

**United Nations Expert Group Meeting on the
Use of Censuses and Surveys to Measure International Migration
24-28 September 2007, New York**

PART THREE
MEASURING INTERNATIONAL MIGRATION
THROUGH SAMPLE SURVEYS*

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Introduction

1. Part 3 of the present report focuses on the use of specialized household surveys to collect data to study international migration. While other data collection systems exist that provide information on international migration, including, in principle, comprehensive data on the *numbers* of international migrants and their demographic characteristics, none offers the flexibility and potential depth of detail that is possible with a specialized survey (Bilsborrow et al., 1997). Thus population censuses, continuous population registers, and border or admission data collection systems can collect basic data on the *numbers of migrants* and a few characteristics, such as sex, age, and either country of previous residence or citizenship, but cannot collect detailed data as that would subvert their main purpose of recording accurate numbers. At most, they can also record date of arrival, country of previous residence, current level of education, and current occupation of the migrant.

2. None of these existing systems collects information on the situation of the migrant *prior to migration*, which is vital for investigating either the determinants or consequences of migration for international migrants and their households (see chapter 3 below). Censuses usually record data on persons, including international migrants, *at the time of the census* and not (also) at the time of arrival, greatly reducing their value for studying the consequences of international migration. Border or admission recording systems collect minimal data on migrant characteristics at the time of entry/exit, so that unless they are supplemented by specialized surveys or interviews of migrants, they also cannot be used to study the determinants or consequences, and even when they are supplemented, the representativeness of the sample is likely to be called into question. In particular, the most commonly available source of data on international migration, the population census, usually suffers from using a narrow definition of international migrants (for example, use of the foreign born or of foreigners); has no information about out-migrants; collects very limited information on the characteristics of persons and their households (including nothing on the pre-migration situation); and usually identifies only the stock of lifetime migrants rather than recent migration flows. Specialized surveys of international migration thus constitute the best data collection system to gather the information needed to study the *determinants* or *consequences* of international migration (Bilsborrow *et al.* 1997).

3. Part 3 thus focuses on the use of surveys for the study of international migration. Although several types of surveys are reviewed, the focus is on the design of specialized *household* surveys to study international migration. A household is usually defined (see UN, 1980a) as a group of persons who share the same living accommodations, pool some if not all of their income, and eat together ("from the same pot"). Household surveys thus seek information from *households* as units of consumption, production, income sharing and decision-making. Most household surveys also include schedules or sections of the questionnaire to collect various types of data on the household, such as demographic composition, characteristics of the dwelling, household assets, and on current members of the household, such as health and nutrition, fertility and mortality, employment and incomes, etc. Sections of the questionnaire or *modules* are sometimes included to identify and describe *former* members of the household who have migrated to live elsewhere, whether within the country or outside it (international migrants); or to ask people who have migrated to join the household about where they came from, etc.

4. The design of surveys to *quantify* and *characterize* international migration is the main topic of this part of the technical report, with the assessment of factors leading to the migration and the effects of that migration also of interest but secondary. Before addressing issues of survey, sample and questionnaire design for specialized surveys of international migration, chapter 1 reviews the utility of existing national demographic data collection systems of countries *to establish sampling frames* for use in collecting more detailed data on international migrants. The use for this purpose will be illustrated by actual country examples.
5. Chapter 2 reviews how various different types of common existing household sample surveys provide (or could provide) useful data on international migrants—on immigrants and/or emigrants—with examples from countries. This includes labour force surveys, which are conducted in many countries, as well as Demographic and Health Surveys, the Living Standards Measurement Study surveys and other multi-purpose household surveys. Specialized migration surveys will also be described, including the recent NIDI-sponsored surveys.
6. Chapter 3 begins with the discussion of how specialized surveys can be designed to collect data on international migration, relating the main *survey purpose* to *survey design*, viz. for what population groups should data be obtained (the "appropriate comparison groups", c.f., Bilsborrow *et al.*, 1997). This is followed by detailed guidelines for the design of samples for surveys of international migration (separately for countries interested in getting data on immigrants and those seeking data on emigrants).
7. Finally, chapter 4 presents several modular approaches to the design of questionnaires for surveys to collect data on immigrants or emigrants by adapting existing surveys or developing specialized surveys on international migration.
8. An annex provides details on many of the surveys referred to in the chapters. Many of the examples were compiled with the help of countries who responded to a questionnaire from the UN Statistics Division.

Chapter 1. Existing national statistical data collection systems as sampling frames for surveys

9. Three traditional national data collection systems— population censuses, continuous population registers, and border/admission records— are discussed below to illustrate their possibilities for providing the basis for creating a sampling frame to design a household survey that can be used to identify international migrants and their characteristics. The creating of a sample frame and some common problems is briefly discussed in chapter 3.

A. Censuses of population

10. In most countries of the world, especially developing countries, a recent census of population is the most viable source of data to use not only to count international migrants (at least as measured by certain population groups like the foreign born) but also to establish a sampling frame for designing a sample for a specialized household survey on international migrants, particularly for immigrants. The use of a census to develop a sampling frame is illustrated in chapter 3. In addition, most other existing surveys which obtain any data on international migration use population censuses as the basis for designing a sample, as will be seen in the examples in chapter 2.

11. Thus a census of population can estimate the stock of international migrants, providing a count of "immigrants," with a single question such as:

Where were you born?
or What country are you a citizen of?

If the response is some other country, then the respondent is an international migrant by virtue of his/her country of birth being different from the current country of residence, hence a *lifetime migrant*. Few censuses ask more than this in their short schedules, though some inquire about *when* the person came to live in the country, which provides a crucial piece of additional information since it allows distinguishing (a) those who came recently, which is likely of particular policy interest, and (b) those who came earlier.

12. Unfortunately, obtaining more detailed information about international migrants in a country from a population census is usually beyond the feasible scope of the census, although a census *long form schedule* administered to a subsample of the population can usually accommodate a few additional questions whenever international migration is of particular interest to a country. Such a schedule is usually administered at the same time as the census so that there is only one visit to the field. The alternative of using the completed census to administer a separate survey later means that a second visit to the field would be necessary, at far greater cost than administering the long form at the same time as the short form.

13. Some countries interested in *emigration* include a question on whether the household has had a member leave it to live abroad during some recent time period, such as in the past 5 years or since the previous census, national election, or other date that respondents can recall well. Few censuses have asked such a question, and it can collect data only about those emigrants who left a household behind that could provide information about them. Thus when

the entire household has emigrated, there is no one left to report on them. But it is possible that the localities from where individual migrants are leaving their households to live/work abroad, as reported by proxy respondents who remain in the household, are also the localities from where whole households are leaving, so that the information on the former could be used to develop a reasonably viable sampling frame to study emigration, albeit whole households would still be excluded.

B. Population registers

14. As with the case of censuses of population above, the interest here is not what questions to include in a continuous population register to identify international migrants (see Bilsborrow *et al.*, 1997, Chapter 3), but rather how can a population register serve as a frame for selecting a sample of international migrants to administer a survey. To the extent that the population register is continuous and has excellent coverage of the population, as in many countries of Western Europe, Japan, and a few others, it can provide an excellent, up-to-date and complete sampling frame, better even than a recent census. Even a recent census will be some months if not years out of date, compared to a continuous population register; in addition, censuses usually do not have as complete coverage of the population as continuous population registers in developed countries (the opposite tends to be the case in those developing countries which have continuous population registers). Thus, for example, the undercoverage of the US census of population at the national level was 4.1, 2.7, 1.8, and 0.1 to 1.2 percent, respectively, in the 1950, 1970, 1990 and 2000 censuses¹, which contrasts with the 0.25 percent of the population missed in the Netherlands population register in 1971 (van den Brekel, 1977).

15. An example of the use of a population register to select a sample to study international migration is seen in a new survey on international migration, called the National Immigrant Survey, implemented for the first time in Spain in 2007. Using the continuous population register (*Padrón Continuo*) as the sampling frame, 21,000 households were selected on the basis of their country of birth not being Spain, and were visited for a personal interview, coordinated by the National Institute of Statistics (INE). For details on the survey see Annex A.

16. As another example, the World Bank proposed to use the population register of Belgium in a pilot study to identify and then interview a sample of international migrants from the Democratic Republic of Congo, Nigeria and Senegal in March-April, 2005. But no report is available as yet.

17. In a population register that is continuous and complete, all immigrants as well as internal migrants much register with the local community in which they come to live, data which is compiled in a central register. Theoretically, all immigrants are therefore covered. In countries which also require residents' emigration to be registered, it is also possible compile have information on emigrants departing, which provides a count as well as certain individual and household characteristics. For emigrants departing who leave a household behind, further information about the household and the subsequent situation of the emigrant may be obtained from proxy respondents remaining in the household.

¹ Petroni and Childers, 2003. The two different estimates for 2000 are based on demographic analysis and dual record estimation, respectively.

18. In practice, registers suffer from incompleteness to varying degrees. Undocumented immigrants by definition will not be included in most population registers, and certain population groups may be systematically excluded depending on the registration rules. The completeness of emigration records are also incomplete for the same reasons already stated, plus the fact that many persons do not deregister themselves, especially when it is beneficial for them to keep their registration unchanged. In countries where completeness of population registers is a significant problem, they will rarely be useful for establishing a frame for a survey on international migration.

C. Border, admission or passenger statistics

19. The use of border/admission statistics to draw a sample of persons for interview from those crossing the border or entering/departing a country is another possible approach to collecting data on international migrants. It should be noted that rather than households, the units here are persons; specifically, persons who cross or are about to cross an international border, or who are entering or departing from a common carrier.

20. Evidently, the use of border/admission statistics is much more likely to catch all people entering, and to function well, in the case of island countries, such as the United Kingdom and Australia, which are among the countries using this approach, compared with countries with long and/or multiple country land borders. However, a major problem in using data from persons crossing at exit/entry points along a border or from passenger lists is the sheer volume of movements that takes place, the overwhelming majority for purposes other than to change residence, with most crossing to shop, sell/trade, work, visit relatives or friends, visit for tourism, etc. It is therefore very difficult to identify the migrants among so many movers. In the case of the United States, for instance, there are roughly a half billion entries each year but less than a million persons are admitted as immigrants (most having applied for residence or work visas through U.S. embassies, or only apply years later after entering for regularization of their status).

21. The design of surveys of movers must confront the additional problem of the lack of an appropriate sampling frame, as there is usually no way of knowing how representative the movers crossing borders or travelling on common carriers are among *all* those actually migrating to a country or leaving a country to change their residence. This is because, in the case of a receiving country, migrants may be entering at many places or points of entry, not all monitored by the data collection process. In the case of passenger lists, they may arrive on many types of common carriers such as various airlines and ships as well as private carriers, again not all monitored, and may arrive at any hour of the day or night throughout the year (the data collection may be only during a certain interval or at certain hours).

22. In addition, many who arrive in a country legally for some purpose, such as work, study, or tourism, end up overstaying their visas and seeking to change/regularize their status afterwards. For sending countries, the situation is the same, even if the country of origin wishes to monitor or keep track of those departing, especially to change their residence to live abroad, people may leave by any land border, common carrier such as airplanes, ships, and trains, and for any destination. And again, they may declare their purpose as shopping, visiting, etc., but may be actually *intending* to stay (emigrate) when they leave, or they may change their mind

later and end up seeking to remain in the other country, thus becoming *de facto* emigrants some months or years after crossing the border or boarding a common carrier to leave.

23. Despite these problems, several countries have implemented surveys of immigrants or emigrants based on samples of persons crossing borders or from passenger lists. The latter is illustrated below by the example of Pakistan and the former by that of the United Kingdom. Additional examples of passenger surveys are found in Annex B (for Pakistan, Mexico and Morocco).

24. In Pakistan, the desire to collect data on migrants (migrant workers) going to the Middle East led to a survey of out-migrants at several major ports of departure in September-November, 1979 (Gilani *et al*, 1981a,c). Since it was thought that most travelled by air, a survey of all passengers departing from the three international airports of Pakistan would be sufficient to identify those leaving to work, specifically in the Middle East. A total of 12,516 male labour migrants were interviewed, recording their age, occupation, place of residence in Pakistan, country of destination, and expected length of stay abroad. This information was then used to create a sampling frame to select a sample of households in Pakistan with migrant workers abroad in the Middle East for a follow-up survey.

25. That survey gathered data on 1,710 households in 250 villages and 50 cities and towns throughout Pakistan, 1,153 of which confirmed having a household member who had left in the past 2 years to work in the Middle East (Gilani *et al*, 1981b). Unfortunately, the procedures used to select households are not described and the mean number of households per community was less than six, indicating a very dispersed sample and high cost of data collection per household. Project documents did note that a major problem was locating the addresses that were provided by departing migrants. Nearly 2,400 households were selected in the sample but only 1,710 were found, of which only 1,153 confirmed having a recent out-migrant as defined. This casts doubt on the representativeness of the sample, even if the three ports accounted for most out-migrant workers to the Middle East. Nevertheless, the use of a frame based on passengers departing to select a sample was innovative.

26. Such an approach could be useful in countries where most out-migration are (i) individuals leaving their families behind to work abroad on short-term (up to several years maximum) labour contracts, where (ii) the aim is to study the effects of that international out-migration on families left behind while the migrant is away. However, if the purpose is to study the impact of the out-migration of the household member during the period of absence, it is desirable to also have a comparison group of non-migrant households in the 300 communities (chapter 3 below). The documents from the survey reported there was in fact such a comparison group, but no information was available.

27. As an example of a receiving country, the United Kingdom has a passenger-based data collection system on immigrants and emigrants, using its International Passenger Survey (IPS), through which face-to-face interviews are conducted throughout the year with a sample of passengers arriving at and departing from UK airports, seaports and the Channel Tunnel. The sample proportion is not indicated in the source available (O'Rourke, 2006), but the total number of contacts is about 250,000 per year, which is surely less than one percent of total entries. Of this, about 3,500 or over 1% are classified as immigrants, i.e., intending to live in

the UK for a year or more; emigrants are similarly defined as those who are departing and intending to live in another country for at least a year, having lived in the UK for at least a year. Administrative sources such as the Home Office are used to correct the IPS totals for asylum seekers and those who switch their status from visitor/short term to long term and vice versa (estimated at 10% of the total).

28. It is interesting to consider the sampling approach, since in principle, whenever the major flow of international migrants from one country to another is across a single common border, something like the Mexican or UK survey may be a useful way to design a sample, and to then interview migrants. If the flow of migrants across the common border accounts for most of the emigration (immigration), then the country of emigration (immigration) has a strong *prima facie* basis for developing such a border survey. Thus the procedure is to determine the magnitude and timing over the year of the usual flows of migrants (documented and not) across the border. In lieu of knowing who are migrants and who are not, all that one can do is count the number of vehicles/persons crossing at, if possible, all border points. Suppose there are j crossing points, and the number of persons crossing at each is found to be, through fieldwork observation, say, n_j , per month on average, with the grand total or sum of n_j for all j being N . Then the proportion of interviewer time (e.g., days) to assign to crossing point j in a year, or whatever the time of study that is possible given the budget, is n_j/N . Then at each crossing point, the *same proportion* of persons or vehicles should be stopped for interview. This would amount to a sample of primary sampling units or PSUs taken in proportion to size, viz., the number of days assigned to each crossing point would be directly in proportion to the number of persons (not necessarily migrants, which is unknown) crossing at that point. Then taking the same proportion of persons crossing at each point (such as one in 10 or one in 100, during specified time intervals) could ensure the probability of selection of every person or element is the same, making it an *epsem* sample. This is the easiest kind of sample, as no weights would be needed in the analysis of data (except for adjusting for differences in non-response at the different crossing points).

29. In a receiving country in which many or most migrants arrive from a single country by land, a similar procedure could be used, providing data on international migrants from the one main country of origin. The procedure could be expanded to additional borders, though requiring additional resources. But to the extent persons cross illegally, the institution of data collection at the main points may lead people to seek new crossing points, subverting the study (by corrupting the sample frame of crossing points).

30. As a sampling frame and a basis for selecting migrants for interview, border crossing surveys have a number of limitations, discussed below from the perspective of a country of immigration, although the discussion for a country of emigration is similar. First, the border survey likely collect data only at the main crossing points, not all. To the extent people enter at other points, or the points change over time, or people come via airplane or boat rather than at land crossing points, then the sampling frame is deficient. Second, the total number of persons crossing is huge compared to those who have any intention of staying, even for a few months, maybe by a factor of say a thousand. This means that interviewers will have to make contact with a thousand people to find someone who may be an actual migrant. This is impractical and a costly use of interviewer time. A third limitation of the border survey method is that when people are crossing borders, even if not surreptitiously, they are usually in a hurry and will not

want to give the time to be interviewed. A reasonable way to deal with this would be to use some very quick screening questions to identify if the person may qualify as a migrant, such as age, country of residence, and purpose for crossing the border (to work or study or change residence). Only those who are adults, residents of A, and coming to B to live would then be eligible for interview. They could then be offered compensation for their time to be interviewed (but only paid at the end, and only if they did not lie in answering the first three questions).

31. While such procedures could be used to screen persons crossing the border for interview, there is a more fundamental problem *if there is interest in going beyond the numbers themselves*. By covering *only migrants*, such a survey lacks an adequate *comparison group* needed to study either the determinants or consequences of international migration. Whether it is useful (representative) for estimating those numbers or some of their basic characteristics, however, depends on the issues raised above.

Chapter 2. Collecting data on international migration from household surveys

A. The crucial issues of sample size and prevalence of migrants

32. In the modern world of the late 20th and 21st centuries there seem to be surveys on everything, and by all manner of mechanisms, from personal interviews at places of work or residence to telephone surveys, mail surveys, internet surveys, surveys when you enter a store, cross a street, etc. Surveys have swept across the developed countries, and the same tendency has begun in developing countries also. Governments, research institutes/universities, non-governmental organizations, and private sector firms carry out many types of surveys in countries around the world. In this chapter, the focus is on serious, scientific attempts to collect data on international migration, from both individuals and households, and from migrants as well as non-migrants when appropriate. The fact that few surveys have collected any data on international migration reflects the fact that those surveys focus on some topic(s) *other than* international migration. However, as interest in international migration continues to rise in so many countries, the feasibility, practicality and methodology for collecting data on international migration from surveys, even existing surveys that have some other primary purpose, will attract more attention.

33. This chapter examines several existing types of surveys commonly administered around the world, to indicate both what they already tell us about international migration, and how they could be adapted to provide useful data, or more data, on international migration. This could have considerable advantages for the generation of statistics on international migration, since the additional or marginal cost would be minimal because it would draw on an existing survey infrastructure and budget. Depending on the main survey topic, the collection of data on international migrants may even be able to draw upon other data already being collected that is useful and cost-free for the study of international migration. This, for example, is the case for adding a few questions on international migration to a labour force survey or a household income/expenditure survey since international migration is usually affected by employment and earnings, or the lack thereof.

34. Key issues to address to determine if it may be worthwhile to use data from an existing survey to study international migration, or to add questions to a survey to collect data on international migrants, are:

1. What is the size of the sample, and its geographic distribution?
2. What is the prevalence of international migration in the country?
3. Does the survey collect data on place of birth, place of previous residence, and/or country of citizenship? Ergo, does it permit defining and identifying international migrants?
4. What *other* questions does the survey contain on international migrants? Does it include retrospective questions, notably on the situation of the migrant in the previous as well as the current country of residence? Subjective questions on perceived reasons for changing residence, or intentions for the future?

35. Each of these are discussed below, focusing on (1) and (2) together since they define at the outset whether there is any point in pursuing the idea of modifying an existing survey to collect data on international migration. In all cases, it is assumed that the main purpose of the survey remains unchanged so that only a few questions or a module of questions on international migration may be interjected into the survey. But given the increasing importance of international migration in the world every year, there is little doubt that countries will be interested in exploring this as a low-cost way of getting more data, however limited, on international migrants.

36. For a "general purpose" household survey to be a potentially useful source of information on international migrants in a country, (1) the survey should have a large sample size or (2) the country should have a high prevalence of international migrants of interest, and ideally both. The term "general purpose" is used here only to indicate that the main focus of the survey is something other than the study of international migration. Thus most existing household surveys focus on a specific topic, such as a labour force/employment survey, population/fertility survey, health and nutrition survey, or income and expenditures survey.

37. In most countries, such existing surveys have sample sizes that are too small to yield statistically reliable data on international migrants. Thus, if we take international migrants to be defined as those persons born outside the country in which they live, their share of the world population is only 3 percent (UN Population Division, International Migration 2006 Data Sheet, from www.un.population), although it is 9.5% in the more developed regions (and 1.4% in the less developed regions). The prevalence is lower than 5 per cent in 69 per cent of the countries of the world which have a population of at least one million persons (*ibid.*), and still under 10 per cent in 78 per cent of the countries. If the typical size of most nationally representative household surveys is 5,000 to 10,000 households, assuming there are four persons per household and that the proportion of foreign-born persons in the population is 5 per cent, then the expected *number* of households containing foreign-born persons would range from 250 to 500 in the survey, with 1,000 to 2,000 individual migrants. Of these, perhaps half or 500 to 1000 would be economically active adults, and hence decision-makers of interest in the migration process. While numbers of that magnitude may provide some indication of the characteristics of the foreign born, the problem of the high sampling error inherent in such small numbers is always present. And they may be distributed widely over the territory of the country, making any sub-national inferences moot.

38. More importantly, the interest is usually *not* in the *stock* of international migrants, here the foreign-born, who may have arrived at their country of destination during any time in their life, but rather, for policy purposes, in those *who arrived within a recent specified time period* (such as within the past two or five years). These will tend to be far smaller in number. On a global scale, the mean net migration rate for developed countries in 2000-2005 was about 2 per 1000, or 0.2% per year. This is a little over 1% over a five year period, or one eighth on average the size of the foreign stock in the more developed countries of the world in 2005 (*ibid.*). This means that in the typical country above in which a survey of 5,000-10,000 households is carried out, there would only be 60 to 120 adult international migrants who had arrived within the previous five years--clearly insufficient for meaningful analysis.

39. This is true whether we are mainly interested in the numbers of migrants coming into a country and their tendencies to increase or decrease or their characteristics, much less in analysing the causes or consequences of international migration. This shows that general purpose surveys, unfortunately, are usually not very useful to use to add questions on international migrants, even to determine their basic characteristics, such as age, sex and education, because of the very small numbers of recent migrants covered.

40. Moreover, general or other-purpose surveys rarely include questions allowing the identification or characterization of international migrants, not to speak of questions on the migration process or the pre-or post-migration situation or experience.

41. Thus, while as a rule other-purpose surveys neither provide data on a sufficient number of international migrants nor sufficient data on the migrants to be useful, there are cases where an existing survey may provide enough data on a sufficient number of international migrants to be useful, or to add questions to make the survey useful, notably in the case of a large survey and/or in countries with a high prevalence of international migrants.

42. For example, in a household survey of 50,000 households in a country which has 10% of its population foreign born and in which migration has increased in recent years so the population constituted by recent migrants may be as high as 3%, then the expected number of households with recent international migrants would be 1,500 with up to 3,000 adult migrants of interest. This is certainly enough to paint a picture of the characteristics of the foreign born, compare them with the native-born, study their age/sex, education, employment/unemployment, income, use of services, etc., on a national if not regional basis.

43. In conclusion, in the case of a small survey, either the proportion of international migrants in the general population should be quite high or specialized sampling methods need to be used to locate and interview households with international migrants to make the effort worthwhile. Methods for doing this are described in chapter 3. In the case of a large survey, such as 50,000 to 100,000 households or more, in a country with a high prevalence of the foreign born in the population, there can be sufficient recent adult migrants to use the data source to investigate the number of international migrants and their basic characteristics.

44. Fortunately, there are increasing numbers of national surveys large enough to capture sufficient numbers of international migrants for meaningful analysis. Since most of these are labour force surveys, we consider them in the next section, before moving on to consider Demographic and Health Surveys, Living Standards Measurement Surveys, and other types of household surveys.

B. Tapping existing types of household surveys

(a) Labour force surveys

45. Labour force surveys provide, potentially, an excellent vehicle for asking about international migrants since the latter are usually motivated to migrate in search of better employment and incomes. And employment is precisely the focus of labour force surveys.

Because of their large sample sizes, many labour force surveys are also the most feasible candidates for using surveys to estimate the numbers of international migrants in a country.

46. Indeed, many countries already have minimal information about international migrants in their labour force surveys. Some labour force surveys include more questions than others to identify and characterize international migrants. Three levels of detail are distinguished below.

(i) Using only a question on place (country) of birth

47. Many countries include in their labour force surveys a question on *place of birth* of all household members, which, provided the data are actually processed by the country of birth as well as internal locations in the country², identifies when the person is a *lifetime migrant*:

Where were you born? (If proxy respondent: Where was X born?)

48. A number of labour force surveys in many developed and developing countries have a question to identify where each person in the sample survey household was born, or at least ask the adult respondent where he/she was born. Such surveys include the annual National Population Survey (PMAU) of Brazil (65,000, carried out monthly but only in the six largest metropolitan areas), and the Labour Force Surveys of European Union countries (which have sample sizes of 60,000-100,000 for the larger countries and 10,000-50,000 for the smaller ones).³ For example, Italy has a survey covering 174,362 individuals (but unknown number of households) in 2007, with questions on country of birth and citizenship. Vietnam also has a large labour force survey of about 100,000 households, to provide statistically reliable estimates at the province level, but it is still on a learning curve in terms of quality (non-sampling errors).⁴

49. The question on place of birth used in the labour force surveys above is also found in many censuses of population around the world, and is better than nothing, but not much better since it does not fix the time of arrival of the person. Someone who is age 50 may have come at any time in the past 50 years, including as a child.

(ii) Using a question on place (country) of birth *and* place (country) of residence at a specified time in the past

50. The addition of a single additional question for those not born in the current country achieves a major improvement:

² It is noted in Bilborrow et al (1997) that just because a question is used in a census does not ensure that the data are processed, and when processed, they may still not be made public or published.

³ The small numbers problem is also evident in most of the European Union Labour Force Surveys, which find that foreign employees constitute only 2-6 per cent of the labour force, missing up to half (see Migration Research Unit, University College London, "Comparison and evaluation of the labour force survey and regulation 311/76 data as sources on the foreign employed population in the EC", December, 1993).

⁴ Based on a discussion with Elizabeth of the Sub-regional Office for East Asia of the International Labour Office in Bangkok, July 2007.

When did you (last) arrive to live in this country? (If proxy: When did X arrive ...)

51. This fixes the time of arrival, and makes possible estimating some international immigration flows and rates, and determining the basic characteristics of those international migrants so identified, depending on what other information is included on all persons in the labour force survey. The data (classified by years of residence in the destination country) could be compared with the data for non-international migrants, if one is interested in studying mobility over time (but see 4 below). Usually labour force surveys collect data on several basic demographic characteristics, such as age, sex, education, and marital status, along with more detailed data on employment (including hours of work, occupation, sector/industry, wages, etc.) and unemployment (reason, duration, work seeking behaviour). Hence the simple addition of the question on time of arrival significantly enhances the value of a labour force survey for studying international migration when that survey only has the place of birth.

52. An alternative *minimal* sequence of questions could also obtain similar data.

Where were you living on (a specific past date)?

(If in same country) When did you arrive at your current residence?

(If in another country) When did you (last) come to live in this country?

The specific past date could be exactly 12 months ago, two years ago, 5 years ago, at the time of the previous population census, or any date that people commonly remember in the country, such as of a national election or a major natural disaster.

53. There are many examples of national labour force surveys that include place (country) of residence at a specified time in the past, in addition to the question on place (country) of birth. For example, the U.S. Current Population Survey, with a sample of about 100,000 households, asks the place of birth of each household member is available every month, and once a year, every March, the place of residence 12 months before is also recorded. (See Annex C for more details on the U.S. Current Population Survey.)

54. Some countries in the European Union have a similar set of questions as the US CPS. For example, Latvia's Labour Force Survey in 2006 had a sample of 19,000 persons, and collected data on country of birth, citizenship, country of residence one year before, and years of residence in Latvia since (last) coming from living abroad. (Unfortunately, the data are not processed on immigrants.)

55. Similarly, Spain's Survey of the Economically Active Population, covering 60,000 households each quarter, asks place of birth, citizenship, and year of arrival (but not country of previous residence).

56. New Zealand's Household Labour Force Survey, a national sample of 15,000 households carried out quarterly, obtains data also on immigrants with the same two questions, on country of birth and years spent in New Zealand for those not born there (hopefully, this would be years since arrived last time).

57. And in its labour force survey, Australia asks place of birth, previous country of residence, and when arrived (last) to Australia.

