply the cognitive test and evaluate its performance (does it do what it is intended to do?). Second, administer the long and short interview under conditions *mimicking those of the interview*. Ideally we should include individuals who are considered difficult, impaired and others who are less so.

Administer the cognitive test, the battery of assessment of nutritional status as well as the protocol for physical limitations. Finally, administer the questionnaire (long and short interviews) as if carrying out the pilot interview. Make sure that you duly note the kinds of

difficulties experienced at all stages, limitations in the wording of the questions, obstacles in the administration of nutritional assessment protocols or in the administration of tests to evaluate physical limitations. Also pay particular attention to issues that may startle, surprise or turn off the interviewee. We need to secure maximum conditions of cooperation and we should use the pretest to ensure that questions do elicit responses and maximize participation rather than the opposite.

At the end of the pretest, the main investigator and team should identify the main areas of problems and design solutions. Whenever changes are needed that may threaten the comparability of the information, we advice that the change not be implemented until having consulted with PAHO.

The pretest should also be used to identify suggestions and pointers for interviewers so that they can be included and emphasized in the manual of the interviewer.

Training of Interviewers and Special Requirements

The pilot test is the best opportunity for assessing requirements needed to optimize the interviewing process. It should be used to

1. determine special needs for instructions to and training of interviewers:
   1.1. training for minimizing refusal rates
   1.2. training for applying visual and hearing tests
   1.3. training for applying cognitive tests
   1.4. training for measuring nutritional status
2. screening the utility of particularly necessary, troublesome or delicate items in the questionnaire:
   2.1. questions regarding institutionalized population
   2.2. phrasing of questions regarding nature and duration of impairments, ADL and IADL, chronic and acute conditions
   2.3. questions regarding use of medications
   2.4. questions regarding hospitalizations
   2.5. questions or items regarding neglect and abuse of elderly.

We suggest that all training be centralized at the level of PAHO. To accomplish this we will have a training session for trainers that will take place in the US during February of 1998. A PAHO team will train these trainers to

- train interviewers in the administration of the interview
- train interviewers in the administration of cognitive tests, the battery of physical measurements, and the battery of physical tests;
- train personnel in the mechanics of data entry and administration of consistency checks

Consent Form

The following consent form was approved by the University of Wisconsin Human Subjects Committee. We recommend that a similar form be administered to subjects in each of the countries participating in the project.

Statement on Protection of Human Subjects

Nature of Research

The Principle Investigator (PI) is the main coordinator of the project, which involves research centers located in seven countries of Latin America and the Caribbean and Puerto Rico. This team is operating under the auspices and with the financial support of the Pan American Health Organization. The PI's tasks are

a) to produce guidelines for sampling;

b) to coordinate pilot testing;

c) to organize the data collected; and

d) to carry out data analysis.

The project is partially funded by the Pan American Health Organization and each of the countries involved. The actual data collection will be carried out within main urban centers in the countries. Human Subjects clearance will be obtained both from the Pan American Health Organization Ethical Review Committee and from the corresponding authorities in each of the countries participating in the project.

The PI will ensure that any changes to the spirit or letter of this statement and of the consent form that may eventually be introduced by the Pan American Health Organization or the countries participating in the study, will be promptly reported to the Committee for the Protection of Human Subjects.

Subjects

The project will interview approximately 2,500 elderly people (aged 60 and above) in seven countries of Latin America and the Caribbean: Barbados, Brazil, Chile, Costa Rica, Cuba, Mexico, and Uruguay. The target population will be representative of the elderly population with oversamples of the oldest-old (aged 85 and above) and of those from poor socioeconomic strata. In some countries, in addition to a target respondent, the questionnaire will be administered also to his/her spouse and a randomly selected sibling provided they are 60 or older. Whoever the eligible respondent may be, the interview will only be carried out after he/she successfully passes a cognitive test designed to assess his/her cognitive capacity.

Research Material

The interview is designed to assess the physical and mental health status of the respondent, the access to and use of medical health, the extent of support from relatives, the resources used to defray medical costs, and the use of medications. In addition, the questionnaire contains items designed to elicit marital histories, occupational histories, and a recent family and individual medical profile.

