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**INH:
Development of a
Shelter Sector
Data Base**

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1.0 INTRODUCTION AND OVERVIEW

1.1 The Background of this Study

The purpose of this report is to review the data and analysis requirements of the Instituto Nacional de Habitacao (INH) for development of computerized data bases and preparation of housing market studies and statistical analyses. In addition, a number of research papers and documents describing housing data collection in the United States were provided to INH during our visit as examples of the types of data collection and analysis of the shelter sector issues that take place here. This report will assist INH to put these various documents in context.

As indicated in the terms of reference for this study, INH has financed the construction since 1984 of over 30,000 dwelling units, with prices averaging less than one-half the median sales price of other units. INH has thus been successful in helping reduce the pent-up demand for new housing designed to meet the needs of moderate income families. However, in order to design and target its future activities, and to carry out its mandate for preparation of a national housing plan, INH faces three major requirements:

- the need to obtain a sharper definition of the portion of the housing market most relevant to INH. From an operational standpoint, INH needs the same kind of detailed market research information as a commercial company;
- the need for data to carry out its mandate to prepare a National Housing Plan. As the agency charged with research into national housing issues and needs, INH does not currently have adequate information to fulfill this mandate; development of an in-house, computerized data base is strongly recommended;
- the need for additional research staff, data processing and analysis software, and research methodologies to develop the computerized data base at INH and carry out the tasks described above.

The importance of a sharper definition of the market has become clear, especially in the face of higher land costs, limitations on credit, and lack of full information on new construction (including clandestine), rehabilitation, and demolition. Also, it is not clear whether or not INH has satisfied the market in some municipalities. Thus, INH needs to better understand the extent of demand still outstanding and the location and characteristics of families requiring this type of housing assistance.

In addition to stimulating and supporting the increased development of low cost housing, the statutes creating INH assign it another role: as the agency which advises the Ministry of Housing on overall housing needs. To a limited extent this function has been assumed by the National INE (Institute of Statistics) and by GEP (Gabinete de Estudos e Planeamento). Much more

could and should be done, however. Both GEP and INE have broad agendas with regard to economic issues in Portugal; housing is simply one of many topics. INH, on the other hand, would concentrate exclusively on housing studies and be able to provide timely and focused research and planning.¹

Data bases adequate to assess housing demand and supply at the national level have not yet been assembled, however, and the responsibility for preparing a comprehensive analysis of national needs does not appear to have been assumed by any institution. An example of a current dilemma faced by researchers at INH helps support this point. The lack of information about the composition of the housing stock and the rate of change of its components is well illustrated by three seemingly inconsistent estimates. The 1991 Census indicates an increase in the stock since the 1981 Census of approximately 900,000 units. Information on building permits and new household formation would suggest a change on the order of 500,000 units. Finally, an estimate made by INH, based on a formula including variables for the existing housing "deficit", new family formation, and replacement of retired units, indicates a need during this time period for about 750,000 units. Thus, additional data are required to facilitate reconciliation of these different measures of changes in the housing stock. INH staff can help define the needed variables and guide the design of such an effort.

1.2 The Evolution of Our Recommendations

This report is a continuation of a study carried out in late 1988.² One of the major conclusions of the prior study was that existing data were not adequate to support needed analyses of national housing supply, housing quality, housing deprivation, and market demand. Since the submission of the earlier review, INH has refined its requirements for housing market and demographic data and, in a memorandum submitted to the National Institute of Statistics (INE), requested that some of these data be collected in the 1991 Census. This request was not acted upon. Nevertheless, INH has continued to define and specify its data requirements. Meanwhile, a national Family Budget Survey, as well as the new Census, was carried out in 1991. If these data can be made available to INH in an accessible form, they will provide an important analytical resource. In addition, however, other data, as well as staff and analytical support, will be required before INH can carry out its agenda as effectively as it would like.

The proposals in this report have been developed within this context. The current recommendations are based on (1) our earlier findings regarding development of housing

¹ In the United States, there is no exact counterpart to the INH. The research division of the Department of Housing and Urban Development (HUD) comes closest, however. Over the years, HUD's large and active research department (Policy Development and Research) has conducted surveys, developed data bases, and performed policy and research studies that form the basis for the creation and evolution of all federally-based housing programs. The Bureau of the Census collects housing information on behalf of HUD; the research, however, is guided by HUD.

² See Sally R. Merrill and Harry Garnett, Shelter Sector Research in Portugal: Development of a municipal data base by INH, January 26, 1989, Abt Associates, Cambridge, Mass.

analyses and the data bases required for these analyses, (2) INH's subsequent refinements of the proposals for data collection, and (3) the imminent availability of 1991 housing and demographic data which could be made available to INH in computerized form. Our recommendations follow extensive discussions with INH personnel, particularly the director of the Department of Research within INH. The goal remains to develop an "in-house" capability in housing research designed not only to help define INH's own programs, but also to assist in understanding the housing sector nation-wide and to formulate INH and other housing programs within this context. INH would be greatly assisted in establishing its priorities with regard to the housing deficiencies of lower income households if additional data were made available and if existing as well as new data were assembled at the level of the municipality.

Several key questions must be addressed by INH in order to better target its clients, understand what types of households are likely to demand housing in the future and what the characteristics of this housing might be, and to place these estimates within the context of nation-wide changes in demand and supply:

- What is the demand for housing, at the municipal and district levels? How is the stock changing through the addition of new units, including clandestine housing? Through demolitions and alterations? What types of housing deficiencies need to be corrected?
- What level of resources are available to households served by INH-assisted projects? What segments of the national distribution are represented? To what extent are low income households able to be assisted?
- What kinds of housing needs exist in municipalities that do not currently have INH-assisted projects? How might these areas be aided?
- What is the nation-wide profile of additions (including clandestine) and deletions from the stock, the pace of household formation, and the distribution of household income?
- What do these nation-wide parameters suggest regarding additions to or changes in Portugal's housing policies with regard to issues such as assistance to low income households, rehabilitation, upgrading, and rent control.

The recommendations for INH action that we feel will be necessary to help address these questions are summarized below. Refer to section 3.0 for a more detailed discussion.

1.3 Summary of Our Recommendations

Our recommendations regarding data collection, data base development, and analysis, briefly stated, are the following:

- **INH should develop an "in-house", computerized, housing data base, using the relevant portions of existing data sets now analyzed elsewhere.**
- **INH should request that additional information on changes in the housing stock be collected in the Statistics of Construction and Housing.**
- **INH should develop a survey regarding housing quality and household income and have the survey fielded in selected municipalities.**
- **INH should respond to INE's request regarding a "biblioteca" of construction information. This in no way takes the place of the proposed INH data base, however.**
- **INH should develop a longterm analysis plan, explaining its approach to studies needed for a National Housing Plan.**
- **INH should expand its research staff and statistical analysis capabilities to accommodate these tasks.**

Our recommendations are designed to provide INH with practical and implementable steps for developing its own "in-house" data bases and analytical capabilities. INH already has well developed information systems designed to track and monitor its operational activities. Our recommendations for additional information and analysis would, in the first instance, complement the operational systems and allow INH to better understand, and therefore better target and select, the families and geographical areas its wishes to serve. More importantly, however, the suggestions point to the creation of a research capability to serve all national needs.

