Plain language summary of the Generalisability Study

(Mealing et al 2010)

This report was prepared for beyondblue: the national depression initiative on behalf of the Sax Institute.
The role of cohort studies in health research

Cohort studies are an important tool for understanding the relationship between health outcomes and a wide range of social, demographic, lifestyle, medical, surgical, and other factors. Cohort studies gather information on exposure to various factors from a group of individuals and follow them forward over time, to see who develops particular health outcomes and who doesn’t. Researchers can then compare the differences in risk of that outcome between individuals exposed and not exposed to specific factors. The classic example of this is a cohort study from the 1950s where Richard Doll and Austin Bradford Hill gathered detailed information from British doctors on smoking, alcohol consumption and other factors and followed them over time to see who developed lung cancer. They then compared the risk of lung cancer in smokers and non-smokers, providing new and convincing evidence on the links between smoking and lung cancer, leading to better health information and strategies to reduce smoking and lung cancer. Cohort studies have since then contributed to our understanding of the risk factors for a wide range of diseases and other health outcomes.

A key feature of a cohort study is that it does not need to be representative of the general population for its findings to be applicable to the entire community. This is because risk is measured comparing one group within the cohort study to other groups in the cohort. What we then have is a measure of relative risk—e.g. people who smoke are 10 times more likely to get lung cancer than people who don’t smoke. We know that British Doctors are not representative of the general population (most of whom are not doctors), yet the finding of lung cancer in smokers applies to all of us.

This is different from surveys, like the Census or the National Health Survey that are trying to find out what proportion (or percentage) of people in the general population are exposed to particular things or have particular attributes, e.g. What percentage of teenagers smoke? What percentage of the population is obese? How many Australians are living in poverty? These surveys need to sample a group that truly represents the general population in order to be sure that the proportions with specific characteristics or behaviours in their sample are similar to what is found in the general population.

Although it is well established (through findings over the years and through statistics and mathematical simulations) that cohort studies do not need to be representative of the whole community for their findings to apply to the wider population, concerns are sometimes raised when cohort studies involve only a small proportion of the population. These are known as concerns about generalisability.

The Generalisability Study and its findings

The Generalisability Study (Mealing et al. 2010) was designed to explore how generalisable the findings of the 45 and Up Study would be to the NSW population. It involved comparing:

(1) The 45 and Up Study, which is a cohort study and not designed to be representative of the general population and;

(2) The NSW Population Health Survey, which provides a representative sample of the NSW population.

Other features of the studies are described in Table 1.
The researchers making these comparisons wanted to know if relationships between things like being overweight and the risk of diabetes, or age and the risk of falls, would differ between the two types of study.

Table 1. Comparison of two study populations

<table>
<thead>
<tr>
<th></th>
<th>45 and Up Study</th>
<th>NSW Population Health Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>total number in this study</td>
<td>101,812</td>
<td>14,796</td>
</tr>
<tr>
<td>percent of people invited who took part</td>
<td>18%</td>
<td>62%</td>
</tr>
<tr>
<td>Type of data collection</td>
<td>Postal questionnaire</td>
<td>Computer-assisted telephone interview</td>
</tr>
</tbody>
</table>

As a first step, the researchers compared the NSW Health Survey Questionnaire and 45 and Up Study questions to see how similar they were, and classified them as ‘highly comparable’, ‘moderately comparable’ and ‘not comparable’ questions. They then examined various measures of relative risk based first on only highly comparable questions and then on moderately comparable questions. Highly comparable questions included comparison of the risk of diabetes or the risk of high blood pressure according to a person’s size, age and psychological distress. Moderately comparable questions included assessment of the risk of complete tooth loss according to whether or not a person smoked.

For highly comparable questionnaire questions, there were no important differences between the two studies in the relationship between risk factors and outcomes. For example, in the 45 and Up Study, people who were obese had a risk of high blood pressure that was 2.72 times (95%CI 2.61-2.85) that of people of healthy weight, while the comparable risk of high blood pressure for obese versus healthy weight in the NSW Population Health Survey was 2.99 (2.13-4.19). These relative risks were very similar, even though the percentages of people with specific health behaviours, e.g. the proportion of people who smoked, differed somewhat between the two studies.

When the same process was repeated for questions that were moderately comparable between the two studies, the same general patterns were found but the magnitude of the Relative Risks differed, because the outcomes and exposures were being measured in different ways. For example, the studies had slightly different ways of measuring education. Although the studies were consistent in finding reduced smoking with increasing levels of education, the 45 and Up Study found that people with a tertiary education were only 22% (95%CI 20-24%) as likely to smoke as those with no educational qualifications; the comparable figure in the NSW Population Health Survey was 34% (27-42%).

The implications of the findings of the Generalisability Study

In conclusion, the main implications from the Generalisability Study are:

- We were able to confirm that cohort studies such as the 45 and Up Study do not need to be representative of the whole community for their findings to broadly apply to the wider population, as long as they are comparing one group to another group within the study.

- The implications for the 45 and Up Study specifically are that the findings based on comparing groups within the cohort should be generalisable to the broader NSW and Australian population.
This research was completed using data collected through the 45 and Up Study (www.45andUp.org.au). The 45 and Up Study is managed by the Sax Institute in collaboration with major partner Cancer Council New South Wales; and partners the National Heart Foundation (NSW Division); NSW Health; beyondblue: the national depression initiative; Ageing, Disability and Home Care, NSW Department of Human Services; and Uniting Care Ageing. We thank the many thousands of people participating in the 45 and Up Study.