Does data quality explain the differences in the current global estimates for mortality and education?

By

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This note discusses data quality as one of the main issues associated with the found differences between the global estimates for mortality and education produced by International Organizations. Areas of great interest and importance related to data quality are the data sources used to produce mortality and education estimates (administrative records, censuses, and household surveys), population projections used to produce estimates, institutional capacity and ability to assess country estimates and to build capacity.

In addition to the quality issues, this note argues that there are other issue/areas of impact that should also be considered when looking at the coherence of data published by International Organization. The reference here is to political issues/changes as in the case of the CEE/CIS and Baltic States, the existence of different data bases, the use of different methodologies for estimation, different interpretations of those data bases and results, and the fact that International Organizations have different schedules and priorities for reporting. In order to improve coordination these issues should be addressed and this note presents a set recommendations.
I. INTRODUCTION

New and better quality data are constantly pursued at the country level by governments, civil society groups, international organizations, and NGOs to develop policies, programs and interventions, and to monitor their accomplishments in improving the living conditions of different populations. At the international level, data of good quality is needed to monitor the goals and targets agreed at international forums and in particular for the Millennium Development Goals (known as the MDGs). The progress towards the MDGs for example is monitored and reported at the country and global level following specific methodological guidelines around previously defined indicators (27 indicators for 8 main goals).

At the country level, governments are responsible for the accomplishments of the MDGs with the support of civil society, international organizations and NGOs. At the global level, the reporting towards the MDGs is coordinated by UNDP including international organizations and NGOs with one or more agencies responsible for the production of global statistics by goal. The challenge for both two levels of reporting (country and global levels) is ultimately the determination of the data and methods of estimation to be used, especially in those cases where more than one estimates is available.

More than one estimate for a particular indicator (under five mortality rate – U5MR- for example) may exist for any country at any particular time when using different data sources (vital registration, census, or household survey data), or methods of estimation (vital registration, birth histories, indirect estimation, modeling, projections). The estimation of MDG indicators, at the country and global levels, do have an embedded a “negotiation” processes among the actors involved in their production. These negotiation processes involve high level of expertise and knowledge of methodologies, policies and programs. In the case of U5MR, the negotiation of the levels child mortality involves the participation of ministries of health, national statistical offices, NGOs, and WHO as the main international agency for health. Since the level of U5MR are highly correlated with the level of development and ultimately refers to children, the World Bank (WB) and UNICEF use this indicator to determine their programmatic activities (both globally and at the country level). When we combine different institutional and political interests with different data sources and methodologies, often the end result is different estimates of U5MR at any particular time. Although the global MDG yearly reporting values for U5MR are agreed values between WHO, the WB and UNICEF, these reported numbers are not necessarily the same reported by each agency in their respective publications or the values reported by the individual countries (both in their MDG report or in their publications). However, the number of countries for which the reporting is coherent across agencies is the majority. The challenge for these organizations is then to work in resolving the observed differences, in the smaller number of countries, following standard assessment methodologies and estimation techniques.

This description is not different for the education indicators embedded in the MDG 2 (universal primary education and 3 (gender equality and empowerment
of women) or other indicator regularly used by international organizations. The objective, in the next sections of this note, is to identify the factors responsible for the differences between estimates provided by international organizations. Among these factors, particular importance is given to the issue of data quality.

The next section describes the common grounds in which international organization develops monitoring and reporting activities as well as the broad issues affecting these processes. Sections III and IV illustrates how U5MR and education estimates can differ between agencies under different assumption of data quality. These two sections also include additional factors associated to the observed differences in estimates provided by international organizations for U5MR and for education indicators. The last section of this note summarize the results and provides a set of recommendations to minimize the effects of the identified reasons for lack of coherence of data published by international organizations in these two areas.

II. DATA QUALITY OF U5MR AND PRIMARY NET ENROLMENT RATIOS

International organizations systematically report on internationally agreed indicators. Data for these indicators are to be produced using clear definitions and guidelines for data collection, assessment, analysis and reporting at the country level. Data are regularly produced, at the country level, by vital registration systems, administrative records or surveys (households, institutions, etc.). The assessment of the collected data takes into account methodological and definitional issues, trends analysis, internal and external consistency of results as well as the conditions affecting the data collection process.