58. Argentina has a large Permanent Survey of Households (EPH) which adopted a revised methodology in 2003. It has an annual sample size of 100,000 households with more or less national coverage (31 urban agglomerations and one urban-rural stratum). It asks all members of the household the questions place/country of residence 5 years before, as well as place of birth. (However, it is unclear from the discussion of the new methodology (Argentina, INDEC, n.d.) whether this information is obtained for 100,000 households or only 25,000 households.)

(iii) Using a module of questions added to a labour force survey

59. Several examples of actual country experience in using a module of questions to study international migration are briefly below.

60. The 1979 Population, Labour Force and Migration Survey of Pakistan (PLM) illustrates how the addition of questions to an on-going survey can allow a better characterization of international migration (Irfan et al, n.d.). Questions were added to two rounds of the national Labour Force, Income and Expenditure Survey. The head of household was asked to indicate whether any member of the household had ever migrated to live elsewhere since December 1971, when war with India erupted (a date easy to remember). Anyone moving abroad (and not returning) or coming from abroad within the 8 years preceding the interview was then identified as an international migrant (including return migrants). The survey was reported to cover 10,242 household members (less than 2,000 households), containing 0.15 per cent return migrants (only 15 persons!) and 0.48 per cent (49 persons) international out-migrants. The information recorded on migrants was limited to age, sex, dependency status, year of departure or return, and labour force participation while abroad, but note that this does include both dates of departure/return and work activity (even without details) while abroad, which are otherwise not covered in labour force surveys.

61. Although there are significant cost advantages in latching onto an existing survey, this example indicates very well that, even with a generous 8-year time window for defining international migrants, the peculiarities of international migration usually call for special approaches to get data on enough international migrants to make the effort worthwhile. The reason is that international migrants tend to *rare elements* in the population and are hence seldom represented satisfactorily in general purpose samples, once one defines migrants as those coming or leaving in a recent time interval. In addition, the questions that can be added pertaining to international migration without disrupting the main function of an existing survey are usually too limited to allow more than a superficial characterization of international migrants. Still the fact that international migration is becoming of much greater interest calls for further examination of the possibilities. This leads to the next, very recent (2006) example, of adapting a large national labour force survey, in Thailand.

62. Another example of adopting a large national labour force survey is illustrated by the case of Thailand. In Thailand in the last quarter of 2006, an experimental new module was added for the first time to seek further information on international migration. A total of 22 questions were added, for every person, referring to the 12-month reference period before the survey date. The full sample size was 79,600 households. (see Annex D for detailed description.)

63. Nevertheless, given the sample size and good question modules used, it is instructive to quickly summarize some results of the analysis of the data from the survey (Thailand, 2007b) as they indicate the limitations of even large surveys when countries have a low proportion of international migrants of interest. Thus, the survey led to an estimate of 65.5 million for the population of Thailand in the last quarter of 2006, based on the nationally representative set of 5,796 sample areas. With less than one percent (0.6%) of the population born abroad, the absolute number of persons born abroad was about 480, or not much more than about 100 households, making all the statistics on international migrants produced in the publication for the country based on the national inflation factor of 823 (=65.45 million/79,560) very unreliable. One example suffices, a table is presented showing the reason for migrating to Thailand, based on 17 reasons, for the five regions in Thailand. It does not take much perspicacity to see that the numbers of observations in most cells are tiny, before they are inflated by 823. Only 13% of the households received any money or goods from others, only 6.7% of this was from people abroad; funds were used overwhelmingly for food and clothing (71%), with little for investment.

64. Other countries which have developed excellent modules that it has added to its annual labour force surveys are Costa Rica and Ecuador (see Annex E).

65. A few countries in the European Union go beyond the labour force surveys of type (i) or (ii) above to seek more information on international migration. For example, Poland has a national survey of 24,700 dwellings, the latest in 2007 (first quarter), which includes, for identifying immigrants, questions on country of birth, citizenship, and when arrived in Poland. On emigrants, it has information about members of the household staying abroad more than 3 months, for which proxy respondents were asked country of current residence, when the person left, and why. The survey found those with non-Polish citizenship to constitute less than one percent of the total population, with those living abroad more than 3 month being much larger at 520,000.

66. The United Kingdom carries out a quarterly labour force survey covering 0.1 to 0.2 % of the population, around 53,000 households (asked in the April-June quarter). Like the US CPS, it covers two groups of international migrants: (1) all persons whose address 12 months before was outside the country, and (2) persons born outside the UK, for whom it asks when they arrived in the UK. Again, as in the CPC, the initial interview is in person, with follow-up interviews by telephone, since that is much less expensive. The sample is said to be representative of about 70% of the new migrants, excluding those living in group living quarters, such as students and asylum seekers.

67. Several other approaches to adding a module to the country's ongoing national labour force survey are less orthodox and worth noting as examples in countries with particular interests in international migration. These include the cases of Armenia, the Philippines, Egypt and Mexico,, all with large flows of emigrants and receipts of remittances that are fundamental to the consumption and poverty alleviation of thousands of families and indeed to the development of the country. (See Annex E.)

(b) Demographic and Health Surveys

68. Demographic and Health Surveys (DHS) have been carried out in 75 countries since 1984, a total of over 200 household surveys. These surveys are generally financed primarily by the US Agency for International Development with some inputs paid for by the countries themselves or other donors, and receive technical assistance from ORC Macro (some from the US Centers for Disease Control). Their focus has always been on demographic behaviour (taken narrowly to mean fertility, contraceptive use, and mortality), but the health (including HIV/AIDS) components have increased over the years to become dominant parts of the questionnaires by now. Migration, whether internal or international, has never been a significant part of the surveys, despite many requests, since it is not of much interest to USAID. Nevertheless, most recent DHS surveys do ask at least place of birth, and process by foreign country as well as by internal administrative jurisdiction. Since almost all DHS surveys are based on nationally representative samples, even only identifying the foreign born population provides some useful data, being the same as type (i) under labour force surveys in the preceding subsection. This can result in reasonably reliable estimates of the foreign born population at the time of the survey, and hence of the increase in that population since the previous census, per the discussion below.

69. In addition, the DHS survey has been used several times as a convenient vehicle to seek more information on international migration by incorporating a small module on international migrants. One of the first examples was the 2004 DHS survey in Ecuador, a country which since 1995 has witnessed an explosion of emigration, to the new destinations of Spain and Italy as well as the United States and Canada. The survey (ENDEMAIN IV) had a large sample, 28,908 completed households, which permitted generating reliable estimates at the province level (CEPAR, 2005). A module of questions on international migration (emigration) was developed which were incorporated for the first time in a DHS-type survey in Ecuador, resulting in data that show that 9.3% of all households in Ecuador had one or more household members *living abroad*, 56% of those being male, 59% sons or daughters of the head, 75% aged 15 to 39; 53% married/in consensual union; 68% with some secondary or higher education; and 81% had left to work, 75% since 1999. In addition, 48% were living currently in Spain and 38% in the United States; and 62% had sent money back in the past 12 months. Since the survey, as all household surveys,⁵ could not collect data on international migrants leaving as *entire households* (since there would be no one remaining behind to report on them), the figure of 9.3% is an underestimate, which documents the extraordinary level of emigration in the country (mostly since the last census in 2001) which had very little before 1995.

⁵ An alternative methodology is to ask respondents about any close relatives (not necessarily former household members) who live abroad, or who have left to live abroad within the past X years. This methodology was proposed by Jorge Somoza several decades ago (1977, 1981a,b), drawing on the success of the orphanhood questions for making possible much better estimates of adult mortality in developing countries lacking reliable vital registration systems. This method can produce reasonable estimates if the relationship is very close and well defined and if the time period is recent. Thus respondents could be asked about their siblings, biological parents, or own children live abroad. The number of people responding for a particular person must be controlled for to avoid double counting: thus if there are 4 siblings, and one is abroad, that international migrant may be reported by three different persons. The time frame must also be recent, to increase the likelihood that the respondent will reliably know whether someone is living abroad and basic characteristics of the migrant. See also Zaba (1986, 1987).

70. The questionnaire module in Ecuador contained the following questions, focusing on *emigration*:

- Has any member left this household to live in another country?
(Name, relationship, sex, current age, year when left)
- What was the marital status of [name] at the time of leaving?
- What was the education level completed of [name] at the time of leaving?
- Did [name] work at any time during the year before leaving?
- What was the main motive for leaving?
- In what country does [name] live currently?
- In the past year, did [name] send money, with what frequency, and how much in total?
- What was this money used for, principally?

71. This module is concise and has the virtue of getting information on marital status and education *at the time of migration*, which may affect migration, rather than at the current time, which could have been affected by events subsequent to migration and hence be a consequence of migration. It also asks about whether the person sent remittances back to the household in the previous year. It asks about the *current* country of residence rather than the original country of destination, which is also more important, since in many cases the latter is only a transit point planned at the outset, rather than the main destination. However, the module could have been improved, and even simplified, which is always a virtue in surveys, first, by asking work *during the month before* rather than the whole year, which is too imprecise and for which a positive response could still obscure lack of work shortly before migration as a motive for that migration; and second, by not asking (and wasting interviewer time) so many details on remittances, since cramming so much into the short question and response space allocated to the module had probably led to poor data, which probably is why no data are published beyond whether or not the household received remittances in the past year. It would also have been useful to add to the household roster or fertility section a simple question, for children not living at home, on where they are currently living--elsewhere in the country or abroad (and country). Finally, a useful addition especially in a country where there is such a drive to emigrate, would have been to ask about *migration intentions*, viz., whether the respondent or other adult member of the household intends to migrate abroad, and if so, when. Data on migration plans can be very useful for policy and planning.

72. As another example, in the most recent DHS survey in Colombia, ENDS (*Encuesta Nacional de Demografía y Salud*), in 2005, questions were also included for the first time to study emigration. Again the national sample of 37,211 households was the largest DHS ever in Colombia, to produce results valid at the *departamento* or province level (Ojeda et al, 2006). The household head or proxy was asked if any person who used to be a member of the household was living in another country at the time of the survey. A series of questions was then asked about that person: Name, sex, age, relationship to head, current marital status, reason for leaving, year left, country of current residence and duration of residence there, whether left alone or with spouse/children, and other countries lived in besides current country.⁶ Four percent of Colombian households reported having one or more former

⁶ The Colombia DHS also asks in the household questionnaire whether the mother of each person, if alive, lives in Colombia or in what other country. It also inquires for all women aged 50 to 69, whether her sons and daughters live in Colombia or elsewhere, and how many in which country. The latter seems too complex to make much

household members living abroad. Given the size, quality and comprehensive geographic coverage of the survey, and the better quality of interviewers due to their experience and training compared to census enumerators, this estimate is probably more reliable than the estimate from the prior census of population in Colombia, which is also likely the case with respect to the survey in Ecuador, described above. The module of questions differs from that of Ecuador in several ways, including a question on whether the person left alone or with family members (a useful addition), but fails to ask about education or work, asks for current marital status rather than at the time of departure, and asks complicated and not crucial questions on other intermediate countries lived in prior to the current one.

73. Both countries could also have simplified data collection by asking when the person left *right after age and sex*, and then limiting the further detailed questions only for those members who had left recently, say in the past 5 years, or since a prominent date in the country. This would yield better quality data in less interviewing (and respondent) time.

74. While it must seem anomalous to discuss DHS modules on international migration only for two countries which are in the same region and similar in many respects, a large project reviewing what is known about international migration in DHS surveys (the Migration, Globalization and Poverty Project) of the Development Resources Centre at the University of Sussex (UK), has compiled a list of 59 countries (not including Ecuador or others not done by ORC Macro), carrying out recent DHS surveys with their modules, and the only country with a module on international migration indicated is Colombia.

75. With the increasing interest in international migration all over the world, it seems certain that more countries will want to include modules on international migrants in their DHS surveys in the future, whether on immigrants and/or emigrants. In the meantime, most DHS countries will continue to have the place of birth recorded *only* for the person responding to the individual questionnaire (usually one woman of child-bearing age in the household; but see footnote below) and the place of residence five years prior to the survey (including if it is a different country, but unfortunately without specifying the country). The latter question is evidently included to determine (internal) migration status. The desirable approach for collecting minimal data on both internal and international migration would be to instead add a question to the household roster to ask where each person was born, and code the country as well as internal political jurisdictions.

76. Many countries also carry out their own demographic, health, and/or nutrition surveys, outside the DHS programme. One example is the New Zealand Health Survey in 2003/4, of 12,939 persons responding to the household survey, which has the question on place of birth.

(c) Living Standards Measurement Study surveys

77. The Living Standards Measurement Study surveys (LSMS) began as a research project of the World Bank in 1980, to assist countries to collect micro-level data to assist policy-makers in improving policies related to health, education, and poverty alleviation. LSMS surveys have been carried out since 1985 (the first being in Peru and Cote d'Ivoire) in

sense of. On the other hand, surprisingly, place/country of birth is *not* collected for anyone in the household.

about 40 countries—over 60 surveys—funded by the World Bank. Most surveys are nationally representative but have modest sample sizes (3,000-6,000 households⁷). The World Bank is currently in what it calls Phase III, in which the data files are being made more available to researchers around the world, along with many working papers, publications, and methodological documents. The Migration, Globalisation and Poverty project of Sussex has also compiled a list of all LSMS surveys (in addition to DHS surveys), noting whenever the country had a specific module on migration, which was found to be the case in about half (31) of the LSMS surveys

(http://www.migrationdrc.org/publications/resource_guides/Migration_Nationalsurveys/index). However, in only two cases does there appear an interest in international migration, with modules entitled "emigration" included in the Armenia LSMS and "international migration" in the Peru LSMS. The LSMS survey of Ecuador (its fifth) in November 2005-October 2006 had a national sample of 13,536 households, including a module on emigrants from the household, recording their current age, sex, relationship, education, and whether left minor children under age 18 behind (there being some concern, also in Peru, about who is taking care of them).

78. The LSMS module on migration focuses on *internal migration*, and includes questions to identify both lifetime and fixed term international migrants. For example, the 1988 Ghana LSMS (portrayed on the LSMS World Bank website as a prototype questionnaire) and the 1994 Peru LSMS (which is said to have a module on international migration) have the same questions: (for members of the household above age 15), place of birth (noting country if abroad), emigration (at what age left place of birth, and why), where lived between birth and current residence, year when came to current residence, and why came).⁸ This appears to be the prototype migration module in LSMS surveys (see www.worldbank.org/LSMS/guide). It may be considered as a limited module of type (ii) above (see subsection under (1) labour force surveys), with its key questions limited to place of birth and when came to current residence. Beyond that, it only asks the main reason for coming, with nothing substantive related to the migration move, such as circumstances of the migrant prior to migration, or just after returning, such as education, work, and marital status. It also has nothing on emigration.

79. Nevertheless, LSMS surveys have considerable flexibility, depending on country interests, with one having a module on emigration (Armenia), others on labour migration (Ecuador, India), several tracing migration to times of dissolution (of the Soviet Union) or the end of a conflict (Timor-Leste). Given the growing interest of the World Bank in international migration, remittances, and their relationship to development, it seems likely that modules on international migration for LSMS surveys will be strengthened in the future. For example, LSMS data are used to study migration in Albania by Carletto and colleagues (e.g., Carletto et al, 2004), revealing an extraordinary change in recent years from a traditional orientation to internal migration to a huge volume of international migration, mainly to neighbouring EU countries.

80. As a result of their very small sample sizes and the extremely limited data collected on international migration, the LSMS surveys in their current form are still not very useful for

⁷ The 1993-94 Integrated Household Survey (LSMS) in South Africa had a sample of 9,000 households.

⁸ As another example, the 1998 Ecuador LSMS asks about residence at a fixed past date (10 years ago). But both that place and the place of birth do not even have "other country" coded by country.

studying international migration, neither for counting migrants nor characterizing them. While this is not their major purpose, as long as it is not more than a sideline interest, the LSMS surveys will not be a useful resource for studying international migration.

81. Surveys similar to the LSMS are implemented in some countries outside the LSMS fold. One example is the New Zealand Household Economic Survey of about 3,000 households, carried out in July 2007. It includes a question on country of birth, and year of arrival in New Zealand to live, if not born there. There is a fine line between such surveys and others described in subsection (4) that follows.

(d) Other general or multi-purpose household surveys

82. Many countries have occasional or regular large-scale sample household surveys which are not primarily labour force, DHS or LSMS surveys, and have some information on international migration, if only from a question on place of birth of the respondent or of all household members. One example is the survey in Brazil called the *Pesquisa Nacional por la Mostra de Domicilios*, which began in 1967, reached 65,000 households in the 1980's, and now has a sample size of 110,000 households. Another is the National Sample Survey of India. Vietnam implemented a large Survey on Population Change and Family Planning starting on April 1, 2007, with the sample said to be 15% of the country's population. The household head or proxy respondent was asked to identify any household member who had come to live permanently in Vietnam in the past 12 months.

83. A number of countries in the European Union carry out surveys similar to the LSMS, as part of the European Union Survey on Income and Living Conditions (EU-SILC). Poland, for example, carried out a survey covering 16,000 households in 2005, with national coverage. Data on immigrants are available from the two questions asked of everyone on place (country) of birth and country of citizenship, while some data on emigrants are also available, from questions on persons staying abroad, whether for less than a year or more, and reason for being abroad (from a proxy respondent). However, the actual country of residence abroad is being collected only starting with the 2007 round of the survey.

84. The EU-SILC survey in Latvia in 2005 had a sample size of 3,843 households, also providing national coverage. Data on immigrants are available from the questions on country of birth and citizenship. The Central Bureau of Statistics of Latvia reports that these data are not processed since that was not part of the tabulation plan.

85. Mexico carried out a National Survey of Household Income and Expenditures in 2005 based on a national sample of 25,443 dwellings. It asks for each person where he/she lived five years before the survey, and obtains detailed data on remittances received. It yielded an estimate of about one-half of one percent of the population being immigrants during the five year time window.

86. The United States has a number of large, national household surveys, annual or nearly annual, which include a question on place of birth.⁹ The US Census Bureau recently initiated a

⁹ Including the National Health Interview Survey (2005), the Survey of Income and Program Participation in 2004, the American Housing Survey in 2005, and the National Longitudinal

large multipurpose annual survey, the American Community Survey (ACS), which is intended to replace the long-form in the US Census of Population in 2010. In the ACS, international migrants are identified by the questions: Where was X born? Is X a citizen of the US? When did X come to the US (but not where from). It also asks about whether a language besides English is spoken at home, and knowledge of English. The fact that it has basic data on education, work activity, and income of each person aged 16+ makes it useful for studying those aspects of the situation of international migrants by duration of residence and country of origin. By comparing these aspects with those of non-migrants, the ACS can be used to study the mobility and integration of immigrants in the US. Since the survey has such a large sample size, about 2% of the US population, it can be used and is being used to estimate the stock of the foreign born each year. The fact that the sample size is 30 times that of the traditional Current Population Survey makes the latter no longer the survey of choice for estimating changes in international migrants in the US.

87. The World Bank has launched a new programme to obtain data on remittances, involving the creation of specialized surveys in countries from which remittances are being sent, but no publications are available yet. A new series of household surveys on poverty which includes international migration is also starting up, with the first survey carried out in Congo in 2005, focusing on poverty, with a sample size of 5,000 households (Congo, 2005). In Section 06 entitled Migration...it includes a few questions on migration: "Did anyone in the household leave to live in some other place for at least 6 months (outside the current district of residence, but inside the country or abroad); why did this person leave, and does this person intend to return?" Additional questions inquire about economic and other problems which may be linked to migration: "Has your family suffered from the social-political troubles since 1993, and how? In case of emergency, could you get 10,000 francs, and how? If not, who would you go to first for help?" Note that the information obtained on migration per se is quite limited, just whether someone in the household left and whether the respondent thinks the person intends to return. There is no attempt to identify who the out-migrant is, his/her characteristics, when left, situation before or since migration, or even the country of destination. It is thus not a serious effort at getting data on international migration, but rather a survey on poverty and disruptions due to the civil strife. Hopefully other surveys in this new program will be undertaken in countries not suffering so much from violence so they can focus more on migration. .

C. Specialized surveys on international migration

88. A number of surveys focusing on international migration have been conducted over the last decade that illustrate both the potential usefulness of specialized surveys and the shortcomings inherent in the designs adopted by most of them. In this section, some of them are reviewed in more or less chronological order, providing only an overview of the surveys in seven sending and receiving countries organized by NIDI since they involve both classical and innovative sampling methods. Details on the NIDI surveys are covered in Annex F. Reviewing the many efforts at collecting data for small areas of sending or receiving countries to study the determinants or consequences of international migration is not done here as that is beyond the scope of this undertaking. Specialized surveys on international migration are very useful complements to existing national demographic data collection systems that typically collect

Survey.

only minimal data on the numbers of migrants (based on questions of types i or ii illustrated in the subsection on labour force surveys above) since they collect data allowing an in-depth study of those international migrants, or at least a subsample of them, which is not possible from the traditional data collection systems.

(1) *Réseau d'Enquêtes sur les Migrations et Urbanisation en Afrique de l'Ouest*

89. An example of a household survey programme which attempts to produce estimates of the *numbers* of international migrants in several countries which lack even the most basic data on international migration is a project coordinated by CERPOD and the University of Montreal in seven Francophone West African countries plus Nigeria in 1993, entitled *Réseau d'Enquêtes sur les Migrations et Urbanisation en Afrique de l'Ouest*. Migration surveys were carried out in Burkina Faso, Côte d'Ivoire, Guinea, Mali, Mauritania, Niger, Nigeria and Senegal in 1993 (CERPOD, 1995).

90. All surveys used nationally representative samples, with sampling frames based on a previous census, and were aimed at *measuring the stocks and flows of migrants* as well as their characteristics. Sample sizes varied from 6,900 households in Niger to 33,992 in Nigeria, with the sampling rates (proportion of the country's population covered) varying from 0.21% in Nigeria to 2.65% in Mauritania. Migration histories were obtained for all adults interviewed.

91. The seven country surveys together covered nearly 100,000 households, but because they were interested in both internal and international migrants, the sampling designs made no special effort to find international migrants (i.e., there was no stratification or oversampling). As a result, the numbers of international migrants were small (see Bocquier and Traoré, 1998). In addition, project documents did not explain clearly how samples were selected, which always raises questions about the quality of data gathered (see, e.g., Senegal, n.d.). However, the CERPOD surveys do have the advantage of covering both migrants and non-migrants, providing the basis for comparisons that may shed light on the determinants of migration (see chapter 3). This possibility is enhanced by the surveys being carried out simultaneously in countries linked by major migration flows (such as Burkina Faso and Côte d'Ivoire; and Mali and Senegal), which facilitates a more comprehensive analysis of the causes and consequences of international migration than any other data collection effort to date in Africa. Thus in each sample household in each country, one adult was interviewed to provide information about out-migrants, to any destination.

92. When whole households out-migrate, there is no one left in the origin area to report on them, so out-migration, including to international destinations, is always underestimated in a survey to the extent whole households leave. A way to get information about whole households departing is from survey in the main destination countries. In the case of the West Africa surveys, this potential exists: Whole households migrating from Côte d'Ivoire to Burkina Faso are missed in the former but could show up in the latter, making possible an adjustment upward in the estimate of emigration from Côte d'Ivoire (see also chapter 3). Unfortunately, this has not been done, and in any case, the small samples of international migrants reduce their potential for such an adjustment to improve the estimation of emigration. Accordingly, research based on these data has focused on internal migration (e.g., Beauchemin, 2005).

(2) MIREM project (Return Migration to the Maghreb)

93. Several countries have developed specialized surveys on *return migrants*, to assess the impacts of their migration experience on them, their families and communities in the origin country, and sometimes the country itself. One example is the MIREM project (Return Migration to the Maghreb), which includes Algeria, Morocco and Tunisia. Surveys were carried out in the three countries by teams led by the European University Institute in Florence, Italy, from September 2006 to January 2007. 992 interviews were carried out, covering both migrants who returned voluntarily and those forced to return, on their situation before they left, their experience while abroad, and conditions in their origin country after returning. Data were obtained on their socio-demographic characteristics, professional situation and skills, social and financial capital, migration experience, why they returned and reintegration experience, and current situation and perspectives on their whole experience. Results will be posted online as they come out at www.mirem.eu/datasets/survey. Although details on the sampling procedures are not available and the samples in each country are evidently very small, the data should be useful for learning about both the determinants and consequences of international migration from these three countries.

(3) Specialized surveys on international migration in individual countries

94. Prior to its participation in the MIREM surveys, Morocco carried out several surveys on return migrants, including a panel survey in 1986-88 and a survey of 1,467 households with at least one return migrant, in September, 2003, called Survey of Return Migrants Living Abroad. The latter was carried out in two regions, Greater Casablanca and Souss-Massa-Draa, covered those who had left to live a year or more abroad and then returned, excluding students. The questionnaire is extensive, with 102 questions, some with multiple parts, including for each h/h member up to age 20, so it can only be summarized here. It covers h/h composition, housing quality, place of birth and current work of every h/h member; migration history of every member, including reason for each change of residence; situation of the migrant before first departure abroad, including who made the decision and whether received any help and type of help; whether married and work situation of spouse; situation in destination country (not clear if first or last), including if received any training/skills and who funded; whether spouse accompanied or not and why, ditto for children, whether studied abroad; births abroad; language skills, social activities abroad, frequency of visits to Morocco, and whether had source of support in case of financial difficulty. Finally, questions were asked about their "reinsertion" into Morocco, including who decided to return, why, whether received any help, whether working before return, evaluation of foreign experience, whether invested in Morocco since returning and why or why not, type and place of investment; and whether experienced any problems in returning.

95. Migration movements from eastern to western Europe became significant starting in the late 1980's and 1990's with the dissolution of the Soviet Union and several eastern European countries. The Economic Commission for Europe coordinated surveys in three countries of Eastern and Central Europe in the early 1990's--Lithuania, Ukraine and Poland-- to study both emigration and short-term international travel originating from those countries (Frejka, 1995;

Mullan and Frejka, 1995; Okolski et al, 1995; Sipaviciene, 1995). Although there is variation across the three surveys, all are based on samples that are not representative of the populations of the countries of origin (even of the few origin communities selected). While some also fault them for using proxy respondents to obtain information on migrants absent from the household, this is the only way data can be obtained on international out-migrants in most situations.

96. Some countries carry out large migration surveys with national coverage. While the focus is almost always on internal migration, they usually get data on international migrants as well. Malaysia, for example, has had an annual migration survey, administered by the Department of Statistics, since 1992, covering 74,500 households. The Migration Survey Report 2003 is the most recent publication, recording 126,612 immigrants. The questionnaire inquires about any changes of residence in the past 12 months, for all persons at least one year old, plus the reason for moving. Those aged 15+ at the time of interview are asked one additional question on their occupation before moving. The number of international migrants reported above is impossible for the sample size indicated, as it would imply that practically all households have multiple immigrants. Thus the number reported must be an estimate of the *total number* in the country based on inflating the survey results.

97. The use of *longitudinal surveys* to study the consequences of international migration should also be mentioned, as they are particularly useful for monitoring changes over time in the situations of immigrants. Canada has an annual Longitudinal Survey of Immigrants (LSIC), carried out most recently in September 2005. The survey involves interviewing new immigrants who are at least age 15 at the time of arrival, and then 6 months, two years and four years after they arrive, in several provinces and major cities of arrival of immigrants. Thus the target population for the 2005 survey was all immigrants who arrived between October 2000 and September 2001, who were then interviewed for the last time in 2005. This covers about 2/3 of the 250,000 arriving each year, excluding those arriving as refugees or to seek refugee status and those who seek to regularize their status after arriving in Canada. Interviews are carried out both in person and by telephone. The survey is *not* used to estimate international migration flows, and instead uses the database from Citizenship and Immigration Canada as its sample frame. Australia also has a programme of interviewing immigrants at the time of arrival, plus four more times--after one month, one year, two years and 5 years. Such data should be very useful for analyzing the integration of migrants and the consequences of migration for the migrants themselves if sample attrition is low, but do not permit a full assessment of the consequences since there is no comparison group (see chapter 3).