The interview will be accompanied by the administration of a protocol to measure nutritional status. This will be done using scales, measuring tape, calipers and dynamometer. The resulting measures (weight, stature, skinfold and grip strength) will be used to estimate body mass and nutritional status. The instruments selected for measurement are non-invasive, of easy application and routinely used in other medical and anthropological research. Some countries

will also implement a second procedure for data collection. This entails obtaining medical records for respondents who were in need of medical attention during the year prior to interview. These records will be obtained with the consent of both the individual and the corresponding health agencies.

Recruitment and Consent Procedures

Respondents will be identified through a probability sample of major urban areas utilizing as sampling frame the most recent census or survey in the country. Interviewers will sweep selected neighborhood units (similar to census tracts in the U.S.) and will proceed to identify households where there is at least one elderly person. If there are more than one eligible elder, a random selection of a unique respondent will follow.

In order to enhance participation, the survey will be preceded by extensive and massive publicity from TV, radio and newspapers. Also, interviewers will be selected from among paramedical personnel to increase the population's interest and trust.

Consent for interviewing and measurement of nutritional status will be obtained by reading a standardized protocol to the potential respondent, and then by asking for verbal and written consent. The oral statement will indicate that the respondent is free to decline answers to any questions and that the interview can be terminated at any time without there being any consequences for the subjects. The interviewers will be instructed to abandon interviews when the potential respondent reports that they do not want to proceed with the interview.

A copy of the consent form will be left with the respondent. Copies of consent forms will be maintained at three different places: the national institution administering the interview, the Pan American Health Organization, and the Center for Demography and Ecology, University of Wisconsin.

In order to be eligible, a potential respondent does not necessarily need to be literate. Once consent from the potential respondent is obtained, a battery of hearing, vision and cognitive tests will be administered to determine if the subject is eligible for interview. In case of impairment in any of these areas, a proxy will be selected from within the household. In such cases, consent will also be obtained from the proxy as well.

In countries where the operation can be undertaken, consent for utilization of medical records will be obtained from the respondent after reading a written statement which will then be signed by the respondent (see below). All the operations of record linkage will be done on site: that is, by personnel employed by the health facility where the records are kept. This implies that no record linkage will be done unless there is full participation of and consent from the health agency and medical personnel involved.

Identification of Risks and Problematic Cases

Since participation is completely voluntary and since the interview can be broken off at any point, we believe that issues of participation of the population are non-problematic. There are, however, other issues that are equally delicate and that need to be addressed. These concern the conditions of the elderly and the potential need for immediate action upon discovery of those conditions.

Discovery of Health Conditions in Need of Medical Attention

Personnel carrying out interviews will be trained so that either through visual inspection or through the responses to selected questions, they are in a position to detect the existence of conditions that may require immediate medical attention. If that occurs, the respondent or one of the adult members of the households will be given instructions to proceed and they will be provided with the name of a contact person in the center carrying out the project. This person will be instructed to take action as required according to a protocol that will be elaborated for the purpose by trained medical personnel.

The consent form will reflect this procedure and the interview will only proceed if the respondent or proxy agree to the terms of such a course of action. If the respondent and/or proxy agree to the interview and to the consent form but in the end decline to receive proper help if a problem has been discovered, the household will be identified and trained professional personnel will be advised of the situation.

Discovery of Abuse or Neglect

Personnel carrying out the interviews will also be trained to detect the existence of physical or mental abuse or neglect of the elderly respondent or of any other elderly living in the household. If such evidence is uncovered, the interviewers will be instructed to speak to the contact person at the center who will then proceed to take appropriate action.

Confidentiality

All information collected will be coded and all personal identifiers eliminated. The actual interviews will be destroyed soon after the database is constructed and operational.

Risk/Benefit Trade-Offs

We believe the project will bring about important benefits to the elderly population and their relatives. We also think that the provisions adopted guarantee that risks to the population are exceedingly small.

Statement to Be Read to the Subjects (Interview)

[Note: This is a prototype that can be modified in each country according to guidelines set forth by the Pan American Health Organization and the government agencies in each of the countries involved in the project.]

"How are you? My name is (*name of interviewer*) and I am with the (*country center*). You have been selected to participate in an important study on the health of elderly people. Perhaps you have seen news about it on TV or read about it in newspapers or heard about it on the radio (*interviewer shows newspaper clippings*). This study is sponsored by the Pan American Health Organization and by (*name of country center and supporting health agency*).