Some specific recommendations for developing housing market information are summarized below. In order to expand INH's analytical capability as cost-effectively as possible, the majority of these recommendations are based on use of existing data and data bases, most of them already developed by INE. These include the Census, the Statistics of Construction and Housing, and the Family Budget Survey. Because of INH's desire to understand housing need in specific, local real estate markets, however, the recommendations include design and implementation of a new survey specially focused on INH analytical requirements. These requirements cannot be

met through existing data for two major reasons: the appropriate data are not available for local areas, such as municipalities or even neighborhoods, and information on household income and housing attributes is either missing entirely or insufficient. We therefore make the following suggestions:

- (1) INH should obtain machine-readable extracts of data from three major surveys: the Census (Censos), the Family Budget Survey (Inquerito aos Orcamentos Familiares), and the Statistics of Construction and Housing (Estatisticas da Construcao e da Habitacao). These data would form the nucleus of INH's "in-house", computerized data base.
- (2) Data from both the Family Budget Survey from the Census sample should be obtained for individual households. This will allow a "micro level" data base to be constructed, from which INH can easily derive any aggregates it wishes. Furthermore, only with this type of "micro" data base can the types of multi-variate statistical analyses that we recommend be undertaken. As an example, from the Family Budget Survey, INH can determine what proportion of households in each income decile lack adequate services.
- (3) INH should request INE to immediately modify the procedures by which housing stock data are obtained annually from the municipalities for preparation of the report on the Statistics of Construction and Housing. Both production of clandestine housing and demolitions should be included so that the components of change of the stock can be understood. The Census of 2001 would be similarly modified.
- (4) INH should also begin preparation of a data base utilizing its own information on the status of its projects, but including data on the income and family size of the households served by its projects. These data are currently available for cooperative projects; they should also begin to be collected for municipal and developer projects. These data should be entered into the computer as the applications are processed and made available in a research file to be used by the Research Department. This data base would provide an initial look at the association of household characteristics and planned-for housing characteristics. Differences among municipalities could be analyzed.
- (5) INH should develop a capability to analyze "local level" data in detail. Thus, INH should design and implement a highly-focused survey of housing needs and households characteristics, focusing on municipal level data for a limited number of representative and high priority municipalities. Because this is survey, that is "primary" data, the observations are taken at the household level, as for the Family Budget Survey. While the data from the sources indicated above are

important for many of INH's analyses, they are not sufficient in level of detail nor disaggregation to support "local level" analyses.

- (6) The National Institute of Statistics has recently announced its intention to develop a "Biblioteca Central De Dados Da Construcao", presumably a central library on construction statistics. INE has requested specific statements of interest from INH and other institutions. While INH should certainly provide such a statement of interest, this "Biblioteca" in no way supplants the need for INH to develop its own in-house computerized data base. Even if INE completes this task, the data will not meet all of either INH's needs nor national needs for information. (At a minimum, the INE data would not include all the needed variables, nor the type of "linked" files we are suggesting.) INE will indeed remain the major national data collection agency. It is INH, however, rather than INE which can provide well-focused housing studies in a timely manner.
- (7) INH should begin the process of clarifying the current goals of the Ministry of Housing for the National Housing Plan. A complete analysis plan for housing studies and schedule for execution should be prepared and discussed with the Ministry, INE, the Census, GEP, and any other interested groups.
- (8) As has been indicated, INH has developed detailed computer systems for its own programs. The personnel assigned to these functions, however, are already fully occupied with existing tasks and do not have time to undertake further studies. Thus, additional personnel should be made available to the Gabinete do Estudos (Research Department) within INH in order to assist existing staff carry out the analysis functions. These personnel should have strong backgrounds in housing economics and statistical research methods.
- (9) Specialized software should be made available to the staff of the Gabinete in order that the requisite data bases may be developed and the research carried out appropriately. We recommend software programs that provide a wide variety of easily accessible multi-variate analysis functions, such as SAS (Statistical Analysis System). A version of SAS has now been perfected for PCs. The computers at INH appear to be able to accommodate this program and handle data bases of ample size. However, to provide access for additional staff, INH is likely to need additional PCs. These should be purchased with the expanded analysis function in mind, as capacity and speed become particularly important in working with large micro data sets and more complex analytical functions.

2.0 AN OVERVIEW OF THE INH PROGRAM

2.1 Background

Between its provisional inauguration in mid-1984, and 1990, INH has financed the construction of dwelling units with sales prices that, on average, have been less than one half the median market price. The INH program gives developers access to subsidized interest rate lending so as to stimulate the production of low-cost housing. By the end of 1990, the INH was supporting another 14,515 units under construction. With total assets of \$416 million at the end of 1990, INH disbursed some Contos 28.5 million (approximately \$200 million), a record level of activity, and contracted the financing for 7673 units.

Cooperative organizations were the principal beneficiaries of INH programs, accounting for 69 percent of the total authorized lending in 1990. In the five year period 1984-1989, they accounted for 67 percent of all financing contracts signed with the INH. These projects, and those developed by municipal governments and private entrepreneurs, produce housing units with prices affordable to families with aggregate incomes as low as 91,000 escudos per month (\$630), well below the median estimated at 120,000 escudos for 1991.

Table 2.1 presents recent INH output data according to the type of developing organization and the stage of the process.

Table 2.1
INH Output by Promoter

| DEVELOPER | 1988 | % of Total | 1989 | % of Total | 1990 | % of Total |
|---------------------------|------|------------|------|------------|------|------------|
| 1. COOPERATIVES | | | | | | |
| Approved Projects | n/a | n/a | 5280 | 52.8 | 1277 | 57.2 |
| Contracted Loans | n/a | n/a | 4633 | 61.1 | 4147 | 54.0 |
| Completed Units | 2810 | 81.1 | 3590 | 66.1 | 3643 | 65.3 |
| 2. MUNICIPALITIES | | | | | | |
| Approved Projects | n/a | n/a | 3361 | 33.6 | 409 | 18.3 |
| Contracted Loans | n/a | n/a | 2024 | 26.7 | 2676 | 34.9 |
| Completed Units | 305 | 8.8 | 1201 | 22.1 | 1244 | 22.3 |
| 3. PVT. DEVELOPERS | | | | | | |
| Approved Projects | n/a | n/a | 1365 | 13.6 | 545 | 24.4 |
| Contracted Loans | n/a | n/a | 922 | 12.2 | 850 | 11.1 |
| Completed Units | 348 | 10.0 | 641 | 11.8 | 692 | 12.4 |

Nationally, total official housing production (that is, with permits etc.) reached 61,656 units in 1989, the largest level on record. Previously the official total had never passed 50,000, and, in fact, in 1985 a low of 38,397 was recorded. It is expected that production in 1990 will have been lower than the record 1989 level due to a combination of restrictive GOP credit policy and increased interest rates.

