Table 14: Percentage distribution by socio-economic status (SEIFA) of GEHF members# who used private general dental practice (patients##) and made a claim from New South Wales, Australia, during 1992-1995**

By age groups in each SES groups - 18 years and over

	Age groups of patients##							
SES (SEIFA)**	**18-24**	**25-34**	**35-44**	**45-54**	**55-64**	**65-74**	**75+**	**Total**
Lowest SES	11.9	27.4	28.8	18.5	10.7	2.5	0.2	13.5 (100.0)
2nd SES	11.8	26.8	30.3	18.2	9.8	2.8	0.2	19.5 (100.0)
3rd SES	13.1	26.8	30.3	18.5	9.1	2.1	0.1	22.1 (100.0)
4th SES	13.2	27.8	30.0	17.6	8.6	2.6	0.2	18.7 (100.0)
Highest SES	13.7	24.7	29.5	19.5	9.3	3.0	0.3	26.2 (100.0)
								100.0

** As defined by the Index of Relative Socio-economic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998a]

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who used private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

Table 15: Percentage distribution by socio-economic status (SES, SEIFA)* of GEHF members who used private general dental practice (patients##) and made a claim from New South Wales, Australia, during 1992-1995. By SES group in each age group - 18 years and over

	Age groups of patients##							
SES (SEIFA)**	**18-24**	**25-34**	**35-44**	**45-54**	**55-64**	**65-74**	**75+**	**Total**
Lowest SES	12.6	14.0	13.1	13.5	15.4	13.0	13.0	13.5
2nd SES	17.9	19.8	19.8	19.2	20.4	21.1	17.9	19.5
3rd SES	22.5	22.3	22.4	22.0	21.3	18.0	11.1	22.1
4th SES	19.2	19.6	18.8	17.7	17.1	18.3	20.4	18.7
Highest SES	27.8	24.3	25.9	27.6	25.8	29.6	37.6	26.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

** As defined by the Index of Relative Socio-economic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998a]

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who used private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

4.2.2 Socio-economic status by geographical areas

The distribution of socio-economic status groups in three geographical areas showed that those living in the capital city belong to the highest socio-economic status (37 per cent). As they move away from the capital there were less in the highest and second highest SES groups **{Table 16}.**

Table 16 Percentage distribution by Socio-economic status, SES (SEIFA), of Government Employees Health Fund members## from New South Wales, Australia, during 1992-1995**

By geographical location^{o} - 18 years and over

SES (SEIFA)**	Geographical location^{o}			
	Capital	Extra metropolitan	Rural & remote	Total
Lowest SES	12.1	16.6	16.6	13.9
2nd SES	15.6	20.2	28.2	19.7
3rd SES	13.3	30.8	41.9	23.3
4th SES	21.7	22.6	10.5	18.6
Highest SES	37.2	9.8	2.8	24.6
Total	100.0	100.0	100.0	100.0

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who used private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

o As defined by the Rural, Remote and Metropolitan Zones classification (Department of primary industries and energy and development of human services and health 1994)

** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998a]

4.2.3 Dental visits by socio-economic groups

4.2.3.1 Frequency and percentage distribution of dental visits

Frequency and percentage distribution of dental visits by socio-economic groups SES (SEIFA) is shown in **Table 17** and **Figure 24**. Members from the highest SES group made the most number of visits to a private dental clinic (28 per cent). Members from the lowest SES group visited private general dental clinics, the least (only 13 per cent of the total dental visits).

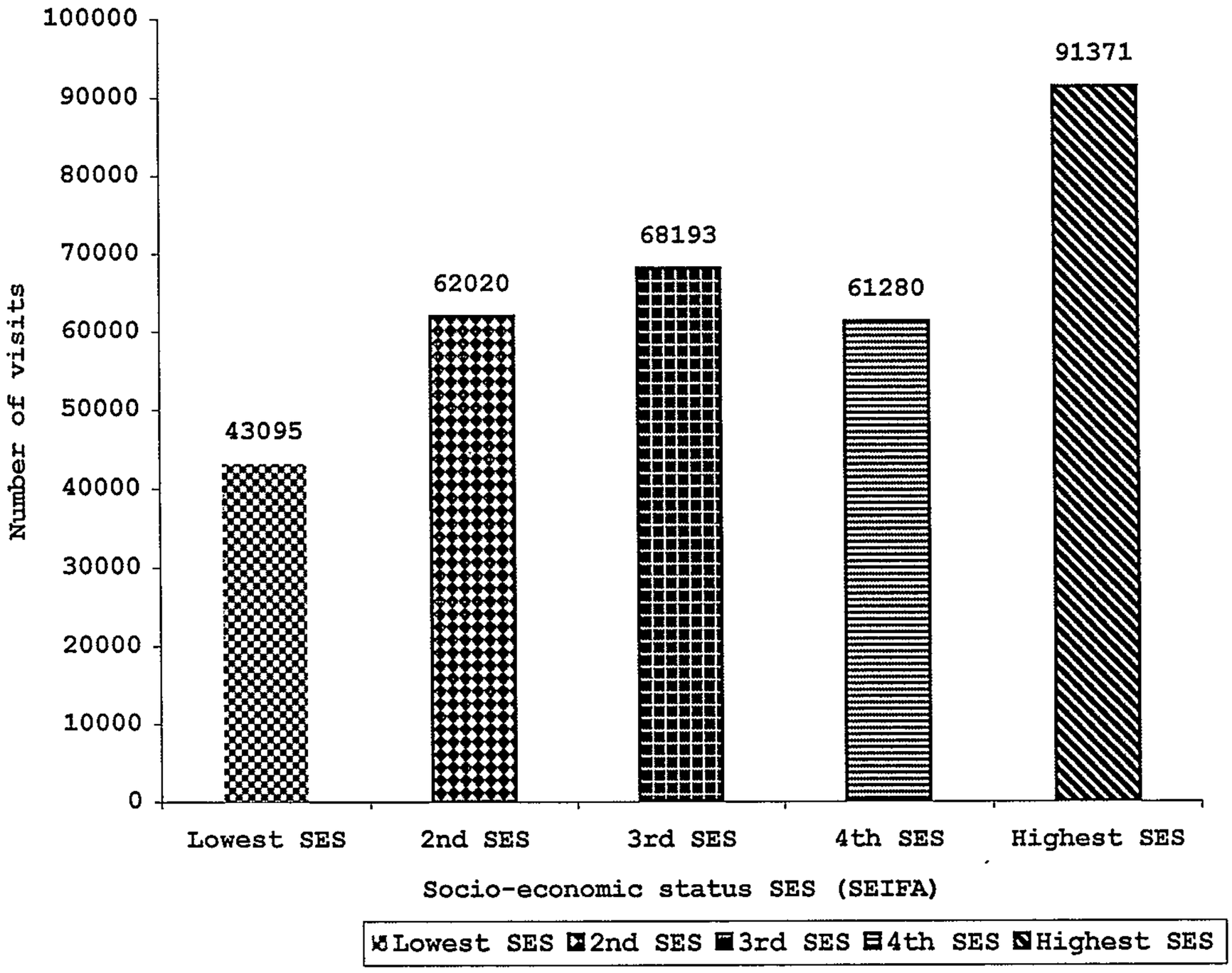
Table 17: Frequency and percentage distribution of visits by socio-economic groups SES (SEIFA) of Government Employees Health Fund members from New South Wales, Australia, who used private general dental practice (patients[##]) and made a claim during 1992-1995, 18 years and over**

SES (SEIFA)**	Frequency of dental visits	Per cent
Lowest SES	43,095	**13.2**
2nd SES	62,020	19.0
3rd SES	68,193	20.9
4th SES	61,280	18.8
Highest SES	91,371	**28.0**
Total	325,959	100.0

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who used private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998a]

Figure 24: Frequency of dental visits of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA).



4.2.3.2 Mean number of dental visits

The mean number of dental visits per patient per year to a private practitioner was **2.4 {Table 19}.** Members from the 3rd SES group showed the least mean number of visits, while the highest SES group showed the highest mean number of visits. The univariate analysis using Poisson regression has shown patients in the 2nd and 3rd SES groups had significantly fewer visits compared with the reference group which was the highest SES group **{Table 18}.** However, relative risk, when adjusted for gender, age, length of membership and geographical location, indicated that the lowest SES group had made significantly more visits than the highest SES group. This indicates that other factors such as, age, length of membership and geographical location, may have had effect on mean number of visits **{Table 18}.**

There was no difference in mean number of dental visits per patient year between gender for the entire sample, and similar pattern was shown among different groups of SES **{Table 19}.**

Table 18: Relative utilisation ratios of mean visits per patient year of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA).**

SES (SEIFA)**	Mean no of visits per patient## year	Unadjusted relative ratios	Adjusted*** relative ratios	Adjusted*** mean no of visits per patient## year
Lowest SES	2.43	0.99 (0.98__1.01)	1.03* (1.02__1.05)	2.52
2nd SES	2.38	0.97* (0.95__0.98)	1.01 (1.00__1.03)	2.47
3rd SES	2.31	0.94* (0.93__0.96)	0.99 (0.98__1.01)	2.43
4th SES	2.42	0.99 (0.97__1.00)	1.01 (0.99__1.02)	2.47
Highest SESR	2.45	1.00R	1.00R	2.45
All study sample	2.40			

R Reference category

* Significant (confidence level does not cross 1.00)

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who utilised private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998a]

*** Adjusted for gender, age, length of membership and class of location.

Figure 25: Relative utilisation ratios of mean visits per patient year of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA).

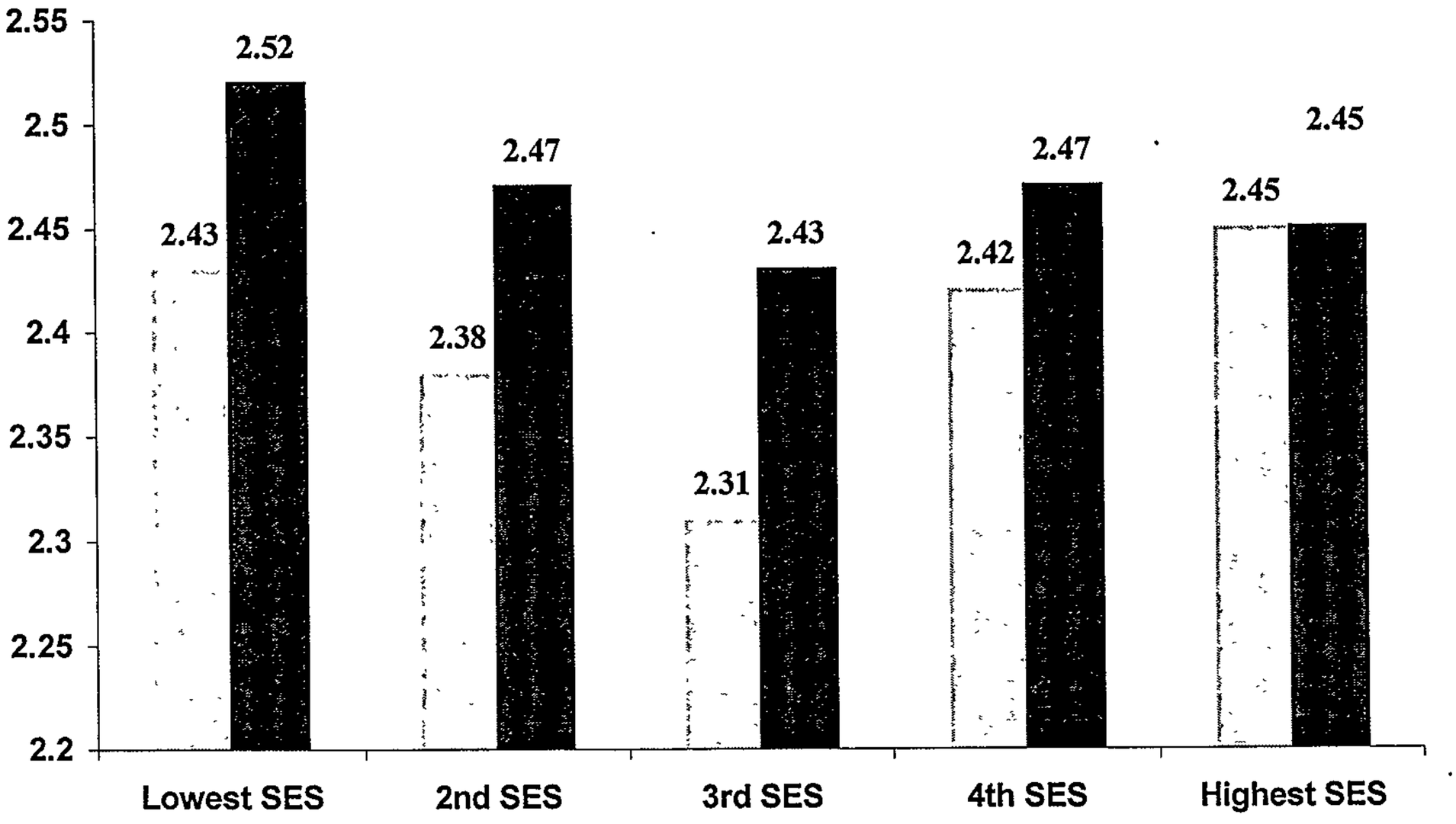


Table 19: Mean number of visits of GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA) and gender.**

SES (SEIFA)**	Gender		All study sample##
	M	F	
Lowest SES	2.43	2.44	2.43
2nd SES	2.38	2.37	2.38
3rd SES	2.32	2.31	2.31
4th SES	2.42	2.41	2.42
Highest SES	2.44	2.46	2.45
Total	**2.40**	**2.40**	**2.40**

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who utilised private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998]

4.2.4 Dental services (item category) by socio-economic groups

4.2.4.1 Frequency and percentage distribution of dental services

The pattern of distribution of dental services by item category was similar to the dental visits by SES **{Table 20, 21}**. The highest SES group had the highest number of services (29 per cent) and the lowest SES group had the least (13 per cent).