The reality across countries is a complex one with important variations between and within data sources. Vital registration systems and administrative records in developing countries are consistently affected by problems related to definitions, timing and coverage of reporting. Countries that formed the Soviet Union, for example, have used for years a definition of what constitute a "live birth" which is at odds with the WHO international recognized definition. Similarly, NER estimates at the country level can be produced by using either the International Standard Classification of Education for primary (ISCED 1)\(^1\) as used by UNESCO or the country specific NER definition according the ministry of education guidelines\(^2\).

As a result, different estimates of U5MR and NER are obtained when using either definition. Similarly, in many countries vital events are not registered on a timely fashion and/or do not cover the country as a whole. It is common to

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1 A classification system designed as an instrument for assembling, compiling and presenting comparative indicators and statistics of education both within individual countries and internationally.

2 In the case of Bosnia and Herzegovina, the NER according to the UNESCO Institute for Statistics (UIS) should be estimated for children 6-9 years of age while at the country level, the NER is estimated for children 7-14 to report on the concept of compulsory education rather than primary.
see countries reporting vital events with high levels of underreporting due to late reporting and/or low levels of coverage of the population.

Regular reporting by countries to WHO on vital registrations (births and deaths) and to UNESCO on education statistics are commonly affected by considerably levels of underreporting and internal consistency along common and expected variables (age, gender, place of residence, etc.). The yearly reporting by international organizations, as good as it is, has generated the possibility of year to year comparison of estimates that do not support the exercise. As we will see in section III and IV, these indicators rarely show real changes during short periods of time and changes in those indicators can easily be generated by factors related to data quality or measurement changes.

One of the important challenges when using vital registration and administrative records is to identify an appropriate reference population or denominator to obtain the desired indicator (U5MR or NER). The population reference/denominator for vital events (mortality and births) is usually obtained from population projections, which by themselves poses a whole new set of parameters, assumptions and limitations. At the same time, vital registration systems have advantages when implemented with national coverage, allowing for geographical and demographic estimations. These estimates can be easily combined with data obtained from other data sources (household surveys) to arrive to more robust estimates.

Surveys have emerged as a measurement alternative in those countries where vital registration or administrative records are not existent or of deficient quality. Although not affected by the reference/denominator problem, sampling and non-sampling errors must be taken in consideration when interpreting their results. Similarly, the measurement and definition of indicators can be different from the ones using vital registration or administrative records and this is illustrated below.

III. UNDER FIVE MORTALITY RATES (U5MR)

As mentioned before the U5MR is highly associated with the levels of development of any society or country. It is defined as the probability that a child born alive has of dying before his/her fifth birthday. As many other indicators, the U5MR needs a definition of a numerator (number of deaths of children less than five years of age born during a specific year) and a denominator (number of children born alive during a specific year). U5MR estimates generated and regularly published by international organizations tend to have low coherence. Thus, the 2002 U5MR estimates by WHO and UNICEF exhibit differences of at least 5 percent in 129 out of 196 countries (in 85 the differences were of 10 percent or more) for which estimates were available.

The issues of data coherence between the U5MR values published by international organizations are all associated with the characteristics of the data included in the numerator and denominator of this probability. These characteristics can be classified under the following categories:
1. The data sources used (vital registration or surveys)
2. The methods of estimation (direct or indirect approach)
3. The type of adjustments done to the original data (fitting trends)
4. The use of interpolation and extrapolation procedures, and
5. The timing of the results publication by each agency

1. Data sources used to estimate the U5MR

The two most common data sources to estimate U5MR are vital registration of births and deaths and household surveys. When using vital registration, the U5MR is usually defined as the number of deaths of children less than five years of age per 1,000 live births in a given year. Both the denominator and numerator when obtained from vital registration statistics can present different levels of under reporting. Alternatively, the denominator can be obtained from existing population projections but this decision can also produce different results depending on the chosen value.

Estimates from vital registration can also be affected by differences in the definition of live birth. In Uzbekistan, for example, the U5MR reported by WHO using vital registration is 32 per 1,000 live births compared to 68 reported by UNICEF using household surveys estimates. Although the vital registration estimates could be affected by under reporting of events, by now, we know that most of the differences are due to definitional problems. On one hand, the World Health Organization (WHO) uses the following definition of a ‘live birth’ since 1950: “The complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached.” (WHO, 1992, definition 3.1).

