

# The increasing cost of the basic foods required to promote health in Queensland

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Diet quality varies with social status, and this contributes to health inequalities.<sup>1</sup> There is evidence that retail food prices are higher in rural and remote localities than urban areas throughout Australia, and this may have negative nutrition and health consequences.<sup>2-8</sup>

The 2004 Healthy Food Access Basket (HFAB) survey was the fourth biennial state-wide cross-sectional survey of the costs and availability of a standard basket of basic

## ABSTRACT

**Objective:** To assess changes in the cost and availability of a standard basket of healthy food items (the Healthy Food Access Basket [HFAB]) in Queensland over time.

**Design and participants:** A series of four cross-sectional surveys (in 1998, 2000, 2001 and 2004) describing the cost and availability of foods in the HFAB over time. In the latest survey, 97 Queensland food stores across the five Australian Bureau of Statistics remoteness categories were compared.

**Main outcome measures:** Cost comparisons for HFAB items by remoteness category for the 97 stores surveyed in 2004; changes in cost and availability of foods in the 81 stores surveyed since 2000; comparisons of food prices in the 56 stores surveyed in 1998, 2000, 2001 and 2004.

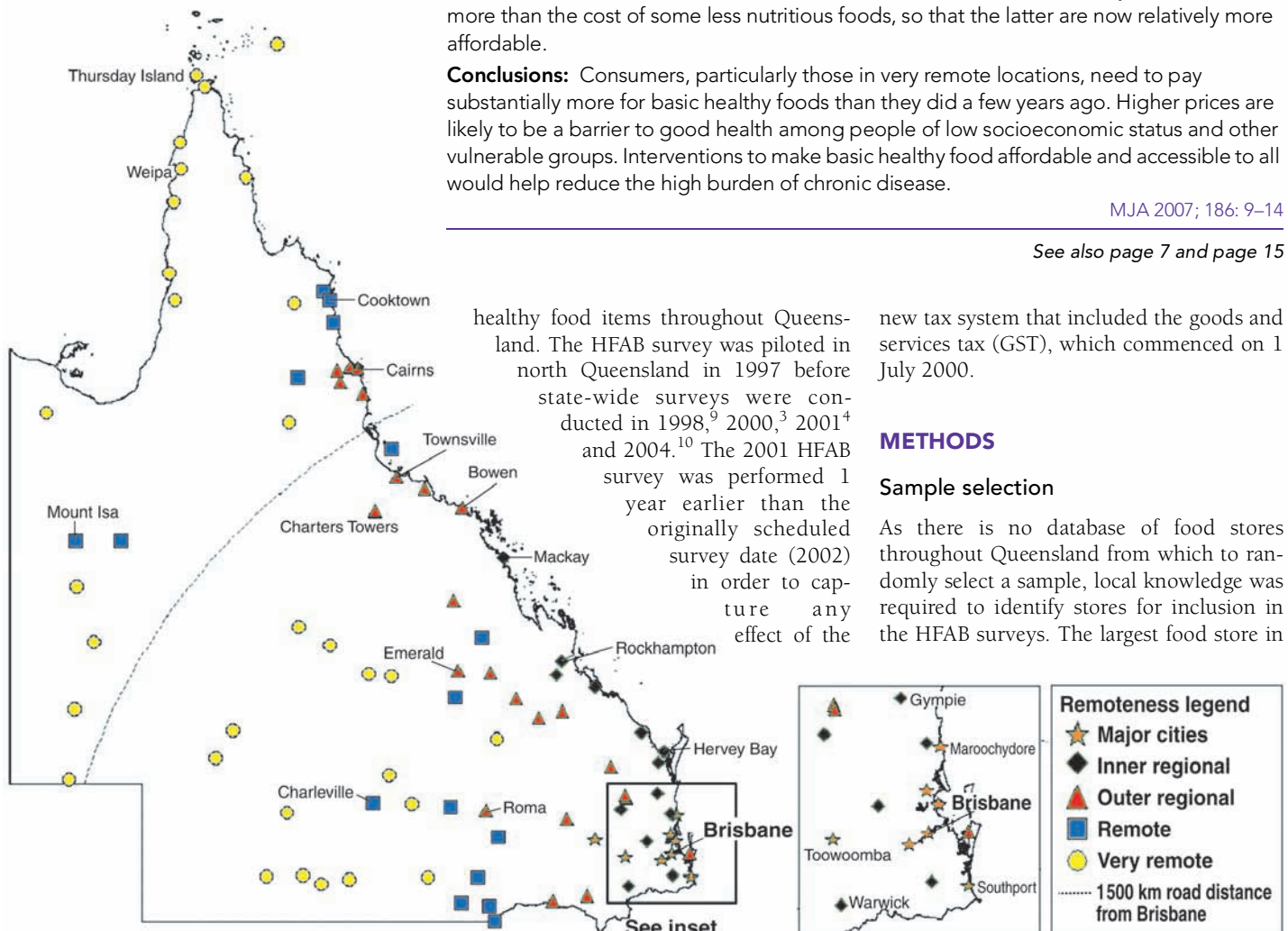
**Results:** In 2004, the Queensland mean cost of the HFAB was \$395.28 a fortnight. The cost of the HFAB was 29.6% (\$113.89) higher in "very remote" areas than in "major cities" ( $P < 0.001$ ). Between 2001 and 2004, the Queensland mean cost of the HFAB increased by 14.0% (\$48.45), while in very remote areas the cost increased by 18.0% (\$76.93) ( $P < 0.001$ ). Since 2000, the annualised per cent increase in cost of the HFAB has been higher than the increase in Consumer Price Index for food in Brisbane. The cost of healthy foods has risen more than the cost of some less nutritious foods, so that the latter are now relatively more affordable.

