

QUANTITATIVE AND QUALITATIVE METHODS



Quantitative and qualitative methods generate different types of data. Quantitative data is expressed as numbers; qualitative data is expressed as words. Quantitative and qualitative methods can be combined in many ways to build on the strengths of both, and minimise their relative weaknesses. There is a growing consensus that both are important. This has led to an increased interest in mixed methods evaluations.

Quantitative and qualitative methods generate different types of data. In general, quantitative methods result in quantitative data, whilst qualitative methods produce qualitative data.

- **Quantitative data** is expressed in numbers (e.g. units, prices, proportions, rates of change and ratios).
- **Qualitative data** is expressed as words (e.g. statements, paragraphs, stories, case studies and quotations).

As well as resulting in different forms of data, quantitative and qualitative methods pursue different approaches to collect, analyse and use data. Many of these are covered elsewhere in the M&E Universe, under separate papers. The table opposite summarises some of the broad differences.

Most monitoring and evaluation (M&E) systems generate a mixture of quantitative and qualitative information. For example, almost all CSOs produce budgetary reports (quantitative information) and regular narrative progress updates (qualitative information). However, within the evaluation and research communities there have often been fierce debates around whether quantitative or qualitative methods are most appropriate for assessing change, and under which conditions.

People engaged in these debates can be divided into three groups. The first value quantitative information most, whilst recognising that qualitative information can be an important and useful supplement. The second group are more interested in qualitative information, whilst accepting that numbers also have a role to play. The third, and now by far the largest, group see quantitative and qualitative methods as complementary. This group recognise that both have their own particular strengths and weaknesses, and that they can be more effective when used in combination.

Strengths of quantitative methods

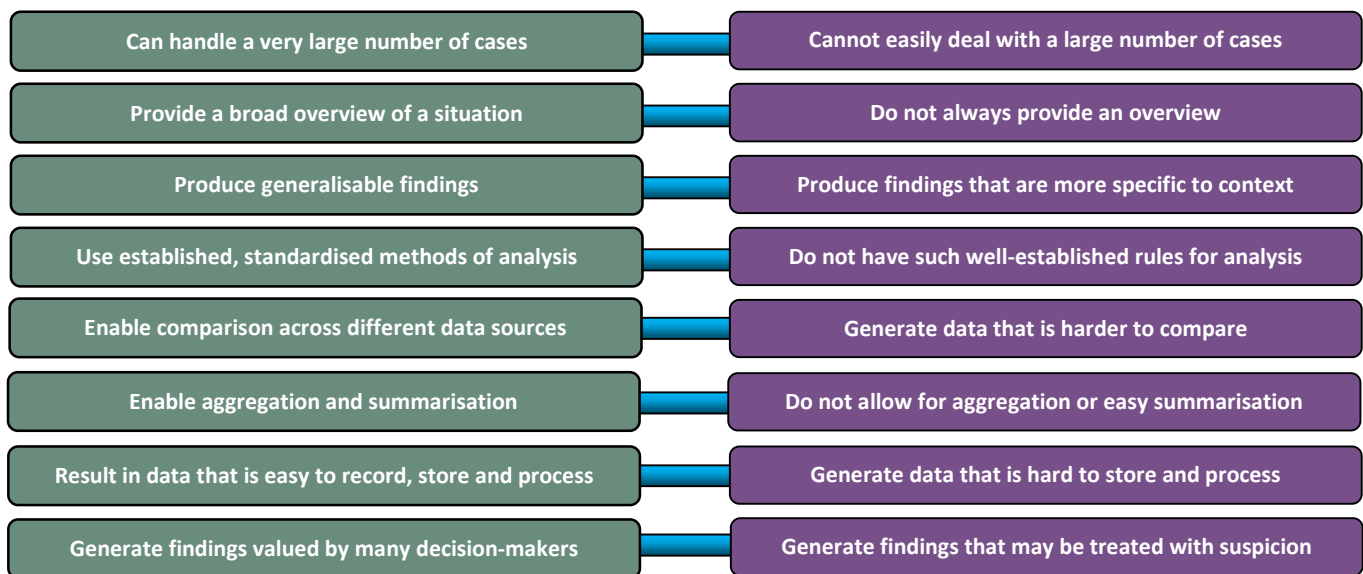
Some of the strengths of quantitative methods, compared to qualitative methods, are given below. However, these are generalisations, and there are often exceptions. The differences are summarised in the diagram on the next page.