The purpose of this study is to help doctors, educators, and public health officials better understand the factors that influence the health condition of the elderly and the kinds of resources that can be used to ameliorate their health, social and economic situation. This interview will cover aspects related to your health, the access and use of health services you have, and the types of resources you can use when you are in ill health. We will also talk about some of your behavior (diet, for example smoking) that is presumably related to your health

condition. We will also measure your height, weight, skinfold and grip strength to help us assess your nutritional status. Before beginning the interview, you will be administered a battery of tests that will enable us to determine if you have vision or hearing problems that may affect your responses to the interview (*explanation of procedures should follow*).

We want to emphasize that participation in this study is completely voluntary and that all the information you provide will be kept confidential. The scientist involved in this study will need your information for statistical purposes, not for ever linking the information back to you at any time. In fact, records of this interview will be destroyed after we enter the data in a coded form, so that it will not be possible to trace the data back to you.

If you decide not to participate in the interview, there will be no consequences for you nor for the type of medical and health services you currently receive.

If during the interview we identify health problems of which you were not aware, or of which you were aware but did not treat properly, we will explain the conditions to you and request that you accept to be referred to properly trained medical personnel. If you do not agree to this, we will not carry out the interview.

Similarly, if during the interview we discover indications of mistreatment, abuse or neglect, we request that you consent that we alert and you be referred to specialized personnel. If you do not consent to this, the interview will not be carried out."

Statement to Be Read to the Subject (Record Linkage)

"Since you have had a medical condition that required medical attention within the last year, we would like to ask your permission to participate on another phase of the study. This implies that you give us your permission to access the medical records of the facility where you were treated. We will extract information on the diagnosis, treatment and prognosis only and this information will be appended to the information you have provided to us in the interview. The extraction of information will be done at the medical facility where you were treated and by personnel authorized by your doctor or doctors. Once this information is appended to your interview, all traces of your name will disappear and the entire folder for your case will be destroyed."

NATURE OF INFORMATION AND ANALYSES

The data collected through the pilot and main survey (with or without the supplemental information from record matching) will be sufficient to provide a descriptive picture of the health status of the selected population, patterns of health related behavior, access to and use of health care and, finally, patterns of family support employed to cope with deteriorating health conditions in old age. Furthermore, the information will be complete enough to enable us to identify differentials by socioeconomic status, sex, and cohorts in all four of these areas. The descriptive accounting can be done through conventional frequency tables and tests of proportions, such as those utilized in previous PAHO surveys. The discussion about samples above was predicated on the assumption that the sample size (over 1500 individuals) in each country should exceed somewhat what is required to produce reliable point estimates of important quantities and, therefore, we take it for granted that basic descriptive measures with point estimates of parameters or differences of parameters will be robust enough.

However, more sophisticated analyses will be possible. These analyses can be used to test or falsify a set of fairly simple but important hypotheses and conjectures. In what follows we first state the nature of *selected hypotheses and conjectures* and then briefly identify major forms of analyses.

Main Hypotheses and Conjectures: Health Conditions

An important but controversial issue is whether or not the aging of population will signify an increase in the quantity of sickness and disability experienced by the society as a whole. Trivially, as the proportion of elderly increase, there should be an increase in the proportion of the population experiencing illnesses and disability and in the total time spent ill or disabled. But this is a purely mechanic effect of the growth of the population who is old. The problem is really another one, namely, what will be the level of sicknesses and disability among the elderly? The evidence in developed countries is somewhat murky and contradictory. Some researchers have insisted that aging is accompanied by a compression of the period of time during which sickness and disability occurs; others, instead, have argued that increases in life expectancy early and life as well as improvements in mortality at older ages increase the average frailty of the population attaining old age and, therefore, that the quantity of sickness and disability experienced by it expands correspondingly. It is very difficult, if not impossible, to verify what the trends are without access to longitudinal data or, at least, to a time series of comparable cross sections. In fact, what one needs is a set of measurements of sickness and disability by age groups over a relatively long period of time. Our research will establish a benchmark: each age group consists of a cohort carrying its own load of disability and sickness. If similar benchmarks are established in the future, it will be possible to assess the degree to which the load of sickness and health change over time for different cohorts.

