

SUCCESS AND FAILURE IN BUSSELTON 1966-1978

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Summary

Busselton people and their doctors have demonstrated a willingness to collaborate in the detection of health disorders by repeated mass examinations. They have accepted the need for better compliance in taking medication, particularly for hypertension and diabetes. Adults are gradually giving up cigarettes and maybe taking more exercise than hitherto. Behaviour modification experiments into eating habits have resulted in moderate weight losses over 3 years in 31 subjects.

By contrast obesity in men has been on the increase and has shown no decline in women. Weight gains have been largest in males who consume thirty grams or more of alcohol per day - subjects given specific diets more often than not do not take advice given them. Despite these conflicting problems, there have been encouraging trends in CHD and stroke mortality in this community.

## INTRODUCTION

Experimentation in Busselton over the last 12 years has given us a good idea of what efforts have been rewarding and where we have failed to make much headway.

## HYPERTENSION

Hypertension provided our first evidence showing how compliance to medical recommendations can be achieved. When we first started the studies, blood pressures were poorly controlled, a fact which spurred us to try and do better. At first we needed to convince doctors that hypertensives in the mild to moderate grades were worth treating. We had to remind many patients of the need for treatment as well as establish a modest disease register run by a nurse not attached to the doctors. All hypertensives were circulated with a list of current drugs in use together with their potential side effects. They were advised they would probably need treatment for life. Between 1972-75 we saw much improved results in that about 80% of surveyed hypertensives had DBPs of below 95 mmHg (Cullen et al. 1976). Recently we have published the mortality data (Cullen et al. 1979) showing a significant decline in deaths from strokes in men over the ages of 50 years.

(Table I over page).

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TABLE 1

CVA, AND CHD MORTALITY OF THE 1966/69 BUSSELTON  
COHORTS 50 YEARS AND OVER 1967-77.

PERSON YEARS BUSSELTON POPULATION	C A U S E O F D E A T H											
	C V A					C H D						
	Male		Female		Male		Female		Male		Female	
	No.	No./1000 per year	No.	No./1000 per year	No.	No./1000 per year	No.	No./1000 per year	No.	No./1000 per year	No.	No./1000 per year
	Buss	W.A.	Buss	W.A.	Buss	W.A.	Buss	W.A.	Buss	W.A.	Buss	W.A.
<u>50 - 74 years</u>												
1967-72 (6yrs)	14	2.8	2.2	10	2.0	2.0	44	8.8	9.5	20	4.0	3.8
1973-77 (5yrs)	3	0.7	2.1	8	1.9	1.8	26	6.2	8.5	14	3.3	3.4
<u>&amp; 5 years and over</u>												
1967-72 (6yrs)	14	16.2	19.3	15	16.2	25.0	21	24.3	43.0	29	31.3	30.9
1973-77 (5yrs)	7	8.3	19.0	17	20.3	18.9	26	31.1	37.4	22	25.7	27.6
Total	10875	10993	38	50	117	85						

## DIABETES

With regard to diabetes, in the 1978 health screenings we tested long term control of blood sugars in all diabetics by measuring levels of HbA<sub>1</sub> (glycosolated haemoglobin). The results showed that 87% of treated diabetics had HbA<sub>1</sub> levels of below 12%, a fairly satisfactory finding when compared with published results of 49% of a diabetic clinic sample with total HbA<sub>1</sub> below 12% in a Perth teaching hospital. The Royal Perth Hospital findings (Davis et al. 1978) reflect perhaps that intractable diabetics attend their clinics.

In Busselton we now have a diabetic clinic run by a trained nurse at the health centre. Accurate blood sugars are now possible using the Ames reflectometer in the doctors consulting rooms, diabetic clinic and more recently in the patients' homes. This has led to further improvement in the desired blood sugar levels and to a better understanding by patients of their disease. Hopefully diabetic 'mortality' may decrease after 1978.

## OBESITY

These changes for the better in hypertension and diabetes highlight our long term failures in obesity. In men we have been witnessing changes in weight rather reminiscent of the explosion in heart attacks around the 1960s. Between 1966-72 there was a significant increase in the proportion of the surveyed men with obesity.

TABLE II

Busselton weight changes 1966-78 expressed as percent of desired weight.

		115%	115-129%	130%
Males (%)	1966	59	30	13
	1972	48	34	18
	1978	-	-	17
Females (%)	1966	44	30	26
	1972	42	29	29
	1978	-	-	26

Of those showing 130% or more of their desirable body weight, 13% of men and 26% of women were noted in 1966 as against 17% of men and 26% of women in 1978. Regarding diabetics, between 1975-78 there were no favourable trends in women in that 49% were 130% or over in 1972 compared with 53% in 1978. In men 37% of diabetics were 130% or over of desired weight in 1972 compared with 26% in 1978.

As for the hypertensives in 1972, 45% of women were found to be 130% or more of desirable weight compared with 42% in 1978. In male hypertensives, 24% were 130% or over desired weight in 1972 compared with 29% in 1978. All this information clearly shows that doctors and their patients have succeeded in accepting the need for medication but fail concerning weight reduction.

