

RESEARCH FOR POLICY: INFORMING OR MISLEADING?

ISSUES PAPER NO. 7

STUART BIRKS and GARY BUURMAN



**CENTRE FOR PUBLIC POLICY EVALUATION
2000**

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INTRODUCTION

This collection of papers is part of the Centres' programme of assessing the type of research being used for public sector policymaking. We were motivated to pursue this subject as a result of the State Services Commission's project on the quality of policy advice given to Ministers. The project which was set up due to concerns raised by Jenny Shipley. The Commission identified several problems, one of them being, "Inadequate and/or ineffective use of information, research, evaluation and consultation techniques as policy inputs".

This collection starts with a brief summary of the State Services Commission's project, followed by comments based on three pieces of public sector analysis. The first is the recently conducted New Zealand Time Use Survey. The survey illustrates how definitions, classifications and prior opinions can shape research, affecting the nature and value of results. The second uses a study on the economic cost of family violence to illustrate how assumptions, transferred from one study to another, can come to be regarded as established facts. That study also illustrates that awareness of the subject area is as important as knowledge of the relevant economic principles. The third study to receive attention, on pay gaps, is used to illustrate the importance of the methodology used and the need to determine what results are likely under different circumstances.

A subsequent Issues Paper will look critically at approaches and reasoning considered acceptable within selected disciplines. "Experts" may well bring with them biases arising from their training.

It is not intended that these analyses be taken as specific criticisms of the studies chosen, but rather as illustrating difficulties that analysts face and pitfalls that they may encounter.

Stuart Birks and Gary Buurman

August 2000

Chapter One

THE QUALITY OF POLICY ADVICE TO MINISTERS AND THE INSTITUTION OF POLICY IN NEW ZEALAND

By Gary B. Buurman

1. INTRODUCTION

In 1997, under the instigation of Jenny Shipley as Minister of State Services, the State Services Commission (SSC) in New Zealand began a project concerned with the quality of policy advice being tendered to Government Ministers. The project came up with a number of issues that impact on the quality of policy advice. The contention here is that the SSC is on the right track and is targeting a number of very important issues within a crucial area. Further, it is argued that other sectors in New Zealand are not immune from these issues which result in misinformation in the policy-making arena. There have also been biased methodologies. Thus faulty analysis, often affected by bias, is spread and reinforced over time.

Studies produced from research are of value, among other reasons, because they are open to criticism. Over time, assumptions are examined; there can be experimentation with new values and causality can be challenged. There is little critical appraisal in New Zealand. One reason given by the SSC is a lack of outside 'think tanks' (Occasional Paper, No. 9. p. 5). Hence New Zealand may lack academic or independent researchers to critically analyze results. It might be expected that public sector policy advice would meet certain standards of impartiality and hence be one of the first places to go for such critical assessment. While it is also expected that lobby and special interest groups hold preconceived ideas, it is hoped that the public sector would be more critical. Again this does not always appear to be the case in New Zealand. An impression can be gained that only results fitting the preconception are welcome. Numerous instances could be advanced as examples for debate. One recent one might be the Shared Parenting Bill, defeated at its first reading.

The two main sections of this paper begin first with a summary of the main findings of the SSC's project to date. The next section includes some implications for policy formation as well as suggestions for improvement.

2. THE SSC AND THE QUALITY OF POLICY ADVICE

As stated, the SSC's project started in 1997. Three early papers that contribute to the project are released on the web at http://www.ssc.govt.nz/documents/Occ_Papers_Contents_Screen.htm. We are mainly concerned here with Occasional Papers 7 and 9 which deal with evaluation and

improving policy advice respectively. Occasional Paper 8 is more of a specialist nature and is of interest to those involved with human resource issues affecting policy advice (No. 8, p. 5). More recently the SSC has released two further specialist papers dealing with examining the characteristics of high performing policy units (No. 22) and looking at the use of secondments and the case of rotation in the New Zealand Public Service (No. 23).

Some of the general concerns of the project are:

- Inability of the Public Service to define outcomes the government seeks
- Inadequate human resources in some policy units
- Inattention to implementation issues
- Counter-productive departmental patch protection

The project identifies five contributing factors;

- Lack of clarity from ministers on desired outcomes
- Insufficient incentives for cooperation on policies that 'cut across' departments
- Variations in standards of leadership
- Under-investment in capability development leading to shortages
- Inadequate and/or ineffective use of information, research, evaluation and consultation techniques as policy inputs

Clearly there are important issues here. There is a communication problem dealing with exactly what it is that policies are supposed to achieve. There is also competition (seen here as unhealthy rivalry) among Public Service Departments. Departments also face resourcing and leadership issues. However economists are specifically interested in the use of research, information and evaluation; as well as implementation issues (the latter are sometimes assumed away).

Achieving good policy results depends upon "analysis that is searching and disciplined, and leads towards design of practical delivery instruments" (No. 9, p. 3). Paper 9 (p. 4) notes a Ministerial perception that advice presented is not underpinned by robust information and research and that policy managers, in charge of the advice, don't see this as a problem. Many cabinet papers are turned back to the Ministries and independent assessments have raised concerns on the quality of policy information that has been presented.

While it is always possible to improve the quality of advice and the information behind it, there are trade-offs. The policy advisor's task is to sift through all relevant information for quality data and to draw intelligent conclusions. However there are now more and increasing sources of information, ranging from primary research to secondary sources including the internet (No. 9, p. 5). The time frame is important in this respect. Very short time frames inhibit in-depth research. Further, short-term incentives encourage production of short-term outputs at the expense of long-term research. Hence a department may not be in a state of readiness for the next policy request (p. 5).

Paper 9 also points out that brevity is required in the presentation of advice, particularly in cabinet papers. Cabinet papers are generally not referenced with information sources. Thus there is no assurance that the contents are not just 'informed guesswork'. This makes it difficult for ministers and their advisors to crosscheck different assertions. As an aside, it is noticeable that over time, fewer publications in the social sciences require page numbers in references. The upshot is that a researcher can be referred to an entire book to trace an assertion, to check if exactly the correct meaning was ascribed to the original author.

There are many aspects to policy advice, including a knowledge of what works and what doesn't, what needs to be changed and what alternatives are available (p. 8). Wellington based advisors may not have access to all these perspectives and can even be isolated from staff in their own dept. Thus advice can be based on theoretical frameworks, extant information, current practice and/or dependable sector interest groups. This means that policy can be out of touch with actual conditions in New Zealand.

