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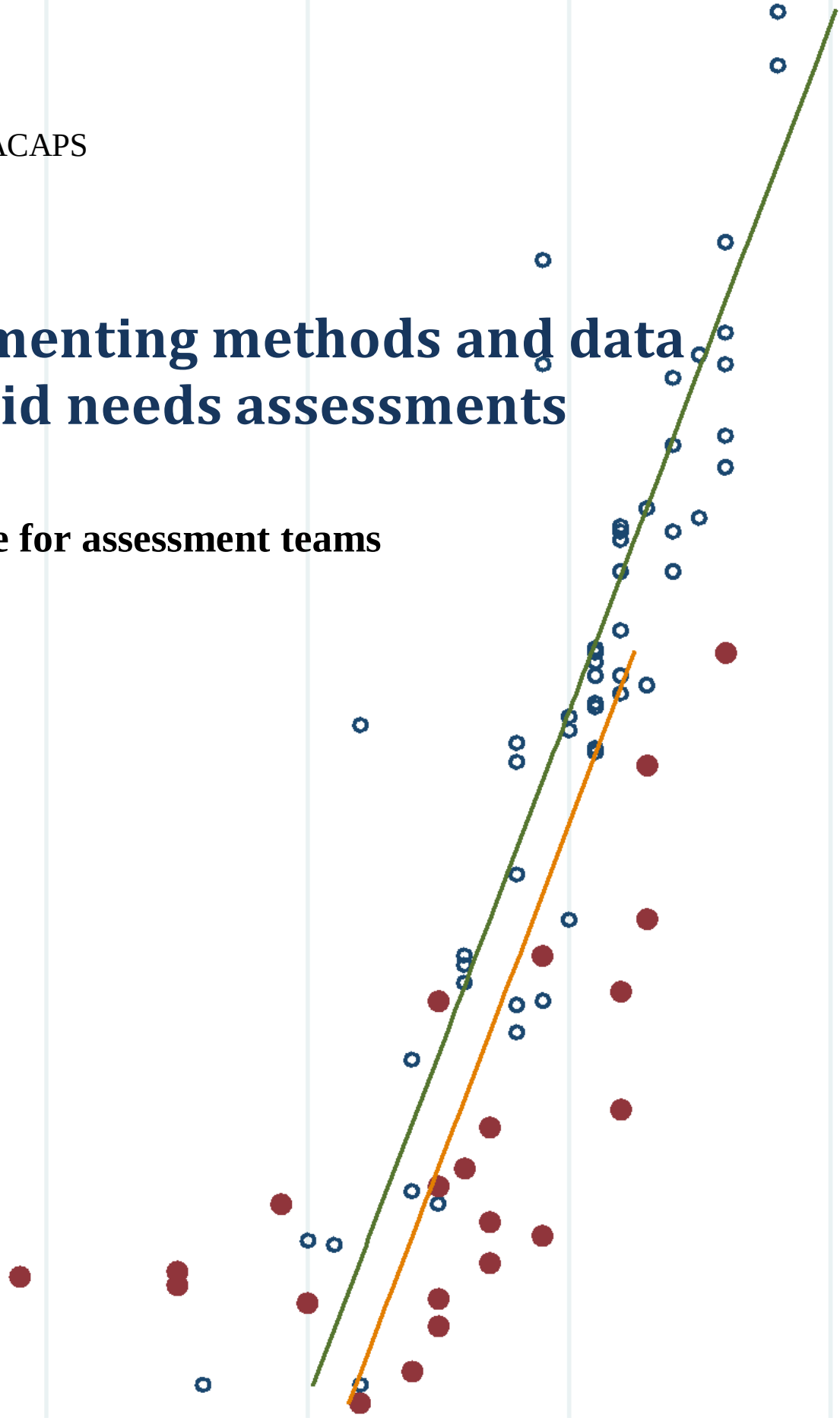
A note for ACAPS

Documenting methods and data in rapid needs assessments

Guidance for assessment teams



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Tables and figures

Acknowledgement

For the structure of the sections on data and methods, I have been inspired by "The Chicago Guide to Writing about Multivariate Analysis" (Miller 2005). Patrice Chataigner, with ACAPS, drew my attention to the Guide.

The metadata recommendations regarding GIS projects largely follow advice from Olivier Cottray, Geneva International Center for Humanitarian Demining, and Charles Conley, iMMAP, Washington DC.

This and related notes are available from the Resources page of the ACAPS Web site, at http://www.acaps.org/en/resources.

Summary

This note offers guidance for writing the methodology section of rapid needs assessment reports. It also enumerates good practices in documenting the databases that the assessment team leaves behind for its principals, successors and other interested parties.

The recommendations are presented in a short version for the rushed reader, and in a longer one that provides rationales.

The section on data addresses the "who" and "what" of the universe and sample used in the assessment. The section on methods deals with the "how", and specifically with

- Design and design participation
- Data collection methods
- Sampling process
- Data processing
- Analysis methods and participation

The database section assumes that data will be held in spreadsheet and GIS applications and enumerates requisite metadata and additional good practices.

The data and methods chapter should be short, not exceeding six pages. It is short because of time pressure and of the fatigue that dampens both those who write and those who read it. This has several consequences:

- Information about the data that is not of general interest should be described in the metadata areas of the databases, not in the report.
- The chapter must not be a restatement of the terms of reference or a condensed version of the substantive chapters.
- Outside the mandatory basic points, interest in the chapter is best stimulated by focusing on the unusual and on methodological innovations that the assessment contributed.

Our approach to "Data and methods", therefore, can be summarized as *"culture before checklists"* - the chapter is to argue the methodological soundness of the assessment while giving the analyst considerable freedom as to how he makes his case.

"Methodological soundness", however, is a backward-looking concept unless the analyst makes an effort to formulate at least some points worth remembering when the next disaster strikes, and the next assessment begins. This is chiefly a matter of style and emphasis, of highlighting the unusual over the trivial, the innovative over the well-rehearsed, the teaching moment over the accountant mindset.

Recommendations - Short version

This is a short version of the recommendations, stripped of most of the rationales given in the longer chapter. The recommendations regarding the metadata to be placed inside the databases are not abbreviated here; only a reference to them is given to the pages where you find them in already fairly condensed formulation.

Generalities

- Empathize with the readers of the assessment report, with your personal successor in the team, other assessment teams, with others needing to re-use the data.
- Make limitations, strengths and innovative content of data and methods transparent.
- Make the data reusable.
- Write the "Data and methods" chapter such that it strengthens the credibility of the assessment.
- Do not re-write yet another substantive summary or restate the terms of reference.
- Give credit to participating stakeholders, in ways that highlight the networked approach, not as a substitute for methodological accountability.

You determine the reasonable effort, space and detail. Write as little as you can, as much as you must, but do provide the level of detail that enables the reader to understand the limits of validity, reliability and completeness as well as the value-added to the wider assessment culture and toolbox.

Information is required both on the data and on the methods by which they were collected and analyzed. Detailed variable descriptions belong inside the databases, in spaces meant for metadata, not in the report.

Data

The data section speaks to cases, content (variables) and values, in different detail.

Cases

- Define the universe, the set of units (affected groups, communities, areas) about which the assessment was conducted and the resolution of the data (villages, subdistricts, districts, etc.).
- Define the denominators if impacts are described in rates or ratios.
- Describe sample *size and structure* (by area, group, data-collecting agency, whichever is of chief interest) but reserve the description of the sampling *method* for the methods section.
- [As a style reminder for the entire report: If the sample size is below 100, use absolute numbers, not percentages.]

- A map colored by coverage intensity (e.g., *"Full enumeration in all sub-districts" / "Some enumerations, some estimates" / "Estimates for all sub-districts" / "Global district estimate" / "No estimate so far"*) may be helpful.

Content

- Briefly enumerate the topics on which detailed data were collected and refer to the database(s) that contain more detailed descriptions of the variables.
- Enumerate the topics and sources of important secondary data sets *("Data on the number of mobile phone calls made out of sub-districts in two periods immediately prior to and after the earthquake - an indicator of service disruption - were obtained from ..").*
- Give more detail if measures are used that are not intuitive, unconventional, or derived in complex modes.

