

Schools, Telecom, and Distributional Equity

David Peacock, Public Health Medicine Registrar, Dunedin

Abstract:

Objective: to determine if there is any association between the socio-economic status of schools and the amount of donations they received from the Telecom New Zealand Ltd. *School Connection* programme.

Methodology: the socio-economic ranking of schools was based on an indicator developed by the Ministry of Education; the amount of donations received by each school was provided by Telecom. Using this data, Concentration Curves and Concentration Indices, techniques borrowed from economic research, were used to plot the distribution of donations to schools against the socio-economic catchments of the schools.

Results: on average, schools from more affluent socio-economic catchments received larger donations than disadvantaged schools.

Conclusion: the *School Connection* programme increases the income gap between rich and poor schools. Although the amounts involved are modest in comparison to overall educational expenditure, private enterprise involvement in the resourcing of State schools needs to be carefully considered. Any extension of similar schemes could significantly disadvantage poor schools that already struggle to deliver a quality education in an increasingly competitive education sector.

Public Health Implications: as educational attainment is positively associated with health, any interventions that may disadvantage the already-disadvantaged need to be closely-monitored. Public Health researchers can refine and implement the tools to quantify inequities. The results of such work may benefit the development of healthy public policy.

Inequity is a public health issue.¹ Access to quality education is a major determinant of wellness.² A State public education system should “equalise educational opportunities available to children from families with varying degrees of wealth”.³ But the fair provision of education is under threat.⁴ In this context, this paper describes a corporate scheme that undermines the equity of the New Zealand State education system.

Telecom New Zealand Ltd. (“Telecom”) is New Zealand’s major telecommunications company. In 1993, it launched the *School Connection* programme in which domestic consumers could donate 5 percent of their toll charges to the school of their choice; the donations received by schools for the years 1993-1998 were publicly released by

Telecom in April 1998.⁵ The amount of money received by different schools varied widely. This variation raises the question as to whether or not the amount received by schools is related to the socio-economic catchment of the school. This paper attempts to answer this question.

1. Method

1.1 Measuring Inequality

The amount of inequality is illustrated and quantified using Concentration Curves, ($CC(donations)$ in Figure 1) and a Concentration Index, (CI).⁶ The Concentration Curve, and Index have similarities to the Lorenz Curve and Gini Coefficient, respectively, that have been used for many years by economists to illustrate and quantify income inequality.⁷ In plotting the Concentration Curve, the cumulative proportion of pupils, ranked on the horizontal axis from most to least disadvantaged, is plotted against the cumulative proportion of Telecom donations received, on the vertical axis (Figure 1).

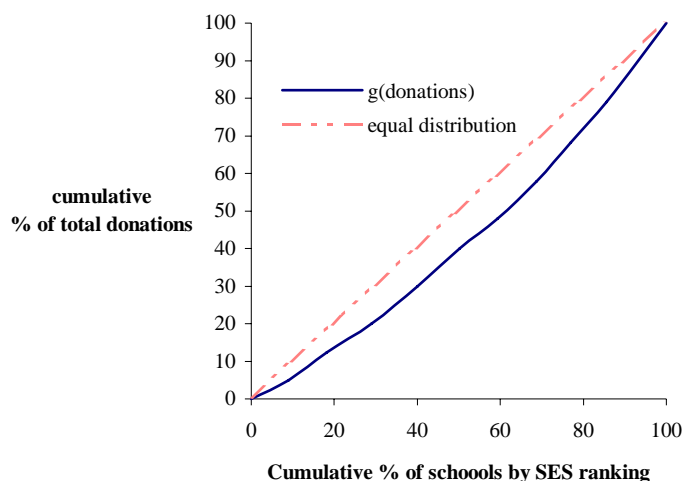


FIGURE 1 Concentration Curve for a hypothetical distribution of donations

If poorer schools receive less than their “fair” share, the Concentration Curve sags beneath the diagonal. Conversely, if poor schools received the most benefit from the *School Connection* program, the Concentration Curve would lie above the diagonal. Finally, if all schools received donations proportionate to their pupil share, the Concentration Curve would coincide with the diagonal. The extent of inequality is quantified by the Concentration Index, which is twice the area between $CC(donations)$ and the diagonal. It is negative if $CC(donations)$ lies above the diagonal, indicating inequality favouring the poor, and positive if inequality favours the rich.