A second aim of our research is to clarify group differentials in health and health care. As in more developed countries we expect to find differentials in health status and access to and use of health care across a number of characteristics. This expectation can be articulated more precisely through a series of hypotheses. In these hypotheses the term ‘health conditions’ refers to any of the indicators of health that can be designed using self-assessment of chronic and acute conditions, ADL and IADL, assessment of physical limitations and of nutritional status, or a combination of all or some of these as is, for example, the index of Active Life Expectancy, ALE.

(i) There are important sex differentials in health conditions. In part these differentials are due to female disadvantages in access to and use of health care as well as socioeconomic conditions during adulthood, but are also the outcome of selection effects that operate more powerfully among males who are exposed to higher levels of mortality than females throughout adulthood. Other conditions being constant, we expect sex differentials to be larger in countries that have experienced larger sex differentials in mortality at all ages before 60.

(ii) There are important cohort differentials in health conditions. To the extent that the secular decline in mortality ensures than younger cohorts experience less severe selection than older cohorts do, health conditions could be worse off among the former. In addition, Barker and colleagues have suggested that survival after experiencing certain childhood diseases may, ceteris paribus, increase risks in adulthood. Thus, younger cohorts who have benefited from advances in preventative and curative

medicine, may be at a disadvantage at older ages. It is likely that younger cohorts also differ in terms of their health related behaviors as well as their knowledge about access and use of medical care and this may partially offset the effects of their disadvantages. Finally, differences in health conditions and in access and use of health care across cohorts could simply reflect age differences at the time of the survey.

(iii) There are important socioeconomic differentials in health conditions that are only partially explained by differentials in access to and use of health care. These socioeconomic differentials are more pronounced among females than among males and among younger than among older cohorts. Similarly, socioeconomic differentials should be more intense in countries with a weaker tradition of delivery of medical and health care to the population.

(iv) There are important differentials in the processes that lead to illnesses and the corresponding recovery processes. These differentials occur across a number of dimensions, including gender, cohort, and socioeconomic conditions and remain after relevant factors are controlled. More concretely, these differentials translate in contrasts in the magnitude of the rates of transition from the healthy state to illness and back.

(v) There are significant differentials in health conditions and in the processes that lead to illnesses and recovery processes among the institutionalized and non-institutionalized populations. These differentials are only partly accounted for by differential composition by gender, cohort, and socioeconomic conditions of the institutionalized and non-institutionalized populations.

(vi) The extent to which elderly individuals receive any form of support (living arrangements, transfers of assets, income flows, care and attention, etc.) from members of a close kin group (co-resident or not) varies by socioeconomic status of the elderly and strategic members of the kin group. Its prevalence and timing change with the health condition of the elderly and the type of alternative support that may be available to them.

Analyses

In what follows we will outline very roughly some analyses that can be used to test the aforementioned conjectures. It should be noted that all analyses outlined below will become considerably more powerful if survey information is enhanced with data retrieved from record matching or from a second wave. Our intention here is not to be exhaustive nor to summarize precisely all pertinent theoretical frameworks regarding causal relations but to highlight analyses that can be performed with the proposed data collection protocols.

Life Tables of Active and Disability-Free Life Expectancy

Combining information on self-reported illnesses, self-reported and objective physical and functional limitations, and their reported duration one can construct life tables portraying the impact that illnesses, physical, and functional limitations have on the total amount of time spent free of them. The techniques for construction of such quantities are well known and although better estimates could be obtained from longitudinal observation protocols, it is possible to use reported duration of condition and time of onset of various episodes to replace what would be obtained from a follow up.

Estimates could be obtained by cohorts, socioeconomic conditions and gender. Applying simple statistical tests one can then verify the existence of differences across selected groups in the life expectancies.

An important limitation of these procedures is that the information which will be available to us regards processes affecting the surviving population. No information on mortality can be incorporated for the population we study unless a follow up is carried out. This could only be done if we implement a second wave of the study whereby information on survival can be retrieved in a simple way. The price we pay for this is that estimates will be based on the very strong assumption that processes observed in the sample are identical to those that would be observed had we also included information on mortality.

Multivariate Analyses of Illnesses and Physical Limitations

Of fundamental importance is the estimation of models representing the effects of covariates on transition rates between healthy states and states characterized by illnesses. At any age an individual can be classified as being in a healthy state or, otherwise, in a state characterized by some type of illness, disability or limitation. What is of interest in these processes is how individuals move in and out of these states, the degree to which they remain once they begin a sojourn in the state, and the extent to which they return to the state once they move out of it. Of equal importance is the assessment of how various characteristics of the individual (education, income, participation in social programs, behavioral risk profile, access to and use of health care) affects the intensity of the transition rates and, therefore, the ultimate distribution of the population across various states.