Values

- Restrict remarks to missing values and problematic outliers. Refer to places where the users may find descriptive statistics (annex, tables in Excel workbook).
- Note missing value problems if significant numbers of cases are excluded from some or all analyses because of missing data. If imputations were made, describe them in the methods section.
- If cases are disqualified or adjusted because of suspect values (extreme outliers), note extent and coping measures *(".. will be resurveyed next month ..").*
  [Caveats about problematic data have to appear also in the substantive chapters (e.g., *"The districts <u>for which we have data</u> reported that .."*)].

Methods

Design

- Unless taken care of in other chapters, describe how the assessment was designed, and which organizations were active in the design.
- Describe the data collection methods in minimally instructive detail *("Teams of interviewers sat with small groups of key informants in each of the visited affected villages, conducting semi-structured interviews in Haussa and Fulani, using a common thematic guideline printed in English. In addition, the teams conducted short interviews with, and collected attendance statistics from, personnel of schools and health care facilities found operating within a one-kilometer radius from the village centers ..").*
- Elaborate on the unusual and innovative, highly successful or unexpectedly difficult, language issues.
- State which instruments were pretested, and with what consequences.
- Do not claim multi-method synergies (e.g., triangulation) unless you can demonstrate some non-trivial benefit.

- If questionnaire interviews were one of the principal methods of data collection, attach the questionnaire(s). Mostly this has value for others only if you annotate them for what they should know (problems, rationales for category sets, etc.).

Sample

- Describe the sampling *process.*
- For purposive samples, state the dimensions in which the assessment sought to fathom range and diversity of impacts and needs, the planned and effective sample sizes (and reasons for significant deviations), the sampling frame (or frames) and the stratification. Describe convenience-sampling aspects, such as those imposed by logistics.
- A table of sample strata, with planned and effective units, is helpful.

Data processing and analysis

- Describe field-editing post-coding, translation (if any), routing, error-checking and data entry arrangements, use of novel media and problems of more than fleeting interest.
- Basic descriptive statistics do not warrant listing, save a reference where tables can be found. However, describe analytical statistics (= anything that uses probabilities), composite measures, spatial analyses, uncommon measurement units if any, together with the software used.
- If missing values are imputed, document method and extent (cases, variables). This holds also when statistics are based on zeros de facto replacing the missing. [In the database, create new variables for imputations and keep the original ones.]
- Unless taken care of elsewhere in the report, state data owner and public data source, or address at which to apply for releases.
- Just as with design and data collection, if stakeholders gave significant input to the analysis, describe it, in terms of events (workshops, etc.), translation support, interpretation and connections with third parties.

Documentation in the final datasets

- Provide minimum metadata in spreadsheet workbooks and in GIS projects
- In particular, for every important data table in spreadsheet workbooks, create a separate sheet listing all variables, with column number, variable names and labels, formulas, as well as other comments.

The requirements as well as recommended good practices are enumerated starting on page 29.

Introduction

This note details good practices that should be followed in documenting the methods used and the major data sets assembled during a rapid needs assessment. Methodological notes and annotated data sets - data about data, "metadata" - allow users to better see the scope, strengths and limitations of the assessment. They can be used also to highlight innovative qualities as well as critical connections to other endeavors, documents, data sets or standards.

Purposes of documentation

Such notes and metadata have both social and technical functions. Socially, they mitigate the loss of organizational memory when humanitarian personnel turn over. This is true regardless of whether persons come and go within the same assessment team, across cooperating teams, or across related assessments. The documentation is valuable particularly for later arrivals and for remote users who are not in direct contact with those initially collecting and analyzing the data. It helps them to make sense of the data and of their conceptual and institutional milieux.

Technically, the documentation makes the data reusable, linkable to data from other studies and safe from confusion with outdated, defective or unauthorized versions that tend to clutter hard drives and e-mail attachments.

Too little or too much guidance

Most needs assessment reports place their methodological notes in a distinct chapter although some minimal information regarding methods and data appears, by necessity, in substantive chapters and in the executive summary. It is reasonable to assume that the methodological chapter is the last one written, under time pressure, and sometimes after essential substantive chapters have already been shared and debated with some of the stakeholders. Time pressure and wind-down atmosphere may explain why there seems to be little or nothing in the way of minimum requirements for documentation and data preservation. In an informal review of 37 rapid assessment reports, all from major international disasters between 2004 and 2011, ACAPS noted that key methodological elements were treated very unequally.

Table 1: Methodological details in a sample of 37 assessment reports

Methodological elements	Reports detailing
Assessment date	34
Assessment objective	33
Data collection method	28
Sample size	22
Data limitations	16
Sampling design	15
Questionnaire attached	12

Even the customary assumption that reports would routinely carry, in appendices, the questionnaires used in the principal data collection proved incorrect.

[Sidebar:] A close look at some reports

In order to put a bit of flesh on the dry bones of prescriptive methodology, and also to honor those many assessment team members who troubled to give accounts of the how's of their work, we briefly scan four reports for the extent, style and notable takeaways. Here we are not so much concerned with the completeness of the data and methods section, as detailed in the above table, but with their orientation in time. Does the section essentially look backward, on what was finished, or does it (attempt to) send messages for future assessments?

The multi-cluster assessment in the Pakistan floods of 2010

The "Multi-Cluster Rapid Humanitarian Needs Assessment" (UNOCHA 2010) was administered in four provinces of Pakistan struck by massive floods in 2010. It dovetailed its methodological accounting between sections of the report and a collection of appendices made available, for a while, on a public Web site. In the report itself, the introduction has as much of a methodological thrust than the dedicated "Note on sampling and methodology". A "note on gender mainstreaming" elaborates on the gender-segregated information collection in villages and the subsequent merging of the male/female records in the analysis. Those sections together fill about five of the 54 pages.

With multi-stage selections made of districts (in Sindh also sub-districts), villages and households, the focus is almost entirely on sampling. Interestingly, districts were selected on the strength of information supplied by local NGOs and by preceding single-agency assessments such as a WFP Initial Vulnerability Assessment. Villages were selected, in three provinces, at random from a list of affected villages, and, in the more turbulent Sindh, by snowballing within the two subdistricts reported to have the most displaced people within each selected district.

While the account is informative, there is little to be taken away in terms of lessons learned. The "geographically dispersed purposive sample of the population in the areas most affected", with 383 settlements visited and 2,442 households interviewed, is massive by the habits of purposive sampling. As usual for this type, the authors affirm that their findings "*cannot be statistically extrapolated to arrive at firm numeric conclusions."* Is this really so? One is left to wonder why certain other options were not taken: 1. a much smaller sample of villages, without household-level data collections, and with an emphasis on speed, or 2. an attempt at representative

estimates of some kind, using auxiliary information (e.g. hydrological data) for some sensible post-stratification.

The Initial Rapid Assessment after the Haiti earthquake of 2010

The draft version of the "CDC Summary of Initial Rapid Assessment (IRA) conducted by UN OCHA in Haiti" (UNOCHA and CDC 2010) (121 pages) carries a brief summary description of the methods used (1 page) and a discussion of "limitations" (1 page). These are followed by a more detailed presentation in the appendix (5 pages with maps) and an extensive discussion of variables (as interview questions and response entered in PDAs) (11 pages). No fewer than 223 sites were visited; analytic sample size for substantive sections varied between 158 and 212.

This assessment is unusual in the sense that it drew and implemented a systematic, stratified, two-stage sample. The systematic selection was based on a complete tiling of the country by 10-by-10 km squares with random starting points and fixed intervals. The stratification was between the highest earthquake intensity area, which was Port-au-Prince (sections with complete census), and the rest of the country (sample of quadrants). The two stages were of sections in Port-au-Prince / quadrants outside and then two sites or settlements within each first-stage unit.

This data and methods section clearly has learning value for users engaged in future assessments. To the extent that the IRA tool had been standardized, the detailed, question by question, accounting of what went well and what less so, suggested areas to be revised and others to be kept flexible. The limited programmability of PDAs should give pause for the use of such instruments or, alternatively, fire up the development of rapidly reprogrammable survey software. The sampling is carefully documented, and reasons why, despite the systematic sample type, population-level estimates were not feasible are noted.

