Impact of income management on store sales in the Northern Territory

Julie K Brimblecombe, Joseph McDonnell, Adam Barnes, Joanne Garngulgkuy Dhurrkay, David P Thomas and Ross S Bailie

ABSTRACT

Objective: To examine the impact of a government income management program on store sales.

Design and setting: An interrupted time series analysis of sales data in 10 stores in 10 remote Northern Territory communities during 1 October 2006 to 30 September 2009, which included an 18-month period before income management; a 4–6-month period after the introduction of income management; a 3-month period that coincided with a government stimulus payment; and the remaining income-management period.

Main outcome measures: Trends in (i) total store sales; (ii) total food and beverage sales; (iii) fruit and vegetables sales; (iv) soft drink sales; and (v) tobacco sales.

Results: Modest monthly increases indicative of inflation were found for all outcome measures before the introduction of income management, except for soft drink sales, which remained constant. No change from the increasing rate of monthly sales before income management was seen in the first 4–6 months of income management or for the income-management period thereafter for total store sales, food and beverage sales, fruit and vegetable sales and tobacco sales. The rate of soft drink sales declined significantly with the introduction of income management and then increased significantly thereafter. The 3-month government stimulus payment period (during the period of income management) was associated with a significant increase in the rate of sales for all outcome measures.

Conclusion: Income management independent of the government stimulus payment appears to have had no beneficial effect on tobacco and cigarette sales, soft drink or fruit and vegetable sales.

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METHODS

We collected sales data from 10 ALPA stores that had retrospective data available in monthly intervals from 1 October 2006 to 30 September 2009. Communities ranged in size from 247 to 1574 people, representing about 14% of the Indigenous population living in remote NT. Two communities had access to a take-away outlet that was separate from the community store. All 10 communities supported a school canteen or “Meals on Wheels” program or both. Alcohol was not permitted in eight of the 10 communities at the time of the study (Box 1).

Data were obtained through the ALPA central database in two report formats — department sales data and individual item sales data. Department sales data were used to examine trends in tobacco sales, total store sales and contribution of food and drink sales to total sales. Each monthly department sales report contained a cumulative monthly dollar value for each of the department lines. Individual item sales data included a barcode for each store item sold, an item description, a cumulative quantity sold and dollar value (sales price) for each item sold.

Department and individual item sales data were imported separately into a Microsoft Access 2003 database (Microsoft Corporation, Redmond, Wash, USA). For individual item sales data, non-food items were removed, weights and volumes for each food and drink item were determined, and food types were grouped.

For departmental sales data, total store sales and tobacco sales (dollar) values were calculated for each monthly interval based on the dollar value of monthly department sales data for all 10 stores.

For individual item sales data, total food and drink sales values were calculated based on the sum of the value for each food and drink item by store, year and month, as were total sales values for fruit and vegetables combined (including fresh, dried, frozen and canned) and soft drinks. Similar measures with regard to weight (turnover) of the indicator foods were also calculated.

Per capita values for each of the outcome measures were determined based on the size of the community served by each store, as shown in Box 1. Data were analysed using Stata, version 10 (StataCorp, College Station, Tex, USA).

Statistical analysis

In the interrupted time-series model, the variation in sales was partitioned into four components to provide tests of: (i) the rate of change in mean monthly sales (slope) for the period before income management (pre-intervention); (ii) the rate of change in mean monthly sales (change in slope) in the first 4–6 months after the introduction of income management (this time period varied across communities, so as to not overlap with the government stimulus payment period); (iii) the change in slope in the 3-month period over which the study communities benefited from the Economic Security Strategy Payment (November 2008 to January 2009); and (iv) the change in slope after the first 4–6 months of income management (excluding the stimulus payment months). November and January were included in the Economic Security Strategy Payment period to account for spending in anticipation of the payment and for delayed spending. The model included a variable for the pre-intervention trend, another representing a possible short-term effect during the first 4–6 months of income management, a third representing a possible effect with a stimulus payment, a fourth for a change in trend following the intervention, and dummy variables for each of the communities. A fixed-effect model was used, which assumes that the pattern of change in each of the communities was similar. As the communities varied, random-effects models were also fitted as a form of sensitivity analysis, but the findings were not greatly different from

1 Demographic characteristics of the communities served by the 10 Arnhem Land Progress Aboriginal Corporation stores studied