	Quantitative	Qualitative
Data	Numbers	Words
Typical methods of data collection	Predefined options and closed questions in surveys, direct measurement, digital data collection	Open-ended questions in surveys and interviews, focus group discussions, observation, case studies
Analysis	Statistical data methods (averages, correlations, regression analysis)	Summarisation, reduction and scoring; in-depth analysis of individual cases
Sampling	Large, random samples	Purposive (deliberate) sampling of most interesting cases
Indicators	Specific, measurable, numeric indicators	Broadly defined qualitative indicators or questions
Milestones and targets	Easy to define and to communicate	Hard to define and communicate
Baselines	Numeric collection and presentation of data	Narrative collection and presentation of data
Control or comparison groups	Often used in experimental or quasi-experimental methods	Rarely used in qualitative inquiry
Typical monitoring questions	How much? How many? How often?	How or why did something happen? For whom?
Data storage and processing	Data stored as numbers; large amount of automatic processing	Data stored as words or as attached reports; less automatic processing

- Quantitative methods can easily cope with very large numbers of cases. This is because it is generally much easier to process numeric data. For example, it is much simpler to work out the average number of days lost due to illness across a very large number of people

Quantitative methods ...

Qualitative methods ...



than to summarise their perceptions of how illnesses are transmitted. This is largely due to the difficulties of handling and processing large amounts of qualitative data.

- Partly because they are better able to handle large numbers of cases, quantitative methods are better able to provide a broad overview of a situation, and to make generalisations across populations. For example, if an evaluation collects information on the education level of heads of households, and how many of their children go to school, it is possible to make general statements, such as people who are better educated are more (or less) likely to send their children to school. Qualitative methods are less able to do this as they are often more focused on taking an in-depth look at individual cases.
- There are standard ways of analysing quantitative data, such as calculating averages, producing correlations, or using regression analysis. These work according to agreed and established rules, which can be taught and replicated. Providing the methodology of a quantitative study or evaluation is transparent, the accuracy and reliability of results can be measured. This is not so in qualitative inquiry, where the rules are not so well established.
- In theory, anyone analysing the same quantitative data should be able to come up with the same findings. Quantitative methods should work irrespective of who collects and analyses the data, and data should be comparable across multiple locations, even if many different people are involved in data collection. This is not true in qualitative inquiry, where analysis is much more dependent on the skills, honesty and integrity of those collecting and analysing the information (Patton 1990).
- It is much easier to aggregate and summarise numeric data than large amounts of qualitative data. For example, a computer can calculate the average weight

and height of 1,000 babies as easily and as quickly as it can 10 babies. By contrast, qualitative data cannot be aggregated, and as the number of cases increases it becomes much harder to summarise. Summaries of qualitative data also have the potential to be more subjective, and open to bias.