A concluding comment in Paper 9 is that quality advice boils down to a problem of demand and supply (p. 11). The demand side (meaning Government Ministers) does not press hard enough for high quality advice while the supply end (policy analysts and their various Ministries) respond to information that is being demanded as if it is a policy machine facing critical deadlines (in a rushed manner).

Occasional Paper 7 concerns evaluation. One perceived problem is a new focus on the actual output of advisory departments rather than on the outcomes that government is seeking. Thus Government Departments might be 'best fitting' existing outputs to the accountability targets set by the new management style. Few departments evaluate the extent to which the policy outputs they produce contribute to the priorities of the Government. If ex ante links between outputs and outcomes are weak, ex post are worse (p. 1).

Without evaluation, the quality of advice is unknown. Many factors affect outcomes and there are problems with causality. It can be tempting to simply not evaluate (pp. 3-4). Outcome evaluation is not a strong feature of New Zealand policy because of low demand (in that ministers were not interested in evaluation); funding problems; a fluctuating policy environment with a three year election period and a lack of skilled evaluators (pp. 4-6).

Occasional Paper 7 poses the question, "why is evaluation of outcome not a strong feature of New Zealand policy?" (p. 4). Among the reasons advanced are fluctuating policy settings due to changed objectives, sometimes through a change in the elected Government. This idea can be used as another argument for a longer term of office. However it is noted (p. 6) that the evaluation climate is changing and some good practices in New Zealand are set out.

An interesting point concerning the difference between outputs and outcomes was brought out by Matheson (a senior manager in the SSC in 1994). He stated (p. 7) that it was comforting to policy advisors to see themselves as being responsible for outputs, while Cabinet Ministers were responsible for outcomes. However the problem then is that a focus on output (what they were doing and how they were doing it) meant losing sight of the reason why they were doing it. This focus has not assisted the decision making of policy makers.

3. IMPLICATIONS

As stated in the introduction, other sectors in New Zealand are not immune from the issues raised in the SSC's project. We could speculate on how these situations could arise. We have seen that research in government departments is constrained by limited resources, structural problems and political direction. Researchers outside these departments also face funding difficulties, poor access to information and databases, time constraints and barriers constraining the contribution that they can make to political and media debate. These barriers include lack of interest by the media, delays in publishing research results, conflict between pursuit of academic incentives and contribution to policy debates, and the extent to which policy is driven by lobby groups and political factors, rather than being research-based.

Much of the research undertaken, even within government departments, can be classified as advocacy research. In other words, there are specific assumptions or directions that are not to be questioned, and sometimes the methodologies are designed to highlight particular perspectives at the expense of others.

Academic disciplines are self-policing in their journal editorial and refereeing processes. This can result in particular perspectives dominating over others and the limitations of various disciplines not being identified for some time.

Other safeguards can be put in place. The practice by some departments of seeking outside peer-review of their research could be more universally applied. There could be more careful assessment of methodologies use. Data could be more freely available for university and other researchers.

It would also be prudent to be more aware of the limitations of current research and available information, and to accept the constraints that this places on our ability to plan and monitor appropriate interventions in the economy and in society in general. The establishment of the SSC's project, arising from political concerns about the quality of policy advice, is indicative of a political awareness of the problem.

4. CONCLUSION

The SSC's project and the concerns raised in the implications section, above, raise questions about the grounds for policy and have serious implications for the quality of policy advice. These include:

- A lack of evaluation in policy areas. This does not only apply to traditional areas of economics. What about evaluating the effect of laws and the legal system, structures and institutions, etc.?
- Poor quality research and the problem of bias. Myrdal stated (p.18) that there is no necessary connection between superficiality and the extent of bias, and that biases in research emanate from the influences exerted by society, from our personal involvement in what we are studying and from a tendency to apply approaches with which we are familiar. Myrdal was talking about the LDCs, but (No. 9, p. 8) mentions advice based on theoretical frameworks, extant information, current practice, and dependable sector interest groups.
- Policy research in the private sector and in universities is not immune from the difficulties found by the SSC.

A healthy democratic system requires appropriate research and a well-informed electorate and policymakers. As illustrated by the examples that follow in this publication, the SSC's concerns about the quality of policy advice appear to be justified. The papers that follow are a part of a wider programme of research that indicates that problems are endemic in New Zealand.

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State Services Commission (1999), *Minds Over Matter: Human Resource Issues Affecting the Quality of Policy Advice*, Occasional Paper 8, (State Services Commission: Wellington).

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Chapter Two

COMMENTS ON THE NEW ZEALAND TIME USE SURVEY

By Stuart Birks

A time use survey was conducted in New Zealand for the year July 1998 to July 1999, by Statistics New Zealand under contract to the Ministry of Women's Affairs which sponsored the survey at a cost of \$2million. Results are published on the Statistics New Zealand web site.¹

1. GENERAL ISSUES

Fleming R and Spellerberg A (1999) discuss the motivation for and methodology of the New Zealand time use survey. The first section of the publication is written by Fleming. She discusses the history and use of time use surveys. Spellerberg concentrates on the methodology.

Fleming indicates the motivation for time use surveys:

"It is recognized that in both the developing and the industrial world women do the greater share of unpaid work, and men do the greater share of paid work. This imbalance has been identified as a major factor in women's lower status, lack of access to resources and increasing poverty."
(p.17)

The situation is not a clear cut as Fleming claims, however. "Work" here is measured in terms of hours, not necessarily value of output. It is not clear that women have lower status, less access to resources, or increasing poverty in comparison to men. Status would depend on measures used and valuations placed on the results. For example, would a greater likelihood of award of custody of children indicate lower or higher status? Would an obligation to pay child support without any accountability in the use of the money or rights to contact with the children indicate lower or higher status? Would gender balance across all government boards and committees (and aim of the Ministry of Women's Affairs by the year 2000²) indicate lower status for women? Access to resources depends on income and intra-family transfers. Poverty depends on both income and wealth. The "gender wage gap", measured in terms of

¹ http://www.stats.govt.nz/domino/external/web/Prod_Serv.nsf/htmldocs/Time+use

² The Ministry of Women's Affairs has a Nominations Service, for which women can register. Names are then put forward to Ministers and departments in response to requests from them. See: <http://www.mwa.govt.nz/work/nom.html>

hourly ordinary time rates of pay, is either static or narrowing over time and women's workforce participation is increasing, whereas men's is decreasing. Prue Hyman reports that women's share of total wealth in New Zealand rose "from 30.5 per cent in 1980-81 to 38 per cent in 1987-88, partly as a result of more equal sharing of property after divorce" (Hyman, 1994, pp.219-220). This is a remarkable increase. Perhaps we should consider it more as an exercising of rights obtained through marriage, though, in which case the wealth distribution figures presumably significantly understate women's total claims on assets. For example, a married person's legal claim to half of their partner's superannuation should be taken into account by a reduction in the measured wealth of the one with superannuation and an increase in the wealth of the other.