98. In the United States, the New Immigrants Survey began being fully implemented in 2004. Its universe is all persons granted permanent resident status during a given year. A sample of 12,500 immigrants and 1,250 children (of immigrant and immigrants married to US citizen) is selected from administrative records of the former Immigration and Naturalization Service, on new immigrants who have documents acquired abroad to legally enter the US, plus those adjusting their status within the US during a given year, the first year being 12 months in 2003/4, both groups acquiring permanent residence. Geographic coverage includes all 85 Metropolitan Statistical Areas (MSAs) plus the 35 counties with the largest number of immigrants, plus 10 more MSAs and 15 counties selected at random from the rest of the US. It is thus not a fully nationally representative sample, though it must cover the vast majority of

immigrants achieving permanent residence status in the year. Immigrants selected are contacted by telephone soon after they obtain permanent residence to ascertain whether they are willing to participate, then are interviewed in-depth, and followed up a year later. Information is obtained on the pre- and post-migration situations of the migrant, including education, migration, and marital and employment histories in foreign countries as well as in the US. Self-reports of health, housing conditions, income, and financial assistance received and given (notably remittances) are also collected. The data will be useful in assessing the short-term integration of legal immigrants to the US and the consequences of the migration for the migrants themselves. However, the lack of information on non-migrants in the country of origin prevents an adequate assessment of the causes or consequences of international migration (see chapter 3), and the lack of data on undocumented migrants, which are almost half the total in the US, means the picture painted of international migrants will be incomplete and inevitably biased towards a more sanguine depiction of their status in the US than would result if all migrants could be studied.

(4) The NIDI surveys of international migration

99. A major multi-country project involving surveys in both mainly sending countries and mainly receiving countries was carried out by the Netherlands Interdisciplinary Demographic Institute (NIDI) and EUROSTAT in 1997 (Schoorl et al, 1998). The purpose was to collect data to study the determinants of international migration from various important countries of origin to the European Union. What was unique about the project was that surveys were carried out in *both* countries of origin and destination in countries linked by not only recent migration but historical colonial ties, language, international trade, and/or earlier flows of international migrants. The design of the project is thus consistent with the systems approach to the study of international migration (Zlotnik, 1992; Kritz and Zlotnik, 1992; Bilsborrow and Zlotnik, 1994) and the recommendations of chapter 3 below, which draws on Bilsborrow et al (1997). The countries of origin were *Egypt, Ghana, Morocco, Senegal and Turkey*; and the countries of destination *Spain and Italy*. The goal was to design a sampling strategy based on (1) nationally representative (in receiving countries) or regionally representative (in sending countries) samples of households which (2) had sufficient numbers of recent migrants for statistically meaningful analysis, with recent defined as having migrated *within the 10-year period prior to the interview* to live in another country for at least a year. To achieve (2), procedures were implemented to ensure that (recent) migrant households ("rare-elements") would have a much higher probability of being selected than non-migrant households or earlier-migrant households, that is, over-sampled (see chapter 3).

100. In sending countries, migrant households were defined as those with one or more persons who had left to live for at least 12 months in *any* other country. In contrast, in each receiving country, interest was on immigrants coming from just *two* countries of origin--two of the five sending countries--thus the sample frame excluded immigrants from all other countries. Primarily for budgetary reasons, target sample sizes were set at 1,500-2,000 households in sending countries (about half each, with and without emigrants) and 600-800 households for each of the two immigrant groups in each receiving country.

102. A common sampling strategy was developed by NIDI for all countries, to be adapted by each only as necessary to confront local conditions. The following steps were adopted as a model sampling strategy:

1. Classify geographical areas in each country (e.g., provinces, then districts) according to the estimated prevalence of households with recent international migrants (based on census or other quantitative data, when available, and if not, on expert opinion).
2. Stratify areas by the prevalence (proportion) of households with one or more recent international migrants.
3. Sample (select) areas from prevalence rate strata so that those with a higher expected prevalence of migrant households are oversampled.
4. Conduct two-phase sampling in sample areas: In phase 1, use a short screening questionnaire to list all occupied households as containing migrants of interest or not.
5. In phase 2, interview all or some fixed or maximum number of households containing migrants, (plus non-migrant households as well in sending countries).

103. The two key aspects of the sample design are the use of disproportionate sampling in step (3) to oversample areas with high expected proportions of migrants, and the use of two-phase sampling in step 4 to *screen* households to identify those of interest. In Annex F, it is indicated how these procedures were applied, or deviated from, in real-world applications in both sending and receiving countries in the NIDI project.¹⁰ A detailed discussion of the methodology is found in chapter 3.

(5) More recent specialized surveys

104. A number of countries have introduced new surveys on international migration in recent years, some without results yet. The existence of these new surveys is proof of the greatly increasing interest in international migration in the world today, and recognition of the need to develop better statistics. For example, Argentina used its latest population census in 2001 to carry out a survey of international migrants in 2002-03, defined as anyone born in any of the five countries bordering Argentina. Called the Complementary Survey on International Migrants (ECMI, in Spanish), it was carried out in the main areas of residence of each of the five immigrant populations, varying from two areas for Brazilians to six for Chileans, and being 18 political areas for all combined, so it is not a national sample, which made the fieldwork less expensive. Households were interviewed if they contained at least one person born in any of the five countries. The description of the sample is not complete (INDEC, n.d., p. 5ff), but states that, except in the city and districts around Buenos Aires, a one-stage sample of households was drawn using strata formed based on both (a) the number of persons in the household from the reference country (one, two or 3+), and (b) the number of years of residence in Argentina (13 or less, 14-23, 24-32, and 33+). A two stage sample was drawn in the B.A. areas, yielding a sample of 13,296 households. The number in the other locations is calculated to be 8,222, for a total of 21,518 households. Data were obtained for each member of the household 18 and over. A module on Spatial Mobility was used to ask each person aged 18 + about his/her last residence in the country of birth (place, composition of household,

¹⁰ The discussion of the three countries below is adapted from papers presented by Groenewold and myself at PAA in 2004 and EAPS in 2005 (c.f. Groenewold and Bilsborrow, 2006, In Press).

reason for leaving, education, employment), when arrived in Argentina, residence history in Argentina (dates, household composition, employment, marital status changes, visits to country of birth, sending and receiving remittances, residence of close relatives and friends in Argentina and country of birth, property in country of birth, participation in civil society in Argentina, migration intentions, etc. The questionnaire content is broad, and similar to that of the new survey in Spain (see B above). Although the sample is not national, the survey should produce considerable useful data on the five immigrant groups, but only to the extent they were enumerated in the census and have not migrated extensively since to other political jurisdictions (if so, many could be lost, the most mobile ones, which are likely to differ from those who did not move since the census). There is no discussion of whether there was a screening process in sample areas. If not, then an important shortcoming would be interviewing only persons from lists enumerated in the census, which would not include the immigrants without legal papers who are less likely to be enumerated, as well as those enumerated who subsequently migrated internally.

105. Statistics New Zealand initiated a national survey of 5,000 migrants called LisNZ. It is a panel survey conducted in three waves, with the first round being from May 2005 to May 2007. The sample is selected from records of those approved for permanent residence, excluding refugees. Data are not immediately available on the sampling fraction or methods. Migrants are interviewed in their homes.

D. The use of sample surveys to estimate the number of international migrants

106. There are many countries in the world, most but not all with small populations, for which there is currently no reasonable basis for estimating the *number* of international migrants living within their borders, much less anything about those migrants. There is therefore considerable interest in developing ways to estimate the numbers of migrants living in those countries, even if only via a household survey. However, in the absence of any data on the foreign born population from a population census or other national source in the country (even if out of date), the use of a household survey by itself to estimate international migrants is *not* recommended in general, because of not only sampling error associated with any sample survey but more importantly because there would be no basis for determining how to "inflate" the results from the survey to derive plausible estimates for the country. Nevertheless, the issue warrants further exploration, if for no other reason that there may be no alternative in some countries. Thus some countries lack data from traditional data collection systems on international migrants, because they (a) have not administered a population census, do not have a continuous population register, and lack border/admission statistics; (b) have such systems but they do not collect data that can be used to identify immigrants or emigrants, or do not process the data if they do collect it; or (c) have data but they are totally unreliable. In such circumstances, and in others where the latest census may have occurred many years earlier, it may be useful to consider how a household survey could be helpful for estimating the number of international migrants living in a country (immigrants) or who have left (emigrants) and their characteristics.

107. Suppose we are interested in estimating the number of immigrants living in a country where the only data are from a census many years ago, which may or may not have obtained

data on the foreign born population. In this case, it is possible to use a household survey to generate an *estimate* of the stock of migrants in the country at the time of the survey, and of the flow of migrants into the country since that census. Suppose the census was 10 years ago, and *did* collect data on the foreign born population. This can be used to calculate the prevalence of international migrants at that time for all administrative areas (provinces and districts within provinces, at least). The prevalence P is computed for each area as the proportion, foreign born/total population. Then all administrative areas of the country, say districts, are stratified according to P . A stratified sample of districts or PSUs can then be selected (see chapter 3) for the survey. In each selected sample district, all dwelling units (or a subsample, depending on the size and area) are then *briefly* visited to perform a *listing or screening* operation, recording for each occupied dwelling, all household units living there with the total number of household members as well as the number of foreign born. For the latter, it would be useful to also note if the person came since the last census.¹¹ The listing operation provides an estimate of the stock of international migrants living in the country at the time of the survey in the sample areas. If it also ascertains whether the migrant had come in the previous T years, it can also be used to estimate migrants arriving during those T years. In either case, it is an *underestimate* since it does not include those who came and then left, nor those who came and then died, so it is a list of surviving immigrants. It is also not *net* immigration since it does not take into account emigration, for which very few countries have good estimates (mainly those with high quality continuous population registers in which people departing report their leaving to live abroad).

108. But let us explain further how a survey can provide a reasonable estimate of the stock of international migrants in a country at the time of a survey. There are several alternatives:

(1) Suppose there are no usable data for determining the distribution of the population of the country, much less the number or distribution of international migrants, but maps are available showing the location of urban and rural places. Then lists could be prepared of urban and rural places and a large random sample of each could be selected, using multistage sampling to ensure a broad distribution of the sample (see chapter 5). In each last-stage sample area selected, a field team will then perform a complete listing or screening survey (see chapter 5), to determine the total number of occupied dwellings and the number of inhabitants in each, and identify the foreign born. The proportion foreign born is then obtained for each sample area. The proportion for the country as a whole is then computed by weighting the proportion foreign born by the population size of each sample area. Finally, this is multiplied by whatever estimate is available for the total population of the country to estimate the total number of foreign born population in the country.

(2) Suppose there is at least an old, out-of-date census, showing the location of the population in the country, but with no data on migrants or the foreign born population. This provides estimates of population size for each area of the country, which allows selecting a random, representative set of sample areas with probabilities proportional to (estimated) population size of PPES. Then the same type of complete listing operation as described above could be carried out in each sample area selected (or a randomly selected part of the sample area, if the areas are very large), resulting in obtaining updated population sizes for each sample area as well as numbers of migrants. The total population of each sample area is

¹¹ The listing operation is the first phase of two-phase sampling, described in 5 below.

compared with that of the census to estimate the increase in the population of the country, assuming the sample is representative. This is more likely the larger the number of sample areas selected. The *new* corrected population figures from the screening or listing survey at time t , $P_i(t)$, for each sample area i , and $\sum P_i(t)$ for all sample areas i combined, can be compared with those of the old census [$P_i(0)$ and $\sum P_i(0)$] to determine the proportionate increase in the population of each sample area i since the previous census at time 0, say $P_i(t)/P_i(0)$, as well as the proportionate increase in the *total population* in the country at time t , or $P(t)/P(0) = \sum_i P_i(t)/\sum P_i(0)$. If the sample is representative, it is just a matter of multiplying this ratio by the *total* population in the previous census $P(0)$ to estimate the total population at the time of the screening survey. Thus $P(t) = [\sum_i P_i(t)/\sum P_i(0)] \times P(0)$. This weighs the previous census total population by the ratio of the current population of sample areas to the population living in the sample areas in the previous census.

The total number of *migrants* can be estimated by first summing the migrants in the sample screening areas and dividing by the sum of the populations of the sample areas (both at time t , of course), or the total sample size. This is multiplied by the ratio of the population of the sample at time t to that at time 0 times the total population at the time of the census, or $M(t) = \sum M_i(t)/\sum P_i(t) \times \sum P_i(t)/\sum P_i(0) \times P(0)$.

The quality of such an estimate is directly contingent on the representativeness of the sample areas selected. The sample is *less representative* the farther back the latest census used for selecting the sample of areas, since that makes it more likely that the population distribution could have changed between the census and the screening survey through internal migration. But this is not a major issue since it is only the final population sizes in sample areas that are being compared with the numbers of migrants to determine the proportion of migrants. Note this method does not require any prior data on the foreign-born population: An example is the CERPOD surveys in West Africa (subsection on specialized surveys above).

(3) If there is a previous census with a reasonable estimate of the foreign born population and its geographic distribution, a better way of estimating the current stock of the foreign born is available. In this case, strata should first be formed based on the *proportion of migrants or foreign born population* in each area in the previous/last census. A stratified sample of sample areas is then selected, perhaps oversampling areas with high proportions of migrants in the prior census (see chapter 5). This should make the screening and listing operation in the field much more efficient, viz., more likely to find households with international migrants, by concentrating the effort on areas with high proportions of migrants. The screening operation will provide the number of international migrants in each sample area, which is summed and compared with the sum of the numbers in the same areas at the time of the previous census. The ratio $\sum M_i(t)/\sum M_i(0)$ thus indicates the proportionate increase in the number of migrants in the country since the prior census. Assuming the sample areas selected are representative of the country, this ratio is then multiplied by the total number of migrants [$M(0)$] to obtain the updated estimate of the number of international migrants in the country, i.e., $\sum M_i(t)/\sum M_i(0) \times M(0)$. This was the procedure used in the example described below, for Ecuador.¹²

¹² If disproportionate sampling is used instead of proportionate (as was used in Ecuador), then the numbers of migrants must be weighted by the inverses of the probabilities of selection of each household in each sample area

109. The method described in (3) was used to estimate the number of Colombians migrating in the previous 6 years to the five northern provinces of Ecuador in 2006. The sampling frame used was based on the previous census of population in November, 2001, which had a question on the place (including country) of previous residence exactly 5 years prior to the census. This identified Colombians coming to Ecuador in that fixed 5-year time window, which was used to create a sampling frame. Thus, for all geographic areas and disaggregations available from the census in Ecuador--for provinces, cantons (equivalent to US counties or districts in other countries), *parróquias* (parishes), and even down to the level of census sectors (averaging about 120 households in urban areas and 80 in rural sectors, actually 60 in the study region), data were available to compute the proportion of the population constituted by recent migrants from Colombia. Budgetary considerations restricted the domain (see 5A) of the study to the northern 5 provinces, which were the five with the highest proportions of census population constituted by recent migrants from Colombia, and together accounted for over 70% of the total. With data at the level of the census sector, it was possible to plan to pinpoint the survey effort in census sectors with the highest proportions of migrants, proportions necessarily higher than those at higher levels of disaggregation¹³, though this would make for a more dispersed sample and higher time cost of data collection. The sampling procedures and fieldwork are described in detail in Bilborrow and CEPAR (2007) and Bilborrow (2007).

110. In the five provinces, for each census sector, the proportion of the population who were Colombians that had arrived in the five years prior to the census was computed by dividing the number of such Colombians by the total census population of the sector. Five strata were then formed according to these proportions--those census sectors with fewer than 3% Colombians, 3-4.9%, 5-9.9%, 10-14.9%, and over 15%. In the 5 provinces there were over 8 thousand census sectors, so since the budget was deemed sufficient only to cover only 100 or so, all sectors which had fewer than 3% Colombians were excluded a priori. A stratified proportionate sample of census sectors (105) was then selected randomly from the remaining sectors using systematic sampling, that is, the probabilities of selection of each sector were proportional to the proportion of Colombians in the sector (see chapter 3). In each of the sample sectors, a listing or screening operation was performed in which all dwelling units were visited to list households by the number of members and identify those with recent Colombian migrants (see chapter 3 on two-phase sampling). These lists were then used to select (sample) households with Colombians for a second, detailed survey on their migration experience and past and present living conditions, especially those related to the Millennium Development Goals.¹⁴ The lists also evidently provided the total number of recent Colombian migrants in the 105 sectors, which was compared with the total in the census of 2001 to estimate the proportionate change in the flow of Colombian migrants into Ecuador since 2001 compared to the previous five-year period before the census. Overall, the number of Colombian migrants rose by 29%, which was still much less than anticipated by the United Nations High Commissioner for Refugees. Apart from the possibility that the number of in-migrants was in

(see chapter 3, the section on using weights).

¹³At the province level, the percentages varied from 0.3% to 1.2% in the five study provinces, being only 0.175% at the national level, truly "rare elements" in the population.

¹⁴A supplementary snowball sampling procedure was also used to attempt to increase the number of households in the study areas with recent Colombian migrants, but led to finding only about one-half person for each person interviewed in the main sample.

fact lower than expected, another explanation could be that the sample frame was defective, that Colombian migrants are highly mobile within Ecuador after they arrive, so that the sample areas (census sectors) in which recent Colombian migrants were concentrated in the 2001 census were not the same as the areas where they were concentrated in 2006.

Chapter 3. Design of Specialized Surveys on International Migration

A. Defining the target population in specialized surveys of international migrants

111. The characterization of international migrants varies from one data source to another, including surveys. Indeed, given the flexibility that surveys offer in terms of the type and depth of information they can gather, they offer the broadest options for defining international migrants. There are three alternative ways to classify people as international migrants or not: on the basis of place of birth, citizenship, or place of previous residence being different from that of the country in question. In general, surveys use the place of residence as the definition since they are usually interested in examining some aspect of the determinants or consequences of the migration movements for the migrants themselves, the household members that accompany them, the household members that do not accompany them (remain in the origin), and/or the communities of origin or destination. Thus to analyse either the causes or the consequences of international migration, a change of residence from one country to another is usually the critical event of interest. However, not all persons who change their country of residence are the same: A person born in origin country O who has always lived in country O but then moves to country of destination D is not the same as someone born in country D, moves to country O, and then returns to country D. Thus, return migrants, including of citizens, must be distinguished from persons arriving for the first time. Furthermore, distinguishing the inflows of persons who "belong" to a country from those of persons who do not "belong" is crucial from the policy perspective, the main marker of "belonging" being citizenship.

112. Surveys either gather information directly from the migrants themselves or indirectly from (proxy) respondents who provide information about persons who have moved from their household, to whom they are usually related. Data from proxy respondents are usually less reliable than data directly from the migrant himself/herself, however. Since "change of residence" is critical, it is necessary to assess *which* changes of residence matter the most. To be most useful, a survey should collect data on *recent* events since not only is data quality likely to be higher than for events farther in the past, but it is the analysis of recent events that can provide timely information on the factors that shape migration or the consequences which is of policy interest. It is therefore advisable to concentrate on international migrants who have changed residence during a recent period preceding the survey. The choice of a cut-off point for that period is not obvious: The further back the cut-off point from the date of the survey, the less likely the events are relevant for an analysis of the current situation. On the other hand, the closer the cut-off point to the survey, the smaller the proportion of persons in the study population who will have changed residence during the time period and hence the greater the difficulty of finding the migrants to interview. In addition, data quality considerations argue against adopting a cut-off point that is set too far in the past. Since respondents in a migration survey should be asked to provide information regarding the *period immediately preceding the most recent change of country of residence*, the farther that event is in the past, the more likely the data will be affected by recall errors (Som, 1973; Bilsborrow et al, 1984, Ch. 4). Consequently, despite the problems associated with locating an adequate sample of recent international migrants, it is strongly recommended that attention be focussed on persons who have changed country of residence within a recent time period, such as 5 years preceding the

survey (at most 10 years, as used in the NIDI surveys discussed in Chapter 2). A survey covering all inflows would encompass *citizens as well as foreigners* moving into the country of interview during the reference period. Similarly, when the survey aims to obtain information on former household members living abroad, it should focus on those who left within a recent time period such as in the past five years, including emigrating citizens and others (foreigners or non-citizens). The latter are usually of little interest from the perspective of the origin country O which is the locus of the survey, since they are usually returning to their own origin country, country of citizenship, or to a third country.

113. Any survey that focuses on international migration or which intends to obtain data on its volume, place/country of birth and citizenship, country of previous residence, and time of the most recent change of country of residence should be recorded for all persons interviewed, and ideally for all household members. In addition, any change of citizenship and its timing should be recorded for each international migrant interviewed so as to ascertain whether the most recent change of residence took place before or after the change.

B. The key issue of identifying appropriate comparison groups for the study of the determinants or consequences of international migration¹⁵

(a) Introduction

114. A key decision that must be made at the outset in designing any specialized survey on international migration is: What is the purpose of the survey, is it to estimate the number of international migrants and their basic *characteristics*, or is it to study the determinants and/or consequences of international migration, and for what countries or population groups? This decision affects the sample size and its geographic distribution, including in what country or countries the survey should be carried out and the population group or groups of migrants and non-migrants for which *data* should be collected to serve as the appropriate comparison or "control group". Despite this point being emphasized in earlier books (Bilsborrow et al., 1984; Bilsborrow et al., 1997), there appears to continue to be confusion in the research literature regarding the data needed to properly investigate the determinants or consequences of international migration, and hence failure to recognize the serious limitations of most existing micro-level empirical studies. This will be made clear below. The discussion in this section assumes that international migrants have been precisely defined and that a country can be characterized as being either mainly a country of origin or a country of destination of international migrants. In reality, every country is both a country of origin for some migrants and a country of destination for others. The artificial dichotomy is used only to make evident the country perspective here, but is omnipresent in the literature.

115. The ideal way to assess either the determinants or consequences of international migration for the migrants would be to interview a sample before the migration, then trace or follow those that migrate; there would then be no memory recall error or deliberate distortion of the data possible, which can occur with a single interview of migrants after the fact. In any case, it is vital to acquire data about the background situation of the migrant prior to migration to study

¹⁵ The discussion here is a much reduced version of Bilsborrow et al. (1997, Chapter 6.B).

the determinants or consequences of migration. While a longitudinal or panel survey involving data collection and tracing the same migrants from one country to another is ideal, this is costly, requiring funding, recruiting and training survey teams, getting government approvals, etc., in two or more countries. Although it appears possible at first glance to appraise the consequences of international migration *for the migrants themselves* by examining changes in the migrants' situation over time based on panel data for the migrants, such an appraisal represents only a partial view of the picture and may even be misleading. Thus, suppose an index indicating the migrant's status or welfare in the country of origin just before migration had a value of 100 which rose to 150 five years later after migration to the destination country. The migrant is clearly better off. But suppose the same index for non-migrants remaining in the country of origin rose from 80 to 140 over the same period. A comparison of the migrant's status five years after migration with that of the non-migrants at the same time would find the migrant better off, but the migrant would have gained less from migration than non-migrants remaining in the country of origin. This illustrates the importance of assessing change not only with respect to the migrant's own situation but also in relation to the appropriate reference or comparison group, which in this case is non-migrants remaining behind. The remainder of this section discusses the key issue of designing the survey to select the appropriate comparison population groups to fit the purpose of the survey. The study of the determinants of international migration (referred to below often as emigration) is discussed first below, followed by the consequences.

(b) Comparison groups for the study of the determinants of international migration

116. A number of types of analyses of the determinants of international migration can be distinguished, based on the survey design and locale. These differ first according to whether the interest is in studying the determinants of migration of individuals, of households, or both; and on whether it is on the determinants of out-migration from a country, of return migration to the country, or of intentions to migrate. Situations can be further differentiated according to whether interest is in the determinants of international (e-)migration from a single country of origin, from a single country to a single destination country, or from one country of origin to several major countries of destination, or to all possible destination countries. A study of migration may focus on countries linked closely by migration, international trade, language, colonial ties, and/or geography (being neighbours), referred to as a *migration system*. Finally, one could examine migration flows from several countries of origin to several countries of destination, as was the case in the NIDI Push-Pulls Project (see Chapter 2 above). The discussion here begins by indicating the way to design a survey to collect data for the analysis of the determinants of international out-migration, that is, the survey should collect data for the appropriate populations. This requires identifying *which* population groups should be interviewed, and in which survey locales or countries. Since the ideal design is usually not feasible, for budgetary and logistical or political (i.e., not all countries agree to participate) reasons, I then describe alternative data collection scenarios, along with their limitations.

117. The ideal and recommended approach for studying the *determinants of emigration* of individuals from an origin country O is to collect data from samples of migrants in each of the major countries of destination, D₁, D₂, D₃, from persons who migrated there from O in the previous x (e.g., five) years, plus data from non-migrants in O, which serves as the appropriate comparison or "control" population. The data are pooled from all the surveys to create a data file that can be used to estimate *migration functions*, that is, multivariate statistical models of the

determinants of why some persons emigrated and others (from the same household, as well as other households without emigrants) did not. Evidently, data are collected in special sample surveys in each of the D countries from the migrants themselves (only those coming from O) at the time of interview (using methods for rare populations, described in section C below). In each D country survey, the migrants (in-migrants there) are asked when they (last) came and their situation and that of their household just before their departure, since it is those circumstances that led to that emigration.

118. At the same time, a survey is carried out of households in O, representative of non-migrant households--the appropriate comparison population. While the sample design is straightforward, the data collection is not as easy as is usually assumed, since the data collected from non-migrants should pertain to the *mean time of migration* of the migrants interviewed in the D countries. If a five year definition is used for the latter, this means data should be collected for non-migrants pertaining to their situation 2.5 years prior to the time of interview (if both are carried out simultaneously). The key is that the data refer to the situations of both those who decided to migrate from O and those who did not at approximately the same time. Instead, existing studies have almost invariably collected data on the control group of non-migrants only at the time of interview, several years after the migration (and non-migration) decisions were made. To the extent the situation of non-migrants in O changed in the 2.5 year interval, this introduces errors in the data.

119. Two other approaches to designing a survey to investigate the determinants of migration of individuals from origin country O are possible. One is the same as that above but with a single destination country, D. Data would then be collected in separate surveys of non-migrant households in O and migrants in D, and pooled for analysis, as above. It has the analytical limitation of examining the determinants of only *one specific flow* of migrants, from the dyad of country O to country D, which fails to take into account the other main flows of emigrants from O and hence leads to potentially biased estimates of the determinants of emigration from O to D.

120. The other, overwhelmingly dominant type of data used in the literature in micro-level studies of the determinants of international out-migration is a *single survey carried out only in O*, the country of origin of the emigrants whose emigration decisions are being analyzed. In this approach, which is the most common since it is the least expensive and least complex to set up logistically, a single survey of *households* is carried out in O, in households with and without international out-migrants. Here data are pooled on individuals who have emigrated and those who have not, along with information on characteristics of the household and perhaps communities, to estimate migration functions. But there are three important limitations of such a study. First, and often recognized, is that the information on the emigrants must usually be obtained from proxy respondents (usually a close relative of the migrant remaining in the origin household), and hence cannot be as detailed or reliable as that obtained directly from the person himself/herself.¹⁶ Second, and not recognized, when the international migrants of interest are defined as those having left country O during the x years preceding interview, the relevant

¹⁶ Occasionally, it is possible to time surveys in countries of origin to capture emigrants during holiday seasons when they return to their origin households for visits. But this is still likely to miss many if not most emigrants, and to capture a biased sample of those who emigrated, perhaps the more successful ones who can afford to return for visits.

reference date for data being collected for non-migrants should *not* be the time of interview but rather $X/2$ years before, that is, the *mid-point* of the period over which the change of residence decisions of emigrants occurred.

121. The third and most important limitation of this survey is its missing some emigrants, since it cannot normally collect data on *whole households that moved*, since there is no one left to report on the migrants and the circumstances of their departure. This is an inherent limitation of *all migration surveys carried out only in areas or countries of origin* (see Bilsborrow et al., 1984, Chap. IV; Bilsborrow et al., 1997). Data on those migrating as households can usually be collected only via surveys of households (containing migrants of interest) in countries of destination. This leads to the issue of how to design surveys to collect data to study the determinants of migration of *households*, to which we now turn.

122. As with individuals, discussed above, the ideal procedure is to collect data from samples of households originating in O in various destination countries, D_i , plus a survey of non-migrant households in O. Data are then pooled for all these households to investigate the determinants of emigration of whole households from O to the major destinations of households that emigrate from O, by estimating migration functions. Again, special sampling procedures are needed to locate the samples of households in each of the D_i , and the reference period for non-migrant households remaining in O should be the mid-point of the period of migration.

123. A more limited and biased approach is to carry out the destination survey of migrant households in only *one country* of emigration. But what happens to individual migrants from O subsumed in households which are mixed households in the country of destination? In fact, there is no reason for a survey in a destination country to not collect data on them as well, as they can be readily identified during the first or screening phase of the two-phase sampling that is likely to be used to seek out the international migrants of interest (see 5 below). The fieldwork in D would then collect data on both individual and household migrants from O living in D at the time of interview. Then, extending the argument, households in the origin country O which have one or more individual emigrants to any of the destination countries of interest should also be included in the sample in the origin country. Between the surveys in both the O and D countries, data would have been collected on non-migrant households and individuals (in O) and migrant households and individuals (in D).