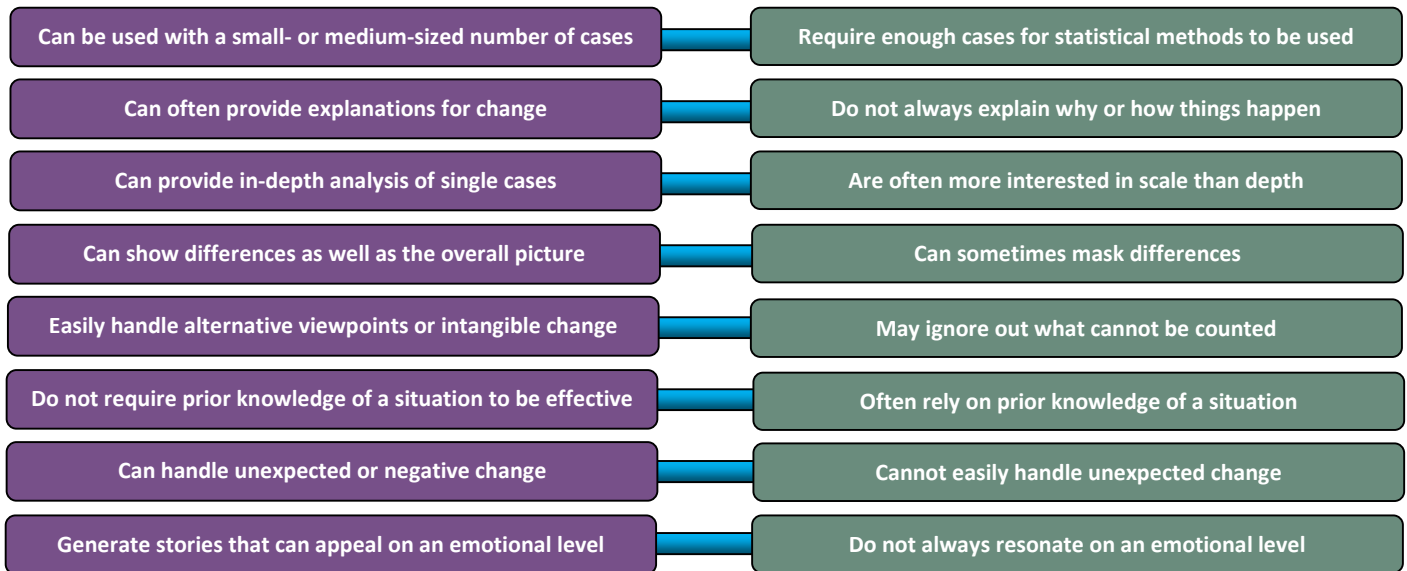
- It is much easier to record, store and process quantitative data than qualitative data. Numbers are easy to enter onto a database, and can be processed automatically. It takes longer to record and store qualitative information, and it is usually harder to process it automatically. Because of this, fewer CSOs have systems for storing and analysing qualitative information (see ITAD 2014).
- Many (not all) decision-makers, especially government representatives, trust quantitative analysis more than they do qualitative analysis. This is largely because they feel that: a) it provides a better overview of a situation and allows for generalisations; b) findings are less dependent on the biases of individual evaluators or researchers; and c) the rules are standardised and accepted. Some decision-makers are deeply suspicious of qualitative methods, and feel they can easily be manipulated to suit the purposes of different evaluators, researchers or organisations.

Strengths of qualitative methods

Qualitative methods also have many strengths. These are often mirror images of quantitative methods. Where quantitative methods are seen as being strong, qualitative methods are seen as (relatively) weaker. And where quantitative methods are seen as weaker, qualitative methods are seen as (relatively) stronger. Some of the main strengths of qualitative methods are listed below, and are summarised in the diagram above. As with the section on quantitative methods, these are general rules only, and there are often exceptions.

Qualitative methods ...

Quantitative methods ...



- Qualitative methods can be used no matter how few cases there are, and can work well with a small- or medium-sized number of cases (anywhere between 1 and 100). This is because they are concerned with examining a selection of cases in-depth. This is why CSOs generally use qualitative methods when evaluating work such as advocacy or capacity development, where there may only be a few organisations or policies to consider. By contrast, in order to work properly, many statistical methods require a sufficient number of cases.
- In some situations, quantitative analysis can show what has changed, but is unable to explain why or how it has changed. On the other hand, qualitative analysis methods often shed light on the processes that led to change. This means they are usually considered better if the need is to find out why something happened, or how it happened. Qualitative methods can almost always be used to investigate causality (assessing how far a change was caused by an organisation or programme) whereas quantitative methods can only do so in a narrow range of circumstances.
- Qualitative methodologies are often used to examine a small number of cases – sometimes even just one case – in-depth. They often look at multiple aspects of a case (or cases), and are likely to pay more attention to the individual context of a case, or set of cases, compared to quantitative methods.
- Qualitative methods are often concerned with cases that are different – perhaps ones that are not typical, or exhibit particular points of interest. These cases can easily be lost when using quantitative methods, which tend to focus more on the big picture. For example, during data collection quantitative methods often use pre-coding – asking people to tick boxes such as whether they travel to work via foot, bicycle, bus or

car. By contrast, a qualitative study might deliberately choose to focus on people who travel to work by unusual means, such as by camel.