A more recent study by Infometrics, using 1997 data, found that women's average wealth was 86% of men's.³ This figure also does not make any adjustment to consider unrealised claims on partners' assets through marriage, as with superannuation. Such adjustment would further reduce the gender difference.⁴

Fleming proceeds to quote from the 1995 UN Human Development Report that, "*a major index of neglect is that many of women's economic contributions are grossly undervalued or not valued at all*" (p.17). Presumably this is a reference to inclusion in national accounts, because intra-family transfers, state benefits, public provision of goods and services, and matrimonial property legislation all indicate a high valuation of women and their contributions. These forms of recognition have far more substance than an economic measure which was designed for another purpose.

She contends that, "*time use data provides empirical evidence of unequal sharing within households and the barriers to participation in paid work presented by caring responsibilities*" (p.17). In fact this time use survey may distort and overstate women's contribution relative to men, it understates their financial position relative to men, and it could equally be argued that society's expectation that men provide financially for their families acts as a barrier to their participation in family life. Similarly, separation, more commonly the woman's idea⁵, and the associated non-custodial status of most of the fathers⁶, is a barrier to fathers' caregiving activity.

She also claims that time use data is of value because, *inter alia*, "*consistency of data collection allows comparisons to be made between ... different groups within the same population*" (p.16). This is not the case if groups are poorly identified, and if

³ In Wheeler (1999), section 5.2.

⁴ Noting that there are about 6% more women than men aged 20 and over (Statistics New Zealand PCInfos database), this translates into women directly holding 47.5% of total wealth, and having actual but unrealised claims on portions of the other 52.5%. Superannuation is 18.1% of males' total wealth, and 8.1% of females' total wealth (from Wheeler, 1999, figure 5.2.3).

⁵ Maxwell and Robertson (1993), table 1.4.3 on p.37.

⁶ In 1994, 84% of lone parents were women (The Child Support Review Working Party, 1994, p.24).

groups are not treated identically in the survey. Both these problems apply with the current survey for certain groups, as illustrated below.

She claims further that, "*Married women are increasingly involved in paid work, but the evidence is that men are taking up unpaid work only slowly or, in some countries, hardly at all, resulting in a double burden for working women*" (p.16). One New Zealand study (Fletcher, 1978) found that full-time homemakers put in less time in total than their working husbands, and the increased hours (paid and unpaid) of women in paid work were essentially a catch-up to the hours put by men in full-time work. Given that women do 60-65 percent of the unpaid work (p.36), and men do the majority of paid work, it would be more accurate to say that both men and women have a "double burden".⁷

The Ministry of Women's Affairs claims that its priority areas of work include: "measuring **women's** contribution to the economy and community through unpaid work".⁸

As Spellerberg points out in the development of the survey, "the needs of sponsors ... were obviously paramount".⁹

It would appear that there are distortions in perception of the issues even before the data are analysed. These may have a significant impact on the questions asked and interpretation of results.

2. SPECIFIC CONCERNS

The results of a study can depend on the methodology used. This includes the definitions used and the groupings made.

"Household" or "family"?

This survey uses the household as a defining criterion, rather than the family. In particular, there is a distinction drawn between caring for children who live in the same household and children who do not live in the same household. Note that there are a large number of families where the parents do not live together in the same household, as indicated by the more than 200,000 parents who are paying child support.¹⁰ According to the definitions, non-custodial parents do not live in the same household as their children. Their time spent caring for their children is therefore classified differently. As the criterion is simply one of household ("unpaid work for own household: looking after a child who lives in the same household as you"), the relationship of caregiver to child is not identified. It is therefore not possible to

⁷ See also "Valuing unpaid work" below.

⁸ My emphasis, from <http://www.mwa.govt.nz/work/priority.html>.

⁹ Fleming and Spellerberg, 1999, p.57.

¹⁰ Inland Revenue figures for 31 August 1999 indicate 200,738 persons paying child support, in relation to about 300,000 children.

determine whether a caregiver in the same household as the child is a parent, a step-parent, someone in the parenting role, or another adult (older sibling, cousin, aunt, or uncle, say) living in the household. Similarly a non-custodial parent's time with a child would be classified as "informal unpaid work outside the home: looking after a child who does not live in the same household as you".

What is "caregiving"?

The "looking after" category only applies for children under 14 years old. For children older than that, the only activities considered are, "coaching, training, teaching, or helping with schoolwork, etc.", unless the person needs special care because of illness or disability. It is not clear that this covers the wide range of parenting activities described in Birks (1999), as distinct from the narrow "nurturing" and traditional-female-focused definitions of parenting used in such places as the Family Court.

Simultaneous activities

People can be engaged in several activities at the same time, as when cooking a meal while listening to the radio and keeping an eye on children. Spellerberg states that, "*if only main or primary activities are recorded, information will be lost on childcare (and passive leisure activities)*".¹¹ To measure time use, it is important to identify all the activities being undertaken at any time, but it does reveal a problem.

In time use surveys, time spent on an activity is used as a measure of input, which is then equated to output of that activity. Can you be as productive in each of two or more activities conducted together as you would if you spent the same amount of time on one alone? If you can, then time spent does not reflect the opportunity cost of the activity because it does not preclude other activities. If you cannot, then time spent on one activity does not reflect output in that activity unless allowance is made for any other activities undertaken at the same time.

While there may be problems with the concept of a main, or primary activity, it can be useful to identify what might be considered the most significant of several activities being undertaken at the same time. It might be imagined that such an activity would be the one that took up most time, attention, or effort, or was considered the most important by the person concerned. The survey uses a different definition of primary activity:

"Primary activity is not determined by the respondent in that the diary does not allow identification of primary and secondary activities. Rather, the order has been determined by the MWA [Ministry of Women's Affairs] in conjunction with SNZ [Statistics New Zealand]." (Guide p.21)

This is quite amazing. It means that the MWA determined the order of priorities for the various possible activities, with the primary activity being defined as whichever of

¹¹ Fleming and Spellerberg, p.51

the activities undertaken is highest on the list. The list is at the “second level classification” of activities, giving twelve groups in the following ranking from most important downwards: personal care; labour force activity; education and training; caregiving for household members; household work; purchasing goods and services for own household; unpaid work outside of the home; religious, cultural and civic participation; social entertainment; sports and hobbies; mass media and free time activities; residual.

