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Design of Samples for International Migration Surveys: Methodological Considerations, Practical Constraints and Lessons Learned from a Multi-Country Study in Africa and Europe

by

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1. Introduction

Both actual international migration flows and potential migration to the European Union (EU) have increased in magnitude and complexity in recent decades. Migration flows to Europe in the first decades following the Second World War were predominantly labor migration and post-colonial flows, followed by a period characterized by family reunification and marriage migration. In the past decade, refugees and asylum-seekers have arrived in increasing numbers, from war-torn countries or driven by poverty, though this has declined recently as a result of new restrictions imposed by EU countries. As a result of these developments, migration and potential migration to the EU has become an important policy issue for most European Union governments and political leaders. To harmonize and design new migration, naturalization and integration policies, governments in Europe need more insight into (recent) migration processes, including statistics on stocks and flows of migrants (European Commission 1996).

For these reasons, the Commission of the European Communities (EC) entrusted Eurostat, its statistical Bureau, and the Netherlands Interdisciplinary Demographic Institute (NiDi) with a project that had as its main objective, to examine, using an international comparative perspective, the determinants and mechanisms of migration to the EU, particularly migration from countries in West Africa and the Mediterranean region to the EU. The project entailed the design and implementation of specialized surveys of international migration, including the collection of macro-level contextual information, in five countries that are predominantly senders of migrants: Egypt, Morocco, Turkey, Ghana and Senegal; and in two countries that mainly receive migrants (Spain and Italy). In Spain, immigrants from Morocco and Senegal were interviewed, and in Italy, immigrants from Ghana and Egypt. In each of these countries, local research teams were formed who were responsible for the technical realization of the project, including adaptation of a model sampling design to local conditions and the collection, processing and analysis of their survey data. In close consultation with the teams, and with the support of external experts, NiDi developed the research instruments for the project, provided methodological and technical guidance, monitored the implementation of the project and conducted several comparative analyses. Survey data were collected between late summer 1996 (Turkey) and winter 1997/1998 (Senegal) (Schoorl *et al.* 2000).

The objective of this paper is to share our experience with the sampling of international migrants in the NIDI/Eurostat study, by describing and evaluating the different sampling strategies used in each country from the perspective of a model sampling strategy. Furthermore, we argue that specialized migration surveys are needed to properly study the determinants and mechanisms of international migration and that certain substantive and methodological considerations should guide the design of samples in both migrant-sending and receiving countries. Moreover, fieldwork should be carefully monitored and documented to ensure that statistically representative data are gathered and accurate sample design weights can be derived.

In section 2, we briefly address main approaches to migration data collection and point to the need for specialized migration surveys. In section 3, the overall study design and sample

design issues of the NiDi/Eurostat migration project are discussed, including a model sampling strategy that served as the basis for country teams to develop country-specific designs. In section 4, we summarize main features of country-specific designs and identify differences and common features. In section 5 we reflect on the approach followed by the project regarding the sampling of international migrants and conclude with some recommendations for future international migration surveys.

2. Collection of data on international migration

A number of different types of data collection systems can obtain data on international migration, such as population censuses, population registers, border or admission statistics, administrative systems that control the admission and stay of foreigners (e.g. consulate procedures and naturalization requirements), systems of recording data on refugees and asylum-seekers, and work permit statistics. Although all of these systems can gather some information relevant to the characterization of international migration stocks and flows, the information is too limited for in-depth analysis of either the causes or consequences of international migration, even if the data from person-records in these systems could be linked. One of the key shortcomings of these systems is that they do not collect data on the situation of migrants prior to their migration, which is of vital importance for the understanding of the determinants or consequences of migration for international migrants and their households. In addition, most of these systems are deficient in not collecting data on international migrants departing, and they use different and non-inclusive definitions of international migrants. But perhaps their biggest shortcoming, which is inherent in the main purpose of each system of identifying and measuring migration flows, is the very limited breadth of data that can be recorded on the international migrant and his/her household. With such limited data, it is difficult to gain an accurate understanding of the causes or consequences of migration for the migrant, his/her household, and for non-migrants and the larger society.

General-purpose surveys are potentially more useful sources of information as they may allow in-depth questioning on the characteristics and motivations of the international migrant, and include data on non-migrants as a comparison group. But a major drawbacks of such surveys is that sample sizes are too small to yield statistically reliable data on international migrants, since they usually comprise a very small part of the population. This is the needle in the haystack problem common to virtually all studies of migration, especially if the main interest is in recent migration movements, as is often the case. Regarding admission or border crossing statistics, it is difficult or too costly to single-out those persons who are actually international migrants (moving from one country to another to change their usual place of residence) from the very large volume of movers at border crossing and entry points (Bilsborrow et al. 1997).

Therefore, specialized surveys of international migration are desired to collect the type and depth of data needed to address the particular migration research goals. To properly study international migration, data should be collected in both migrant-sending and migrant-

receiving countries on the same migration process. Specialized migration surveys can be designed to ensure that data are collected on a sufficient number of households with *and without* international migration experience. The key issue is to collect data on persons and households that constitute *appropriate comparison groups* for analyzing the determinants or consequences of international migration. Thus, to study the *determinants of international migration*, data are ideally needed on: (1) households in countries of origin that have not migrated; (2) households in countries of destination from that same origin country that have migrated as entire households, (3) individual migrants in the country of destination that have come from the same country of origin, and (4) households remaining in the origin country from which someone has migrated to that destination country. Data from (1) and (1) can be pooled to investigate characteristics that have led whole households to migrate or not migrate, and data from (3) and (4) can be used for the same purpose to examine individual migration. This allows distinguishing factors affecting international migration of individuals from those influencing international migration of households (Bilsborrow et al. 1997; Bilsborrow and Zlotnik 1995; Zlotnik 1992). Of course, ideally, it would be desirable to have comparison or comparable data on out-migrants going to all destination countries, and even from all countries of origin. However, in the absence of a large international program akin to the World Fertility Survey or its sequel, the Demographic and Health Survey program—a program which could be called the World Migration Survey—this is not possible. The best that can be hoped for are paired surveys of countries that constitute an international migration system (Kritz *et al*. 1992), that is, on two countries with a significant migration flow between them, in which surveys of households and persons (see above: (1) to (4)) are carried out.

Similarly, to study the *consequences* of international migration for migrants and their households in areas of origin and destination, data are needed on similar groups from surveys in countries of origin and destination (Bilsborrow *et al*.1997). In all such surveys, in both countries of origin and countries of destination, special sampling strategies are desirable, and this is the subject matter covered in the next sections.

3. The NIDI/Eurostat international migration project: study and sample design considerations

3.1 Study design and survey characteristics

The main theoretical approach that guided the overall design of the NIDI study on the determinants and mechanisms of international migration is the migration systems theory, extended with elements of social network and cumulative causation theories (Kritz *et al*. 1992; Schoorl *et al.* 2000; Massey *et al.* 1993). However, in terms of data requirements, such an approach is extremely demanding, as it requires, preferably, the collection of data in all countries belonging to the same migration system. The simultaneous study of several countries that are part of the same migration system has the advantage that several key types of comparisons can be made, such as of: (1) migrants originating from the same country who migrate to different countries of destination; and (2) migrants originating from different countries who now live in the same country of destination. The analysis of data from such comparisons can shed important light on the effects of differences in economic and political

circumstances in countries on migration and on migrants, as well as on the functioning of migrant networks under different conditions. For this purpose, it is desirable to collect data in each country at multiple levels, on individuals, households and communities, as well as on the larger socio-economic, institutional and policy and administrative context that may affect international migration (Bilsborrow *et al.* 1997; Bilsborrow and Zlotnik 1995; Zlotnik 1992).