1.2 Sources of data

The analysis was performed for New Zealand State and Integrated Schools. Each school is given a Targeted Funding for Educational Attainment (TFEA) Decile ranking by the Ministry of Education reflecting the socio-economic catchment of the school;^{8,9,10} schools are ranked from one to ten, the lower the score, the more disadvantaged the school. The Ministry of Education also supplied the estimated 1998 school rolls. Finally, Telecom published the donations received by each school from the *School Connection* programme.

All values were manually entered by the author onto a Microsoft Excel spreadsheet (version 5.0) for analysis (using Excel macros, also written by the author).

1.3 Procedure

The total donations received by schools in each TFEA decile was plotted against the number of pupils in each decile.

One problem with the Concentration Index is that there is no accepted way of calculating its standard error.¹¹ Therefore, to estimate the statistical significance of the result obtained, a theoretical frequency distribution was generated assuming no association between TFEA ranking and school donations for this sample. For over eleven hundred iterations, each school was assigned a random TFEA ranking whilst retaining its original *School Connection* donation, and the overall Concentration Index value calculated. The distribution is approximately normal ($\mu = 0.000$, $\sigma = 0.013$) (Figure 2). From this distribution, the estimated probability of obtaining a Concentration Index value greater than 0.04 is less than 0.01 if, indeed, there is no association between the TFEA ranking of schools and the amount of donations received by schools.

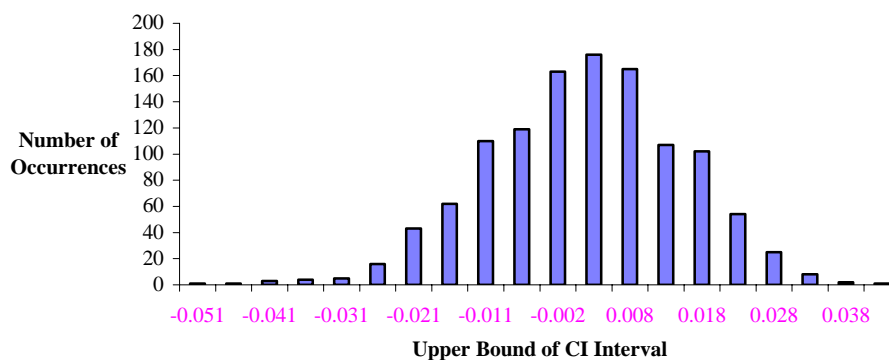


FIGURE 2 Theoretical Probability Distribution for donations to Schools (corrected for school size) given no association between TFEA ranking and the amount of donations received

2. Results

Table 1 outlines the rankings of schools involved in the study.

Decile	Number of Schools	% of all Schools	Number of Schools with Data	% of School Data Captured
1	267	10.3	233	87.3
2	266	10.2	240	90.2
3	271	10.4	254	93.7
4	259	10.0	238	91.9
5	249	9.6	228	91.6
6	259	10.0	241	93.1
7	264	10.1	251	95.1
8	253	9.7	241	95.3
9	252	9.7	245	97.2
10	263	10.1	261	99.2

TABLE 1: The total number of schools with a TFEA ranking and the number of schools to which a *School Connection* donation was made

Not all schools with a TFEA ranking were analysed (2433 schools out of 2603) for three reasons. Firstly, there were schools in the same region with the same name (principally Catholic Schools) and it was not possible to unambiguously associate donations to schools. Alternatively, some schools did not have an entry in the Telecom booklets (and, presumably, did not receive any donations). Finally, the roll for one school was unavailable. Overall, 93.4 percent of schools with a TFEA ranking had data on both the estimated school roll and the amount of donations received. Of the 170 schools not included in the analysis, 76 (45%) were from Deciles 1-3 and 21 (12.4%) from the upper three deciles, 1-10.

Decile	Number of Pupils	% of all Pupils	Number of Pupils Reported	% of Pupil Data Captured
1	65737	9.4	62452	95.0
2	67960	9.8	64006	94.2
3	76846	11.0	74843	97.4
4	82123	11.8	76957	93.7
5	74533	10.7	70782	95.0
6	66881	9.6	64310	96.2
7	66959	9.6	64879	96.9
8	58603	8.4	57621	97.7
9	60930	8.8	60014	98.5
10	100712	14.5	100436	99.7

TABLE 2: The total number of pupils on the file of TFEA rankings and the number of pupils in schools to which a *School Connection* donation was made

Table 2 shows the numbers and proportions of pupils in each decile with a TFEA ranking for which donation data was available.