It is notable that the ranking fits closely with the activity classification which was designed in part to maintain consistency with international classification used overseas. The only difference is that the ranking reverses the order of “caregiving for household members” and “household work”, putting the former ahead of the latter.

The approach leads to some anomalous results. One subcategory of caregiving for household members is, “available for care of household members”. It appears that this would rank above actually undertaking household work. The primary activity of someone doing household work while a child sleeps is caregiving. However, consider someone working from home and actively involved in caring for children in the household at the same time. That would give a primary activity of labour force activity. Even more strange, a non-custodial parent actively caring for a child while undertaking household work would have a primary activity of household work. Caring for the child does not count as caring for a household member because the child does not live in the same household (even if the child is in that parent’s sole care for anything up to 145 nights in a year, given the New Zealand Child Support Act definition of non-custodial). Instead, the caring is classified as, “unpaid work outside the home (informal), caring for non-household members”. Unlike the case with household members, there is no sub-category to allow for a non-custodial parent who is “available for care”.

Grouping and variability within groups

Ideally for analysis, there should be homogeneity within groups (group members should be identical in relevant characteristics). If there is much variability within a group, then average group characteristics will not accurately reflect individual characteristics, so results will imprecise and could be misleading.

As has already been mentioned, people are grouped by household rather than by family, making it difficult to identify whether someone is a parent or other adult. Non-custodial parents also cannot be identified. There could be much variability within groups on this basis.

Households in the study can be classified by "family type". Family type is defined on page 34 of Statistics New Zealand (1999). Categories are: couple without children; couple with child(ren), some or all aged less than 18 years; couple with child(ren), all aged 18 years or more; one parent with child(ren), some or all aged less than 18 years; one parent with child(ren), all aged 18 years or more; non-family.

It is not clear why 18 is used, when 14 appears to be a crucial age in the survey. There is no identification of relationship between the couple and the children, so one could be a step parent or even short-term live-in partner. With "some or all" children aged under 18, there may be several young children, and there may or may not be older children able to care for them. An individual's unpaid work in the home may be highly dependent on the ages of all members of the household. Even in "couple" households, one or both might have repartnered, with other family members or non-custodial parents in other households. One parent households include never-married, separated, divorced and widowed parents. There may be large differences in the circumstances of these.

Data are given as average time in an activity either for the whole population, or for participants in the activity, where the population is people aged 12 and over. It may be that those aged 12-14, say, may be unrepresentative of the population as a whole.

Unfortunately the time use survey published tables give average times, with no measures of variability of time use among members of the group.

Measurement of income

The questions on income follow a similar pattern to the census, with the same problems, as discussed in appendices 4 and 5 of Birks (1998). Namely, they do not allow for child support paid, or tax on child support, there is no mention that child support is tax free to the recipient. The study is likely to understate custodial parents' incomes and overstate the incomes of non-custodial parents, while failing to pick up the parenting input of non-custodial parents and associated reduction in parenting obligations of custodial parents. Moreover, the income measured is that of the surveyed individual, not of the household, and wealth and lump sum transfers are not identified. The latter can be important in that, for example, a separated spouse may receive a lump sum payment in place of an entitlement in an ex-partner's superannuation, thus receiving the income in advance without it being counted as income. For the other partner, when the superannuation is received, will be recorded as having the full amount as income with no account being taken of the payout made.

Valuing unpaid work

Fleming gives results from a 1992 Department of Statistics publication in which the value of unpaid work was estimated as a percentage of GDP.¹² The lowest estimate is based on valuing unpaid work at the legal minimum wage, with the highest estimate using the average ordinary time wage. These figures are used as estimates of the opportunity cost of the time spent on unpaid work. Using legal minimum wage, unpaid work was valued at 29% of GDP, and with average ordinary time wage the figure was 66% of GDP.

It may be inappropriate to assume that individuals had the alternative option of paid work for the time spent on unpaid work, and there is the general problem of valuing

¹² Fleming and Spellerberg, 1999, p.36.

all units at the value of the marginal unit. Nevertheless, these are fairly standard assumptions. There is another problem, though. Given that unpaid work primarily benefits the individuals and their households or families, it might be more appropriate to consider the apparent opportunity cost to them, namely after-tax income foregone. If we adjust for taxes at average rates of say 20% for the minimum wage and 25% for the average wage, then the percentages fall from 29 and 66 to 23.2 and 49.5.

Fleming states that women's share of unpaid work was 65% on the minimum wage valuation, and 60% on the average wage. Statistics New Zealand provides data on GDP and on compensation of employees. The latter would understate the value of paid work because it omits earnings of the self-employed. From these data, compensation of employees in 1997/8 is about 45% of GDP. In Birks (1994) I estimated that women contributed about half as much as men in terms of before tax earnings.

Table 1 gives estimates of men's and women's paid and unpaid work contributions as a percentage of GDP on this basis.

Table 1: Value of work contributions by gender (% of GDP)

U/W valued at:	Paid work		Unpaid work		Total	
	Men	Women	Men	Women	Men	Women
Min. Wage	30	15	10.15	18.85	40.15	33.85
Av. Wage	30	15	26.4	39.6	56.4	54.6
After Tax Min. Wage	30	15	8.12	15.08	38.12	30.08
After Tax Av. Wage	30	15	19.8	29.7	49.8	44.7

Note that labour costs are only part of a country's GDP. Other components include a return to capital, for example, recognizing that inputs other than labour are needed for production. As it would be inappropriate to measure GDP purely in terms of payments to labour, similarly it is inappropriate to measure the value of goods and services provided through unpaid work simply on the basis of an estimated cost of the labour used. A more consistent approach would recognise the value of the capital input into production. Perhaps it is not only unpaid labour, but also unpaid capital, that goes to produce unpaid outputs in the home and elsewhere.

In other words, not only are there problems with the measurement of unpaid work, but also there are difficulties with the further analysis which attempts to value the output from this work.

