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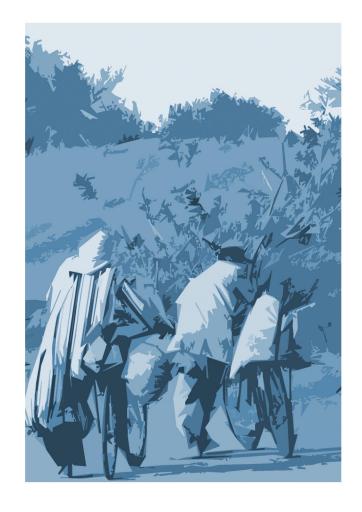## Migration Operational Vehicle

Operational Note No. 2

MEASURING MIGRATION USING HOUSEHOLD SURVEYS

Gero Carletto and Alan de Brauw

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MIGRATION OPERATIONAL VEHICLE
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Measuring Migration using Household Surveys[*]

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I. Introduction

Migration has recently emerged as one of most debated and contentious policy issues in developed and developing countries alike, with supporters advocating the many opportunities it offers to the development of both the migrant sending and receiving economies, while critics emphasize the potentially damaging effects that massive population movements may have both for sending and receiving countries.

Since 1975, the number of people reported to be living outside their country of birth has more than doubled to 190 millions, representing about 3 percent of the world's population (United Nations, 2006). Sixty percent of the foreign-born currently reside in more developed countries, with the remaining 40 per cent living in less developed countries (United Nations, 2002).

Despite the obvious and increasing importance of migration to the global economy, efforts to measure and characterize migration have been haphazard, limiting the scope and quality of policy research on the topic. Current national data collection systems are ill-prepared to gather detailed information on migration and remittances. There are objective difficulties in measuring migration, as reflected in the lack of consistency in defining migration across countries. For example, although the UN has offered a consensus definition of an international migrant for several decades now, very few countries currently comply with it, as it is deemed impractical and operationally unfeasible. As a result, the definition of international migrants varies across and sometimes even within countries, making it difficult to compare migration statistics.

Even though data on migration are not generally comparable across countries, most countries now regularly report data on immigration stocks, primarily derived from population census data. However, very few countries report statistics on migrant flows, due to the lack of reliable data from administrative sources such as population registrations and border statistics. The perceived scarcity of migration statistics is accentuated by the fact that the data are often of poor quality and poorly documented, further complicating and constraining their use. Furthermore, although important in its own right, the mere quantification of the phenomenon is insufficient to provide the insights needed for sound policy making. A better understanding of the determinants and consequences of migration is needed, and relevant data of adequate quality must be generated on a regular basis.

The main objective of this operational note is to provide some broad guidelines and useful references to researchers and development practitioners planning to collect and analyze migration data. Given that the subject is vast and this note is somewhat limited in scope, we focus the discussion on specific aspects of the measurement of migration, including the definition of different forms of migration, and some of the main sampling and survey design issues. Specifically, the note will elaborate more extensively on the measurement of out-migration from, and return migration to, sending countries using household surveys. We justify this choice because much recent work in the migration literature focuses on understanding the decisional process leading to migration (and/or return), and the impact that these decisions have on the households and communities of origin in developing regions of the world.

The remainder of the document is organized as follows. In the next section, we define migration in its many dimensions and discuss the implications for data collection. In section III we review the main sources of data on migration, while in Section IV we review some of the key methodological issues related to the sampling of migrants. Section V provides useful guidelines for designing questionnaires for the study of migration. In section VI, we conclude.

II. Who is a migrant? What type of migrant?

In studying migration, one must first tackle the issue of defining a migrant. As pointed out by Zlotnick (1987), migration is without doubt the most difficult demographic

phenomena to measure, because unlike mortality and fertility, it is not related to a tangible biological occurrence. Quantification of migration is complicated by the fact that there are several angles from which to study migration, and each require different methods and data sources. For example, much of the literature on migration and the majority of available data sources focus on collecting information on immigrants in destination countries, primarily from population censuses and registers. However, measuring and characterizing emigration from sending countries is equally, if not more, important. Yet the available data on emigration clearly lags data on immigration. Although an immigrant of one country is an emigrant from another, measuring the latter has proven more challenging particularly in view of the fact that emigrants typically leave less developed countries for more developed ones, and those sending countries have less capacity to collect relevant and timely migration data. Nonetheless, even countries like the United States collects little data on emigration.

In order to quantify migration, one must first resolve what characteristics make an individual a migrant. Although no consensus exists on the definition of a migrant or an international migrant, from the perspective of a household survey there are five concepts that should be considered when explicitly defining migration. These characteristics are the place of birth, (change of) residence, household membership, duration of stay away from residence, and a reference period. These different criteria may assume more or less relevance according to the specific interest and definition adopted but, in general, they should be recorded for all individuals interviewed. People who were not born in the place where the survey is being conducted, or who have changed their residence from another place to the place where the survey is being carried out, are typically considered migrants. When considering international migration, individuals with citizenship in another country and who were not born in the destination country can be considered immigrants.[†] Emigrants, then, are individuals who left the place where the survey is being conducted.