To study the determinants and mechanisms of migration, it is important to examine the motivations, characteristics, and circumstances not only of those who actually migrated but also of those who did not migrate; it may also be useful to collect data on those planning to migrate, and on those who have returned from living abroad. Therefore, data on migrants as well as on non-migrants need to be collected in the country of origin. If the focus is on the study of determinants of international migration only, and not the consequences, the reference group of non-migrants at destination can be omitted (Bilsborrow and Zlotnik 1995; Bilsborrow *et al*. 1997; Hammar *et al.* 1997).

Guided by these considerations, the NIDI/Eurostat project objective was to study the migration process in the context of five migrant-sending countries (Ghana, Senegal, Morocco, Egypt, and Turkey) and two migrant-receiving countries (Spain, Italy), as all these countries are considered part of the same migration system: that is, migration to the EU from Africa and the Mediterranean region. This number of countries was less than initially intended as result of budget limitations, once needed sample sizes were determined for each country.

Regarding the sending countries, Morocco and Turkey were included in the study, as they are examples of countries with a long migration history, and with an increasing diversity of migration destinations in Europe. Moroccans traditionally migrated to France, and to a lesser extent to the Netherlands and Belgium. More recently, a growing number of international migrants from Morocco have chosen Spain and Italy as destinations. For Turks, the traditional destinations were Germany and, at a distance, the Netherlands, other European countries, and the United States. More recently, Middle Eastern countries have also attracted Turks. Ghana was included, even though earlier migration focussed on the United Kingdom (due to the common colonial past) and later the United States, because of growing recent migration to the EU, including Italy, Germany and the Netherlands. Among the Francophone countries in Africa, Senegal stands out as the one with the greatest variation in destinations, although old colonial ties keep France as the most important destination (Direction de la Prévision et de la Statistique 1998; CERPOD 1995). However, Spain, Italy, the United States and other EU countries increasingly receive migrants from Senegal. Egypt is perhaps the odd one out, as most of its migration has been to the Gulf States and Libya rather than to Europe. Nevertheless, in smaller numbers Egyptian migrants have also moved to southern Europe and Germany, and Egypt's migration potential is considerable, given its size and closeness to Europe.

As far as the receiving countries are concerned, Italy and Spain were selected primarily because of the limited availability of previous data on international migration in these countries, which led research institutes and the government to be interested in supporting the

project, and because of a recent presence of sizeable immigrant populations (Schoorl *et al.* 2000).

To fill the need for contextual data on migrant sending and receiving countries, besides the micro-level survey data (household and individual data for migrants and non-migrants), the NIDI study included as well a macro-level survey in each of the countries (contextual data at the national, regional, and community level). To reflect the multi-dimensional nature of migration, the content of questionnaires covered socio-economic, demographic as well as psychosocial dimensions of migration (see Annex 1). Although budget and time constraints prohibited a longitudinal survey approach, all implemented single-round cross-sectional surveys included retrospective questions, along with a migration history module for current and return migrants (see Annex 1, table 2).

A period of 'ten years preceding the survey' was chosen as the cut-off-point to distinguish between recent and non-recent migration. This reference period was considered most relevant from a policy point of view as the main interest was in the determinants of recent migration flows. A shorter period was deemed undesirable because it would make finding recent migrants more difficult, exacerbating the 'rare-element' problem of households with an international migrant experience defined according to the cut-off point. This would have further complicated the problem of finding sufficient households with a recent migration experienced.

3.2 Sampling objectives, constraints and model sampling design

The original sampling objectives were two-fold: (1) to generate survey results that are nationally (receiving countries) or regionally (sending countries) representative; and (2) to design a sampling strategy that ensures that a sufficient number of migrant households will be in the sample to carry out statistically meaningful analyses. The second objective implies that migrant households, which in most countries are 'rare' elements, must have a higher probability of being selected into the sample than non-migrant households, that is, migrant households must be over-sampled. In probability samples, the selection probability for each household can be determined. Based on this, a sample design weight (or compensation weight) can be derived, which is equal to the inverse of the overall selection probability of a household. As a result, in statistical analyses the sample population, as weighted, is representative of the actual population in the study areas. Annex 3 illustrates over-sampling of migrant households in the Senegal survey.

The approach in sending countries was to consider migrant households as those with migrants to *any* international destination, though of course the country of destination was documented. Therefore, such migrant households were selected in the sample, as well as non-migrant households. In contrast, in receiving countries, the center of attention was immigrants coming from two particular origin or sending countries, in each case. In Spain, the focus was on sampling Senegalese and Moroccan immigrants, while in Italy it was on Ghanaian and Egyptian immigrants.

Thus, in the receiving countries, immigrants originating from *other* countries as well as natives were not included. The target sample size in sending countries was set at 1500-2000 households, of which about half should include recent out-migrants. In receiving countries, the target sample size in each country was set at 600-800 households from each of the two immigrant groups.

Sampling strategies for surveys of international migration studies generally have to overcome at least three constraints:

- Migration is a chain process, whereby migrants tend to *originate from specific areas* of origin countries, and, once they have migrated*, migrants tend to concentrate in specific areas* in the country of destination. Thus, to facilitate meaningful analysis of the migration process, it is useful to focus the data collection on those particular geographical areas (here called 'regions'). Therefore, to keep the cost of data collection down, sampling procedures must ensure that sufficient numbers of households are sampled in particular regions, rather than scattered from all over the country.
- Despite the focus on specific regions above, international migrants still tend to be *rare elements* in a country's total population, and in the regional populations. This calls for specialized sampling procedures, described below.
- There is usually also a *lack of an adequate sampling frame*, i.e., of data on the number and geographical distribution of households with international migrants, in both sending and receiving countries. Selecting a nationally representative sample would therefore place a heavy burden on financial resources because national-level sampling frames would need to be developed. It is less expensive to develop regional sampling frames, as well as to carry out the actual fieldwork on a regional scale rather than on a national scale.

For migrant-receiving countries, the following can be added:

- The target population of migrants is *even more 'rare'* than in migrant-sending countries, since immigrants from only two countries need to be found..
- An unknown but large number of undocumented or *illegal immigrants* reside in these countries.

Given these constraints, we developed *a model sampling strategy* for all country teams, to be adapted by each only as necessary to meet local conditions. Once criteria were developed at NiDi to distinguish migrant and non-migrant households, the following steps were adopted in the model sampling strategy, which result in over-sampling of migrant households:

1. Purposively choose study regions within the country, guided by the study objectives.
2. Classify geographical areas within each region (e.g., districts) according to the estimated prevalence of households with international migration experience (use available quantitative data or, if absent, estimate the relative prevalence of migrant and non-migrant households based on expert opinion, from key informants).
3. Create strata to classify areas according to the (relative) prevalence of households with international migration experience.
4. Sample (select) areas from each 'prevalence rate' stratum, whereby areas with higher expected prevalence of migrant households are over-sampled.