For all SES groups the **highest rate of services** was **restorative 35 per cent** of the total services followed by **diagnostic services** (26-27 per cent) **{Table 21}.** As Orthodontic services were the least, only 0.4 per cent, it was omitted from the tables. With the exception of oral surgery where the lowest SES group used the highest rate, the highest SES group utilised the most numbers of services for each item category **{Table 20}.**

Table 20: Number of services and percentage of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA).**

Category	SES (SEIFA)**					
	Lowest SES	2nd SES	3rd SES	4th SES	Highest SES	All study sample##
	Number (Per cent)	Number (Per cent)	Number (Per cent)	Number (Per cent)	Number (Per cent)	Number (Per cent)
Diagnostic services	27,146 (12.7%)	39,273 (18.4%)	42,801 (20.1%)	40,850 (19.2%)	63,003 (29.6%)	**213,073**
Preventive services	18,808 (13.0%)	24,865 (17.2%)	28,116 (19.4%)	28,481 (19.6%)	44,742 (30.9%)	**145,012**
Periodontics	1,565 (15.3%)	1,555 (15.0%)	1,825 (17.8%)	2,097 (20.5%)	3,187 (31.2%)	**10,229**
Oral surgery	3,751 (15.7%)	4,987 (20.9%)	5,631 (23.6%)	4,350 (18.2%)	5,166 (21.6%)	**23,885**
Endodontics	7,391 (13.0%)	10,832 (19.0%)	11,376 (19.9%)	10,852 (19.0%)	16,616 (29.1%)	**57,067**
Restorative services	36,964 (13.3%)	52,310 (18.8%)	56,776 (20.4%)	53,296 (19.1%)	79,379 (28.5%)	**278,725**
Crown and bridge	2,892 (13.2%)	4,240 (19.3%)	4,249 (19.3%)	4,272 (19.4%)	6,346 (28.9%)	**21,999**
Prosthodontics	5,497 (17.1%)	6,892 (21.4%)	6,789 (21.1%)	5,715 (17.8%)	7,293 (22.7%)	**32,186**
General services	1,921 (12.4%)	2,939 (19.0%)	3,078 (19.9%)	3,206 (20.7%)	4,327 (28.0%)	**15,471**
Total services	**105,974**	**147,952**	**160,729**	**153,195**	**230,134**	**797,984**
Per Cent	**(13.3%)**	**(18.5%)**	**(20.1%)**	**(19.2%)**	**(28.8%)**	**(100%)**

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who utilised private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998a]

Table 21: Number of services and percentage of the GEHF who utilised private general dental practice services and made a claim during 1992-1995, by service category and socio-economic status (SES, SEIFA).**

Category	SES (SEIFA)**						
	Lowest SES	2nd SES	3rd SES	4th SES	Highest SES	All study sample##	
	Number (Per cent)	Number (Per cent)	Number (Per cent)	Number (Per cent)	Number (Per cent)	Number	(Per cent)
Diagnostic services	27,146 (25.6%)	39,273 (26.5%)	42,801 (26.6%)	40,850 (26.7%)	63,003 (27.4%)	**213,073**	**(26.7%)**
Preventive services	18,808 (17.8%)	24,865 (16.8%)	28,116 (17.5%)	28,481 (18.6%)	44,742 (19.4%)	**145,012**	**(18.2%)**
Periodontics	1,565 (1.5%)	1,555 (1.1%)	1,825 (1.1%)	2,097 (1.4%)	3,187 (1.4%)	**10,229**	**(1.3%)**
Oral surgery	3,751 (3.5%)	4,987 (3.4%)	5,631 (3.5%)	4,350 (2.8%)	5,166 (2.2%)	**23,885**	**(3.0%)**
Endodontics	7,391 (7.0%)	10,832 (7.3%)	11,376 (7.1%)	10,852 (7.1%)	16,616 (7.2%)	**57,067**	**(7.2%)**
Restorative services	36,964 (34.9%)	52,310 (35.4%)	56,776 (35.3%)	53,296 (34.8%)	79,379 (34.5%)	**278,725**	**(34.9%)**
Crown and bridge	2,892 (2.7%)	4,240 (2.9%)	4,249 (2.6%)	4,272 (2.8%)	6,346 (2.8%)	**21,999**	**(2.8%)**
Prosthodontics	5,497 (5.2%)	6,892 (4.7%)	6,789 (4.2%)	5,715 (3.7%)	7,293 (3.2%)	**32,186**	**(4.0%)**
General services	1,921 (1.8%)	2,939 (2.0%)	3,078 (1.9%)	3,206 (2.1%)	4,327 (1.9%)	**15,471**	**(1.9%)**
Total services	**105,974 (100%)**	**147,952 (100%)**	**16,0729 (100%)**	**153,195 (100%)**	**23,0134 (100%)**	**797,984**	**(100%)**
Per cent	**13.3%**	**18.5%**	**20.1%**	**19.2%**	**28.8%**	**100%**	

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who utilised private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998]

4.2.3.3 Mean number of services per patient visit

The mean number of services per patient visit for those who used a private general dental practice (patient) was **2.45 (Table 23 & 24).** The **highest SES group had the highest mean number of services per patient visits** as **2.52**. The 3rd SES group has shown the least mean number of services per visit **(2.36)**.

The univariate analysis indicated that patients in the highest SES group had significantly more services per patient visit than the lowest, 2nd and 3rd SES groups. After adjusting for gender, age, length of membership and geographical location, the lowest and the 4th SES group showed significantly more services than the highest SES group. **{Table 22, Figure 26}.**

These results indicated that there was a slight effect of socio-economic status on mean number of services per patient visit. Age, length of membership and geographical location also had an impact on the mean number of services per patient visit.

Table 22: Relative utilisation ratios of mean services per visit of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA).**

SES (SEIFA)	Unadjusted mean no of services per visit	Unadjusted relative utilisation ratios	Adjusted*** relative utilisation ratios	Adjusted*** mean no of services per visit
Lowest SES	2.46	0.98* (0.96__0.99)	1.03* (1.02__1.04)	2.59
2nd SES	2.38	0.95* (0.94__0.96)	1.00 (0.93__1.01)	2.52
3rd SES	2.36	0.93* (0.93__0.95)	1.00 (0.99__1.00)	2.52
4th SES	2.50	0.99 (0.98__1.00)	1.01* (1.01__1.02)	2.54
Highest SES[R]	2.52	1.00	1.00	2.52
All study sample[##]	**2.45**			

R The Reference category

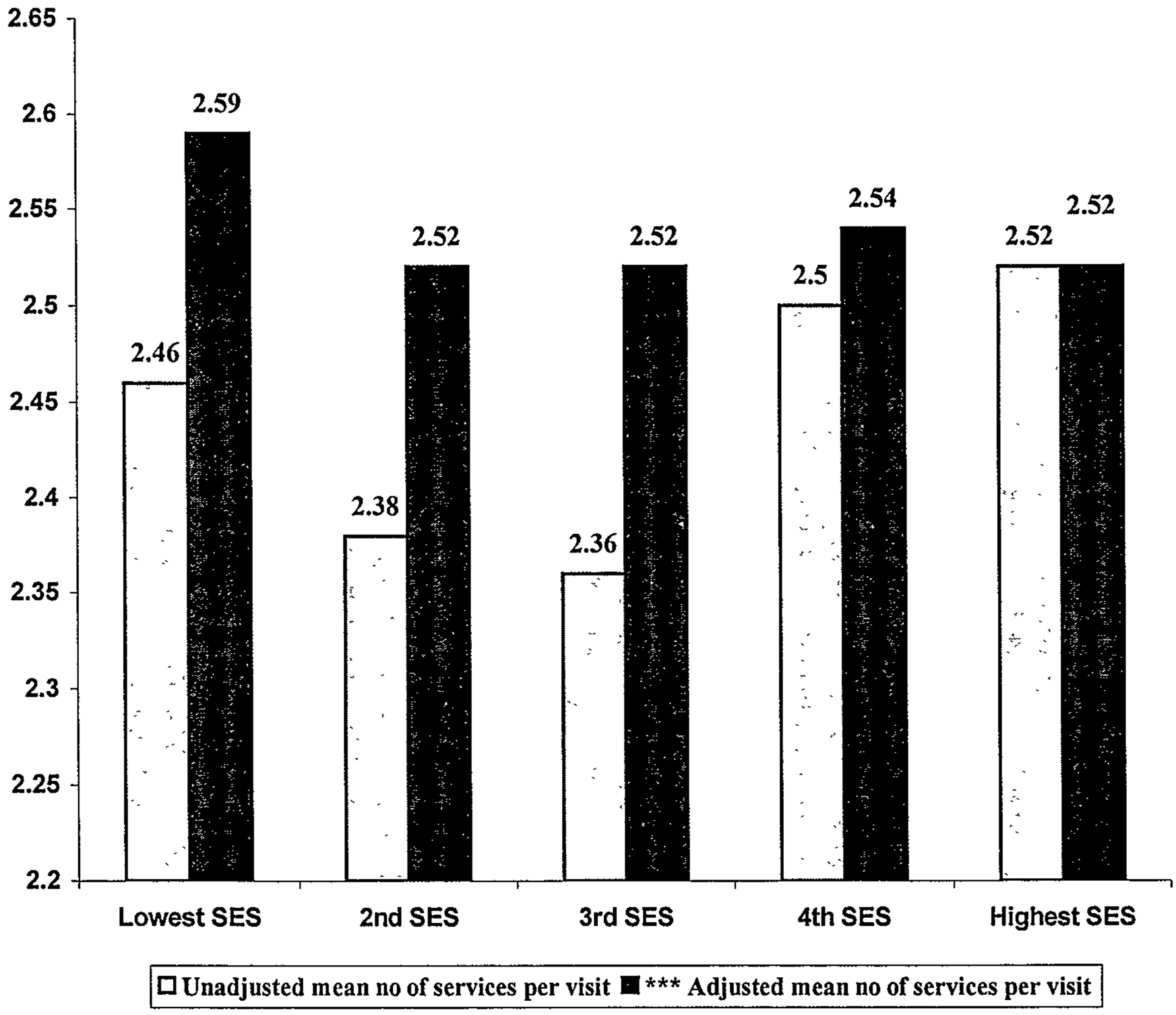
* Significant ($p < 0.05$)

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who utilised private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998a]

*** Adjusted for gender, age, length of membership and class of location.

Figure 26: Relative utilisation ratios, both adjusted and unadjusted, of mean services per patient visit of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by SES (SEIFA).



The mean number of services per patient visit by item category is shown in **Table 23**. Restorative services demonstrated the highest mean number of services for all SES groups (**35 per cent** of the total services), followed by diagnostic services (**27 per cent**).

The lowest SES group showed higher oral surgery services **(0.09)** than the average mean number of services for the whole study population **(0.07),** while the highest SES group showed less **(0.06).**

Table 23 **Mean number of services per visit of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA)** and service category.**

Category	SES (SEIFA)**						
	Lowest SES	2nd SES	3rd SES	4th SES	Highest SES	All study sample##	
	Mean no. (Per cent)	Mean no. (Per cent)	Mean no. (Per cent)	Mean no. (Per cent)	Mean no. (Per cent)	Mean no.	(Per cent)
Diagnostic services	0.63 (25.6%)	0.63 (26.5%)	0.62 (26.4%)	0.67 (26.8%)	0.69 (27.4%)	**0.65**	**(26.5%)**
Preventive services	0.43 (17.5%)	0.41 (17.2%)	0.42 (17.9%)	0.47 (18.8%)	0.49 (19.4%)	**0.46**	**(18.8%)**
Periodontics	0.04 (1.6%)	0.03 (1.3%)	0.03 (1.3%)	0.03 (1.2%)	0.03 (1.2%)	**0.03**	**(1.2%)**
Oral Surgery	0.09 (3.7%)	0.08 (3.4%)	0.08 (3.4%)	0.07 (2.8%)	0.06 (2.4%)	**0.07**	**(2.9%)**
Endodontics	0.17 (6.9%)	0.17 (7.1%)	0.17 (7.2%)	0.18 (7.2%)	0.18 (7.1%)	**0.17**	**(6.9%)**
Restorative services	0.86 (35.0%)	0.84 (35.3%)	0.83 (35.3%)	0.87 (34.8%)	0.87 (34.5%)	**0.85**	**(34.7%)**
Crown & bridge	0.07 (2.8%)	0.06 (2.5%)	0.06 (2.6%)	0.07 (2.8%)	0.07 (2.8%)	**0.07**	**(2.9%)**
Prosthodontics	0.13 (5.3%)	0.11 (4.6%)	0.1 (4.3%)	0.09 (3.6%)	0.08 (3.2%)	**0.1**	**(4.1%)**
General services	0.04 (1.6%)	0.05 (2.1%)	0.04 (1.7%)	0.05 (2.0%)	0.05 (2.0%)	**0.05**	**(2.0%)**
Total	**2.46 (100%)**	**2.38 (100%)**	**2.35 (100%)**	**2.5 (100%)**	**2.52 (100%)**	**2.45**	**(100%)**

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who utilised private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998]

4.2.3.4 Mean number of services per patient year

The mean number of services per patient year was **5.9** for the GEHF members in New South Wales who utilised general dental practice services. The highest SES group has shown the highest mean number of services **(6.2)** and the 3rd SES group showed the least mean number of services per patient year **(5.5)** for the unadjusted data.