Distinguishing *short-term* (temporary) from *long-term* (permanent) migration may also be important for policy purposes, as the determinants and effects of these types of migration are likely to be different. The decision to migrate (or to return) is not irreversible; consequently, a temporary migrant may decide to overstay and remain permanently in the host country or, vice-versa, a permanent migrant may decide to go back. Generally, an arbitrary threshold on the length of stay is used to separate the two types of migration. For example, the United Nations' definitions (UN, 1998) use a threshold of 12 months to define a long-term migrant; conversely, any migration episode between 3-12 months is classified as short-term. At the time of a survey, migrants' intention to stay (or to return) may also be taken into account, although the subjective nature of such questions makes their statistical validity questionable. Questions on the actual steps taken in planning for the next move could also be asked.

A related point is the issue of identifying *return migrants* in countries of origin. An inevitable consequence of increasing out-migration is return migration: a share of

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[†] When immigrants have children abroad, if their children keep citizenship in the native country the children should not be considered immigrants.

migrants, regardless of their initial intentions, will return home and settle back in their country of origin. Measuring return flows may be particularly important, as return migrants have the potential to catalyze development at the origin through the potential use of their newfound skills and capital. However, return migration is difficult to quantify for several reasons. Some migrants may come and go seasonally, making them appear to be return migrants to the analyst, whereas they are better characterized as seasonal migrants or part-time migrants. Others may have returned from a long-term migration spell, but have the intention or willingness to migrate again if given the opportunity. For example, in Albania, many returnees reported to be intentioned and willing to migrate again if the necessity arose. In the same spirit of the definitions of short and long term migrants, return migrants could be defined as an individual who has been abroad for at least *n* months over the past *m* years, and who has lived in his/her country of origin for the last 12 consecutive months. The use of 12 months would automatically exclude from the definition all seasonal migrants who tend to migrate every year for a limited number of months. One could possibly incorporate information about the respondent's intention to stay or migrate in the future in the return migration definition, but these questions are again somewhat subjective in nature and could affect the statistical validity of any return migrant figure generated.

Differentiating migrant *stocks*, i.e. the population present in a country at a given time – from migration *flows* – i.e. the number of individuals admitted to a country in a given period – is also important for measurement purposes. Making a distinction between foreigners and foreign-born population may also be important when quantifying stocks. While population censuses generally provide a reliable data source for stocks of immigrants in a country, measuring flows is considerably more demanding, as it normally requires well-functioning administrative record systems. Many recent censuses now gather information on place of residence at some point in time in the near past, thus making it possible to estimate flows. However, the decennial frequency of census makes them less suitable to maintain up-to-date flows figures. In addition, migrants may and often do migrate several times during the course of their lives. When measuring migration flows, then, even within one period of time it is important to specify whether one is interested in measuring the gross migration flow (including multiple migration spells for one migrant) or the number of in- or out-migrants. Net migration flows, which would measure the number of migrants who left the country during the period less the number who returned, may entirely miss out seasonal or short-term migration spells that have been completed within that period.

Finally, a large number of migrants are *undocumented*, thus making them more likely to evade enumeration. In most studies, one would be interested in capturing all migrants, irrespective of legal status. Some data sources, intentionally or by construct, gather information only on legal migrants, while others, despite the many difficulties, attempt to enumerate illegal migration as well. In any event, vast undercounting of this group is likely, and it should be acknowledged when making inferences from these sources.

Given that migration has many dimensions, one must first clearly identify the particular group of migrants it wishes to measure. Obviously, that will depend on the country

context and the specific objectives of the study. Once identified the particular aspect to investigate, a clear, unequivocal definition of the concept to measure is needed. Although no consensus exists on the definition of an international migrant, when collecting household survey data most center around similar notions: place of birth, household membership, (change of) residence, duration of stay and a reference period. The fact that these definitions are often incomparable is often related to the different thresholds used to define migrants and to differentiate between different types of migrants.

To illustrate, below we provide two definitions of international migrants which, with modifications, are often applied when measuring international migration in household surveys. The first definition refers to household members of a sample household, and aims at capturing past migration experiences (here defined as a period of 6 months or more) during a pre-specified reference period (here constrained to the 5 years prior to the date of the interview):

"An international migrant is a person who has lived for at least 6 months in a country other than that in which they are being interviewed and whose move into the country of interview occurred during the 5 years preceding the interview." (Bilsborrow et al., 1997).

If this definition is used, the survey will not provide any information on individuals who, at some point in time in the past, have left the household to migrate abroad. For this reason, most household surveys also adopt a complementary definition:

"An international migrant is a person who used to live in the country in which the interview is being conducted and was a member of the household of the person being interviewed but who left at some point during the past 5 years preceding the interview to live abroad for at least 6 months." (Bilsborrow et al., 1997).

Clearly, the 6-month criterion is arbitrary and its choice will depend on the specific context. One consideration to keep in mind is that the longer the duration that is used, the lower the number of observations of migrants will be. However, shorter spells may be more difficult for the respondent to recall, thus leading to increased recall bias for longer reference periods. Also, shorter lengths of stay, e.g. 1 month, are more likely to create ambiguities with other types of movements such as vacation or visits.

Similar issues derive from the choice of reference period. Ideally, one would want to record all migration episodes in adulthood. However, this is often impractical, or just simply impossible. The choice of a reference period of 5 or 10 years is deemed more reasonable in most environments. However, there may be circumstances in which a longer reference period may be favored. For example, in transition countries in Eastern and Central Europe, at least for the time being, extending the recall period to around 1990 (i.e. the beginning of transition and the opening up of the borders) is recommended and still feasible. Similarly, in other circumstances, starting the recall period in a year clearly

marked by a major event or a policy change may be suitable. A relevant example is the 2005 Albania Living Standards Measurement Survey (INSTAT, 2005).[‡]

An even thornier issue in the above definitions, but common to any measure of migration, relates to the notions of household membership and residence. This is clearly the *Achilles' heel* of any definition, as it often relies on respondents' perception and/or arbitrarily set criteria of residence subject to different interpretations, resulting in the improper inclusion or exclusion of certain individuals.