3. WHAT WE CANNOT SAY WITH THE SURVEY

In June 1997 the Ministry of Women's Affairs claimed that¹³:

the information revealed by a time use survey would assist our understanding of the following:

- the proportion of time people spend in paid work, compared with the time in unpaid work such as caring for the sick, elderly or disabled and childcare
- the amount of time involved in voluntary work, for both groups and individuals, to identify the volume of unpaid voluntary work in the health sector, the labour market and other areas of the community
- the amount of time voluntary workers put into providing support services for people involved in early release programmes, as well as time volunteers, families and friends put into supporting people who are in prison or otherwise detained. This information would assist improved design and delivery of services in the justice sector
- the time people spend recovering from illness which cannot be classified as accidents, for example the effects of stress and overwork
- the range of activities of people in particular population groups, of interest to a wide range of organisations
- the geographical location of people at particular times of the day, of interest to civil defence planners
- information on people's participation in activities such as shopping, use of leisure facilities and cultural events
- identifying whether people usually combine education, training and skill development activities or whether the typical pattern is to pursue each separately

The classifications used in the survey are such that it would be difficult to get any precise information on any of these issues. "Proportions of time" or "amounts of time" cannot be identified accurately because of simultaneous activities and an imposed ranking of activities. There are few categories for voluntary work in the community. Information is not gathered on early release programmes, nor on recovery from illness such as stress and overwork. Geographical locations of a person's activities are not identified. Only selected leisure facilities are considered, with parks being a notable omission. Activities are widely grouped, hence sporting activity would be counted under "organized sport", "exercise" or "other sports and hobbies". Overall the ministry's list overstates what can actually be achieved by the current survey.

The survey is really very limited in its usefulness. Among some of the things it cannot tell us are:

- Differences in workload according to:
 - the number of adults and children in a household;
 - relationship of the adults to the children;

¹³ <http://www.mwa.govt.nz/work/whttus.html>

- the nature of the relationship between the adults (recently married, de facto, reconstituted family...);
 - the working situation of other adults in the household (unless both were surveyed and the household identified).
- Relative parenting contributions of custodial and non-custodial parents.
 - Total time spent on caregiving.
 - The amount of paid childcare undertaken.
 - Household incomes.
 - Whether the children in the household spend much time living in another household.
 - Whether the time spent on unpaid work is productively and efficiently used.
 - What the self-perceived priorities are during multiple activities, and which activities took most effort or concentration.
 - The extent to which people chose their particular allocation of time, as in the amount of paid work undertaken, for example, identifying the relationship between paid and unpaid work obligations.

The use of “household” as a classifying unit and the absence of clear identifiers of family relationships seriously limits the usefulness of the information provided by the survey.

However, the most significant problem is the method of determination of “primary activity”. This arises because of people’s simultaneous engagement in several activities. The survey does not determine people’s assessment of the relative importance of these, or of their allocation of effort over them. Instead, it imposes the Ministry of Women’s Affairs’ own ranking of activities irrespective of individual preferences or effort. For some issues, the ranking of an activity depends on the family situation (intact or living apart) of the people concerned. In a survey specifically intended to give clearer information on unpaid work, it is hard to see how this approach can be justified.

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Chapter Three

COMMENTS ON THE ECONOMIC COST OF FAMILY VIOLENCE (A selective critique of Snively, Suzanne (1994), *The New Zealand Economic Cost of Family Violence*, Department of Social Welfare, New Zealand)

By Stuart Birks

There are many problems with Snively's study. The following discussion should not be taken as comprehensive, but simply as indicative of the speculative and problematic nature of the study and its findings.

Andrew Stone, in the *New Zealand Herald*, wrote:

“Drawing on official statistics, Suzanne Snively and her team of domestic abuse experts calculated that nearly 300,000 women and children were “survivors” of family violence.”¹

I looked at her study to find out where this figure came from. A seminar was held in June 1994. There were 20 participants, primarily from the public sector (for example Police, Justice, Social Policy, Social Welfare, Health, and Women's Affairs). These participants were consulted to determine the level of family violence. She starts with a prevalence rate:

“A commonly agreed prevalence rate of family violence amongst service providers in New Zealand is estimated at 14% or 1:7. It is also the middle assumption between 1 in 10 and 1 in 4 measured by other studies attempting to assess the prevalence of family violence ... Based on the New Zealand population as at end March 1994, one in seven children is 129,556 and one in seven women is 172,125, a total of 301,691.”²

The prevalence rate is clearly not from “official statistics”. Nor is it clear that it is “commonly agreed”:

“The seminar participants expressed different views on the prevalence of family violence. There was agreement to use 1:4, 1:7 and 1:10 ratios to estimate the number of families experiencing family violence (survivors).

¹ Stone A (1999) "Billion-dollar cost burdens society", *New Zealand Herald*, 20 August. <http://www.nzherald.co.nz/nzherald99/story.cfm?theStoryID=12950>

² Snively (1994), p.11, para. 5.2

For this project these ratios are applied to estimate the number of women and children without any attempt to adjust for different family types.”³

So despite differing views, this is how a crucial value in the Snively study was determined. It can hardly be claimed that she and her experts “calculated” a figure of 300,000 survivors based on “official statistics”.

There are two main sources for statistics on family violence, police and court records are one, and broader social surveys are another. There is a marked difference between family violence data drawn from these sources. The former record males as the main perpetrators of partner violence. The latter give higher rates of partner violence overall, with little difference between rates for men and for women. Snively's police data for the 1993 calendar year show 21,008 domestic dispute incidents for the whole of New Zealand, whereas Magdol et al. (1994) give partner violence victimisation results from a cohort of Dunedin 21 year olds as 34.1% for males and 27.1% for females.⁴ Given Snively's specification of women and children only in the 'survivors' category, and a reliance on the opinions of service providers, it is not clear that survey data were taken into account.⁵

The choice of the figure is further justified by Snively on the basis of overseas studies using similar prevalence rates. Care should be taken with this, as overseas studies have in turn quoted Snively's study.⁶ There is a danger of reinforcing misinformation through the growth of such studies.

The New Zealand definition of family violence may be broader than that used overseas, thus giving an inflated figure for New Zealand, so international transmission of prevalence figures may be misleading:

“In New Zealand, it is customary to include violence perpetrated on any family members, not only partners. The definition also includes threats of violence and encompasses men, women and children. This definition forms the essential basis on which our assignment (NZECFV) has been developed.”⁷

If the nature of “violence” varies, threats being included in New Zealand, for example, then the impact of this violence is also likely to be different.