The mean donation to schools in the lowest decile is \$24.47 per pupil compared to \$51.81 per pupil in the most advantaged schools (Table 3). Overall, the mean

Decile	Number of Pupils	Mean Donation/pupil (\$)	Range (\$)	Median Donation/Pupil (\$)
1	62452	24.47	0.59-221	20.17
2	64006	35.85	0.70-323	30.04
3	74843	39.94	2.10-1148	32.90
4	76957	41.18	5.73-398	30.28
5	70782	41.22	6.82-540	31.26
6	64310	49.86	5.62-925	33.50
7	64879	46.97	1.33-1045	32.22
8	57261	56.22	6.93-483	41.35
9	60014	55.21	11.23-922	44.42
10	100436	51.81	3.18-427	43.13

TABLE 3: Mean, median and range of donations per pupil for schools within each TFEA decile

donation was \$44.38 per pupil. Therefore, pupils from the most socially advantaged schools received approximately twice as much as those suffering the greatest burden of disadvantage. Using a non-parametric test to rank donations (Kruskall-Wallis, Table 4), this distribution is unlikely to have occurred by chance ($H \approx 313$, $p < 0.001$).

Decile	Rank Sum	mean rank
1	150837	647
2	222147	926
3	280377	1104
4	278837	1172
5	274972	1206
6	315320	1308
7	353520	1408
8	365564	1517
9	361826	1477
10	355128	1361

TABLE 4: Kruskal-Wallis rank statistics for schools ranked by mean donation per pupil.

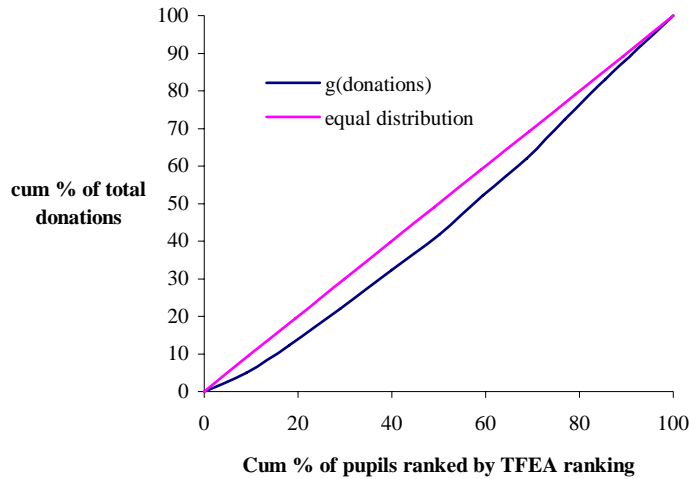


FIGURE 3 Concentration Curve of donations to schools with number of pupils ranked by TFEA rating from most to least disadvantaged (CI = 0.117; $p < 0.01$)

The total donations for all school in each TFEA decile were plotted against the number of school pupils in each decile (Figure 3). As illustrated, the Concentration Curve sags below the diagonal indicating that the distribution of Telecom donations favours the more affluent schools. This inequality is quantified by the Concentration Index. (The Concentration Index has a value of 0.136 for schools not corrected for the school roll.)

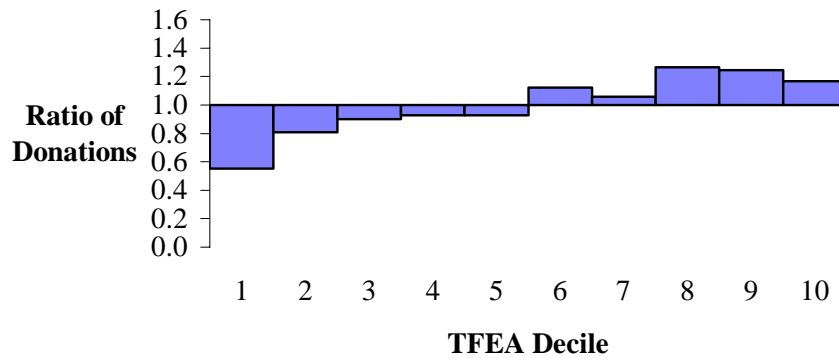


FIGURE 4 Ratio of proportion of donations received in the specified decile against the proportion of pupils in that decile

Figure 4 illustrates the ratio of actual donations received by schools in each decile to the amount that they would have received if the donations and be proportionate to their pupil population share. A proportionate distribution would be represented by a straight line with value 1. Values under 1 indicate relative disadvantage. Schools in Decile 1 received 44 percent less and Decile 10 schools about 20% more than under a proportionate distribution of donations.

