research paper on the relationship between income& bulk billing rates according to federal electorates. This was compiled by Ian McAuley, lecturer in public sector finance at the University of Canberra.

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AUSTRALIAN CONSUMERS ASSOCIATION

Bulk billing by income/electorate

Introduction

There has been a recent fall in bulk billing of medical services. Because medical practitioners are experiencing real cost increases and because Medicare rebates have fallen behind general income growth, it is likely that this fall will continue.

Bulk billing rates vary widely across the country; for example they are much lower in country regions than in metropolitan regions. This spatial variation in turn results in a political dimension to the decline in bulk billing.

Because bulk billing rates are collated by electorate, and because income data is also collated by electorate, it is possible to analyze both the equity and political dimension of bulk billing. The task was to test the hypothesis that bulk billing has been highest in high income regions, on the basis that there is likely to be a higher concentration of medical practitioners in those regions.

The data used relates to bulk billing rates as at March 2003 (supplied by the Commonwealth Department of Health and Ageing) and wage and salary income by electorate as at 1999-00, from an August 2003 Parliamentary Library research note.

Findings

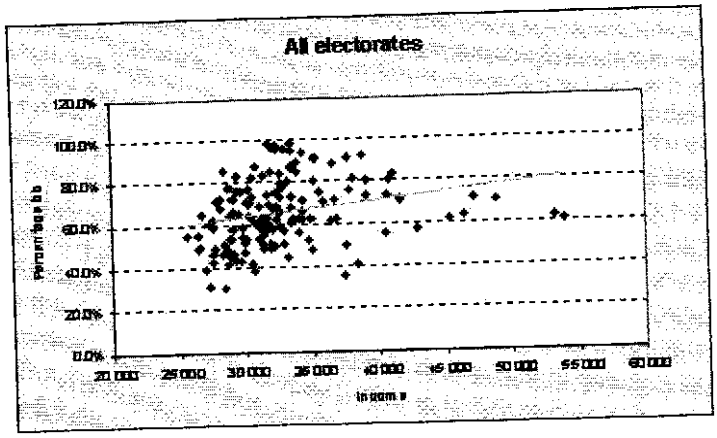
There is evidence of a relationship between income and rates of bulk billing, but it is not a simple linear one, and the causal factors are not clear.

As expected, there is a strong regional dimension, particularly between country and city regions. In terms of political affiliations, bulk billing rates are lowest in National Party electorates and highest in Labor Party electorates. The electorates with the highest rates of bulk billing (above 90 percent) are all held by the Labor Party, and are all in Sydney.

The relationship between income and bulk billing is complex. Bulk billing does, indeed, rise with income, but only up to a point, and the relationship is probably explained by region as much as by income. The lowest incomes and the lowest bulk billing rates are in rural electorates. As one moves to provincial cities, and on to outer metropolitan regions, incomes and bulk billing rates increase, but, for electorates in the three highest income decile groups. bulk billing falls with income. These electorates are mainly metropolitan. The relationship between income and bulk billing is essentially an inverted "U" shape.

Further falls in bulk billing therefore are likely to have their strongest impacts on medium-income electorates held by the Labor Party. In electorates held by the Coalition, because bulk-billing rates are already low, the impact is likely to be much more subdued. At first sight one may believe that this is a manifestation of incomes in Labor seats being lower than in Coalition seats. But, contrary to folk wisdom, average incomes in Labor and Coalition electorates are similar. The difference comes in the spread of incomes, with the Coalition holding seats at both ends of the income spectrum where bulk billing rates are lowest – low income rural regions and in high income inner metropolitan regions. Labor representation is more concentrated in middle income electorates, at the peak of the inverted "U".

Broad relationship to income



There isn't any. The scatter diagram is alongside. One can discern a weak correlation, which, at first sight, suggests there is some positive relationship between income and bulk billing rates.

But the coefficient or correlation (R^2) is only 0.05 – which, in effect, says that only five percent of the variation can possibly be explained by variation in income. Such a finding has no statistical significance.

Broad relationship to region

When we re-aggregate the data into regions as defined by the Electoral Commission, there is some evidence of a relationship – but probably more to region than to income. Region may affect both bulk billing rates and income. (See the final presentation at the end of the paper)

Table 1 – bulk billing rates by broad region

Region	Bulk billing rate	Average income
Inner metropolitan	74.8%	37 300
Outer metropolitan	75.2%	32 900
Provincial	60.8%	31 200
Rural	56.2%	29 300
All	68.5%	32 800

"Average" income is unweighted across electorates - does not allow for possible variations in electorate sizes. "Income" relates to wage and salary income 1999-2000— does not include other sources of income – business income, government transfers.

Bulk billing rates for unreferred attendances, March Quarter 2003.

In this presentation, there is no significant difference between inner and outer metropolitan bulk billing rates, though there is a large difference in income between these regions.

There is a significant difference between metropolitan, provincial and rural bulk billing rates, however, even though the income differences between these regions are comparatively small. Again, that reinforces the notion that it is region, rather than income, that is a significant variable.