The majority of the units constructed with INH support were located in the major urban areas along the Atlantic coast, including Braga, Porto and Vila Nova da Gaia, Coimbra and the Lisbon metropolitan area, and around Faro in the Algarve. The Lisbon area accounted for a major share of the construction, and the INH construction data appear to reflect accurately nationwide population migration trends.

In 1990, INH loan contracting and actual disbursements grew at a much slower pace. More surprisingly, as can be seen in Table 2.1, new project approvals, the first step in the process, declined by 70 percent from prior levels. These conditions result more from the impact of national economic policy than from a clear reduction of pent-up demand. It is possible, nevertheless, that for some segments of the market, and in some localities, the INH has been successful in satisfying the demand for new housing.

2.2 New Program Orientation

Home Acquisition: the INH Program

In spite of lower numbers of project approvals, the INH program has continued to offer Portuguese families access to units at well below the cost of those produced outside the program, with unit prices commonly below 5,000 contos (\$34,000), and many of the smaller units (one, and two-bedroom) affordable to families with monthly incomes between 91,000 and 100,000 escudos per month (\$625-\$690), levels 2.2 times the national minimum wage.

At the same time, INH efforts to continue to stimulate production of low-cost housing, are being complicated by increasing land development costs and inflation levels that have led to higher interest rates. Higher land costs, resulting from liquidation of the existing stock of properties owned by municipalities, and available for residential development, and higher financing costs, are forcing housing developers to more precisely define effective demand.

Rehabilitation of Existing Stock

In addition, Government policy has supported **rehabilitation** of existing stock as an effective way to increase access to affordable housing. To date, the INH has not become directly involved in this type of project; however, the need for bridge financing to help tenants or landlords initiate projects might be resolved by INH investment, should the Government decide to increase the pace of this activity.

The potential impact on the demand for new housing could be substantial if large scale rehabilitation of the existing stock were to occur. Estimates of the number of units held off the market due to rent controls and deteriorating conditions go as high as 20,000 units, largely in

the Porto and Lisbon metropolitan areas. It will be important for the INH to understand the impact of expanded rehabilitation programs on its present target population and developer group.

Replacement of shanty-towns with low-cost rental housing

Another Government program, labeled "reajuntamento," has been controversial because of the increased commitment of government grants to cover fifty percent of the cost of a unit, and because of the use of a long-term loan from the INH to cover the remaining fifty percent.

Furthermore, though initiated in 1987 with the signing of agreements with local governments covering the construction of more than 17,000 units implying grants of some 26 million contos, its implementation has been slow, and, for the most part has involved use of budget allotments to the IGAPHE. The amounts allotted have not increased in recent years, three million contos, and it seems unlikely that the volume will be increased. A few municipalities have made aggressive use of this program to relocate families living in shanty-towns. Many are not able to take on the additional debt.

This program is important, at least conceptually, as it is the only public sector initiative directed specifically at the worst-housed families. The implementing experience, therefore, should give the participating organizations a good idea of the type of beneficiary and the need at the lowest income levels.

The National Plan

The INH is also responsible for preparation of and the subsequent updating of a National Housing Plan (PDH), a document which should provide the base for Government decisions regarding its support programs for the housing sector.

3.0 RECOMMENDATIONS FOR ADDITIONAL DATA COLLECTION AND REVISED PROCEDURES

3.1 INH Data Requirements

As was indicated in the previous sections, two major analytical challenges face INH. First, to efficiently channel program resources to meet the most pressing housing needs, it is essential that INH obtain a better understanding of the demand for affordable housing and the needs of its local markets, especially in the current environment of limited credit for housing. Second, absence of adequate housing information at the national level has hindered preparation of a national plan and analysis of major issues of supply and demand; this not only hinders global planning, but does not permit INH to analyze its own programs in a national context.

This section seeks to define these information requirements in greater detail and relate them to the major existing data sets in Portugal. Given a list of basic analysis goals, we then review the existing data sets with regard to completeness, timeliness, and level of geographic disaggregation. Three types of questions emerge from this effort to match information needs with available data:

- (1) what types of analyses can be supported with existing data?
- (2) how can the existing data sets be accessed and utilized by INH in computerized form? and
- (3) what analysis needs cannot be supported with existing data, but rather require changes to current data collection procedures and/or implementation of a new survey specialized to meet INH's needs?

Analysis Requirements

The market research and analysis efforts which INH has indicated it wishes to undertake, and the additional analyses which we recommend, all require specialized information that, in turn, demands a variety of data at several levels of geographic disaggregation. Typical analysis questions include the following:

INH Market Analysis

- What level of resources are available to households served by INH-assisted projects? What segments of the national distribution are represented? To what extent are low income households able to be assisted?

- What is the demand for housing for municipalities of major concern? What types of households need improved housing? What types of housing deficiencies need to be corrected?
- What kinds of housing needs exist in municipalities that do not currently have INH-assisted projects? How might these areas be aided?
- Are some households in greater need of subsidies than households actually receiving them? Could programs be targeted toward needier groups?
- What is the affordability gap (the difference between the ability of the household to pay a reasonable fraction of its income on housing and the actual cost) at different income levels?

Analysis of National Housing Issues

- What are the current dimensions of the national housing stock by type of housing? At what rate is the national housing stock growing? What types of housing are being demanded and where are the major areas of growth? How is the stock changing through the addition of new units, including clandestine housing? Through demolitions and alterations?
- How do household income and household characteristics relate to the housing that these families occupy? What types of households do not have adequate facilities? What proportion of income is spent on housing for different types of households?
- What do these nation-wide parameters suggest regarding additions to or changes in Portugal's housing policies with regard to issues such as assistance to low income households, rehabilitation, upgrading, and rent control?
- How does rent control impact the cost, quality, and availability of housing?

- What is the demand for housing credit and how have different households fared in obtaining the desired level of credit?

The data necessary to meet the INH analysis agenda can be summarized in several broad categories:

Components of the Housing Stock:

Additions to the Stock, including Clandestine Housing

Repair, Rehabilitation, and Demolitions

Housing Characteristics and Housing Quality

Household Characteristics and Household Income

Housing and Utility Costs

Critique of Existing Data Sources

A review of data available to date (or soon to become available) identified five main data sources which provide these types of data:

The 1991 Census (and the 1981 Census)

The Family Budget Survey

Statistics of Construction and Housing

Annual Demographic Directory

INH Operations/Application Data

Each of the existing sources were reviewed against a set of analysis requirements and several general "criteria" which describe the information needs. As has been discussed, INH has expressed a need to better understand and target its markets. This requires a combination of small area analysis, and combined (linked) data on housing quality and household characteristics. Obviously, the information should also be up to date. On the other hand, to obtain an accurate estimate of changes in the housing stock on a national or district basis, requires collection of the requisite variables in a consistent manner nation-wide. In summary, the criteria by which we have reviewed each major data set are:

- geographic disaggregation of data collection and reporting
- frequency of collection and reporting
- variables included in each survey
- availability of raw data for analysis by computer.

Refer to Table 3.1, which summarizes the types of information in each of the surveys and the manner in which it is collected. These data sets can provide a reasonably large proportion of the required data, not only at the national level, but at a more disaggregated level, including municipalities, as well as districts. Together, the data sets offer a fairly broad array of housing and household variables. Since both the Census and the Family Budget Survey have just completed a new survey effort, the data are also timely.