124. This leads to the *ideal overall survey design* for the study of the determinants of international migration from a single origin country, as follows (using a 5-year definition of migrant):

- Conduct a household survey in O comprising (a) a sample of households with one or more former members having emigrated to the destination countries of interest within the five-year cut-off period prior to the survey, the countries being the main countries of destination of emigrants from O; and (b) a sample of equivalent non-migrant households. Individual-level data are collected for all adults (potential migrants) in (b) as well as for all adults remaining in (a) households plus emigrants (from proxy respondents). Although data on the latter can also be collected directly from the individual emigrants in the companion surveys in countries of destination, collecting the data about them from proxy respondents in their origin households at minimum would facilitate a fascinating methodological study of the

- extent to which the reported data differ. To take one particularly important example, what is the value of remittances reported by recipients compared to that reported by senders?
- Conduct a household survey in each major country of recent emigration of migrants from O using sampling methods appropriate for rare elements (see section C). In this survey, all households which have one or more recent migrants from O would constitute the sampling frame. Note that no data would be collected for non-migrants, if the purpose is only to examine the determinants of international migration.
 - In all surveys, collect data on the characteristics of the migrant at or just before the time of migration, as well as of the household including household composition at that time. In (2) this means asking the migrants to provide retrospective data on their situation and that of their household at the time just prior to migration. In (1) it requires obtaining data about individual emigrants from the household from the proxy respondent most knowledgeable about the particular emigrant. In (1), data should also be collected pertaining to the situation of the household at both the time of emigration of each emigrant from the household in the time interval, as well as at the midpoint of the migration interval.

125. In the ideal situation, with sufficient budgetary resources, the household surveys would this be carried out in both the country of origin and the major countries of destination. Given the great effort (large screening survey) required to locate/identify migrants from a single country of origin in each destination country involved in the project, it would be logical and fairly inexpensive to list and sample migrants from *other* countries as well in the destination survey. This might stimulate surveys in additional origin countries to provide a matching population, resulting ultimately in a selection of origin countries together with their main countries of destination countries in a migration system, which was the original goal of the NIDI project (Chapter 2).

126. Other types of studies of the determinants of migration refer to *return migrants* and *potential migrants*, both viewed from the perspective of the origin country. The ideal approach for studying the determinants of return migration is to interview migrants who had left O for D but returned to O in O, along with emigrants from O to D remaining in D since the latter constitute the "at risk" population of return migrants who did not return. If it is not feasible to conduct the survey in D as well as O, data on the at risk group remaining in D could be obtained from proxy respondents remaining in O, though the data could not be as detailed. In either case, observations from the two groups of individuals (or households) would be pooled to estimate migration functions for the determinants of return migration.

127. Finally, for potential migrants, all individual adult members of origin households would be asked if they intend to migrate or not (actual questions are discussed in Chapter 4), with those who say they do and those who say they do not pooled to estimate a migration function. The analysis could determine who intends to emigrate or not, or it could determine who intends to migrate to certain major destinations, D_1, D_2, D_3, \dots , vs. not migrate, if sample sizes are sufficient, using, e.g., multinomial logistic regression. While "intentions" are subjective and often not reliable even at the time of interview, and moreover are subject to change later, understanding the determinants of migration intentions could still provide useful information for policy planning to the extent the determinants of migration intentions are similar to those of actual migration--a topic requiring much more research.

(c) Survey requirements to study the consequences of international migration

128. Paralleling the treatment of the analysis of the determinants of international migration, we briefly discuss here the types of analyses potentially relevant for the study of the *consequences* of international migration, and their implications for data. As indicated in the discussion above on determinants, the preferred approaches are those in which data are collected on the appropriate population at risk, although the applicability of this concept is less straightforward in relation to the consequences of migration than with respect to the determinants. However, since international migrants are selected from a *pool of potential movers*, the best comparison group in both cases is always *non-migrants remaining in that pool*. Below we discuss four different types of approaches and the survey designs linked to them for the study of the consequences of international migration, first for individual migrants, then for households.

129. The recommended approach for the study of the consequences of international migration is to administer a survey on *non-migrants in the origin country O* and a second survey in the *destination country covering (only) individual migrants* from O residing in D. Data from the two are then pooled for the analysis, to compare their situations at the time of interview to determine the effects of migration *per se* on the situation of the migrants in D compared to the non-migrants in O, once other factors are statistically controlled for, including (all measured at the time of migration) age, gender, education of the individual¹⁷, work experience, education of the head of household and/or spouse in the origin country, household assets including land, household income other than the potential migrant's income, characteristics of the local community in O, household migration networks in D, etc. This approach collects data on the appropriate comparison populations, and also has the advantage of collecting the data *directly* from both the migrants and non-migrants themselves, without recourse to data from proxy respondents. The survey in D, however, has to contend with the problem of selecting a representative sample of migrants from a single country of origin O, and hence rare elements (see NIDI examples in Annex F).

130. This type of analysis could be expanded to be a single country of destination and *multiple countries of origin*, O₁, O₂, O₃, etc. This requires a survey in country D of migrants from the various countries of origin of interest as well as surveys of non-migrants in each of those countries of origin, since the latter represent the appropriate comparison groups. Although such a data collection approach is evidently much more expensive, at least it involves straightforward surveys in each origin country (i.e., no need for complex surveys to collect data for rare elements). It also would have less of a rare elements problem in D since the migrants of interest are those coming from a number of major countries of origin in recent years rather than from a single country. By comparing migrants in D with non-migrants from multiple countries of origin, a much broader assessment of the consequences of international migration for the migrants to D can also be made, which can, in principle at least, take into account the effects of not only differences in individual and household (and local community) factors but also the effects of differences in the situations in *countries* of origin, including emigration policies, macroeconomic

¹⁷ This refers to education only up to the time of migration (subsequent education obtained by both would have effects incorporated in the migration or non-migration, and should be manifest in the outcome variables of interest, such as employment, income, housing, health, etc.

conditions, etc., on the international migration of persons. The latter can yield useful information about the effects of policies on emigration.

131. A third alternative, though barely acceptable, is to carry out a single survey in the country of origin O using proxy respondents to report on the current status of international migrants residing in country D. The situation reported on migrants would then be compared with that of non-migrants covered in the same survey in O. Although such a survey design has two advantages--lower cost because it involves a survey in only one country, and it does use the appropriate comparison group--it is not ideal since the data on migrants come from proxy respondents and hence cannot be as detailed or reliable as data obtained directly from the migrants. In addition, the selection of a representative sample of emigrants *to a single destination country* is an onerous task as it must usually involve a large screening survey, given the rarity of emigrants during a recent time interval to a single destination country (though there are exceptions, such as Mexican migrants to the US, Ecuadorians to Spain, Poles to the UK recently, etc.).

132. The fourth and last type of analysis is by far the most common because it is simplest and usually least expensive, requiring that a survey be carried out only in a single country of destination. Unfortunately, it is also virtually useless to indicate the consequences of migration, though it is used all the time ostensibly for that purpose. This survey collects data on non-migrants in D as well as migrants from O. The current situation of the two groups is compared, using various indicators, such as employment, earnings, housing conditions, school attendance of children, health status, participation in local organizations, etc. Then to the degree the measures show migrants are doing as well as or better than non-migrants, the consequences of migration are considered to be positive for the migrants; if the measures show they are doing less well, they are considered to have not benefited from migration. In such studies, it is necessary to statistically control for differences in the other characteristics of migrants and non-migrants (viz., age, sex, education, years of labour market experience) to isolate the effect of migration *per se*, but this is often not done. More fundamental, the main drawback of this approach is that it relies on an *inappropriate comparison population* since the situation of the migrants should be compared with that of *non-migrants remaining in the country of origin* and not with non-migrants in the country of destination: This is because it is the former which constituted the population "at risk of international migration" in O--which had the potential of migrating or not--not non-migrants in D. The typical comparison in the literature of migrants and non-migrants based on a single survey in the country of destination can, at best, shed light on the *degree of integration* of international migrants in the host society, D, *not* on the consequences of the migration for the migrants.

133. Moving to the consequences of migration for households, we first consider an appropriate survey design for collecting data to study the consequences of households migrating internationally as intact household units from a single country of origin O to a specific country of destination D. This design involves a survey in D of migrant households from O and a survey of the appropriate comparison group, non-migrant households remaining in O. The justification for this being appropriate is the same as that above for individual migrants. Moreover, the scope of this type of project could also be expanded by encompassing migrants in D from *multiple* major countries of origin: In this case, a survey of non-migrant households would be carried out in each of those countries as well as the survey of migrant households in the country of destination D.

And as above, this would permit a much fuller understanding of the consequences of migration for households moving to D, including taking into account the effects of differences in the conditions, including emigration-related policies, in the diverse countries of origin.

134. Another approach is a survey conducted only in the country of destination, collecting data from migrant and non-migrant households, to compare their situations at the time of observation. However, as noted above, this is useful only to study the process of integration of migrant households, not the consequences of migration for migrant households.

135. Finally, it is possible to study the consequences of migration for households returning to their origin country. Parallel to the design of a survey to study the consequences for individual migrants returning, a survey carried out only in O is useful, since both the return migrant households and the larger sample of households from which they were originally selected for emigration--an appropriate comparison population--are both present in O. However, *finding* the return migrant households--a subset of a small set of emigrating households in the first place--will likely require a very large screening effort. Also, note that the assessment of the consequences here embodies the consequences of both the emigration of the household and its return considered jointly. To examine the effects of return migration from D back to O alone would require, in addition to the survey of the rare elements in O (return migrant households from D who had migrated from O to D), a separate survey of those migrant households from O who remained in D, which would constitute the ideal comparison population at risk of return migration to O. Note a full assessment of the consequences of migration from O to D would then include the sum of the experiences of those who remain in D plus the experiences up to the time of leaving of those migrants from O to D before they return to O. Not including the latter may well significantly bias the appraisal of the consequences of the migration for the migrants from O to D: Thus, if the return migrants tend to be those who are not very successful, omitting them biases upward the assessment of the migration experience, and conversely.

(d) Bringing it together

136. It should be clear from the above that the preferred survey loci are often the same for studying *both* the determinants of international migration and the consequences, and for examining individuals versus whole households. Thus, the comparison groups for studying the determinants of international migration are similar to those for the study of the consequences such that whenever a survey is planned to study one of the two, one should assess if the survey(s) can be designed to also collect data for the other topic as well, providing a data set that will permit a wider range of important analyses based on having data on appropriate comparison groups, to the extent feasible. This would have a notable advantage of spreading out the substantial effort and cost over a wealth of analyses, sorely needed to advance the methodology of migration surveys as well as provide much more reliable results. Since the ideal survey design usually involves surveys in more than one country, even if only the minimum of one country of origin and one of destination, the cost is not small, so spreading it out over several quality analyses can make the cost per knowledge gained modest.

137. Therefore, the data should usually be gathered to facilitate studying *both* the determinants and consequences of international migration, even if the main *a priori* interest is only one of the two. This would make the data collection effort not only more cost-effective but

also more relevant for policy formulation: Studies of the determinants of migration tell us what factors affect international migration and therefore help provide guidelines regarding how to alter international migration, including what policies might be effective. But such studies tell us nothing about whether it is desirable to do that. Instead, it is studies of the consequences of international migration that indicate whether it is desirable to change policies, that is, whether the consequences are good or bad overall (especially if the consequences assessed go beyond those for individuals and households to those for communities, regions and the country). But studies of the consequences tell us nothing about *how* to alter migration flows. Thus studies of *both the determinants and consequences* of international migration are desirable to develop or modify policies relating to international migration (Bilsborrow et. al, 1997, Introduction).

138. To do this, at minimum a survey in the country of origin covering both non-migrant households and migrant households (since they include individuals who did not migrate) is needed, along with a survey in the country of destination covering migrants (*both* individuals and households). This provides the appropriate comparison groups for studying both the determinants and consequences of international migration from O to D. Note that it is not necessary to collect data on non-migrants in the destination country for either purpose. Nevertheless, surveys conducted only in a single country of origin or a single country of destination or even one of each linked still have limitations, but are often necessary for budgetary and logistic reasons. It is extremely important to explicitly recognize these limitations, rather than sweep them under the rug, to stimulate large and more organized, systematic surveys of international migration in the world, if we are ever to come to a solid understanding, as has evolved in the case of fertility, drawing on the huge data collection effort involving now around 300 national fertility surveys only in the developing countries in the past four decades

C. Sample design

(a) General issues

139. The quality of any survey depends on the quality of its sample. Many government officials and social scientists are not trained in statistics or data collection methods, and do not recognize the importance of a good sample in studying a population. Sampling aspects are particularly important in the case of surveys on international migration, especially because international migrants are usually rare elements in the country, whether a receiving or sending country. Although it is noted above that the ideal approach to the study of either the determinants or consequences of international migration involves surveys conducted in both the country(ies) of origin and linked country(ies) of destination, this is usually not practical or possible for budgetary if not political reasons. Therefore, it is assumed henceforth in this section that the international migrants of interest are those originating in a particular country of origin or living in a particular destination country. Most of the sampling issues described and solutions suggested below apply equally to multiple-country approaches. The discussion also focuses on designing samples to conduct surveys of international migration in countries of destination, as procedures in countries of origin are similar. When this is not the case, it will be noted.

140. This section describes key principles in selecting a sample for a specialized survey on international migration. The general principles, other than those relating to rare elements, apply to any kind of other household survey as well. The first *crucial* general principle is that the

sample be a *probability sample* in whatever areas are covered by the survey (viz., even if it covers only certain regions or cities): The reason is that only probability samples allow statistically valid inferences to be made about the population the sample represents based on the analysis of the survey data. A *probability sample* is one in which every element in the sample (whether an individual migrant or a household containing an immigrant or out-migrant) has a known non-zero probability of selection. To ensure that the probabilistic nature of the sample is maintained, personal judgement must be completely avoided in the selection of the sample of respondents or observations to be interviewed. Thus during the fieldwork stage of the survey, supervisors must ensure that interviewers do not exercise personal judgement in determining whom to interview and whom to not interview. Too many surveys have been vitiated by procedures that overtly or subtly allow elements of judgement to enter into the selection of observations to interview¹⁸.

141. The first step in designing a sample is to define the *domain* of the population to be studied. A domain is a well-defined set of elements, including their location, about which one wants to draw inferences--such as immigrants living in a specific geographic region or city, or regions in a country of origin for which emigration is to be studied. A domain need not be the entire country. When a sample is drawn to cover only certain domains, inferences from the analysis of the sample data are valid only for those domains. In surveys on international migration, budgetary limitations often limit the domain of the survey to particular regions or cities, whether in countries of destination or origin. A survey in a country of destination may, for instance, cover only the cities or areas thought to be attracting most international migrants, or migrants from a particular origin country of interest. The *population covered* in a survey thus depends on the domain or domains of analysis selected *a priori* as well as the types of migrants of interest and the appropriate comparison groups needed (see section B of this Chapter).

142. The *sampling frame* provides the basis for drawing a sample of *elements* belonging to the domains of interest. Elements are the ultimate units to be analyzed, in this case, international migrants (and in studies of the determinants or consequences, appropriate non-migrants as well, as described in section B above). The quality of the sampling frame is a major determinant of the extent to which a sample can be selected which is representative of the population in the domain of interest. A sampling frame is a *listing of elements in the domain of interest*. A frame is perfect if every element appears on the list separately, once and only once, if no element is omitted, and if no inappropriate entries are on the list. With respect to international migration, a perfect sampling frame would have a complete list of all international migrants living in the country of destination at time t who had arrived in that country in the years since $t-5$ (if a 5-year cut-off is used in the definition of migrant). An optimal list would have the current address of each migrant. In countries maintaining a continuous, universal population register, such a list could be available from the register if it tracks migrants well and includes place/country of birth, which is the case in Japan and many countries of Western Europe that have a population register. Such a "list" (computerized) might even include other information about recent international migrants, such as country of citizenship or country of previous residence, year when the person came, age, education, household size, etc., which may be relevant for designing the sample.

¹⁸ "Serious biases of subjective selection have been demonstrated time and again, whether choosing heads or tails, random samples of integers...plants from a field, or people on streets or in homes" (Kish, 1965, p. 29).

143. Countries having a register of foreigners may also be able to use that register as a sampling frame, although it excludes citizens returning after living abroad; but this is desirable unless there is interest in studying return migrants. Even if the list of foreigners from the register is imperfect (some migrants may have migrated internally in the destination country after arriving or returned to their origin country without de-registering, and migrants without documents are unlikely to be recorded in the register, creating false entries and missing elements, respectively), such a list can provide an adequate basis for constructing a sampling frame. A key requirement is that the research team guarantee the confidentiality of any data provided from the population register so that it can draw upon the records of the continuous population register.¹⁹

144. However, most countries lack such an excellent potential frame as a continuous population register, or the register may not be accessible for reasons of confidentiality. Far more common, as noted in Chapter 1, is the availability of a population census as the basis for creating a sampling frame. However, unlike population registers, censuses do not process and store information on exact addresses, and since the data are usually collected only once every 10 years, the information is reasonably up-to-date only for say a year or two right after the census. Thus if the survey of international migrants living in the country of destination is carried out soon after the census, census data can serve as a good sampling frame, and for most other countries, even if the census is 5, 10 or 15 years ago, it will still usually be the only option, especially in developing countries. The 1990 census of France was used to identify international migrants for a specialized survey carried out soon after the census (Tribalat and Simon, 1993; Tribalat, 1995).

145. In some countries, census data have been incorporated into a geographical information system (GIS) in which geographic identifiers or locations of each dwelling or street are geo-referenced with the use of geographic positioning system (GPS) receivers. Without allowing the identification or exact address of individuals enumerated, such a GIS data file could be used to identify micro-locations (blocks, census sectors) where international migrants are concentrated based on geocoded data on households in the census. Note this is useful only if the census data were not processed and available at the census sector level in the first place. For example, the latter was the case in the 2001 census in Ecuador, used as a frame to select a sample of international migrants from Colombia (see Section D in Chapter 2 above).

146. Finally, in Chapter 1 above the possibilities are noted of using not only censuses and continuous population registers but also border and passenger statistics are mentioned as bases for creating a sampling frame to design a survey on international migration. But while border and passenger data can be useful for investigating the situation and mobility of immigrants and emigrants and their families, as described therein via various examples, they have serious limitations for the creation of a sampling frame that covers all the population of interest, and should not be used for this purpose.

147. To select the sample of areas (primary sampling units or PSUs) to constitute the first-stage sampling units in the sampling frame, it is usually necessary to first determine the proportion of the population constituted by international migrants in each geographic area of the domain(s) of interest, in order to stratify areas according to the prevalence of international

² This section and others below, to a lesser degree, draws on *Bilsborrow et al. (1997)*, Chapter 6.

migrants (details and examples are provided below). However, most censuses do not have data on international migrants who have moved into the country during a recent time period, such as a five year reference period (type (ii) in the subsection on labour force surveys in chapter 2) and instead only have data on the place of birth. This is not adequate if the project aims to study *recent* migrants to the country (or emigrants from households remaining in the country, in countries of origin). Thus to the extent the geographic distribution of recent migrants in the country differs from the *cumulative* distribution of the foreign-born population (most of whom arrived decades earlier) that is available in most censuses, the use of census data on the foreign born as the sampling frame is an imperfect sampling frame. However, if this is the only source of data on the presence and location of international migrants, then that is the best one can do: It implicitly assumes the geographic distribution of recent migrants in the (destination) country is the same as that of migrants that arrived over decades in the past. This is a shaky assumption to make, since international migrants, by virtue of being migrants, also tend to be highly mobile *within* the country of destination after they arrive. For a detailed discussion of frame problems, see Kish (1965, pp. 53-59 and 384-433).

(b) Selecting a probability sample

148. As noted above, in a *probability sample* every element (here, a migrant individual or household) has a known, non-zero probability of being selected. Probability samples permit statistical inferences about means, variances, regression coefficients and other statistical measures related to the population in the domains of interest. Inferences from non-probability samples do not have statistical validity. To the extent existing surveys on international migration are not based on probability samples, this vitiates inferences from them to the larger populations they are intended to represent. In a probability sample, selection criteria for selecting areas and elements are established *a priori*, based on survey goals and probability procedures.

149. The simplest probability sample is a *simple random sample* (srs), in which every element has exactly the same, known probability of being selected. When the number of elements is large, tables of random numbers can be used to effect the selection once every element in the sample frame list is assigned a unique identifier. If the elements are in a list or can be arranged in a list (e.g., by geographic location, or from north to south, or by population size or economic status), then *systematic sampling* can be used, in which (a) the sampling interval is determined based on the number of elements or observations desired in the sample (the sample size) relative to the total number of observations in the sampling frame, and (b) a randomly selected starting point is then selected. A common way of selecting PSUs is sampling areas with probabilities of selection proportional to the number of estimated elements the PSU contains, such as the number of households. This is called sampling with "probability proportional to estimated size" or *PPES*. However, for a sample to be a probability sample, it need not be a srs or srs with ppes; this is especially true for sampling international migration. Simple random sampling has the advantage of resulting in self-weighting samples, since each element has the same probability of selection, but when the purpose of the survey is to study rare elements, specialized sampling procedures are necessary to capture those elements in the population, as is described in the subsections that follow.

(c) *Sample size*

150. The size of the sample is important for estimating sample means and other statistics, and is inversely related to sample variance. Sample variance does not depend on the fraction of the population in the sample, a common misconception. By using stratification (next subsection), a smaller sample can have more information content, so sample size is *not* the key factor in ensuring a small variances. In addition, the quality of survey execution in the field is usually more important than the sample size *per se* for reducing total survey error. Non-sampling error, which comprises all sources of error other than sampling error, is usually both larger and more controllable (with careful field procedures) than sampling error, which depends on the sample size which is usually in turn dependent on budgetary resources available for the survey.

151. Determining the desired sample size for a survey is seldom as easy in practice as it appears in textbook examples. Sample size is determined by considering: (a) the standard error of the key variable or parameter to be estimated from the survey; (b) the size of the error in that estimate considered acceptable; and (c) the statistical power of the test of hypothesis used for the key variable or parameter. Textbooks focus on examples where the variable to be estimated is a sample mean, a sample proportion or a rate, such as mean income; in the present context, this could be the proportion of international migrants in a population, or the rate of out-migration from an area. *A priori* knowledge of the population variance of the key variable is needed to determine the size of the sample required; in stratified samples (below), such knowledge is required for every stratum. It is rare that there would have been a recent survey in the country with a similar sample design which would have obtained data on the same key variable and its variance to provide the information needed, and especially unlikely in the case of surveys of international migration since there have been so few..

152. As noted above, a critical factor in determining the necessary sample size is identifying the key variable of interest. In complex surveys, such as those needed for the study of the determinants and consequences of international migration, the measurement of a *number of statistical relationships* between variables (such as the effect of education on migration) is of more interest than the levels of variables themselves, such as the proportion of international migrants in the population. Consequently, specifying in advance a single key variable or parameter to determine sample size is not only arbitrary but also risky since that variable may turn out to not be the most important for the population under study.

153. On the other hand, if a major purpose of the survey is to estimate, say, the proportion of (recent) international migrants in the population, the standard deviation can be computed, and hence the sample size. Thus if p indicates the proportion, then the standard deviation of p is $\sqrt{p(1-p)}$. For example, if the sample size is $n = 10,000$ and $p = 0.1$, then the mean expected number of migrants, M , is given by $E(M) = n \times p = 1,000$, and its standard deviation is $s_m = \sqrt{(1000)(.1)(.9)} = 9.49$. Then if the distribution of the sample mean is assumed to be normal, which is virtually certain in a large sample whatever the original distribution is of the observations in the population, then a 95% confidence interval for $E(M)$ is $1000 \pm (1.96) 9.49$, or about 981 to 1019, since $z_{\alpha/2} = 1.96 =$ standard normal value for the normal distribution when $\alpha = .05$. Then the 95% confidence interval for the proportion is $0.1 \pm 18.59/1000$ or 0.0981 to 0.1186. This means that we can assert with a probability of .95 that the true proportion of international migrants is in the interval of .098 to .102 if the sample proportion is expected to be

0.1 a priori. As another example, if the other parameters are the same but $p = .05$, then $E(M) = 500$, $s_m = 23.75$, and the 95% confidence interval for p is .049 to .051. In general, the 95% confidence interval for a proportion p is $p \pm z_{\alpha/2} \sqrt{p(1-p)/n}$.

154. If the other values are known, the desired *sample size* needed to estimate the confidence interval, $p \pm \delta$, is determined from $n = p(1-p) (z_{\alpha/2}/\delta)^2$. For example, if $p = 0.1$, $\delta = .03$, and $\alpha = .05$, then we are asking what sample size is needed to be 95% sure that if the true proportion is 0.1, that we will estimate it with an error of no more than .03. It can be found that $n = 384$. If we want to have more accuracy, say $\delta = .01$, then $n = 3,457$, so the result is highly sensitive to the precision of estimate desired, much more than to p or α .

155. When all is said and done, however, it is the budget that usually proves to be the main determinant of the sample size of a survey. In Chapter 2 above, the sample sizes of the many types of surveys reviewed, both specialized surveys on international migration and others which had some other primary purpose, such as labour force surveys, are indicated, with labour force surveys often the largest ones in a country. Note the surveys may find 10% or more of the population in a country to be international migrants based on place of birth, but if we are interested in *recent* migrants, this proportion is likely to be no more than one or two percent. If we wish to estimate this percent, say .01, with an error of no more than .002 95% of the time, we will find n needs to be 9,508. Therefore, labour force surveys of 100,000 are far more than sufficient. As another example, in the NIDI study of Turkey (see table 1 in Annex F), it was necessary to screen 12,838 households to find 2,178 with at least one recent out-migrant (defined as having left within the previous 10 years), which yields a rather high proportion of 0.17, or about one in six households.²⁰ If the purpose of this survey (it was not) were to estimate the true proportion of households with international out-migrants in the previous 10 years from Turkey with a 95% confidence interval of 0.02, then the necessary n would need to be only 1,355 households, for those parts of Turkey (the domain of the survey) characterized by heavy international out-migration. But in fact the purpose of the survey was to collect data to estimate the relationships between out-migration and a *number* of other factors, so n needed to be much higher. How much higher could not be determined a priori, so budget considerations ultimately prevailed.

156. The issues regarding sample size refer to *each* separate domain for which parameter estimates are desired, so that, for example, if one wishes to estimate the proportion of migrants in 10 provinces or regions, then the numbers above would need to be multiplied by 10. Another factor to take into account is the extent to which the population of interest is fairly homogeneous (requiring a smaller sample) versus heterogeneous (requiring a larger sample). Also regarding the total sample size of the survey, for studies of the determinants or consequences of migration, the survey should contain a sample comprising both migrants and non-migrants, so the final sample will need to have sufficient numbers of each, with about half the households containing (one or more) international migrants. Large sample sizes are not necessary provided specialized sampling techniques are used to locate international migrants, as will be shown below.

²⁰ This by no means the proportion of households in all of Turkey with an international out-migrant, since the survey domain was a set of non-contiguous areas which had the highest proportion of households with international migrants in the previous census.

(d) Stratification

157. Stratification is the division of the population into sub-groups or strata according to objective criteria or variables available for the population of interest. Once the population is divided into strata, the total variation across elements can be divided into variation between strata and variation within strata. Because *stratified sampling* involves sampling separately from each stratum, using different (unequal) probabilities of selection, or even entirely different sampling procedures, stratification eliminates the variation between strata from the computation of total variation in the sample, thus reducing total variance to the sampling variance within strata. The gain in reducing total variance by stratifying the population can be substantial, to the degree the strata are formed such that the elements within each stratum are similar to each other (reducing intra-stratum variance) while the strata differ as much as possible from each other (that is, have means for the stratification variables that differ widely). To be effective, stratification should be carried out on the basis of variables that are the focus of the study or that are closely associated with the key variables being studied. Stratification can be performed on the basis of one or several variables. The latter, called *multiple* stratification, requires that the stratification variables used be related not only to the survey objectives but also be as different from each other as possible (uncorrelated).

158. How many strata should be formed? There is no general answer, but first, every stratum must have at least two elements to allow for within stratum variance, and second, (multiple) stratification on the basis of several independent variables that produce k strata is more efficient than stratification by a single variable producing the same number of k strata. Thus, for example, it is better to stratify by place of residence (urban vs. rural), socio-economic status (low, medium and high), and proportion of recent migrants (e.g., less than 0.1 per cent; 0.1 to 1.99 per cent; 2.0 per cent or higher), therefore producing 18 strata, than to create 18 categories on the basis of any one of the three variables alone. Stratification variables for use in the study of international migration should be correlated with that migration. For example, if the proportion of households having international migrants differs markedly between urban and rural areas, from one region to another, or is correlated with socio-economic status, those variables could be used for stratification, as was done in the five developing countries of the NIDI project (see Annex F). Stratification also allows the use of different sampling frames and even different sampling procedures in the different strata. Thus, if adequate maps and sampling frames are available for urban but not for rural areas, different sampling procedures could be used. An example of the use of stratification is found below in subsection (f).