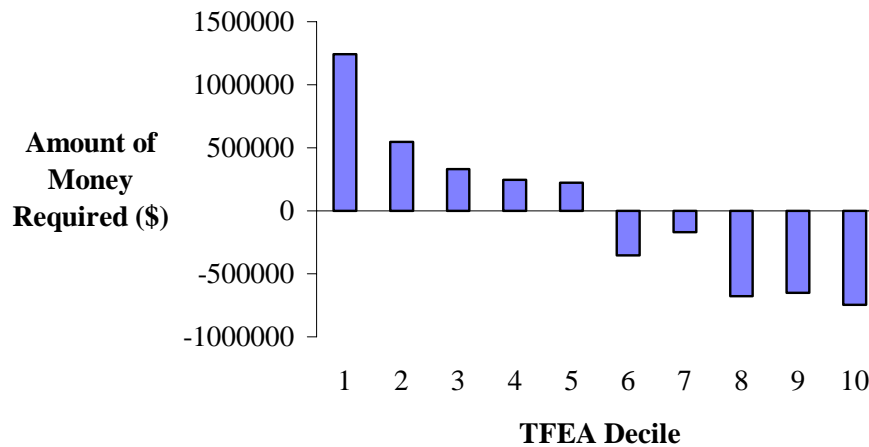


FIGURE 5 The amount of money required by each TFEA decile to achieve an equal distribution of donations.

Alternatively, Figure 5 further indicates the change in the amount of donations required to give each decile a share equivalent to its pupil population share. For example, the poorest schools in TFEA decile 1 would need a total increase in donations received of approximately \$1.2 million to achieve their proportionate share. By contrast, schools with TFEA rating 10, the most advantaged, would need to receive \$750,000 less.

3. Discussion

There are two distinct issues aspects of this study. The first concerns the interpretation of the results and the value of the techniques used. The second concerns ethical implications raised by the *School Connection* initiative.

The results obtained are not unexpected. An association between the TFEA ranking of schools and the amount of donations received does exist. Of course, in common with all ecological studies, this does not mean that *all* schools in TFEA decile 1 receive less than *any* school in decile 10. Some schools with a socio-economically deprived catchment did quite well out of the *School Connection* programme. By contrast, a few decile 10 schools received little money. Nevertheless, the evidence presented gives ground for rejecting the null hypothesis that there is no association between the TFEA ranking of a school and the amount of *School Connection* donations received. On average, more affluent schools receive more money per pupil than poor schools.

The Concentration Curve approach is a convenient way to illustrate this distribution. It is intuitively easy to understand and includes data from all schools and not just from the extremes of the spectrum. The Concentration Curve and Index have particular value as comparative measures in longitudinal studies. It is important to recognise that the Concentration Index is a statistical measure of inequality but one that also has normative implications.⁶ On the one hand it simply quantifies a particular degree of inequality and, as such, clearly lies within the realm of ‘positive’ economics. On the other, given an agreed measure of ‘social welfare’, the greater the Concentration Index deviation from zero, the greater the inequality. It is recognised

that other inequity measures do exist and determining the most appropriate way to measure inequity is a significant challenge that needs addressing.^{12,13}

In this study, data was aggregated at a national level. Results were not sought at smaller level, say by region or by ethnic group because numbers are too small. It is of particular concern, however, that a number (38) of small Maori schools did not seem to have received any *School Connection* donations. If, in fact, this is true and as most were Decile 1 or 2 schools, then their inclusion would have increased the inequality detected. Overall, this study supports the conclusion that the amount of donations received by schools, adjusted for school size, is positively associated with its socioeconomic ranking.

Secondly, this study raises major issues about justice and the role of private enterprise in the funding of social services.