In typical household survey, a household is defined as all individuals who normally live and eat their meals together. Additional rules are generally imposed to more clearly define household membership, including a duration of residence rule, e.g. usually, that they have resided in the household for a minimum of 3-6 months over the previous 12 months[§]. For migration purposes, this restriction may be problematic, as the excluded individuals are exactly the type of migrants for which we require information. For this reason, whatever the definition adopted, any survey should attempt to also gather partial information for those individuals who fail the residency rule, and are therefore not considered household members. We take up this issue more extensively in section V.

III. Data sources

Household surveys are only one of the possible sources of migration data and actually, at least to date, other sources have been more widely used to describe migration. In this section, before expanding on household surveys, we briefly describe the main strengths and weaknesses of the most commonly used data sources to describe migration, namely population registers and population censuses. Given that this note is focused on the measurement of migration through surveys, describing alternative sources of information on migration is important for at least two reasons. First, alternative information sources can provide an accurate quantification of international migration, which can help guide the researcher as they plan a household level survey. Second, they can provide information towards much-needed sampling frames for household surveys.

Population registers

Particularly in developed countries, population registers and other administrative recording systems can be used to keep track of migration, among other purposes. Despite their widespread presence, to date only a handful of developed countries use population registers to regularly report migration flows. No developing country publishes flow figures. If population registers are updated in real time, they have the advantage that they can provide a continuous measure of migrant flows consistent with stock figures. However, particularly for our purposes, a number of shortcomings of population registers make them of limited use. First, population registers generally record information only on legal residents, thus missing undocumented migrants, who represent a considerable

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[‡] Other surveys have also used longer recall periods, again beginning the recall period with a significant reform. For example, a survey completed by the Center for Chinese Agricultural Policy (CCAP) that focused on internal migration in China began the recall period in 1980 (de Brauw et al., 2002), around the time that the Household Responsibility System reform took place (Lin, 1992).

[§] Special provisions are generally made for the household head, newborns and new household members.

share of migrants in many countries. Furthermore, unless strong incentive mechanisms are built into the system, registration and de-registration often lag behind the actual figures. This issue is further complicated by inconsistencies across systems in terms of definition of residence, i.e. whether *de jure* or *de facto* criteria are applied[**]. In addition, administrative records such as registers are not run by national statistical offices, creating problems of coordination and interfacing with statistical data and definitions. Finally, given the budgetary and human resource requirements, well-functioning population registers remain beyond the reach of most developing countries.

<u>Population censuses</u>
As mentioned, the vast majority of countries of the world, including the most recently formed, have now conducted at least one population census, and most carry them out regularly every ten years. Migration figures, especially on the stock of migrants in the country at the time of the census, are now regularly collected, but few comply with the UN definition of international migrant.[††]

The greatest strength of a population census is its universal coverage. Because basic socio-economic and demographic characteristics are also collected for each individual in the country and their families, a simple characterization of migrants is often possible. However, the list of weaknesses is considerably longer. First and foremost, the decennial frequency of population censuses makes them unsuitable to monitor trends of a dynamic phenomenon such as migration. Also, based on a review by Chen (2006), a total of 93 censuses collect information on citizenship, while 112 record place of birth, allowing for the estimation of the foreign-born population. Also, despite an increase in the number of population censuses with migration data, still less than half of the countries report migration stock figures (Chen, 2006). As a result, migration data from censuses are incomplete and generally not comparable across countries. Lack of cross-country comparability of migration data in censuses remains a serious lacuna.

Although it is possible to use censuses for some level of characterization of migration, the information which can be collected through a census is grossly inadequate for more in-depth analyses, in part because census forms are typically very brief. To date, migration data has been low priority in national statistical systems, and as a result migration figures are not immediately tabulated and made available. Although the increasing importance of migration implies that migration figures should take on more importance in the future, it may not in reality. Furthermore, most population censuses are meant to capture the *de facto* population on a specific date. Consequently, a census misses any temporary and seasonal migrants who may be out of the country at that census date. In addition, marginal groups like migrants, even if legally in the country, are more likely to live in unusual housing arrangements, speak a different language, mistrust authority and be more mobile, rendering them more prone to be undercounted in census

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[**] *The facto* refers to the actual population present in a country at a given time, while *de jure* is the population with right of residence.
[††] Out of 153 countries reviewed by Chen (2006), only 1 country is compliant with UN definition and another 11 are "close". Most of these cases are small island countries in the Caribbean.

enumerations. Finally, censuses are also unlikely to document migrants who are in the country illegally.

Despite these limitations, population censuses remain the most reliable source of comparable immigrant stocks.[‡‡] However, censuses seldom are informative of migration flows[§§], cannot be used to identify return migrants and virtually never contain information on out-migration. For this last reason, the use of population censuses in their current form as a sampling frame for migrant surveys in sending countries is highly unsuitable[***]. As we will explore in a later section, they can indeed provide a useful basis for more effective sampling listings and, perhaps in the future, could even contain some information to identify (e)migrant households.