Here again, the main limitations we will face is that our estimates will be obtained assuming that processes are identical as what we would observe had we followed the population to observe significant attrition due to mortality and that the retrospective information on timing of events and types of events is accurate.

Analysis of Clustered Data for Partitioning Estimated Effects on Health Status

Data collected for individuals who share similar environments but not similar genetic traits (spouses) and others who may share some genetic traits but are exposed to different environments (siblings) is necessary to attempt to identify the role played by genetic characteristics, environment, and individual behavior either on the incidence of illness or on mortality. Although the study design we propose is necessarily and intentionally limited in this regard (a more complete study would include a large sample of siblings and information on those sharing work environments not just those sharing residential environments), it will nevertheless enable us to apply a number of techniques for the analysis of clustered data. The main purpose of these models is to identify and estimate efficiently the effects of individual behavior, shared environments, and shared genetic endowments on (a) the occurrence of certain diseases, (b) the experience of physical and functional limitations.

Risk Profiles and Disability / Morbidity / Mortality Forecasts

Assume that through analyses such as those proposed in (c.1) through (c.3) one succeeds in retrieving robust estimates of the effects of some covariates on incidence and duration of chronic illnesses, disability, and functional impairment at various ages (while purging for the influence

of genetic conditions) for all individuals aged 65 and above. Suppose further that we can, through external sources, derive mortality estimates at various ages for individuals who experience some of those health conditions and limitations. It should then be possible to entertain forecasts of future illness, disability and physical impairment and mortality of those now aged 55-64: we need to combine the estimated effects of selected characteristics and observed patterns of behavior ('risk profile') on the experience of illness, limitation or impairment of individuals for the entire sample with the prevalence of risk profile among those now aged 55-64. If, in addition, we know or can estimate health costs associated with each condition, it will be possible to combine their (discounted) value with forecasts of illness and disability to project total health costs within the next five to ten years.

Most of the analyses suggested above require three dimensions for the information on illnesses, disability and limitations: nature, severity, and duration. It is well known (United Nations, 1995) that such dimensions are better informed by longitudinal surveys than by cross sectional ones. However, it is possible to retrieve relatively accurate information provided that one limits the recall to a short period in the past, that the inquiry sweeps only a few, well-defined conditions, and that a battery of questions or tracers is used to better retrieve degree of severity.

Morbidity and Functional Limitations

A particularly important part of the analyses involved in (d) above requires the assessment of the relation between chronic conditions (arthritis, cerebrovascular disease, cardiovascular problems) and functional limitations. If through retrospective reports one is able to sort out the timing of events (for example, to determine that a chronic conditions precedes the onset of a functional limitations), it will be possible to assess the degree to which these two sets of conditions are related to each other (after proper controls for confounding factors are introduced). To the extent that we are able to estimate the effects of chronic conditions on functional limitations, we will be able to also provide an estimate of demand for assistance required by predicted levels of limitations. And, if behavioral profiles are used to predict chronic conditions, we will be able to link them to functional limitations and ultimately to demand for assistance from elderly with functional limitations.

Models to Understand Family Support

In recent studies of families and households in Latin America reference is often made to the fact that the elderly rely heavily on support provided by close members of their families (children, grand children, in-laws). Furthermore, it is assumed that, as has occurred in developed countries, the prevalence of family support has been on the decrease, and is likely to drift even lower in the decades to come. However, neither contention has been put to a rigorous test. The information we propose to collect will provide a rich base to carry out numerous tests of the various hypotheses.

First and foremost we will be able to focus on different types of support (co-residence, transfer of assets, income flows, exchange of goods and services; care and attention when ill or disabled). Second, we will be able to distinguish what is realized and observed (observed support) from what could have been (potential support). It is not enough, for example, to verify that there is a certain level of prevalence of co-residence with children. What one needs to ascertain also is the maximum prevalence *given availability of surviving children.* Third, we will be able to assess the timing of the support (if any is available). For example, we will be able to

determine if support increases in difficult times and then wanes, or whether it is provided as a constant, regular flow. Fourth, we will be able to determine the extent to which elderly people provide resources to other kin in exchange for support.

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