Bangladesh - Flooding and water-logging (2011)

This regionally limited disaster triggered a joint assessment in which 12 NGOs joined forces and collaborated with local government officials. The 87-page final report (Anonymous 2011) devotes two pages to the methodology. The section gives a succinct overview of different types of data (quantitative area based versus qualitative site-based) and of the geographical coverage. Some methodological points such as the scoring system for priority interventions are explained, briefly, in the substantive chapters.

Of note, the division of labor among NGOs was geographic for the data collection, but by sector for the analysis. Besides the site-specific focus group discussions, supplementary information was obtained through emergency market mapping and nutrition surveillance. All in all, 61 sites in 41 local government areas were assessed. The 41 Unions were designated by the government; the mode of selecting the 61 sites within them for focus group discussions is not explained.

The lessons to be taken away for others are essentially about the ability to rapidly form an effective task force from engaged NGOs and to create, within a two-day workshop, a common instrument that all will master in the field. Since participation, speed and consistency are often thought to be in conflict, some greater detail about this successful dynamic and its challenges, if any, would have been instructive. Also, the characterization of data as "qualitative" vs. "quantitative" is in part misplaced, here as well as in other rapid assessment literature, hopefully motivating the search for more appropriate labels.

Yemen - Joint rapid assessment of a regional conflict zone (2011)

In this assessment, six international NGOs with a tradition of working in the country were supported by ACAPS. The 157-page report is one of the densest in terms of quantitative

information, most of it presented in charts (ACAPS 2011a) (available at https://sites.google.com/site/ierpjna11/home). The 15-page methodology section carefully balances that orientation with institutional and assessment process information. The sampling of ultimately 46 focus group sites is derived over several pages, detailing the four sample strata (by type of conflict outcome) as well as the regional distribution (of IDPs and of the individual NGOs' mandates). Since the statistics are about estimated population totals per district, the sampling frame (we expect a list of sites to select from) is not entirely clear, despite the amount of detail. The effective sample, however, is fully transparent, by district, agency and affected group type.

In considerable detail, topics of security and access, training and ethics, data management and data collection instruments as well as the assessment timeline are covered. Little is said about the analysis although early on in the report the reader receives precise guidance as to how to read the charts.

In terms of accountability, the methodology section is more than sufficient, even generous. Doubts, however, arise as to the learning value for the reader who submits to parsing these fifteen pages. What transpires forcefully from them is that the assessment succeeded in large part because responsibilities, functional and regional, were allocated very precisely among the partners, in a conflict region where security and movements were always precarious. By contrast, the report makes no attempt to include any critical reflections on the analytic aspects. In fact, it excuses itself with the, for outsiders, mystifying reference that *"ACAPS followed a 'Rubik Cube' data management and analysis model that has been tested in previous emergencies (Bolivia)".* One must assume that such questions were discussed, at least to some degree in the workshop and in the organized feedback, but that the short timeline forbade their elaboration in the report.

Looking backward or forward?

Although these four examples come from a small fraction of rapid needs assessment reports, they make it obvious that the accounting for the methodology poses two related dilemmas:

For the assessment agencies, the methodology section justifies that the work was done correctly. The reader, however, would like to take away non-trivial implications for a critical reading of the substantive findings and as reminders for future assessments. With the exception of Haiti, the tension between accountability and teachable moments was largely resolved in favor of the former.

The data and methods chapter may lean more towards the institutional setup or more towards the internal analytic logic. Since most assessments bring together coalitions of the willing, in other words of temporary partners who otherwise each live in their own organizational universe, some detail about the cooperation framework is appropriate. However, (again with the exception of the Haiti report) little is said about measurement issues and validity challenges, about how scales and rankings were handled, or composite measures, if any, defined.

In sum, while brevity versus lengthiness is not of great concern, one may say that the reports, by their argumentative choices, emphasize defensive accountability over aggressive projection, an orientation towards the past over one towards the future. Their authors can rightly point out that they had neither the time nor the mandate to teach others lessons. Also, collective learning is better served by the movement of experienced team members to future assessments than by spilling more sweat and ink on documents that generally are short-lived. But to the extent that one writes on methodology anyway, he might just as well strive to transcend the single moment.

International standards and tools

On the other extreme, in academic research, commercial survey and government IT milieux, *"the world of metadata has become greatly elaborated in the last few years"* (Groves, Fowler et al. 2004: 338). Several international initiatives have been working to define standards for data documentation (IHSN 2009a, 2009b; DDI 2011; Wikipedia 2012a, 2012b). Researchers find detailed guidance in a freely downloadable book by the Organisation for Economic Co-operation and Development (OECD 2007). The International Household Survey Network (IHSN) offers a freeware application for data documentation useful for other survey types as well. Statistical applications such as STATA facilitate documenting data structures with semi-automatic codebooks. It is conceivable that Excel add-ins for similar purposes exist; we have not found any yet. Metadata standards for geographic data have been developed by the International Organization for Standardization (ISO 19115 and affiliates) and, in the USA, by the Federal Geographic Data Committee.

Reasonable effort

While the internationally promoted metadata standards provide useful pointers, they are too detailed and too laborious for the purposes of rapid assessments. We need a pragmatic system of good practices and tools, adequate for the purpose and appropriate given time and work pressures, low user priority and limited shelf life. While common practices are ideal, the particular situation of each assessment has to be recognized. Ultimately, it is up to the assessment team to determine the extent and emphases of the documentation. The team will determine the right amount of information, in order to lend credence to the report and to make the data further usable.

Culture rather than checklists

It also seems productive to give considerable freedom to the team member who writes most of the chapter on data and methods, or who is the one synthesizing the contributions by others. This person will often be the one in the team who led the analysis, and who knows the data landscape best. She may have a clear notion of the key points to communicate to users and successors in a methodological narrative of her own that should be helped, but not hindered by standard checklists.

Our guidance for describing data and methods, therefore, is "culture, not checklists". This is not true to the same degree of the final shape expected of the databases. This ought indeed to be edited respecting some specific requirements.

Accordingly, the rest of this note is divided into a section that guides the description, in the assessment report, of methods and data and another concerning metadata to be given in the databases.

Methodology section in the report

Data and methods can be described in different places in the assessment report. The default case will be the production of a separate chapter devoted to both. The chapter is to speak to the majority of assessment users, in ways that clarify how data limitations, choice of method, innovations and special efforts affect the substantive findings. In addition, if we must anticipate subsequent assessments, evaluations or studies by specialist experts, separate notes may be helpful, such as on the specifics of a GIS project that was created to visualize assessment findings.

The "must have"s

Chapter sections may focus on the data and on the methods used to collect and analyze them. The separation will remain incomplete because both the generation of primary data and the incorporation of secondary data depend on methods. However, we appreciate the advice of the "Chicago Guide to Writing about Multivariate Analysis" (Miller 2005: 272-300) to organize the data description by sections inspired by W-words and honorary W-words, such as

- Who
- When
- Where
- How, and
- What.

In practice, the distinctions will not always as clear-cut as one wishes. The interpretation of what belongs in the "who", and what in the "what", remains somewhat uncertain. In the Chicago Guide, the "who" relates to the *cases* (the disaster-affected entities), which, technically, become the rows of the data tables. The "what" comprises the *variables* that express properties of the cases (in particular measures of specific impacts), handled in the columns of the data tables.

Also, one has to keep in mind that in needs assessments there is no strict analog to the academic "study design" and that they are often carried out by networks of government and NGO participants, with local variations in methods. If these variations are consequential (such as for the pattern of missing information), the methodological chapter needs to report them. The strength or absence of multiple participants, their functional or regional affiliations, and their differences vis-à-vis data types and data quality will influence how and where in the chapter we want to list the data sources.

This is another way of saying that a listing of participating organizations, or of local officials interviewed, is not a sufficient description of the assessment methodology. Similarly, the broad consensus implied by the logos, displayed on the cover pages, of agencies that have signed up to the assessment, does not dispense from presenting the soundness of methods and the scope of the data.