Soviet Union and some Central and Easter Europe countries maintained an alternative and less rigorous definition of live birth. The Soviet definition only counts breathing as a sign of life, and presumes infants who are born before the end of 28 weeks of gestation, or who weigh less than 1,000 grams at birth (there is considerable overlap between these two groups) to be non-viable – they are not counted as live births until they have survived a full seven days (or 168 hours). If they survive for less than this time, they are considered as miscarriages, and not counted at all (Aleshina and Redmond, 2003, and Kingkade and Sawyer, 2001).

Household survey data as the one collected by the Demographic and Health Surveys (DHS) program, UNICEF’s Multiple Indicators Cluster Survey (MICS) or CDC’s Reproductive Health Survey (RHS) produce information to assess vital registration estimates and to estimate recent levels of U5M. U5MR from survey data can be obtained using birth histories (direct estimates) or the Brass approach (indirect estimates). These estimates are affected by sampling errors and by the quality of the data collection, processing and assessment (non sampling errors).
Generally, difference in estimates produced from household surveys of not less than 10 percent can be easily accounted by sampling errors variations as illustrated by a recent DHS comparative report of mortality estimates (Mahy, 2003). In this sense, U5MR rates published by international organizations are coherent for global estimates and for most of the countries. Currently, WHO, the WB, the UN Population Division (UN-PD), and UNICEF are undergoing a coordination exercise to obtain infant and U5M at the country and global level. This exercise is looking at the data sources and methodologies used by the four agencies, and aiming to the establishment of a unified methodology for U5MR estimation that will produce the values for the 2005 MDG Report.

2. Methods of estimation

The ideal method of estimation is the one that can be used with vital registration information on births and deaths. However, as we discussed before these type of information is frequently incomplete and can yield misleading results. There are two basic approaches to estimate U5MR from data collected via household surveys: birth history and the Brass approach better known as the direct and indirect methods respectively.

Both methods have limitations in terms of the assumptions and methodologies (see Shryock and Siegel, 1999 and UN Manual X, 1978), that can not be disregarded when providing estimates, interpreting results, or forecasting future trends. In the process of producing country and global estimates of U5MR, international organizations make use of all the available estimates although not necessarily in a standardized manner. Sometimes, more credibility is given to the vital registration information as may seem the case by WHO since they do work directly with the countries in the production of vital registrations. UNICEF and the WB use all the available estimates and adjust them to a model of estimation that produces a trend line along time for current and future estimation. The UN-PD obtains U5MR that are consistent with the levels and structure of adult mortality to produce population projections. As mentioned before the interagency coordination effort is a challenge to standardize mortality estimates across agencies.

A much bigger challenge here is how to translate these approaches at the country level. This requires not only the existence of the empirical evidence and methodological advantages but also the existence of the capacity to use it and to coordinate at the country level. Often, MOH produce U5MR based on vital registration, while the NSO based its estimates on survey data. Likewise, international organizations lack technical capacity at the country level to use these data and methodologies and to create the needed capacity with counterparts.

3. Type of adjustments done to the original data
Both vital registration and survey data are assessed for internal and external consistency. The number of deaths for example should be consistent with an expected structure by age, gender and place of residence as well as with past observed trends. One common used way of minimizing the observed differences in U5MR estimates is to fit a model throughout the existing points as in the example below for Uzbekistan. While the WHO estimates based on vital registration values seem to indicate a sharp decline in the levels of U5MR, the survey data from DHS and MICS show also declines but at a slower pace. The fitted model is much less conservative on assessing the decline of U5M in Uzbekistan and tends to maintain the trends identified by the surveys.

One disadvantage of this estimation process for U5MR is that countries are not involved in the definition of the most likely model that fits the country’s conditions and therefore lacks their ownership. Consequently, when countries find these values in publications of international organizations (e.g. UNICEF’s State of the World’s Children), they find this not encouraging and disorienting especially since they are the ones that produced the original data use in the modeling. The potentiality of this approach can be maximized by extending the interagency coordination to involve individual countries officials in the determination of the most appropriate model. Alternatively, country officials can be brief and trained in the use of this methodology and the obtained results.