However, the review also revealed a number of major shortcomings when judged against INH's analysis needs. The major problem by far is lack of a tradition of providing computerized extracts of raw data available to selected users outside INE (with, of course, proper safeguards for confidentiality and sampling concerns). The other key problems include (1) lack of income data in the Census; (2) a "small" national sample for the Family Budget Survey, which makes geographic disaggregation impossible; and (3) lack of sufficient housing quality data to fully characterize the stock.

INH, in a memorandum prepared in June 1991, entitled "Statistical Information on the Housing Sector" (Informacao Estatistica Sobre o Sector da Habitacao), reviewed the problems with the housing information available in the Census, the Statistics of Construction and Housing, and the Annual Demographic Directory. INH also commented on new information under consideration by INE of companies involved in construction and public works and noted a number of missing data items from the proposed survey. Finally, other data items completely absent from the surveys noted above were listed, including information on household income and household preferences with housing features. Based on INH's own review, on our discussions with INH concerning their needs, and on our own review of the currently available data, we have developed an inventory of the needed information and sought workable solutions to the problems.

Overall, the shortcomings can be summarized as follows:

- Difficult access to the data, with the exception of published reports, since data do not appear to be readily available from INE in a computer readable format.
- Insufficient data to fully characterize changes in the housing stock over time;

**Table 3.1
Data Needs to Support Housing Market Analyses and Availability of Data in Major Data Bases**

| | <u>Census</u> | <u>Family Budget Survey</u> | <u>Construction & Housing</u> | <u>INH Program Data</u> | <u>Demographic Directory</u> |
|--|---------------------------------------|-----------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| Frequency of collection and reporting | every 10 years | every 10 years | yearly | on-going | yearly |
| Unit of Analysis | household | household | housing units | housing units | household |
| Geographic Level of Reporting | nation districts municipalities | nation | nation districts municipalities | nation districts municipalities | nation districts municipalities |
| Data Availability | | | | | |
| Components of the Housing Stock | | | | | |
| Total number of units | x | - | x | - | - |
| New constructions | - | - | x | - | - |
| Rehabilitations | - | - | x | - | - |
| Additions | - | - | x | - | - |
| Demolitions | - | - | - | - | - |
| Clandestine Units | - | - | - | - | - |
| Housing Characteristics | | | | | |
| Size (area) | - | x | x | - | - |
| Number of rooms | x | x | x | x | - |
| Type of housing | x | x | - | - | - |

Table 3.1 (continued)
Data Needs to Support Housing Market Analyses and Availability of Data in Major Data Bases

| | <u>Census</u> | <u>Family Budget Survey</u> | <u>Construction & Housing</u> | <u>INH Program Data</u> | <u>Demographic Directory</u> |
|-------------------------------------|---------------|-----------------------------|-----------------------------------|-------------------------|------------------------------|
| Housing Quality | | | | | |
| Basic quality indicators: | | | | | |
| Water, sewer, electricity, plumbing | x | x | x | x | - |
| Central heating | - | - | x | x | - |
| Kitchen | x | x | - | - | - |
| Repairs & Rehabilitation | | | | | |
| Needs & costs | - | - | - | - | - |
| Housing Costs | | | | | |
| Tenure | x | x | - | - | - |
| Mortgage payments | x | x | - | x | - |
| Rent | x | x | - | - | - |
| Utilities | - | - | - | - | - |
| Household Income | - | x | - | x* | - |
| Household Characteristics | x | x | - | x* | x |

* Could be collected from the present onward from application forms.

- Lack of a "complete" set of variables, available in one single survey, pertaining to the same household, and disaggregated for small geographic areas;
- Lack of income data for smaller geographic areas such as districts or municipalities, preventing an analysis of income distribution, rent burden, and housing characteristics, and therefore the identification of housing needs, at the local level;
- Limited data on housing quality, beyond a few basic housing indicators of housing standardness, such as overcrowding, lack of water, electricity or plumbing.
- Absence of data to determine needs for repairs and rehabilitation and measuring the costs associated with these activities.

Our recommendations to deal with the shortcomings are presented in Table 3.2. Each of the existing surveys has its strengths and weaknesses, and these are discussed in Section 3.2 below. Section 3.3 discusses the formation of a computerized data base the need for improving information on the housing stock and housing quality, the lack of information on income, and the development of a new INH survey. Finally, Section 3.4 offers some analysis suggestions for INH research, particularly the importance of micro data to the analysis. It then notes the documents that were presented to INH for review: major surveys in the United States, primarily the Census and the Annual Housing Survey, and major categories of housing research.

3.2 Review of the Existing Data Bases

The Census

The Census obviously has the greatest geographic coverage and thus does not have any of the problems associated with data based on small samples of housing units or households. It is thus ideal for small area analyses. But, as with all large data collection efforts, the costs of gathering the data are very high and the number of variables to be collected must be kept to a minimum. The availability of data for housing analyses is quite limited and can only support a few basic analyses.

The main deficiencies of the Census are the lack of sufficient data to analyze changes in the components of the housing stock and the absence of data on income of households to determine the income distribution of households living in different types and quality of housing and the percentage of their income spent for housing (rent burden).

Table 3.2
Shortcomings and Recommendations for Addressing the Shortcomings

| <u>Shortcoming</u> | <u>Recommended Action(s)</u> |
|--|---|
| 1. Absence of a national overview of the housing stock and a National Housing Plan | <ul style="list-style-type: none"> • Assume responsibility as the housing agency charged with development of the National Housing Plan. Coordinate with INE. |
| 2. Difficult access to data | <ul style="list-style-type: none"> • Obtain micro level data from INE and build on INH computer data base • Build in-house data processing capabilities at INH • Increase analysis resources at INH |
| 3. Insufficient data to characterize Housing Stock | <ul style="list-style-type: none"> • Change procedures for collecting permit data from municipalities to include information on: <ul style="list-style-type: none"> - construction activities in the clandestine sector - housing stock losses due to mergers, condemnations and demolitions • Link listing of units for census taking to the permit process and record for each unit the status of units at the time of the Census. The procedure must allow INH to identify both clandestine construction and demolished buildings which were replaced by a new building on the same parcel/lot. |
| 4. Lack of Income Data at the local level | <ul style="list-style-type: none"> • Add to Census for a sample of households only (e.g., 20 percent), AND/OR • Conduct a new survey designed by INH |
| 5. Limited data on housing quality and housing costs | <ul style="list-style-type: none"> • Define variables appropriate for measuring housing quality and "standard/non-standard" housing • Conduct a new survey designed by INH, including these variables |
| 6. Lack of data on repair needs and housing costs | <ul style="list-style-type: none"> • Include selected questions in the new INH housing survey • Add a section on repairs and rehabilitation to the Family Budget Survey |

Statistics of Construction and Housing

The Statistics of Construction and Housing, based on permit information provided by the municipalities, also has the advantage of being available at the level of the municipality; furthermore, the data are collected on a yearly basis. These statistics are essential to track changes in the housing stock components between the Censuses. This database provides more detailed information on changes in the housing stock than the Census, as it contains information on additions to the stock, broken down by new construction, additions, transformations and rehabilitation.