Surveys

As described in the previous sections, with respect to international migration data the main objective of population censuses and registers is primarily to *identify* and *measure* (im)migrant stocks and/or flows. These sources are of limited use to analyze the determinants and consequences of international migration and to provide the basis for sound analysis for policy making. For these latter purposes, surveys in general, and household surveys in particular, offer researchers more helpful and cost-effective ways to generate the much-needed policy advice to shape future migration strategies and to analyze the impacts of migration on sending and destination communities. In this section, after briefly describing two types of surveys commonly used to collect migration data, we focus on household surveys, illustrating in detail some of the main features which set them apart from all other sources of information to study migration. We also highlight some of the weaknesses and propose ways to ameliorate them through careful survey design.

Passenger surveys

Passenger surveys are carried out in several countries, often to complement existing statistics on migration flows. For example, the United Kingdom carries out at all its border crossings the International Passenger Survey (IPS), an all year round, personal survey to estimate flow figures. The main problem with this class of surveys is that only a very small percentage of travelers fall into the migrant category. For example, in the case of the IPS, more than 300,000 people must be approached in order to get 3,500 "hits". Also, given the nature of the survey, only limited information can be asked and there are clear differences between stated and actual intention, causing misclassification. Furthermore, given the increasingly short-term nature of many movements, the

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[‡‡] For an application on the use of census data for the estimation of bilateral migrant stocks for 226 countries and territories see Parsons et al. (2007)

[§§] According to Chen (2007), a total of 88 countries collect information in their census of place of residence at some point in time in the past. Depending on the reference period, this information can be used to estimate inflows.

[***] Even for the purpose of identifying (im)migrant households in destination countries for possible follow up surveys, the population census is of limited use as no names are generally entered in databases. However, they can be used to identify high immigration areas and, in most cases, the location of the dwelling in which the household was enumerated.

possibility for double counting is high. Finally, the representativeness of such surveys is doubtful, as travelers are not a random sample of the population.
Qualitative surveys

Qualitative migration surveys typically involve quite in depth interviews of small numbers of migrants or migrant-sending households. With the exception of the Mexican Migration Project, which conducts interviews in more than 100 migrant-sending communities in Mexico, most of these surveys involve only few communities and households. For the purposes of broadly characterizing migration, qualitative surveys have several shortcomings. Although they study their subjects in much detail, the sample size is always quite small, and because they usually involved only one or two communities or few purposively selected households or areas, they are fairly unrepresentative of the migrant population as a whole. Furthermore, qualitative surveys of migrants must take place in migrant destinations, and as such there is not a comparable group of people who did not migrate to learn about the factors that influenced the decision not to migrate among those comparable individuals.   However, qualitative surveys are excellent sources of initial information for understanding the types of issues that members of specific migration flows deem important and can be extremely valuable both in the design of quantitative surveys as well as to better understand some of the key findings of quantitative analyses. By no means, qualitative surveys should be seen as a substitute for quantitative surveys based on probability sampling.

Household surveys

The data sources reviewed, although valuable in many ways, fail to provide the depth of information needed to analyze international migration. For example, in order to properly assess the factors influencing the decision to migrate, information on both migrants and non-migrants at some point in time in the past prior to being exposed to the "risk" of migration is needed. This type of information can only be collected through in-depth household surveys.

Broadly speaking, we can differentiate household surveys to collect migration data into two different types: specialized surveys and general purpose surveys – also known as multi-topic or multi-purpose surveys such as the Living Standards Measurement Study (LSMS). While a specialized survey presents many advantages over a multi-purpose survey and could in principle be recommended as a preferred option to characterize international migration, they are not often feasible in many low-income country contexts, which struggle to maintain precarious and under-funded household survey systems. Many countries have instead opted for collecting migration information within large multi-purpose data collection efforts. This option presents several advantages but also a number of potential drawbacks, which can be partially ameliorated through proper planning and innovative survey design.

An important feature and advantage of multi-purpose surveys is their broad thematic coverage.   In addition, most multi-purpose surveys also collect comprehensive information about household welfare allowing researchers to perform distributional

analysis on variables of interest such as migration. However, this thematic breath may come at a cost in terms of depth. As more themes are loaded into a multi-topic survey, each must necessarily be covered with less depth, including migration. Therefore, while the marginal costs of including a migration module in a planned survey may be low, so may be the benefits, particularly if resistance is met from other stakeholders in expanding the scope and length of the survey. Another possible drawback of piggybacking an extensive migration module on an existing survey may be the inability to control for the high non-response that some of these surveys seem to suffer from. An example of this would be piggybacking migration information on types of surveys such as a Household Budget Survey (HBS), which are characterized by very high non-response rates. Obviously, with proper precautions in place, many of these drawbacks can be dealt with.