**Conclusions:** Consumers, particularly those in very remote locations, need to pay substantially more for basic healthy foods than they did a few years ago. Higher prices are likely to be a barrier to good health among people of low socioeconomic status and other vulnerable groups. Interventions to make basic healthy food affordable and accessible to all would help reduce the high burden of chronic disease.

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See also page 7 and page 15

## Location and Australian Bureau of Statistics remoteness classifications<sup>11,12</sup> for the 97 stores in the 2004 Healthy Food Access Basket survey



**1 The 2004 Healthy Food Access Basket (HFAB) — foods and quantities for a “reference family”\* over a 2-week period**

Basket item	Unit size	Total amount in HFAB	Basket item	Unit size	Total amount in HFAB
<b>Dairy group</b>			<b>Bread and cereals group</b>		
Fresh full-cream milk	2 L	8 L	White bread	680 g	6800 g
Fresh reduced-fat milk	1 L	1 L	Wholemeal bread	680 g	6800 g
Powdered full-cream milk	1 kg	1 kg	White flour	2 kg	2.5 kg
Powdered skim milk	1 kg	1 kg	Wholemeal flour	1 kg	2.5 kg
Long-life full-cream milk	1 L	4 L	Weetbix	750 g	1500 g
Cheese	500 g	500 g	Rolled oats	1 kg	750 g
<b>Fruit, vegetables and legumes group</b>			White rice	1 kg	5 kg
Apples	1 kg	6 kg	Tinned spaghetti	420–425 g	1275 g
Oranges	1 kg	11 kg	Instant noodles	85 g	1020 g
Bananas	1 kg	5 kg	Sao biscuits	250 g	1 kg
Tinned fruit salad in natural juice	400–450 g	3520 g	<b>Meat and meat alternatives group</b>		
Orange juice (100%)	2 L	4 L	Tinned corned beef	340 g	340 g
Tomatoes	1 kg	5 kg	Tinned meat and onion/vegetables	400–425 g	820 g
Potatoes	1 kg	10 kg	Beef mince	1 kg	1 kg
Pumpkin	1 kg	1.5 kg	Rump steak	1 kg	1 kg
Cabbage	half	1.5 kg	Frozen chicken	size 14	2 kg
Lettuce	whole	1.5	Tinned smoked oysters	85–105 g	170 g
Carrots	1 kg	2 kg	Large eggs (min 50 g)	700 g	1320 g
Onions	1 kg	2 kg	Sausages	1 kg	1 kg
Frozen vegetables	500 g	2.5 kg	Tinned ham	450 g	1 kg
Tinned peas	420–440 g	880 g	<b>Non-core foods</b>		
Tinned baked beans	420–425 g	1700 g	Unsaturated margarine	500 g	1500 g
Tinned beetroot	425–450 g	450 g	White sugar	2 kg	3 kg
			Canola oil	750 mL	750 mL

\* Consisting of a man (> 19 years), a woman (> 19 years), an older woman (> 61 years), a teenage boy (14 years), a girl (8 years) and a boy (4 years). ◆

the largest town(s) in each of the 38 Queensland health service districts was selected, in order to reflect prices paid by the majority of the community. Where possible, the same stores were included in 1998 and each successive survey, but for any store that later closed or no longer wished to participate, an alternative store in the same town or a nearby location was included.

