



State of the State 2018 – Article 2
Beyond GDP: Measuring New Zealand's
wellbeing progress

Appendices and bibliography

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Appendix 1

Data

To ensure consistency and comparability across countries, in the first instance we have relied on the standard OECD *How's Life* data. This provides time series for the data used to compile the OECD diagram and table in Figures 2 and 3.

Unfortunately, the data is incomplete. As a first approximation, we had to fill in the gaps through a combination of linear interpolation (for missing data / values in between available data series), and last-value imputation (when we had to extrapolate). Rijpma et al (2017), pp. 27-28, offer a brief analysis of alternative "imputation" methods. Ours is a choice based on simplicity and practicality.

[Further details on data and methodology can be obtained from the authors: joey.au@vuw.ac.nz; girol.karacaoglu@vuw.ac.nz.]

Normalisation of data

This is what Rijpma et al (2017), pp. 28-31 refer as a solution to the "scaling problem". As they explain it: "Without putting the indicators on a common scale, indicators with a large data range would drive most of the index. In this sense, the choice of scaling the variables influences the relative importance of the variables, much like weighting does" (Ibid, pp. 28-29).

There are various options for dealing with this issue. A simple and practical solution is to restrict the normalisation options to linear transformations, thus keeping it simple and avoiding influencing the trend of the transformed indicators. The three options considered by Rijpma et al (2017), p. 29, are:

- Normalise: set to a 0-1 range.
- Standardise: set the mean to zero, and the standard deviation to 1.
- Index figures: set the base year to 1 and express all other years as a ratio to that value.

Following Rijpma et al (2017), pp. 30-31, we choose the first (normalisation) option by using the corresponding OECD indicators as benchmarks. Thus, the movements in each indicator is measured as a ratio of the corresponding OECD average for the same (or similar) indicator. In addition, to ensure that each indicator contribute to the overall composite wellbeing indicator in the desired direction, we subtract the normalised indicator from 1, in cases when more of an indicator is desirable.

Aggregation functions

The next choice relates to the method used in aggregating the indicators of different domains of wellbeing into sub-indices to represent each of the eleven BLI domains, and then aggregating the resulting sub-indices into an aggregate wellbeing index for New Zealand. This is another contentious issue on which there is a huge literature.

Appendix 2

BLI Domain	BLI Indicators	How's Life? Indicators
Income	Household net adjusted disposable income	Table A.1. Household net adjusted disposable income
	Household net financial wealth	Table A.2. Household net wealth
Jobs	Employment rate	Table A.3. Employment rate
	Personal earnings	Table A.4. Average annual gross earnings per full-time employee
	Labour market insecurity	Table A.5. Labour market insecurity
	Incidence of job strain	Table A.6. Incidence of job strain
	Long-term unemployment rate	Table A.7. Long-term unemployment rate
Housing	Rooms per person	Table A.8. Rooms per person
	Housing expenditure	Table A.9. Household expenditure on housing
	Dwellings without basic facilities	Table A.10. Dwellings without basic sanitary facilities
Work-Life Balance	Employees working very long hours	Table A.11. Employees working very long hours
	Time devoted to leisure and personal care	Table A.12. Time devoted to leisure and personal care
Health	Life expectancy	Table A.13. Life expectancy at birth
	Self-reported health	Table A.14. Perceived health status
Education	Educational attainment	Table A.15. Upper secondary educational attainment among working-age adults
	Student skills	Table A.16. Cognitive skills of 15-year-old students
	Years in education	Table A.17. Competencies of the adult population, aged 16-65
Community	Quality of support network	Table A.18. Social support
Civic engagement	Stakeholder engagement for developing regulations	Table A.19. Having a say on what the government does
	Voter turnout	Table A.20. Voter turnout
Environment	Water quality	Table A.21. Satisfaction with water quality
	Air pollution	Table A.22. Population exposure to outdoor air pollution by fine particulate matter (PM2.5)
Safety	Homicide rate	Table A.23. Deaths due to assault
	Feeling safe walking alone at night	Table A.24. Feelings of safety when walking alone at night
Life Satisfaction	Life satisfaction	Table A.25. Life satisfaction measures from national statistical office sources
		Table A.26. Life satisfaction measures from the Gallup World Poll

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