5. Screen households in areas selected in step 4, that is, briefly visit all households with a short screening questionnaire and prepare a list identifying all households as migrant or non-migrant households.
6. Create strata of migrant and non-migrant households for each sample area.
7. Allocate a disproportionate share of the sample for each area to the stratum of migrant households (i.e., over-sample migrant households).
8. Following predetermined criteria, interview clusters of non-migrant households in each area as needed to economize on fieldwork time and costs.

The above model design uses two phases (*two-phase or sequential sampling*) to select both migrant and non-migrant households. First, areas are sampled in purposively chosen regions, and areas are sampled whereby areas with high (expected) proportions of international migrants are over-sampled (steps 1-4). Then, the two-phase sampling operation is performed in the final stage sampling areas. In phase 1, all households in the sampled areas are 'screened' to prepare a list of those that are migrant households and non-migrant households (step 5). In phase 2, households are then sampled according to pre-defined numbers or proportions sought of the two types (steps 6-7). The objective of this sampling strategy is to ensure that a sufficient number of migrant households are selected, that is, 'disproportionately', taking into account the 'rare' but unknown prevalence of such households in the general population (Bilsborrow *et al.* 1997; Kish 1965). The above two-phase, multi-stage, stratified cluster sampling strategy is not self-weighting, so that sample design weights must be derived from the overall selection probabilities of households. As the magnitude of weights affects analytical results, it is important to avoid making errors by ensuring that each step in the implementation of a sample design in the field is carefully recorded, documenting households selected, visited, and refusals, to develop appropriate compensation weights.

In sending countries, teams were asked to identify four regions using a combination of the following criteria: (1) high versus low level of economic development, and (2) having an established versus recent migration history. This allows for the study of migration flows under different economic conditions. This model design was then adapted and used in each sending country to select regions purposively, in the first stage.

The concept of 'region' as used here requires clarification. In most of the five sending countries, a region is an artificial construct, created by purposively selecting geographical or administrative areas for which it is known or expected that they contain relatively high proportions of migrant households. Such areas will usually be provinces, districts or even voting districts, which may comprise smaller geographical or administrative units. Moreover, a region constructed in this way may contain areas that are not necessarily contiguous and may be made up of one or more such areas. In receiving countries, the aforementioned regionalisation (step 1) was not applied, as the *a priori* objective was to generate survey results representative at the level of the country as a whole.

4. The NIDI/Eurostat international migration study: country-specific sample designs and their implementation

4.1 Sending countries

Egypt

In *Egypt*, the latest census was in 1986 when the sample was designed for the Egyptian survey on international migration. The Egyptian national statistics office, CAPMAS, used 1986 census data to project populations for all administrative units. This was used to develop a nationally representative and self-weighting 'Master Sample' for 1996. This Master Sample served as the sampling frame. With the exception of five frontier areas, all governorates in Egypt, including Cairo and Alexandria, were grouped into four strata that differ regarding levels of economic development (low, high) and history of experience with international migration experience (earlier, recent). A multistage, stratified, self-weighting, sample of areas was selected, comprising 71,000 households from 21 governorates (40,520 urban households and 30,480 rural households).

An urban 'area' in Egypt consists of about two thousand households and a rural 'area' of about one thousand households. An 'area' is a spatial unit and comprises *'segments'*. An urban 'segment' has about 200 households and a rural 'segment' 100 households. Across all regions and governorates, all 'areas' were grouped into an urban stratum and a rural stratum. Then, in the first stage sampling of 'areas' (i.e., Primary Sampling Units, PSUs) took place independently in the urban and rural strata using systematic selection. Within the selected 'areas', 'segments' (Secondary Sampling Units, SSUs) were sampled randomly, and ultimately, within sample 'segments', households were randomly selected. This sampling procedure ensured that all households would have the same chance of being selected, making the Master Sample design fully 'self-weighting'.

The next step was to estimate how many households would need to be sampled and screened from this Master Sample of 71,000 to ensure that a predetermined number of recent migrant households would be included in the sample to be interviewed. The predetermined total target sample size was fixed at 1,600 households, composed of 600 recent current migrant, 400 recent return migrants, and 600 non-recent/non-migrant households. These numbers were increased to compensate for an anticipated non-response rate of 25 per cent, which is extraordinarily high. Based on information from previous migration studies in Egypt, it was estimated that about ten per cent of the households in the four regions would be recent migrant households. Therefore, it was decided to subsample and screen about 30,000 households from the Master Sample to ensure that, after screening, about 3,000 (or 10 percent) would qualify as recent migrant households. This was considered sufficient for selecting the predetermined target sample 1,000 recent current migrant and recent return migrant households.

The sampling strategies used for the Master Sample and the screening survey ensured that half of all Egyptian governorates, including Cairo and Alexandria, and all four regions would be represented in the sample of 'areas'. After the international migration status of almost

30,000 households was determined, households were grouped by region into three international migration status strata (i.e., recent current, recent return and non-migrant/non-recent migrant households). The total sample size was allocated to the three household migration status strata in about equal numbers to ensure that the predetermined numbers of households from each migration status group would be achieved. Systematic selection was then used to sample households within the strata.

To summarize, the sampling, stratification and screening of almost 30,000 households out of a nation-wide Master Sample of 'areas' containing 71,000 households provided the sampling frame for a target sample of 2,588 households, to be selected from four regions and distributed among three 'household migration status' strata. A total of 1,943 households were actually successfully contacted and interviewed, comprising 992 recent migrant households, 332 non-recent migrant households, and 617 non-migrant households. This compares with the target total of 1600 total households, and shows that the estimated 25 % non-response rate was too pessimistic.

Ghana

Ghana has an estimated population of 13 million. The international migration study was carried out in 17 electoral areas in the four administrative regions of Brong Ahafo, Ashanti, Eastern, and Greater Accra. These regions are located in a belt that runs west and south of Lake Volta to the coast of the Gulf of Guinea. With some 6.4 million inhabitants, they are considered the main regions of origin of international migration to Europe. Greater Accra and Ashanti are regions with a high prevalence of both long-term, established and recent international migration compared with Brong Ahafo and Eastern regions.

As it was not possible to access to 1990 census data and maps, the best source of data to use as the sample frame was the 1996 voting register. Voters are registered and listed by constituency (i.e., voting district). Depending on the region, a region may consist of 22-33 constituencies, with each constituency subdivided into electoral areas (EAs). An electoral area has 2.5 to 5 thousand persons aged 18 and over. As the four regions are very large in size, it was decided to choose a number of electoral areas *within* each region as the study areas. Thus, in the case of Ghana, the concept of region is defined as a group of non-adjacent and purposively selected electoral areas.

In each region, electoral areas were purposively selected in two steps. First, all constituencies were grouped into three strata: (1) regional capital cities; (2) other urban areas; and (3) rural areas. From the first two strata, one constituency was selected by judgement. From the third stratum, one or two constituencies were chosen based on discussions with district assembly members and chiefs. Second, within each selected constituency, one electoral area was purposively selected, leading to a sampling frame of 17 electoral areas in 4 regions, from which households were to be sampled.