Selected stores were categorised by the Australian Bureau of Statistics remoteness structure<sup>11</sup> and using the updated Accessibility/Remoteness Index of Australia (ARIA+)<sup>12</sup> by populated localities as the basis for the definition of remoteness (see map, page 9). ARIA+ defines localities in terms of remoteness of geographical location as well as access to services.

In the 1998, 2000 and 2001 HFAB surveys, there were 111, 92 and 88 stores, respectively. In 2004, 102 stores agreed to participate (100% response rate). However, only 97 were included in the current analysis, as four surveys arrived too late and one survey was lost in the mail.

### The Healthy Food Access Basket

The range and type of foods included in the HFAB represent commonly available and popular foods selected to provide 70% of the nutritional requirements and 95% of the estimated energy requirements of a “reference family” of six people over a 2-week period (Box 1).<sup>13</sup>

Basic healthy foods in the HFAB include bread and cereals; fruit, vegetables and legumes; meat and meat alternatives; dairy foods; and limited amounts of some energy-dense foods (margarine, oil and sugar). The quantities of food included in the HFAB are based on model B of the core food groups.<sup>13</sup> For comparative purposes, two takeaway foods (190 g meat pie, 375 mL cola beverage) and two tobacco items (50 g tobacco, pack of 25 cigarettes) were also surveyed (they are referred to as “unhealthy” items in our analysis). Information about missing HFAB items was also collected. Only missing items for the total basket from stores surveyed from 2000 to 2004 were compared.

Data were collected on-site by Queensland Health nutritionists and health workers during April and May in 1998, 2000 and 2004. In 2001, the data collection period extended into June.

Stores were not advised of the specific date and time of surveys, so that results reflect usual availability and cost for consumers. Details relating to selection of brands and sizes of food items are described elsewhere.<sup>3</sup>

### Cost comparisons

The cost of the total HFAB; the fruit, vegetables and legumes in the basket; and the unhealthy items were compared by remoteness category for the 97 stores surveyed in 2004. Changes in cost and availability of foods since the previous two surveys (2000 and 2001) were also analysed by remoteness category for the 81 stores that were included in all three surveys. Further comparisons of food prices were made for the 56 stores that were included in all four surveys (1998, 2000, 2001 and 2004), and increases were com-

pared with increase in the Consumer Price Index (CPI) for food in Brisbane over the same period.<sup>14</sup> Because the usual store stocking practices for ham and cabbage changed after the 1998 survey, the total basket could only be compared from 2000 onwards.

The CPI for food is based on a wide range of commonly purchased items (including soft drinks, cakes, biscuits, confectionery, takeaway foods and fast foods), several of which incur the GST. Basic food items (such as those in the HFAB) that are required to support and maintain health are mostly exempt from this tax. All CPI figures, including price data for individual foods used to calculate the CPI, are available for capital cities only.

### Data analysis

Data were analysed using SPSS for Windows version 12.0.1 (SPSS Inc, Chicago, Ill, USA). For missing items, the mean price for the item in the corresponding remoteness category was used as the default price for that year. The differences in mean costs of the HFAB contents across remoteness categories were assessed by one-way analysis of variance. The differences in mean costs over time were assessed by paired *t* tests. The trend differences in means were assessed using Kendall's tau ( $\tau$ ).

To compare changes between consecutive HFAB surveys, only the stores previ-

ously surveyed were included. As the time intervals between the four successive HFAB surveys were different, the results were "annualised" to allow for comparable time frames for assessing price change. This was done by calculating the square root of the price difference between the 1998 and 2000 surveys, and the cube root of the price difference between the 2001 and 2004 surveys.