Education is a special good. It may be regarded as a “fundamental” need inasmuch as its absence will harm or detrimentally affect a person in a fundamental way.¹⁴ That is not to say that everyone should receive an equal education but, rather, that everyone should receive an education adequate for the demanding needs of autonomy and citizenship.^{15,16}

The funding and provision of education have normative implications. All children have an equal interest in receiving a quality education; the quality of their education should not depend on their race, sex or the wealth of their parents. Telecom has established a system whereby schools receive more money depending on the rather arbitrary criterion as to how many toll calls a domestic consumer makes. As making a toll call is not an essential activity, such a system would seem to favour the more affluent. Consequently, the resourcing gap between rich and poor schools increases. Now, whether or not that is bad depends on one’s perspective on education. From a libertarian viewpoint, it may not matter. Education is a market good just like any other. The State should not have a significant role in education,^{17,18,19} as epitomised by Friedman, “In principle, I don’t think the government should spend anything on education as such.”²⁰

But there is a contrary view.^{21,22} Given that all children have an equal right to receive a quality education, it seems unacceptable that a major corporation should establish a system that increases the relative disadvantage of already disadvantaged schools. Of course, all nominated schools received some money. Surely, this is to be applauded, any initiative that diverts some money into education must be beneficial. Unfortunately, this is not necessarily true. In an increasingly competitive world, relative disadvantage, and not just absolute disadvantage, may be just as damaging. Given that the State education system should strive to give equality of opportunity for educational success, should private enterprise introduce schemes that may compromise this goal? It is important to recognise that the issue is not simply about what free individuals should do with their own money. That is their choice. Rather, it concerns the ability of a major corporation to establish a system, a conduit, that distorts the resourcing of State schools. This distortion is in addition to any that exists due to the free choice of parents.

Nevertheless, the donations from the Telecom *School Connection* programme are relatively small. Thirty-eight million dollars in an overall compulsory education budget of approximately thirteen billion over the five years of the programme. However, a small amount of money can have a large effect, particularly at the margins. Over the last decade, there has been a sea change in the structuring of the State educational system. These changes are not unique to New Zealand: “Everything, from school education to public services, is being restructured on the self-destructive basis of self-interest”.²³ In common with many other New Zealand State institutions, the management and control of schools has been decentralised.^{24,25} To allow choice, the management of schools has been devolved to communities. However, choice can be expressed in two ways: by participation in the running of the local school (“voice”) or by transferring from an ‘unsatisfactory’ local school to another more desirable one (“exit”). There is evidence that “exit” has predominated over “voice”.^{26,27} One consequence has been that State education system has become more competitive and, in response, many schools have started to market themselves along business lines.^{28,29} Even the Ministry of Education discusses schools competing for their “market share”.²⁵ Marketing by schools has become more prominent and marketing addresses differences at the margins: the basic structure of a car, for example, is relatively fixed, advertising concentrates on small peripheral changes. In their advertising, schools have commonly stressed their pupil:computer ratio and other high-tech capabilities and it is precisely these features that Telecom has emphasised in its publicity. It seems likely that these are the areas that the *School Connection* programme is resourcing.⁵ Additionally, if the *School Connection* programme is viewed as acceptable, then implications for an equitable education system by an extension of such schemes are profound and disturbing. From a Rawlsian perspective, the *School Connection* programme would raise concerns.³⁰ It does not seem clear that agents acting behind a ‘veil of ignorance’ would support school funding schemes based on the purchase of luxury goods; in this instance, toll calls.

On an even more fundamental level, introducing neo-classical economic concepts into the provision of social goods raises concerns, “The market and education make odd bedfellows”.³¹ Allowing private enterprise funding of school resources encourages the perception that education, and knowledge, are just other individual, marketable commodities. Such behaviour “... is related to the modern Marxist view that the inner logic of capitalist society is that of the commodification of human activity.”³² In the current political and economic climate, private sponsorship of education, if not actually encouraged, is not discouraged either.