Perhaps Busselton is experiencing favourable trends in cigarette smoking. The adult community seems to be gradually giving up smoking as about 1% of people population per year appear to be giving up the habit. Ex smokers in 1975 were inclined to gain weight compared with their weights in 1966. We are faced with the old problem of how to provide people with sufficient pleasure in their lives. As elsewhere, we have failed to control cigarette smoking in school children.

By 1975 we were well aware of our failure to influence obesity in Busselton. I am grateful for the following report by McCotter and Welborn (1978) who persuaded 61 subjects to attend a weight control programme over 12 months. Obese subjects (desirable weight 139%) were invited to attend at the Health Centre, the strategy involving (1) small group meetings supervised by district nurses; (2) a simple quantitative low carbohydrate dietary regime; and (3) behaviour modification techniques. Of 203 subjects invited, 96 agreed to participate, and 61 completed regular attendances for 12 months.

The low carbohydrate diet (60 g. per day) was easy to administer and the mean weight loss in the 61 subjects was 4.4 Kg. over 8 weeks. Thereafter 30 subjects elected to pursue behaviour modification (B-M group), the remaining 31 continuing diet alone and weekly group meetings.

The behaviour modification techniques administered by nurses in the group setting included - (1) self-recording; (2) stimulus control; (3) reinforcement; (4) alternative behaviours; (5) chaining; and (6) aversive imagery. Each new behaviour "package" was introduced at intervals of 2 weeks over a 12 week period. Subsequently all 61 subjects continued monthly weighing until the 12 month follow-up.

In the B-M group mean weight loss at 12 months was 6.8 Kg. compared with 3.4 Kg. in the diet-only group. At 3 years 52 subjects were available for weighing: in the B-M group mean weight loss was 3.1 Kg. compared with 1.5 Kg. in the diet-only group.

TABLE III

3 years weight changes following behaviour modification and diet only in 61 Busselton obese subjects.

Weight Change	Behaviour-modification Group (N=30)			Diet Only Group (N=31)	
	6mths.	12mths.	3yrs.	12mths.	3yrs.
Lost 5.0 Kg.	63%	55%	23%	26%	19%
Lost 2.1-5.0 Kg.	23%	33%	33%	35%	6%
Static± 2.0 Kg.	13%	13%	23%	26%	42%
Gain 2.1-5.0 Kg.	-	-	3%	6%	6%
Gain 5.0 Kg.	-	-	3%	6%	10%
Lost to Follow-up	-	-	13%	-	16%

## OBESITY IN GENERAL BUSSELTON MALES

The preliminary analysis of weights in 1975 showed a clear relation between weight gain and alcohol consumption of over 670 mls of beer per day in males between 1966-1975.

TABLE IV

Mean weight changes (1966-75) in Busselton men who consume less than or greater than 30 g alcohol per day.

Age	Non smokers				Smokers			
	Under 30 g alcohol		30 g alcohol		Under 30 g alcohol		30 g alcohol	
	No.	Wt.(kg)	No.	Wt.(kg)	No.	Wt.(kg)	No.	Wt.(kg)
30 yrs	(51)	4.9	(2)	17.1	(20)	3.9	(8)	6.8
30-39	(43)	3.7	(2)	22.2	(41)	4.0	(15)	7.5
40-49	(43)	0.2	(3)	3.7	(38)	2.6	(7)	1.5
50-59	(32)	1.7	(2)	4.9	(33)	2.4	(7)	0.8
60-69	(28)	6.4			(16)	0.7	(2)	10.0
Total	(197)		(9)		(148)		(39)	

The consumption of alcohol in Busselton appears to be on the increase. Alcohol consumption in Australia has increased from a national average of 8.9 litres per head during 1969-70 to 15.6 litres per head during 1978-9 (Smith 1979 personal communication).

### EXERCISE

As for exercise and obesity the only groups to lose weight in these 9 years were men aged 20-29 and 40-49 who exercised 4 times per week or more but the majority of people are clinging to their ways. In 1975 less than 10% of people became out of breath with exercise; 75% took no regular exercise, and the position seemed unchanged in the 1978 survey. In 1977, we advertised the health centre facilities for measuring fitness and about 40 people took up the offer. This was somewhat better than the 7 of 200 (4%) smokers under 40 years who accepted another offer to take part in a trial of behaviour conditioning to help them give up smoking (2 of those have stopped smoking).

### DIETARY ADVICE

As for mass dietary advice, we provided all households with National Heart Foundation recommendations on food intake. In addition we gave each of 650 subjects with either raised cholesterols or triglycerides a relevant diet in 1975. By the 1978 survey, less than half of them said they were keeping to a low saturated fat or low carbohydrate diet.

### CONCLUSIONS

Busselton people are pleased to regularly find out about their health patterns. They accept our invitation to take drugs but they resisted most attempts by us to spoil their pleasures or involve them in denial or pain.

Despite this, Busselton has also shared in the national decline in deaths from ischaemic heart disease. We have seen a decline in premature deaths in middle age due to CHD. The efforts of our profession have probably been a significant factor in this decline and we should remain optimistic about good results or persistence and hard work in reducing current scourges needlessly suffered in our society.

We will have to modify the family eating habits. Michael Gracey and Nancy Hitchcock, by their careful work have indicated the size of this problem in Busselton families. It is up to us to be innovative in developing better methods of nutrition education for schools and families if we are to see dietary patterns change for the better.

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