The most critical issue in using probability household surveys in general, and multi-purpose surveys in particular, to collect international migration data is that migration is a rare event, even in countries with high migration rates. Consequently, a multi-purpose household survey traditionally designed to be nationally representative may fail to identify enough occurrences of migration within the sample to make statistically meaningful conclusions, unless the sample size is quite large. As previously discussed, the incidence of migration in the sample will also be affected by other factors, including the thresholds used to define international migration; however, in most cases, the probability of locating a migrant household from a random draw will still be quite low. One potential solution would be to carry out very large multi-purpose surveys, say on the order of 50 to 100 thousand households. In most developing countries, such large surveys are impractical at best and infeasible at worst, nor are they cost-effective for collecting migration data. Furthermore, even such huge survey may end up capturing only a few hundred migrants, while the benefits due to the large sample size are likely to be annulled by an exponential deterioration in non-sampling errors. Moreover, migrants typically use networks to lower the cost of migration, and if migration is relatively rare and clusters with high migration prevalence are randomly excluded from the sample frame, migration might be measured as almost non-existent. In most migrant sending countries, the incidence of emigration among the adult population is only about 1-2 percent. Given that the typical multi-purpose, nationally representative survey has a sample size between roughly 5,000-10,000 households, the small incidence of migration translates into even smaller samples of migrant households, which may well be insufficient for any meaningful analysis. Therefore, special sampling designs are often required to ensure proper representativeness of the migrant population in the survey. In the next section, we discuss some sampling techniques proposed in the literature to overcome the "rare event" problem. Although the problem may be more acute in multi-purpose surveys, the notion that migration should be considered a "rare event" would apply to virtually any migration survey.[†††]

Given the strengths and weaknesses of different survey instruments, the first step in planning a migration survey is to assess the current household survey system in the country, including the contents and sampling designs of each survey, the availability of

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[†††] Small countries with a large proportion of their populations out-migrating, such as many Caribbean countries and small island countries in the South Pacific, are obvious exceptions.

sampling frames, plans for future surveys, as well as the country's human and financial capacity to carry out household surveys. The goal of learning about the current household survey system would be to first explore the feasibility of piggy-backing a migration survey onto an existing or planned effort, given the informational needs and the local capacity and motivation to carry out additional data collection work.

IV. Sampling

A probability survey is as good as its sample and its sampling frame. This statement may be even more pertinent in the case of migrant surveys, in which the appropriateness of the sampling approach is bound to determine the validity of the survey. The reason is that, except when the incidence of migration is relatively high, a traditional probability sample based on a multi-stage cluster design will not succeed in finding many migrants, and there is a risk of finding exceptionally few migrants. One such exception was a recent LSMS, carried out by the National Institute of Statistics in Albania: out of a sample of 3,640 households, approximately one third had at least one former household member abroad at the time of the survey, mostly adult sons and daughters of the household head and/or spouse. An even higher proportion of households had past experience with migration, as approximately one half of sample households included at least one current or former household member who had been abroad since 1990. In an environment in which migration is substantial, a traditional multi-stage cluster sample design may be perfectly appropriate.

A probability sample, by assigning a known non-zero probability of selection to each sampling unit, allows for making inferences to the whole population. The foundation of a proper sample is an updated sampling frame. However, as already mentioned, this is the main stumbling block in the design of a migration survey, as most available frames do not contain any information on the exposure to past or current migration of the listed households, preventing ex-ante stratification of the sample based on migration status. Neither the population census nor available administrative records provide fully adequate sampling frames for selecting emigrants in a given sending country. Nor, in most cases, they provide information on previous migration experience to be able to identify temporary migrants and returnees.

A number of techniques have been proposed in the literature to better identify rare events such as migration (Kish, 1965, among others). In this section, we provide some details on two such approaches, as deemed more appropriate to the objective at hand particularly if used in combination, namely (a) disproportionate sampling, and (b) two-phase sampling. However, both sample designs require some prior knowledge of migration in the population.

One can use disproportionate sampling, which implies that PSUs with higher migration rates are identified and oversampled. In other words, the PSUs known to have a high rate of emigration would be allocated a higher probability of selection than PSUs with low migration. Representativeness would be regained through weighting. One drawback to

this method is that the migration rate might still be too low within each PSU to use simple random sampling or systematic sampling to select households within each PSU.

Alternatively, one can initially select PSUs using the standard method and then, within each primary sampling unit, oversample households known to be migrant households relative to other households. This method is known as two-phase sampling. The reason for doing so is that, even in high migration areas, the prevalence of migration is unlikely to be so high that a random draw of households within a PSU will be an efficient way to select a sufficiently large number of migrant households. Towards this end, a listing operation to clearly identify households with migrants may be a more cost-effective way to select a more balanced sample of migrant and non-migrant households. Listing operations are generally not very expensive and, except in special circumstances, they only add up to about 10-15 percent of the total survey budget (Muñoz, 2007), and the benefits may greatly outweigh the costs.

Finally, one could combine the two methods, by initially giving more weight to PSUs with higher migration levels and then oversampling migrant households within each selected PSU. Whichever approach is used, the primary goal is to ensure that a large enough number of migrant households are drawn. It is important to note that using any of these methods is predicated on having prior information about the prevalence of migration in the population either at the area or household level. While this may be the case if one is interested in sampling immigrants in a destination country, it is rarely the case for the study of emigration in a source country. For methods 1 and 3, one needs information on the relative prevalence of emigration by PSU, and for methods 2 and 3 one needs information about emigration within PSUs.

Assuming that migrants can be properly identified in the frame, one further decision to make is whether to select based on the proportion of migrants over the population in the in the reference area or, conversely, based on the proportion of households with migrants out of the total number of households. As much of the analysis on migration is done at the household level, the second option may be preferable (Bilsborrow et al, 1997)[‡‡‡].

For the specific purpose of using surveys to learn about emigrants in sending countries, the lack of a suitable sampling frame would still be an obstacle to implementing a disproportionate sampling design. One possible modification, but a departure from a full probability sample, would be to use alternative data sources to identify high-emigration areas in a country. These sources may include, for example, expert opinions, qualitative surveys, or surveys in destination countries where, in addition to the immigrant's country of origin of the immigrant, the specific location of departure is asked. However, the latter method is not recommended unless most emigration from the source country has a specific destination and all of these main destinations are covered.