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<th>10</th>
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<tbody>
<tr>
<td>Population served</td>
<td>1574</td>
<td>842</td>
<td>247</td>
<td>595</td>
<td>427</td>
<td>836</td>
<td>362</td>
<td>429</td>
<td>328</td>
</tr>
<tr>
<td>Month in 2008 that income management commenced</td>
<td>March</td>
<td>May</td>
<td>April</td>
<td>May</td>
<td>June</td>
<td>May</td>
<td>April</td>
<td>June</td>
<td>May</td>
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<tr>
<td>Food services in the community other than store</td>
<td>2 take-away outlets, Meals on Wheels, School canteen</td>
<td>Meals on Wheels, Meals on Wheels, School canteen</td>
<td>Meals on Wheels, Meals on Wheels, School canteen</td>
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<tr>
<td>Alcohol restrictions</td>
<td>Prohibited</td>
<td>Prohibited</td>
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* Take-away outlet independent of store. † A Home and Community Care Program service. ‡ Temporary variations were made to these arrangements during the study period.
2 Summary of average per capita monthly sales for each outcome measure from the 10 Arnhem Land Progress Aboriginal Corporation stores, 1 October 2006 to 30 September 2009

<table>
<thead>
<tr>
<th>Outcome measures</th>
<th>Pre-intervention*</th>
<th>First 4–6 months after intervention</th>
<th>Government stimulus payment period</th>
<th>Postintervention$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per capita monthly mean (CI)</td>
<td>SD</td>
<td>Per capita monthly mean (CI)</td>
<td>SD</td>
</tr>
<tr>
<td>Total store sales ($)</td>
<td>458.11 (435.72–480.50)</td>
<td>158.92</td>
<td>537.28 (490.19–584.36)</td>
<td>169.13</td>
</tr>
<tr>
<td>Food and drink sales ($)</td>
<td>265.98 (252.36–279.61)</td>
<td>96.73</td>
<td>323.67 (294.66–352.68)</td>
<td>104.19</td>
</tr>
<tr>
<td>Tobacco sales ($)</td>
<td>83.60 (79.01–88.18)</td>
<td>32.56</td>
<td>87.68 (78.38–96.98)</td>
<td>33.39</td>
</tr>
<tr>
<td>Fruit and vegetable turnover (kg)</td>
<td>3.15 (3.01–3.29)</td>
<td>1.01</td>
<td>4.49 (4.10–4.89)</td>
<td>1.42</td>
</tr>
<tr>
<td>Soft drink sales ($)</td>
<td>34.01 (32.28–35.73)</td>
<td>12.27</td>
<td>29.03 (25.86–32.21)</td>
<td>11.41</td>
</tr>
<tr>
<td>Soft drink turnover (L)</td>
<td>8.07 (7.65–8.48)</td>
<td>2.94</td>
<td>6.73 (6.00–7.45)</td>
<td>2.61</td>
</tr>
</tbody>
</table>


3 Three-month rolling average per capita sales for total store sales, total food and drink sales, fruit and vegetables, soft drink and cigarettes and tobacco, for all Arnhem Land Progress Aboriginal Corporation stores combined, 1 October 2006 to 30 September 2009

Ethics approval
The study was approved by the Human Research Ethics Committee of the Northern Territory Department of Health and Families and Menzies School of Health Research. Letters of consent were obtained from each of the participating stores and from ALPA.

RESULTS
Monthly per capita means
Box 2 shows that the average monthly per capita sales for each of the outcome measures were higher in the first 4–6 months after the introduction of income management, during the 3-month government stimulus payment period, and in the postintervention period, compared with the preintervention period. Exceptions were tobacco and soft drink sales. There was a reduction in soft drink sales and turnover immediately after the introduction of income management. Although average per capita sales appeared higher for both tobacco and soft drinks in the postintervention and government stimulus payment periods, these differences were not statistically significant.

Trends in sales
Total store sales had been increasing slightly before income management was introduced (Box 3 and Box 4) at a rate consistent with inflation.14 No change in the underlying increase in rate of monthly store sales was associated with income management. There was a significant increase in the rate of sales...
during the 3-month period that coincided with people receiving a government stimulus payment (Box 4). This same pattern was found for food and drink sales. Monthly food and drink sales increased in absolute terms in association with the government stimulus payment period, but decreased as a proportion of total store sales during this time (Box 4).

We found an increase in monthly tobacco sales for the period before income management (Box 3 and Box 4). In the first 6 months of income management, monthly tobacco sales seemed to drop slightly, but not significantly. This drop was not sustained, and the underlying increasing trend in tobacco sales remained unchanged. A marked increase in sales was associated with the government stimulus payment period (Box 4).