A listing operation of screening survey was carried out in each of the 17 selected electoral areas to determine the migration status of all households. Then, households were grouped into the strata of recent current migrant households, recent return migrant households, and

non-migrant/non-recent migrant households. The total target sample size was set a priori for Ghana at 1,980 households, allowing for 10 per cent anticipated non-response. The sample was divided and allocated equally to the four regions. Within each region, 495 households were allocated to electoral areas so as to satisfy the following conditions: (1) at the regional level, half of the 495 households must go to the recent current and recent return migrant household strata, the other half to the non-migrant/non-recent migrant stratum; (2) at the level of the electoral area, the sample allocation to the substratum of recent migrant households depended on whether the electoral area belonged to a constituency in stratum one, two or three.

In the 17 electoral areas, 21,504 households were screened and classified according to household migration status stratum. Based on the screening survey data of these electoral areas, the reference population for which the sample is representative is approximately 75,000 thousand persons. Subsequently, the total sample size of 1,980 households was allocated to regions, constituencies, and electoral areas, and across migration-status strata within electoral areas. In the end, 1,571 households were successfully interviewed, including 709 recent migrant households, 43 non-recent migrant households, and 819 non-migrant households. Survey results are representative of populations in the four regions, which had been formed by non-contiguous electoral areas.

Morocco

In Morocco, the principal traditional areas of emigration are the Rif and the Sous, and more recently also central Morocco, the Mid-Atlas and Jebala regions. Suitable sampling frames were absent but with information from previous migration studies and expert knowledge, the Moroccan team identified five out of the 49 provinces as 'regions' in which international migration is or has been important. In addition to differing in levels of economic development, these five provinces differ regarding main countries of destination of emigrants. For instance, in the north, the province of Nador is characterised by high and established levels of emigration to the Netherlands and Germany. In the south, Tiznit province is characterised by a long tradition of emigration, mainly to France. More recently, international migration flows originate from the provinces of Settat, Khenifra and Larach. Our sampling strategy was then to generate data representative at the level of these five provinces.

From secondary data it was deduced that about 3.5 per cent of urban households and 2.5 per cent of rural households have one or more members with an international migration experience. From this data, it was deduced that, in order to successfully interview about 2000 households, the actual target numbers to be sampled in urban and rural areas needed to be 1,130 households and 1,110 households, respectively, including an allowance for non-response. A stratified, multistage sample design with disproportionate allocation in the last sampling stage was developed.

All 'villes' (towns) and 'communes rurales' (rural municipalities) in the five provinces were grouped into an urban stratum and a rural stratum. Within the two strata, the units were grouped by province and various socio-economic, environmental and international migration

history criteria. Using 1995 census data, within the urban stratum, 11 out of 47 'villes' were sampled with selection probabilities proportional to the estimated number of households. In the same manner, in the rural stratum, 15 out of 117 'communes rurales' were selected. In each province two 'villes' and two to four 'communes rurales' were chosen. In a second sampling stage 'quartiers' were selected at random in each sample 'ville' and 'douars' from each sample 'communes rural'. A total of 23 'quartiers' and 26 'douars' were eventually selected to carry out the fieldwork, including the screening of 4,512 households to group them into five migration status strata (i.e., recent migrant households, non-recent migrant households, non-recent return migrant households, mixed[1] migrant households, and non-migrant households). The urban and rural target sample was distributed across the strata by allocating a disproportionately large share of the target sample to the stratum of recent migrant households. In the end, 1,953 households were successfully interviewed, of which about half (1,061) were recent migrant[2] households, 399 non-recent migrant households, and 493 non-migrant households. Survey results are representative of the populations in the five provinces.

Senegal

In *Senegal*, one third of the Senegalese population, estimated at 8.5 million in 1996, lives in the regions of Dakar and Diourbel, the two study areas for the project. In the past 25 years, rural-rural and rural-urban migration has increased, instigated by recurrent droughts and crop failures since the 1970s. More recently, international migration to other African countries and to Europe (France, Spain, Italy) has increased, and the Dakar and Diourbel regions became the most important focal points for international immigrants and emigrants. Of the two regions, the Dakar region is economically more developed.

To increase the likelihood of getting migrant households in the sample and to ensure proper management of fieldwork, the actual study area was limited to a set of smaller spatial units within the two regions. Within the Dakar region, and within the 'departements' of Dakar and Pikine, five 'communes' were selected as the actual study areas. Within the Diourbel region, eight spatial units (called villages) in the Touba city agglomeration were identified as the actual study areas. Thus, in the case of Senegal, 'region' means an area consisting of a number of purposively selected lower level administrative areas within the Dakar region and within the Touba agglomeration. This is the level for which survey results are representative.

Suitable sampling frames for the study of households with a recent international migration experience were absent. The 1988 census listing of census blocs (Districts de Recensement (DR)) was chosen as the only feasible starting point to develop a suitable frame for sampling households. In 1988, census blocks were small geographical areas, created within administrative areas and containing about a thousand persons. Since then, much has changed and the number of persons in many census blocks has increased dramatically. Census blocks were identified with the aid of local key informants and were then subdivided into smaller units so that a new set of census blocks of more manageable size was created.

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[1] A mixed household (*ménage mixte*) is one in which more than one type of migrant is present, such as recent and non-recent current migrants or one of those categories plus a return migrant.

[2] Including current as well as return migrants.

However, nothing was known about the prevalence of households with a recent international migration experience in these census blocks. This issue was resolved by developing a questionnaire for key informants working at the administrative level of the 'quartier' within 'communes' and 'villages' in the two study area. With their help, the relative prevalence of recent international migrant households was roughly estimated and the census block labeled as 'migrant' or 'non-migrant'. Thus in each region, two strata were constructed, one with migrant household census blocks and one with non-migrant household census blocks. The two strata of the Dakar/Pikine study area contain 149 'migrant' and 319 'non-migrant' census blocks, respectively. The two strata in the Touba region contained 84 'migrant' and 618 'non-migrant' census blocks, respectively.

A stratified, two-stage, sample design was created in which the target sample of 1,971 households was divided between the two study areas of Dakar/Pikine (estimated 1.8 million inhabitants) and Touba (266,000 inhabitants). Within each study area, the target sample was allocated to the two strata so that 80 per cent of the households to be sampled would be in the 'migrant' census block stratum and 20 per cent in the 'non-migrant' census block stratum. The consequence of this is that households in the strata with 'migrant' census blocks were oversampled (see also table 3, Annex 3). In the much less populated agglomeration of Touba households were also oversampled, since this agglomeration has recently become a major focal point for international immigrants and emigrants.

Thus, in each of the four strata in the Dakar and Touba study areas, a number of census blocks were selected. Subsequently, in each sampled census block two-phase sampling was done, to list for all households their international migration status. A *fixed number* of households of a particular type (recent, non-recent and non-migrant households) was then selected in each sample block.