4. Use of interpolation and extrapolation procedures

One of the advantages of fitting models to existing data, as described before, is the possibility of obtaining estimates within the trend line produced (interpolation) or for values beyond the defined line (extrapolating/forecasting) into the future. Forecasting becomes relevant when measuring progress towards the MDGs in 2005 or 2015 in terms of the requirements to get to the desired goals. Data published by international organizations may lack coherence if the published values are based on estimates obtained via interpolations or extrapolations based on models, since in most of the cases these estimates do not coincide with the original data produced at the country level. This is further complicated when different organizations used different assumptions in their modeling as in the case of UNICEF and the WB estimates.
Often, UNICEF and the WB use different weights to fit the same observed data points to a desired model of U5MR predictions (using the same methodology). The current inter agency effort to coordinate efforts for U5M estimation is looking carefully at the possibility for either use standard weights and/or the coordinated use of common weights across agencies. Yet, it is important to emphasize again that estimates obtained from models that use vital registration and survey data tend to minimize the error observed for individual estimates.

On the other hand, and as in the modeling case, the obtained estimates tend to be different from the values produced at the country level (often based on one data source or method) generating in this way the before mentioned consequences of no coordination between estimates and distrust on values generated by international organizations. It is of imperative importance to
promote coordination in the production of U5MR estimates not only between international organizations but also with agencies and officials responsible at the country level for the production of U5MR estimates.

5. **Time of the publication of the results by each agency**

U5MR estimates produced by international organizations are often different due to timing of their yearly publication. For any specific year, data published towards the end of the year, as in the case of the State of the World’s Children (SOWC) by UNICEF, which is published in November, includes more up to date U5MR estimates than earlier publications, as in the case of the World Health Report by WHO published in March and the World development Report by the WB published in April every year.

In reality, these estimates tend to have high levels of coherence when observed along time and space. For a limited number of countries observed differences are due to the other reasons analyzed before as in the case of the CEE/NIS and Baltic States. It is important to emphasize the need for greater coordination among international agencies for sharing of data sources, use of model estimation, and coordination at the regional and country levels. Of particular importance is the coordination with agencies and officials in charge of U5MR estimation with emphasis in capacity building.

IV. **NET ENROLMENT RATIOS (NER)**

NER values published by international organizations for primary education (UNESCO, UNICEF and the WB) often present important differences not only in the levels and differentials (total and by gender, place of residence, etc.) at the country and global levels but also in terms of the associated estimates of the absolute numbers of children out of primary school. Therefore, the UNESCO Institute for Statistics (UIS) 2003 Education Digest and the EFA Global Monitoring Report, published NER values for primary education for the year 2002(??) that for many countries are substantially different from the ones published in UNICEF’s 2004 State of the World’s Children. These differences are also reflected in the reports by the WB, UNDP, and any other agency using UIS data in current and past publications. Here again, the differences can be analyzed by considering factors associated with the process of producing, assessing, and use of the data needed for NER (numerator and denominator):

1. The data sources used (administrative records or surveys)
2. The methods of estimation (enrolment or attendance)
3. The type of adjustments done to the original data (fitting trends)
4. The timing of the results publication by each agency

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3 The net enrolment ratio (NER) is defined as the number of pupils in the official age group for a given level of education who attend school in that level, expressed as a percentage of the total population in that age group.

4 Household survey data can collect data on enrolment and/or attendance.
1. Data sources used

The primary NER published by UIS, and included in the EFA Reports, MDG Reports, WB, and UNDP reports are based on data obtained at the country level from administrative records. Every year, the UIS collects information from ministries of education on the number of children enrolled in primary education by grade, age, and gender. UIS uses this information in conjunction with the population estimates from the UN-PD, to derive primary NER estimates. UNICEF also incorporates primary NER in its SOWC yearly publication but complements the NER data with data on school attendance (NAR) obtained from household surveys\(^5\). In general, enrolment and attendance refer to different concepts, one referring to the intention of participate in school and the other referring to the actual participation in the system. For the interest of this presentation, it is assumed that attendance is the desired situation for children.

The graphs included below are illustrations of NER and NAR estimates for the last 20 years in five different countries (Rwanda, Niger, Senegal, Bolivia and Indonesia) using data from administrative records and household surveys (DHS and MICS). It is assumed that in general, the NER values tend to be higher than the NAR since not all enrolled children ended up attending school. The displayed data not only confirm this assumption but also confirm to us the complementary value of household survey data when trying to determine either enrolment or attendance. For the five countries both pieces of data are very consistent in reflecting trends, levels and differences between boys and girls.