## RESULTS

### Costs by remoteness category

The 2004 HFAB survey results show a trend of increasing food prices with increasing remoteness category (Box 2). In the "very remote" category, the cost of the HFAB was 29.6% (\$113.89) higher than in the "major cities" category, and the cost of fruit, vegetables and legumes was 20.3% (\$32.34) higher. Furthermore, there were significant differences *within* the very remote category. For very remote stores > 1500 km from Brisbane (*n* = 16), the cost of the total HFAB was 13.2% (\$61.69) higher and the cost of fruit, vegetables and legumes 18.8% (\$32.91) higher than in very remote stores < 1500 km from Brisbane (*n* = 16) (see map). The cost disparity across remoteness categories for the unhealthy items was less than for the HFAB, with the cost of takeaway and tobacco items in the very remote category

being 14.2% (\$4.47) higher than in the major cities category (*P* < 0.001).

There were significant differences in the cost of items in all basic healthy food groups<sup>13</sup> by remoteness category. The differences between remoteness categories were greater for the "bread and cereals" and "dairy" groups than for the "fruit" and the "vegetables and legumes" groups (Box 2).

### Cost increases over time

There has been an increase in the price of basic healthy food in the 81 stores that were surveyed in 2000, 2001 and 2004 (Box 3). Between the 2001 and 2004 surveys, the Queensland average price of the HFAB increased by 14.0% (\$48.45). The cost of the HFAB increased significantly more in very remote areas (18.0%, \$76.93) compared with major cities (13.2%, \$44.96, *P* < 0.001).

On an annual basis, the increase in the Queensland average price of the HFAB between 2001 and 2004 (4.5%, \$16.15 per year) was minor compared with the 12.0% (\$36.98) increase experienced for the HFAB between 2000 and 2001.

State-wide, the price of fruit, vegetables and legumes in the basket increased by 17.9% (\$24.98) between 2001 and 2004 (Box 3). Differences in the price of fruit, vegetables and legumes in the basket across the remoteness categories were not as great

## 2 Mean cost (95% CI) of the Healthy Food Access Basket (HFAB) and basic healthy food groups in the 97 stores surveyed in 2004, by remoteness category<sup>\*††1,12</sup>

	Queensland ( <i>n</i> = 97)	Major cities ( <i>n</i> = 7)	Inner regional areas ( <i>n</i> = 14)	Outer regional areas ( <i>n</i> = 25)	Remote areas ( <i>n</i> = 19)	Very remote areas ( <i>n</i> = 32)	% (\$) increase in mean cost from major cities to very remote areas
HFAB (\$)	395.28 (395.25–395.31)	384.74 (360.32–409.16)	392.18 (382.51–401.85)	412.02 (399.82–424.22)	441.21 (426.89–455.54)	498.63 (480.57–516.68)	29.60% (\$113.89) <sup>§</sup>
Fruit, vegetables and legumes (\$)	164.58 (164.56–164.61)	159.42 (134.08–184.76)	166.25 (156.32–176.18)	174.35 (164.82–183.88)	177.87 (169.82–185.92)	191.76 (181.80–201.73)	20.30% (\$32.34) <sup>§</sup>
Bread and cereals (\$)	91.34 (91.33–91.35)	87.94 (86.56–89.32)	89.99 (87.55–92.43)	96.18 (90.84–101.51)	108.68 (102.56–114.80)	128.11 (122.73–133.49)	45.68% (\$40.17) <sup>§</sup>
Dairy foods (\$)	52.03 (52.02–52.03)	50.50 (48.32–52.69)	51.35 (49.95–52.76)	54.17 (52.01–56.34)	59.91 (56.94–62.88)	69.15 (66.46–71.84)	36.93% (\$18.65) <sup>§</sup>
Meat and meat alternatives (\$)	74.71 (74.70–74.71)	75.24 (74.02–76.46)	71.15 (68.25–74.05)	73.75 (71.06–76.43)	78.92 (75.64–82.20)	90.44 (86.83–94.04)	20.20% (\$15.20) <sup>§</sup>
Fruit (\$)	88.14 (88.12–88.15)	84.56 (70.04–99.08)	87.90 (82.41–93.38)	97.24 (91.02–103.46)	95.99 (90.54–101.45)	103.95 (98.29–109.62)	22.93% (\$19.39) <sup>§</sup>
Vegetables and legumes (\$)	76.45 (76.43–76.46)	74.86 (63.19–86.53)	78.36 (72.62–84.10)	77.11 (72.45–81.77)	81.87 (76.20–87.55)	87.81 (81.38–94.24)	17.30% (\$12.95) <sup>¶</sup>
"Unhealthy" items <sup>‡</sup> (\$)	32.05 (32.05–32.05)	31.47 (30.75–32.20)	32.00 (31.15–32.85)	33.09 (32.43–33.76)	34.70 (33.28–36.13)	35.94 (34.55–37.33)	14.20% (\$4.47) <sup>§</sup>