³ Snively(1994), p.6, para. 3.7

⁴ For more discussion, see for example section 5.5 of Birks (1998)

⁵ As one illustration of the opinion of service providers, see Barnes, G (1999)

⁶ See for example chapter 7 of Australian Capital Territory Community Law Reform Commission (1996)

⁷ Snively (1994) p.3 para 2.3

Problems do not stop at the selection of the 1-in-7 prevalence rate figure. Once we have selected a prevalence rate, is it appropriately used? A prevalence rate gives the number of people experiencing family violence. It is not an incidence rate, and it does not state whether it refers to experience in a family at any time, or experience in a year. Snively uses the figure as an annual incidence rate, with each survivor experiencing one incident. There could be several people per incident, and more or less than one incident per year.

Snively presents three scenarios. These give three estimates of the economic cost of family violence for each assumed prevalence rate. In her report she discusses the scenarios for the 1-in-7 prevalence rate.

Base scenario

The “base scenario” costings are mainly based on the characteristics of those families who acknowledge family violence by calling the police. The number of reported cases is assumed equal to the number of Family/Domestic Associated Incidents/Offences reported to the Police. These include domestic dispute incidents; violence against women offences; child abuse offences; and all domestic related breach offences.⁸ Somewhat surprisingly, these are all added together. The total number of incidents plus offences is then referred to as the number of callouts. If there is an incident resulting in an offence being recorded, this would show up in the Snively study as two callouts, one for the incident and another for the offence. Snively may be as much as double counting each reported incident. On this basis alone, Snively's estimate of the level of reported violence may be twice the actual level. In addition, Snively assumes that the number of incidents/offences equals the number of “survivors”. If during the year anyone experienced more than one reported incident or offence, then Snively is further overestimating the number of reported survivors. On the other hand, the 1-in-7 approach considers children living in families experiencing family violence as “survivors”, as it does women in families experiencing family violence against children, even if they are the perpetrators.

The base scenario is not limited to a consideration of reported cases only. As with the other two scenarios (five times callout, and income foregone), it assumes that the total number of survivors is 301,691. It does this by including non-reported cases calculated as the total number of survivors minus the number claimed to be reported cases (301,691 - 37,144). Note that there is a large number of unreported cases partly because each case is assumed to have only one survivor.

For unreported cases, it is assumed that the main costs are 2 doctors' visits and 2 drug scripts per person. For the 37,144 reported cases, 25% (9286) were said to incur accommodation costs of a year's private rental at \$180 per week each, plus \$120 deposit, \$1000 for furniture, etc., and \$730 for other household expenses as a result of the family violence. An additional 1% of reported cases bought homes, with \$8000

⁸ Snively (1994) p.35, fn 1.

deposit per person included in the costs, despite it being a recoverable capital outlay, plus other costs.

Other costs included 12.5% (4643) requiring dental treatment at \$120 each.⁹ This is quite remarkable, given that the Hamilton Abuse Intervention Pilot Project found over nearly 3 years only about 5 cases of teeth broken or knocked out.¹⁰ Given the catchment of about 100,000 people, and a New Zealand population of say 3.6 million, that would translate into about 60 cases a year on the whole country. This compares with Snively's estimate of 4,643 among reported survivors.

Even more remarkably, government costs of dental treatment are calculated on the basis of treatment not for 4,643 people, but for 12.5% of all 301,691 "survivors", or 37,711 people.

In addition, every reported case is assumed to suffer a drop in income equal to 3 months at the average women's gross ordinary time wage. This was an estimated figure, with no explanation given save that, "It is generally accepted that every family affected by family violence will suffer a direct fall in family income at the time they acknowledge the violence."¹¹ Gross income figures are used although they are described as costs to the individuals, ordinary time wages are used rather than earnings, and women's wages are used although it is described as a 25% fall in "family income". Those not earning are assumed to have been prevented by family violence from entering the workforce. For some unexplained reason, there is a further loss of income due to loss of work time. The latter calculation uses total average female weekly earnings for those in full-time work, and the median (not average) part-time wage for those in part-time work.

Footnote 13 on page 36 says that those remaining in full-time work will require full-time childcare, the costs of which are included as costs of family violence. No explanation is given as to why such childcare was not needed when the women were working before. Childcare costs are included also for women in part-time work.¹² It appears that the survivors are all women. Although only 8% of those reporting family violence stay in full-time work¹³, these 8% are all expected to require full-time childcare. The 1-in-7 figures indicate that there are far more women than children survivors of family violence, so it is not clear where the extra children are coming from. Moreover, some of those reducing or stopping work will be caring for children

⁹ See the quote below by Tony Ryall comparing the New Zealand definition to that of other countries. As presumably a tooth broken or knocked out would be considered violent offending, the 12.5% figure could therefore translate into a 25.0% rate elsewhere.

¹⁰ See table 2 of Maxwell (1994)

¹¹ Snively (1994), p.36, fn 12

¹² Snively (1994) p.36, fn 14

¹³ Snively (1994) p.36, fn 15

or doing other activities which have some value, but this is ignored. It is puzzling how the 37,144 women and children appear to have become 37,144 women.

Government health care costs include hospital costs. They assume 50% of survivors, or 150,846 people, use accident and emergency services, no explanation given. They also assume 16,955 admissions with an average stay of 6.1 days. This is based on a “conservative” application of findings from a 1983 study of women's refuges sampling 83 women and children. Total government health care costs in relation to family violence are estimated at \$141m.

Despite direct costs to individuals being listed, benefit payments are also considered. It is assumed that one seventh of payments for unemployment, the DPB, sickness, accommodation, special needs, and childcare arise as a result of family violence.¹⁴ This is double counting as costs to individuals should consider change in earnings, not just losses. It also assumes that these payments have arisen because of family violence. It is interesting to note the assumed link with unemployment, whereby family violence is considered to be responsible for a fixed proportion of unemployment benefit outlay. This suggests a very close link between family violence and the state of the economy, but with causality running in the reverse direction to that which might be expected, and suggesting differing levels of violence according to socio-economic group. Total costs of benefits paid as a result of family violence in this scenario come to \$468m. \$270m is in income costs for reported survivors, with a further \$109m in accommodation costs to these reported survivors.