Party representation

In terms of political persuasion, it may be useful to see how bulk billing varies by representation. I did not expect to find a difference between Liberal and Labor electorates, because many seats can tip on small margins and income is not a strong determinant of voting.

But while there is little income difference between Liberal/Labor representation, there are significant differences in bulk-billing rates. Unsurprisingly, National Party electorates have low income and low rates of bulk billing.

Table 2 – bulk billing rates by party

Party	Bulk billing rate	Average income
Labor (64)	76.3%	32 900
Liberal (68)	62.8%	33 800
National (16)	55.6%	28 600
Coalition (84)	*61.6%*	*32 800*
Independent/Green (2)	72.6%	33 400
All (150)	68.5%	32 800

Notes as for Table 1.

"National" includes one CLP member and two "independents" in Kennedy and New England.

If the National Party were independent of the Liberal Party, they may consider bulk billing to be a political issue. Bulk billing rates are low in Liberal electorates, but this is partly explicable by the composition of Liberal electorates, for the Liberal Party holds many rural seats. (National Party seats are largely confined to New South Wales and Queensland.) Not separately identified in the table is the low bulk billing rate (60.7 percent) in the rural electorate Calare, the only electorate held by a long-standing independent, who may have an interest in the issue.

Table 3 – electorate composition by party

	Liberal	Labor	National	Independent
Inner Metro	16	25	1	0
Outer Metro	22	23	0	0
Provincial	7	10	0	1
Rural	23	6	15	1
Total	68	64	16	2

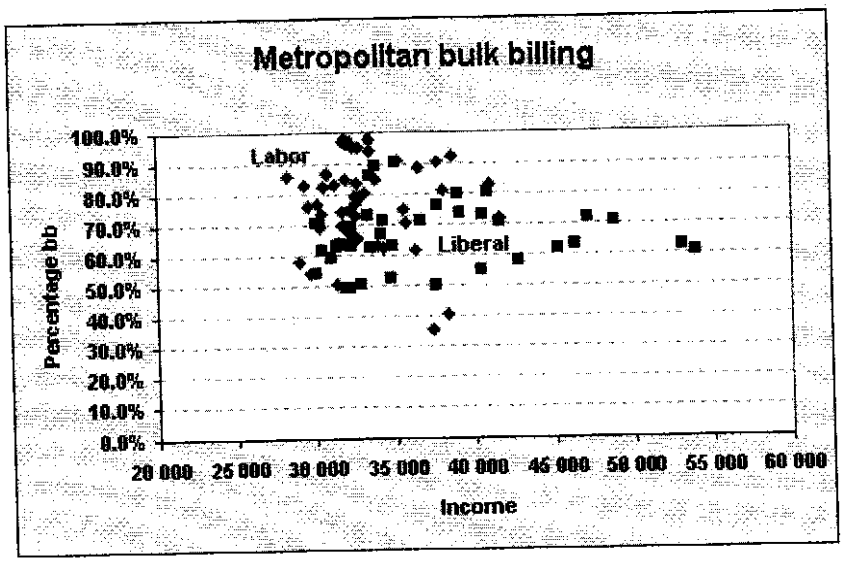
Notes as for Table 1.

Looking at metropolitan electorates alone, there are distinct differences between Labor and Liberal electorates – differences in both income and bulk billing. These are summarized in Table 4. But, within cities, bulk billing rates are weakly *negatively* related to income. (The coefficient of correlation is very small, however – $R^2 = 0.24$.) Labor electorates have low incomes and high bulk billing rates, while Liberal electorates have high incomes and low bulk billing rates. Again, as seen in Table 1, while incomes vary between inner and outer metropolitan electorates, bulk billing rates do not.

Table 4 – Metropolitan bulk billing rates by party

	Bulk billing rate	Average income
Labor inner metropolitan	79.5%	34 900
Labor outer metropolitan	81.2%	31 700
Labor all metropolitan	*80.4%*	*33 300*
Liberal inner metropolitan	67.0%	41 200
Liberal outer metropolitan	67.6%	34 100
Liberal all metropolitan	*67.3%*	*37 100*

Notes as for Table 1.



The pattern of relationships is interesting, however, as revealed on the scatter diagram alongside.

In Labor electorates the rates of bulk billing vary widely, but are not related to income; income is clustered around a fairly narrow range. (The pattern of red dots is not far off vertical.) The eleven Labor electorates with more than 90 percent bulk billing are all in Sydney, and the two with very low rates of bulk billing are in the ACT.

In Liberal electorates, by contrast, the rates of bulk billing vary less, while income varies widely. (The pattern of blue dots is close to horizontal.) The six high income (>45K) Liberal electorates are in Sydney and Melbourne.

State

Bulk billing rates by state are shown below. At first sight this appears to support the hypothesis that bulk billing and income are closely related. New South Wales has high income and high bulk billing, while Tasmania has low income and low rates of bulk billing.