\* Weighting proportional to Queensland population size by each remoteness category. † Source: Healthy Food Access Basket survey 2004.<sup>10</sup> ‡ "Unhealthy" items: 190 g meat pie, 375 mL cola beverage, 50 g tobacco, pack of 25 cigarettes. § Kendall's  $\tau$  < 0.001. ¶ Kendall's  $\tau$  = 0.006.

### 3 Mean cost (95% CI) and increase in mean cost of Healthy Food Access Basket (HFAB) and "fruit, vegetables and legumes" group in the 81 stores surveyed between 2000 and 2004, by remoteness category<sup>\*†11,12</sup>

	Queensland (n = 81)	Major cities (n = 8)	Inner regional areas (n = 13)	Outer regional areas (n = 22)	Remote areas (n = 14)	Very remote areas (n = 24)
Cost of HFAB in 2000 (\$)	308.92 (297.67–320.17)	301.84 (291.39–312.29)	307.73 (301.57–313.89)	319.30 (304.08–334.52)	356.24 (338.18–374.30)	405.03 (387.71–422.35)
Cost of HFAB in 2001 (\$)	345.90 (336.02–355.78)	339.78 (331.85–347.71)	342.96 (333.59–352.33)	357.70 (345.05–370.35)	385.44 (366.93–403.95)	428.23 (412.42–444.04)
Per cent (\$) increase in mean cost, 2000–2001	12.0% <sup>‡</sup> (\$36.98)	12.6% <sup>‡</sup> (\$37.94)	11.4% <sup>‡</sup> (\$35.23)	12.0% <sup>‡</sup> (\$38.40)	8.2% <sup>‡</sup> (\$29.20)	5.7% <sup>‡</sup> (\$23.20)
Cost of HFAB in 2004 (\$)	394.35 (381.77–406.93)	384.74 (361.73–407.75)	392.18 (382.50–401.86)	414.54 (401.04–428.04)	439.00 (422.53–455.47)	505.16 (483.78–526.54)
Per cent (\$) increase in mean cost, 2001–2004	14.0% <sup>‡</sup> (\$48.45)	13.2% <sup>§</sup> (\$44.96)	14.4% <sup>‡</sup> (\$49.22)	15.9% <sup>‡</sup> (\$56.84)	13.9% <sup>‡</sup> (\$53.56)	18.0% <sup>‡</sup> (\$76.93)
Cost of fruit, vegetables and legumes in 2000 (\$)	116.08 (110.87–121.29)	115.14 (102.96–127.32)	112.53 (105.53–119.53)	117.05 (108.53–125.57)	135.09 (125.31–144.87)	151.72 (142.93–160.51)
Cost of fruit, vegetables and legumes in 2001 (\$)	139.59 (135.59–143.59)	137.09 (132.09–142.09)	139.49 (131.09–147.89)	144.82 (137.54–152.10)	151.54 (142.38–160.70)	163.77 (156.32–171.22)
Per cent (\$) increase in mean cost, 2000–2001	20.3% <sup>‡</sup> (\$23.51)	19.1% <sup>§</sup> (\$21.95)	24.0% <sup>§</sup> (\$26.96)	23.7% <sup>‡</sup> (\$27.77)	12.2% <sup>‡</sup> (\$16.45)	7.9% <sup>§</sup> (\$12.05)
Cost of fruit, vegetables and legumes in 2004 (\$)	164.57 (159.06–170.08)	159.42 (135.53–183.31)	166.25 (156.31–176.19)	177.46 (167.38–187.54)	176.19 (167.22–185.16)	193.69 (181.74–205.64)
Per cent (\$) increase in mean cost, 2001–2004	17.9% <sup>‡</sup> (\$24.98)	16.3% <sup>§</sup> (\$22.33)	19.2% <sup>‡</sup> (\$26.76)	22.5% <sup>‡</sup> (\$32.64)	16.3% <sup>‡</sup> (\$24.65)	18.3% <sup>‡</sup> (\$29.92)