Despite these caveats, in most cases the chapter can indeed by divided, more or less neatly, into a data section and a methods section.

The section on data

The sequence of data aspects that this section addresses - the "who", "what", etc. - is to a certain degree malleable. We give preference to context and coherence over a fixed treatment. The sequence followed here therefore gives an example rather than a firm rule.

The "who"

The universe of the assessment - the subject of interest and the sites, groups or individuals concerned by it - will already have been described in the main part of the study. The sample on which the findings are based will likely have been mentioned in several places in the reports, if not fully described. The data-and-methods chapter is to make the definitions more precise.

Defining the universe

The default assumption is that the assessment is purely about disaster-affected regions and groups. This in itself is not clear enough. Three factors need attention:

- The **degree of resolution** in defining groups or regions: For example, the population of all communes affected by a flood is not the same as that of all affected districts (there may be unaffected communes in parts of affected districts).
- The **specificity of the defining impacts**: To stay with the same example, communes affected by the flood are not necessarily the same as communes with households displaced by the flood (there may be villages on higher ground whose low-lying crops were destroyed while the built-up area remained dry). For different impacts, different units will come into play - persons for deaths, households for displacements, hectares for crop loss, etc.
- The **impact threshold** for inclusion: During the assessment, information will surface also about non-affected and lightly affected groups and areas; it will help to delimit the significantly affected ones. Lightly affected units may pose definitional problems that need to be decided one way or another.

One of the tasks in this chapter is make the actual operational definitions and denominators clear.

The result of sampling, not yet its method

That concerns the *universe* - that about which the assessment speaks. As for the *sample* - the units within the universe that provided the evidence -, the data section should summarize the final analytic sample, i.e. the number and distribution of surveyed units

about which enough data was collected in order to be included in all or in most of the relevant statistics. *How* the sample was drawn belongs in the methods section.

Problems may arise when the analytic sample fluctuates by variable, and the missing values are not justified by substantive differences (such as between stable communities and camps for displaced persons). This happens, for example, in networked assessments when some participating organizations drop questions from their survey interviews. If the differences can be succinctly described, it should be done here, in a phrase such as *"Information about most disaster impacts was collected in 45 sample villages in all five affected districts; however, information about the education situation is available for 35 villages in four districts"*. If the analytic sample is intricate, with arcane differences, it should be described in the methods section, perhaps with a detailed tabular breakdown in an appendix.

Regardless, the process of drawing the sample and the differences between planned, executed and analytic samples are to be described under "methods".

Data sources

At some point in this section, the data sources should be described. There are no universal rules where this is done best. One might proceed, for example, starting from the "what this is exactly about", followed by "the major portion of data was collected in a sample of .." and "these communities were visited by workers of ..", and supplemented by "in addition, these sources contributed [primary, secondary] information on ..", with an overview table, possibly stating public file locations. The section can then conclude with the discussion of the analytic sample, as suggested above.

The "what"

The detailed description of variables is best left to the Variables sheet or other metadata sections in the database, such as in the final Excel workbook. In the data section of the report, the assessment team should briefly enumerate the major sub-topics (e.g, by sector, data source, or by data table if there are several tables for distinct entities). Greater detail should be reserved for explanations of variables that are

- not intuitive
- measured in unconventional ways
- derived from others (such as a composite measure of impact)
- (if they are important) excluded from analysis on account of poor data.

This is the section also where reliability and missing information are appropriately discussed. In broad terms, we evaluate measures as valid / invalid and measurements as

- precise and reliable
- precise, but unreliable

- coarse estimates
- missing for this particular variable ("item non-response"), or
- missing for all variables in the case ("unit non-response").

If missing values were imputed, the imputation methods belong in the methods section.

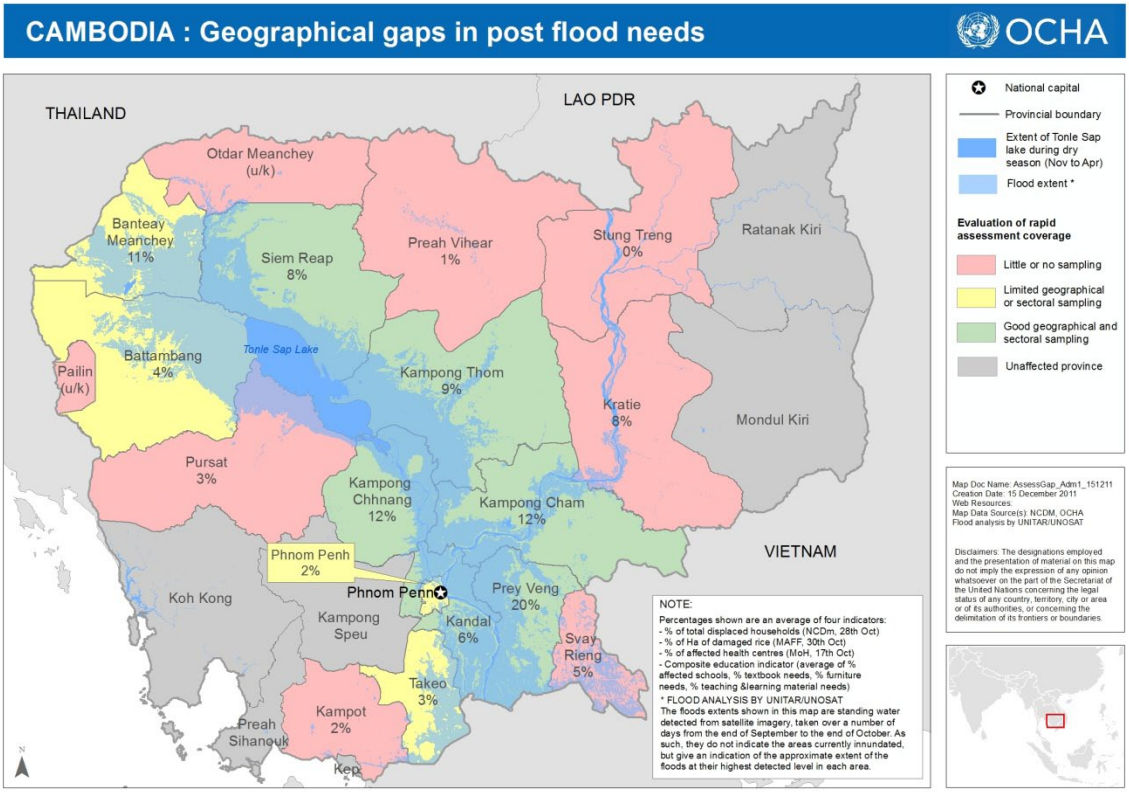
When the data are problematic

Unreliable, coarse and missing information, and their various mixtures, provoke interpretation problems. These must be signaled already in the main parts of the report. There, appropriate language qualifiers suffice (e.g., *"The districts for which we have data reported approximately 12,000 displaced households"*). The methodological chapter should delimit these challenges in greater detail. Two major considerations apply:

- *Formally*, statistics computed from mixtures of precise and coarse values create a wrong impression of precision and reliability when in fact none or few cases returned precise and reliable values. "A total of 12,341 displaced households" may result from 341 in District A (counted by officials, but the true value may be closer to 500), 12,000 in B (rough estimate) and missing in C (because no counts or estimates were communicated).
- *Substantively*, unreliable, imprecise and missing data are not random. Units with no reports, incomplete reports, or reports with broad estimates only may be facing particular difficulties:
    - They may be severely impacted; the disaster impairs data collection or data transmission.
    - They may have reservations towards the assessment and choose to respond selectively or not at all.
    - They may place high estimates of casualties and damage in order to attract attention and relief.
    - They may be only lightly touched by the disaster and therefore may not have received much in the way of assessment support.

Significant patterns of unreliability (which we often can judge subjectively only), imprecision and missingness should be detailed. This can be done in tabular form or, more compellingly, in maps colored by information quality. For example, districts in which floods displaced people could be graded on a scale like *"Full enumeration in all sub-districts" / "Some enumerations, some estimates" / "Estimates for all sub-districts" / "Global district estimate" / "No estimate so far"*. Obviously, an acceptable terminology has to found in labeling grades. This example is from Cambodia.