However, some differences are also evident. In the case of Rwanda for example, the UIS and EFA values signal a almost universal enrolment for children of primary school age, while the survey data (DHS and MICS) confirm rather levels of primary school attendance in pace with the levels of enrolment observed during the period 1980-90. The Bolivia and Indonesia data also seem to indicate the existence of lower levels of participation than the indicated by the enrolment data. As shown in the next sections, data quality is an important aspect for consideration when trying to estimate enrolment and to explain difference between data sources. This is of particular importance for those countries that have achieved levels of primary school participation above 85 percent.

The conclusion from this analysis is not that household survey data is better that data obtained from administrative records. As a matter of fact, the discussion should start with the basic premise that in real life, data from administrative records should be ideal and sufficient. Unfortunately, reality is different in many countries and we need to resort to data obtained via household surveys to assess and adjust existing official estimates. In other words, household surveys data should be seen as a complementary data sources for existing official data collection systems. Complementary also because, NAR estimates obtained from surveys such as DHS and MICS are also affected by sampling and non-sampling errors.

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\(^5\) The primary net attendance ratio (NAR) is similarly defined to the NER but instead of enrollment, the measurement is on attendance during the week before the survey or at any time during a school year.
The graphs also illustrate the possibilities that these data provide to international organization to end up with different estimates of indicators. It is true that conceptually NER and NAR are different, but internally they should maintain minimum levels of comparability and complementarities. Household survey data should be used more actively to assess administrative records and to determine not only past and current levels of school participation but also to implement analysis of their differentials and determinants according to current socio-demographic conditions. Likewise, data on attendance could also be produced, assessed, analyzed and reported together with the data on enrolment as done by UNICEF in the State of the World’s Children yearly publication.
2. Methods of estimation

Primary school net enrolment and attendance ratios are estimated and reported by international organizations according to the internationally agreed classification (ISCED1, 1997 revision). This classification reflects, for each country the age range corresponding to the primary school cycle. Both NER and NAR are summary ratios of observed single age ratios of the respective levels of school participation. The analysis of single ages of primary school enrolment or attendance is of importance to assess the quality of the data used to produce both primary school enrolment and attendance ratios. The graph included below illustrates the single age school participation for Indonesia obtained from administrative records and household survey data.

![Proportion of children attending school by age and data source. Indonesia](chart.png)

Primary school ages for Indonesia are 7-12 and the respective NER and NAR are 96% and 89%. One way of understanding this difference is by looking at the individual age estimates from both sources where we can identify two main points:

a. The administrative data is reflecting values over 100% for the ages 8, 9 and 10 which are not possible in reality. This indicates that there are more children of a specific age enrolled in primary school (the numerator) than the total number of children of that age in the total population (the denominator). Either one of these two values or both could be incorrect and responsible for producing values above 100%. Given that the denominators are obtained from the population projections prepared by the UN-PD, it seems more likely that the errors reside in the data obtained from the administrative records and reflected in the numerator.
b. A further indication of quality issues in the administrative data is observed in the drastic change observed from age 11 to 12 and then a recovery at age 13. The observed change seem to be more associated to reporting data quality issues for this age group rather than a real change. Notice that the values presented for age 12 includes children enrolled in both primary and secondary education.

Here again we should emphasize the value and importance of survey data to better understand the data obtained from administrative records and the need to consider it when assessing and determining the current levels of school enrolment. In the case of Indonesia, we could see the consistency of the age pattern depicted by the MICS data. UIS and UNICEF are currently involved in a technical work to optimize estimates of NER/NAR using all available data sources and to jointly produce estimates of the number of children out of primary education.

3. Type of adjustments done to the original data

The NERs and NARs values published by international organizations reflect to some extent the direct situation at the country level obtained via administrative records and household surveys. Survey data adjustments are implemented during data collection and analysis to reflect the situation of countries collecting data during periods outside of the normal school duration. Survey data is also assessed using standard procedures for data quality.