The fixed numbers to be selected in each sample census block were derived based on an analysis of other data sources, and by specifying a number of restrictions, as follows. The 1993 Demographic and Health Survey revealed that census blocks in Dakar and Touba consist, on average, of about 170 households. Previous migration studies (Condé *et al*. 1986; Findley *et al.*, 1988) found that *at least* ten per cent of these households are migrant households. To ensure that a sufficient number of migrant households would be sampled in a sampling block, the following restrictions were arbitrarily set: (1) the number of migrant households to be selected in each sample census block should be about twice the number of non-migrant households; (2) the number of *recent* migrant households should be about equal to the sum of non-migrant and non-recent migrant households; and (3) the total number of households selected in a census block should be inflated by ten per cent to allow for non-response.

The above criteria determine, for each type of household, the number to be selected from a census block. Thus at least 17 migrant households (10 per cent of 170) can be expected on average from a census block, so this number was chosen as the minimum number of migrant households to be interviewed in a census block. This was raised to 18 to compensate for non-response. Consequently, 18/2 or 9 non-migrant households would be selected, so that the total

number of households sampled within a census block would be 18+9=27.And since about half of this is to be allocated to *recent* migrant households, then 13 households should contain recent migrants, leaving 5 non-recent migrant households (18-13), and 9 non-migrant households. The total number of census blocks to be sampled could now be derived as (1971)/27 or 73.

It was decided that 35 census blocks would be taken from the Dakar/Pikine study area and hence selected from a listing of 568 census blocks (comprising 149 'migrant' census blocks and 319 'non-migrant' census blocks). Similarly, 38 census blocks would be sampled in the Touba agglomeration from a list consisting of 154 census blocks (including 69 'migrant' census blocks and 85 'non-migrant' census blocks). In each study area, about 80 per cent of the blocks sampled would be from the stratum of 'migrant' census blocks. In each of the four resulting strata, the numbers of census blocks indicated above were selected and then screened, and 27 households were sampled and interviewed in each selected census block.

In the 73 census blocks sampled, a total of 13,290 households were listed, of which 1,971 were selected and 1,742 households successfully interviewed. Of these, about one third are recent migrant households, one third non-recent migrant households, and one third non-migrant households. Thus, the survey results are representative of the populations living in the selected ' communes' and 'villages' in the regions of Dakar and Diourbel, respectively, and not of the regions as a whole.

Turkey

In *Turkey*, the target sample size was set at 1,800 households, to be equally divided over four regions, so that in each region 450 households would be selected. Contrary to most developing countries, data were available on the international migration experience of households as well as on the level of economic development at the district level. Thus, regarding the former, a question in the 1990 census asked, in each household, whether any household member was living in another country on the census day. In addition, a recent nation-wide socio-economic survey (Dinçer 1996) facilitated the classification and ranking of all 850 districts by level of economic development. Thus it was possible to identify four regions with distinct economic and migration history characteristics. From these districts were purposively selected, which are spatially proximate but non-contiguous, to form study regions. The four regions are situated south, east and southwest of Ankara and in the south-east of Turkey, near the border with Syria. The aforementioned prior information was of sufficient detail to even add an urban-rural dimension to the design so that each district was further subdivided into an urban and a rural sub-district. Within each region, all such sub-districts were sorted by migration intensity, the sub-district's 'P-value', or proportion of households with at least one international migrant. Two strata were formed, one stratum comprising sub-districts with relatively high P-values and another stratum with the sub-districts with relatively low P-values.

The selection of sub-districts from these two strata went as follows. First, from pilot survey data it was deduced that the number of interviews that a team of four interviewers could handle was about 12 households per day. Thus, 450/12=37.5 (rounded to 37) team-days were

required in each region. Second, these 37 batches or sets of 12 households each were then distributed over the sub-districts in the two strata in proportion to the magnitude of the sub-district's P-values, using systematic selection.[3] This ensures that more households are selected from sub-districts with high P-values than from those with low P-values. Although the exact sampling procedures in urban and rural sub-districts differ, the general approach was to select and seek to interview a maximum of ten 'recent migrant households' and at least two 'other types of households' from each group of a hundred households (see below). Third, in the selected sub-districts, the listing or screening operation, sampling and interviewing of households was all done at the same time in the field. The listing of households was done for a hundred households at a time. The number of such batches of a hundred households to be screened in a particular sub-district is the same as the number of groups of 12 households to be interviewed in the selected sub-district. In the screening survey, all households were asked questions that made it possible to determine if they were a 'recent migrant household' or 'other type of household'.

In the end, some 12,838 households were screened and categorized and 1,773 households were actually sampled, 1,564 of which were successfully interviewed (656 recent migrant households, 173 non-recent migrant households, and 735 non-migrant households). The Turkish survey was the first to be carried out in the NIDI project, with the fieldwork between July and September, 1996. The survey results are representative of the populations in the four regions consisting of non-contiguous districts.

4.2 Receiving countries

Italy

In *Italy*, the immigrant populations of interest were from Egypt and Ghana, the goal being to obtain data for 800 households each. In general, immigration is a fairly recent phenomenon in Italy. In fact, Egyptian and Ghanaian immigrants are relatively small immigrant populations in Italy, being the tenth and fourteenth largest immigrant populations. In 1997, there were 23.5 thousand Egyptian and 15.6 thousand Ghanaian documented immigrants. Members of these study populations are thus truly 'rare' elements in the Italian population of almost 60 million, and moreover their registration is said to be poor. The Ministry of the Interior estimated in 1998 that undocumented immigrants constitute 18-27 per cent of the total number of immigrants (Ministero dell'Interno 1998). In the absence of a national sampling frame, and given the objective to generate nationally representative survey results for the Egyptian and Ghanaian immigrant populations, traditional sampling strategies were considered inappropriate. Instead, an alternative methodology was developed called 'Centre Sampling Method' (CSM) (Blangiardo 1993). The main features are: (1) the sampling frames for Ghanaian and Egyptian immigrants consist of a listing of popular places, called aggregation-points, where Ganaians and Egyptians, irrespective of whether they are legal or illegal residents, tend to meet other members of their country (e.g. mosques/places of worship, entertainment venues, (health) care centers and aid institutions, telephone calling

[3] Sampling of 'every k^{th} element'.

centers, public squares, shelters, population register, employment office); (2) using *ex-post*, instead of *ex-ante,* determination of respondent selection probabilities, based on answers to a special questionnaire; (3) coverage of legal as well as undocumented immigrants.

The underlying assumption of the method is that any immigrant, legal or illegal, visits at least one major meeting place known to be frequented by peers of that immigrant group (see below). CSM entails the following. First, on the basis of information from local key-informants, scattered data sources and a pilot survey, a number of geographical areas in Italy were identified where most of the Egyptian and Ghanaian immigrants reside. Thus Egyptians are thought to be concentrated in the metropolitan areas of Milan and Rome and do not move around much. However, Ghanaian immigrants are more widely dispersed and tend to move around more frequently, as many work as petty traders. Two regions were identified, each consisting of four 'local areas': (1) a Centre-South region, consisting of the four provinces in which Rome, Latina, Naples and Caserta are located; and (2) a North region, comprising the four provinces in which the cities of Milan, Brescia, Bergamo and Modena are located. It is estimated that about 77 per cent of the documented and undocumented Egyptian immigrants and 36 per cent of the Ghanaian immigrants live in these two regions (Ministero dell'Interno 1998). Second, within each province in each region, a screening operation took place at *major* meeting places/centres known to be frequented by either Egyptian or Ghanaian immigrants. The screening was subcontracted out to persons who deal with these immigrants in their regular paid or voluntary jobs (e.g., Caritas). In this way, sampling frames of 'major' meeting places, called 'aggregation points', were created. Third, in each 'local area' (e.g., Milan province), a purposively determined number of aggregation points was randomly sampled to be visited, with replacement, from the list of 'aggregation points'. At the aggregation points visited, people visiting from the appropriate immigrant group were selected for interview, though they could choose to be interviewed at home, if they have one.