(e) Multi-stage and cluster sampling

159. The most efficient sampling designs usually involve more than one sampling stage. This is particularly likely to be the case in large countries, such as where the domain is the whole country. In such situations, there are likely to be multiple layers of political jurisdictions, such as provinces and districts in Pakistan, or states and counties in the US, or states and municipios in Brazil, or provinces, districts (Kabupaten), and subdistricts (Kecamatan) in Indonesia. If one desires to develop a national sample, fieldwork is likely to be very dispersed and costly if one were to only select a sample in one stage, at the level of the lowest political jurisdiction, such as a district, county, or municipio, since those units would be scattered all over the large country. Hence, it is important to use multiple-stages in such situations, to concentrate the fieldwork in a

representative sample of, e.g., provinces, and within those provinces also in a reasonable sample of districts or municipios. While PPES sampling can be used to select areas at each stage, yielding a self-weighting sample, the data can easily be weighted to take into account different probabilities of selection, which is likely to be the best approach in designing a sample for a survey involving rare elements such as international migrants. On the other hand, in a small country in which even the second stage political jurisdictions are of modest population size and not extremely numerous (say no more than 100 or 200), and in surveys covering only a part of the country (such as the survey of Colombian migrants in Ecuador, described in Section D of Chapter 2), a one-stage sample may be quite satisfactory.

160. In *multi-stage sampling*, the *first stage* sample is often the selection of PSUs in proportion to estimated population size, or PPES. In a *single stage* sampling design, areas within a country or region are first selected through some procedure, and then *all* elements (e.g., households) within them are included in the survey. A survey on international migration should never use a single stage sampling design in which the first stage units are large areas such as regions or provinces because international migrants are too widely dispersed over such large areas to be worth looking for. Multi-stage sampling is particularly useful to ensure that a sample is representative of a whole country or a large region, since it allows a sample to still be fairly dispersed while still keeping down the cost of field operations.

161. To make the field operations of surveys less costly, clusters of households are usually selected in the last stage of sample selection. In *cluster sampling*, sampling units are clusters of respondents, such as, e.g., all households in the Ultimate Area Unit (or UAU), or a certain number (e.g., 10) closest to the northeast corner of the UAU. Clusters are used to reduce the cost of achieving a given sample size of elements, or households in this case. Thus, the cost of locating 1,000 respondents using clusters of size 20 (meaning only 50 areas have to be visited) is far less than if clusters of size 5 are used, much less if the 1,000 respondents are selected randomly over the whole UAU area. Thus, the larger the cluster, the lower the mean cost per element of collecting data in the field; however, at the same time, the mean sampling variance per element is larger, so there is a trade-off between cost and variance. A second and often determining consideration of the size of clusters to use is practicality. The size should relate to logistical aspects of the organization of the field work and duration of interviews: It should take into account how many interviews a field team of interviewers can carry out in a day, or during its stay in each UAU, on average. Suppose a field team consists of 4 interviewers and one supervisor, and that it has been determined from a pilot survey that interviewers will complete an average of three interviews per day. The team can therefore complete an average of 12 interviews per day, so 12 (or 24, 36...) would be a desirable cluster size in such a situation.

162. The use of clusters increases the overall survey sampling error or variance. The sampling variance of an element is related positively to the heterogeneity of the population elements (persons) and negatively to the sample size. A statistic called the *design effect (deff)* measures the loss in precision (increase in sampling variance) resulting from departures in the sample design actually used from simple random sampling. *Deff* is the ratio of the variance of the actual complex multi-stage cluster design used in practice to the variance of a simple random sample with the same sample size (Kish, 1965: 217-229 and *passim*):

$$deff = s_c/s_r = 1 + \rho(b-1)$$

where s_c and s_r are the element variances of the complex and simple random sample survey designs, ρ is the intra-cluster correlation coefficient, and b is the average cluster size, or the number of respondents to be selected per UAU (equals the total sample size divided by the number of UAUs). The right side of the equation indicates that *deff* increases with cluster size and with homogeneity within clusters. The more *deff* is greater than 1.0, the greater the design effect, and the more sample statistics based on simple random sampling such as standard errors are underestimates, so the statistical significance of regression coefficients is exaggerated. ρ indicates the average degree of *homogeneity within clusters*: The more households are similar, the higher the ρ and the greater the design effect (closer to 1). The more heterogeneous the households in the clusters, the smaller the ρ (closer to 0), and the less important the effect of using (large) clusters to reduce field costs, viz., the less the *actual* sample design deviates from simple random sampling.

163. ρ is usually above zero in human populations, reflecting the tendency of neighbouring elements (persons) to be similar in some ways, e.g., socio-economic status, race, housing quality, religion, etc. Values of ρ for human populations are commonly 0.1 to 0.2. If clusters of size 11 are used and ρ is 0.1, *deff* = 2, meaning that for a survey with a complex sample design to have the same precision as a srs, it would have to have a sample size twice as large. Since cluster sampling is less expensive, field costs may well still be lower with the much larger sample size and a complex sample design than with srs. Note that variations in cluster size are much less important than differences in ρ , as a small change in the latter is multiplied by the whole number $b-1$, which an increase in b is multiplied by a small value of ρ . In an assessment of the experience of World Fertility Surveys, Verma and O'Muircheartaigh (1980) found that values of ρ were generally lower than 0.1, so that the WFS surveys could have used much larger cluster sizes that they did without raising *deff* above 1.5 to 2.0 (see Bilsborrow, 1984, p. 98ff). Given the common tendency for international migrants in receiving countries to live nearby each other (particularly recent migrants), ρ is likely to be comparatively high for international migrants, but still well under 0.2.²¹ In sending countries, ρ is likely to be lower than in receiving countries, even though there will be some clustering of similar households in some respects due to migration networks.

164. The definition of international migrant used has implications for cluster size: the more stringent the definition (e.g., if limited to those arriving within the five years preceding the survey, or to migrants coming from or going to a single country), the rarer international migrants will be and the larger the cluster size should be to ensure that international migrants are encountered in the UAU. The larger the cluster size used, the lower the ρ , so there is some compensation in terms of the implications for *deff*. The size of clusters may also be determined

²¹ Verma and O'Muircheartaigh reviewed 12 country studies, with mean cluster sizes ranging from 7 to 148, but most in the range of 10 to 50 and the median being 21. The values of *deff* for five variables averaged across the 12 countries ranged from 1.0 to 2.3. In the latest Ecuador DHS-type survey in 2004 (CEPAR and CDC, 2005), clusters of size 18 to 24 were used, and design effects were usually 1 to 1.5, and very rarely as high as 2. With a cluster size of 18 and a *deff* of 1.5, ρ is found to be only 0.03. One of the higher values of *deff* was 2.25 on whether anyone was ill in the household in the previous 30 days, based on clusters of size 24. This yields a ρ of 0.054, so it appears that a ρ even for most complex surveys of international migration may only be around 0.1. However, the sample in the Ecuador survey was only one stage and did not involve strata beyond urban and rural, which leads to a lower *deff* than the recommended sampling approach here involving stratification and disproportionate sampling.

by geo-political considerations, such as the size of administrative units, census sectors, city blocks, or villages: In the survey in Ecuador of recent migrants from Colombia in 2006, clusters were taken to be census sectors, since data were available for census sectors as the UAUs. The mean cluster size was thus about 120 households in urban areas and half that in rural areas.

165. In conclusion, the interrelations between sample variance and cluster size are complex. The survey objective (e.g., achieving some desired number of households with and without international migrants) and the survey budget are likely to be the major determinants of both average cluster size and total sample size. But the "cost" of using particular cluster sizes in terms of design effects (*deff*) must be borne in mind in planning the analyses on the data to be gathered.

(f) Finding "rare elements": The use of stratification and disproportionate sampling

166. It has been noted throughout this document that international migrants, especially *recent* migrants, are relatively rare in destination countries, just as households with out-migrants to international destinations are fairly rare in sending countries. Thus recent international migrants constitute a small proportion of the population, and may be considered *rare elements*. This is referred to in the sampling literature as the "rare elements" problem. Kish (1965) lists eight procedures that can be used to address it (a) use of *multi-purpose* samples; (b) *cumulation* of rare cases from a series of continuing surveys; (c) use of *controlled* selection; (d) use of *stratified sampling* with disproportionate probabilities of selection (sampling fractions); (e) use of *two-phase* sampling; (f) use of *large clusters*; (g) use of *batch* testing; and (h) use of *multiplicity* surveys.

167. The use of multi-purpose samples (a) may help spread the cost of locating migrants, but does not increase the proportion of the sample constituted by international migrants, so will not usually solve the problem of locating a large enough number of international migrants to make the analysis meaningful. The cumulation of international migrants from a series of surveys (b) has the same problem, and is likely to be impractical for the study of international migration because of the dynamism of migrants, so that the international migrants captured by one survey may have little in common with those of later surveys. The use of batch testing (g) cannot be applied to human populations. Snowball sampling (Goodman, 1961) is not a way of selecting a probability sample in itself, but rather a way to build up a roster of elements, such as migrants, that could constitute a viable sampling frame; but it would be extremely difficult to do this for a whole country. Multiplicity surveys (h) also have some attractions, but serious limitations, and are discussed in subsection (i) below. Consequently, the most viable strategy is the use of stratified sampling with disproportionate probabilities of selection (d), combined with two-phase sampling (e), large cluster sizes (f), and possibly controlled selection (c) if it is deemed important to include certain areas in the sample *a priori*: see Goodman and Kish, 1950). This is discussed below.

168. The following discussion assumes that a population frame exists which can be used to create a sampling frame to select a sample of international migrants (and non-migrants as well, depending on the survey purpose: see section B above). The population frame may be a population census, a continuous population register, a more-or-less complete register of foreigners or foreign contract workers, or a comprehensive listing of persons entering the country together with their addresses (for recent arrivals). The key is to have a source which identifies or

registers the international migrants by their location of residence (the more recent, the better). Although the international migrants identified in the population frame should ideally be the same as those that are to be the focus of the survey, differences in definition will often have to be accepted, such as using data on the foreign born to create the sampling frame even though the survey will interview only recent migrants. The key is to have some way of at least roughly quantifying the prevalence and location of international migrants.

169. A preliminary issue to consider in constructing a sampling frame is whether data are available on individual international migrants, on households containing one or more international migrants, or on household heads who are international migrants. Sometimes it is easiest for the computer to just read the first line of the census return for the household head to identify the place of previous residence (or if not available, the place of birth) to classify the household as a migrant household or not. However, the population frame would be more complete if the identity of *all* persons in the household could be assessed by country of birth by macro area (such as a province or state or region), micro area (such as census sector or block or village), and intermediate political jurisdiction (such as districts, municipios, or counties). This would make it possible to compute the proportion of the *total* population in all geographical areas of the country who are international migrants, or the proportion of household heads who are, or the proportion of households with one or more international migrants. In receiving countries, this is straightforward, but requires that the census have a questions on at least place of birth of all household members, and preferably also, for those born in another country, when the person (most recently) came to live in this country, and where were they living when they left to come here.

170. In sending countries, since international migrants living abroad are generally not available to be interviewed, the best one can do is identify households which report having a former member now living abroad. This requires that the census have a question that asks the respondent whether the household has any former member who has left within x years to live abroad and is still living abroad. This is *not* a traditional question in census schedules, but is becoming more common as more countries come to be very interested in international migration. It should be noted that in sending countries, there is usually no reliable source of data on whole households that have emigrated.²²

171. The discussion above notes the desirability of having complete data in the population frame on the proportion of the population constituted by international migrants throughout the country. However, since interviewers visit households, a strong case can be made for using data on household heads *or* on the classification of households according to whether they contain an

²² Three possible sources of data on whole households emigrating exist. One is to inquire in a census or survey of neighbors, but this will usually only work in communities where people know each other, and would not likely even come up unless, for example, a neighboring dwelling is vacant. A second source could be to compare or match census records from one census to a subsequent census, by address, or name, and if some family reported in one census was not found in the subsequent census, it could be assumed that it had left the country. Of course, the family could have disappeared due to death, or been broken by separation/divorce, so the method could not provide very useful data unless all these data collection systems worked well, and moreover, there was a way to interlink files. That leads to the third possibility that in fact does just that, the continuous population register, which records all vital events and changes of address within the country. But for purposes here, it would have to also have accurate data on persons emigrating.

international migrant or not. Indeed, the sampling methodology discussed here is based on households as the ultimate observational elements.

172. Once a population frame is available showing the proportions of international migrants in the different administrative areas of the country (for the domains of interest), a sample, likely multi-stage, can be designed. For illustration, we assume that the hypothetical country under consideration has three levels of geographic sub-divisions for which data are available from the most recent data source, assumed to be a population census: provinces, districts and census sectors. The sampling design will thus have as ultimate area units (UAUs) the smallest geographical divisions, census sectors. Provided estimates of both the total population and the number of international migrants (or *households with international migrants*--the focus from here on) are available at each of the three levels, sample selection can proceed as follows. At the first stage, provinces constitute the primary sampling units (PSUs), so a sample of provinces could be selected with probabilities of selection proportional to the estimated *number of international migrants* in each PSU (i.e., using PPES, as described above). If the number of households whose heads are international migrants is available for each province instead, PSU selection could proceed on the basis of those numbers.

173. In a second sampling stage, districts in those PSUs selected in the first stage are classified into strata according to the *proportion* of households containing one or more international migrants in the population of each district. That is, the proportions for the districts in each sample province are calculated from the census data, and ordered from lowest to highest, regardless of what part of the country they are located in. Then the proportions are examined to determine natural groupings, and strata are formed. The key issue then is how to select a sample of areas (districts) in this *second* stage from each stratum. In stratified sampling the optimal statistical procedure is to select a number of elements from each stratum in proportion to the estimated *variance* of the stratum's elements with respect to the variable of interest. Using p , the proportion of households containing an international migrant as the key variable of interest, the fraction of the districts to be selected from each stratum should be proportional to the estimated standard error of p for the stratum, namely, $s = \sqrt{[p(1-p)]}$. Making sampling fractions proportional to s implies that one is using *disproportionate sampling*, a highly efficient procedure to sample rare elements (see Kish, 1965, pp. 92-98, 142-144, 279-282). To complete the second sampling stage, therefore, districts in each stratum are selected in this manner.

174. The third sampling stage is similar to the second. Again, it requires computing the proportions of households with migrants but only in all census sectors of the *districts already selected* in the second sampling stage, in each sample province. Census sectors are then also grouped into strata according to the proportion of the households containing international migrants. Then the number of sectors in each stratum is selected in proportion to the standard deviation of the mean estimated proportion of households with international migrants in that stratum, as described above for stage 2.

175. A major advantage of and reason for using multi-stage sampling is that it leads to some geographical concentration of field work (mapping, listing households, and interviewing) and hence significant cost savings. But it may also reduce the work involved in preparing a sampling frame at each stage since tabulations of the proportions of population constituted by international migrants need to be prepared for the whole country only at the province level. After that, they are

prepared at the district level only for those provinces already selected in the first stage, and for census sectors only for the districts selected at the second stage.²³ However, there are countries where the tabulations necessary for the third sampling stage are not available (either because of confidentiality concerns, or because the location code for the dwelling was not processed at the census sector level. In such situations, census sectors should be selected at the last stage in accordance to their population size, i.e., by PPES. In applying PPES in such cases, it is desirable to homogenize the sizes of census sectors by combining those with small sizes and splitting up larger ones, so that each sampling unit in the list that constitutes the sampling frame for any given stratum contains UAUs of approximately equal size. From such a list census sectors may be selected randomly (e.g., by systematic sampling), preserving the equal probability of selection of households across sectors within each stratum.

176. Returning to the use of disproportionate sampling, a numerical example is useful. If four strata are created with the *mean proportions* of households with international migrants in the geographic areas constituting each stratum being²⁴ .2, .05, .01 and .001, then the standard deviations of the four means for the strata are, respectively, .40, .22, .10, and .03. Since the *statistically optimal* approach for sampling from the strata is to select fractions proportional to the standard deviations of stratum means, the probability of selecting an element (e.g., district, in stage 2) from the first stratum must be about twice as high as that of selecting one from the second stratum, four times as high as that of selecting one from the third, and 13 times as high as that of selecting elements from the fourth stratum.

177. The probabilities of selection used in the various strata actually can be anything, even more disproportionate than indicated in the example above. We illustrate this in Table 2, where all the numbers are as above (except the mean proportion assumed in stratum 1), but N_h , the *number of entries* (such as the number of districts in a province, or in a country with a two-stage sample; or the number of census sectors in a sample province or district) in each stratum h is also indicated in column (1), to illustrate the process completely. In Table 2, n_h is the number of units to be selected in the sample from stratum h . In *proportionate* allocation, the number of elements selected n_h is proportionate to the number of elements in the stratum, and is shown in column 5. This allocation is not efficient in a study of international migration since migrants tend to cluster in certain locations (as illustrated in column (1)). Note that in proportionate allocation, the data collection effort is *not* concentrated in the areas which have the most migrants but instead dispersed over all the elements, which is evidently an inefficient way of allocating fieldworkers in a study of rare elements, such as households with recent international migrants.

178. Therefore it is desirable to allocate the sample in some *disproportionate* way across strata. One simple approach is to allocate the same *absolute* number to each stratum, as in column (6). This implies, in this case, a sample which takes 7 of 10 units in stratum 1, 7 of 20 in stratum 2, 7 of 50 in stratum 3, and 7 of 200 in stratum 4. Optimal allocation results in column

²³ Nowadays, computers can estimate the proportions of households with migrants at all administrative levels (such as provinces and districts) as well as at lower levels such as census sectors when the location of dwellings is coded and entered down to that level.

²⁴ Each number in column (2) is the mean of a stratum or *category*, with each category extending to the limits of the stratum comprising the units with observed proportions of households with international migrants in that range in the selected PSU. For example, the mean for stratum (1) may be for a stratum comprising all units or elements of 0.07 and above, while the mean in stratum (2) is from a stratum of .02 to 0.67, etc.

(8). But in many studies, even these two types of disproportionate allocation may still yield *low numbers* of rare elements--households with international migrants. As a result, even more extreme or disproportionate allocations can be considered and are sometimes used, such as allocation B in column (7). There, all units in stratum 1 are selected, half in stratum 2, and small numbers in the two strata with low expected proportions or prevalence of international migrants. For example, in the NIDI survey in Spain, the sample frame excluded *a priori* all census sectors with no international migrants from Morocco or Senegal registered in the previous census, which was used to create the sampling frame. This meant implicitly assigning 0 units to be selected from this vast number of census sectors in that stratum. The latter was also done for budgetary reasons in the study of Colombian migrants in Ecuador.

179. A problem that can arise with selecting no units from strata with few or no expected international migrants is that there are still likely to be a significant number of migrants of interest in that large, dispersed stratum, and, moreover, they are likely to be significantly different in way from the international migrants living in areas with much higher densities of migrants: for example, in a receiving country, they are more likely to be successfully integrated into the larger population, and hence more educated, with higher incomes, etc. In a sending country, households in areas with such concentrated emigrants are may be the initial pioneering households, the first in their areas sending out international migrants, and less linked to migration networks which tend to be created over time in families, communities, ethnic groups, regions, and cities. Given the difference in the characteristics of the migrants who are dispersed vs. concentrated, it is desirable to *not* totally exclude selecting PSUs in all the many areas which have an expected low or zero representation of international migrants of interest. But the trade-off is that field workers will be sent to some areas where they will find no one of interest, or very few, so that high weights need to be applied to weight up the few to represent the whole stratum. If only a few cases are found, and they are weird in any way, that weirdness will be weighted up many times (see subsection (h) below). This is an argument for an allocation closer to the statistically optimum one of column (8), which in fact ensures that there will be some areas (elements) included in the sample from the low prevalence stratum. This allocation may be contrasted with what might be called the fieldwork optimum (not shown), which has no areas selected from the lowest prevalence stratum: As a result, it would be expected to interview the largest number of international migrants for a given fieldwork cost, i.e., yield the lowest cost of data collection per migrant. For example, in column (7), reallocate the 3 units in stratum 4, 2 to stratum 2 and one to stratum 3. Some surveys of international migration, either because of not understanding the desirability of having *some* representation of international migrants from all strata, budgetary reasons, or both, do not select any area units at all from the lowest prevalence strata. But there is a trade-off that must be considered in determining if this should be done, in selecting which approach to disproportionate sampling to adopt.

180. A real-world example showing the effects of using disproportionate sampling, oversampling of households with migrants in selecting UAUs, is shown in Table 3, for Turkey, in the NIDI survey. In the four study domains (regions), it can be seen that oversampling led to proportions of households with current migrants 3 to 6 times higher than they would have been with proportionate sampling.

181. The data in table 2 can be used to illustrate the actual *numbers* of international migrants expected from each stratum, by multiplying the number of units selected into the sample from

each stratum, n_h by the mean proportion for sample units in that stratum, p in column (2) times the average population size (number of households) in the area units being used, for example, census sectors. Thus if the mean population of census sectors is 100 households, the mean number of households with international migrants expected from allocation C in column (8) is, in stratum 1, $100 \times 0.1 \times 5 = 50$. The values for the other three strata are found to be 30, 8 and 1, for a total of 89. It is clear that the vast majority are in stratum 1. In general, the formula for the total sample yield or take from a domain is then

182. $M = \sum_h b p_h n_h$, where M is the number of migrant households, b is cluster size, p_h is the proportion of migrants expected in stratum h based on previous information such as a census, and n_h is the number of elements or areas selected in the sample.

183. How different should the sampling fractions implied by disproportionate sampling be from those implied by the simpler, proportionate sampling across strata for it to be worthwhile to use disproportionate sampling? The question is important because proportionate sampling has the advantage of yielding a self-weighted sample that makes all the subsequent statistical analyses simpler since no weights need be used. Kish (1965, p. 94) suggested that the sampling fractions should differ by a factor of at least two, a view apparently accepted by Moser and Kalton (1972, p. 94). This means that the proportions of households with heads who are international migrants must differ by a factor of at least four between strata. This will surely be the case with international migrants, who tend to cluster.

184. Sometimes in a survey it is decided *a priori* to include one or more areas or PSUs with certainty, called "self-representing" areas. This is a form of controlled selection (Goodman and Kish, 1950) and may be the case, for example, of a city known to be a major cynosure for international migrants, or of a province known to have had many out-migrants. The city, for example, would be included in the sample with certainty, meaning that it is treated as a separate domain where a different sample design may be used from that being used in the rest of the country (where, e.g., a three-stage design is used, as described above).

(g) Finding "rare elements": The use of two-phase sampling

185. The procedures above use PPES and disproportionate sampling to select the study provinces, districts within provinces, and/or census sectors as the ultimate area units (UAUs) in which the survey is to be conducted. Once the UAUs are selected, favouring those with high expected proportions of migrants, then it is necessary to seek out the households with migrants in these sample UAUs, where they will usually be in the minority if not still rare elements. Therefore it is necessary to identify households with international migrants and those without in sample UAUs. Depending on the survey purpose (section B above), a sample of each should usually be taken in each sample UAU. Despite the efforts above to select UAUs expected to have relatively high proportions of households with international migrants, most sample UAUs will probably still have only a few or even no households with migrants. It is therefore desirable at this last stage of selecting households to use a special procedure that ensures that the survey effort is oriented to identifying and then interviewing households with migrants.

186. The recommended procedure is to first conduct a *listing operation*, to list all households in sample UAUs to identify those which have and those which do not have

international migrants, as defined for the survey. The next step is to oversample those with international migrants while selecting a much smaller proportion of the many that do not have migrants. This procedure is known as *two-phase sampling*, with the first step being the listing or *screening* operation, which is usually followed by a sampling procedure and then the second phase, the interviewing of households and individuals.

187. To describe the procedure in more detail, in phase I, first, a listing operation is carried out in the field in which all *occupied dwellings* within the borders of each sample UAUs are listed (see example of a Phase I listing sheet in Chapter 4). Separate households within each dwelling or structure must be sought out, identified and listed. A *minimum number of questions* is asked of each household in the listing survey, accepting responses from any responsible adult member, asking about how many people live here normally in this household, and (in a sending country) whether any member left to live abroad in the past x (e.g., 5) years, and (in a receiving country) is there anyone living here who came here since exactly x or 5 years ago. Answers are recorded on the listing sheet, one line per household. The "lister" should visit all households in the UAU in some sequential order to be sure to not miss any dwelling, not the one difficult to get to high up on the mountain or in the swamp, nor the one tucked in behind another one or a store or business in a crowded urban slum. All addresses are recorded in order²⁵, usually also with the name of the household head, number of household members living there, and whether any is an international migrant eligible for interview (e.g., over age 15).

188. Note that when this screening process is used only to get a count of international migrants, then it is not necessary to get the name of the household head. In some cases, such as for migrants without legal documents, some respondents may be more willing to confirm the presence of international migrants in the household. In any case, neighbours should always be asked, which may reveal a few families hiding their undocumented migrant status.

189. Then, a selection procedure determined in advance is used to select (sample) some or all of the households containing international migrants and some of the households without international migrants are selected (sampled) for the actual interview, which is phase II of two-phase sampling. For example, the survey purpose may be to study the determinants of migration, in which case in a country of origin, households with and without international migrants (emigrants in the past x years) both need to be included in the sample and interviewed. Before the fieldwork, the total desired sample size in the project will have been determined, for households with emigrants (immigrants, if a receiving country) and those without. Suppose an equal number is desired. The procedure used in phase II could be to select either a fixed proportion of all households in the UAU or a fixed total number of households (say 10) in each UAU, which let us assume on average contains 100 households. Then if the UAU happens to have 3 migrant households, all 3 are included in the sample plus 7 non-migrant households chosen randomly (e.g., by systematic selection from the phase I listing). If there are 8 migrant households, then only 2 non-migrant households are selected. If there are more than 10 migrant households, then a maximum of 10 may be selected (randomly), with no non-migrant households selected. This type of approach, with simple selection rules, is easy to implement in the field: supervisors, without senior project personnel overseeing them, can be trained to do it, so the final

²⁵ In rural areas, some space should be allowed to indicate the relative positioning of occupied dwellings.

sampling of households in sample UAUs is done in the field, on the spot, without first bringing all the listing sheets back to the central office for households to be sampled there.

190. However, one problem with this approach is that there will be some UAUs with no households with emigrants (or immigrants, in receiving countries), whereas it is preferable to have at least two of each type in each UAU, for reasons we need not go into here. One could require that there be at least two households with no emigrants included in each sample UAU and interviewed no matter what, with then at most eight with emigrants. An alternative could be to select a larger fixed minimum number of non-migrant households so as to reduce the total number of UAUs to be visited in the survey, which would ensure that the time of listing sample UAUs which have no households with migrants is not in vain. Thus a minimum number of households could be selected, such as 6 or 10. This would also ensure a somewhat wider and appropriate distribution of non-migrant households in the sample. In practice, phase II procedures adopted still tend to yield smaller numbers of households with vs. without emigrants (e.g., see NIDI examples in Annex F) than hoped for in the final tally, for reasons which are not fully understood.

191. Evidently, there are a variety of approaches that can be considered. Determining a fixed number of households to interview no matter what is one, which has the advantage of making the final total survey sample size known, and the work and time of field teams more or less equal in all UAUs, which is helpful for planning field work. In this approach, with a fixed sample "take" of 10 per UAU, a minimum of two non-migrant households is selected and a maximum of 10, while the number of migrant households selected varies from 0 to 8. Unfortunately, this will almost guarantee getting more non-migrant than migrant households, so a slight alteration is preferred, viz., select all migrants households up to some larger number in the UAU, such as 10 or 15, plus a minimum number of non-migrant households such as two. While the number of households to be interviewed per UAU is no longer fixed, this can yield a larger proportion of total households in the sample comprising international migrants.

192. In most cases, use of two-phase sampling should ensure that the number of households containing international migrants is not much smaller than the number of households without emigrants (or immigrants in the case of a country for which in-migrants are of interest). Note that if the survey calls for only *counting* migrants, it is only necessary to conduct the listing or screening operation (see Section D in Chapter 2). And if the survey purpose is to interview only immigrants/households with immigrants (or households with emigrants, if a sending country), then it may not be necessary to conduct the field work in two-phases, with one visit to each household in the first phase and then a second visit to households selected in the sample. This would be the case if interviewers simply go from house to house in the selected UAUs listing households and then on the spot, conducting interviews in all households with appropriate migrants (or with proxy respondents about emigrants) as part of the same field effort. The only problem with this would be if a large number of migrants is found in some UAU, so a maximum number should be set. A second problem would arise if a maximum is desired and several persons are simultaneously conducting the listing operation in a UAU. It would then be necessary for them to communicate each time they encounter a migrant household, with each other or with a supervisor, such as by cell phone to coordinate.