The data base does not, however, include data on clandestine housing and on demolitions. The inclusion of these two categories of activities is essential to obtain a total picture of the housing stock at any point in time and to measure changes over time.

The Family Budget Survey

The Family Budget Survey is the most comprehensive data base available for INH's needs. It contains for the same household, data on family composition, housing characteristics, income, and housing expenditures. This information is essential to establish and identify basic housing needs, analyze housing affordability and determine the housing demand of various groups of the population. The data on housing characteristics and housing quality are limited, but will nevertheless allow an analysis similar to that which can be done with Census data.

The existence of data on household income is particularly important. It allows analyses of household income distribution for the nation, for the districts, and for the newly defined NUTS (national statistical units). Following this, INH can determine where its clients fall in this income distribution (at the median, or higher or lower, for example).

The existence of both income and housing data for all the households in the Survey is also particularly important. Having information on housing characteristics, housing expenditures, and income for the same family, will for the first time allow INH to calculate rent burden and to examine the incidence of deficient housing in conjunction with rent burden.

The usefulness to INH of the Family Budget Survey to answer some of the basic questions is, however, limited by its small sample size. The number of interviews is too small to support analyzes at the local level, below the level of the NUTS. Information on housing needs, housing deficiencies, and rent burden, are needed at the level of the municipality, if INH wants to be able to target its program resources to these municipalities with the greatest needs.

Finally, the main objective of the Family Budget is to collect expenditure data to measure changes in cost of living. Its focus is not on housing and despite its relatively broad coverage, it does not collect important housing data on housing characteristics, utility costs, or repairs and rehabilitation. The next Family Budget survey will not occur for a decade. Thus, we do not recommend that INH request any change in the Family Budget Survey at this time. Instead we

recommend that INH conduct a new survey targeted to collect the data needed to support analyses of housing quality and housing demand, and to access the housing needs in some selected municipalities. (This survey is discussed in Section 3.4 and a detailed list of variables to include in the survey is presented in Appendix A.)

INH Operating Data

INH has begun to process client data submitted by the cooperatives when applying for a construction loan. The form for every construction project includes an entry for each potential buyer of the units in the project, including the locality, the household size, the household income, the unit size applied for and the monthly mortgage payments.

Similar data are available to municipalities, but are not currently submitted to INH. We strongly suggest that INH attempt to obtain the information from the municipalities. For example, households applying through municipalities tend to have lower income than members of cooperatives. This information will help INH in gaining a better understanding of the income distribution and rent burden distribution of its clientele, and as discussed above, in comparing the needs of its clientele to the needs of households overall. Data on clients applying to projects built by private developers may be difficult to obtain, but are not as important given the relatively small numbers of these households.

The Annual Demographic Directory

The Annual Demographic Directory provides data on population changes on a yearly basis. It includes useful data on births, deaths, marriages, divorces, and separations. It does not, however, provide data on household size and household formations, which are important variables in analyzing changes in the demand for housing. The publication of data for households as well as for individuals would enhance the usefulness of this data source. To our knowledge, the survey is not readily available in computerized format. Given the weaknesses noted above, it is perhaps wise to assign this survey a lesser priority than the other sources listed above.

3.3 Recommendations for Data Base Development and Data Collection by INH

Our recommendations for making use of the strengths of these data sets and coping with the shortcomings identified above are discussed below. **What is required first and foremost, is to obtain data extracts in a form utilizable for analysis directly by INH; that is, computerized extracts of the raw data, particularly from the Family Budget Survey and the Census, and possibly from the Statistics of Construction and Housing.** These data extracts would form the core of INH's analysis data base. This data base should then be supplemented by (1) additions to INH's own operational data and (2) a new survey designed by INH to gather important information not available elsewhere. Specific recommendations, discussed below, include the following:

- INH should assume the role of the leading agency in housing research and take responsibility for preparation of the National Housing Plan as well as conduct market analyses on behalf of its own operations;
- INH should make maximum use of available data from existing surveys and immediately obtain computer extracts of selected (raw) data from these surveys;
- INH should avoid suggesting major changes to existing surveys. It is particularly hard to change the Census; rather, use of a 20 percent subsample to collect additional data on income and quality might be proposed. The Statistics on Construction and Housing must be changed, however, to be able to measure stock at year-end.
- INH can deal with many of the remaining data needs by designing its own survey and implementing it in a subset of important municipalities;
- As lead agency for housing research, INH must increase its analysis staff and ensure their access to appropriate hardware and statistical software.

3.3.1 Creation of a Computerized INH Data Base from Existing Data Sets

Our major recommendation regarding data and analysis procedures for INH is to obtain computerized data extracts of "micro" data from the Census, the Family Budget Survey, and the Statistics for Construction and Housing. By "micro" data we mean data at the original unit of collection/analysis, which is the household for both the Census and Family Budget Survey.

For the Census data, the household information would be organized by municipality. For the Family Budget Survey it would be organized by the most geographically disaggregated area possible, given the sample size; this may be at the level of the district or possibly the national sampling units (NUTS). For the survey on the Statistics on Housing and Construction, in contrast, the counts are taken at the level of the municipality. It may be possible to obtain identifiers for geographic areas smaller than the municipality; this would help INH move toward "neighborhood" level analysis.

These types of extracts in the United States, from both the Census and the American Housing Survey, are processed frequently. Thus, procedures for maintaining confidentiality are in place and could presumably be discussed with INH if further information is required.

The data sets need not be extremely large. Only very selected data on housing and household characteristics are relevant to the INH data base. Furthermore, it would be advantageous for INH to select a limited number of high priority and/or representative municipalities. These would be selected because they are important target areas for INH or because they are representative of areas of concern to a national housing plan (for example, urban/rural distinctions; population size; average level of income, and so forth). As discussed below, INH could then implement its new survey in a selected number of these target/analysis areas.

Recommendations

Selection of Census data. Both INH's rehabilitation and relocation programs will benefit from the information gathered in the 1991 Census. The Census data will reflect on the condition and occupancy of the existing housing stock, and will, therefore, offer Government planners confirmation of the need to deal with underutilized or unsanitary housing. The INH, responsible for the National Housing Plan, will be able to use this information to provide the basis for new policy orientation.

It is recommended that INH obtain a limited number of data items for all municipalities, obtaining the data at the household level. If possible, the data should be disaggregated (that is, geographic identifiers provided) for even smaller areas (wards, for example). Alternatively, INH could select a number of important municipalities and obtain selected Census variables for these municipalities at the household level.

The types of variables that should be requested in the extract are those listed in table 3.1. If possible, the same variables should be obtained for the 1981 Census; INH already has some of the 1981 Census data on computer and has been conducting various analyses. Obtaining the 1991 data would allow an evaluation of the change in the situation for municipalities of interest. The analysis could also be done at a level even more disaggregated than a municipality, since household data will make up the file. It is necessary therefore to obtain all the available geographic/sampling descriptors in order to undertake small area analysis.

