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# Appendix 1: Analysis outline

The chi-square tests used are those calculated by SAS (SAS Institute Inc., 1999–2001). The SAS printout provides three chi-square tests: the Pearson (the “usual” test), likelihood-ratio, and Mantel-Haenszel chi-square tests. The Pearson test can be inflated by very low expected frequencies, but the likelihood-ratio test is not, so we mainly used the likelihood-ratio test results. The Mantel-Haenszel test is useful where both variables are measured on an ordinal scale (like a Likert-type scale, as most of our variables were), as it tests the alternative hypothesis that there is a linear association between the row variable and the column variable, and the test statistic is based on the Pearson correlation coefficient. This is the situation that we in fact have with many of our tests for association. A linear association is one where, for example, respondents with a low level of overall stress tend also to report a low level of stress about resourcing needs, and those with a high level of overall stress report a high level of stress about resourcing needs.

We report associations that had a  $p$ -value of less than 0.01 for the likelihood-ratio chi-square test, or where the  $p$ -value was between 0.05 and 0.01 on the likelihood-ratio test, and less than 0.01 on the Mantel-Haenszel chi-square test.

Where there were statistically significant associations between variables, we usually illustrate these with comparative percentages. Usually, these percentages differ by about 10 percent, but some that differ by less are also reported in cases where there was a strong linear trend across the table.

## **Making factors**

We used regression, fitting the model in R (R Development Core Team, 2003) to model the relationship between well-being and aspects of principal’s role reported in section 6. For this model, we used principal component analysis with varimax rotation, using SAS (SAS Institute Inc., 1999–2001) and formed a total of 12 scales, as shown below, where the names used to

describe the scale, items used to make the scale, and where appropriate, a measure of Cronbach's alpha<sup>1</sup> for the scale are given.

### *Well-being (0.88)*

- During the past week have you experienced frustration in relation to your job as principal?
- During the past week describe your state of general happiness with job and life
- During the last week describe your emotional state
- During the past week how often have you been feeling tense?
- During the past week how often have you been feeling optimistic about your life and job as a school principal?
- Over the last week, how would you describe your stress level?
- During the past week have you had feelings of impatience?
- Your job gives you great satisfaction<sup>2</sup>
- During the last week choose the closest correct statement with regards to your level of tiredness

### *Fitness (0.75)*

- During the past week how often have you carried out some other [not at the gym] form of fitness activity for at least 30 minutes at a time?
- During the past week how often have you exercised in a gym for at least 30 minutes?
- Which of the following statements [about regularity of exercise] best describes you?

### *Stressors related to staff (0.85)*

Stress caused by:

- Staff resistance to change
- Interpersonal conflicts at school
- Poorly performing senior management
- Slow teacher/staff morale
- Staff competency
- Employment issues in relation to staff

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<sup>1</sup> Cronbach's alpha is a measure of the reliability of a scale, or a measure of association between the items. The values of alpha are typically between 0 and 1, with values over 0.8 indicating good reliability. Usually, as a guideline, scales with values of 0.7 or more are used.

<sup>2</sup> This item fitted better here than anywhere else, although it is not strictly speaking a "health" item. It certainly is more strongly associated with the health outcomes than with any other variables.

### *Stressors related to students (0.76)*

#### *Stress caused by behavioural/violence problem pupils*

- Dealing with children who have severe behavioural problems at your school is [something you do how often]?
- Stress caused by Child Protection issues
- Stress caused by Critical Incidents

### *Stressors related to paperwork, resources, and compliance (0.70)*

- Stress caused by Compliances
- Stress caused by OSH regulations
- Stress caused by Ministry initiatives, paperwork and other system demands
- Stress caused by resourcing needs
- Stress caused by lack of ICT support

### *Workload & role balance (0.66)*

- Stress caused by the multi-tasking nature of the job
- There is so much work to do, I never seem to get on top of it
- Stress caused by lack of time to focus on teaching and learning
- What percentage of your work is management rather than leadership orientated?

### *Stressors related to parents (0.76)*

- Stress caused by aggressive behaviour from parents
- Stress caused by parental expectations
- Stress caused by complaints management

### *Relationship with Board of Trustees (0.78)*

- Stress caused by Board of Trustees involvement in management of school
- Which option best describes your relationship with your Board of Trustees?
- Stress caused by Board of Trustees competence
- Stress caused by employment issues in relation to yourself and Board

### *Support (0.67)*

- Level of support from NZEI
- Level of support from Advisory Service
- Level of support from Ministry of Education
- Level of support from NZST
- Level of support from NZPF

### *Participation (0.67)*

Attendance at:

- Other regional, interest or sectional conferences
- Regional Principals' Association conference
- NZPF National Conference
- Meetings of local Principals' Association

and

- How often do you either meet with, ring or contact fellow principals formally/informally to discuss issues, work, coping needs or to socialise?

### *Being valued*

- Do your Board and community value the work that you do as their principal?
- Do your staff (all staff) value the work that you do as their principal?

### *Network review*

- Stress caused by Network Reviews
- How concerned are you about the possibility that your school will be involved in a Network Review?

Scale scores were formed by taking the mean of the items. Where some items on a particular scale were rated 1–5 and others 1–4, say, they were scaled to be on an approximately similar scale before the mean was calculated. The scale score was then converted to a 1–10 scale, where a score of 1 would indicate the worst possible scenario, and a score of 10 the best.