UIS data on the other hand is presented based on three modalities of estimation: using national data on enrolment and the UN-PD estimates, using estimates produced by the country, or using UIS estimates based on other sources or existing data. Estimates are often affected by recent changes in the primary education structure or in the calculation of enrolment ratios.

There are not statistical models of fitting trends and adjusting existing data to a model to predict past, current, and/or future levels of enrolment or attendance. This exercise could be developed using all available estimates, minimizing variations and errors in existing estimates and producing results that could be easily used by different organizations.

4. Timing and periodicity of publication of results by each agency

Most of the international organizations do report on education indicators on their yearly publications, including the most up to date estimates. The production of these estimates can also create lack of coherence between values produced by the same organization and between organizations. This is mostly due to the pace at which data is generated and to the improvements in measurement along time.
Users of up to date estimates are not aware for example that primary NER estimates included in the 2003 UIS and 2003/2004 EFA reports are for the year 2000/2001 and that estimates refer to three years before the time of publication\(^6\) (UIS, 2003 and UNESCO, 2003). UNICEF’s 2004 SOWC reports on primary NERs and NARs are referred to the periods 1997-2000 and 1992-2002 respectively to guarantee the inclusion of estimates for a greater number of countries.

Since these reports have been produced for more than one year in the past, users tend to compare estimates produced for two or more years often reaching to erroneous conclusions. Changes in the primary NER/NAR are easier to identify over longer periods of time (3 or more years) rather than from one year to the other when data quality issues and measurement issues could account for the observed differences. Better monitoring and reporting by countries from one year to the next as well as changes in the number of year or ages included in the primary cycle are often responsible for changes between years. Trends analysis encompassing all available information, and perhaps adjusting a prediction model, may be able to minimize instances of no coherence between data published by international organizations and of spurious conclusions embedded in analysis based on data produced for shorter periods of observation.

As with the U5MR analysis and discussion, the NER/NAR estimates produced by international organizations can also differ due to timing of their yearly publication. For any specific year, data published towards the end of the year, as in the case of the State of the World’s Children (SOWC) by UNICEF, includes more up to date NER/NAR estimates than publications produced at the beginning of the year, as in the case of the UIS Reports. In any case, the identified differences should be real ones and should not be considered as cases of lack coherence in the estimates.

It is important to emphasize the need for greater and constant coordination among international agencies for sharing of data sources, assessment and estimation procedures, and coordination at the regional and country levels. Of particular importance is the coordination with agencies and officials in charge of education indicators estimation with emphasis on capacity building.

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\(^6\) Primary school enrolment data for the school year 2000 were reported to UIS by member states in 2001-2002 using a standard questionnaire. However, for some countries these data are collected via surveys under the World Education Indicators (WEI) project or provided by the Organization of Economic Cooperation and Development (OECD) or Eurostat.
V. SUMMARY AND RECOMMENDATIONS

This note started with the basic assumption that statistics published by international organizations are not always coherent. This seems to be the case for the values published by UN agencies for two important socio-demographic indicators: under five mortality rate (U5MR) and the net enrolment/attendance ratios (NER/NAR). Differences between these estimates are associated with issues of data sources, data quality, methods of estimation, levels of analysis, and timing of the publications.

Vital statistics (births and deaths) and data obtained from administrative records are the most desirable and commonly used data sources to monitor levels and trends of U5MR and NER. However, when producing these indicators, very often these data sources are not complete or are not consistent with the population to which they refer. Alternatively, household survey data represent an alternative to improve estimates for these two indicators and to improve the routinely systems of data collection.

The examples included using vital registration, administrative records and survey data illustrated the issues of data quality and the complementarities of these data sources for the analysis of current levels of U5MR and primary school participation, trends, and analysis of their differentials and determinants.

Improvements in the coherence of estimates produced by international organizations can be achieved by including all available estimates, obtained from different data sources and methods, when producing those estimates. It is also desirable to adjust existing estimates and trends to statistical models that minimize the discrepancies between estimates and allow for estimates that can easily be used by different organizations. One last challenge for international organizations is to include in this process of estimation government officials at the country level.

This note also emphasizes the need for greater and constant coordination among international agencies to increase sharing of data sources, procedures of estimation, assessment, and coordination at the regional and country levels. Of particular importance is the coordination with agencies and officials in charge of producing estimation of U5MR and education indicators with emphasis on capacity building.
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