Figure 1: Map of affected provinces, Cambodia 2011 floods, by information density



Source: UNOCHA (2011: 27, Figure 19)

Attach questionnaires, but ..

If a questionnaire was used in the principal data collection, it should be placed in an annex. Readers can peruse it for the kinds of questions asked and for the categorizations that the coding instructions reveal. However, the learning value from reading a questionnaire is limited unless it is presented with detailed annotations. Teams will likely not have the time to produce them. Instead, for users who wish to go deeper into the methodological aspects (for example, while designing a similar assessment elsewhere), it may be more helpful to create a column "Refers to question no." in the Variables sheet of the database.

"Know as you need", no more

The tenor of our guidance for this section is: Say as little as you can, say as much as you must, but do provide the level of detail that enables the reader to understand the limits of validity, reliability and completeness. Refer to metadata provided as part of the database or in separate technical notes.

The "when" and "where"

The "when" and "where" are elements that one may treat as subordinate to, or properties of, the "who" and "what". Notably, units have locations, and variables are measured for certain points in time or periods of time. Relevant temporal and spatial information is therefore attached to units and variables. The "who" and "what" sections can take care of the details that need to be communicated. They do not justify separate sections.

Special situations

Here we wish to point out some special situations that should be described in appropriate places in the chapter and/or in the databases. Such arise when there are temporal or spatial discrepancies between units or variables that the analysis combines. Frequently, the points in time when data on numerators and denominators were collected differ.

Rates of affected populations, denominated to census figures of administrative units, provide an example. The census may have taken place several years back. If we make adjustments for population growth, we need to state assumptions and parameters. Temporal differences may occur also in slowly evolving disasters. In such situations - say, the Pakistan floods moving from north to south -, the dates of first community assessments may extend over a considerable period. If this is of consequence for the adjustment findings, the way of dealing with it analytically should be noted.

In the spatial dimension, a common problem arises when impact variables are aggregated to different administrative levels. For example, displaced households may be counted at the lowest local government level, such as the commune or union, whereas crop damage is estimated for districts only. Practically, if these impact types are to be compared side by side, one needs to aggregate upward to the lowest common level. More finely grained information on crop damage may become available later, which may again change analytic opportunities.

The diversity of special situations in the temporal and spatial aspects is not foreseeable. The only firm rule is that the chapter needs to explain what is needed to understand current findings and to connect to subsequent assessment work.

The section on methods

This section tells the "how" - the ways and tools used to collect, process and analyze the information on which the findings are based. This information may be broader than the conventional aspect of "data". Some of it may consist, for example, of collections of notes that team members jotted down in villages, outside the more structured interviews. If village transects and the ensuring notes, however informally compiled and used, were an important source of information, they should at least be mentioned *("In addition to formal interviews, notes taken during villages transects were used for..")*. De facto, many assessments may be "multi-method"; this should be brought out in the methods section.

The "how"

Key aspects of the "how" that should be described include:

- Design and design participation
- Data collection methods
- Sampling process
- Data processing
- Analysis methods and participation

The extent to which stakeholder participation during design and analysis are to be elaborated in this section depends on the actual input from outside the assessment team and on whether the institutional set-up (scope, partners, coordination, etc.) was already given sufficient space in preceding chapters. Even if this has already been taken care of, stakeholder participants *may* have made important methodological contributions, such as providing template elements from their own assessment work, questionnaire translation-retranslation tests, or setting weights for different disaster impacts when preliminary findings were discussed in a workshop. If their participation did influence specific methodological choices, the methods section needs to reflect them.

The sequence in which the key elements are presented may vary. For example, some may want to describe the sampling process before the data collection methods.

Design and design participation

Once the assessment objectives have been defined, they are translated into a mental model of how the effects of the disaster will work themselves through the affected communities. In the pragmatic world of rapid assessments, these models remain implicit. For the most part, they are not put on paper because they are understood intuitively, both at the design point and later by readers and users. In this, rapid assessments differ from conventional academic research, which requires an explicit translation from theory to measurement.

Indicators and uncommon measures

An explicit treatment, however, is required of standardized indicators that were selected at the design phase and supposedly collected uniformly in all assessed sites. The indicators need to be presented in the methods section, such as in a conceptual tree chart. Some may be straightforward (the number of casualties as the expression of physical impact), others will need justification. Two examples:

- The fraction of operating health centers after the disaster is less informative than the number of consultations compared to pre-disaster levels, but easier to establish.

- The celebration vs. cancellation among villages, in the weeks after the disaster, of an important annual festival may attract ridicule as an indicator in a needs assessment, but, if properly explained, it may be legitimate as a quick measure of community stress.

As a general rule, any measure designed to proxy for something else needs description and rationale in this section.

In a similar vein, multiple measurements of the same impacts are a design element that needs explanation. In the Pakistan floods, for example, identical questionnaires were administered to separate male and female groups in the community, out of concern to include the women's perspective and knowledge. If composite measures were foreseen at design, they are to be described here. If they were constructed ad-hoc later, the description belongs in the analysis section.

Local contributions

The participation of stakeholders is acknowledged not only as a matter of respect and integrity (in a spirit similar to scientific citations). It also will help explain substantive and methodological choices advised by local knowledge. Participants from outside the core team may offer pre-calibrated instruments. For example, a partner NGO may, pre-disaster, have been using a "most significant change" method in its routine monitoring (Davies and Dart 2005). Its tested local implementation is likely to work better in the needs assessment than an imported question battery. Such adoptions are explained for due authorship and to rule out the impression of incongruous foreign bodies.

Data collection methods

The opinions of assessment teams are probably formed more by information other than that produced with formal methods. Visual contact, ad-hoc conversations, "bingo!" stories, media images are more powerful than statistical tables. *"What is necessary in sensemaking is a good story"* (Weick 1995: 60-61; as quoted by Davenport and Prusak 1998: 82).

These informal ways of sense-making and belief-testing shade into semi-formal acquisition and processing, as in personal notes, and are finally "hardened" by the use of formal methods. In this sense, needs assessment are multi-method, with less formal, but more efficient "give me the big picture"-activities supplemented by more structured and therefore more tedious formal methods.

What is a method?

On the informal end, information gathering is hardly ever documented. Recognized formal methods, such as standardized questionnaire interviews, focus group discussions, hydrological modeling in GIS, are candidates for the methods section (even though, as we have seen, by far not all reports describe their methods). Semi-formal areas form a

grey zone; brief visits to villages, en route to some other place, may not count as methodical work unless they follow some common pattern that qualifies them as "transects" in the rapid appraisal lingo.

The minimum of formalization needed in order to earn description in the methods section is not a universal constant. As a vague guideline, one may want to note as data collection *methods* anything that

- results in data tables or maps, or
- follows a repeated query pattern, or
- was taught in a training event as a way to collect information.

GIS-based analyses and interview-based surveys exemplify methods of the first kind, frequent informal questioning during fieldtrips about disruptions of weekly markets the second (Benini 1992), instructing village teachers during payday how to organize cattle counts the third.

Multi-method claims

Researchers, particularly of the qualitative and participatory creed, have taken to "triangulation", the claim that they corroborate findings by testing them under several methods. Few such claims deserve to be taken seriously, in the sense of concurrent methods meaningfully focusing the falsibility of clearly stated hypotheses. Nevertheless, if assessment findings were honed in a multi-method approach, this section should elaborate on it. For example, estimates of displaced households supplied by commune councils may be correlated with proportions of built-up zones that are flooded, calculated from aerial photography. Not only the concordance between methods, but also the divergence - in this example, why people persevere in flooded homes, or why they leave in anticipation of worse to come - is of interest.

Finally, under data collection methods, the personnel applying them (were there any female interviewers?), the training they received, translations and translation tests, pretests (what, when and where, what consequences) need to described in adequate detail.

Adequate detail

"Adequate" is a matter of common sense, context and competing tasks. For example, information on whether the team had time to pretest the principal questionnaire or not is a "must-have" piece in the methods section. To write, in a description of focus groups, that *"numerous socio-professional groups were represented"* may be scant. *"In the majority farmers, but also traders, teacher, health care personnel, and imams were present. Separate sessions were held with women, most of whom engaged in farming, but in many villages also midwives, students and domestic servants"* may be enough. *"Self-rated occupation in attendance sheets revealed that 54 percent were male farmers, etc."* in a long listing would tire the reader.