193. An example can help illustrate the value of two-phase sampling. Suppose that to reduce the costs of sending interviewers to households throughout the UAU the survey selects a random cluster of households within each UAU to conduct interviews with all households. Suppose the clusters are of size 20 and the average UAU size is 200 households. If a UAU has 198 households without international migrants and 2 households with migrants located in different clusters, the probability of finding even a single household with international migrants is only $2 \times 20/200$ or 0.2. That is, only one out of every five clusters selected (and only one of every 5 UAUs in the corresponding stratum) would have a single household with international migrants. This means that most of the time, interviewers would be wasting their time in a sense by not finding any eligible households with international migrants for interview. In contrast, in two-phase sampling, all 200 households would be listed, and the two households would be identified and hence included in the list in phase I and interviewed in phase II. Furthermore, the listing process documents the total number of occupied households with and without migrants in the UAU, with the numbers of members, and hence provides an updated population count desirable to use in the calculation of appropriate weights (subsection (h) below).

194. To conclude, it is worth noting that two-phase sampling is useful even in countries or regions where *no* data whatsoever are available on the number or proportion of households with international migrants. In such a situation, multistage sampling is probably desired, to first select provinces and perhaps districts with probabilities of selection proportional to population size (PPES). Then UAUs may be selected the same way, if data are available such as for census sectors or villages, or a random sample of UAUs within sample districts may be selected. A phase I operation is then carried out to list all households in those sample UAUs to identify those with and without international migrants. Such lists could then be processed in a central location and aggregated across UAUs to obtain the overall numbers of the two types of households in the country. As noted in Section D in Chapter 2 above, this information can be used to estimate *the number and proportion of international migrants* in the country.

195. The listing operation also provides a basis for determining sampling fractions from the migrant and non-migrant populations found, as follows. All the data could be brought to the central office so districts (pre-final stage) sampling units could be *stratified* so disproportionate sampling could be used to select a number of UAUs in each with probabilities of selection proportional to the now known UAU sector variance (computed from the known proportions of migrants). Once the UAUs are selected, the numbers of households with and without international migrants from each sample UAU are also known. This can be helpful for defining what operational procedure to use in each UAU, viz., how many households of each type and which ones should be visited in phase II. Hence it allows precise planning of the time and cost of phase II interviewing. A significant disadvantage--which is why it should be done only when no population frame is available for international migrants--is its requiring a costly and time consuming household listing operation in the districts selected, which are relatively large and dispersed all over the country in sample provinces.

196. In implementing any two-phase sampling procedure, it is important that if two separate field visits are anticipated, phase II must be carried out as soon as possible after phase I. The longer the hiatus between the two phases, the less accurate the information gathered during phase I--as individuals and households move into or out of the selected UAUs, or die. In a 1975-76 survey of internal migration carried out by the National Statistical Office of Thailand, migrants

identified during phase I were sought for interviews 6-7 months later; but by that time less than a third of the households identified as having migrants contained the exactly the same household members (Bilsborrow et al., 1997: 286).

(h) Use of weights in the analysis

197. Probability sampling is necessary in surveys of international migration to provide reliable information about the number and characteristics of migrants as well as for statistically valid tests of hypotheses about the determinants or consequences of migration. In a probability sample, every element or observation (every household and person) has a known probability of having been selected, which can be computed from the sample design and results of the fieldwork. In the case of a multi-stage sample, the probability of selection must be known *at every stage* so the probability of selecting an element (individual or household) is the product of the probabilities of selection at each stage. For example, in a three-stage sample, suppose the PSU or province in which a migrant household is located has a probability of 0.2 of having been selected in stage one, and that one in ten districts is selected into the sample, so the district in which the household is located within the PSU selected has a probability of selection of 0.1 (such a sample is more concentrated in provinces than one with the numbers reversed). Then suppose that the household belongs to a census sector (UAU) which has a probability of selection of 0.05 of being selected in the sample district. Finally, suppose that the household is one of 100 in its UAU according to the listing operation, which found 6 households containing one or more international migrants. Suppose also that the *a priori* selection rule was that half of the migrant households up to 10 were to be selected. Then the household's probability of being selected is $(.2)(.1)(.05)(.5)$ or .0005. This means that the values of all variables associated with that household need to be weighted (i.e., multiplied) by $1/.0005$ or 2000 whenever the sample observations are aggregated to represent the entire population in the domain.

198. The weight for non-migrant households in the same UAU can be determined based on the actual number selected, but this cannot be known *a priori* even if a simple rule is used for selecting them, such as a fixed number of 5 per UAU. The reason is that the actual number of households in the sample UAU is not known beforehand (it may be 30 or 300, for example). Thus the denominator, the population (non-migrant households in the UAU) at risk of being selected into the sample is not known. In addition, if a *variable* number is to be selected depending on the number of migrant households found in the cluster, then there is a second reason it cannot be known *a priori*. This is the case, for example, if the rule is to select a minimum of 2 and a maximum of 10 in the case of no migrant households. The weights will differ for migrant and non-migrant households from one UAU to another depending both on the number of occupied households found in the listing process and the proportion found to contain migrants. Thus the final weights for households for the analysis cannot be computed *a priori* but rather only *a posteriori*, after the complete national sample is drawn and all the fieldwork is completed.

199. The above is not yet a complete example, since it does not take into account non-response, which may vary from one province or region of the country to another, across districts and UAUs, and for migrant and non-migrant households. The proportion of sample elements not responding in each UAU must be taken into account in determining weights, since the greater it is, the greater the weight that must be assigned to similar elements that do respond to

compensate. To illustrate, suppose in the example above that only two of the three migrant households responded. Then the weight for each of those two would be multiplied by 3/2 yielding a final weight of $1.5 \times 2000 = 3000$.

200. The weight for each household i is the inverse of the probability of that household being selected. Let P_m be the probability of selecting a migrant household in the sample UAU (= 1.0 if all are selected). Then the general formula for the probability of selecting element (a migrant household) i from UAU (e.g., census sector) j in district k in province q is

$$P = P_q \times P_{kq} \times P_{jkq} \times P_m, \text{ or } \Pi P_q P_{kq} P_{jkq} P_m,$$

where Π indicates the probabilities are to be multiplied. Suppose we also use R_m to indicate the response rate of migrant households in this reference UAU (proportion responding, being 0 to 1). Then the total final weight to be assigned to the migrant household is $1/P \times 1/R_m$. If non-migrant households have a probability of selection in the UAU of P_n and a response rate of R_n (note there should be no substitution of non-migrant households selected in the sample, even though there may be many to choose from!), then this term P_n is substituted for P_m in the formula for P above and R_n is substituted for R_m . Computing the weights for all elements provides appropriate national-level (or domain-level) totals for migrants and non-migrants, their numbers and characteristics.

201. To perform statistical operations, it is desirable to have the weights "normalized", meaning that each weight for each element is divided by the sum of the weights for all the observations in the final sample. Then the sum of all the weights is 1.0, meaning the sample, once all observations are weighted, represents the national population. The use of multi-stage stratified samples using clusters in the final stage complicates statistical analyses, but standard statistical packages including not only SUDAAN (the first one to do this) but also SAS and STATA can now handle complex sample designs in multivariate regressions. Therefore, in surveys of international migration, which inherently involve "rare elements" and hence the desirability of a complex sampling design, it is no longer much of an advantage to use a simple sampling design just so the sample is self-weighting and statistical computations are easy. Simple sample designs imply very inefficient allocations of field work and must be avoided in studies of international migrants.

202. The procedures described above in this section--using strict probability sampling, developing an appropriate sampling frame, grouping areas into strata according to their expected proportions of international migrants, using stratified multi-stage sampling with oversampling of areas with larger proportions of migrants via disproportionate sampling, and employing two-phase sampling to list and identify households with international migrants in the ultimate area units sampled prior to selecting households for interview--are generally appropriate for specialized surveys of international migration. They apply whether the goal is to interview only households with international migrants in a country of destination, households with international out-migrants in a country of origin, or either of these along with households without migrants in the same country. In most cases, it is desirable to collect data on a sample of both migrant and non-migrant households to ensure that appropriate comparison groups are included. It is also desirable to undertake a survey in *both* the country(ies) of destination and the country(ies) of origin, for reasons described in Section B of this Chapter. While that has been rarely done for budgetary and political reasons, the limitations of studies that fail to do this should be noted in

write-ups of studies of the determinants or consequences of international migration, but this is sadly rarely done.

(i) Use of multiplicity sampling, snowball sampling and other unorthodox methods

203. In studying rare elements, the biggest problem is locating them in the first place. In the absence of a good population frame on the location and prevalence of international migrants, it can be cost effective to use other techniques to seek out and identify the rare elements that are the international migrants of interest. Thus once migrants are encountered, they are asked if they know of other migrants. This procedure can be useful especially if the survey is interested in studying migrants from the same country of origin (immigrants in a receiving country). When they respond yes, then the interviewer asks for the address, telephone numbers, and directions for locating them. This multiplies the number of persons of interest known from the initial ones, which explains the term *multiplicity or network or snowball sampling*. The key is to develop a *multiplicity rule* by which one can keep track of the chance of learning about the second or referral set of persons. The goal of all these approaches is to increase the size of the sample of rare elements at relatively low cost.

204. As Sirken (1998, p. 1) stated, in the 1970's and 1980's network sampling was promoted in surveys of rare populations for whom residence rules are well-defined, but sampling error effects are often large. Composite counting rules are used in which rare persons are linked to their own residences and also to other persons with whom they have well-defined relationships, such as children. Sample variances in such cases can be smaller than with srs, but this is less likely the greater the extent of clustering and variability in the multiplicities (Sirken, *op. cit.*, p. 2). An alternative way for linking elements to multiple sources was first suggested in the 1960's but has been used mainly since the 1990's, including in the NIDI-supported survey in Italy described in the Annex F. In the latter, sample frames for people are the establishments where they visit or conduct transactions. For example, in a study to sample the homeless population in Washington, DC, three distinct types of establishments or frames were used: homeless shelters, soup kitchens, and an area sample based on streets and encampments (under bridges, in construction sites, etc.). Membership in more than one type of frame was estimated by asking respondents about their membership in the other types during the 24-hour period of sampling (discussed in Lohr, 1999, p. 402). This is akin to the establishment-based sampling approach used in Italy.

205. Sirken defined *multiplicity surveys* as those in which "sample households report information about their own residents as well as about other persons who live elsewhere, such as relatives, friends or neighbors, as specified by a multiplicity rule adopted in the survey" (Sirken, 1972, p. 257). That is, each person or household can report on other persons/households linked to it in a quantifiable way, referred to as its network (Lohr, 1999, p. 402). People thus have more than one chance of being identified and included in the sample, and therefore do not have equal chances of being identified. A common and desirable approach is to have the multiplicity rule based on close relatives, such as siblings, so that the chance of anyone being included depends on the number of siblings that person has. An only child has only one chance, but someone with two siblings has 3 chances of being reported on in a population. But if the survey is based on households, then the number of independent chances of being reported on is the number of *different households* siblings live in around the country. This is used to develop weights to adjust

for the number of siblings, so the weight of each element located through multiplicity would be $1/k$ where k is the number of siblings. To specify the multiplicity rule and thereby develop weights to adjust the data, there should not be any ambiguity about the number of ways in which a person can enter the sample. Thus a person's own father, mothers, own children, and siblings are all well-defined, but "relatives" or "wives plus ex-wives," "neighbors," or "friends" do *not* lead to a specific number. For example, most definitions of "neighbors" do not specify a fixed universal number k that could be used for sample households in all urban and rural areas of a country.

206. Experience with multiplicity sampling is mixed. One of the few studies based on migration (internal migration) was carried out for 201 households in 1978 in Rhode Island (Goldstein and Goldstein, 1979). Data about the out-migration of relatives in the previous year, including events such as the date of migration, reason for migrating, and the migrant's current address, were obtained from parents, children, siblings, and ex-spouses. Even for these close relatives, only 61 % gave the same reason for migrating as the migrant gave, and only 70 % provided the correct address. The fact that this was in the USA, in a very small state, and involved only very close relatives indicates a serious limitation of multiplicity surveys, that the initial persons contacted may not be able to provide correct addresses, which is crucial for being able to locate the additional migrant referred to in order to take advantage of the multiplicity. If either the original migrant respondent contacted or the person sought by multiplicity is an undocumented migrant, then the original person may well not be willing to provide a name much less an accurate address for the other person, even if known.²⁶

207. Snowball sampling is based on the idea that members of a rare population know each other. For example, in a given city, a few international migrants from a country could be asked about others they know from the same country living in the city. Those persons are then contacted to ask them about others they know, etc., until most of the people in the rare population group living in the city are accounted for. Unfortunately, this does not make possible selecting a probability sample since some elements (an unknown number) may still be missed, so the probability of selecting anyone on the list is not known. However, a snowball sample *can* be useful to produce a large number of persons from which a sample could then be selected to interview, to learn something about that population, such as one of international migrants. Evidently, if the "snowballing" is done a sufficient number of times, it may generate a sampling frame comprising virtually all the rare elements in the geographic area constituting the sample domain, which could be used to then select a fairly representative sample, but a sample limited in geographic area.

208. A recent example is, nevertheless, instructive. In the survey of Colombian migrants in Ecuador in 2006 (Chapter 2), the number of recent migrants found through the use of both disproportionate sampling and two-phase sampling was still less than desired, so snowball sampling was used to attempt to get more international migrants to interview, even though those migrants would not form part of the probability sample constituted by the others. It was expected that each individual person interviewed would be able to provide usable information on two other Colombian adults (including addresses and instructions on how to find them, or telephone

²⁶ This was found to be a problem in the 2006 survey of Colombian immigrants in Ecuador. See Bilborrow and CEPAR (2007), and Chapter 2 Section D.

numbers), but in fact each provided on average less than half a person. Thus the snowball procedure did not work well even for such a well-defined population. We had expected that Colombians would know about each other, facilitating successful snowballing. The procedure did not work particularly well for several reasons: That expectation was probably not realistic for most immigrants, since they came from different origin areas within Colombia, some precipitously fleeing violence, and settled in dispersed areas of Ecuador. Many were also undocumented, 50% according to Table 11.1 in Bilborrow and CEPAR (2007), and their friends may have been as well, so they did not want to tell interviewers about them. There were also problems with addresses being incomplete and unusable.

209. In summary, the problem with most multiplicity or network samples is the need to be able to identify exactly *how many possible ways* every element could enter the sample. One can locate other international migrants based on being *close* relatives, using a specific rule, such as being siblings, but that leads to another problem: clusters of such migrants will tend to be similar (high ρ), reducing the effective sample size. The alternative of locating additional international migrants of a particular group or nationality of interest based simply on friendship does not provide any basis for weighting the observations *ex post* to adjust for differences in the frequency of being cited, since some people will have (and identify) many friends and others few, and it is not possible to know what those differences are to quantify them.

Chapter 4. Questionnaire Modules for Surveys on International Migration

210. In-depth household surveys on international migration constitute an *invaluable complement* to the traditional national data collection systems that provide data on the numbers of migrants and perhaps when they came or left. But they do not and cannot collect the depth of data needed to study the determinants or consequences of international migration. For this specialized surveys of international migration are needed. This can help enormously in understanding what is behind the basic numbers--what is it that causes migration and what are its consequences, for migrants and their households, in sending and receiving countries. As noted in section A of Chapter 3 above, this understanding is useful for developing policies for international migration.

211. The discussion in this Chapter is concise and practical, oriented to suggesting questions or modules that may usefully be incorporated in or added to existing data collection instruments. This makes the marginal cost of collecting the data very small. First, in section A, questions to use to screen populations crossing a land border or at ports of entry, such as airports or seaports, are discussed. Second, in section B, modules of questions recommended for adding to existing surveys are presented, first for labour force surveys and then for other types of household surveys. This is done separately for sending countries, interested in collecting data about emigration, on members of households who have left to live in another country; and for countries receiving international migrants. In section C, which is shorter, an example of a listing or screening sheet is presented, for identifying households with migrant and without, used in two-phase sampling, and also for counting migrants. Finally, in section D, some of the many topics that might be included in a survey of the determinants of out-migration to international destinations, and in a survey on the consequences of international migration, are touched upon, including remittances. In all cases, countries may have particular interests/concerns or circumstances that call for modifications to these questions, or adding or deleting questions.

A. Modules for surveys at the border or ports of entry, including passenger surveys

212. This section follows Section C of Chapter 1. We first consider surveys of those entering receiving countries, since they are usually the ones most concerned about persons entering their territory, especially without documents, since it is an issue of national sovereignty and territorial integrity who enters, and then once inside the country, what rights they have, as temporary residents and as undocumented migrants. To collect data on those crossing the border then, the first issue is what quick and easy screening questions can be used to quickly identify persons who *may* be of interest as migrants and distinguish them from the overwhelming majority who are coming (or leaving) as tourists, to work across the border on a daily or commuting basis, or to shop or visit near the border. The second issue is logistically how to do this, so it is as facile and not-bureaucratic as possible. Also, it is desirable to not question the many persons travelling with others as dependent or accompanying family members, including all persons who appear below some cut-off age, such as below age 10.²⁷ Thus, those even as young as 10-14 should be

²⁷ One would normally think of age 15 or 18 as the minimum age cut-off for questions, but there

asked, if they are not accompanied by an adult family member. It may be crucial in some countries, for getting reliable information, for the screening survey below to *not* be administered by a government body but rather by an independent research centre or university, with the screeners wearing clearly identifiable badges and doing the screening some meters away from the actual border crossing or customs control points.

213. A set of screening questions is suggested below, including some already common in border forms, ports of entry and passenger lists, and customs forms, but others go beyond the usual questions, as follows (D indicates name of destination country):

In what country do you currently live? What is your citizenship?

(those who are returning residents or citizens screened out)

Do you have any family members with you?

(screen out all but one adult spokesperson in family group)

What is your age?

(those over age 10 travelling with family member screened out)

Are you here for a day or a short visit, or do you intend to stay?

(screen out all the former)

What is your main purpose for coming to D?

(if daily commuting with work permit, visiting friend or relative, shopping, tourist with visa, student with visa--screen out)

Do you have any document for entering D (visa, passport, work permit, border crossing permit, other)?

Where is your intended destination in D?

(if border town, could screen out)

214. Based on responses to the above, and any document presented by the person, over 95% of those crossing the border or entering through ports of entry can usually be immediately screened out, making the follow-up survey sketched below feasible to administer. Thus it should be possible to quickly screen out the vast majority of persons as returning residents or citizens, those coming from the neighbouring country for the day or a short stay, and those who are accompanying family members. However, for others who intend to enter deeper into the country than the border (or are already at such a port of entry), further questions should be asked, including:

Sex, age, educational attainment and current school attendance, marital status.

Do you have any children? (if no, skip)

How many living children do you have and how many are living in O (country of origin), in country of citizenship, in D, and elsewhere?

Repeat for parents.

Have you visited here (D) before? Have you lived here before? Worked here?

When was the last time (dates of arrival and departure)?

What is your employment status (employed currently or not, and if not, for how long unemployed? Your occupation, branch of economic activity?)

is growing interest in child migrants traveling autonomously.

215. Additional questions could be asked, including detailed intended address, telephone, etc. (for possible follow-up, or to check on persons changing their intentions and therefore their status later); whether the person has certain documents useful in D, such as an identity card, driver's licence, employment card, etc.

216. With respect to screening survey of those leaving, few countries keep track of them, whether citizens, other residents, visitors, illegal aliens, refugees, etc.; whether they are leaving temporarily as tourists, or for shopping or visiting; or to seek work or study or take up residence in the other country; whether leaving with appropriate documents (of course, those leaving on public international carriers, such as airplanes or boats or trains routinely have their documents checked at the port of departure). But the increased interest in international migration is sparking more interest in getting countries to collect data on those departing, as well as entering.

217. For those leaving, screening questions may be similar to the first set of questions above, with coming replaced by going, and entering by leaving. In the discussion in the subsection on the DHS (chapter 2) on Morocco, a large number of interesting questions are listed for return migrants, and others for those leaving. These questions can provide a good basis for developing a more detailed set of questions that asks also about remittances, acculturation, language skills, and cultural adaptation, etc.

218. Notice that in any case, the key question is on *intentions*, which may be falsely stated, or not known with certainty, or change later after the person enters the country. Getting the details about the intended place of stay, as a tourist/visitor or otherwise, could be useful for a follow-up survey later, which could reveal those overstaying, as well as be useful to ascertain their situation, including whether working, place of employment, with whom they are living, use of public services, etc. Clearly this would be most appropriate for those coming legally to work with documents. For others stating they are coming temporarily, a system of government records using, e.g., records of entries and exits by passport number, could be used to keep track of those who entered under temporary auspices who have already left versus overstaying. Carrying out a follow-up survey on the persons not screened out by the above sets of screening questions, a few weeks or months after they arrived, could be useful, before the person has moved to a different location, making it more difficult to trace him/her to conduct an interview. Still, any such follow-up is fraught with questions of Big Brother watching you, and indeed the results could be used by the national authorities to help identify patterns among those entering of giving false information about their intentions and hence overstaying or violating their visas.

B. Modules to add to existing types of household surveys

219. In all cases, we assume there is a cover sheet which identifies the location of the household in detail and the name of the head of the household, plus at least a minimal household roster which lists all current members of the household by name, age, sex, relationship to the head, place of birth, educational attainment, and marital status, preferably in that order. Note that place of birth is assumed to be included normally, which, if the responses are coded by country, provides at the outset data on the number and location of lifetime international migrants. The limitations of such data, however, are indicated in the Section on Labour Force Survey in Chapter 2, so the rest of this section here assumes we seek more current and detailed data on international migrants, including at minimum when they came and from where.

Labour force surveys.

220. These are the most common national surveys carried out under government auspices, by virtually all developed countries and most large developing countries or those with fairly developed national statistical offices, about 120 countries in total. While some carry out labour surveys annually, quarterly or even monthly, others may skip years due to government budgetary constraints or lack of adequate skilled staff. Still, labour force surveys are often not only regular in most of the countries but also have large sample sizes and national coverage. They also routinely include detailed questions on current employment, including work status, occupation, sector, hours worked in past (reference) week, wages, and whether receive any work benefits.

221. The additional questions that would be useful to add relating to international migration and which would not break the bank, i.e., not drastically lengthen the questionnaire nor alter its fundamental purpose, are as follows. They should be asked of each person aged 15 or more living in the household, who was born abroad, directly to the person whenever possible (R = Respondent; C = country of citizenship). Questions of secondary importance are indicated with an asterisk *, to be included only after the non-asterisk question, for example, when the country has a major interest in international migrants, especially in the labour force of the destination country, for which the questions are intended. An asterisk * at the beginning of a line means all the questions following on that line/topic are also optional.

(If born abroad) When did you (or X, if proxy R) *most recently* come to live in D (month, year)? Where were you living before coming here?

*Had you come here before that, to live or visit? What country did you live in before coming the first time?

Are you a citizen of D? If yes, but not born in D: When did you become a citizen? If not a citizen: What is your country of citizenship (C)?

What level of education did you have when you (last, if more than once) arrived?

*What was the main reason you left D? For choosing to come to D?

Were you working in the month before you left O (country of previous residence)?

What was your occupation, industry, work status (as employer, employee, own account, unpaid family worker, etc.), *was it full/part time, did you have a

*written labour contract, *how long had you been working in same work?

*If not working: Were you seeking work? For how long had you been seeking?

*What was your marital status in O before you came to D? Who was living in your household (list) with you before you came here to live?

*With whom did you come? Did anyone join you here later?

*Did you have close relatives (parents, spouse, children, siblings) or friends living here in D before you came to live here (the last time)? Who?

*Do you have close relatives or friends still living in O or C or elsewhere?

[Note: Current education, employment, already covered in labour survey.]

Did you or any other member of this h/h receive any money from someone in O or C or any other country in the past 12 months? How frequently do you

receive money? How much the last time? *From whom? *In what

country? *What was the total amount you received in the past 12 months?

*By what means do you usually receive money (bank, in person, etc.)?
 *Did you receive any goods, such as the following: clothing/shoes, food, toys, medicine, personal care products, electrical appliances, such as a computer, TV, etc.; car, motorcycle or bicycle; business or agricultural equipment, other? What do you estimate to be the value of the goods of each type?
 Do you send money back to someone living in O (or C or elsewhere)?
 To whom (relationship to you)? Total amount last time, number of times in past 12 months, estimated total amount sent. *What was it used for mainly?
 *What mechanism was used for sending money?
 *Apart from small birthday presents, etc., did you send or take any large goods on visits back to O? [Details as above.]

222. The first questions are simple and fundamental to identify and measure international migrants, by their place/country of previous residence and citizenship, and key characteristics *at the time of the move*, including education, marital status, and employment. The question on education at time of arrival is important to be able to determine, first, the human capital coming to D (and leaving O), which when compared with the current education level will show if the migrant has increased his/her education after arrival in D. The proposed additional questions on employment will allow comparing the situation of the migrant before migration with his/her current employment in D as routinely covered in the labour force survey. An even more complete assessment could also ask about the first job after arrival, but that is feasible only in a survey which focuses on migration (such as section D below), not a government labour force survey. Other questions listed pertain to the move itself, reasons for leaving O and for choosing D (which may be quite different and revealing), the family situation/context before the move, who came then/later, and lives currently in D. This indicates the previous and current family situation, and separations linked to the migration. The questions on sending and receiving money and goods evidently seek key data on remittances and its effects on the receiving and sending household. It is likely to be far too much a burden on the labour force survey to ask more than the most *minimal* questions on household composition prior to migration compared to now and remittances, which is why most questions have asterisks. However, these questions and more should be included in a specialized migration survey (D below).

223. The discussion above is for countries receiving international migrants. For countries *sending* migrants, data on (out-) migrants and their impact on origin households can be obtained only from proxy respondents. A proposed set of questions for a labour force survey supplementary module follows:

Is there anyone who used to be a member of the household living abroad now?
 Age, sex, *relationship of X to h/h head, current education level.
 Place of birth of X, place of residence at time of leaving country, if not this h/h. Year left. *Reason for leaving. *Country of destination at that time.
 Country of current residence. How many years living there continuously now.
 *For those age 12 or older at time of leaving: Marital status at departure. Did X leave behind any own children under age 18, how many? *Who cared for them?

Was X mainly working, studying, looking for work, doing housework, other, during the month before leaving? (skip if not working or looking)
 In what branch of economic activity was X working? Occupation; sector; status as employee, manager, day labourer, own account worker, unpaid family worker, housemaid, other.
 Is X currently working in D, looking for work, studying, housemaid, other?
 Branch of economic activity, occupation, economic sector, work status.
 *Is any other member of the household thinking of emigrating? Who--how many persons? Where is Y thinking of migrating to? How soon?
 Did X send any money in the past 12 months to anyone in the household? When was the last time? How much was received? *Who received it?
 *How many times did the h/h receive money from X in the past 12 months? How much was received in total?
 *What was it used for?
 *If invested in a business-- in what economic sector (branch)? Where?

224. The discussion of the purpose of the questions here and their linkage to other questions in the labour force survey in general follows that of the discussion of questions for countries receiving migrants above. Note data are sought here to determine why the migrant left, from the characteristics of the migrant which may be compared to those of others who did not out-migrate in this and other households in the sample in the country of O; and from reasons given. This can shed light on the *determinants* of emigration, though a fuller analysis requires not only the questions here including those with asterisks but further ones (D below). In addition, the questions here allow some study of the consequences of the emigration for the migrant himself/herself, by comparing the education (human capital) of the migrant before and after migration, as well as marital status and employment before and after.

225. The *consequences* of the emigration on the household remaining in O can also be partially examined from the data on remittances received and how they are used. A more detailed assessment of the consequences would require additional details on the situation of the household and not just of the migrant just prior to the time of the migrant's departure. Such data should be sought in a specialized survey of international migration carried out in a country of emigration, such as in the five countries described in the NIDI surveys (Annex F).

Other household surveys

226. Surveys such as the DHS and LSMS surveys collect detailed information on not only the dominant themes of the survey but other topics that may be related to international migration, provided that some *minimal* questions are added to the survey questionnaire on international migrants (see 3C and 3D above), namely, country of birth, country of previous residence, and when came. From DHS, one could entertain a detailed study of the health conditions of migrant and non-migrant households, as well as study difference in fertility, use of family planning, child and maternal mortality, HIV/AIDS and other illnesses and treatment received, use of health services in the country, school attendance of children, violence against women and children in the household, attitudes toward the above, housing conditions, nutrition, etc. From LSMS, one could compare migrants and non-migrants on some of the above topics as well, though not in as much detail, but the heart of LSMS is economic characteristics that could be compared between

migrants and non-migrants, including occupation, earnings, and time worked. Undoubtedly, some DHS and LSMS surveys are starting to include the minimal questions indicated, and occasionally more (see e.g., DHS-type survey of Ecuador, in 3C), but they usually will still suffer from small-to-moderate total sample sizes and hence rather small samples of international migrants to provide data on sufficient numbers of migrants for the study of those rare elements, international migrants, unless specialized sampling methods are incorporated in those surveys.