Finally, motives are important. If Telecom’s prime motive was to help children then, surely, the issue of marginal utility would have been more prominent. Targeted assistance to poor schools would increase social welfare more than the diversion of a similar amount of resources to affluent schools. But Telecom’s focus seems to be different. The company acknowledges that “helping schools to access information technology and use it to enhance learning is the main aim of all Telecom’s schools programmes” (Telecom, personal communication, 18/5/98). Telecom itself is a major supplier of such technology. More generally, concerns may arise because “Corporate recognition of sponsorship of non-profit organisations and community events as part of a successful marketing strategy happily coincides with the dismantling of the

welfare state. For their contribution, ... [the company] gets the image of a 'good corporate citizen'." ³³

A copy of the results and spreadsheet were sent to Telecom for their comments. In its reply (personal communication, 18/5/98), Telecom acknowledged the distortion that was occurring and had already made some changes to the *School Connection* programme which were "especially designed to help a small number of disadvantaged schools". This new initiative is to be commended. However, the details of the new scheme are unclear.

4. Conclusion

So, what conclusions can be drawn? Firstly, given the potential to increase relative disadvantage, programmes like *School Connection* should not exist.

Secondly, measuring inequality and inequity is not easy. It is recognised that "...the transition from inequality (which is statistical) to inequity (which is a moral judgement) is neither automatic nor straightforward."³⁴ Although inequality is not synonymous with inequity, some inequalities are inequitable. The health and wellbeing of people are profoundly affected by unjust inequalities. To improve the 'common weal', it is important to identify and quantify significant inequities that exist. The next step is to correct them. The tools needed may require refinement but, hopefully, a statement of seventy years ago still holds "The complicated analyses which economists endeavour to carry through are not mere gymnastics. They are instruments for the bettering of human life."³⁵

Thirdly, the provision of an adequate education is a public health issue. Research has shown an association between low educational attainment and poor health.^{36,37,38,39} Additionally, the level of education achieved by individuals is potentially modifiable unlike some of the other determinants of ill-health such as age, gender and race. Importantly, Daniels (1985, p46) points out that education, like health care, "address needs which are not equally distributed among individuals" unlike other more equally distributed needs such as those for food and clothing.⁴⁰ This unequal distribution puts the need for education in a separate category to other needs that people may be expected to purchase from their fair income share.

In conclusion, this study has examined an example of corporate sponsorship of an important social good that may increase inequality. Even if it is considered that the inequality introduced is insignificant, the need for continued vigilance is inescapable. The current dominance of free-market ideology has implications for all social services.

5. Recommendations

- research is undertaken to determine techniques for investigating inequality and possible applicable to New Zealand;

- the Public Health community needs to monitor the entry of private enterprise into social services which have health implications;
- clear Government protocols need to be established to monitor the effect of private sector financial involvement in State-funded social services.

Acknowledgements: to the Ministry of Education for supplying the TFEA rankings and school rolls; Telecom New Zealand for the donation data; and Dr Nick Wilson (FAFPHM) for helpful comments on an earlier draft of this paper.

(There was no funding provided for this study. There is no conflict of interest.)

¹ Baum F. Editorial. *Aust NZ J Public Health* 1999; 23:115-116.

² National Health Committee *The Social, Cultural and Economic Determinants of Health in New Zealand: Action to improve health*. Wellington: National Health Committee, 1998.

³ Baum F. *The New Public Health: an Australian perspective*. Melbourne: Oxford University Press, 1998; 426.

⁴ Peters M, Olssen M. Compulsory Education in a Competition State. In: Boston J, Dalziel P, St John S. (Eds) *Redesigning the Welfare State in New Zealand*. Auckland: OUP, 1999.

⁵ Telecom New Zealand *We couldn't have done it without you!* Telecom New Zealand, 1998.

⁶ Wagstaff A, Paci P, van Doorslaer E. On the measurement of inequalities in health. *Soc Sci Med* 1991; 33(5):545-557.

⁷ Dasgupta A. *Elements of microeconomic theory*. Dunmore Press: Palmerston North (NZ), 1990.

⁸ Ministry of Education *Ministry of Education Socio-Economic Indicator for Schools*. Wellington: Ministry of Education, 1997.

⁹ Dialogue Consultants Ltd. *Development of Socio-economic indicators of educational disadvantage in schools*. (Report prepared for the Ministry of Education). Auckland, 1991.

¹⁰ ----- *Socio-economic indicators of educational disadvantage in schools*. (Report prepared for the Ministry of Education). Auckland, 1990.

¹¹ Mackenbach J, Kunst A. (1997) Measuring the magnitude of socio-economic inequalities in health: an overview of two available measures illustrated by two examples from Europe. *Soc Sci Med* 1997; 44(6):575-771.