Sampling

The preferred sampling method in rapid needs assessments is the purposive sample. We select units (such as affected village and urban communities) because we have reason to assume that they, more than others, serve the *purpose* of the assessment. This purpose is to narrow the information gaps considered, at this point of stakeholder debate and assignment design, the most pressing. An ACAPS technical brief gives the rationale together with a simulated case study and detailed instructions (Acaps 2011b). The bottomline is that purposive sampling aims to maximize our learning about the range and diversity of disaster impacts rather than estimating averages representative of the whole population of affected units.

Aspects of the sampling process to be reported include:

1. purpose (a brief restatement of what we were after)
2. sample size and deviations from plan
3. information about the units from which the sample was drawn (sampling frame)
4. stratification if any

The appropriate sequencing depends on material, style and best coherence.

Purposive and convenience samples

De facto, in most situations, the sample is a mixture of purposive and convenience elements, and the task of the methods section is to summarize the planned, executed and analytic samples and to explain how much they deviate from each other, and why.

Convenience rivals with purpose chiefly for logistics and security reasons. Visits to selected sites may not be feasible; yet teams have to make the best use of their time, transportation and other support resources. They may thus have to substitute achievable site visits for initially planned ones, sometimes en route and based on shaky information[1]. Inaccessible selected sites and substitutions should be noted and commented on for the possible bias that these changes may induce, e.g. by being limited to meeting communities that are plausibly less affected, etc., as may be the case.

Reporting the sample size

The effective sample is the set of sites actually visited. The analytic sample is the set of visited sites that yield useful information for the analysis. In data terms, the analytic sample size is the number of cases with non-missing values. This number varies depending on whether we consider a single variable or a set of variables. One can

[1] In random sample-based surveys, substitutes are sometimes fixed in advance (also based on random selection, usually within a short distance from the first choice). In disaster-affected areas, this is not practical, and anyway not called for in purposive designs. But the purposive vs. convenience sample challenge remains.

conceivably define the analytic sample on the basis of one pre-eminent indicator, such as physical destruction in an earthquake: *"The assessment is based on visits to X affected communities for which on-site visits produced estimates of the relative degree of habitat destruction."* In this example, X would not be influenced by the number of communities for which, say, landslide data are available.

Conversely, the sample size can be model-based. This obtains, for example, when a composite measure is used. If reasonable in the circumstances, some missing values might be replaced with imputed ones, and units with imputed valued kept in the analytic sample. The language must reflect this: *"The assessment is based on visits to, and reports from, 25 sub-districts for which we have data on displaced households, crop damage and health service disruption. For five sub-districts with no crop damage data, area-weighted median values were substituted as temporary estimates (see details below)."*

The point is that the sample size of interest is more than a simple number; it has to be qualified, if briefly, for adjustments such as en-route substitutions of sites or imputed values.

From what did we select?

Samples are drawn from enumerable sets of units that reflect the target population. Such a set is known as a sampling frame. Most commonly, this is a list of all the units that have a chance to be selected, such as the villages that are marked by name and location on a map, or a list of affected communities provided by authorities.

Sometimes the selectable units have an indirect relation to the sites that we endeavor to investigate. This may be the case, for example, when we only have map grid squares, in the absence of village points. On arriving at selected squares, teams would then select localities within, as a second stage of the sampling. It can also happen that end-stage localities are not selectable because there is not enough information on them; instead, teams select from a number of presumably feasible circuits or itineraries on which they hope to find instances of the entities of interest. This applies chiefly to shifting populations such as nomads and refugees.

Multiple-frame sampling occurs when teams have information on affected sites from several sources and based on different entities, such as a list of affected villages and an aerial map (or hydrographic model) of the flooding. Several types of information are then put together in making on-site visit plans. If this occurs, it is to be described in formulations such as: *"The sample is composed of two parts. At first, 15 sites were selected from a list of 145 affected communities in seven districts on which authorities provided some initial information. The locations were identified, as far as possible, on existing maps and were compared to flood maps derived from aerial photography. In a second step, in two districts with large pockets of unreported flooded communities, a*

separate list was made, from maps, of 55 place names in those areas, and a supplementary sample of ten sites was selected."

Why we selected them

The reasons for which the purposive selection was done are to be stated if that has not yet been done earlier in the report. If dealt with earlier, they may simply be reiterated in one sentence and then used in row or column titles of an overview table.

The sample may have been stratified ex-ante, i.e. sub-samples were defined by categories of interest (e.g. by target group, from ex-ante lists of IDP camps, host communities, communities with returnees, etc.). The effective sub-samples will most likely have been reported in the preceding substantive chapters. Here, in the methods section, the frame and sample size figures for the strata should be presented side by side. They can be crossed with other factors of relevance, e.g. the participating agencies, but such tables quickly become unwieldy.

In other situations, stratification will not be relevant (e.g., in an earthquake affecting a relatively homogenous set of communities) or not possible ex-ante. Also the effective sample may contain cases that mix the categories, e.g. communities that host significant numbers of IDPs from other areas as well as of returnees. While inconvenient for neat tabulation, such discoveries are welcome in purposive-sample designs that probe the diversity of situations. Common sense will dictate what can and must be described at this point, in words, tables or short references to preceding chapters.

In fact, "stratification" is a bit of a misnomer in purposive sampling since any type of information of interest may justify inclusion in the sample even if it attaches to one unit only.

Generalizing from purposive samples to the population

Under tenuous assumptions - that local contexts and disaster impacts are similar within certain population subsets -, one may consider generalizing from a purposive sample to the wider affected population. The areas of presumed similarity would have to be defined - e.g. concentric rings of similar Mercalli Index values around the epicenter, elevation bands in a flood model - with enough sample members in each of them for a sample reweighting. This is similar to poststratification in other contexts (Olsen, Orr et al. 2010: 19-21). The estimates would still be biased, but less so than if we generalized from the unweighted sample.

To the extent that this procedure uses information from the sampling frame - notably size and coordinates of populated places -, this should be mentioned here, in the section on sampling, for the first time. The precise method should be described under "analysis method".

We have not found any such reweighting applications in rapid needs assessments and will therefore not pursue this for the moment. Readers interested in the generalization from purposive samples may also consult Shadish et al. (2002: 374-389).

Data processing

If the assessment ran more or less smoothly, interest in data processing will be mild. The report might briefly describe error-minimizing mechanisms and data entry organization.

While in large-scale sample surveys field editing arrangements may be elaborate (Sana and Weinreb 2008), in rapid assessments it must suffice for somebody to have a look at completed questionnaires while those collecting and those processing them are still around and their memories fresh. The data processing segment should briefly describe the checks - by whom, at what point, plus any problems of more than fleeting interest.

Similarly the segment should devote a short para to the data flow - which may be as trivial as one team returning to its base and entering notes in computers every evening - and where and how data were entered, and partial tables combined into final comprehensive tables. If translation occurs between interviews and database, describe where (when interviewers filled in questionnaires, or later at data entry) and by whom. Mention the use of modern data entry and transmission media - whether in computer or mobile phone assisted interviewing or in email transmission of decentralized batch entry files.

Where are the data now?

If this has not been done elsewhere in the report, this segment should mention the names and types of essential master data files left with the assessment authority, the ownership, and how to obtain copies (from a Web site, or by applying to an office): *"The assessment team submitted final master tables of the community survey data, the sampling frame, and auxiliary matter in [x-application, presumably Excel]. A GIS project with administrative, populated places, river and road layers was created in [y-application], with record identifiers that link to the substantive data tables."* Etc.

A small photo and map image library may be part of the files deposited. If so, proper captions and credits will keep them usable.

Analysis methods and participation

In theory, analysis follows collection and entry. In practice, some exploratory analysis activity may take place already while collection and entry are ongoing. Descriptive statistics and outliers can be usefully established on partial data while field teams and entry personnel are still available for questions of plausibility and understanding.