But other pair comparisons and other clusterings suggest that income is not a strong explanatory variable. Note the wide variation between three states with similar incomes – Queensland, South Australia and Tasmania.

Nor do rural/metropolitan variations offer an explanation. While New South Wales and Victoria are both high income, their rates of bulk billing are very different. Victoria is much more urbanized than New South Wales, but its bulk billing rate is much lower – which is not the result we would expect if rural/metropolitan differences were the only strong explanatory variable. Similarly South Australia and Queensland have much the same income, and South Australia is much more urbanized, but its bulk billing rate is much lower.

Table 5 – bulk billing rates by state

	Bulk billing rate	Average income
NSW	76.3%	34 800
Vic	66.9%	33 000
Qld	64.3%	30 500
WA	65.1%	32 100
SA	60.9%	30 600
Tas	54.0%	29 300
NT	61.5%	33 700
ACT	38.2%	37 900

Notes as for Table 1.

The residual explanation is that the differences may be related to state-specific conditions, such as supply of medical practitioners.

Income decile

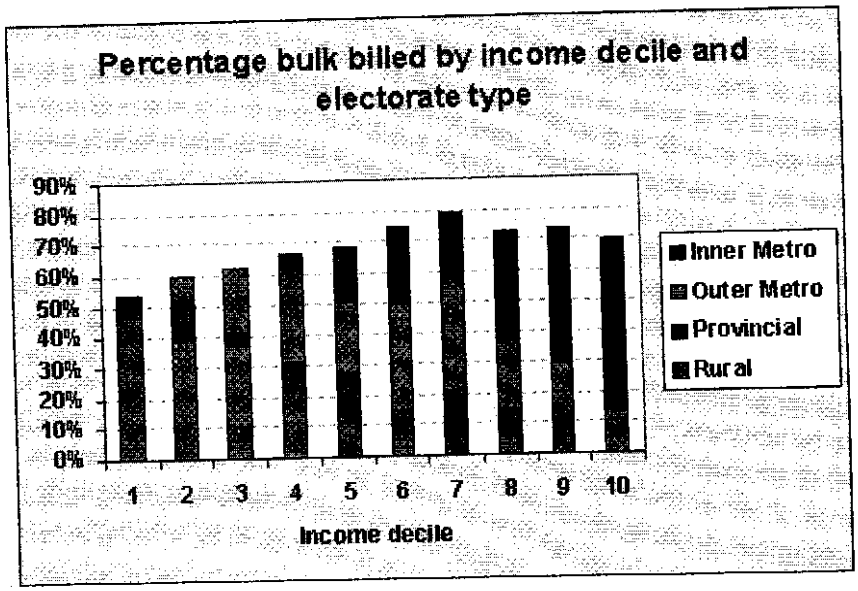
I gathered the electorate data into ten deciles of income, ranging from lowest to highest. Such a gathering should smooth out some of the "noise" of particular local factors. For example, we would expect competitive pressures in some places within electorates to result in clusters of bulk billing practitioners; the conditions which cause such competition (or its withdrawal) are probably very local and particular.

Table 6 – bulk billing rates by income decile

	Bulk billing rate	Average income
Bottom	53.6%	27 116
Second	60.2%	28 575
Third	62.2%	29 604
Fourth	66.4%	30 655
Fifth	68.4%	31 590
Sixth	74.5%	32 341
Seventh	79.1%	33 145
Eighth	72.7%	34 262
Ninth	73.7%	36 954
Top	69.6%	44 145

Notes as for Table 1.

This reveals a non-linear relationship, with bulk billing rates rising over the first seven deciles, but falling over the top three deciles. It is because of this non-linear relationship that no income- based linear correlations could be expected to be statistically significant.



There is also a strong regional component, as the final column chart shows. The column heights reflect the inverted "U" shape of Table 6. The colours within the columns reveal the regional composition of the electorates which comprise those deciles.

For example, the fifteen lowest-income electorates comprise thirteen rural and two provincial electorates; this is revealed in a long pale green bar of 13/15 of the height and a dark green

top of 2/15 of the height. At the other end of the distribution, twelve of the fifteen electorates are inner metropolitan and three are outer metropolitan.

This presentation shows the strongest clear relationships between region, income and levels of bulk billing, but, as statisticians always warn, demonstration of a relationship does not allow us to make any inferences about cause and effect.

A qualification to this analysis is that Australia, so far, has avoided large regional variations in income. There is only a 63 percent variation in wage and salary income between the top and bottom quintiles of groups of 15 electorates, and only a 111 percent variation between the highest income electorate (Bradfield) and the lowest (Mallee). If non-wage and salary income were included in the data base these differences would almost certainly shrink, for in low income electorates there would be supplementation from government transfers, and rural electorates would have significant income from farm businesses. Electorates, even those classified as "inner metropolitan", are reasonably large regions of around 130 000 population, and can be expected to hold pockets of affluence and of poverty.