Selection of Data from the Statistics of Construction and Housing. Again, we recommend that INH obtain selected data for all municipalities from this data base. The data are published in document form at the level of the district. However, it would be more advantageous to INH to obtain the data in computerized format for municipalities and, if possible, subsections of municipalities. The subsections should be the same as (or at least be consistent with) the geographical disaggregation to be utilized for analysis of Census data. To prioritize the analysis, the same target areas of analysis as for the Census could be utilized. Furthermore, since the change in the rate of construction is an important indicator for INH, annual data going back as far as feasible would be ideal.

Again, this file would not need to be large. The variables listed on Table 3.1, and possibly some others, would be the most appropriate and would complement the Census data. In this

manner, INH can begin an integrated file of information for selected, target areas. (As discussed below, these are the municipalities in which INH might then conduct its own survey.)

Selection of Data from the Family Budget Survey. As we have noted, this is an extremely important survey and we recommend that INH obtain selected variables for each household included in this survey. It would also be advantageous to obtain the same variables for each household in the previous Family Budget Survey. Since this is the only survey which combines household income, housing cost, and housing characteristics, it will be invaluable for supporting development of the National Plan.

Again, the appropriate variables are listed on Table 3.1. However, we have also carried out a more detailed analysis and comparison of housing and household data collected on the Census and the Family Budget Survey; Appendix 2 lists these variables. In some instances, the data do not overlap; in other instances the data overlap but the variables are not defined in the same manner. As much overlap as possible should be built into selection of variables; analysis of Census housing data in small geographic areas can then be consistent with Family Budget analysis analyses at the national level. Finally, very detailed information is provided in the Family Budget Survey on items of both household expenditure and household income: this level of detail is not required for analyses by INH. Data extracts should be designed to include only the relevant totals and the housing-related portions of expenditures.

3.3.2 Improving Data on the Housing Stock

The INH computer data base described above will face two important shortcomings: inadequate data describing the total housing stock and its features and lack of income data for small geographic areas. The income data are discussed below. Regarding the housing data, three actions will be necessary to improve the problems: (1) immediate changes to the Statistics on Construction and Housing; (2) parallel changes to the next Census; and (3) design and implementation of an INH Survey.

First, information on clandestine housing and other changes to the stock should be collected in both the Statistics of Construction and Housing and the next Census. These variables include:

- The basic characteristics of newly-completed units (housing type, number of rooms, other basic descriptors);
- Inclusion of clandestine construction in this survey and in this basic typology;
- A count and basic description of demolitions; and
- Alterations in use of structures that enter or exit the residential stock, and major additions to the residential stock.

These data would allow a count of changes in the housing stock at the end of each year. We recommend that INH work with INE and the municipalities to put in place some procedures for reporting construction activities in the clandestine sector as well as the official sector and for including statistics on demolition activities. Since this survey is conducted annually, these revised procedures should be set in motion as soon as possible.

We also recommend that the next Census determine stock conveyed via the clandestine sector or formal sector and obtain parallel information on demolitions, alterations, and additions. Taken together, these changes would eliminate inconsistent estimates of the total stock and provide an analysis of what type of changes have occurred.

Secondly, the number and type of housing descriptors is quite limited in all the surveys under consideration. We do not recommend that INH attempt at this time to have the Census greatly expanded to include these variables. First, experience in the United States suggests that it is extremely difficult to change a Census survey document. Second, experience has also shown that Census enumerators do a poor job of rating housing quality in an accurate and consistent manner. Third, in any event, none of the information would be available until the next Census, which certainly limits its usefulness for INH planning.

INH should therefore determine what additional housing quality variables are of most interest and include them on the special INH survey discussed below. Even though this survey is not likely to be fielded nation-wide, data would be available to describe the housing stock in key areas. Also, INH could ensure that the survey takers are trained in providing consistent answers to the questions.

3.3.3 Improving Household Income Data

As we have noted, only the Family Budget Survey includes income data, thus preventing any analysis of income and payment burden for geographic areas smaller than districts. INH staff have noted that they think income varies a great deal for different municipalities and for urban and rural areas. This obviously has a great impact on the type of programs INH can expect to assist. It is also crucial input to a National Plan.

It should also be stressed, however, that this is a concern at the national level and in this context should be addressed by INE. INH should stress the difficulties caused by the absence of these data, and assist INE in finding an approach to adequate data collection.

There are at least four plausible solutions to overcoming the absence of geographically disaggregated income data: (1) add income variables to the full Census; (2) add income variables only to a special wave the Census, a small sample of 20 percent, for example; (3) enlarge the sample for the Family Budget Survey for several important urban areas; and/or (4) include income data in the special INH survey. (In addition, the principal home loan originators, the Caixa Geral de Depósitos, the Crédito Predial Portugues and the Montepio Geral, all

Government-owned institutions, have final data on family incomes for their borrowers; these institutions are likely to be extremely reluctant to share this information, however, and the households do not constitute a representative sample.)

We recommend two of the four approaches to improving the income data. Since the problem is, as noted, a broad national issue, INH should definitely urge INE to include income questions on the Census. In order to reduce the costs of adding a large group of variables, it may be advisable to include income on a subset of the population, such as a sample of 20 percent. The sample would be chosen to meet some particular, statistically valid reporting criteria.

Obviously, new data would not be available for another decade. Thus, income questions should be included on the special INH survey. This is, in part, a matter of timeliness for INH. It is also, however, desirable to have a fully-linked micro data base (that is, data on all relevant subjects from the same household).

INH should be able to get assistance and funds from INE in order to include the income data, since these data could be made available to INE for general use. The format for the questions should follow the broad categories used in the Family Budget Survey, but do not need to include this level of detail. The sampling plan should also be discussed with INE, to assure the desired type of representativeness for INE's needs as well as those of INH.

3.3.4 Design and Implementation of an INH Housing Survey

Given the shortcomings of the available data sets, a special survey, designed to meet both INH's analytical needs and the needs of a national housing analysis, becomes a crucial part of the strategy. Reliance on major changes to the existing national surveys to meet all of INH's needs is not likely to be satisfactory for several reasons. First, as we have noted, it is difficult and expensive to make changes to large national data collection efforts. Second, we have also found that general enumerators are not able to collect consistent data on housing attributes. Third, new data from a revised Census or Family Budget Survey will not be available for over a decade. Finally, the housing characteristics data needed by INH for detailed analyses is too specific to be included in the full Census or in the Family Budget Survey.

In preparation for designing the Housing Survey, INH should undertake the following steps:

- prepare an analysis plan, describing the general areas of research which will be addressed and what specific research questions are the most germane to each of the major topics;
- decide which areas (districts, municipalities, and/or NUTS) should be included in the sampling plan (for example, will the entire focus be on Liboa and Porto or is

a random sample of municipalities the preferred approach);

- decide for what geographic areas each type of question should be able to answered in a statistically sound manner (this decision, along with the target areas on which the survey will focus, determines the sample size);
- based on target areas and priority analysis topics, determine what data points (variables) are needed;
- based on the desired data points, and with reference to other surveys in Portugal and elsewhere, decide how to phrase the questions and what level of detail is relevant (income data should be consistent with the Family Budget Survey, for example, but does no need to have as much detail).
- finally, based on the type and difficulty of the questions, determine the required experience level of the enumerators and what type of training would be required.