The univariate analysis showed patients in the 2nd and 3rd SES groups had significantly fewer services compared with the reference group **{Table 24}.** Relative utilisation ratios, when adjusted for gender, age, length of membership and geographical location, indicated that the lowest SES group has significantly more mean number of services than the reference group (the highest SES group).

This indicates that other factors (age, length of membership and geographical location) may have an effect on mean number of services per patient year.

Table 24: Relative utilisation ratios of mean services per patient[##] year of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA).**

SES (SEIFA)**	Mean no of services per patient year	Unadjusted relative utilisation ratios	Adjusted*** relative utilisation ratios	Adjusted*** mean services per patient year
Lowest SES	6.0	0.97 (0.93__1.01)	1.06* (1.02__1.1)	6.6
2nd SES	5.7	0.92* (0.89__0.95)	1.02 (0.98__1.05)	6.3
3rd SES	5.5	0.88* (0.85__0.95)	0.99 (0.96__1.03)	6.1
4th SES	6.0	0.98 (0.95__1.01)	1.02 (0.98__1.07)	6.3
Highest SES[R]	6.2	1.00	1.00	6.2
All study sample	**5.9**			

R Reference category

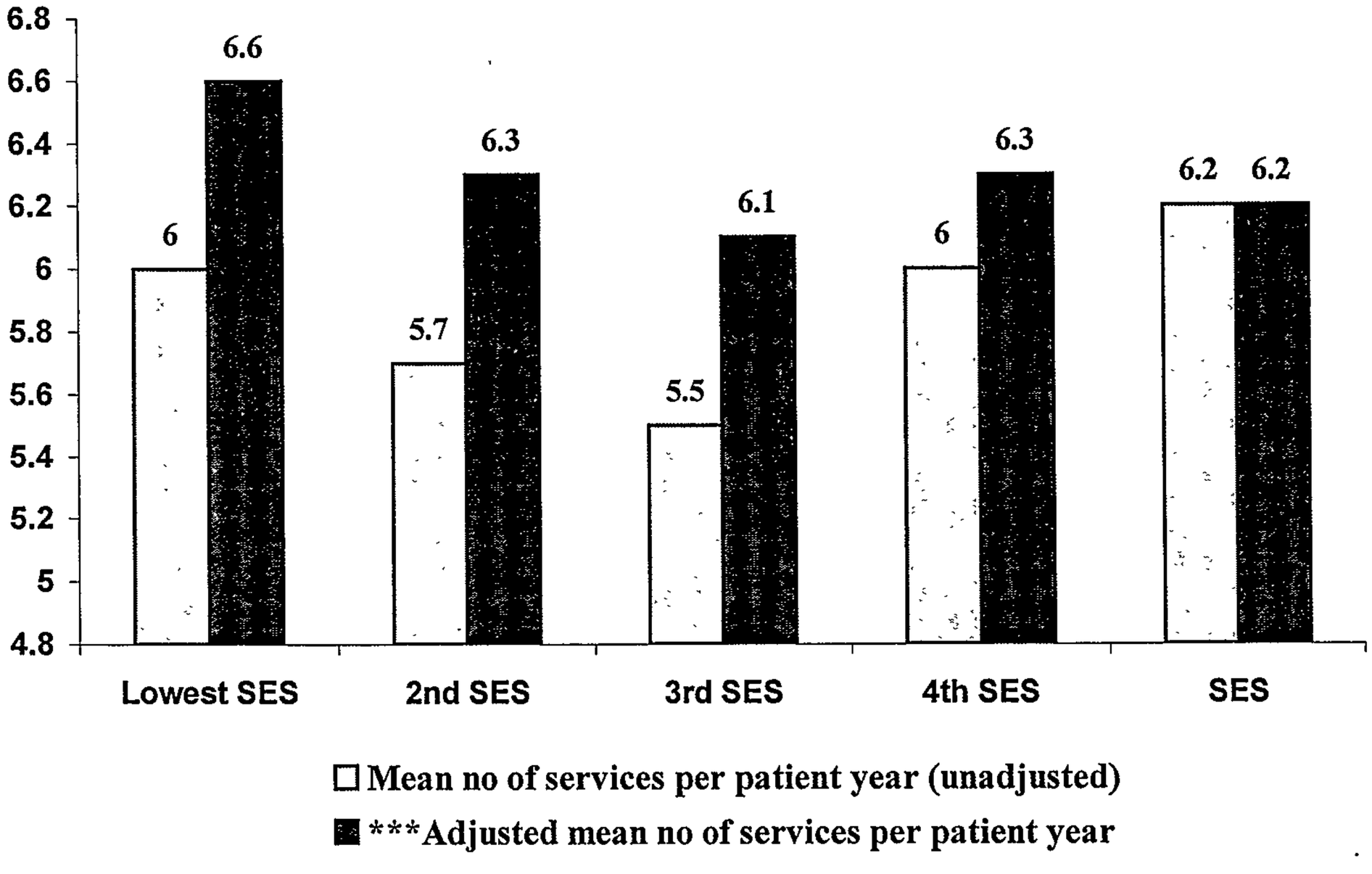
* Significant ($p < 0.05$)

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who utilised private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998]

*** Adjusted for gender, age, length of membership and class of location.

Figure 27: Relative utilisation ratios, both adjusted and unadjusted, of mean services per patient year of GEHF members who utilised private general dental services and made a claim during 1992-1995, by SES (SEIFA).



The mean number of services by item category for different socio-economic status is shown in **Table 25. Restorative** services were the highest for all socio-economic status groups followed by **diagnostic** services **(1.57).** The highest rate was in the highest socio-economic group for **{Figures 26, &27}** restorative services **(2.13)** and diagnostic service **(1.69).**

The highest SES group utilised more diagnostic, preventive and endodontic services compared with other groups **{Table 25, Figure 27, 28 & 29}.** The lowest socio-economic group had more oral surgery treatment **(0.21).** Most of the oral surgery services were extraction of teeth, which resulted in an increasing need for prosthodontic services by the lowest SES group **(0. 31).** There was the same usage of periodontal services for both of the lowest and highest groups. The 2nd and the 3rd SES groups utilised less periodontic services.

Table 25 Mean number of services per patient## year of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA) and service category.**

Category	SES (SEIFA)**					All study sample
	Lowest SES	2nd SES	3rd SES	4th SES	Highest SES	
Diagnostic services	1.53	1.50	1.45	1.61	1.69	**1.57**
Preventive services	1.06	0.95	0.95	1.12	1.20	**1.07**
Periodontics	0.09	0.06	0.06	0.08	0.09	**0.08**
Oral Surgery	0.21	0.19	0.19	0.17	0.14	**0.18**
Endodontics	0.42	0.41	0.39	0.43	0.45	**0.42**
Restorative services	2.09	2.00	1.93	2.10	2.13	**2.05**
Crown & bridge	0.16	0.16	0.14	0.17	0.17	**0.16**
Prosthodontics	0.31	0.26	0.23	0.23	0.20	**0.24**
General services	0.11	0.11	0.10	0.13	0.12	**0.11**
Total	**6.0**	**5.7**	**5.5**	**6.0**	**6.2**	**5.9**

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who utilised private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998]

Figure 28: Mean number of services per patient year of the GEHF members who utilised general dental practice services and made a claim during 1992-1995, by service category.

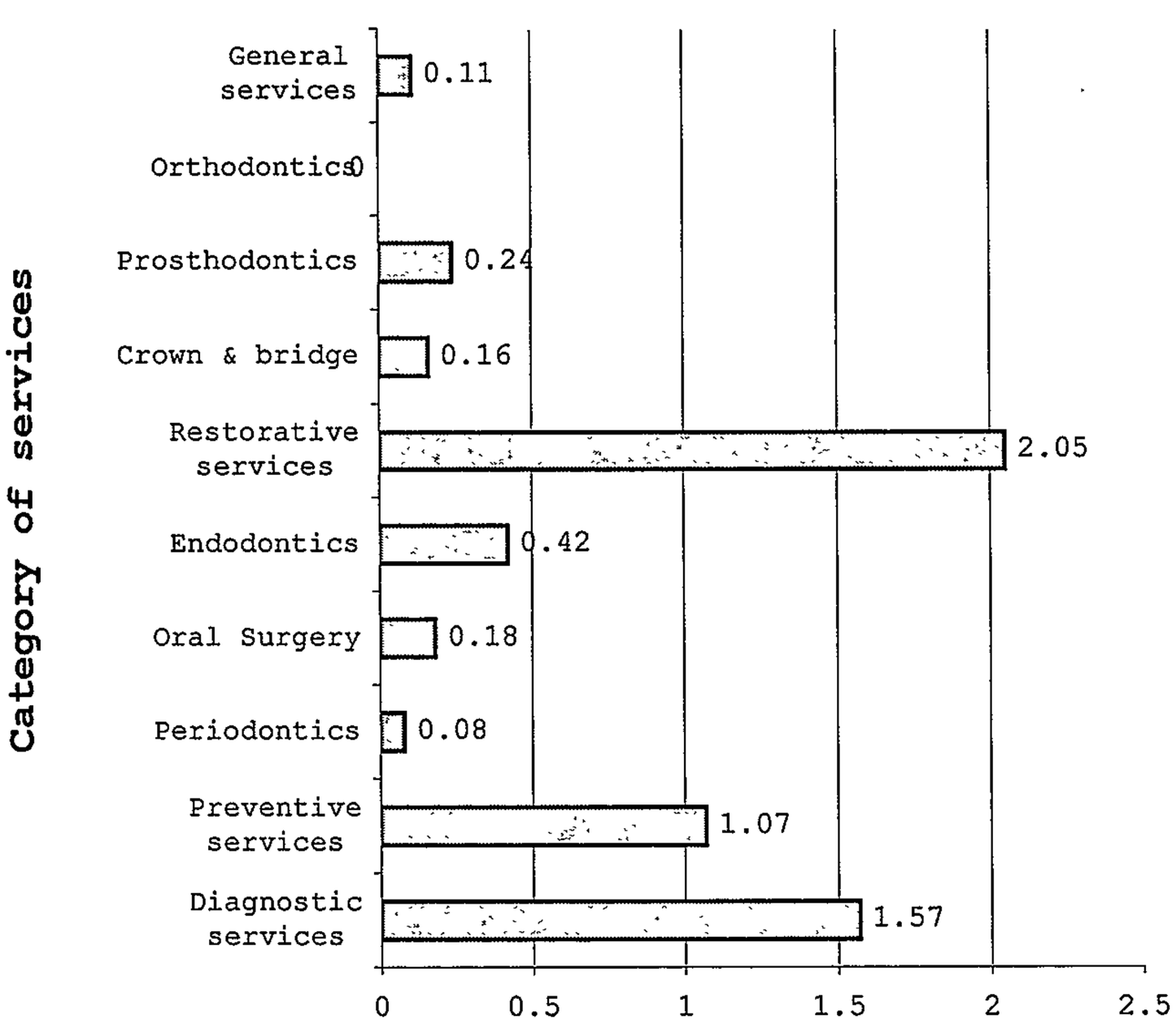
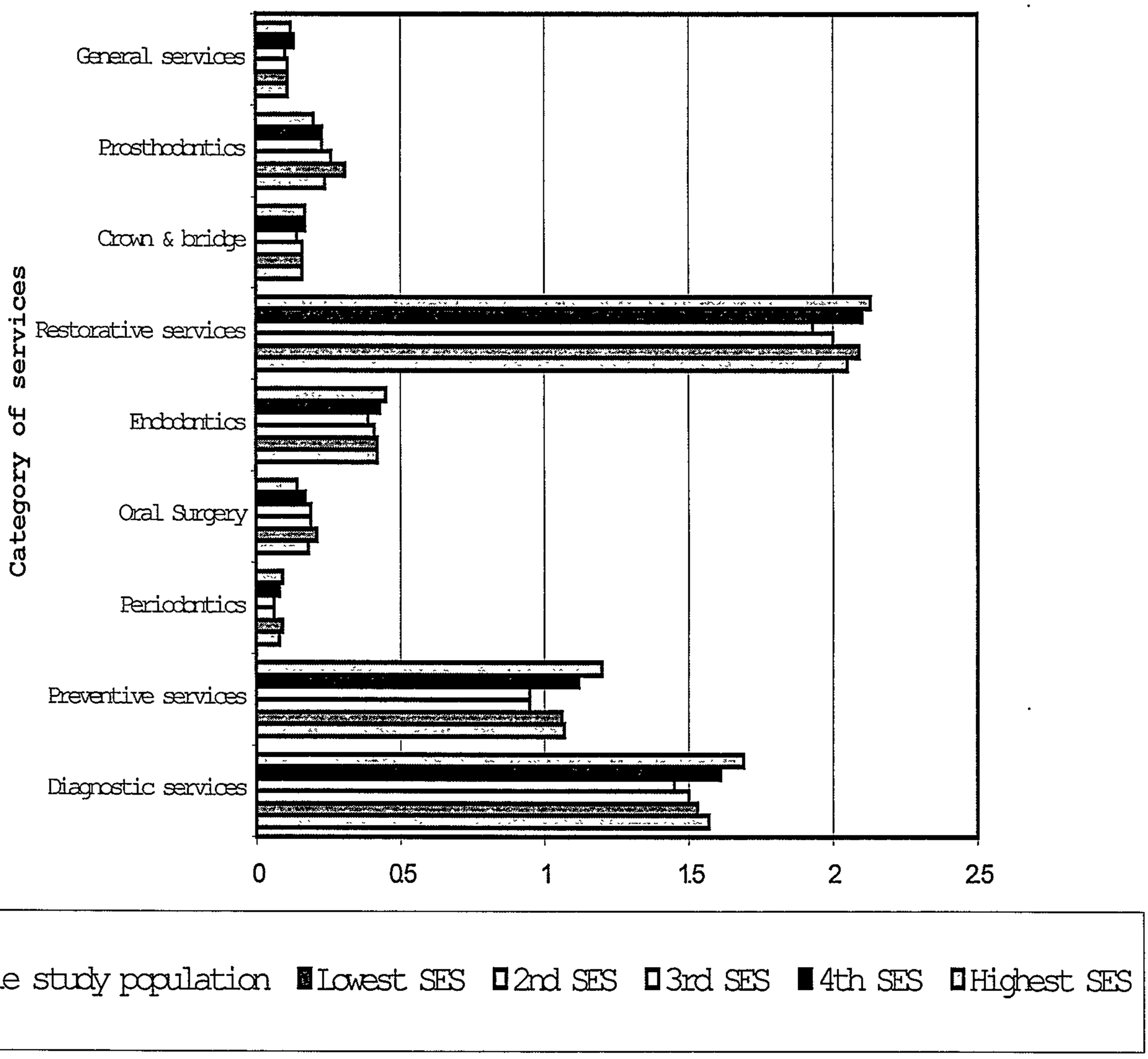


Figure 29: Mean number of services per patient[##] year by the GEHF members who used private dental practice services and made a claim during 1992-1995, by service category and socio-economic status (SES, SEIFA)[**].



Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who utilised private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

** As defined by the Index of Relative Socio-economic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998]

Figure 30: Mean number of services per patient year of the GEHF members who used general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA) and service category.

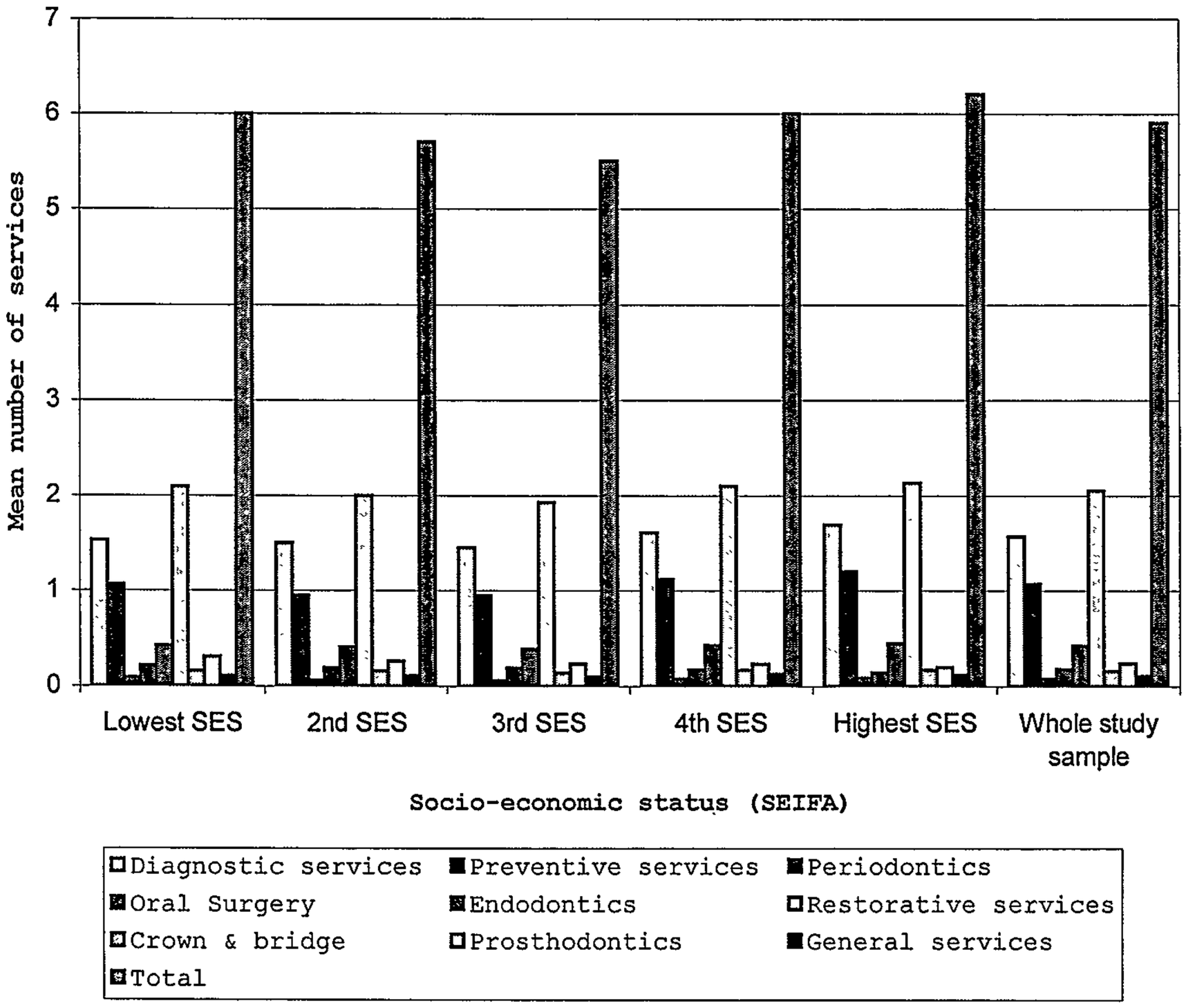
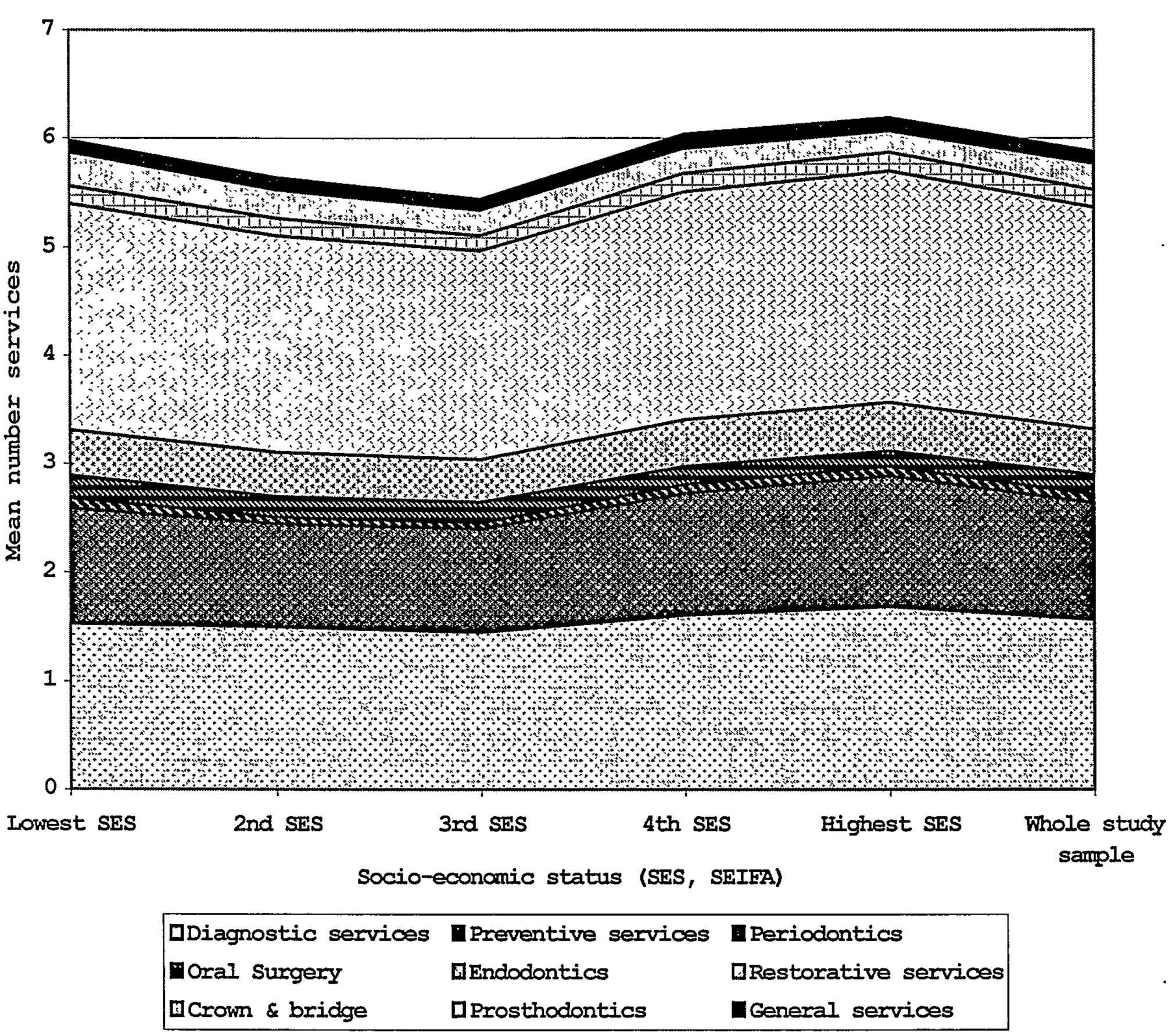


Figure 31: Mean number of services per patient year of the GEHF members who utilised general dental practice services and made a claim during 1992-1995, by socio-economic status and service category.



4.2.3.5 Cost per item of service

The median cost of an item of service for all patients was **A$36.7** with an interquartile range of A$25.1 to A$61.5. The mean cost was **A$62.4** with a large standard deviation of 110.9. The data was highly skewed as indicated by the fact that the median was A$ 36.7. **{Table 26, Figure 32}.**

By socio-economic status, the unadjusted median cost per item of service showed no definite pattern. The width of the interquartile range also did not change noticeably from the lowest to the highest SES group, which remained relatively constant. The present study indicated that the mean and median cost of an individual item of dental service showed no difference by SES status **{Table 26}**.

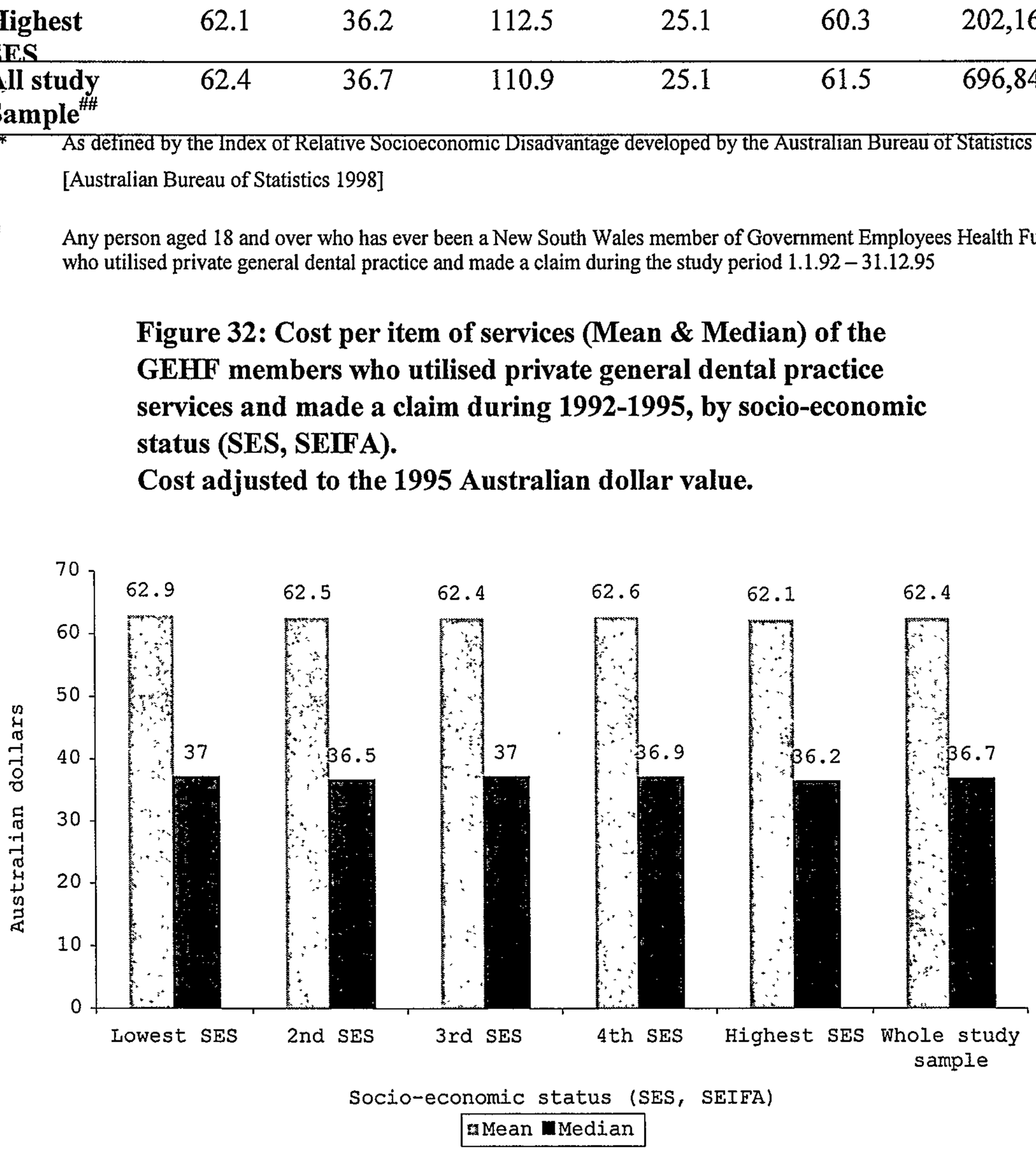
Table 26: Cost per item of service of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA).
Cost adjusted to the 1995 Australian dollar value.**

SES (SEIFA)**	Mean	Median	Standard deviation of Mean	25th percentile	75th percentile	Number of items of services
Lowest SES	62.9	37.0	110.2	25.0	61.0	91,389
2nd SES	62.5	36.5	110.1	25.0	62.0	129,120
3rd SES	62.4	37.0	110.6	25.3	62.3	140,275
4th SES	62.6	36.9	110.0	25.3	63.0	133,899
Highest SES	62.1	36.2	112.5	25.1	60.3	202,166
All study Sample##	62.4	36.7	110.9	25.1	61.5	696,849

** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998]

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who utilised private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

Figure 32: Cost per item of services (Mean & Median) of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA).
Cost adjusted to the 1995 Australian dollar value.