- Qualitative methods can easily handle alternative or contrasting viewpoints. They are also good at handling aspects of peoples' lives that cannot easily be measured, such as perceptions, relationships, opinions or attitudes. Quantitative methods, on the other hand, work best when dealing with things that can be counted or measured.
- Qualitative methods do not rely on prior knowledge of a situation to be effective. For example, it is possible to hold interviews with people and explore their situation even if very little is known beforehand. In addition, information often emerges over the course of a qualitative evaluation or study. This is not true of most quantitative studies, because they rely heavily on collecting pre-identified numeric indicators, and because analysis is more likely to be done at a point in time, rather than ongoing. This also means that quantitative methods are less likely to pick up on unexpected or negative changes.
- In many complex programmes it is very hard to predict change beforehand, and therefore hard to define numeric indicators at the start of the programme. Qualitative methods are often considered better in this situation, as they are better able to handle uncertainty, and can be employed to identify and interrogate changes as they evolve.
- Finally, many people are happier engaging with stories and case studies than statistics. This may be because they do not fully understand statistical methods. But sometimes it is because in-depth stories of change or case studies describing changes in peoples' lives can allow people to empathise with beneficiaries, and engage on an emotional level.

Combining quantitative and qualitative methods

Quantitative and qualitative methods can be combined in many ways to build on the strengths of both, and to offset their relative weaknesses. Three of these ways – triangulation, sequencing and cross-analysis – are described below.

Triangulation: This is often used in M&E to look at data from different points of view: for example, collecting data via different methods, talking to different groups of people, or employing different researchers or evaluators. Triangulation is designed to improve the quality of M&E information, and make analyses more reliable. One way to do this is to compare information generated through quantitative and qualitative methods.

For example, statistical data may show that school dropout rates are falling amongst teenage girls in a district. If qualitative information from focus group discussions then reveals that girls perceive the school environment to be improving, this backs up the quantitative data. If, however, qualitative data indicates that the school environment is more supportive of teenage girls, but quantitative data shows dropout rates increasing, there is a need to go back and ask more questions to find out why there is a discrepancy.

Sequencing: Sometimes, one kind of method can be used to help shape another kind. This involves carrying out qualitative and quantitative methods one after another, rather than in parallel (Better Evaluation, u.d.). Some of the different ways of doing this are:

- using the results of a qualitative study to develop theories or hypotheses that can then be examined through quantitative methods, such as a large survey;
- examining quantitative findings from a large population (such as a town, village or district) and then examining particular contexts (such as people living with disabilities in one village) more closely through qualitative inquiry;
- engaging in qualitative analysis in a deliberate attempt to better understand or explain some of the changes identified through a quantitative survey;
- using the findings of a statistical survey to help identify a sample of cases to follow up in greater depth, using qualitative methods; and
- using qualitative inquiry to help pre-identify coded categories of answers (such as the methods used to travel within villages) that can then be used in statistical studies.

A key issue for evaluators or researchers is to consider what is the primary question they want answered, and how much they already know about the situation. A good general rule is to use the first phase of an evaluation or study to gather insights that can then inform the second phase. For example, quantitative methods could be used in the first phase of a study to help focus the second phase. In

the second phase, the primary question could then be investigated using qualitative methods. Or vice versa.

Cross-analysis: Another way of combining the two methods is to perform some level of cross-analysis. For example, quantitative data is often analysed qualitatively in order to validate it, or draw out its meaning. This might involve interpreting or analysing tables, charts or graphs qualitatively (e.g. providing explanations for quantitative data, or discussing the implications).

A common way of cross-analysing data, used by many CSOs, is to translate qualitative data into quantitative formats. This is done by collecting qualitative data, coding it, and then analysing it using quantitative methods. This approach is particularly useful when monitoring and evaluating complex areas of work such as governance, empowerment, or capacity development.

For M&E purposes, the most common way to translate qualitative data into quantitative formats is to use rating (or scalar) tools. A rating tool is designed to allow evaluators, project or programme staff, or beneficiaries to rate performance, competence, progress or quality along a common, agreed numeric scale, or using pre-defined statements, such as 'never', 'rarely', 'often' or 'always'. The great advantage of this kind of cross-analysis is that it can allow complex qualitative change to be processed and presented numerically, and then shown graphically, through graphs, tables or charts.

CSOs also combine quantitative and qualitative methods in other ways. Some of these are described below.