It is important to note that, at the time of the interview, the *ex-ante* selection probability of a randomly selected respondent in a particular 'aggregation point' is not known because it is a function of: (1) the frequency of visits to that centre by that person and all other members of that immigrant group (e.g., Egyptians); and (2) the number of other 'aggregation points' in the list that are visited by potential respondents. To compute, *ex-post*, the selection probabilities of respondents and to therefore be able to compute weights to compensate for differences therein, all respondents were posed a number of questions, such as 'which of these other aggregation points was visited, how often, and when'. Using the responses to additional questions, 'attendance-at-aggregation point' profiles were created for each person, and used to derive *ex-post* selection probabilities and sample design weights for each person interviewed. In addition to these weights, other weights were derived that re-scale the ratios of Egyptians/Ghanaians and men/women in the sample population to those in the most highly accredited official statistical sources for legal Egyptian and Ghanaian immigrants in Italy. These latter weights were applied because one cannot assume *a priori* that the existing ratios in the population at large are reflected in the populations attending the meeting places. For each respondent, component weights were combined into an overall sample design weight, which was used in the analysis to ensure that the survey information obtained from the modest number of respondents adequately represents the population of Egyptian and

Ghanaian immigrants in the two study areas, center-south and north Italy. By interviewing these respondents, a total of 1,605 households were eventually contacted (i.e., 756 Egyptian and 849 Ghanaian households), of which 1,177 were successfully interviewed (508 Egyptian and 669 Ghanaian households) in March-June 1997. 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, where, according to official statistics, 77 per cent of the Egyptian and 36 per cent of the Ghanaian immigrants live.

Spain

In *Spain*, Moroccan and Senegalese immigrants are the two groups of interest for this study, but their numbers are small. Thus in the last, 1991 Census of Spain, the sampling frame used for developing the Spanish sample, only 1,202 Senegalese immigrants and 35,318 Moroccan immigrants were counted among the 40 million residents in Spain. At that time, these immigrants were located in about 30 provinces of the 52 provinces in Spain. Nevertheless, one third of all Moroccan immigrants counted in the census lived in the provinces of Mellila and Ceuta. These provinces are actually located in North Africa, bordering Morocco and the Strait of Gibraltar. A further 40 per cent of the Moroccan immigrants lived in the provinces of Gerona, Málaga and Barcelona. Of the Senegalese immigrant population, 55 percent were counted in five provinces only: Las Palmas (Canary Islands), Barcelona, Valencia, Gerona and Alicante.

The approach adopted was to design a *nationally representative* two-stage, stratified sample design. The objective was to select 600 households in each of the two immigrant groups, in order to end up with 500 (allowing for 20 per cent non-response). For each immigrant group separately, identical sample designs and procedures were applied. It was decided to use census blocks as the primary sampling units (PSUs). The Spanish territory is subdivided into 31,881 census blocks, but Moroccan and Senegalese immigrants had been recorded in the census in only 5,342 and 359 census blocks, respectively. The sample design aimed at sampling Moroccans from 107 census blocks in 25 provinces, and Senegalese immigrants in 174 census blocks in 30 provinces.

For each immigrant group, the same sampling strategy was adopted. First, all census blocks containing any members of that immigrant population were grouped into strata according to the percentage of immigrants of that immigrant group among the total Spanish population. More specifically, the percentage is defined as 'the number of immigrants present of a particular group in the census block as a percentage of the total number of immigrants from that group in Spain'. The most efficient stratification appeared to be grouping census blocks of Moroccan immigrants into five 'prevalence rate' strata, and those with Senegalese immigrants into four strata. The strata differed regarding the number of census blocks they contain, with the high prevalence-rate stratum containing fewer blocks than the lower prevalence-rate strata. Second, the total target sample of households was evenly distributed over the strata so that more households would be selected in higher prevalence rate strata. Third, the decision was taken that different numbers of migrant households would be sampled in blocks that belong to different strata. More specifically, more interviews would be conducted in blocks selected from higher prevalence rate strata. For instance, for the

Senegalese, it was decided that in blocks selected from the lowest prevalence rate stratum only 3 households would be sampled and interviewed, whereas this number would be 6, 9 and 12 households in blocks belonging to the other three strata. Fourth, based on the even distribution of the total target sample size to the strata and on the fixed number of households to be selected from census blocks belonging to different strata, the number of census blocks to be sampled was derived. Then, these blocks were subsequently sampled from each stratum, independently, using the systematic selection method. Fifth, all households in the selected blocks were screened for the presence of Moroccan (or Senegalese, as the case may be) households and the predetermined number of migrant households were selected from these census blocks, again using the systematic selection method. As 'birds of the same feather' tend to concentrate, the anticipated effect of the design was that fieldwork would, geographically speaking, be more 'concentrated', as census blocks with a high prevalence of the migrants sought would, geographically, be more proximate and more households would be sampled in such blocks.

However, after the sample was drawn, the geographic distribution of census blocks containing one or more immigrants of either group was found to be too dispersed for the available budget and the time frame set for the completion of fieldwork. Therefore two modifications were introduced that somewhat distorted the probability sample design: (1) the number of households to be sampled in blocks from the 'low prevalence' stratum was reduced, while the number from the high prevalence stratum was increased; (2) some replacement of physically distant and inconvenient census blocks with more convenient ones was done. The overall effect of these two changes was to reduce the number of census blocks to be visited by 15 per cent.

But even after these modifications were implemented, the Spanish team was confronted with yet another problem. The screening of a number of selected sample census blocks found far fewer Moroccan and/or Senegalese immigrants than expected. This may have been due to changes in the place of residence of these immigrants between the 1991 census and the survey in 1997 (through internal migration within Spain, return migration to Morocco, etc.). To cope with this and to ensure that the fieldwork would generate a sufficient number of interviews for analysis, interviewers were instructed to continue 'searching' for additional immigrants in sample census blocks. Thus interviewers asked respondents in sample households whether they knew of other immigrant households nearby or in adjacent census blocks. If the answer was affirmative, such 'non-sample households' were traced and interviewed. This approach is also known as chain, network or 'snowball' sampling and it added, during implementation, a non-probabilistic dimension.

The fieldwork was carried out from July to November 1997. To facilitate management of the fieldwork, all census blocks selected for the study of both sets of immigrants were grouped into five fieldwork regions: Madrid, Cataluna, Levant, Andalucia and Canarias. A total of 1,113 households were successfully interviewed, providing detailed migration information for 598 Moroccan and 515 Senegalese respondents. The consequence of the adjustments to the sample in the actual survey implementation is that survey results are not quite representative of the two immigrant groups at the national level, as had been desired. In

particular, the failure to keep track of which households were selected by the snowball method unfortunately makes it difficult to assess to what extent the overall sample is representative of the two target immigrant populations, since part of the data were collected from non-sampled households. This is an all too common error in fieldwork, to substitute for or add households in the field without properly documenting this.