4.2.3.6 Cost of services per visit

The mean cost per visit was **A$153.8** with a standard deviation of 244.3. **{Table 27}**. The median cost of services received at a visit for all SES groups was **A$93.5** with an interquartile range of A$63 to A$149.9 **{Table 28, Figure 33}**. The median cost of services at a visit for the lowest SES group was A$92.6. By socio-economic status, the median cost of services showed no clear trend of increasing cost per visit but the fourth lowest and highest SES groups received highest median cost of services per visit. The width of the interquartile range was highest in the fourth group.

When adjusted for gender, age, length of membership and geographical location, **the mean cost per visit was least for the lowest SES group and the highest for the highest SES group.** The estimated ratio of means indicates that the cost per visit of the lowest, 3rd and 4th SES groups were significantly lower than the referent SES group (the highest). **{Table 28, Figure 34}.**

Table 27: Cost of services per patient visit of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA).**

Cost adjusted to the 1995 Australian dollar value.

SES(SEIFA)**	Mean	Median	Standard deviation of Mean	25th percentile	75th percentile	Number of services
Lowest SES	155.0	92.6	244.4	60.3	149.9	43,095
2nd SES	150.6	90.0	247.5	60.0	144.7	62,020
3rd SES	147.4	89.9	236.5	60.0	142.0	68,193
4th SES	158.3	96.4	249.0	65.4	155.9	61,280
Highest SES	157.0	96.4	244.5	65.9	152.0	91,371
All study sample	**153.8**	**93.5**	**244.3**	**63.0**	**149.9**	**325,959**

** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998]

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who utilised private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

Table 28: Relative cost ratios of mean services per patient[##] visit of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA).**
Cost adjusted to the 1995 Australian dollar value.

SES (SEIFA)**	Mean cost of services per patient visit	Estimated cost ratios of means*** (95%CIs)	Adjusted*** mean cost per visit
Lowest SES	155.0	0.94* (0.89__0.99)	147.6
2nd SES	150.6	0.99 (0.98__1.00)	155.4
3rd SES	147.4	0.97* (0.96__0.99)	152.3
4th SES	158.3	0.98* (0.97__0.99)	153.9
Highest SES[R]	157.0	1.00	157.0
All study sample	153.8		

R The Reference category
* Significant ($p < 0.05$)
Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who utilised private general dental practice and made a claim during the study period 1.1.92 – 31.12.95
** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998]
*** Adjusted for gender, age, length of membership and class of location.

Figure 33: Cost of services per visit (Mean & Median) of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA).
Cost adjusted to the 1995 Australian dollar value.

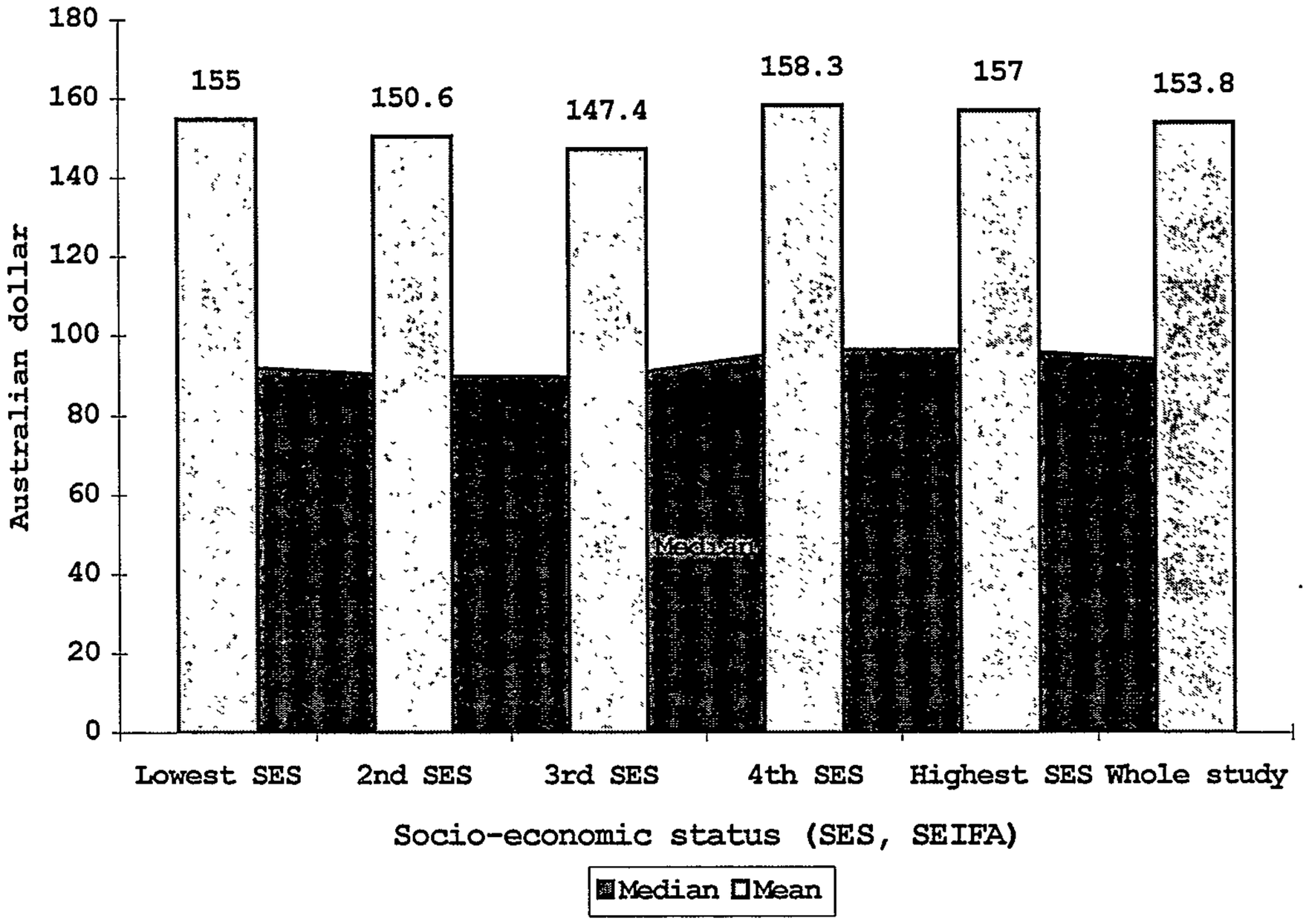
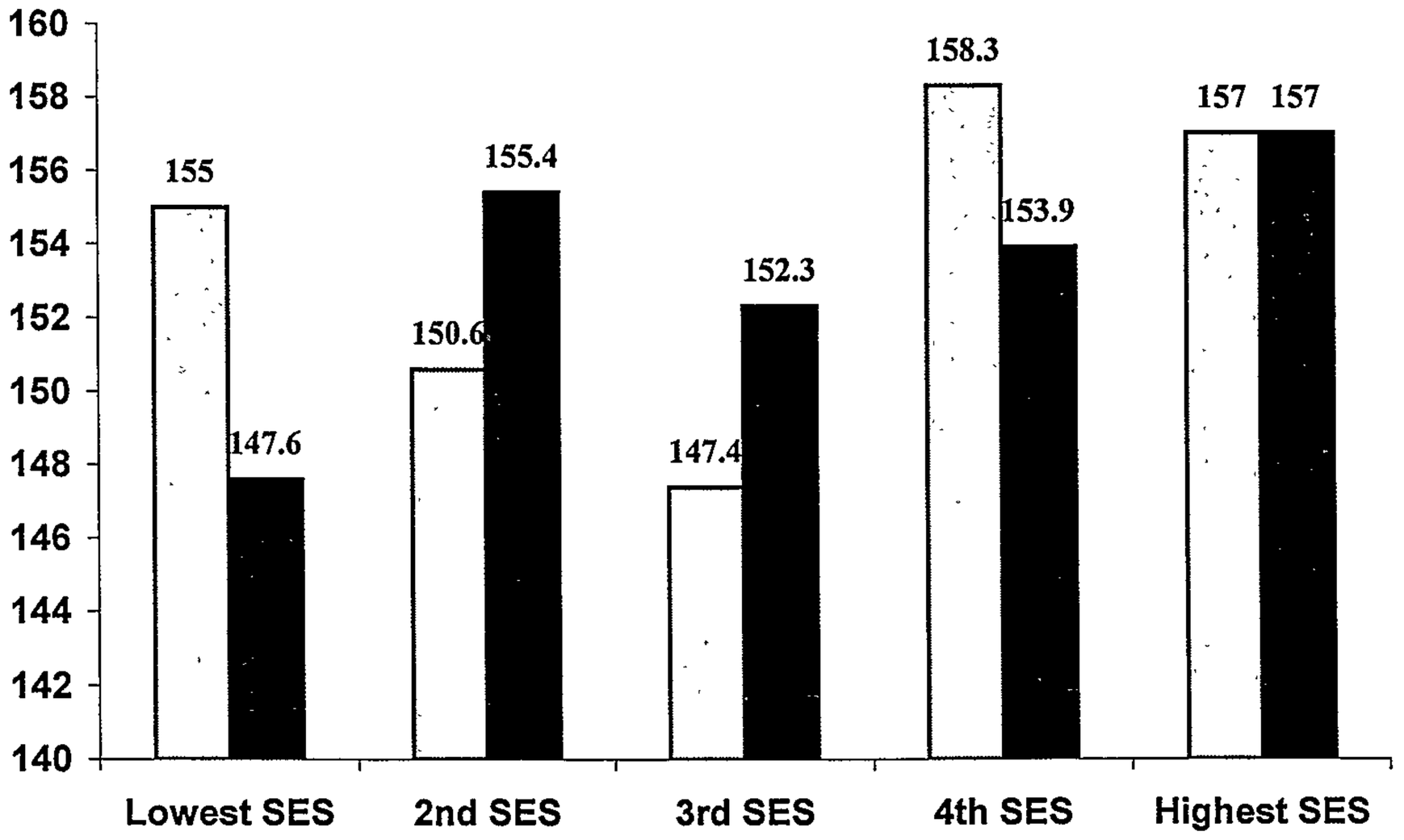


Fig 34: Relative cost ratios of services, both adjusted and unadjusted, of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status(SES, SEIFA).
Cost adjusted to the 1995 A$ value.



4.2.3.7 Cost of services per patient year

The **mean cost of services per patient year** was A$384.8 with a huge standard deviation of 608.0. The highest cost of services per patient year A$399, was for the fourth SES group **{Table 29, Figure 35}.**

The **median cost of services for a patient per calendar year** for all socio-economic levels was **A$183.3** with a very wide interquartile range of 94.1 - 409.1 **{Table 29}.** There were no clear changes in the median cost per patient-year from the lowest to highest SES groups. However, the fourth and highest SES groups received the highest cost per patient

The adjusted mean cost of services per patient-year (95 per cent confidence interval) from the Weibull regression model indicates that for all lower four SES groups, compared with the highest SES group, have shown significantly differences **{Table 30, Figure 36}**. The fourth highest SES group showed the highest while the lowest SES group showed the least cost of dental services per patient year.

The cost of services per patient year for the lowest SES group showed A$30 less then those from the highest SES group **{Table 30}.**

Table 29: Cost of services per patient year of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA).**
Cost adjusted to the 1995 Australian dollar value.

SES (SEIFA)**	Mean	Median	Standard deviation of Mean	25th percentile	75th percentile	Number of services
Lowest SES	396.5	185.9	603.0	93.8	422.9	18,469
2nd SES	375.1	175.2	625.1	89.8	397.1	27,096
3rd SES	359.1	170.6	627.9	88.5	376.5	30,591
4th SES	398.8	190.7	602.5	97.3	427.1	26,323
Highest SES	396.9	193.0	584.7	99.3	422.3	38,612
All study sample##	**384.8**	**183.3**	**608.0**	**94.1**	**409.1**	**141,091**

** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998]

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who utilised private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

Table 30: Relative cost ratios of mean services per patient year of the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFE).**
Cost adjusted to the 1995 Australian dollar value.

SES (SEIFA)**	Unadjusted mean cost of services per patient year	Estimated cost ratios of means*** (95%CIs)	Adjusted*** mean cost per patient year
Lowest SES	396.5	0.92* (0.90__0.94)	365.2
2nd SES	375.1	0.97* (0.95__0.99)	385.00
3rd SES	359.1	0.94* (0.92__0.96)	373.1
4th SES	398.8	0.96* (0.94__0.98)	381.0
Highest SES[R]	396.9	1.00	396.9
All study sample[##]	384.8		

R The Reference category

* Significant ($p < 0.05$)

Any person aged 18 and over who has ever been a New South Wales member of Government Employees Health Fund who utilised private general dental practice and made a claim during the study period 1.1.92 – 31.12.95

** As defined by the Index of Relative Socioeconomic Disadvantage developed by the Australian Bureau of Statistics [Australian Bureau of Statistics 1998]

*** Adjusted for gender, age, length of membership and class of location.

Figure 35: Cost of services per patient year (Mean & Median) of the GEHF members who utilised private dental practice services and made a claim during 1992-1995, by socio-economic status (SES, SEIFA).
Cost adjusted to the 1995 Australian dollar value.