The types of analyses that we have discussed with INH, and the variables that are needed to support these types of analyses, are shown in Appendix 1. The general analysis areas include:

- **Housing Characteristics**
- **Housing Quality**
- **Housing Costs**
- **Repairs and Renovations**
- **Household Characteristics**
- **Household Income**
- **Land Availability and Land Price**

For each of these analysis areas, we have noted variables that are drawn from one of three surveys: the Census and Family Budget in Portugal and the American Housing Survey, the nation-wide biannual housing survey which is the main source of housing data is the United

States. As we have mentioned, for data already collected in Portugal in the major surveys, it would be wise to maintain consistency and compatibility. Thus, either the Census or the Family Budget Survey is the suggested source for many of the questions. The American Housing Survey is particularly useful for data collected in the United States but not in Portugal; this includes data on housing quality, housing costs, and housing characteristics.

There are almost certainly important variables we have failed to include but which are uniquely important in distinguishing the stock of most interest to INH. For example, construction typologies and characteristics of "standard/substandard" housing differ in Portugal and the United States; thus INH should modify our recommendations to better portray the relevant issues. In addition, we have removed one category of analysis which was of interest to INH: preferences for different housing characteristics. In our experience, this is a difficult area of analysis, not always worth the expense of obtaining the numerous data items needed to describe different stock. In a survey context, it is difficult either to introduce a realistic budget constraint or have respondents make the necessary number of trade-offs among housing features. Thus, a discussion of preferences is perhaps best approached through discussion groups, such as focus groups.

It is important to note again that the INH Housing Survey has two definitive purposes: (1) collection of small area data in municipalities of most interest to INH's future program planning; and (2) analysis of national housing needs, which will ultimately impact a broader set of programs than just those of INH. These two purposes are clearly related but may not be compatible with regard to design of the sampling plan and selection of analysis topics and variables. For example, a statistically valid assessment of housing deficiencies, related to levels of household income would be important for Portugal as a whole and possibly for the districts. On the other hand, if INH wished to focus on selected municipalities within Lisbon or Porto (or on even smaller areas within the municipalities), the sample would have to be very concentrated.

Thus, assuming some reasonable limits on the budget and thus on sample size and survey length, there are clearly important tradeoffs that will have to be addressed in the design of the survey. As indicated above, INE should assist with this effort, especially with the income questions, which will be of greatest interest to INE. INE may also be encouraged to supply the field enumerators to implement the survey.

3.4 Recommendations for Analysis by INH

3.4.1 The Importance of Micro Data

A representative list of analysis questions was presented above in Section 3.1. These analysis topics are meant only to be illustrative; INH has already been developing topics of interest, such as those implied by the data areas listed in the memorandum cited above, "Informacao Estatistica Sobre o Sector da Habitacao". We have also suggested a number of analysis topics of national interest and of interest to INH's market assessment in the 1989 report.

We continue to stress, however, two features of INH's data collection effort that will greatly enhance its ability to perform sophisticated analyses on any topic: (1) assembling all the data in micro (raw) format in the computer for geographic areas as disaggregated as possible; and (2) obtaining as many variables as possible for the same unit of analysis (which is the household for the Family Budget Survey, the Census, and the INH Housing Survey).

"Micro" data provides far greater flexibility in analysis than data that is already aggregated according to a fixed scheme. With micro data, one can (1) relate variables to one another in a completely flexible manner, and quickly change the way the analysis is performed; (2) examine the joint occurrence of several variables at once; and (3) perform multivariate statistical analyses (such as regression or correlation analysis), which allow us to estimate functions such as the demand for housing.

The ability to look at the joint distribution of the incidence of housing quality indicators is a very important step in identifying housing needs. INH will, for example, be able to know whether overcrowded households tend to be in units lacking plumbing, water or electricity and also have high rent burden. This type of assessment could be done separately for different income groups, and the definition of the groups is easily changed. As another example, INH could estimate a probabilistic function (using probit or logit analysis, for example) which sought to estimate the probability of being in deficient housing as a function of income level, location, family size, and so forth. This would be an appropriate approach to using the Family Budget Survey, because the number of observations is too limited for undertaking very detailed crosstabs. Finally, both the Family Budget Survey and the INH Housing Survey, provide good data for estimation of housing demand functions; these estimations provide, among other things, estimates of the income elasticity of demand, and the marginal impact of other household characteristics on the willingness to pay for housing.

3.4.2 Staff Resources and Analysis Software

Having a sufficient number of appropriately experienced staff with access to analysis software is another crucial aspect in the design and utilization of the INH housing data base. Much of the software and hardware currently in use at INH is fully appropriate to the types of computerized analyses we have been discussing. Similarly, INH staff are familiar with these systems and with a number of analysis techniques. We have three concerns, however: (1) that there be enough staff so that one or more can devote themselves full-time to INH data base and analysis tasks; (2) that some of these staff have specialized training in economics, preferably housing economics; and (3) that they have access to software specially designed for analysis (with regard to this point, we discussed both PC SAS and PC SPSS with INH staff).

3.4.3 Survey and Research Documents for Review by INH

To assist INH in its efforts to create a Housing Data Base, to develop an analysis plan, and to review the type of housing research that is conducted in the United States, we provided a variety of survey documents and housing studies. A complete list is provided in Appendix 3; the following sources and topics summarize the types of information represented:

- American Housing Survey
 - Survey Form
 - Codebook
- United States Census Documents
- World Bank Housing Indicators Program
- National Association of Home Builders
- Housing Demand
- Rent Control
- Renovation and Repair
- Hedonic Quality Indices.

Appendix 1
Suggested Variables for a New Housing Survey

| <u>Housing Characteristics</u> | <u>Source</u> |
|--|----------------------------|
| Use of unit (residential/business) | Census ¹ |
| Type of structure/materials | Census |
| Type of Housing | |
| Classic: | Budget Survey ¹ |
| Single family detached | |
| Single family attached | |
| Apartment or flat | |
| Barrack | |
| Other | |
| Number of units in building | Census |
| Number of stories | Census |
| Elevator present | AHS (Q.213d) ¹ |
| Year built | Census/Budget Survey |
| Number of rooms | Census/Budget Survey |
| Number of bedrooms | Budget Survey |
| Kitchen/kitchenette | Census |
| Number of bathrooms | AHS (Q.26a) |
| Full bathrooms | |
| (cold and hot water <u>and</u> sink <u>and</u> | |
| flush toilet <u>and</u> bathtub or shower) | |
| Half bathrooms | |
| (toilet <u>or</u> bathtub <u>or</u> shower) | |
| Garage/Parking | Budget Survey |

¹ The sources include the Portuguese Census and Family Budget Survey and the AMERICAN HOUSING SURVEY, the bi-annual housing survey for the United States.