As with tobacco sales, income management had no apparent effect on fruit and vegetable sales (Box 3). A significant but modest increase in monthly sales was shown in the period before income management (Box 4). There was no change in the level of fruit and vegetable sales in the first 6 months of income management. The trend in the postintervention period appeared to decline but did not differ significantly from the underlying trend. As shown for other commodities, a marked increase in monthly sales was associated with the government stimulus payment period. This pattern held for fruit and vegetable turnover, except that no significant increase in monthly turnover was associated with the government stimulus payment period compared with the underlying increasing trend. This is probably a result of the short time period studied and month-to-month variation in turnover.

Monthly soft drink sales remained constant for the pre-income-management period (Box 3 and Box 4). During the first 6 months of income management, the rate of monthly sales dropped significantly. Thereafter, the rate of soft drink sales increased significantly compared with the underlying trend (Box 4). A marked increase in monthly sales was associated with the government stimulus payment period. The pattern for soft drink sales held for the monthly rate in volume of soft drink sold (Box 4).

**DISCUSSION**

Against a background of increases in total store sales and in all commodities before income management at a rate consistent with inflation, income management appeared to have no effect on total store sales, food and drink sales, tobacco sales and fruit and vegetable sales, independent of the government stimulus payment. Soft drink sales and turnover dropped initially with income management, but increased thereafter.

These findings suggest that, without an actual increase in income as occurred with the government stimulus payment, income management may not affect people’s spending overall. The findings challenge a central tenet of income management — that people’s spending habits will be modified in a positive way with mandatory restrictions on expenditure alone.

These findings do not support official government reports of improved healthy food and drink purchases in association with income management. In 2009, of 66 store operators interviewed by the Australian Government, 63.6% reported an increase in store sales with income management, while one-fifth (20.6%) reported a decrease. We found that store sales increased markedly in association with the government stimulus payment, but showed no change with income management independent of the stimulus payment.

Furthermore, our study showed that across 10 stores in the NT, income management had no effect on fruit and vegetable sales or turnover, contrary to results reported in official reports. The average daily turnover of fruit and vegetables throughout the 18-month income-manage-
of all store commodities, including fruit and the government stimulus payment on sales issues. This is contrasted with the impact of ble when issues of availability, quality, and in a government-prescribed minimum standards need to be met in order to benefit from income-managed funds. This difference relates to the restrictions on the FOODcard. In all other respects, the stores are expected to be similar to other community stores in areas where government-prescribed standards apply and where income management has taken effect. Secondly, in communities where the NTER has restricted or moderated people’s access to alcohol, income management may impact on store sales differently to our findings in this study in which eight of the 10 study communities were prescribed “dry” (ie, no consumption or sale of alcohol allowed in the community) before the NTER.

The government’s aim in introducing income management is to ensure that people receiving welfare payments use this money in a government-prescribed “socially responsible” way, and in a way that makes money available to “feed, clothe, house and provide for the education of their children”. Our findings suggest that income management may not be associated with healthier food and drink purchases, and may be having no effect on tobacco sales.

A reduction in the level of soft drink sales and food and drink expenditure and was four times that of fruit and vegetable sales.

A Tobacco use (17%), and high body mass (16%), physical inactivity (12%) and high blood cholesterol (7%), in all of which diet plays an important role, contribute 52% of the health gap reported for Indigenous Australians compared with non-Indigenous Australians. In addressing the health gap, effective strategies are needed to restrict tobacco use and to encourage healthy eating for people in remote communities, including increasing people’s consumption of fruit and vegetables when issues of availability, quality, affordability and home storage remain key issues. This is contrasted with the impact of the government stimulus payment on sales of all store commodities, including fruit and vegetables. Our data cannot be used to ascertain the relative merit of a budgeting tool such as the ALPA FOODcard or additional income on positively influencing people’s spending, but these initiatives do indicate the existence of confounders that need to be considered in assessing the impact of income management on store sales.

Our study has several limitations to the extent to which the findings can be generalised to other remote communities in the NT. First, the 10 stores included in the study were managed by ALPA, so the vehicle for income management (the FOODcard) differed from that used in other communities where government-prescribed minimum standards need to be met in order to benefit from income-managed funds. This difference relates to the restrictions on the FOODcard. In all other respects, the stores are expected to be similar to other community stores in areas where government-prescribed standards apply and where income management has taken effect. Secondly, in communities where the NTER has restricted or moderated people’s access to alcohol, income management may impact on store sales differently to our findings in this study in which eight of the 10 study communities were prescribed “dry” (ie, no consumption or sale of alcohol allowed in the community) before the NTER.

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**ACKNOWLEDGEMENTS**

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**COMPETING INTERESTS**

Julie Brimblecombe was commissioned by the ALPA to undertake a preliminary study that was later extended to include the 10 communities in this study.

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