4.3 Common features and differences in the sample designs

Despite significant differences between sending and receiving countries, the sample designs have a number of main features in common. First, it should be recalled that, in all countries, the main problem to be resolved was the "rare elements" problem, requiring specialized sampling design procedures. Thus:

- All designs attempted to use both available quantitative and qualitative information (i.e., recent censuses, household surveys and the opinions of experts or key informants) to develop sample designs to ensure that a sufficient number of migrant households would be obtained in the samples to permit statistically meaningful analyses.
- Households or individuals were selected in the last stage only after a series of multiple sampling stages had been carried out, each to over-sample areas expected to have higher proportions of migrant households in the population. Thus, regions or provinces with such proportions were selected first (often purposively), then districts within provinces, villages within districts, and census blocks or voting areas within villages. Geographic areas were stratified according to the proportion of migrants expected, forming migrant-prevalence rate strata. Areas with higher proportions were then over-sampled. The purpose at each stage is to increase the likelihood that the rare elements, or migrant households, will be included in the sample.
- At the last stage, in the selection of ultimate sampling units or households, a listing or screening operation was performed, to list households with and without qualified international migrants. This involved the use of a short questionnaire to determine whether a structure is currently occupied by a household and whether the household is a 'recent migrant household' or 'other household'. In sending countries, it was used to distinguish 'recent current migrant households', 'non-recent migrant households' and 'recent return migrant households'. In destination countries, it was used to identify international immigrants by country of origin.
- A disproportionate allocation of the total target sample size is made to the stratum of 'recent migrant households'.

Table 1 summarizes, by country, key data regarding overall sample design and implementation. The table shows that in all sending countries, except Turkey, the sampling objective was realized such that about half of the target sample should consist of recent migrant households (see also section 3.2 and the example in Annex 3). Still, differences in the country experiences are considerable and reflect many factors, such as specific country goals, the adequacy or even existence of a sample frames, local sampling experience, desire to concentrate the sampling as much as possible in particular areas, and even cultural factors (polygamous households in Senegal, for example).

Table 1. Summary information on sample designs and implementation

Country	Level of statistical representativeness aimed at	House-holds screened	Target sample	Households successfully interviewed	Number of successfully completed interviews, by migration status of household		
Receiving countries:							
Italy	National	Not applicable	1,605	1,177	Egyptian: 508	Ghanaian: 669	
Spain	National	Not reported	1,200	1,113	Senegalese: 515	Moroccan: 598	
Sending countries:					recent migrant	non-recent migrant	non-migrant
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

5. Conclusions and recommendations

The main sampling objective was to generate results that are 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 in part to the difficulty of finding rare elements, the lack of an adequate sample frame, and budgetary limitations, this objective was only partially met, with compromises and deviations of greater or lesser importance in all countries. Thus, in sending countries the substantive meaning of 'region' differed from one country to another, resulting in very different sizes of the geographical region and whether a region even comprised contiguous geographic units. Usually administrative or political jurisdictions are used for the first or second stage sampling units, e.g., in Turkey, Egypt, Morocco, Senegal, and Spain, spatial units used are sub-districts, census blocks or election areas that were selected through probability sampling methods within each of the regions purposively selected at the first stage. However, in Ghana, within each sample region selected by judgement, at the second stage judgement was again used, that is, voting districts were *purposively* selected using key-informant information, and within each, one election area was 'sampled'. This approach does not yield a probability sample, so that the results, statistically speaking, are not strictly representative of the population of the region, but only of the population living in those selected election areas, which is much smaller than that of the region as a whole. Also in Spain, although the objective was to generate nationally representative results on Moroccan and Senegalese immigrants, various implementation problems occurred weakening the claim of representativeness. And in Italy, an unconventional albeit innovative sampling approach results in a sample that can only claim to

be approximately representative of eight provinces in northern and central Italy, where most of the Egyptian and Ghanaian immigrants live. Therefore, the objective to generate data that are statistically representatives at the level of regional or national populations was not fully met by the project.

Some (but not all) of the short-cuts or compromises that weakened the representativity of the samples in the seven case study were difficult if not impossible to avoid. In addition, the migration flows in sending and receiving countries are not matched in the ideal way as recommended (Bilsborrow *et al.* 1997). Thus, in the sending countries, when whole households migrated, there is no one left behind to be interviewed, so that data on emigrants are biased to the extent that characteristics, motives, status, economic success, etc., as reported for migrants who moved as entire household units, may differ from migrants who moved as individuals to live in another country, with the rest of their household remaining in the country of origin. Similarly, surveys in receiving countries necessarily include only those migrants who chose to migrate there, and have neither died nor migrated onward to other countries, including back to their country of origin.

Despite the limitations, the NIDI/Eurostat study led to the design and implementation of similar specialised surveys of international migration that have resulted in a unique, multi-country data set useful for studying the determinants and mechanisms of international migration to the EU. Thus data were collected in countries that are part of the same migration system, in more or less the same time frame, using very similar survey instruments. Particular attention was paid to sampling procedures, in an effort to adhere to rules of probability sampling by developing a model sampling strategy that would serve as the basis for country-specific sample designs. With the exception of Italy, variants of this model design were used, which resulted, in most countries, in obtaining a sufficient number of 'rare elements', that is, households with international migrants of a particular type.

Important lessons were learned from the survey, and in particular from the experience in attempting to have multiple countries use a common model sample design. A number of problems faced by the project regarding sample design and implementation could be avoided in the future, though sufficient funding will always be an issue. We recommend the following for future specialized sample surveys of international migration:

1. Organize a pre-project workshop on sampling design and implementation, to bring together sampling experts from each country team, to learn and discuss about a model sampling design and identify potential problems with applying the model design in their country (e.g. lack of census data or an adequate sample frame, lack of data on prevalence of migrants or socio-economic conditions). Approaches for confronting those problems can then be developed *a priori* with the aid of lead institute sampling specialists.
2. Plan sufficient time, budget and personnel to monitor and document problems encountered in the field and solutions adopted in the implementation of the sample design so that, after completion of the fieldwork, relevant data are available to determine to what extent the survey adhered to the rules of probability sampling. This would make it possible to flag subsets of data that come from households and persons

that were added to or substituted in the sample, using non-probability procedures. For example, if records had been kept during the Spanish field work on which households were the "linked" households resulting from the snowballing procedure, it would have been possible to flag or delete them, and adjust sampling weights for the actual viz. expected number of immigrants in each area, and thereby preserve probability sampling.

Annex 1. Topics covered by household survey questionnaires

All sets of questionnaires share the same basic modular design and layout. A household questionnaire and one or more individual questionnaires were administered in each household. For the sake of comparability, modules were standardised across countries, although, as mentioned in the main text, countries could include some questions of special interest or in response to particular conditions. Depending on whether an eligible respondent (all persons aged 18-65) was the economic head of the household or a current, return, or non-migrant, certain sets of questions (or modules) were included or skipped.