Lacking a proper sampling frame, a less than perfect alternative would be to select all area sampling units (or clusters) at the different stages with probability proportional to

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[‡‡‡] For a worked out example of a three-stage disproportionate sample of immigrants using a suitable sampling frame, see Bilsborrow et al., 1997 (pages 280-283)

the estimated size (PPES) of the overall population (or the number of occupied dwelling units) and carry out a full listing operation only in the area sampling unit last selected. The method would be appropriate only in the unlikely event that the shares of migrants or migrant households are similar across area units, but finding a sufficient number of migrants in the select units may still be a challenge.

To select rare events, other non-probability sampling techniques may be used; for example, multiplicity methods such as snowballing have been used in the migration literature. One use of snowballing, for example, is to gather information on undocumented migrants, using as starting point, or "seed", a list of members of a diaspora organization or a list of migrants assisted by an NGO in destination countries. The "seed" household is used to identify additional migrant households of the same country of origin, and so on until the necessary number of observations is reached. Although snowball sampling does not generally lead to a representative sample, a more recently developed technique, respondent driven sampling, can weight observations from non-random sampling techniques to mimic a representative sample (Heckathorn, 2002).

Also, techniques such as random walks using selected households in a community as starting point could be used to identify additional rare events. Yet another method recently used in a survey of Nikkei population in Brazil is the aggregation point intercept method which, together with snowballing, was compared with more traditional census-based random sampling (McKenzie and Mistiaen, 2007). In all cases, when using these non-probabilistic methods, it is crucial to collect ancillary information on the implementation of the sample to be able to identify the reference population in an attempt to make "educated inference" to a larger population group. In fact, as shown by McKenzie and Mistiaen (2007), non-probability methods, such as the aggregation point intercept, are unlikely to provide representative samples and tend to overestimate the migrant population. However, they also show that reweighing the intercept point estimates to account for visits by the same individual to multiple aggregation points may generate estimates rather close to the census-based method.

V. Questionnaire design

Based on the objectives of the survey and the definitions adopted, a number of decisions need to be taken about the content of the questionnaires. These decisions very much depend on the particular survey design chosen, with a stand-alone survey presumably allowing for much more flexibility and space for questions on migration. A number of issues, however, are common to any migration survey.

First, a reference period must be chosen. As the household is asked about individuals of interest who may be out-migrants, longer reference periods enable the survey to capture a larger number of occurrences of migration, at the cost of potentially higher recall biases. Conversely, shorter reference periods may improve the quality of information collected but leads to a smaller sample. In the definition provided in Section II, a reference period of 5 years has been proposed. In general, a 5 year period can be considered a good compromise, although in some cases, depending on the incidence and characteristics of

migration in a specific country, a shorter or longer period could be preferred. Furthermore, at equal reference period, smaller episodes farther back in time, are more likely to be underreported or missed altogether (Smith and Thomas, 2003, Bilsborrow et al., 1984, Som, 1973). Anchoring the timeline to specific time marks, such as major economy-wide or local events, as well as idiosyncratic events specific to the household, such as births, deaths, or marriages, can help reduce recall errors. Properly training the enumerators to use such cues cannot be emphasized enough.

Next, one must decide how to identify migrants, which is affected by the survey's definition of household membership. In a typical household survey, a household is defined as all individuals who normally live and eat their meals together. Additional restrictions are generally imposed to refine the concept, for example by asking the number of months the individuals has been absent from the household over the previous 12 months. Then, if a member has been absent for more than 3 (or 6) months, he or she will no longer be considered a household member and thus excluded from data collection past the basic household roster.

Generally one would be interested in identifying (1) all current household members with past experience with international migration over a given period, (2) all former household members who are now living abroad, and (3) all former household members with past international migration experience who now live in the source country. Collecting information for each group presents different challenges, mostly driven by the necessity to use a proxy respondent (groups 2 and 3) or not (group 1).

It must be noted that individuals in the last two groups may have left the households 20 or 30 years earlier or, conversely, be part of that sub-group of individuals who were excluded because did not pass the 3-6 month residency restriction. Both sub-groups should be considered. Furthermore, one must decide whether these groups should include all former household members (i.e. any individual who used to live in the household at any point in time in the past) or only members of the nuclear family i.e. sons and daughters of the household head and/or spouse as well as the spouse of the household head. Including all former household members may result in large double counting and greater inaccuracies in the respondent's self-reported definition of household membership. Although the latter approach may results in an underestimation of the total number of international migrants, it may be preferable.

Several techniques have been attempted to identify and characterize migrants in past surveys. A first method considers including in the household roster *all* individuals who have been household members at any point in time in the past. Conversely, the list could include all current household members plus all sons and daughters regardless of where they live. This method has been applied to internal migration in a nearly nationally representative survey collected in China (de Brauw et al., 2002), and again in the Mexican National Rural Household Survey (Richter and Taylor, 2005).