227. Multipurpose surveys are carried out occasionally in some countries and even regularly in several dozen other countries. They often cover most of the topics of DHS and LSMS surveys but in less detail, as well as additional topics, which can give them great flexibility. This can make them excellent candidates for incorporating a significant module on international migration, at least on an occasional basis. But again, the value of doing this depends first on the sample size. If large enough, a multipurpose survey could facilitate studies on a wide range of topics comparing and contrasting migrants and non-migrants.

C. Listing schedule for two-phase sampling

228. In the discussion of two-phase sampling in Chapter 3 above, it was noted that a screening questionnaire is needed to list households in the Ultimate Area Unit (UAU), such as a census sector or village, to identify those with and without recent migrants, in order to create a sampling frame for the UAU to use to sample households. A listing sheet lists all households in an UAU on sheets, with one line per household. Evidently, the sheet should identify clearly at the top the province, district, and UAU, by both name and code number. For a study of migration, each sheet should include all or most of the following, in columns numbered from left to right (asterisks indicate possibly optional).

- Column 1: For office use, for recording numbers or renumbering sample h/h
- Col. 2: *Number of block in census sector, if urban. Of segment, if rural.
- Col. 3: Number of building/structure (address number, if posted)
- Col. 4: Number assigned to household in building (there may be many, if an apartment building, each with its own floor and number).
- Col. 5: Sequential number of all (occupied) households in UAU.
- Col. 6: Address of dwelling (in rural areas, description of location)
- Col. 7: Occupied or not
- Col. 8: *Name of head of h/h
- Col. 9: Number of persons living there normally, excluding visitors, emigrants.
- Col. 10: *Number of persons living temporarily in household
- Col. 11: *Number of foreign born living in h/h
- Col. 12: Number of foreign born who came to D in past 5 (or X) years
- Col. 13: Number of those over age 15 at time of arrival who live here now
- Col. 14: Note if information provided by member of h/h or neighbour/other
- Col. 15: *Day and time convenient for follow-up interview

229. There will be some variation in what works in different countries, e.g., in urban vs. rural areas. And on whether unoccupied dwellings should be listed at all (it can help interviewers find the occupied ones from the listing sheet, if phase II is carried out on a different day from phase I). Sketch maps should also be prepared to indicate the orientation of streets, blocks, major

non-residential structures in the UAU (if urban), and roads, streams, and other physical landmarks (if rural).

230. The listing operation is *extremely important* in any survey, but especially in migration surveys since the quality of the sample and hence the survey depends on a complete and accurate accounting of all migrant and non-migrant households in sample UAUs. The information collected should be understood by both supervisors and listers before the fieldwork begins, meaning both should be trained, and themselves and the draft listing sheet tested in a pilot survey in the field before the survey begins. That is, both the draft listing sheet and the questionnaire should be pre-tested in the field before the survey begins. It seems that in practice only the questionnaire is pre-tested. This can result in problems and confusion in both the listing operation and the sampling of households later, as happened in the beginning of the survey of Colombians in Ecuador (see Chapter 2).

231. A good listing operation counts migrants and non-migrants in all sample UAUs, which can be used to estimate the proportion of the population accounted for by migrants in the country or the survey domain. It can therefore provide, with an independent population total, a good estimate of the number of migrants in the country. However, details beyond those numbers and their spatial distribution must come from a phase II (interviewing) operation.

D. Specialized surveys of international migration

232. There are many possible types of specialized, intensive surveys on international migration, which can address substantive topics that go well beyond counting migrants and their logistics (who moved, when, citizenship, country of origin or destination). In the sections above, a number of extensions of questions and topics discussed are noted, which relate directly to the manifold possibilities that could be discussed here, but are beyond the scope of this document. For example, a migration history of the respondent and his/her family members could be gathered, to allow understanding the process, and key linkages between the timing of moves and other main events in the person's life, such as completion of school, marriage, childbearing, job changing, separation or divorce, or retirement. More details should be obtained on the situation of not only the migrant but of the whole household just prior to the time of the person's emigration or immigration. In particular, more economic details are needed on time/hours and months on the job worked, earnings, responsibilities, evaluation of job, etc., prior to the move, which can be compared with the same details for the first job in the (first) country of destination, as well as the current job. Migration networks/contacts, sources of information, expectations of assistance, and language ability before migration (and currently) should be collected. Most of these additional types of information are useful for studying both the determinants and consequences of international migration. A number of modules of questions to seek these additional details are found in Bilsborrow et al. (1997, Annexes 1 and 2, for countries of destination and origin, respectively).

Annex A. National Immigrant Survey, Spain

Spain has just implemented for the first time in 2007 a new survey on international migration, called the National Immigrant Survey, using its continuous population register (*Padrón Continuo*) as the sampling frame. 21,000 households were selected on the basis of their country of birth not being Spain, and were visited for a personal interview, coordinated by the National Institute of Statistics (INE). The questionnaire is somewhat long (51 pp.), but well designed and complete, so it is worth indicating its content in some detail as an example of how a register can be used to select a sample to study international migration, as follows:

In what country were you born? In what year?

(If not born in Spain) In what year did you come to Spain?

(If arrived less than a year ago) Do you plan on staying at least a year?

Are you a Spanish citizen? Since what year? Are you also a citizen of another country?

What is your mother tongue? Can you read and write in that language?

What other languages do you know--speak, read, or write?

What is the highest level of education you have attained? Was this completed in Spain?

Marital status. (If married) Age, country of birth of spouse.

Is spouse a citizen of Spain? Since when? What other countries is spouse a citizen of?

Data on children under 4 living in hh, including knowledge of Spanish, school attendance.

Data on own children that do not live in this dwelling: sex, age, country of birth, citizenship, current country of residence.

Data on brothers/sisters living: Where do they live? What is their citizenship?

Data on father/mother: If alive, country of birth, citizenship, current country of residence?

Housing conditions of current residence in Spain.

Migration history of respondent: countries lived in, when moved, with whom, why moved?

What was your situation in your country of residence just before you left to come to Spain? Did you own your house? How many persons lived with you? Where did your close relatives live at that time?

At that time, were you working, studying, taking care of the house, etc.?

If working, occupation, industry, work status, whether had labour contract, hours worked per week, when did that work end?

Form of transport used to get to Spain? From what country? How long had you lived there?

Did you have someone to go to in Spain, to get assistance, when you came?

How much did you pay to move to Spain? For how many people was this? How did you pay?

Did you need a loan? From what institution or persons?

Work in Spain: *last week*--questions as above, plus income.

(If not first work in Spain), same questions, plus how long it took to get first work, and how got it? Whether ever without work for a month or more in Spain, how many times?

Residential history in Spain. For each place: location, when lived there, how many persons, payment, size in sqm.

Did anyone from your country who already lived in Spain influence your migration to Spain?

Are you still in contact with people from your origin country? Using what means?

How many times have you visited it? Year of last visit. Reasons for visit. Duration of visit.

Do you send money back home from Spain? Frequency, amount, to whom, by what means?

Do you still own a house, business, land, cattle, or car/other vehicle there?

Have you made any investments in a house or business or bought property, etc., in Spain?
Are you involved in any organization for foreigners in Spain or in any local organization?
Have you voted in Spain?
Do you intend to remain in Spain? Bring (additional) family members?
What (legal) documents do you have now for living in Spain?

Results are not yet available from the survey, nor is the methodology of the sample described, but this survey promises to provide a gold mine of data for Spain, which has experienced in recent years a huge influx of migrants from Ecuador, Peru, Morocco, and other countries.

Annex B. Examples of international passenger surveys

Pakistan, 1993

Pakistan also undertook a survey of male migrants *returning* to Pakistan on flights from the Middle East (Azam, 1994), in April 1993. Data were obtained on Pakistani men who had worked abroad: age; occupation; marital status; residence in Pakistan; country of work and length of stay abroad; whether had a written contract with an employer abroad; if so, whether it had been signed in Pakistan before departure and processed by the Protector of Emigrants Office, and whether the contract had expired or whether the migrant was returning home just for a visit. Flight manifests were obtained to determine the total number of people on a flight as it arrived, but it could not be known how many were migrant workers returning. Since in 1992 Pakistan stopped requiring its citizens to pass through immigration on re-entry, a logistical problem arose of how to identify and retain for interview returning Pakistani citizens at the airport. Interviewers were simply instructed to interview at least 20 per cent of the migrant workers on each flight, and in fact managed to interview 48 percent, albeit with no attempt at random selection (17,524 of 36,155 men were interviewed, 13,899 returning from work abroad). Among the workers arriving, 5,170 were returning definitively, the rest were making short visits. Although the cost of the survey was considered low, it was not based on a representative sample so its results cannot be interpreted as indicating the experience of all return migrants. In addition, its covering only one month means it may not be representative of the whole year.

Mexico, since 1993

A much larger effort is that of Mexico based on border statistics. Since 1993 a survey has been carried out along the northern border of Mexico, *Encuesta sobre Migración en la Frontera Norte de México* (Santibáñez-Romellón, 1993; Bustamante et al, 1994; El Colegio de la Frontera Norte, 2005) on both inflows and outflows of Mexicans. Sampling points are border crossings. Originally, the 28 possible border crossings were studied to observe the quantity of persons crossing, which led to selecting 10 cities in Mexico as the main crossing points, accounting for over 95% of all land crossings into the United States. Sampling sites where migrants arrive or depart were identified at each crossing area (e.g., highway points with immigration posts, bus terminals, train stations, and airports). By 2005, two of the ten had been updated, with the 10 accounting for over 90% of those crossing by land. In 2005 the survey was also extended to six airports in the interior of Mexico (Mexico D.F., Guadalajara, Morelia, Aguascalientes, Zacatecas and El Bajío--Guanajuato), to also include passengers departing for and arriving from the US via those airports (El Colegio de la Frontera Norte, 2005). Finally, another border crossing survey has begun at the southern border with Guatemala, to conduct a separate study of those coming from Central and South America into Mexico as a country of transit to the US.²⁸

The survey methodology requires first measuring actual flows at all the main (currently 10 + 6) points of departure to/entry from the United States, in order to allocate the intended sample "take" to each in proportion to the number of persons crossing at that point during the year. In each of the border crossing points (cities), people would be also interviewed in proportion to the number passing that point, at bus terminals, train stations, and vehicle/walking crossing points.

²⁸ Noted by Rodolfo Corona, of El Colegio de la Frontera Norte, in an email communication with Bilborrow in June, 2007.

Similarly, in the six interior airports, narrow corridors where people enter or leave the country, including immigration checkpoints and baggage claims, were used in proportion to the people passing each point. Days in the week and hours in the day to catch people leaving/entering were then also allocated in proportion to the number of persons crossing. Through these procedures, the goal was to give all persons the same probability of being selected, so that weights would not be needed in the analysis. During the particular times of data assigned for data collection, it is implied that every person passing is screened, though this seems unlikely as it would disrupt or slow down the entry and departure of passengers, especially in airports. A short screening questionnaire is used to determine if the person is an appropriate person for interview, as follows (for those departing):

How old are you? (Must be at least 12 for interview)

Are you going to the US? (If not, no interview)

Were you born in Mexico? (If not, no interview)

In what country do you live? (If not Mexico or US, no interview)

Are you going to the US to work for at least 30 days? (If not, no interview)

Once a person has been screened and found appropriate to interview, he/she is asked to step aside for a confidential interview, which focuses on education and employment: actual/intended school attendance and educational attainment; work experience and training; work history; and knowledge of and intentions to participate in Mexican elections.

Evidently the survey does not capture all Mexican international migrants since, e.g., those leaving for or returning from other countries are not covered. And the frame is not complete since some migrants may go to Canada or other countries first in order to later enter the US, and it excludes those travelling by boat or who intentionally misstate their purpose or later change it (e.g., overstay a tourist, student or work visa). But the results of the survey do continue to provide a wealth of data on migration flows from Mexico to the United States (since most persons do cross the long land border), trends over time, basic characteristics of migrants, and reasons for departing (and returning). The project has helped establish El Colegio de la Frontera Norte as a major university center in Mexico for the study of Mexican migration to the US and the consequences for the migrants and their families remaining behind. It has also contributed to a professional journal, *Frontera Norte*, and a monthly international seminar series on international migration.

Armenia, 2001-2002

Armenia conducted a special one-time survey for 12 months from February 2001 to January 2002 based on persons crossing its land borders. It collected data on 5,581 persons departing and 4,508 persons arriving (Armenia, National Statistical Service, "Survey Results", n.d.). It is not stated what fraction of those crossing were covered, nor how the sample was distributed among border crossing points or times in the day, only that it was implemented 5 days each month at all operating border guard posts. Among its findings are that citizens of Armenia constituted 2/3 of those arriving (returning) and 95% of those leaving, indicating continuing emigration of Armenians. The vast majority leave to work in Russia, with 93% of both arriving and departing "passengers" working in Russia, 60% saying it is because of lack of work in Armenia.

Cyprus

Cyprus has a passenger survey conducted at (the two international) airports and (two) seaports, to measure the volume of inbound and outbound travellers, including tourists and short-term migrants entering and departing. One purpose is to estimate revenues from tourism. Data are collected from interviews with air passengers, with sea passengers (only 10%) not interviewed; instead, data are taken from ship manifests (records). Interviews are conducted in person, all day long throughout the year, one person per family. Among those departing, all residents of Cyprus are interviewed compared to one in six non-residents. Unfortunately, further data are not available in English on the sampling fraction nor on the practices used to select respondents. On the other hand, the questionnaire for arriving passengers is available and quite useful, distinguishing those arriving by citizenship; status as tourist, student, worker; whether coming/returning for short visit or longer, and purpose of entry, planned duration of stay and major destination; where coming from, duration of time away from Cyprus if a citizen; current level of education; whether travelling with family members and number by age and sex (but not relationship or marital status); if coming or returning to work, expected occupation, industry, and work status. The questions are useful for characterizing those arriving, to the (unknown) extent people do not change their status later. Similar sets of questions are asked of those departing, including how much they spent as tourists, whether came on a package tour, etc. To the degree the sample is large enough and allocated representatively across the 4 sites, inflation factors could be used to estimate immigration well. The same is true of emigration. However, there is no evidence of a methodological assessment.

Morocco, 2005

Morocco has a special survey conducted on *both arriving and departing travellers* at its eight principal border crossing points. This includes a survey in August 2005 of Moroccans crossing the border to return to their foreign residence, but there is no information on the sample size or method of selection for interview (see www.cered.hcp.ma). The questionnaire asks place of previous residence in Morocco, country of current residence and duration, household composition in the foreign country, including country of birth and citizenship of each h/h member; number of visits to Morocco in the past 3 years; work status, branch, occupation, whether skilled or not, whether full time or not, in country of current residence; and housing quality. The head of h/h is also asked when he/she first left Morocco, residence before leaving, first destination country, whether any h/h members are thinking of returning to Morocco. The head is also asked if he/she has or intends to obtain foreign citizenship; if married, where was spouse living before marriage, and did spouse accompany the head or migrate later to the destination country; number of children with them vs. in Morocco or other country; education, including years and skills acquired in destination country; number of children who studied in destination country. Then a series of questions is asked about the schooling of a randomly selected son and daughter in the h/h, including what language each speaks with each parent, siblings, and in the street. Further questions for the head continue on where he/she goes for vacation, which country's television programs watches, whether is a member of various types of community groups, whether votes there and has friends, encounters racism, pays taxes, receives government subsidy, and goes out for entertainment. Also, attitude to mixed marriage, whether practices religion and feeling about it there. A series of questions follows on current work, including hours, type of contract, benefits, and whether had trouble getting work due to being

Moroccan, satisfaction with job, plus work history in all countries, including periods of unemployment, and investments in destination country and Morocco. This is an extraordinary amount of data, if indeed it could all be collected as the person/family is rushing to cross the border or departing/entering at an airport. Such detailed information would seem far easier to collect at a place of residence, instead using the survey at border crossing points (at least for those entering, return migrants) as a screening survey only, and then following up.

Annex C. The Current Population Survey, USA

The US Current Population Survey (CPS), with a sample of about 100,000 households and carried out every month since 1947, illustrates how a general purpose survey may be used to analyse some aspects of international migration if it is large enough. Each month the CPS gathers data on labour force participation and employment as well as basic demographic information. Thus the place of birth of each household member is available every month, and once a year, every March, the place of residence 12 months before is also recorded. Starting in January, 1994, country of citizenship has also been recorded every March. The CPS is a *panel* or longitudinal household survey in which each household in the sample is interviewed for four consecutive months, then excluded for four months, and interviewed again for an additional four months before being dropped permanently from the sample. This scheme is meant to minimize interviewee fatigue while ensuring continuity and comparability of results over time. There is a 75 per cent overlap of sample households from one month to the next and a 50 per cent overlap from one year to the next. If a household moves during its 12 month period of being in the sample, it is supposed to inform CPS so it can be followed during that time. The CPS sample rotation scheme means that data relative to a particular person/household can be compared over a maximum interval of 12 months. Thus, international migrants encountered in March will be followed for three more months, then not contacted for four months, then contacted again for four months.²⁹ This provides data sufficient for an analysis of the *short-term* consequences of migration, by comparing the changing situation and fortunes (income, etc.) of the international migrant with those of non-migrants over time. An analysis of the changes experienced by successive cohorts of international migrants from the March rounds of each survey would provide some insights about how the short-term consequences of migration and the integration processes of migrants change (get better or worsen, compared to native born) over time, though I am not aware that this has not been done. The survey is large enough to be used to estimate the stock of international migrants (see 2.G below) based on the question on country of birth, which yields an estimate of the change in the stock over a 12-month period year, and hence an estimate of net new migrants as measured by the foreign born population. The question on residence 12 months before can also be used to identify new migrants arriving in the 12 months based on country of residence, a different measure. However, data from the CPS survey alone cannot be used for an in-depth study of the determinants or consequences of international migration.

²⁹ The first visit is in person, with subsequent follow-up contacts by telephone.

Annex D. National Labour Force Survey, Thailand

Thailand has carried out a labour force survey since 1963, with the sample size and frequency increasing over time (Thailand, 2005). It became quarterly starting in 2001, when a 2-2-2 sample rotation scheme was established which has been used ever since. Thus, in a variation of the US CPS rotation scheme, households are included in the sample for two consecutive quarters--interviewed once each quarter--then dropped for two quarters, then included again for two more, then dropped permanently. This provides 50% continuity from quarter to quarter and year to year, and reduces respondent fatigue. Actually, households are interviewed once out of three months in one quarter, the same the next quarter, then not interviewed for 6 months, then once again interviewed once in a quarter for two more quarters, so there is less respondent fatigue than in the CPS. The total sample size each quarter (and year) is 79,560, with 26,700 covered each month. Such a large sample is used to provide quarterly estimates of employment and unemployment for all 76 provinces, including Bangkok. A two-stage sample is used, in which the primary sampling units (PSUs) were the provinces, and the secondary units (SSUs) were (urban) blocks/(rural)villages selected at random in each province, with the number per province selected in proportion to the estimated population size (based on the 2000 census).³⁰ The total sample then comprises 5,796 SSUs, of which 3,336 are urban and 2,460 rural, providing better representation of the urban population (about 30% of the total in Thailand, but 58% of the sample) than the rural population. Thus the total sample population is 50,040 in urban areas and 29,520 in rural areas. The oversampling of urban vs. rural areas calls for compensating weights to produce national totals.

The basic labour force questionnaire covers the usual minimal information of labour force surveys, on each person aged 13 and above (recently changed to 15+), namely, composition of the household, including age, sex, marital status and education of each member of the household; employment/work in the previous 7 days, including occupation, industry, work status, hours worked in past 7 days, and wages including non-cash benefits such as food and housing; for those not working, reason for not working, time without work, and job-seeking behavior (see Thailand 2007a, n.d.). It is worth noting what information is already included in the questionnaire since all that is already there, cost free, for any study of international migration that would be based on the non-cost-free addition of questions on international migration. In fact, a migration survey has been carried out, generally annually, since 1974 in Thailand; since 2004 it has been achieved by adding a module (number 6) to the labour force survey for the last quarter, meaning that data are provided for the full sample size of 79,600 households (Thailand 2007a,b; n.d.). The additional 19 questions asked once in the fourth quarter of each year for each person in the household are on how long the person lived in the present residence, whether the person is registered there (Thailand has a national continuous population register), whether expects to stay permanently or temporarily and if the latter, how long, reason for not staying, and whether intend to return to previous residence. Then for all persons who moved to the present residence in the past 12 months, province *or country* of previous residence, reason for migrating to this place/household, whether had been working during the month before coming and occupation,

³⁰ Such a sample with PPES makes it unnecessary to weight the data but means that provinces with small populations will be poorly represented compared to more populated provinces, resulting in unreliable estimates for the former. A better procedure would have been to take larger proportions of the population in the smaller provinces.

industry and status; whether the in-migrant sent money or goods to someone *in Thailand or abroad*, amount sent, to whom, how sent, and what it was used for. Note there is considerable information on international migration: one can even compare the occupation in the previous country of residence with that in Thailand.

This migration module in the last quarter of 2006 (Thailand, 2007b) was the vehicle for adding a new, additional experimental module, for the first time, to seek further information on international migration. 22 questions were added, for every person, referring to the 12-month reference period before the survey date: including the following,

Does X receive money or goods from someone living elsewhere (including another country)?

Relationship to sender. Total times, total amount in 12 months. What is it used for mainly?

(If money) What mechanism is used for sending money?

Is X a citizen of Thailand?

(If Yes but not born in Thailand) When did X become a citizen?

(If not a citizen) What is the country of citizenship?

(Ask only if born abroad) When did X first come to live, work or study in Thailand?

Did X come more than once? What country did X live in before coming (the first time)?

When did X arrive most recently (mo., year)?

What level of education did X have when arrived?

What was the main reason for coming to Thailand?

What was the occupation, industry, work status (as employer, employee, own account, unpaid family worker, etc.)?

This is a good module to add to a labour force or other survey, though it might have been useful to also ask language ability and marital status on the occasion of the most recent arrival, as well as with whom (number of family members) they came and whether they intend to stay.³¹ It would also be useful to inquire for those who are not citizens whether they intend to apply. The fact that it asks when X came *most recently* is needed to determine if the person should be classified as a migrant or not. And the questions on previous education and work make it possible to determine changes (gains in human capital, occupational mobility after arriving in Thailand), and therefore assess whether the migrants improved their status with migration (that is, one can study the process of *integration*, and compare the situation of migrants and non-migrants in Thailand), as well as appraising the brain drain (from the origin country) and the brain gain (for Thailand). However, a full fledged study of either the *determinants or consequences* of international migration cannot be carried out based on data collected only in the destination country (Thailand, in this case) but also requires data from non-migrating households in the origin countries.

Nevertheless, given the sample size and good question modules used, it is also instructive to quickly summarize some results of the analysis of the data from the survey (Thailand, 2007b) as they indicate the limitations of even large surveys when countries have a low proportion of international migrants of interest. Thus, the survey led to an estimate of 65.5 million for the

³¹ Also, the reason for coming is asked twice in the case of international migrants.

population of Thailand in the last quarter of 2006, based on the nationally representative set of 5,796 sample areas. With less than one percent (0.6%) of the population born abroad, 94% of whom were from other Asian countries, especially Burma, then Laos and Cambodia. The absolute number of persons born abroad was about 480, or not much more than about 100 households, making all the statistics on international migrants produced in the publication for the country based on the national inflation factor of 823 (=65.45 million/79,560) very unreliable. One example suffices, a table is presented showing the reason for migrating to Thailand, based on 17 reasons, for the five regions in Thailand. It does not take much perspicacity to see that the numbers of observations in most cells are tiny, before they are inflated by 823. Only 13% of the households received any money or goods from others, only 6.7% of this was from people abroad; funds were used overwhelmingly for food and clothing (71%), with little for investment.

Annex E. Other examples of modules added to national labour force surveys

Costa Rica

A country which has developed excellent modules that it has added to its annual labour force surveys, carried out every July, is Costa Rica. It has a national sample of 13,175 completed households (out of a sample of 14,000), which collects data on both immigrants and emigrants from the household. It is worth indicating the questions it uses (see www.inec.go.cr/Encuesta Hogares). It begins with a simple series on immigrants:

Where was X born? If elsewhere, where?

How long has X lived in CR? How much longer does X plan to live in CR?

In what country did X live before coming to CR?

This is followed later by a series of questions on former h/h members now living abroad:

Age now, sex, relationship to head and spouse; time lived abroad.

Where lived abroad (besides country, state or city).

Current education, activity (whether working, studying, etc.), whether sent \$ in last 12 months.

Appropriately situated at the very end of the questionnaire, which of course has a main focus on employment, are two sections on remittances received in the household and whether funds were sent to a relative or friend abroad (not only former h/h members). Having data on *both* is important since it provides an estimate of the value of *net* cash and other transfers. First, regarding remittances received, the questions may be summarized as follows:

Did you or any other member of this h/h receive any money from a former household member in the past 12 months? How frequently do you receive money?

How much did you receive last time? From what country? By what means (bank, in person, etc.)? What was the total amount you received in the past 12 months?

Did you or any other h/h member receive any goods, such as the following: clothing/shoes, food, toys, medicine, personal care products, electrical appliances such as a computer, TV, etc.; car, motorcycle or bicycle; business or agricultural equipment, other? What do you estimate to be the value of the goods of each type, in *colones*?

Then a similar battery of questions is asked at the very end on money sent abroad to a relative or friend: if sent, frequency, amount last time, by what means sent, total value in last 12 months, plus the same set of questions on whether sent goods and estimated value of each type sent.

The questions on remittances are reasonable and complete, except that it may be too much to ask about so many transfers in kind (of goods) and their value. Respondents may balk at providing that information, but at least it is the very last question in the labour force survey, so little is lost in trying. However, in most situations, the value of transfers in kind is reported to be only 5% or so of all transfers. It is also possible that asking only the h/h head or proxy respondent about all transfers received or sent will not yield complete information, since that person may not know about some transfers received or sent by other h/h members. In the case of individual interviews,

which is sometimes done in labour force surveys, in which every person (available) over the cut-off age of 15 (plus or minus 3) is separately interviewed, each person could be asked him/herself about transfers. Note that the Costa Rica survey, while seeking complete data on transfers, does not ask the kinds of retrospective questions useful for investigating either the determinants of consequences of international migration for the migrant.

Ecuador, 2005

In its latest labour force survey with data available from 2005, called Survey of Employment, Underemployment and Unemployment, Ecuador has a substantial module on international migration, again at the very end of the instrument. The survey is based on a national sample of 19,596 "dwellings"³² and has an even more extensive module, with 33 questions on emigrants from the household. These are quite different from those of Thailand and Costa Rica above, and are equally worth summarizing:

Is there anyone who used to be a member of the household living abroad now?
Relationship of X to h/h head. Age, sex, education now.
For those age 12 or older: Marital status at time of departure. Did X leave behind any children under 18, how many?
Was X working, studying, looking for work, doing housework, other, before leaving?
In what branch of economic activity was X working? Occupation. Status as employee, boss, day labourer, own account worker, unpaid family worker, housemaid.
Place of birth. Place of residence at time of leaving. Year left. Reason for leaving.
Country of current residence. Is X working, looking, studying, housemaid, other?
Branch of economic activity, occupation, status.
Is any other member of the household thinking of emigrating? How many persons?

A series of questions on remittances follow:

Did X send any money in November 2005 to anyone in the household? Amount.
Did X send any money between December 2004 to November 2005? How much was sent and how many times?
What was it used for? (up to 4 categories allowed out of 12, including investing in business)
If invested in a business, in what economic sector (branch)?