¹² Coulter P. *Measuring Inequality: a methodological handbook*. Boulder: Westview Press, 1989.

¹³ Allison P. Measures of inequality. *American Sociological Review* 1978; 43:865-880.

¹⁴ Beauchamp T, Childress J. *Principles of Biomedical Ethics* (Second Edition). New York: OUP, 1982.

¹⁵ Mason H. *Education Today and Tomorrow*. Wellington: Minister of Education, 1944.

¹⁶ White J. Problems of the philosophy of education. In *The Oxford Companion to Philosophy*. Oxford: OUP, 1995.

¹⁷ Upton S. *The Withering of the State*. Wellington: Allen and Unwin, 1987.

¹⁸ Prebble R. *I've been thinking*. Auckland: Seaview Publishing, 1996.

¹⁹ Douglas R. *Unfinished Business*. Auckland: Random House, 1993.

²⁰ Friedman M. Technos interview. In *The Education Digest*. Auckland: Education Forum, 1997.

²¹ Kelsey J. *Rolling Back the State*. Wellington: Bridget Williams Books, 1993.

²² Ballard K. *Inclusive education in an exclusive society: some challenges to ideology and practice*. Inaugural Professorial Lecture. Dunedin: University of Otago, 1999.

²³ Saul J. *The Unconscious Civilization*. Melbourne: Penguin Books, 1997:p36.

²⁴ Taskforce to Review Education Administration. *Administering for Excellence: Effective Administration in Excellence*. (The "Picot" Report) Wellington: Government Print, 1988.

²⁵ Lange D. *Tomorrow's Schools: The Reform of Education Administration in New Zealand*. Wellington: Government Printer, 1988.

²⁶ Gordon L. Is School Choice a Sustainable Policy for New Zealand? In Manson H. (Ed) *New Zealand Annual Review of Education:4*. Wellington: New Zealand Council for Educational Research, 1994.

-
- ²⁷ Ministry of Education. *New Zealand Schools 98: A report on the compulsory schools sector in New Zealand*. Wellington: Ministry of Education, 1999.
- ²⁸ Waslander S, Thrupp M. Choice, Competition and Segregation: An empirical analysis of a New Zealand Secondary School Market, 1990-93. In Brown P, Holsey A, Lauder M, Wells A. (Eds) *Education: Culture, Economy and Society*. New York: Oxford University Press, 1997.
- ²⁹ Grace G. Labour and Education: The Crisis and Settlements of Education Policy. In Holland M, Boston J (Eds) *The Fourth Labour Government*. Auckland: Oxford University Press, 1990.
- ³⁰ Rawls J. *A Theory of Justice*. Cambridge, Mass: Harvard University Press, 1971.
- ³¹ Manson H. Editorial NZ – NFS. In Manson H. (Ed) *New Zealand Annual Review of Education:4*. Wellington: New Zealand Council for Educational Research, 1994.
- ³² Brown P, Holsey A, Lauder H, Wells A. The Transformation of Education and Society: An Introduction. In Brown P, Holsey A, Lauder M, Wells A. (Eds) *Education: Culture, Economy and Society*. New York: Oxford University Press, 1997.
- ³³ Light E. Exhibiting a Corporate Conscience. *Marketing Magazine* 1996: 15(5):24-28.
- ³⁴ Leeder S, Grossman S. A din of inequity. *Aust N Z J Public Health* 1991; 15:2-4.
- ³⁵ Pigou A. *The Economics of Welfare* (4th Edition). London: McMillan and Co, 1952:vii.
- ³⁶ Benzeval M, Judge K, Whitehead M. *Tackling Inequalities in Health: an agenda for action*. London: King's Fund, 1995.
- ³⁷ Marmot M et al. Social Inequalities in Health – Next questions and converging evidence. *Soc Sci Med* 1997;44:901-910.
- ³⁸ Wadsworth M. Changing social factors and their long-term implications for health. *British Medical Bulletin* 1997;53:198-209.
- ³⁹ Liao Y et al. Socioeconomic status and morbidity in the last years of life. *Am J Public Health* 1999; 89:569-572.
- ⁴⁰ Daniels N. *Just Health Care*. Cambridge: Cambridge University Press, 1985.