An alternative method takes advantage of the fact that many household surveys already contain a fertility module, in which information on all children ever born from all female

members in reproductive age is collected. By changing the reference group of women to whom to administer the questions, the fertility module can be used as a basis to collect migration information for all sons and daughters of women in the households of age 15 and above not already listed in the houseehold roster. The approach was used in the 2002 Albania LSMS (INSTAT, 2002). A drawback of this method is that it will miss all children of women no longer in the households or who have passed away. A similar approach, implemented in the subsequent 2005 Albania LSMS, is to list in a separate module (not necessarily a fertility module) all adult children of the head of the household and or his/her spouse plus the spouse, if no longer living in the households regardless of when they left. The list should include all sons and daughters that failed the household membership criterion in the household roster and include them even if the mother is absent or no longer alive (INSTAT, 2005, Carletto and Azzarri, 2007).

Finally, another approach proposed in the literature is to also list all siblings of the household head and/or the spouse. A variation of this method was also used in the 2005 Albania LSMS (INSTAT, 2005) The main problem with using the list of siblings is that it is likely to lead to double counting of migrants or individuals in those demographic categories, unless proper adjustments are carried out based on complicated demographic modeling. The problem of double-counting is even more acute if household rosters are further extended to include any former household member irrespective of their relationship to the household head. Constructing the list based on clearly defined familial relationships, such as for children or siblings, renders the identification and recall of potential migrants simpler and more accurate, and the sample more demographically representative.

We next turn to the types of information on migrants that can reasonably be collected in a household survey. Assuming that the objective of the survey is a full characterization of migration in a sending country, one needs to decide what type of information is feasible to elicit on each type of migrant which, in turn, will depend on the type of respondent.

If the objective of the study is to analyze the determinants of migration, information will be required on both migrant (treatment) and non-migrant (control) individuals and their households. Also, information on pre-migration conditions is needed. Assuming a dichotomous model of migration in which a migrant is identified based on an occurrence within a year, the pre-migration timing for migrants corresponds to the year prior to migration. For longer reference periods, ideally one would want to collect information for each single year as the factors affecting migration are likely to have changed over time; however, that may not be feasible or too costly in most surveys. For non-migrants, when migration refers to a longer reference period (say 5 years prior to the survey) it is recommended to collect information relative to the mid-point of the chosen reference period, e.g. 2.5 years preceding the survey (Bilsborrow et al, 1997).

To measure the impact of migration, first one must be clear on the type of impact, e.g. whether one is interested in measuring the impact on the migrant abroad, on the household or community left behind, or on the migrant him or herself either while away or upon return. Second, one must ensure that data on the outcome of interest is collected

in the survey. For example, if one is interested in the impact of migration on poverty, one must collect data on either household consumption or income in the survey in order to somehow measure poverty. Next, one must decide on the identification strategy, as unobservable factors affecting migration are also likely to be correlated with the outcome of interest. Ideally, one would rely on an experimental design in which the treatment is randomly assigned, and before and after information are collected. However, given the nature of migration, this is hardly ever the case.[§§§] These issues are more extensively discussed in the companion operational note. (Sasin and McKenzie, 2007).

As said, the amount of information which can be elicited will depend on a number of factors, including the length of the questionnaire, the capacity and training of fieldworkers but most importantly whether information are being gathered directly from the migrant or through a proxy respondent. The use of proxy respondents to collect information on migrants severely constrains the ability to go much in-depth. However, a minimum set of questions can easily be asked about the emigrants, including their basic demographic characteristics, education level, occupation abroad, country (and location) of current residence, the year of first (and last) migration and remittance behavior. Other questions may be asked about his/her legal status, marital status, the basic demographic composition of their household abroad, frequency of contact with the household, and their occupation prior to migrating. Further questions that relate to the specific objectives of the survey can also be added. An attempt could be made to collect more extensive information on past migration episodes, including timing and country of destination. The 2005 Albania LSMS provides an example of how to reconstruct full migratuion histories for all current household members (INSTAT 2005).

A way to collect more exhaustive information about emigrants would be to track them in the destination country. To make that possible, detailed contact information must be collected from the original households, including addresses and telephone numbers where the migrant can be reached. Ideally, the tracking survey should occur within weeks of the survey in the sending country, given the high mobility of these migrants. Tracking surveys of this type have been carried out in a few countries, including between Mexico and the US, and between Albania and Greece. Alternatively, one can first carry out a survey of migrants in destination countries and, using a similar approach, track down the original household in the sending countries. An example is the aforementioned study by McKenzie et al, between New Zealand and Tonga.

Tracking surveys can also be used as validation of information being gathered in the original household through proxy respondents, as well as to measure differences in perceptions between migrants and household members left behind. However, while allowing for direct interviews with the migrants, tracking presents a number of problems which often outweigh the benefits. Tracking surveys are generally too costly, and are characterized by high level of attrition, particularly when the share of illegal migration is high. Minimizing systematic non-response by particular groups, e.g. illegal migrants, becomes crucial to a successful tracking survey. In a recent survey of Albanian migrants

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[§§§] An exception is work by McKenzie, Gibson and Stillman (2006), who take advantage of the random allocation of New Zealand visas to Tongan residents.

to Greece, a list of contact information of migrants was created from the 2005 Albania LSMS. The phone numbers collected from the original households in Albania were first used by a team in Greece to make a first attempt at contacting the migrant and arranging for an in-person interview. If that failed, either because of refusal or because the migrant could not be found, the team based in Albania re-visited the original households and asked a household member's assistance in contacting the migrant by providing a phone card. In case of positive response, the Greek team would be informed to immediately contact the migrant and arrange for an interview. Despite much effort, however, the survey was successful in locating less than 50 percent of migrants in the original list[****]. Finally, an even more challenging endeavor is to account for, and track, joint migration of entire households. If joint migration is particularly high and of relevance to the analysis, one could think of gathering limited information on the migrant household from the current occupants of the dwellings or, if vacant, from relatives or friends living nearby.