Such clarification can later be helpful for, say, the recoding of variables. Most of such deliberations will likely remain informal and merit discussion in the methods section only

if they fundamentally contradict something that readers would take for granted, or if they lead to a practice change mid-course that affects data collection or variable definitions for the later part of the sample.

Mention the unusual

The analysis operations themselves will for the most part remain simple, given the nature of the sample. Sample weights and survey estimation do not come into play. Excel pivot tables may be the workhorse pulling together all sorts of cross-tabulations, but this hardly needs mentioning. Only if particular statistical packages were used, they should be noted.

More detail is recommended when advanced statistical procedures were employed, or when derived variables are not self-explanatory. Examples include:

- Exploratory factor analysis or other data reduction techniques
- Spatial statistical analyses in the GIS application
- Composite measures of disaster impacts.

Measurement units that are not commonly used need to be explained, e.g. miles outside maritime and US usage, the above-mentioned Mercalli Index in earthquakes, etc. Recoded variables, if the changes are innocuous, are best documented in worksheets within the Excel workbook that hold the original and recoded data. Only if the recoding is motivated by important conceptual changes or produces highly surprising results, should it be discussed in the methods section.

All descriptive statistics on purposive samples are legitimate and need no justification in this section. They speak for the sample, not for the population. The challenge is in the language appropriate in the substantive chapters and in the psychology of writer and reader, who will not easily resist generalizations unless properly warned.

Descriptive statistics do not need justification ..

Conditional descriptive statistics are equally valid if clearly marked or formulated as based on this sample. The statement in a substantive chapter that *"teams visited affected villages at different distance from the epicenter. In the ten villages seen within 50 km of the epicenter, the estimated proportion of destroyed or severely damaged residential buildings varied between 60 and 80 percent. In 15 villages located in the next 50 km out, we estimated a range between 40 and 70 percent. Etc."* is both legitimate and useful. It does not require comment in the methods section. All the same it may be reassuring for some to read here that *"where statistics were presented in the substantive chapters, we repeatedly reminded the reader that they came from a non-random sample"*.

Ranges of purposive sample statistics are particularly useful. Ruling out measurement error, the population maximum is never smaller than the sample maximum. The population minimum is never higher than the sample minimum. Finding one village with

80 percent destroyed buildings implies that the rate of destruction in part of the affected area climbed as high as 80 percent. Admitting the possibility of considerable measurement error (but not systematic bias!), we can still uphold that *"from summary estimates at multiple sites, we conclude that damage in areas near the epicenter is extensive"*.

.. but extrapolations do

The burden of explanation would be much higher if the team went on to extrapolate that, for example, *"based on our xyz statistics and the pre-disaster population distribution, we estimate that between one and two million affected persons will need shelter assistance before the onset of winter."* Something like this would call for detailed demonstration in the analysis section.

Imputing missing values

It is not uncommon to see missing values de facto treated as zeros. For example, from among twenty communities surveyed, the team may have collected estimates of displaced households in 15. A statement to the effect that *"we estimate that 2,500 families from the 20 villages have sought shelter elsewhere"* is therefore incorrect if 2,500 is the sum of the 15 estimates. Correctly, one might say something like *"In the 15 villages for which estimates of displacement were available, a total of 2,500 .."*.

The analyst may have reason to replace missing values with imputed ones. The motivation may be stylistic (qualifiers like the above example are unwieldy and grow tedious over the length of the report) or analytic. The latter may apply particularly with composite measures, in order to minimize loss of cases.

If any imputations were made - including the use of zeros -, their extent (variables, cases) and method should be noted. The literature appears silent on appropriate methods for purposive samples. Spreadsheet users may be constrained to simple methods such as using the median or a population-weighted median. Statistical applications offer more adaptive methods such as predictive mean matching.

In the database, the original variables should be kept as such, and imputations made in a different variable.

The use of imputed values should be signaled already in the data section, the specific methods here.

Stakeholder participation

Analysis and interpretation of analysis results are intertwined in an iterative process. Initial data analysis throws up questions; these may be shared with assessment participants and observers with local or functional expertise. Their response opens new perspectives in which the data, ideally, can be analyzed from different angles.

The typical event in which statistical findings and special knowledge are brought together is the stakeholder workshop prior to finalizing the report. Such meetings, if well done, are extremely valuable, but are seldom presented with more than a perfunctory reference to the fact that they happened. In the analysis segment of this chapter, the team should endeavor to say something specific and meaningful about how emphases and perceptions were changed due to local input, and findings connected with broader agendas, or qualified with specific local insights.

Participation in analysis is particularly valuable in determining the relative importance that the various disaster impacts and unmet needs have in the minds of different stakeholder groups. Under time pressure and with larger groups of participants, methods such as the Nominal Group Technique (Delbecq, Van de Ven et al. 1975; SAC 2003; Makundi, Manongi et al. 2006) can reveal preference orders. If such are used in events with stakeholders, their preparation, conduct and results should be described summarily in this chapter, and, if wider interest justifies, more extensively in a separate note.

Unfinished business

By the time the report is to be finalized, some parts of the assessment - more sites being assessed, supplementary data awaited from another source, etc. - may be outstanding. Arrangements may exist to update database and analysis for stakeholders after publication. If this is the case, the report should mention it, both in the introduction and, for the likely consequences for the current analysis results, in this section as well. A couple phrases like "*as of this writing* [date], … *we are expecting .. Linkages to upcoming assessments are made easier by* [e.g., some feature of the GIS project left behind] .." may be enough.

Documentation in the final datasets

Generalities

For the following, we assume that data are held, shared and archived in two applications: MS Excel for substantive data, and a GIS application for geographically referenced data.

We also assume that the data have been cleaned. For example, numeric variables no longer have any text-format cells. This section does not deal with elementary formatting issues. It recommends a number of practices for data management while recognizing that analysts may have different habits and customs.

Metadata should to a large extent be held in the databases - Excel and GIS - in order to keep the data and methods chapter in the report short. Also, the small number of users who will ever venture into the databases should not have to constantly cross-reference between these and the report.

Our recommendations are for substantially shorter metadata than those required by some of the international standards. For illustration, this footnote speaks about the "Dublin Core" metadata, vaunted for its simplicity, yet comparatively much more demanding[2].

Spreadsheet database

Workbook level

Minimum metadata

The required workbook-level metadata include:

- Meaningful file name, including country, assessment nickname, year-month-day date of closure

[2] The DCMI Metadata Element Set (ISO standard 15836), also known as the Dublin Core metadata standard, is a simple set of elements for describing digital resources. This standard is particularly useful to describe resources related to microdata such as questionnaires, reports, manuals, data processing scripts and programs, etc. It was initiated in 1995 by the Online Computer Library Center (OCLC) and the National Center for Supercomputing Applications (NCSA) at a workshop in Dublin, Ohio. Over the years it has become the most widely used standard for describing digital resources on the Web and was approved as an ISO standard in 2003. The standard is maintained and further developed by the Dublin Core Metadata Initiative - an international organization dedicated to the promotion of interoperable metadata standards.

A major reason behind the success of the Dublin Core metadata standard is its simplicity. From the outset it has been the goal of the designers to keep the element set as small and simple as possible to allow the standard to be used by non-specialists. The purpose of the standard is to make it easy and inexpensive to create simple descriptive records for information resources, while providing for effective retrieval of those resources on the Web or in any similar networked environment. In its simplest form the Dublin Core consists of 15 metadata elements, all of which are optional and repeatable. The 15 elements are:

1. Title
2. Subject
3. Description
4. Type
5. Source
6. Relation
7. Coverage
8. Creator
9. Publisher
10. Contributor
11. Rights
12. Date
13. Format
14. Identifier
15. Language

From: http://www.surveynetwork.org/home/index.php?q=tools/documentation/standards

- Document properties: lead organization as author, full assessment title, comments including team leader, person finalizing this file, other participating organizations, organization that owns the data.

Good practices

- Use R1C1 notation, particularly in documented formulas
- If the workbook contains numerous sheets, create a hyperlinked table of contents, manually or using an Excel add-in such as "excel-it"[3]
- If the workbook has many named ranges, create a listing in a separate auxiliary sheet (helpful for successors / users wanting to re-calculate something)[4].

