

Fact sheet 17: How do I analyse and interpret my data?

This fact sheet aims to give you information and guidance to help you to understand:

- How to analyse and interpret different types of data.

Analysis and interpretation of findings is a huge topic covered by entire postgraduate modules! This is a simple overview, so we recommend seeking specialist assistance if you are not confident in your skills. The Wirral Public Health & Intelligence Team will be able to assist you with more complex analysis.

1. Data analysis

- Consider what methods of data collection you have used and therefore what type of data you have collected – e.g. quantitative or qualitative.
- Consider how the data will be used. Is it to generate some numbers and statistics to confirm performance or will it be used to prepare a narrative summary of a service or intervention?
- What statistical methods will be used?

Quantitative Data analysis - steps

Data entry – the data you generate will need to be entered into a computer and developed into a database for further interrogation.

Data cleaning/checking – the data will need to be checked for accuracy and if necessary cleaned (e.g. correcting typos, checking blank fields, removing duplicates etc). At this point, you may need to create new fields in the data (e.g. a field for age group, calculated from the individual ages collected).

Descriptive analysis – provide a summary describing the basic features of your data (e.g. the relative proportion of age groups represented, the distribution of opinion on a certain question). You can use simple graphs and charts to show these descriptive statistics and often a statistical package is not required. Using excel will usually suffice.

Inferential analysis – this is where you draw conclusions from your data and can investigate questions or hypotheses, and you are trying to infer from the sample what the population thinks.

Statistical tests - Statistical tests can strengthen or confirm observations made through the steps of analysis above. Statistics can help show if an observed effect or relationship is mathematically significant and robust or may just be a chance finding. Statistical tests can therefore show us whether our conclusions about the data described are reliable. The acceptable level of statistical significance is that there should be no more than 5% doubt that the result is correct if the analysis was repeated several times in a similar population. Therefore significance is set at a probability of 0.05 ($p < 0.05$). If in doubt about any aspect of quantitative analysis, and especially the validity of your use of statistical tests, we would recommend seeking advice from the Wirral Public Health & Intelligence Team.

Qualitative data analysis

With a qualitative study you may find that you gather large amounts of often unstructured data. Your data may include case studies, covering long accounts of patient experiences, focus groups with up to ten participants discussing a topic or interview transcripts from in depth interviews. To make sense of all of these data, it is necessary to reduce the volume by identifying significant themes, linkages and patterns. It is important to stand back from the information and not put your own personal beliefs or opinions on to it. You need to consider the issues from the point of view of the participants involved, not what you know or believe to be true. For example, a patient's experience may differ from the norm or from the expected level of service that should be provided, however, this is that patient's experience and so is valid opinion for the purposes of your study.

It can be helpful when carrying out qualitative research to make notes as you go along i.e. when or soon after you are undertaking an interview or focus groups compare the findings to those from other activities you have undertaken for this project. From this you will start to build up a picture of experience or opinion as you go along as key themes begin to emerge. You can then begin to investigate whether these themes differ across different groups or between participants with differing characteristics.

Following this method of analysis you will be able to take your data from its raw form to a series of descriptive statements (statements which describe the content of the data) which you can then interpret alongside each other to discuss the findings and if necessary make recommendations for the future.

There are qualitative data analysis computer packages available that can assist in your analysis (e.g. NVIVO). Such a package can help manage and analyse large quantities of electronically held data, but is by no means essential.

If in doubt about any aspect of qualitative analysis, we would recommend seeking advice from the Wirral Public Health & Intelligence Team.

2. Interpretation of data

- Consider caveats (warnings or caution you need to give the reader about interpreting the data). For example, if there were issues gathering the data or there are unavoidable 'holes' in your dataset due to incomplete data or the only available data is quite old and the picture may have since changed.
- Mention any bias that you know of (anything in the way you collected the data that that may have prejudiced the results), for example, if the participants in a focus group all knew each other but it was the only way to gather a group together with a particular characteristic.
- Bear in mind your original research question and how your findings relate, always go back to your core reason for carrying out the study.
- Consider how far you can extrapolate your findings to another population/setting, is the study generalisable to another population or specific to yours only?
- Consider your audience and what will make sense, explain how you have made certain deductions from your data and show charts and tables for more visual audiences. Some audiences will require less technical 'speak' than others.
- Describe the limitations of your data in drawing conclusions. For example, could/should the population have been larger? Could the participants have been asked more questions if there had been time? Could more data have been elicited if qualitative questions had been included instead/as well as quantitative or vice versa?



More on this topic and further reading

More information about analysis of research or evaluation findings can be found in:

<http://www.statsoft.com/textbook/>

http://www.socialresearchmethods.net/kb/stat_t.php