Table 2. Topics covered in household and individual level questionnaires

Household questionnaire (respondent is economic head of household)	
A	Household roster (demographic, socio-economic, and migration data on all household members)
B	Information about living quarters and housing conditions
C	Current and past economic conditions of the household
D	Remittances
Eligible household member questionnaire	
E	Social, demographic and social interaction (and integration) characteristics
F	Economic activity, work characteristics
G	Migration history
H	Household composition in country of origin before the last migration
J	Economic situation before the last migration
K	Motives for move(s) abroad
L	Information about the last/current destination
M	Migration networks and assistance
N	Experiences at destination
P	Intentions for (future) emigration

Annex 2. Concepts and definitions

Of particular importance for the study and sampling design were the concepts of 'household' and 'migration', and the derived concepts of recent and non-recent migrant household, current and return migrant household, and non-migrant household, as these played a role in sampling design as well as identifying which modules would be appropriate for each person..

Household
For purposes of this study, the usual concept of household was extended to include not only persons who live together and share food but also those who are presently residing elsewhere but have major commitments and obligations to the household and are expected to return, or to have the household members join them in the future. Thus, both the household and the shadow household, referring to members currently living elsewhere, are captured with this definition. The concept of household was difficult to apply consistently due to widely different marital customs and living arrangements in countries of origin. For instance, the practice of polygamy in Senegal tends to often result in very large households comprising a male head and several wives and their children who live together in one compound, or separately, with each wife and her children occupying their own housing unit. In addition, when the husband has temporarily migrated away, including internationally, individual wives may temporarily fall under the responsibility of another man in the family of the husband, usually his father or a brother. In contrast, most households in Turkey are nuclear. Though easier to deal with in a survey, such a household is more likely to have moved as a whole, so that it cannot be captured for interviewing in the country of origin.

Migration
Migration is defined here as a move from one country to another with the intention of living there for a continuous period of *at least one year*. The line has been drawn at one year to allow for comparison with common international definitions, as well as to exclude seasonal migration. An exception to this general rule is the migrant who left the migrant-sending country at least three months ago and has been living abroad for at least three months and planning on staying abroad for at least a year. Such a person is considered a migrant even though it is unknown whether he/she will stay abroad for at least a year.

Recent and non-recent migrant households, and non-migrant households
A *recent migrant household* is one in which at least one member has moved abroad in the past ten years, even though that person has since returned after living abroad for a continuous period of at least one year; or in which the person is currently living abroad and left the country of origin at least three months ago. A *non-recent migrant household* is one in which any move abroad of a household member from the survey country took place more than ten years ago. Both recent and non-recent migrant households may be classified as either the current or the return migrant household type, or a combination of the two. A *non-migrant household* is one where no member has ever left the survey country to live abroad for a period of at least one year, or in which no member has been living abroad for at least three months.

Annex 3. Over-sampling of migrant vs. non-migrant households: the case of Senegal

Over-sampling of particular households (viz., migrant households) entails the use of disproportionately higher probabilities of selection for those households. The extent of over-sampling of a particular type of household is reflected in the sample design weight, which is the inverse of the selection probability of the household.

A sample design weight is the "what if" or hypothetical PPES-selection probability based on *proportionate* sampling of each type of household divided by the actual selection probability of each type of household when *disproportionate* sampling is used:

$$\frac{P(x)^{PPES}}{P(x)^{actual}}$$

where, $P(x)^{actual}$ is the actual selection probability of a household taking into account the probabilities of selection used for all higher order sampling units under which the household is subsumed (e.g., census block, district, region); and $P(x)^{PPES}$ is the 'what-if' selection probability, or PPES-selection probability (Probability Proportional to Estimated Size) of the household if PPES sampling were to be used for all higher order sampling units under which the household is subsumed (Kish 1965). The values of PPES-selection probabilities are derived from estimates of population sizes of each of the migrant and non-migrant populations by region, district, census block and stratum. A self-weighting, multistage stratified PPES sample design would lead to identical selection probabilities for all households.

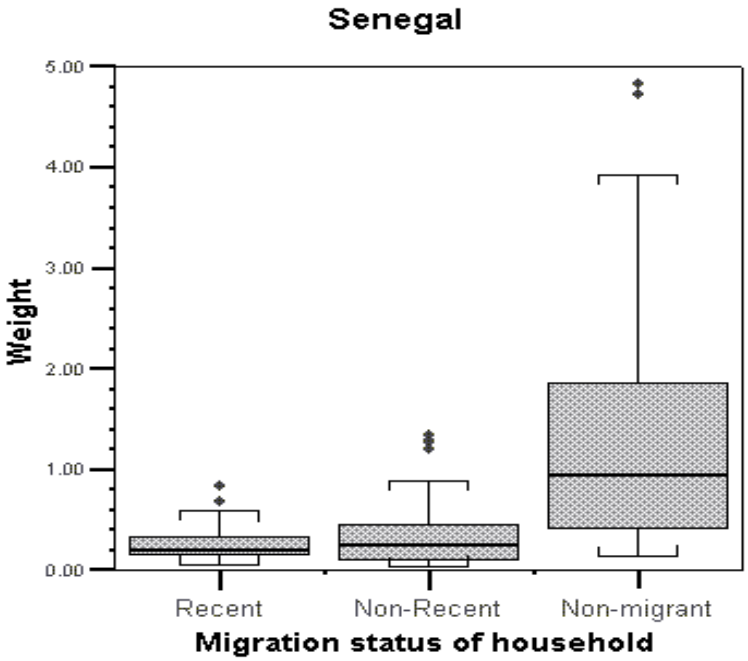
Table 3: Illustration of effect of over-sampling

Region	Migration status of household	Disproportionate sampling		Proportionate sampling
		households	Weight (average)	households
Dakar	Recent	392	0.64	250
	Non-recent	147	0.92	135
	Non-migrant	250	3.92	980
	Total	789	1.73	1365
Diourbel	Recent	470	0.23	109
	Non-recent	168	0.20	33
	Non-migrant	313	0.74	233
	Total	951	0.39	375
Total	Recent	862	0.42	359
	Non-recent	315	0.53	168
	Non-migrant	563	2.15	1213
	Total	1740	1.00	1740

Table 3 below illustrates the effect of over-sampling of migrant households in Senegal, and of households in general in the Diourbel region compared to the Dakar region. The last column shows the number of households that would be selected in a sample based on PPES sampling (i.e., equal probability sampling), whereas the third column shows the result of the actual sample design, which used higher selection probabilities for migrant sending households. Weights are shown for the different types of households in both regions; these weights are used to weight the data for each group so as to make the total representative of the two regions together in Senegal.

The graph below illustrates the effect of oversampling of migrant households in Senegal by plotting and summarizing the weights for households in each group. The median value of the weights (i.e., the horizontal line in the box) for non-migrants is considerably higher that the medians for recent and non-recent migrants. Most of the weights of the latter two groups are well below 1.0, reflecting the degree of oversampling, as the smallest weights are associated with households that were given a disproportionately *higher* probablity of being included in the sample.

Figure 1: distribution of sample design weights by type of household



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