Worksheet level

Minimum metadata

- For each major datasheet in the workbook, create a variables sheet:

    1. If the datasheet is called "CommuneData", name the variables sheet "CommuneVariables", etc.
    2. The minimum fields in the variables sheets include: ColNo (the column number that the variable has in the datasheet), VarName (variable name), VarLabel (variable label), one or several Comment1 Comment2 etc. fields[5].
    3. If columns in data sheet are colored, these colors should also be transferred to the Variables sheet.

- Each datasheet has to have a unique record identifier.

An example can be found in the demo workbook distributed with the ACAPS note "A template for managing data in needs assessments".

Good practices

- Use strictly unique variable *names*, short, no spaces, no special characters except underscore (the variable *labels* in the variables should be descriptively long.)
- Name all column vectors in the data sheets so that they can be readily referenced in formulas[6].
- In addition to the unique record identifier, include linkage identifiers (particularly to the GIS project) and administrative identifiers (e.g., p-codes), as needed.

[3] http://www.excel-it.com/freeadd-ins/AddTOC.zip.
[4] Automate the process with Name Manager, from http://www.jkp-ads.com/OfficeMarketPlaceNM-EN.asp.
[5] VarName is easy to fill by copying the data table header row and paste (transpose, values only) into this column.
[6] Collectively done by selecting the table, then, in the menu: Formulas - Defined names - Create from Selection (check top row only).

- Create tag variables for analytic sample definitions that will be used frequently. Tags are binary variables that take the value 1 if the case is included in the sample, else 0. They allow other users to understand / reproduce Pivot tables.
- Tags must be provided for multi-level or multi-record structures in a table, such as when values for the village are repeated in separate records from male and female focus group discussions. This avoids double counting.
- In data tables, strictly avoid *in-column* derived variables (subtotals, column totals, counts of missing, etc.)
- *In-row* derived new variables are ok and often are necessary. Formulas may be replaced with values (unless in simulations where they depend on parameters and changing inputs). If the formula used are not obvious, then give them in a comment field of the variables sheet.
- If any worksheet - data table or other - uses a considerable variety of formulas, document them in a separate formula sheet using the formula-documenting macro in the appendix.
- Use cell comments sparingly. Use this feature only if they remain few (you cannot sort on comments) and do not critically affect the interpretation of any finding. If many cells need annotation with repetitive text, consider conditional formatting with explanations given outside the table or sheet. For numerous comments concerning entire records, create one or several text variables for this purpose.

Descriptive statistics

The kinds of descriptive statistics that are routinely included in scientific papers are not absolutely necessary in our context, but we may produce them, with little extra effort, as a benefit for the user. In most assessment, it may be enough to leave the table in the Excel workbook.

Descriptive statistics can be efficiently produced in several ways. We hint at two:

- Use *SSC-Stat*, a free Excel add-in offered by Reading University[7]
- Calculate the statistics in the variables sheet, using the INDIRECT function

This screenshot exemplifies the process. The column vectors in the data table had been named with their field names (such as "Total_population"). INDIRECT references these ranges one by one from the list of variable names. The ranges are then passed to the statistical functions such as COUNTA[8]. The formulas are the same in each column.

[7] http://www.reading.ac.uk/ssc/n/software/sscstat/helpfile/ht_start.htm. This tool offers a host of other applications as well, in data manipulation, visualization and analysis. Highly recommended.
[8] Or simply COUNT if we want to exclude text entries.

Figure 2: Use of the INDIRECT function for descriptive statistics

4	8	9	10	11
VarName	**Non-missing**	**Minimum**	**Mean**	**Maximum**
Total_population	2795	315	14448.5	184509
Total_IDPs	2795	0	1400.1	9000
	=COUNTA(INDIRECT(RC4))	=MIN(INDIRECT(RC4))	=AVERAGE(INDIRECT(RC4))	=MAX(INDIRECT(RC4))

Producing the descriptive statistics in Pivot tables is less efficient and not feasible at all for certain ones such as the median.

The GIS project

Project-level metadata

Properties required at this level are similar to those filled in for an Excel workbook:

- Author, title and comments need to be provided in appropriate detail.
- File names too should be informative, giving away country, assessment short title and date.
- Data source locations must be specified.

GIS projects are path-dependent. Saving relative paths and archiving project and data sources in a common directory / subdirectory structure makes the project more portable.

Layer-level metadata

For each layer, the name for the files encapsulating it should be similarly meaningful as those chosen for the project. In addition, information is expected on

- the bounding coordinates (max X, max Y, min X, min Y), or failing that
- the country or region that the data pertains to
- the projection if any
- the original source/author of the data
- the date the data was produced
- the theme (admin boundaries, water, thematic surveys etc.)
- the user or distribution license.

Outlook

This note, spilling ink over thirty pages, offers guidance for a chapter which, if succinctly written, should not exceed 4 - 6 pages. Admittedly, some of the advice pertains to databases, which are documents undergirding, but formally separate from, the assessment report. The reader must by now have noted our preference for keeping the data and

methods chapter short and for leaving in the databases those metadata elements that are of no interest to the majority of assessment readers.

The chapter should be attractive and educating, emphasizing not only the usual challenges and achievements, but particularly also what the assessment contributes in terms of methodological innovation.

"Data and methods", however, must not become a condensed new version of the substantive chapters. Of the five characteristics that the statistician Robert Abelson (1995: 11-14) underlined in well-written quantitatively supported studies:

- Magnitude
- Articulation
- Generality
- Interestingness
- Credibility

"Data and methods" essentially contributes to the *credibility* of the assessment. It is up to the substantive part of the report to persuasively present the magnitude of disaster impacts and unmet needs, to connect the various pieces in mutually reinforcing argument, and to clarify the extent and limits of conclusions drawn from purposive-sample data.

It is in those chapters that the reader primarily expects to find an interesting story. On this point - interestingness - the data and methods chapter can give succor. Discipline and originality in methods, although seemingly opposite values, both project a train of research making important and compelling points. Well groomed, easily accessible databases in turn make the assessment attractive for secondary use beyond its original context and instrumental for the further development of assessment tools.

Appendix

Macro to document formulas in an Excel worksheet

For R1C1 notation

```
Sub ListFormulasR1C1()

' Author: John Walkenbach, http://j-walk.com/ss/excel/tips/tip37.htm
' Adapted from his A1-style by Aldo Benini 12/29/2004
    Dim FormulaCells As Range, cell As Range
    Dim FormulaSheet As Worksheet
    Dim Row As Integer

'   Create a Range object for all formula cells
    On Error Resume Next
    Set FormulaCells = Range("A1").SpecialCells(xlFormulas, 23)

'   Exit if no formulas are found
    If FormulaCells Is Nothing Then
```

```
        MsgBox "No Formulas."
        Exit Sub
    End If

'   Add a new worksheet
    Application.ScreenUpdating = False
    Set FormulaSheet = ActiveWorkbook.Worksheets.Add
    FormulaSheet.Name = "Formulas in " & FormulaCells.Parent.Name

'   Set up the column headings
    With FormulaSheet
        Range("A1") = "Address"
        Range("B1") = "Formula"
        Range("C1") = "Value"
        Range("A1:C1").Font.Bold = True
    End With

'   Process each formula
    Row = 2
    For Each cell In FormulaCells
        Application.StatusBar = Format((Row - 1) / FormulaCells.Count, "0%")
        With FormulaSheet
            'Cells(Row, 1) = Cell.Address _
                (RowAbsolute:=False, ColumnAbsolute:=False)
                'Replacing Walkenbach's A1-style with R1C1-style:
            Cells(Row, 1) = cell.Address _
                (ReferenceStyle:=xlR1C1)
            'Cells(Row, 2) = " " & Cell.Formula
            Cells(Row, 2) = " " & cell.FormulaR1C1
            Cells(Row, 3) = cell.Value
            Row = Row + 1
        End With
    Next cell

'   Adjust column widths
    FormulaSheet.Columns("A:C").AutoFit
    Application.StatusBar = False

End Sub
```

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