- Most qualitative analysis involves some coding and sorting of information around common themes. This is often used to provide estimates of how frequently an issue arises, or how many people feel a certain way on an issue.
- Case studies often include numbers. For example, an in-depth case study on a household might provide statistics on changes in income or assets, or might show how far crop yields have increased or decreased over a period.
- Methods such as the Most Significant Change (MSC) technique or Outcome Harvesting result in multiple stories of change. It is then possible to count the number of stories or cases collected around common themes or domains of change, thereby producing some level of statistical analysis.
- CSOs often use participatory methods that support beneficiaries to analyse their own situations. These include sorting, grouping, ranking, rating and scoring methods. These kinds of exercises often result in statistics being generated.
- Some newer methods, such as Qualitative Comparative Analysis (QCA) are deliberately designed to employ both quantitative and qualitative analysis. QCA involves assigning codes to contributing factors across several in-depth case studies. These codes can then be processed mathematically to generate findings across

wider populations, using specialised computer software. QCA is covered in a separate paper in the M&E Universe.

Mixed methods M&E

The quantitative versus qualitative debate has died down a little over the past decade or so. There is a growing consensus that both are important, and that they should be used together to draw on their relative strengths. This has led to a greater interest in **mixed methods**, particularly in the context of evaluations. Mixed methods can be defined as “*the combination of qualitative and quantitative approaches in a single evaluation*” (White 2009, p14).

However, as White points out, almost all quantitative evaluations have some level of qualitative analysis, and vice versa. Therefore, it is not just a question of whether an evaluation contains elements of both, but of how much, and how they are integrated. Just carrying out a few focus group discussions to complement a quantitative survey, or counting the number of times an issue emerges, does not make a mixed methods evaluation.

Some argue instead that a true mixed methods evaluation needs to do one of two things. It either needs to justify itself as **both** a quantitative and qualitative evaluation (e.g. have proper sampling methods for both, perform both quantitative and qualitative analysis, etc.) Or it needs to plan in advance how quantitative and qualitative methods will be sequenced, and how cross-analysis will be done. This will then enable the evaluation to fully draw on the strengths of both types of method.

The downside of applying mixed methods is that evaluations either become more expensive, and take more time to conduct, or people begin to cut corners and do not implement methods fully.

Summary

As stated earlier, most CSO internal M&E systems contain elements of both qualitative and quantitative inquiry. Consequently, the debate around qualitative and quantitative methods rages most fiercely around how to conduct research studies and evaluations (or sometimes how to conduct the baselines that precede evaluations).

There is a fairly broad consensus that the debate around qualitative and quantitative methods is no longer helpful. It is often more about protecting the jobs and territories of those with vested interests, such as evaluators or researchers who specialise in one method over another. And most people now agree that both methods have their own advantages and disadvantages, which can be overcome through a judicious use of both (mixed) methods.

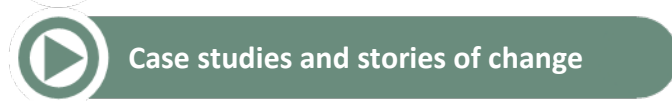
Of course, there are many times when an evaluation (or research study) will be mostly conducted as a quantitative or qualitative evaluation, emphasising one method over another. At other times there may be a more even balance between the two. But this should depend on the purpose and context of the evaluation (or research study) and the resources available, rather than the pre-conceived viewpoints of those managing or conducting the evaluation.

The key for CSOs is do whatever they do well. If carrying out a quantitative baseline or evaluation it should be done according to appropriate quantitative standards, using standardised statistical rules. If it is a qualitative evaluation it should be done according to best practice guidelines. And if it is a mixed methods evaluation it should be done according to the appropriate standards and best practices of both.

Further reading and resources

A useful paper on mixed methods evaluations, including discussion of the strengths and weaknesses of qualitative and quantitative evaluations, can be found in an article called ‘*Introduction to Mixed Methods in Impact Evaluation. Impact Evaluation Notes, August 2012.*’ This was written by Michael Bamberger for Inter Action and the Rockefeller Foundation, August 2012. It is available freely from the internet at <https://www.interaction.org/wp-content/uploads/2019/03/Mixed-Methods-in-Impact-Evaluation-English.pdf>.

Further papers in the *Data Analysis* section of the M&E Universe deal separately with *Quantitative* and *Qualitative Analysis*. There is also a paper on Sampling that covers both quantitative and qualitative sampling. Other subjects discussed in this paper can be accessed by clicking on the links below.



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