All public funding given to Rape Crisis and Women's Refuge is considered to be a cost of family violence. The former is particularly surprising. Children's and Young Person Service funding in relation to family violence (\$108m) is also included. Given the quality of information on the nature of the problem, it is perhaps debatable whether money spent to address family violence issues is a cost of family violence itself or money chasing a cause. Similarly cost of calls to the police for family violence are included (\$13m), although this is a cost of the policies applied in relation to family violence rather than necessarily a cost of the violence itself. In other words, it begs the question as to whether the policy is appropriate and efficiently applied. To illustrate one aspect of the problem, should the cost of fire service callouts on false alarms be considered a cost of fires in New Zealand, or a cost of the approach adopted for dealing with fires? If we are not careful, anything could be made to look like a serious problem simply by spending a lot of money on it. This could then be used as a justification for the expenditure.

To summarise the above figures, the costs estimated in the base scenario include \$141m in government health care costs, \$468m in benefit payments, \$121m in police and CYPS family violence activity, \$270m in income costs for reported survivors, and \$109m in accommodation costs to these reported survivors. These components come to \$1,109m of the scenario total estimated cost of \$1,235m.

¹⁴ Snively (1994) p.39, fn 3

Five times callout scenario

The “five times callout” scenario multiplies the number of reported survivors in the base scenario by five on the premise that there are five people who acknowledge family violence for every one police callout. This figure is described at the one used in a New South Wales study. Note that “*the NSW assumed that there were five women who directly acknowledged family violence and sought help for every one who called out the police*”.¹⁵

Given the different definitions of violence in New Zealand and Australia, it may be inappropriate to simply apply this ratio.

New Zealand violent crime statistics are much higher than those observed in other countries because of our broad definition of violence. As Minister of Justice, Tony Ryall, said in a media release on a UK Home Office study dated 1 September 1999:

“... using similar definitions of violent offending as are used by many countries in the study, New Zealand's rate of violent offending effectively halves”

Supporting information for the Minister from the Ministry of Justice explained that:

“Some countries such as Australia, the Netherlands, and Russia do not appear to include minor assaults, intimidation, and threats within their definition of violent crime. However, the New Zealand definition does include these crimes, which together make up approximately half of all violent crime in this country.”

In this scenario, the figure for reported survivors is taken as five times the figure in the base scenario. This gives a figure of 185,720. Of these, it is assumed that 46,430 require rental accommodation for the year at \$180 per week, and 23,215 require dental treatment. All 185,720 suffer a direct fall in income, although the assumed 301,691 survivors only include 172,125 females aged 14 and over. Once again, children appear to be counted as women.

Estimated total costs in this scenario are \$2,739m. The difference in costs between the base scenario and the five times callout scenario arises entirely as a result of the assumed increase in direct costs resulting from the five-fold increase in numbers of “reported” survivors. Assumed costs to the government are unchanged. This is because there is no change in the assumed 1 in 7 benefit payment component, and health care costs are calculated on the basis of all assumed survivors, even though only reported survivors are assumed to have private health care costs.

¹⁵ Snively (1994) p.7 para. 3.14.

The Income Foregone Scenario

This scenario gives a figure of \$4,206m. Costs to the government are assumed unchanged. Nearly all the increase over the five times callout scenario arises because of assumed income foregone for non-reported survivors (\$1,298m), with an additional \$107m assumed cost to early school leavers.

The calculation of the \$1,298 figure is described in Snively, fn15, p.58. There are some contradictory statements in the description, such as the statement that all women over 14 are in the workforce, 55% of women are in paid work, and the average participation rate of women is 54%. Snively then uses a Women's Refuge estimate of 25% labour force participation for those involved in family violence. This assumes that the Women's Refuge evidence accurately reflects the population as a whole, although the ethnic breakdown would suggest otherwise, with 50% of Women's refuge clients in 1992 being Maori, and 51% being aged 21-30 (National Collective of Independent Women's Refuges *Annual Report 1993*, pp.10-11). She states that, of the "1-in-7" women who are affected by family violence (172,125), 54% minus 25% (29%, or 49,916) gave up work. The figure is then applied to the 115,971 unreported survivors, to claim that 49,916 of these (43%) gave up or were unable to enter paid work. These women are assumed to earn the average wage. She also has all 185,720 reported survivors experienced a 25% drop in income for similar reasons. It seems that the 129,566 child survivors of up to 14 years of age have now become working aged women.

The children reappear in the indirect costs¹⁶, where it is assumed that 50% of 15 and 16 year old school leavers not entering further training left due to family violence. Costs to them are assumed for some unspecified reason to be the difference between the youth wage and the average wage.

How it was reported

The following are extracts from the New Zealand Herald article of 26 August 1999. Quoting Brenda Pilott, who ran the family violence unit:

“... the report was immensely valuable in budging the Government to commit some serious funding to policies addressing family violence... We could have produced a report which used speculative data to get some shocking numbers. But we wanted a robust conclusion which we could stand behind.”

However much of the estimated cost was in fact public funding either directly spent family violence policies already in place, or assumed to be spent as a result of family violence (e.g. one seventh of unemployment benefit payments, and support for Rape Crisis).

¹⁶ Snively (1994) p. 69

“The Snively study found that family incomes dived an average of 25 per cent after episodes of domestic violence.”

It did not find this, it merely assumed it.

Despite falling incomes being considered in this way, Stone reports:

“Economist Suzanne Snively believes the annual cost of family violence could be a staggering \$10 billion if lost income is calculated.”

Stone also says:

“Her report agreed with the NSW standard, which found that for every woman who called police there were five women who turned elsewhere, to friends, a refuge or the family doctor.”

It agreed with the NSW study simply because she chose to use the NSW figure, which is itself simply an assumption (“*The NSW study assumed that there were five women who directly acknowledged family violence and sought help for every one who called out the police.*” (Snively, para.3.13, p.7)

As John Yeabsley of the NZIER says in the Stone article:

“The point is to know whether your responses are right or not. Unless you get good quality data you have no way of knowing whether the policy is appropriate.”

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Chapter Four

PAY GAPS AND FUNCTIONAL FORMS

(Comments on Kirkwood H (1998) *Exploring the Gap: An exploration of the difference in income received from wages and salaries by women and men in full-time employment*)

By Stuart Birks

Quantitative studies of the relationship between variables require a specification of the nature of that relationship. For example, multivariate linear regression models assume “additive separability”. In other words, the impact of each of the explanatory variables is independent of the values of the other variables (separability), and the overall impact equals the sum of the individual effects (additivity). If this assumption is inappropriate, a variable may fail to show up as insignificant in tests of the model while still being important. In other words, if a model is incorrectly specified, results can be misleading.