To learn about whether or not current household members have migration experience, in-depth information about migration histories of current household members should be collected. As previously stated, this information should be collected over at least the reference period for migration (e.g. 5 years), and perhaps longer if a salient event took place in the country slightly farther back in the past that changed the nature of migration opportunities. To ensure that something is known about the household conditions prior to that person's migration, it is useful to also collect other selected information. For example, one could collect information on occupations or assets in the household prior to, during, and after the migration spell of any household member who had migration experience. Other information, often subjective, might also be worth collecting for individuals who are potentially return migrants, such as whether or not they plan to leave the household again; and the reasons for return. Some potential reasons for return, such as health of household members, can be corroborated in other parts of the survey.

VI. Concluding remarks

The goal of this note has been to provide the reader with guidance on some of the issues likely to be faced in measuring international migration. Given the limited scope of this note, it is in no way comprehensive. The emphasis has intentionally been on some aspects of migration which, we believe, are more relevant to the development community, also in an attempt to highlight some of the areas toward which future efforts could be aimed at.

While censuses generally provide information on the stock of immigrants, discrepancies in definitions, and their low frequency and narrow informational base, makes them of limited use for detailed policy analysis on migration. However, the potential role of censuses as sampling frame for migration surveys must be acknowledged and appreciated. While to date census information has provided acceptable sampling frames

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[****] To reduce data collection costs in Greece, the original list only included migrants which lived clustered in groups of at least 5 observations, resulting in the exclusion of a considerable number of spread out observations in small islands of the Greek archipelago.

for area sampling in destination countries, in the future more consideration should perhaps be given to enhancing their use as sampling frame for household surveys in sending countries through the inclusion of a limited set of questions to identify households with out-migrants. The lack of adequate sampling frames remains the main bottleneck to the successful design of migration surveys in sending countries. The 2010 round of population censuses, currently under way, provides a unique opportunity for raising the issue and follow through with National Statistical Offices in high emigration countries.

Until sending countries include questions on out-migration in their census surveys, probability surveys of migrants in sending countries will have to rely on complex and innovative sampling designs. In most cases, a listing operation to identify migrant households will be needed; this should be properly planned and budgeted for when designing a study.

In terms of survey design, all available options should be considered, including piggybacking on an existing multi-purpose survey. Although there are some clear drawbacks with this approach, both in terms of sampling design and questionnaire content, in most less developed country contexts it may still be the preferred and more cost-effective solution. Proper planning, including early involvement of data users in the design stages of the survey, is crucial to ameliorate some of these shortcomings. Reliance on a sampling expert is also recommended.

Given the nature of migration surveys, the use of proxy respondents is inevitable. This will affect both the quantity and quality of information which can reasonably be collected on migrants. However, as evidenced by several recent surveys, sufficient information for a full characterization of migration can be gathered successfully. When feasible, the use of tracking surveys, implemented sequentially on a (sub)sample of migrants from households in the core survey, should be pursued. Although the high costs and problems with attrition are clear disincentives, the potential benefits may be sizable. Also, the use of panel surveys can obviate some of the limitations of current surveys in adequately measuring the effects of migration.

Finally, although good practices in the use of household surveys to measure international migration now exist, more validation of methods is needed. A more concerted effort to design and implement methodological work in the area of measurement of migration and its impact using household surveys is called for.

ANNEX I. Useful resources and references

A number of websites and printed resources are available to researchers and practitioners in the area of migration. Some useful links are the following:

World Bank Migration Thematic Group
www.worldbank.org/migration

World Bank Living Standards Measurement Study
www.worldbank.org/lsms

Migration Information Source
http://www.migrationinformation.org/

Population Division
http://www.un.org/esa/population/unpop.htm

United Nations Department of Economic and Social Affairs / International Migration and development
http://www.un.org/esa/population/migration/index.html

United Nations Statistics Division / Migration
http://unstats.un.org/unsd/demographic/sconcerns/migration/default.htm

In addition, a number of publications, some of which can be found in the web pages listed above, could also be consulted:

Bilsborrow, R., G. Hugo, A. Oberai, and H. Zlotnick. (1997). *International Migration Statistics: Guidelines for Improving Data Collection Systems* (Geneva: International Labour Office)

Grosh, M.E, and J. Muňoz (1996). A manual for planning and implementing the LSMS survey, Living Standard Measurement Study Working paper no 126, World Bank, Washington, DC.

United Nations. (1998) Recommendation on Statistics of International Migration: Revision 1, Statistical Papers Series M, no. 58, rev. 1, Department of Economic and Social Affairs, Statistics Division, New York, NY

World Bank (2000). Designing Household Survey Questionnaires for developing Countries: Lessons from 15 years of the Living Standards Measurement Study, edited by M. Grosh and P. Glewwe, Washington, DC

Finally, technical assistance in the design and implementation of household surveys is provided by staff at the Bank, including members of the LSMS team who can be contacted at lsms@worldbank.org.

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Sasin, M, and D. McKenzie (2007) Migration, Poverty and Human Capital, Migration Operational vehicle, Operation Note no. 1, World Bank, Washington, D.C. http://siteresources.worldbank.org/INTMIGDEV/Resources/MOVeOperationalNote1M WG_0307.pdf

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