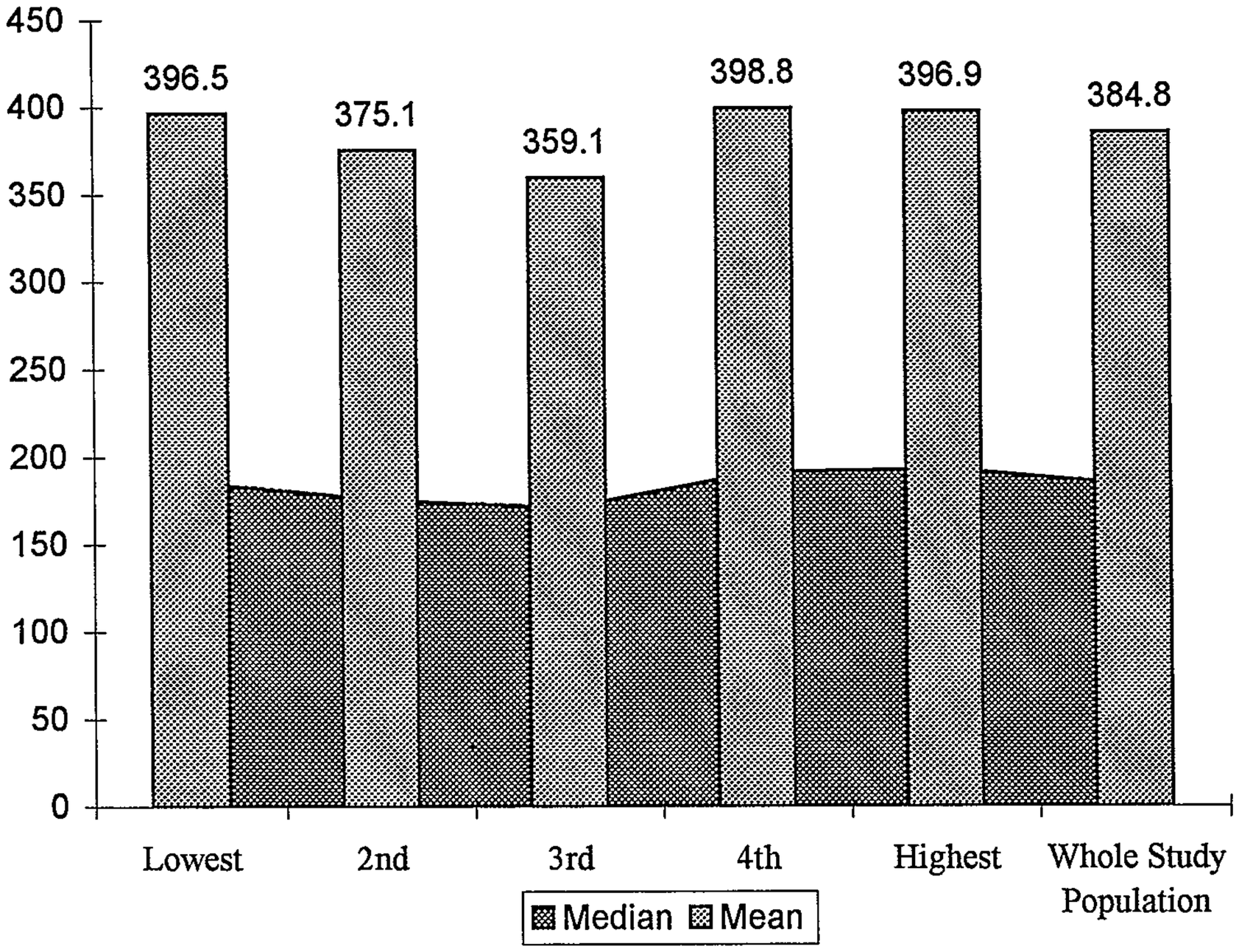
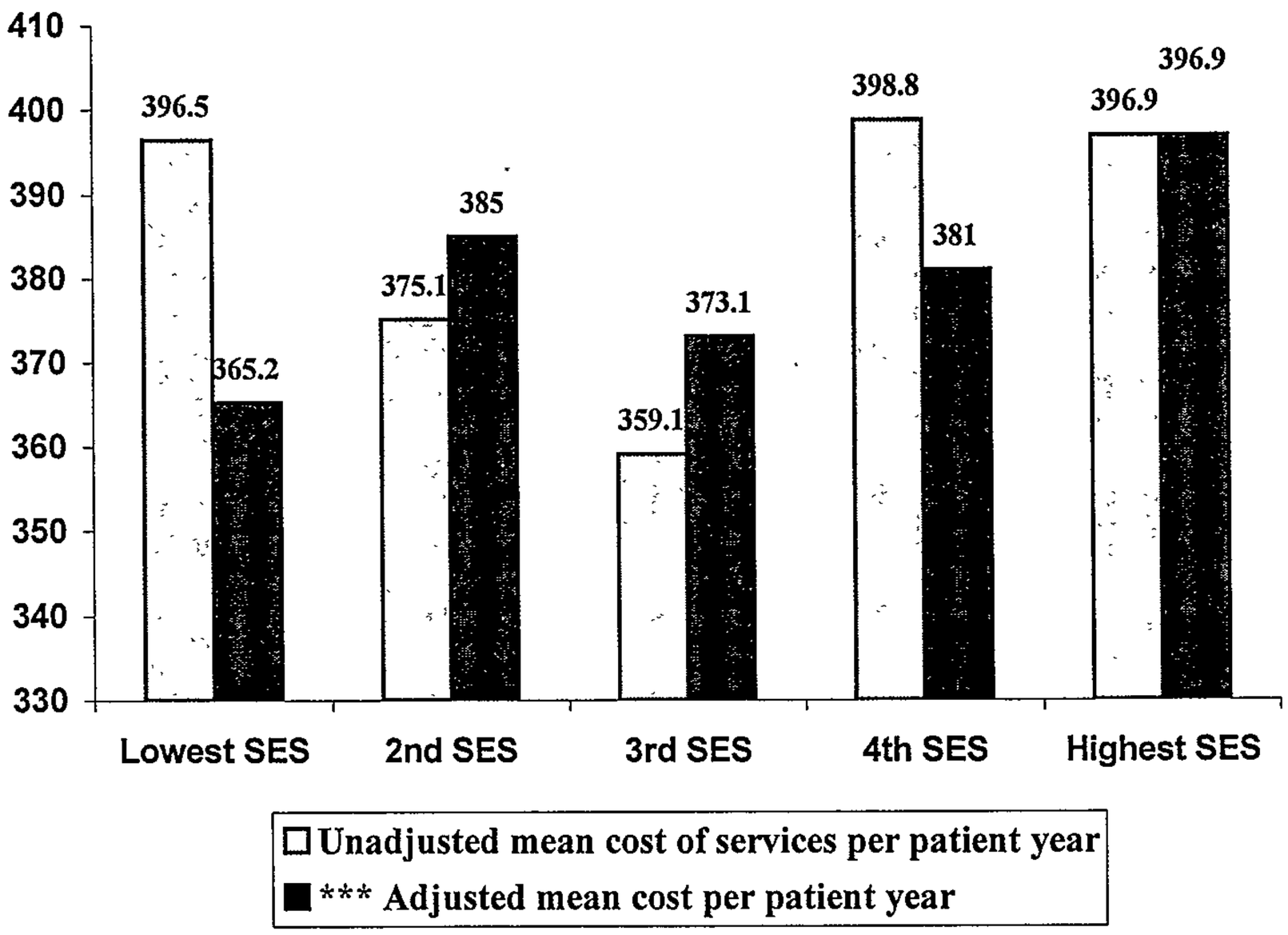


Figure 36: Relative cost ratios of services per patient year (unadjusted and adjusted) by the GEHF members who utilised private general dental practice services and made a claim during 1992-1995, by SES.
Cost adjusted to the 1995 Australian dollar value.



5 DISCUSSION

Monitoring of claims data from health insurance fund records can have many advantages. Examining routinely collected claims data is an objective, quick, valid, economical and efficient method. It can provide information to examine certain aspects of provider behaviour. Claims data could also be used to develop practice profiles by examining the provision of service rates of different services. A methodology, which they had used for developing practice profiles, had been reported by **Bailit and Clive [1981]**. It gives an excellent depiction of the mix of utilisation rates in a provider system. Unlike primary data collection, claims data does not have to deal with inabilities to locate individuals and refusals to participate. The other strength of claims data is that it does not rely on individual recall for reconstructing utilisation histories **[Roos et al 1987]**.

Claims data also lends itself to a cohort study, which is the most feasible and ideal study design for measuring utilisation of an insured population over a period of time, by assessing multiple outcomes and measuring absolute incidence of dental services utilised. Claims data can also provide a useful picture of utilisation, and statistical controls help account for major socio-economic differences among the members. A further advantage of using claims data is that they can provide more complete population-based data on dental utilisation, as reported by the treating dentists themselves rather than from any other sources.

Utilisation rates in the present study were measured on a member basis and then on a patient level for those members who ever used a private general dental practitioner service and made a claim in a calender year. The study documented the services provided in multiple visits within four consecutive years. This longitudinal type

design and a large study sample have the benefit of precision estimates. Other studies in Australia have used cross sectional studies to measure service provision rate, which restricted services to be measured on a last visit basis.

The value of using health fund claims data lies in the ability to link courses of treatment received by individual patients over a period of time to the cost of providing these services as shown in the dentist bills. This database also enables one to differentiate between characteristics that influence use of service (for example number of visits or services) and those that affect cost.

The major limitations of a claims driven database is that utilisation rate is measured on services claimed and rebated, and does not measure services actually utilised in private practice. Although the Government Employees Health Fund covers almost all items of dental service listed on the Australian Dental Association Schedule of Dental Services, not all services utilised can be claimed. There is a waiting period for certain items of service for new members. There is also a $1000 maximum combined benefit in any 12-month period and members may not put in claims for every item of service received. This is not captured in the database and may result in undermeasurement of outcome factors. The other limitation of this database is the absence of useful personal level variables relating to patient characteristics.

The Socio-economic Indexes for Areas (SEIFA), the composite indicator constructed by the Australian Bureau of Statistics was used in the present study to classify patients into SES groups. There are major inequalities in use of dental services existing between socio-economic groups and different geographic regions **[Barnard 1993;**

Brennan et al 1997; Brown & Lazar 1999; Carter et al 1994; Locker 1989; Spencer & Lewis 1989; Spencer et al 1994]. The area-based approach may be a valuable supplement to the traditional use of social indicators for the targeting of services to those persons most in need of them **[Beal 1993].** The result not only provides information about the association between the social variables and health but also allows the geographical location of the subjects to be plotted.

This study analysed the data by translating numbers of services consumed to cost of services. Each of the three indices used in this study quantified a distinct aspect of cost. Cost per service provides insight into the nature of individual items of dental service, which can be obscured in total costs. Cost per patient visit measures cost at a visit depending on how many services are received per visit. Cost per patient-year calculates cost of services provided to each patient over multiple visits per unit of patient time. For this reason cost per patient-year can be described as the bottom line in determining the cost of dental services. Due to the highly skewed distribution of the cost data the median along with its 25^{th} and 75^{th} percentile, is the appropriate measure of central tendency and dispersion and is used to describe overall costs, rather than the mean and standard deviation. As data in this study was derived from dentists billing of services provided it might be skewed to maximise cash flow and effect the validity of service provision rate.

Data which has been gathered in the present research on cost of an individual item of dental service, cost of services on a visit and patient year, would provide a sound basis for the actuarial calculation of premiums and for cost projections for the health funds. This study provides baseline data against which subsequent cost studies for an insured

population can be compared. Other confounding factors on the cost of providing services warrant further analysis to establish the impact of these variables on utilisation of dental services.

Findings from this study will assist those concerned with the financing and delivery of adult dental care in the area of policy development and planning. As there are limited variations between health funds in Australia, as to the scope and level of dental services covered, major findings from this study would be indicative of other insured populations. Planners can use insured dental usage to estimate demands and forecasting future dental demands and thus manpower requirements.

5.1 CHARACTERISTICS OF MEMBERS AND PATIENTS

The present study is based on the database of claims of the Government Employees Health Fund members, residing in the State of New South Wales who used the private general dental practice during the period from 1.1.92- 31.12.95.

In Australia, free school dental services operate in all states and territories with high population coverage. To avoid the potential problems of overlap in the provision of care to children through private dental practice and government school dental services, only members of eighteen years and over were studied (133,467 members). There were a total of 75,501 patients who used private general dental practice and made a claim during the study period.