Similar problems can arise in deterministic models. It is therefore important to understand the nature of the model before drawing conclusions. One way to do this is by means of “synthetic” data, where the underlying structure is known. This enables us to see what results can be expected under various circumstances.

This paper uses synthetic data to test the methodology used in Kirkwood (1998) to explore pay differences between men and women in full-time employment.

Kirkwood’s approach

Kirkwood looked at income data for nearly 10,000 individuals in full-time employment. Numerous other characteristics for these individuals were also available (age, ethnicity, highest educational qualification, etc.) and some of these were used to try to explain differences in pay between the men and the women. She used tree analysis to identify the most significant factors affecting earnings. As she describes it, the analysis produced “115 terminal nodes (or sub-groups), the attributes of which ‘explain’ 45 percent of the earnings of men and women in full-time employment”. She described a smaller model which “still explains 29 percent of average earnings as defined by 12 terminal nodes (or sub-groups). As such, the remaining 103 terminal nodes can appear to each prescribe only a relatively small amount of average weekly earnings. The identification of these main terminal nodes allows for the identification of the most significant factors responsible for earnings”. Given that the analysis used a regression programme, it is more likely that variations in income are explained, rather than income itself. The real point of interest in the study and for this paper is the next step, however.

Kirkwood selected five variables, occupation, hours worked, age, highest qualification, and ethnicity. She used these variables to standardize the data: “this analysis attempts to explore the earnings gap by asking what the gap would be if women and men had the same structure”. Standardisations were done one variable at a time, then “progressively standardizing for all 5 variables bar one”, then for all five variables. It is not clear precisely how she standardized for more than one variable at a time, but in any event there were other identified variables which were omitted from the analysis. That is significant, as will be demonstrated.

Her results, comparing women’s and men’s average weekly earnings, are as follows:

Standardisation for one factor at a time

	Men	Difference	Women	Ratio
Not standardized	\$698	\$144	\$554	0.79
Standardised for:				
Hours (3 classes <37 hrs ,37-<40 hrs ,40+ hrs)	\$665	\$110	\$555	0.83
,, (2 classes <40 hrs, 40+ hrs)	\$664	\$108	\$556	0.84
,, (2 classes <42 hrs, 42+ hrs)	\$661	\$98	\$563	0.85
Age (3 classes 15 - 25, 26 - 29, 30+ years)	\$660	\$119	\$541	0.82
Age (continuous)	\$663	\$121	\$542	0.82
Qualification	\$678	\$132	\$546	0.81
Ethnicity	\$676	\$132	\$544	0.80
Occupation	\$684	\$143	\$541	0.79

Standardisation for five factors less one factor at a time

	Men	Women	Difference	Ratio
Not standardised	\$698	\$554	\$144	0.79
Standardised for:				
4 variables, not occupation	\$662	\$564	\$98	0.85
4 variables, not qualification	\$665	\$557	\$108	0.84
4 variables, not ethnicity	\$664	\$560	\$104	0.84
4 variables, not age	\$676	\$559	\$117	0.83
4 variables, not hours	\$673	\$549	\$124	0.82

Standardisation for all factors

	Men	Women	Difference	Ratio
Not standardized	\$698	\$554	\$144	0.79
Standardised for:				
All 5 variables	\$665	\$563	\$102	0.85
Standardised for all 12 final sub-groups (figure 1)	\$660	\$567	\$93	0.86

Kirkwood concludes that, “Around half the earnings of both women and men in full-time employment can be explained by the variables selected for exploration”, and that, “the remaining 14 percent [the unexplained “earnings gap] could not be attributable to the main variables under consideration here”.

Simulation with synthetic data

The following example uses synthetic data and two factors with three categories each. The factors are age and highest qualification. It is assumed that earnings increase with both qualification and age.

The raw data are in the following tables. There are the same number of men and women in each age group and each qualification group, and income by age and qualification is the same for both men and women. The difference is that, consistent with the current labour market and education situation, there are more highly qualified women in the youngest age group, and fewer highly qualified women in the oldest age group.

MEN numbers

	qualification level			
age group	1	2	3	total
1	3	3	3	9
2	3	3	3	9
3	3	3	3	9
Total	9	9	9	27

income

	qualification level		
age group	1	2	3
1	100	120	150
2	100	140	170
3	100	140	200

WOMEN numbers

	qualification level			
age group	1	2	3	total
1	2	3	4	9
2	3	3	3	9
3	4	3	2	9
Total	9	9	9	27

income

	qualification level		
age group	1	2	3
1	100	120	150
2	100	140	170
3	100	140	200

Note that:

1. There is a difference between men's and women's average incomes.
2. All pay differences can be explained by a combination of age and qualification differences.
3. Each age group has the same number of men and women, so standardizing for age differences would have no effect on the calculations. In other words age “explains” none of the gender difference in pay.
4. Each qualification group has the same number of men and women, so standardizing for qualification differences would have no effect on the calculations. In other words qualifications “explain” none of the gender difference in pay.

5. The above two points mean that standardizing for one factor and then standardising for the other would also result in no change in the averages.

These points are demonstrated in the following tables, which give total incomes by sub-group and average incomes by group.

MEN	qualification level			
age group	1	2	3	average
1	300	360	450	123.3333
2	300	420	510	136.6667
3	300	420	600	146.6667
Average	100	133.3333	173.3333	135.5556
Average overall			135.5556	

WOMEN	qualification level			
age group	1	2	3	average
1	200	360	600	128.8889
2	300	420	510	136.6667
3	400	420	400	135.5556
Average	100	133.3333	167.7778	133.7037
Average overall			133.7037	
Age standardised average			133.7037	
Qualification standardised average			133.7037	

The implications of this simulation are as follows:

- It may not be appropriate to use Kirkwood's method to claim that a certain amount of variation is “explain” by a given factor.
- In particular, if factors are interrelated, then it may not be possible to isolate the impact of individual factors in this way. The relationship between the factor and income is incorrectly specified.
- If any relevant factor is omitted, then the results from using the remaining factors can be misleading.
- Even if all factors are considered, this can give misleading results if it is done sequentially rather than simultaneously.

Care must be taken when using quantitative methodologies to identify relationships between variables. The functional forms can be inappropriate and, as discussed in Birks (1999), inappropriate groupings of data can further distort results. As Desai has said:

“... in confronting theories with facts, the method of testing does not play a neutral role...the answer depends as much on the method used as on the hypothesis and the data being confronted.”¹⁷

¹⁷ Desai (1981), p.96

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