| | |
|---|------------------------------|
| Size of unit (m ²) | Budget Survey or AHS (Q.121) |
| Heating equipment (type) | AHS (Q.45) |
| <u>Housing Quality</u> | |
| Plumbing - | |
| Cold and hot water inside unit | Census/AHS (Q.33a) |
| Flush toilet in the building | Census |
| Bath or shower in the building | Census/Budget Survey |
| Sewage disposal | Census |
| Toilet breakdown in last 90 days | AHS (Q.30) |
| Electricity | |
| Availability | Census |
| All wires concealed | AHS (Q.31a) |
| One working outlet in each room | AHS (Q.31b) |
| Fuses blown in last 90 days | AHS (Q.31c and d) |
| Maintenance | |
| Leaks from outside in last 12 months | AHS (Q.32a) |
| Leaks from inside | AHS (Q.32c) |
| Holes in the floors | AHS (Q.48c) |
| Holes and cracks in walls and ceilings | AHS (Q.48b) |
| Peeling paint or broken plaster | AHS (Q.48d) |
| Signs of rats in the last 30 days | AHS (Q.48e) |
| Public Hallways | |
| Presence and condition of lighting fixtures | AHS (Q.213b) |
| Condition of stairs | AHS (Q.213e) |
| Condition of railings | AHS (Q.213f) |
| Kitchen | |
| Kitchen sink for exclusive use | AHS (Q.27) |
| Refrigerator for exclusive use | AHS (Q.36a) |
| Range/Cookstove with oven for exclusive use | AHS (Q.38a and b) |

Housing Costs

Tenure Census/Budget Survey

- Owner
- Renter
- Sublet

Owners

Year unit was purchased AHS (Q.82a)
Price at time of purchase AHS (Q.82c)
Current value (estimate) AHS (Q.86d)
Monthly costs
 -- mortgage payment AHS (Q.96l)
 -- property taxes AHS (Q.96m(1))
 -- insurance AHS (Q.96m(2))
 -- common charges for building
 cleaning and maintenance AHS (Q.100)
Subsidy, lower interest rate program AHS (Q.96n)

Renters

Year household moved into unit Budget Survey
Monthly rent AHS (Q.64a,b)
Rent lower because
 -- unit under rent control AHS (Q.65e)
 -- subsidized unit AHS (Q.65a-d)
 -- someone works for or is related to landlord AHS (Q.65f)

Utilities (owners and renters)

-- electricity AHS (Q.110a)
-- gas AHS (Q.110b)
-- oil AHS (Q.110d)
-- other fuels AHS (Q.110e)
-- trash/garbage AHS (Q.110f)
-- water/sewage disposal (owners only) AHS (Q.110a)

Repairs and Renovations

For the item listed below, the survey needs to ask if the unit needs the following repairs/renovations, and if the repairs/renovations were made (in the past 2 years), the costs associated with each type of repair.

Additions/replacements

AHS (Q.73)

- rooms
- bathrooms
- kitchen
- equipment (heating system, air conditioning, hot water heater)
- roof
- other

Upkeep and improvement

Expenditures for Residential Upkeep and Improvement (Appendix D: Personal Interview Questionnaire)

- inside painting or paper
- outside painting
- plastering or paneling
- plumbing or water heating repairs
- electrical work
- heating system/air conditioning
- flooring repair or replacement (linoleum, tiles)
- insulation
- roofing, gutters
- installation, repair or replacement of windows or doors
- masonry, brick or stucco work
- other improvements

Household Characteristics and Workplace

| | |
|--|-----------------------------|
| Definition of Head of Household | Budget Survey |
| Age of Head of Household | Census/Budget Survey |
| Sex of Head of Household | Census/Budget Survey |
| Marital Status of Head of Household | Census/Budget Survey |
| Education of Head of Household | Census/Budget Survey |
| Household size | Census/Budget Survey |

Number of workers in household Census/Budget Survey

For each worker in household

- relationship to head of household Census/Budget Survey
- profession/activity Census/Budget Survey
- number of hours of work per week Census
- place of work Census
- duration of journey to work (in minutes) Census
- mean of transportation Census

Income

Household income in the last 12 months from regular or extraordinary sources, including wages, salaries, interests, transfer payments, subsidies, etc. Budget Survey

Appendix 2
Comparison of Housing and Household Variables Available
in Census and Family Budget Survey

| | Census | Budget |
|--|---|---|
| Building and Unit Characteristics | | |
| Number of floors | x | |
| Number of units | x | |
| Percent residential | x | |
| Structure | x | |
| Exterior walls, structure and coverings | x | |
| Year Built | Categories | Categories (slightly different) |
| Type of Housing | More detailed, don't know if house or apartment | Less detail, but know if urban/suburban/rural and if house or apartment |
| Occupancy Status | x | Only occupied unit |
| Tenure | Owner occupied/rental/sublet | Owned w/ mortgage/ or clear |
| Type of Ownership | x | |
| Length of Tenure | | x |
| Total Number of Rooms in Unit | x (exclude kitchen) | x (include kitchen) |
| Number of Rooms occupied by the reference household | - | x |
| Total Number of Bedrooms in Unit | - | x |
| Number of Bedrooms occupied by the reference household | | x |
| Kitchen | x | x |
| Unit Size (area) | - | x |

| | Census | Budget |
|--|---|--|
| Electricity | x | x |
| Piped Water | x (more detail) | x |
| Bathroom | flush toilet/exclusive use/shared/connected to sewer, bathtub or shower | completed/incomplete inside/outside |
| Sewerage Disposal | x | x |
| Monthly Rent | Categories | Detailed, part of expenditures diary |
| Monthly Mortgage Payments | Categories | Detailed, part of expenditures diary |
| Equipment/Appliances | - | Detailed, including phone, vacuum cleaner, video, etc. |
| Vehicles | - | Car, motorbike, bicycles |
| Garage | - | x |
| Second Home | - | x |
| Garbage Collection | - | x |
| Characteristics of the Occupants | | |
| Total Number of Individuals in the Unit | x | x |
| Number of persons in the reference household | ? | x |
| For each occupant of unit | | |
| - relation to reference person (head of household) | x | x |
| - birthdate | x | x |
| - sex | x | x |
| - marital status | x | x |

| | Census | Budget |
|-------------------------------------|--------|---------------|
| - education | x | x |
| - whether cat with family | - | x |
| - profession | x | x |
| - employment status | x | x |
| - line of activity | x | x |
| - number of hours worked each week | x | - |
| - number of employees in enterprise | x | - |
| - sources of income | x | - |
| - receive income | x | x |
| - incur expenses | - | x |
| - pay taxes | - | x |
| - nationality | x | - |
| - place of birth | x | - |
| - literacy status | x | - |
| - usual residence elsewhere | x | - |
| - residence in 1985 | x | - |
| - residence in 1989 | x | - |
| - date of first marriage | x | - |
| - date of last marriage | x | - |
| - number of sons alive | x | - |
| - religion | x | - |
| Household Income | - | Very detailed |
| Expenditures | - | Very detailed |

Appendix 3
Bibliography of Housing Studies
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- Codebook for the Annual Housing Survey
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- Portugal 150-HG-III Low Income Housing Program
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