\* Weighting proportional to Queensland population size by each remoteness category. † Source: Healthy Food Access Basket surveys 2000, 2001, and 2004.<sup>3,4,10</sup>  
Paired-samples t tests: ‡  $P < 0.001$ ; §  $P < 0.01$ .

as those seen for the total HFAB. Within the fruit, vegetables and legumes group, price increases were greatest for fruit.

Annualised per cent increases in costs for the 56 stores surveyed from 1998 to 2004 compared with changes in the CPI for food in Brisbane over the same period are shown in Box 4. The most dramatic change in food costs was between 2000 and 2001. The introduction of the GST may be one factor contributing to the increase in CPI for food in Queensland during that time.<sup>15</sup> The price changes in the CPI for food in Brisbane were very similar to those found for Australia as a whole.<sup>14</sup>

#### Availability

Basic healthy food items are less likely to be available in "outer regional", "remote" and "very remote" areas (Box 5), with almost 11% of HFAB food items not available for purchase in stores in remote and very remote areas in 2004. The most frequently missing HFAB items (in descending order) were wholemeal flour, powdered skim milk, frozen chicken, wholemeal bread, 100% fruit juice, bananas, tinned ham, rolled oats, fresh reduced-fat milk, cabbage and long-life full-cream milk.

#### DISCUSSION

While the higher price increases for the HFAB in more remote areas raise concern about food access and availability for good health, the overall substantial price increases experienced in all five remoteness categories raise a potential barrier to healthy food access for all Queenslanders. This is particularly the case for people of low socioeconomic status and other vulnerable groups, such as Indigenous people, who are known to suffer a greater burden of ill health than other Australians.<sup>16</sup> Higher prices may be a barrier to healthy eating that can compromise nutritional and health status and add to the burden of obesity and chronic disease.<sup>17</sup> Earlier studies have identified poor food and health knowledge and undeveloped cooking and budgeting skills as additional barriers to good health.<sup>8</sup> Various environmental influences, including food access, contribute to the higher death rates experienced by people from more socioeconomically disadvantaged and remote areas.<sup>18</sup>

The cost burden is further highlighted by the higher prices paid by the very remote communities located further than 1500 km from Brisbane. Transportation costs, in addition to double handling of produce

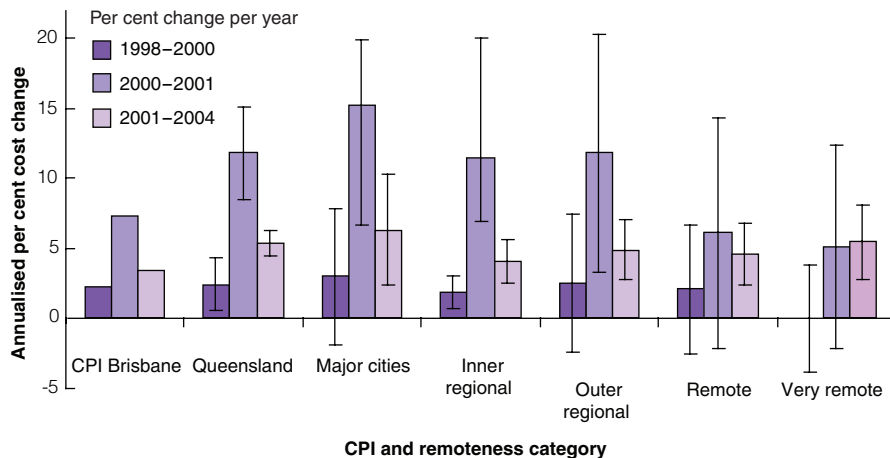
through secondary wholesalers, contribute to this cost disparity. In addition, retailers are unable to achieve economies of scale due to the relatively small number of consumers and higher overheads.