Most of the members (27 per cent) and patients (30 per cent) who used private general dental clinics were in the **35-44 year age group** followed by the 25-34 year age group (27 per cent). The combined percentage of two age groups (35-44) and (45-54) showed the highest rate of insurance cover, 45 per cent for GEHF members and 48 per cent for the patients who used private general dental clinic. The lowest portion of the members and patients were from the 65 and above age group (approximately 3 per cent). The least number of members (0.3 per cent) and patients (0.2 per cent) were from the highest age group, 75 and over. This pattern is the same in each of the five SES (SEIFA) groups **{Table 9, p 190}.**

Age is a prime determinant of demand for private health insurance in Australia. The data of the National Oral Health Survey conducted in 1987-88 and the Health Insurance Survey 1992 of Australia have also shown that there was a higher rate of

private insurance for middle-aged contributors with a lower rate for both younger and older contributors **[ABS 1994c; Barnard 1993]**. Generally, the elderly (65 years and above) are both the least dentally insured and the lowest dental care utilisers **[Burt & Eklund 1992; Gift et al 1981; Lewis 1981; Newman & Larsen 1979].**

The NOHSA data has shown that age group **35-54 years** had the highest proportion of persons with dental insurance (55 per cent) and the lowest dental insurance coverage was among the elderly group, 65 years and over (26 per cent) **[Barnard 1993].** Other survey data has also shown that the elderly groups (65 years and over) have **less private dental insurance** and **less utilisation of dental services [Spencer & Lewis 1989].** Only 39 per cent of the contributor units aged 65 years held private insurance in 1992 **[ABS 1989, 1994c; Slade 1993].** Contributor unit consists of a contributor to a health insurance scheme and all persons in the same family, who are covered by the health insurance arrangements. While this less utilisation of dental services was due in part to the generally lower incomes of the elderly group, many also had access to government health concession cards (79 per cent). Seventy four per cent of those who did not have government health concession cards had private health insurance **[ABS 1994c].**

There were more females (51 and 55 per cent) than males (49 and 45 per cent) in both members and patients who used private dental practice in the present study **{Table 10, p 191}**. This finding is consistent with the general pattern of usage of dental services **[ABS 1980; Spencer & Lewis 1989].** However, the 1987-88 NOHSA data has shown that there were no differences between males and females who held private dental insurance **[Barnard 1993].**

In the present study the majority of the GEHF members (64 per cent) lived in the capital city. The least portion of members (9 per cent) lived in extra-metropolitan areas, while 27 per cent of members were from rural and remote areas. There was a similar pattern of geographic distribution for the patients who used private general dental practice. (61 per cent in the capital city, 11 per cent in extra-metropolitan areas, 28 per cents in rural and remote areas) **{Table 12, p 193}.** The data of the NOHSA (1987-88) has shown the percentage of insured person for the population in the geographical areas. More persons, 15 years and over, in the extra-metropolitan areas (47 per cent) indicated that they held private dental insurance than the persons did in capital cities (45 per cent) **[Barnard 1993].**

5.2 DISTRIBUTION OF MEMBERS BY SOCIO-ECONOMIC STATUS (SEIFA**)

The results of the present study have shown that the distribution by socio-economic status (SES) of the GEHF members is similar to the general trend of the insured population; which is "families with 'higher-income' and 'higher socio-economic status' have greater rates of insurance coverage than families with 'lower-income' and 'lower socio-economic status'" **[ABS 1989, 1994c; Barnard 1993; Grembowski et al 1985; Manning et al 1985; Slade 1993; Waldman 1989a].**

In the present study, the **highest percentage of GEHF** members (24 per cent) was from the **highest SES group** and the **lowest percentage** was from the **lowest SES** group (14 per cent). Twenty two per cent of members were from middle SES group **{Table 13, p 194; Figure 23, p 196}.** Every age group, the highest proportion of members (28 to 38 per cent) were from the highest SES group **{Table 14, 15, p 198}.**

Although the data from Australian Bureau of Statistics **[ABS 1994c]** only classified the contributor units by income level, a similar trend has been shown. Of all persons in contributor units with private health insurance, 8 per cent were in low income units, 33 per cent in middle income units and 59 percent in high income units in 1992 **[ABS 1994c]. {Figure 11, p 123}.** As gross weekly income increases, the likelihood of having private health insurance also increases. Overall, the higher the income of a unit and the older the head of the unit, the higher the probability that the unit was insured **[ABS 1994c]**.

The present study indicated that there is a distribution of socio-economic status groups in three geographical areas. The Capital City had the highest percentage (37 per cent) of insured population who belonged to the highest socio-economic status. Extra-Metropolitan and Rural & Remote areas had the highest percentage of insured members from the middle SES groups, 31 and 42 per cent respectively. Rural and remote areas had a very small proportion of members who belong to the highest SES group, which accounted for only 3 per cent **{Table 16, p 199}.**

5.3 NUMBERS AND MEAN NUMBERS OF DENTAL SERVICES AND DENTAL VISITS BY SOCIO-ECONOMIC STATUS

In the present study, members from the highest SES group had made the highest number of visits to the private dental clinics (28 per cent). The members from the lowest SES group used private general dental clinics, the least, which was 13 per cent. **{Table 17, p 200; Figure 24, p 201}.**

5.3.1 Mean number of dental visits

In the present study the mean number of visits by patients within a year to a dentist in private general clinic and who claimed a rebate, was **2.4** and this was the same for both female and male. The pattern of usage by male and female within each SES group was according to the general pattern for the whole sample. There was no significant difference between females and males within SES groups. **{Table 18, p 203; Table 19, p 204}.**

Rates of visits per year for other insured population groups in Australia are not available and therefore comparisons are made to the general population. The mean number of visits of 2.4 per year from this study was similar to the mean of 2.44 per year for New South Wales, and to the national mean of 2.35 for a representative sample of dentate persons 18 years and over, as determined through a National Telephone Interview Survey conducted in 1994 **[Carter et al 1994].**

In the present study the unadjusted data has shown that the lowest to fourth lowest SES groups had a lower mean number of visits than the highest SES group **(2.45).**

When relative utilisation ratios were adjusted for gender, age, length of membership and geographical locations, **only the lowest SES group had changed and shown significantly more visits than the highest SES group {Table 18, p 203}.** As there was no effect of gender on the mean number of visits **{Table 19, p 204},** the other factors that may have affected the mean number of visits are age, length of membership and geographical location. This finding that the lowest SES group made more visits per year, compared to the highest SES group, is not in line with the general Australian trend that the lower socio-economic groups have lower utilisation of dental services for insured and not-insured population. **[ABS 1994c; Barnard 1993; Slade 1993].**

Other lower socio-economic groups that had shown less dental utilisation than the highest SES group in this study retained the same pattern after relative utilisation ratios were adjusted. It is in accord with the general pattern. The slight impact of socio-economic forces on oral health status and use of dental services seems to remain after other confounding factors are controlled **[Grembowski et al 1989; Petersen 1990].**

The lowest SES persons who joined the insurance program had the possibility of poor oral hygiene status, more caries and periodontal disease and need for more treatment than the highest SES group. Studies have indicated that in urbanised areas of industrialised countries, low SES groups of children and adults had poor oral hygiene status. Low SES groups have high incidence of dental caries, a higher proportion of untreated caries and more prevalent and more severe periodontal diseases in comparison to high SES groups **[Beal 1996; Chen 1995; Chen & Andersen 1997; Milen et al 1981].**

Insurance coverage is positively associated with utilisation of dental services **[Conrad et al 1987; Grembowski et al 1985; Kovar et al 1988; Manning et al 1985; Mueller & Monheit 1988].** The equal access of dental care for all insured SES groups is another factor that may lead to the higher usage of services by the lowest SES group. **Davis [1980]** and **Eddie & Davis [1985]** stated that 'once people are actually in the dental system, in other words, once the hurdle of access has been surmounted, neither education or income exert much influences on the volume of care received. Findings suggested that **the ease of entry into the dental system is the "crucial contingency".**

The reduction of economic barriers through dental insurance lowers the direct out-of-pocket cost to the patients from the lowest SES group. The finding of this study that the lowest SES group had made the most adjusted number of dental visits per year may reflect that insurance improves a person's financial access to dental care and therefore increases their demand for care.

5.3.2 Mean number of services per patient visit

When other factors, gender, age, length of membership and geographical location, were adjusted, **the relative utilisation ratios for the lowest and fourth SES group had shown significantly more services per patient visit than the highest SES group in the present study. {Table 21, p 207}.** These results indicate that other factors (age, length of membership and geographical location) may have effect on mean number of services.

The distribution of services by main areas of service category among the GEHF insured population broadly resembles that of private and public general dental practice in Australia. The present study has shown the **high usage of restorative services across all SES groups. {Table 22, p 210}. There were differences in service mix by SES groups. The highest SES group used the highest rate of diagnostic, preventive, restorative and endodontic services. The lowest socio-economic group used highest rate of oral surgery treatment (0.09).** Most of the oral surgery services were extraction of teeth, which may have resulted in increasing of prosthodontic services for the lowest SES group **(0. 13).**

5.3.3 Mean number of services per patient year

As the members of the GEHF insurance fund differ in their length of membership in each calender year during the study period, allowance was made for the potential to utilise dental services using the person-year method **[Armitage & berry 1994].** In the present study, the services for each patient over multiple visits which measures incidence of completed items of services per unit of patient time were enumerated over a four-year period. The person-years measure enabled analysis of the dynamic study population by allowing the inclusion of members who joined or discontinued the fund at any time during the entire study period. Patient-years computes the time at risk for each patient in a calendar year, which was then used as a denominator to calculate utilisation rate per patient per year. The mean number of services per patient year is the best indicator for dental service utilisation. Other dental utilisation studies in Australia have used cross sectional studies to measure service provision rate, which restricts services to be measured on a 'last' visit basis.

Findings from this study have shown that the unadjusted mean number of services per patient year was **5.9** for GEHF members in New South Wales who used general dental practice. The highest SES group has shown the highest mean number of services **(6.2)** and the 3rd SES group showed the least mean number of services per patient year **(5.5)** for the unadjusted data**.** The univariate analysis showed patients in the 2nd and 3rd SES groups had significantly fewer services compared with the highest SES group (the reference group) **{Table 24, p 213}.**

When other factors, gender, age, length of membership and geographical location, were adjusted, the relative utilisation ratios of mean services per patient year for the

lowest SES group had shown significantly more services **(6.6)** than the highest SES group **(6.2)** in the present study. **{Table 24, p 213; Figure 27, p 214}. Gotowka [1985]** indicated that traditional demographic variables were apparently unimportant for dental practices predominated by insured population.

The distribution of services by main areas among the GEHF insured population broadly resembles that of private and public general dental practice in Australia. The present study has shown the **high usage of restorative services. {Figures 28, 29; p 216, 217}. The highest SES group used the highest rate of diagnostic, preventive and endodontic services {Table 25, p 215; Figure 29, 30, p 217, 218}.** There was the same usage of periodontal services for both of the lowest and highest groups. The 2nd and the 3rd SES groups used less periodontic services.

The lowest socio-economic group used highest rate of oral surgery treatment (0.21). Most of the oral surgery services were extraction of teeth, which resulted in increasing of prosthodontic services for the lowest SES group **(0.31).** There are specific oral surgery services performed by specialist oral surgeons in hospitals and approved dentists. These services are covered by Medicare, the government funded National Health Insurance system, and were not captured in this health fund database. However, most of these specific oral surgery items of services are performed by specialist oral surgeons and would not greatly underestimate oral surgery services provided by general dental practitioners.

Restorative services were highest for all socio-economic status groups and the highest rate was shown in the highest socio-economic group **{Table 25, p 215; Figures**

28-31, p 216-219}. Overall, **diagnostic** services were second to restorative services and the highest SES group used the highest rate of diagnostic services.

This predominance of restorative, diagnostic and preventive services provided by private general dental practitioners is consistent with other Australian studies. The studies have indicated that individuals visit the dentist more for restorative care rather than preventive care. **[Spencer et al 1989; 1994; Brennan 1997; Brennan et al 1997, 1998; Brennan & Spencer 1999].**

It is clear that great variability in beliefs and practices exist among different social groups. The lowest SES group had the highest mean number of services per patient year in the present study support the findings that people from lower social status have more dental diseases and thus need more dental treatment than those from the higher social classes **[Beal 1996].**

5.3.4 Pattern and distribution of services

The pattern of service mix and distribution of dental services found in the present study broadly resembles international and Australian utilisation patterns **[Barnard 1993; Beal 1983; Beal & Dickson 1974; Brennan et al 2000; Maizels et al 1991; Silver 1992; Spencer & Lewis 1989; Spencer et al 1994; Todd & Dodd 1985]**, which have shown that:

* **Restorative, preventive and diagnostic services are dominant.**
* **Higher social class** patients favour **restoration.**
* Members of professional families are also more likely to go for **preventive** visits than manual workers' families.
* **Low SES groups** are more likely to have curative or irregular use of dental services, and treatment received is more likely to be **extraction** in comparison to higher socio-economic groups.

In the present study, the 2nd and 3rd SES groups had significantly fewer services when compared with the highest group. The lowest and the 4th SES groups had mean number of services **(6.0)** that were not significantly different from the highest group. When other factors were adjusted, there was a statistical difference between use of dental services of the highest and the lowest SES groups. However this was reversed and the lowest group showed more services than the reference group [the highest SES group] **{Table 24, p 214}**. That finding indicates that other factors may have influence on the dental service utilisation.

Restorative services, followed by **diagnostic** services, were highest for all SES groups. **The highest SES group used the highest rate of diagnostic, preventive and endodontic services {Table 20, p 206. Table 21, p 207; Figures 28-31, p 216-219 }. The lowest socio-economic group used the highest rate of oral surgery treatment,** which is in accordance with the international trend. However, the usage of periodontal services was the same for both the lowest and highest SES groups. There was no regular pattern of service mix among the other socio-economic status groups.

In the present study, services per patient year measures the incidence of the number of completed items of services per unit of person (patient) time for each calender year. Utilisation data derived from this study provide a valid and precise estimate of utilisation rate. The mix of services received at a visit for this insured group was similar to services received by an insured population as reported by a national sample of representative dentists in Australia **[Brennan et al 1997].** The findings from this study furnish base-line information for population based serial data, rather than individuals, on patterns of care for an insured population. It would indicate that service provision rates from this study could be generalised to represent other Australian insured populations.