Then every person aged 18 or older in the h/h is asked whether he/she had thought of investing the money sent by X in a business, and if not, why not; how the money was received from abroad, how long ago received money (less than a year, between 1 and 3 years, ...m over 15 years ago). And finally, whether X sent any goods in the past 12 months, and approximate value. The latter questions is fine, but this whole last set of 6 questions is a mess, beginning with the fact that we (a) already know what was done with the funds, including if they were invested in a business, but (b) have no idea who actually received or had control over the cash remittances;

³² It is likely that this is really the number of households completed in the survey. The majority of countries totally confuse the two concepts in replying to the UN Statistics Division questionnaire, reporting dwellings (which are not decision-making units) instead of households. At minimum, this is a source of ambiguity and confusion which still requires further clarification even after so many years of efforts.

and yet every adult in the household is asked if he/she has *thought* of investing them in a business, a totally subjective and extraneous question. And asking each adult about whether they had ever received funds from X many years in the past makes no sense, as the information needed is already available from the earlier questions. However, what is true is that asking the head will not necessarily capture all the remittances, so it would be better to ask the module of questions on remittances received of each adult, at least when the person is available, though that is time-consuming. The jury is still out on the best, concise way to inquire about remittances received. And note there are no questions on money sent to the emigrant here. Still, the survey does inquire about work status and occupation of the migrant before leaving and currently, permitting some limited assessment of the determinants and consequences of migration for the migrant. However, it asks current education rather than education at time of leaving, so no assessment is possible of education gained abroad; asks marital status at time of departure, but not current status, meaning it is not possible to assess any change, nor do we know what happened to the children. Finally, the question on whether anyone in the household plans to emigrate should be asked in the beginning, on the h/h roster. Putting it in this module means that it is only being asked in households that already have household members living abroad, totally missing all other households with that important question on potential migration.

Armenian Migration Survey

The Armenian Migration Survey was carried out in 2006, supported by Eurostat and the International Organization for Migration. Though the intention is to implement it in the 3,600 households of the LFS, it was instead tested for quality control in a separate sample of 1,985 households selected (details not available, nor particularly important since it was only experimental) from 11 *marz* or administrative districts in Armenia. It had as screening questions for all household members, age, sex, etc., plus place of birth, citizenship, and whether had left to live in another country for at least 3 months at any time since 1990. For the latter who had returned and were over age 16 at the time of interview, it asked last country lived in for over 3 months, when arrived in that country, when came back to Armenia, whether was working in that country, and whether sent money or goods back to Armenia. Then a series of questions is asked of the h/h for each h/h member living abroad on when and where person was living, whether sent remittances, how much in last 12 months, by what means was it sent, to whom, and for what was it mainly used. Results are not available but will be coming out soon. The questions themselves seem fine, the real issues are how to find households with migrants, and how can the module be included in the regular LFS, and how many migrants would be there. In the case of Armenia, nevertheless, since the country is so dependent on work and remittances in Russia and elsewhere, the sampling issues of finding a large enough proportion of households with international migration experience may not be so difficult as in other countries--viz., they may not be such "rare elements".

Survey on Overseas Filipinos, Philippines

Another example of adding a module to a labour force survey is the Survey on Overseas Filipinos (SOF). This is a continuation of a program since 1987 of adding a small module to the October round of the Labour Force Survey in the Philippines. That survey initially collected data on overseas workers who had gone abroad to work in the previous five years (whether returned or not), and asked about remittances received in the 6-month reference period prior to the survey.

It currently is administered by the National Statistical Office, asks about anyone travelling outside the Philippines within the previous five year reference period, and used to estimate the number of Filipinos working or living overseas, their socio-economic characteristics, and remittances sent in money or in kind. The sample size is 41,000 households, but it is not known how many international migrants were found, and of course when a whole household has departed, there is no one left to report on them. It is interesting that the data in the survey on remittances sent via banks vs. via other means is used to create a factor for multiplying the macro-data from banks on remittances received to obtain a national estimate.

Based on the last round of the survey module in October 2006, the SOF website reports (May 29, 2007) that the number of Filipinos working overseas rose by 14% to 1.5 million in September, 2006, with women slightly out-numbering men and also being younger than men working abroad. Remittances rose 17% from 2005, were 95% in cash, and 79% sent through banks. In response to the UN questionnaire regarding whether there has been any assessment of the quality of the survey for measuring international migration, the response was that "the current sampling design may not be the best for the SOF...since it utilizes the same design meant for the LFS and not for overseas Filipinos." This telling quotation indicates recognition of the difficulties of combining the LFS and the SOF.

Egypt, 2007

Egypt has a module on emigrants including return migrants added to its Labor Force Sample Survey (LFSS). In 2007, the Central Agency for Public Mobilization and Statistics conducted the quarterly LFSS which has national coverage, and asks first if anyone in the household has left in the past 10 years to live abroad for more than 3 months, and currently lives abroad. For each person, age, sex, relationship to h/h head, country of current residence, and year of departure are obtained, along with current employment status, occupation, whether ever sent money to the h/h. It also has an interesting question about how long after the person left did he/she first send money (though with a 10-year time horizon, this is unrealistic, for those who left years ago), how much was sent the last time (but does not ask when was the last time), number of times in the past 12 months, total money sent in the past year, means for sending money, and what were the uses of the money (without noting the main use). Return migrants are asked the main reason for their going abroad, when they last moved abroad and moved back, name of country, work status/category and occupation abroad, whether ever sent money or goods, total value per year (this cannot be reliable for many), how sent, and how much money he/she brought back. The 10-year time frame is definitely too long to be asking all the details indicated, but the modules on both return migrants and current out-migrants abroad are well conceived.

Mexico

Mexico, through its national statistical office, INEGI (Instituto Nacional de Estadística, Geografía e Informática), which administers many kinds of relevant surveys and was one of the first in the world to geo-reference its demographic data and all political boundaries by the early 1990's, has an extensive programme of household surveys (see elsewhere in this document), including a national labour force survey. The latest, National Survey of Occupation and Labour (ENOE) in 2007 has a sample size of 120,260 dwellings providing estimates for 32 states, 32 self-representing cities, etc. To measure immigrants, for each new member of the household, it

asks both place (including country) of birth and of previous residence, and why came. To identify emigrants, it asks the head of household or other usual resident available aged 15+ if any former member of the household has left to live elsewhere, including in another country, and for what motive that person left. No time frame is specified.

In the fourth quarter of 2002, a special Module on Migration was included in a survey which at that time had a sample of 80,000 households. Data were collected for all persons in the household on whether lived elsewhere ever, place of previous residence, and duration in current residence. For those over age 5, questions followed on where that person lived exactly 5 years ago (facilitating computing 5-year migration rates), where, and reason for leaving. Then a series of questions is asked for all return migrants aged 12+ in the household on whether they had ever gone to the United States to work or seek work (note the question fails to capture those going to study or accompany family members who did go to seek work), how many times (but not how many times attempted to enter), month/year of last time, month/year of return, whether had documents (work permit, green card, other, none), and whether currently receives remittances from the US. Finally, a series of questions is asked about any household member who had gone to the US but not returned within the past 5 years, including age at time of leaving, sex, relationship, when left, state of residence in Mexico when left and state of destination in US. There should have been an age filter, but a series of further questions are asked for every such out-migrant from the household: number of times left to live in the US, reason for last move to last US state, means of transport, several questions on remittances received from that person, and country of current residence. These questions are good at identifying migrants, fixing the origin and destination and date, which is necessary for measuring migration, but of very limited use for studying either the determinants or consequences of migration.

Annex F. The NIDI Push-Pulls Survey Project in Seven Countries

Example of NIDI survey methodology in a sending country: Turkey

In Turkey, the objective was to sample 1,800 households, divided equally among four study regions differing in economic development and experience with international migration. For the selection of study regions, recent census and survey data were available to use together to specify the four regions and thereby create the type of sampling frame desired, which was not possible in the other four sending countries. Thus the most recent (1990) census included a question on whether the household had any (former) member living in another country. This made it possible classifying all 79 provinces and 850 districts by the proportion of households with international migrants. In addition, a recent national socio-economic survey was available, permitting ranking provinces and districts by level of economic development. Based on these two sources, four study regions were identified, each comprising a selected number of spatially proximate but non-contiguous districts located within the administrative boundaries of two adjacent provinces, totaling 28 districts (6, 10, 7 and 8 districts, respectively). The study regions comprise the provinces of Denizli and Uşak (i.e., region 1, southwest of Ankara); Aksaray and Yozgat (region 2, southeast of Ankara); Kahramanmaraş and Gaziantep (region 3, south of Ankara, near the southern border with Syria); and Adıyaman and Şanlıurfa (region 4, southeast of Ankara, near the northeastern border of Syria close to Iran). Each sample district was subdivided into an urban and a rural portion or sub-district, resulting in 56 sub-districts in the four regions. Within each region, all sub-districts were classified by migration intensity, i.e., by the sub-district's 'P-value' or proportion of households with at least one recent international (out-)migrant. Then two strata were formed, one comprising sub-districts with relatively high P-values and the other sub-districts with low P-values.

It is useful to further describe how the sampling and fieldwork planning proceeded. In all four regions, the first-stage selection of sub-districts (primary sampling units, or PSUs) and the selection of ultimate sampling units or households from the two strata were as follows. First, in each sub-district, two to three blocks were randomly selected based on the target sample size for each region (450), the number of days a team of four interviewers would need to cover the region was determined. Based on a pilot survey, it was estimated that a team of four interviewers and one supervisor would interview 12 households per day. Thus, 37 ($450/12=37.5$) team-days of interviewing was estimated to be required in each region. In each sub-district, two or three blocks were randomly selected, and for each the State Institute of Statistics was asked to provide addresses of 100 residential structures, based on the previous census.

It was determined a priori that a maximum of 10 'recent migrant households' and at least two 'non-recent migrant or non-migrant' households would be selected from a typical block of 100 screened households. This was based on (i) the expectation that even with oversampling, sample blocks would often have only a few recent migrant households, so most of those found should be taken; (ii) that at least two non-migrant households should be taken from each block for statistical reasons; and (iii) that a maximum number should be fixed to reduce excessive clustering of migrant households. For example, suppose a sub-district had been allocated two batches of 12 households to be ultimately interviewed. A short screening questionnaire was then used to determine the migration status of the approximately 100 households in each block. If a

household was found to be vacant in the screening, neighbors were asked about whether it was occupied. Following screening, the field supervisor created two lists of households for the block right there in the field (rather than returning to the main office, which saves travel time and costs)--one list or stratum of 'recent migrant households' and one of 'other households'. If the block had more than 10 'recent migrant households', only 10 were selected (randomly), leaving two non-migrant households to be selected from the block; if there were no recent migrant households, then 12 non-migrant households would be sampled; and finally if there were fewer than 10, all were selected for interview, and the balance to make a total of 12 were selected from the non-migrant stratum. For example, if a block had 4 recent migrant households, then 8 households were sampled from the non-recent migrant stratum. Thus in each block, 12 households were sampled.³³

In the end, a total of 12,838 households were screened, comprising 2,178 'recent migrant households' and 10,660 'non-recent/non-migrant households'. A total of 1,779 households were selected in the sample using the procedures above, resulting in successful interviews with 1,564 households (656 recent migrant households, 173 non-recent migrant households, and 735 non-migrant households). The survey results are representative of the populations in the four regions consisting of non-contiguous districts in 8 provinces (see Table 3.1 below).

Example of NIDI survey methodology in a receiving country: Spain

In Spain, the two groups of interest for the NIDI study were selected *a priori* to be Moroccan and Senegalese immigrants. Unfortunately, as is customary with international migrants, there was no up-to-date, complete list of immigrants that could serve as a sampling frame, not from a comprehensive population register since Spain does not have one, nor a register of immigrants, nor a recent population census, nor border or admission statistics (see Bilborrow et al., 1997). The official register of foreign residents of the Ministry of Interior was initially considered since it is up-to-date, but it only includes those immigrants with approved permits to be in the country, which excludes the many undocumented immigrants. In the end, the only feasible sampling frame was determined to be the 1991 population census. The implicit hope was that the undocumented migrants would tend to live in the same areas as the documented migrants, which would be consistent with migration chain network findings. The 1991 census counted only 1,202 Senegalese and 35,318 Moroccan immigrants among the 38.9 million residents in Spain, so these immigrant groups, especially the Senegalese, were extremely rare elements in the Spanish population (Eurostat/NiDi, 2000b). The census data also showed that the population of these two immigrant groups was distributed over 30 of the 52 provinces of Spain. Fortunately, they were concentrated in certain areas, with one-third of all Moroccan immigrants enumerated in the provinces of Melilla and Ceuta (in North Africa, bordering Morocco), while another 40 per cent lived in Gerona, Málaga and Barcelona. Similarly, for Senegalese immigrants, 55 percent were found in only five provinces—Las Palmas (Canary Islands), Barcelona, Valencia, Gerona and Alicante.

The goal of the sample in Spain was to select 600 households from each of the two immigrant

³³ A small bias may result from this procedure if the characteristics of the non-migrant households in blocks which are found to have few or no migrant households differ from those of non-migrant households in blocks which have 10 or more migrant households, but this can be adjusted for in the statistical analysis.

groups, after allowing for an anticipated 20 percent rate of non-response. For each immigrant group, the same sample designs and procedures were used. The first step was to develop a nationally representative, two-stage, stratified sample, with census blocks as the primary sampling units (PSUs) and households the secondary sampling units (SSU). The second step was to use disproportionate sampling to oversample PSUs with high expected prevalence rates of the particular immigrants. In the 1991 census, Spain was divided into 31,881 census blocks, with Moroccan and Senegalese immigrants recorded in only 5,342 and 359 census blocks, respectively.

The sampling approach was as follows. First, all census blocks containing *any* member of the immigrant population were grouped into strata according to the percentage of immigrants of the particular immigrant population of interest in the total population. In the case of Spain, a slight modification of the recommended procedure was adopted, with the percentage being "the number of immigrants of a particular group in the census block as a percentage of the *total number of immigrants* of that group in Spain". Since most census blocks have about the same population, this is similar to creating strata based on the proportion of the immigrant group in the total population of the census block, which is the recommended procedure for disproportionate sampling (see 5 below). The Spanish team grouped census blocks of Moroccan immigrants into five prevalence rate strata and Senegalese immigrants into four strata. The strata differed greatly in the *number* of census blocks, with the high prevalence-rate strata containing far fewer blocks than the low prevalence-rate strata. The target *sample number of households* was then distributed evenly across the strata, so that a higher proportion of census blocks and therefore of households would be selected in high prevalence rate strata. Then, to improve the efficiency of fieldwork, a decision was made to sample *even larger numbers of migrant households in blocks in the high prevalence strata*, and fewer households than in proportion in the low prevalence rate strata, i.e., disproportionate sampling. For instance, for the Senegalese, in the lowest prevalence rate stratum, only 3 households per block were selected into the sample for interview, while the number selected was 6, 9 and 12 households per block, respectively, in the three higher prevalence strata.

Based on an a priori (though unnecessary) goal of having an equal absolute number of immigrant households across the strata, the number of census blocks to be sampled in each stratum and overall was derived for each immigrant group. Blocks were then sampled from each stratum independently, using systematic selection. For Moroccans, this resulted in the initial selection of a sample of 107 census blocks in 26 provinces, and for Senegalese 174 census blocks in 30 provinces. These figures demonstrate how spatially dispersed the sample was, especially for the small population of 1200 Senegalese. At this stage it was decided that the sample was far too dispersed for the budget and time available for fieldwork, so the number of provinces covered was reduced to 11 for the Moroccans and 14 for the Senegalese. The number of sample blocks was accordingly reduced to 78 for Moroccan immigrants and 141 for Senegalese, but keeping the total number of planned households (see Arango et al., 1999, p. 17 and *passim*). Even then it was found that some blocks were too dispersed for the budget to handle (in the Canary Is., Ceuta and Melilla in northern Africa), so 11 of the 78 blocks of Moroccans and 22 of the Senegalese blocks (14 and 16 %, respectively) were replaced arbitrarily with other blocks in the more central areas. This increased the concentration of blocks of Moroccans in Málaga to 43 % of the total, but did not distort the geographic distribution of Senegalese blocks. These two changes corrupted the probability nature of the sample already in the first stage (see Arango et al., 1999).

Unfortunately, in the pilot test, fewer households with defined immigrants were found than expected. Hence the uniform distribution of the target sample of households across the 4/5 strata was replaced by reducing the number of households to be selected in the low prevalence rate stratum was reduced while increasing the numbers in the other strata were increased, keeping the total constant. This did *not* in itself affect the probability nature of the sample since weights could be developed to compensate in the analysis.

Two-phase sampling was then used to select households from sample blocks, which involved in the first phase administering a short screening questionnaire to determine the presence or not of a Moroccan (or Senegalese, as the case may be) immigrant in the household. The predetermined total number (12) of households (including up to 10 migrant households) was then selected from each census block, using systematic selection.

Unfortunately, the screening of initial census blocks found far fewer households with Moroccan or Senegalese immigrants than expected in most sample blocks, in fact only 230 households with Moroccans and 271 with Senegalese, in contrast to the minimum of 500 each desired in the survey. This was attributed to the high internal mobility of international migrants after they arrived in Spain combined with the census being nearly six years before the fieldwork which was in December 1996-January 1997.³⁴ To ensure that the fieldwork would still yield sufficient numbers of households with immigrants, interviewers were instructed to search for additional immigrants through a snowball procedure. Thus, interviewers asked respondents in sample households in sample census blocks whether they knew of other immigrants from the same origin country living *nearby or in adjacent* census blocks. If the answer was affirmative, they asked for the address to locate and interview those additional households. This amounts to snowball sampling (Goodman, 1961) rather than network/multiplicity sampling (Sirken, 1970), which can produce probability samples in which the probability of selection of each migrant/migrant household is known. Alas, the procedure was adopted *ad hoc*, after fieldwork was begun, and interviewers were not asked to keep track of which households were in the original, quasi-probability sample and which ones were in the snowball sample. All we know is that only 36% of the Moroccan sample and 48% of the Senegalese samples were in the former. There is thus no way to determine the probabilities of selection, nor therefore the weights to assign to those additional households. In fact, since it is not possible to identify *which* households were in the original (quasi-probability) sample households and which were the “snowball” households added through a non-probability procedure, there is no basis for assigning weights to any households. If the information were available to distinguish the two, the latter could be dropped in the analysis so that the results for the former would be more or less scientifically valid, even if for a smaller sample.³⁵

In the end, a total of 1,113 households were interviewed, 598 with one or more Moroccans and 515 with Senegalese immigrants (see Table 1 below). The adjustments to the original sample blocks selected and the arbitrary inclusion of non-sample immigrant households during fieldwork unfortunately mean that survey results cannot claim to be statistically representative of either immigrant group at the national level or even for the five selected regions. This is

³⁴ An additional reason could have been that the destinations of more recent migrants were not the same as those of immigrants arriving before 1991.

³⁵ The analyses could also be performed based on the (smaller) probability sample of households and compared with those resulting from using the whole sample to see if they are similar.

unfortunate since the sample design *a priori* was the closest of the seven participating countries to the approach recommended in Bilborrow *et al.* (1997), which was the prototype for the NIDI project.

It is useful to summarize the key mistakes again here in the hope that others do not repeat them. First, sample census blocks were replaced with other blocks that were more physically convenient. This is akin to replacing a sample household with a mean dog with a nice looking house on the corner, but on a grander scale--a common mistake in surveys designed by people without sampling expertise, or when interviewers are not properly trained and supervised in the field. Sample areas should not be replaced with other areas once the sample is drawn. The second error was to add non-sample or "snowball" households, combined with the failure to keep track of which households were in the original (intended probability) sample and which were added through the snowballing procedure.

Example of NIDI innovative sampling approach in receiving country: Italy

In Italy, the immigrant populations of interest were determined *a priori* to be those from Egypt and Ghana (from among the five sending countries in the project). The goal was to obtain data for about 800 households from each immigrant group. Significant net immigration is a recent phenomenon in Italy, and Egyptian and Ghanaian immigrants constitute small immigrant populations, being the tenth and fourteenth largest (ISTAT, 1999). Thus in 1997, there were only 23,500 Egyptian and 15,600 Ghanaian documented immigrants residing in Italy, plus an estimated 18-27 per cent more undocumented migrants (according to the Ministero dell'Interno, 1998). Therefore, even if account is taken of under-registration of these two immigrant groups, each represented considerably less than one tenth of one percent of the population of about 58 million in 1997.

In the absence of an adequate national sampling frame, traditional sampling strategies were considered inappropriate and not cost effective, even the use of disproportionate sampling and two-phase sampling, as in the Spanish case. This led to a search for an alternative methodology (Blangiardo, 1993), whose main features were: (1) the development of special sampling frames to select Ghanaian and Egyptian immigrants based on *aggregation-points*, places where Ghanaians or Egyptians get together with others from their country: mosques/places of worship, entertainment venues, health care centers, institutions that provide them with assistance, telephone calling centers, public squares in their neighborhoods, and employment offices; (2) the derivation of *ex-post* rather than *ex-ante* respondent selection probabilities to weight observations, based on the respondent's frequency of visiting each aggregation point; and (3) coverage of undocumented migrants as well as documented migrants. The aggregation points (AP) method assumes that every international migrant from that origin country visited at least one of the places in the sample thought to be frequented by members of that immigrant group. To the extent some immigrants did *not* frequent any of the selected aggregation points, the sample frame would be incomplete and potentially biased.

To select the sample, first, information from various sources (especially ISTAT, 1998, 1999; Ministero dell'Interno, 1998), including local key informants and a pilot survey, was drawn upon to determine the regions and provinces of Italy where the two immigrant groups were concentrated. Egyptians were found to likely be concentrated in the metropolitan areas of Milan

and Rome, and do not move around much within Italy; in contrast, Ghanaian immigrants migrate frequently within Italy after arrival, many working as petty traders, and are hence more widely dispersed. Thus 77 per cent of the Egyptians lived in the provinces of Milan, Rome and nearby Latina, while the heaviest concentration of Ghanaians is 36 per cent in the provinces of Bergamo, Brescia, Modena, Rome, Caserta and Napoli combined (Ministero dell'Interno, 1998). These provinces thus constituted the survey domain, each comprising four 'local areas': (1) a Centre-South region, comprising the four provinces of Rome, Latina, Naples and Caserta ; and (2) a North region, comprising the four provinces which include the cities of Milan, Brescia, Bergamo and Modena.

For each province in each region, and separately for each immigrant group, assistance of the local office of *Caritas* was used to develop a sampling frame comprising all expected *major* meeting places or 'aggregation points', thought to be frequented by Egyptian or Ghanaian immigrants. For each immigrant group, the desired sample size of 800 households was allocated to the eight provinces in proportion to the number of migrants expected. In the second step, *ex ante* data about the popularity of each aggregation point were used to develop a "popularity" index of the likelihood of being frequented by the immigrant population of interest. Then the province allocation was allocated in turn to the aggregation points in proportion to this popularity index. In the third step, persons from the immigrant group were randomly selected or sampled from those entering the aggregation point, and usually interviewed on the spot, though they could opt to be interviewed later at the same aggregation point or at home. At the end of the interview, those interviewed were asked to complete a short questionnaire to indicate the frequency with which they visited each of the aggregation points. This was used to develop an attendance profile for each sample respondent to develop the *ex post* weights for weighting the data of each respondent.

At the time of interview, the probability of selecting sample respondents at the particular aggregation point is not known, because it is a function of: (1) the frequency of visits to that centre by that person and by all other members of that immigrant group (e.g., Egyptians); and (2) the number of *other* aggregation points in the sample frame for the province and the frequency with which the sample person and others visit each of those other points. Once the interview is completed and the attendance profile prepared, selection probabilities were to derive *ex post* sampling weights to weight the data for each sample respondent. This weight was further adjusted for non-response of migrants in different meeting places in each province, providing the overall weight for each sample immigrant interviewed (Eurostat/NIDI, 2000).

A total of 1,605 households were contacted (756 Egyptian and 849 Ghanaian), from which 1,177 were successfully interviewed (508 Egyptian and 669 Ghanaian households). The survey results are representative of the population of Egyptian and Ghanaian immigrants that live in the eight provinces that constitute the two study areas. Given the percentages of immigrants of the two groups living in the two study areas (77 and 36 per cent, respectively), the survey covered Egyptian immigrants much better than Ghanaian immigrants.

Lessons learned

The first step was to review all available quantitative and qualitative information (i.e., a recent census, household surveys, opinions of experts and local area key informants) to determine what

could be used to determine the domain or areas in which the survey could be undertaken and which it would represent. This involved identifying study regions and often areas within regions thought to have relatively high proportions of international migrants (households with emigrants in sending countries, households with immigrants from particular countries of origin in receiving countries). The preferred approach was to use data from a recent census to establish a sampling frame, but this was not possible in a majority of countries, so in those situations, the initial regions or domains of study were selected purposively. In the end, no survey was representative of the whole country.

The second step was to select primary sampling units (PSUs) in the selected study regions using probability sampling. Thus PSUs in the form of districts within provinces, cities or villages within districts, and then census blocks or the equivalent were classified according to the expected prevalence of international migration households, forming migrant-prevalence rate strata. Then disproportionate stratified sampling was to be used to oversample areas with higher proportions of migrants.

In the last stage, two-phase sampling was used to ensure that a sufficient number of international migrant households would be found in sample areas. In the first phase, a screening operation was performed, to visit all households in sample PSUs to list those with and without qualified migrants. In the second phase, (households with) international migrants were oversampled from the list using systematic selection (in the origin survey, non-migrant households were sampled as well to provide a basis for estimating the determinants of international migration). Table 1 summarizes the data on the samples for all seven countries. It shows that in all sending countries except Turkey, the sampling objective was realized in the sense that about half of the total sample consisted of households with recent international out-migrants, despite differences in country situations and deviations from the optimal design. It is worth noting the considerable effort involved in the screening operations, notably Egypt and Ghana.

The main sampling objective of the project was to sample populations so as to be able to generate results representative of the population at the level of the region, in sending countries, and at the level of the nation as a whole, in receiving countries. In practice, due to the lack of an adequate sample frame, the difficulty of finding rare elements, and budgetary limitations, this objective was only partially realized, with compromises and deviations of greater or lesser importance in all countries. Thus, in sending countries the meaning of 'region' varied from one country to another, resulting in very different sizes of study regions and whether a "region" even comprised contiguous geographic units (it did not in Turkey). Administrative or political jurisdictions were used for the first and/or second stage sampling units, e.g., in Turkey, Egypt, Morocco, Senegal, and Spain, with census blocks selected through probability sampling at the next stage. However, in Ghana, for example, even at the second stage judgment was used (in selecting voting districts based on key-informant information), which unfortunately does not yield a probability sample, so the results are not representative of the population of the region. In Spain, the rarity of the target immigrant populations led to deviations from the *a priori* design, as described above. And in Italy, an unconventional but innovative sampling approach resulted in a sample that can only claim to be approximately representative of the eight provinces where the majority of the Egyptian and a large share of Ghanaian immigrants reside.

Despite the deviations from the model sampling strategy in the end, the NIDI/Eurostat study

involved the design and implementation of similar specialized surveys of international migration that resulted in a unique, multi-country data set useful for studying the determinants and mechanisms of migration to the EU. Data were collected in countries that are part of the same overall migration system, in the same time frame, using almost identical questionnaires, leading to unique data sets and useful findings.

Table 1. NIDI Push-Pulls Project: Summary data on sample designs and implementation

Country	Level of statistical representativeness aimed at	Households screened	Target Sample	Households successfully interviewed	Number of successfully completed interviews, by migration status of household																				
Receiving countries:																									
Italy	National #	Not applicable	1,600	1,177	<table border="1"> <tr> <td>Egyptian</td> <td colspan="2">Ghanaian</td> </tr> <tr> <td>508</td> <td colspan="2">669</td> </tr> <tr> <td colspan="3">Senegalese</td> </tr> <tr> <td colspan="2">Moroccan</td> <td></td> </tr> <tr> <td>515</td> <td colspan="2">598</td> </tr> </table>			Egyptian	Ghanaian		508	669		Senegalese			Moroccan			515	598				
Egyptian	Ghanaian																								
508	669																								
Senegalese																									
Moroccan																									
515	598																								
Spain	National #	Not reported	1,200	1,113	<table border="1"> <tr> <td>Recent migrant</td> <td>Non-recent migrant*</td> <td>Non-migrant</td> </tr> <tr> <td>656</td> <td>173</td> <td>735</td> </tr> <tr> <td>1,061</td> <td>399</td> <td>493</td> </tr> <tr> <td>992</td> <td>332</td> <td>617</td> </tr> <tr> <td>709</td> <td>43</td> <td>819</td> </tr> <tr> <td>711</td> <td>462</td> <td>567</td> </tr> </table>			Recent migrant	Non-recent migrant*	Non-migrant	656	173	735	1,061	399	493	992	332	617	709	43	819	711	462	567
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656	173	735																							
1,061	399	493																							
992	332	617																							
709	43	819																							
711	462	567																							
Sending countries:																									
Turkey	Regional	12,838	1,773	1,564	656	173	735																		
Morocco	Regional	4,512	2,240	1,953	1,061	399	493																		
Egypt	Regional	27,438	2,588	1,941	992	332	617																		
Ghana	Regional	21,504	1,980	1,571	709	43	819																		
Senegal	Regional	13,298	1,971	1,740	711	462	567																		

* Includes return migrants.

See text, not national coverage in practice.