Our analysis of a small number of unhealthy items suggests that their price is less affected by remoteness than the HFAB items. One explanation may be that these less healthy products are more robust and more profitable, so the extra cost of providing these items in remote locations can be absorbed by the store.

While a number of reports have stated that the effect of the introduction of the GST was mainly captured in the September 2000 quarter,<sup>15,19</sup> they do not explain the substantial cost increases for basic food items between 2000 and 2001 — costs that were actually predicted to *fall* with the introduction of the GST.<sup>20</sup> With steady or declining farmers' prices and little or no impact of drought on retail prices at the time, it has been suggested that other factors, including retailing issues, contributed to these cost increases.<sup>21</sup>

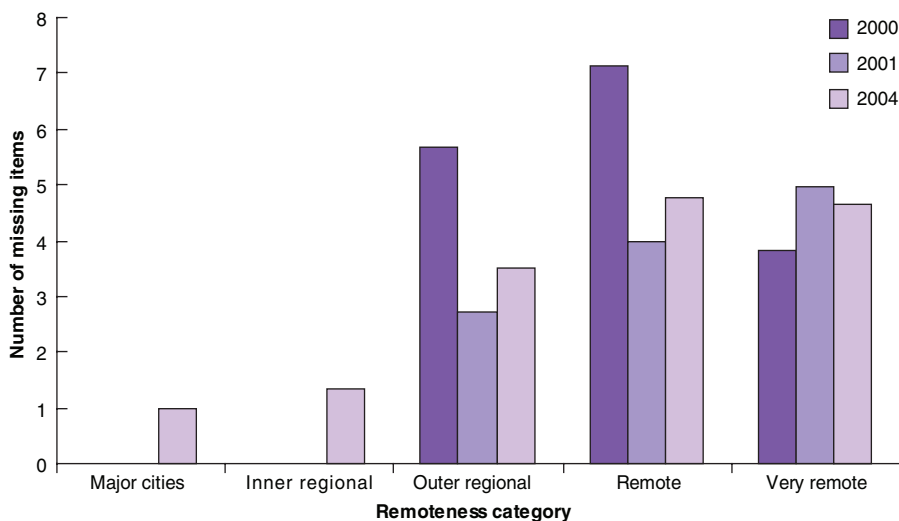
Despite a "stabilisation" in CPI for food in Brisbane over the financial year 2003–04, the HFAB cost increase has continued to be higher than the CPI for food across all

**4 Annualised per cent change in costs\* (95% CI) in the 56 stores surveyed between 1998 and 2004<sup>†‡</sup> compared with the increase in Consumer Price Index (CPI)<sup>14</sup> for food in Brisbane over the same period, by remoteness category<sup>11,12</sup>**



\* Ham and cabbage excluded. † Weighting proportional to Queensland population size by each remoteness category. ‡ Source: Healthy Food Access Basket surveys 1998, 2000, 2001 and 2004.<sup>3,4,9,10</sup>

**5 Number of missing Healthy Food Access Basket items from a total of 44 foods in the 81 stores surveyed between 2000 and 2004,\* by remoteness category<sup>11,12</sup>**



\* Source: Healthy Food Access Basket surveys 2000, 2001 and 2004.<sup>3,4,10</sup>

remoteness categories for the 56 stores surveyed from 1998 to 2004 (Box 4). This suggests that the cost for basic foods necessary to achieve good health has become, and continues to be, more expensive than less nutritious alternatives, as included in the basket to calculate the CPI for food. The price gap between healthy and unhealthy foods has also been illustrated in the United States<sup>17</sup> and France.<sup>22</sup> With

price identified as the most important factor in decisions about what food items to buy,<sup>23</sup> the health of all Queenslanders may be compromised as a result.

The decline in availability of basic healthy food items with increasing store remoteness (Box 5) also raises concerns for consumers regarding food security and the ability to maintain good health. While the count of available HFAB items fails to discriminate

between items not available on the day and those never stocked, time delays in restocking sold-out lines may have an impact on consumer access to healthy foods that could put some individuals at increased nutritional and health risk.

Factors affecting the price, availability and quality of food supply are complex and exist at local, state and national levels. There needs to be an investigation to identify these factors, so that strategies can be developed to improve affordability and access to healthy food for all Queenslanders.

## COMPETING INTERESTS

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