5.4 COST OF DENTAL SERVICES.

The database used for the present study provided a unique opportunity to derive detailed and objective data on the cost of dental services received by patients in Australia. This study has clearly demonstrated that there are differences in the cost of providing dental services within each SES group of the insured population.

Research data has shown that cost of dental service is the most frequently cited barrier to receiving dental care in industrialised or non-industrialised countries **[Davies & Schwarz 1994; Douglas & Cole 1979; Grembowski et al 1988; Slack 1981].** The cost of dental services is especially relevant to adults due to the limited availability of care for those adults unable to afford dental services in the private sector. Surveys among the elderly population in Britain, which has a nationalised (almost free) dental health service, found that the cost of dental care was a deterrent to a proportion of adults **[Slack 1981].**

In Australia, as the public dental system is unable to deliver services to all those in need, it is imperative that private dental insurance is made more affordable and equitable to a larger population. This in turn would reduce the cost barrier to receiving private dental care **[Carter et al 1994].** As there is limited variations among health insurance funds in Australia, it is likely that findings on cost of services from this study could be generalised to other insured populations in Australia.

5.4.1 Cost per item of service

In the present study the median cost of an item of service for all patients was A$36.7 with an interquartile range of A$25.1 to A$61.5 **{Table 26, p 221}.** The mean cost was **A$62.4** with a large standard deviation of 110.9. The data was highly skewed as indicated by the fact that the median was A$ 36.7.

By socio-economic status, the median cost per item of service showed no regular pattern. The median cost per item of service for the middle SES group patients and lowest SES group was the highest (A$37). Almost the same cost per item of service was found for other groups. The width of the interquartile range also did not changed noticeably from the lowest to the highest SES group, and remains relatively constant. **{Table 26, p 221}**.

5.4.2 Cost of services per visit

The present study established that the fourth lowest SES group of the insured population received services with the highest mean cost **(A$158.3)** and the cost of services used by middle third group was the lowest at A$147 **{Table 27, p 223}**.

The median cost of services received at a visit for all socio-economic status groups was **A$93.5** with an interquartile range of **A$63 to A$149.9 {Table 27, p 223}.** The median cost of services at a visit for the lowest socio-economic status group was **A$92.6**. By socio-economic status, the median cost of services showed no clear trend of increasing cost per visit but the fourth lowest and highest SES groups had the highest median cost of services per visit. The width of the interquartile range was highest in the fourth group. The unadjusted mean cost of services for a visit was **A$153.8** with a high standard deviation of **244.3**.

Using the Weibull regression model, when controlled for age, gender, membership duration, and geographical location, the estimated cost ratios of means indicates that the cost per visit of the lowest, the 3rd and the 4th SES groups, were significantly less than the highest socio-economic status group **{Table28, p 224}.** The highest SES group showed the highest cost per patient visit. The lowest SES group showed the least cost of dental services per patient visit. When other factors, age, length of membership, geographical location, were adjusted, **the highest SES group showed the highest cost per patient visit. Other lower SES groups showed lower adjusted cost of services per patient year. The lowest SES group showed the least cost of dental services per patient year.**

As there are no data on cost of dental services for an insured population in Australia, comparisons are made to existing documented data. The cost per insured patient visit from this study ($153.8) was higher than the cost per visit of $91.00 for patients of all ages visiting a private dental practice in New South Wales during 1996-1997 **[Barnard 1999].** Dentists were responding to a questionnaire as part of a dental practice survey. This figure of A$91.00 was obtained by dividing the self reported annual gross practice income of dentists by the number of visits patients made to these dentists during the financial year 1996-1997,

The present study is comprised of adult patients only whereas the other study included children under 18. Almost 99 per cent of the population are dentate in the present study and the proportion of dentate persons in the dental practice study is not known. The different methodologies used in the studies would also explain the discrepancy in cost. Only 60 per cent of the dentists surveyed responded to the questionnaire in the dental practice survey **[Barnard 1999]** and the characteristics of the non-responding dentists are not known.

5.4.3 Cost of services per patient year

The average mean cost of services per patient year for all SES groups was A$384.8. **The highest unadjusted** mean cost of services per patient year **was** A$399 **for the fourth SES group. There was no particular pattern for different socio-economic levels.**

The **median cost of services** for a patient per calendar year for all socio-economic levels was **A$183.3** with a very wide interquartile range of **A$94.1- A$409.1 {Table 29, p 226, Figure 35, p 229}.** The fourth and highest SES groups paid the highest cost per patient. The annual median cost of services per patient-year for the lowest socio-economic group was **A$185.9**, which decreased for second and third SES groups and then increased to the highest group. The width of the interquartile range (A$329.1 for the lowest socio-economic group) was different for each group. The asymmetry of the interquartile range about the median indicates a long right-hand tail to the distribution of costs. The unadjusted mean cost of services per patient for all SES groups was **A$384.8** with a huge standard deviation of **608.0.**

The adjusted mean cost of services per patient-year (95 per cent confidence interval) from the Weibull regression model indicates that for all lower four SES groups, compared with the highest SES group, have shown significantly differences **{Table 30, p 228; Figure 36, p 230}**. The fourth highest SES group showed the highest cost of dental services per patient year. The lowest SES group showed the least cost of services although they had the highest adjusted mean number of services per patient year. This finding indicated that most of the services utilised by the lowest SES group were low cost services. Persons from the lowest SES group had more services for oral surgery treatment. These are low cost services **[Barnard 1996, Appendix 2].**

Patients from the highest SES group might accept the high cost dental treatment recommended by dentists. **Mueller & Monheit [1988] stated that** dental insurance has a direct effect on the type of services demanded or accepted by patients, with the insured using more expensive elective dental care such as crown and bridge work. When dental insurance reduces the patient's financial barrier to care, the treatment recommended by the dentist is more likely to be accepted by the patient **[Bailit et al. 1979].**

It has been shown that fee-for-service payment encourages the over-delivery of more profitable services compared with services provided by salaried doctors **[Richardson 1990]** and fee-for-service method of remuneration in medical insurances favours unnecessary surgical procedures **[McCarthy & Widmer 1974].** In dentistry, fee-for service coupled with dental benefits plan that reduces direct payment by the patient provides economic incentives for dentists to provide: more services; increases the sophistication and expense of treatment; and emphasise treatment rather than prevention of disease **[Beazoglou et al 1988].** However the fee-for service proponents claim that capitation plans encourage undertreatment or substitution of less desirable and less costly services **[Oslen & Chetelat 1979].** Concern has been expressed by administrators that under the capitation system that patients are receiving less desirable services and less costly services **[Oslen & Chetelat 1979];** receiving less care and dentists are withholding needed services from the population **[Atchison & Schoen 1990]. Atchison & Schoen [1990]** documented overtreatment occurring in a fee-for-service practices; and in capitation practices: there was a tendency to under diagnose; underplan; and under treat. Another study **[Beazoglou et al 1988]** documented that under a capitation system lower-cost services were consistently substituted for higher-cost-services and this pattern was also reported when

patients had been treated in the same facility rather than different practices. **[Oslen & Chetelat 1979].**

In Australia, private general dental practices are based on fee-for services. The patients from the highest SES group who visited private dental practice received more crowns and bridge works, endodontics and restorative services. **{Table 25, p 215}.** Cosmetic dentistry, which are high cost services, might be included in restorative services used by the highest SES group. It should be noted that there might be provider-induced high cost dental services utilised by high SES groups. Proponents of the 'supplier-induced demand model' argue that supply creates its own demand and physicians inflate demand whenever the supply of medical manpower is expanded **[Phelps 1986].** Supplier inducement exists within dentistry **[Grembowski & Milgrom 1988].** In a fee-for-service system with a third party payment program there is a relationship between dentist income and the number of procedures performed **[Simnard et al 1988].** Inferences about supplier inducement in dentistry are usually made on the basis of dentist to population ratio. In areas of abundant supply of dentists, incomes are enhanced by the excessive provision of dental services under the National Health Service in the United Kingdom **[Birch 1988].**

Data from the present study on cost of an individual item of dental service, cost of services on a visit and patient year level, would provide a sound basis for the actuarial calculation of premiums and for cost projections for the health funds. The mix of services received at a visit for this insured population was similar to services received by an insured population as reported by a national sample of representative dentists in Australia **[Brennan et al 1997]**. This findings from the GEHF claims data lies in the ability to link courses of treatment received by individual patients over a period of time to the cost of providing these services as

shown in the dentist bills. This study database also enables to differentiate between characteristics that influence use of service (for example number of visits or services) and those that affect cost.

This study provides baseline data against which subsequent cost studies for an insured population can be compared. Periodic profiling of cost from claims data would reflect changes in disease experience among different SES groups, patient demand and treatment philosophies of the dentists. It is likely that findings on cost of services from this study could be generalised to other insured populations in Australia.

6 CONCLUSIONS

This study documented that there are differences in the dental service utilisation and cost of providing dental services among different SES groups of insured population.

The mean number of visits to a private dental practitioner within a year was **2.4.** ***The lowest SES group had shown significantly more visits than the highest SES group*** when gender, age, length of membership and geographical location were adjusted. The **mean number of services per patient visit** for those who used a private general dental practice (patient) was **2.45.** The adjusted relative utilisation ratios showed that ***the lowest and the 4th SES group significantly more services than the highest SES group***. The **mean number of services per patient year** was **5.9.** Adjusted data indicated that ***the lowest SES group has significantly more mean number of services than the highest SES group.***

Variations in service mix by SES groups were also noted. However, the difference in total annual usage of dental services with SES was only identified using patient-year as a unit of measurement. Restorative services demonstrated the highest mean number of services for all SES groups (**35 per cent** of the total services), followed by diagnostic services (**27 per cent**). The lowest SES group showed higher oral surgery services **(0.09)** than the average mean number of services for the whole study population **(0.07),** while the highest SES group showed the least **(0.06).**

The **median cost of an item of service** for all patients was **A$36.7** with an interquartile range of A$25.1 to A$61.5. The **mean cost of an item of service** was **A$62.4** with a large standard deviation 110.9. The **mean cost per visit** was **A$153.8** with a standard deviation of 244.3. The median cost of services received at a visit for

all SES groups was **A$93.5** with an interquartile range of A$63 to A$149.9. The **median cost of services** at a visit for the lowest SES group was A$92.6. The median cost of services showed no clear trend of increasing cost per visit by socio-economic status. When adjusted for gender, age, length of membership and geographical location, ***the mean cost per visit was least for the lowest SES group and the highest for the highest SES group.*** The estimated ratios of means indicate that the cost per visit of the lowest SES group was significantly lower than the highest SES group.

The **mean cost of services per patient year** was A$384.8 with a huge standard deviation of 608.0. The **median cost of services for a patient year** for all SES groups was **A$183.3** with a very wide interquartile range of A$94.1 – A$409.1. The adjusted mean cost of services per patient-year (95 per cent confidence interval) indicated that all lower four SES groups, compared with the highest SES group, had shown significantly less cost of services in a year. The highest SES group showed the highest while the lowest SES group showed the least cost of dental services per patient year. The cost of services per patient year for the lowest SES group showed A$32 less then those from the highest SES group.

It was concluded that the lowest SES group utilised significantly more dental services and made dental visits than the highest SES group and showed a different pattern of service-mix. The pattern and distribution of dental services overall broadly resembled international and Australian utilisation patterns, which are characterised by a dominance of restorative, preventive and diagnostic services. In this study higher social class patients favour restorative and preventive services, whereas low SES groups were more likely to receive emergency services, and extraction. Consequently, the highest SES group received more costly care while the lowest SES group received low cost care.

7 REFERENCES

ABS {Australian Bureau of Statistics}(1980).
Dental health (persons aged 15 years or more), February-May 1979. Catalogue No. 4339.0.
Canberra: ABS.

ABS {Australian Bureau of Statistics}(1989).
Health insurance survey Australia, 1986. Catalogue No. 4335.0.
Canberra: ABS.

ABS {Australian Bureau of Statistics}(1992a).
National health survey. Health related actions 1989-90. Catalogue No. 4375.0.
Canberra: ABS.

ABS {Australian Bureau of Statistics}(1992b).
Social indicators, Australia, No. 5, 1992. Catalogue No. 4101.0.
Canberra: ABS.

ABS {Australian Bureau of Statistics}(1993a).
Australian in profile; 1991 census. Catalogue No 2821.0.
Canberra: ABS.

ABS {Australian Bureau of Statistics}(1993b).
Australian health survey
Canberra: ABS.

ABS {Australian Bureau of Statistics}(1993c).
June 1992 Health insurance survey Australia .Catalogue No 4335.0
Canberra: ABS.

ABS {Australian Bureau of Statistics}(1993d).
Scio-economic indexes: Software Package Version 1.00.
Canberra: ABS.

ABS {Australian Bureau of Statistics}(1994a).
Information paper: 1991 census socio-economic indexes for areas. Catalogue No. 2912.0
Canberra: ABS.

ABS {Australian Bureau of Statistics}(1994b).
Scio-economic indexes: User manual. Catalogue No. 2912.0.
Canberra: ABS.

ABS {Australian Bureau of Statistics} (1994c).
Australian social trends 1994. Catalogue No. 4102.0.
Canberra: ABS.

ABS {Australian Bureau of Statistics}(1995a).
Australian social trends 1995. Catalogue No. 4102.0.
Canberra: ABS.

ABS {Australian Bureau of Statistics}(1995b).
NSW 1994 Regional statistics Catalogue No. 1304.1.
Canberra: ABS

ABS {Australian Bureau of Statistics}(1996a).
Australian social trends 1996. Catalogue No. 4102.0.
Canberra: ABS

ABS {Australian Bureau of Statistics}(1996b).
Consumer price index, Australia. Catalogue No. 6401.0.
Canberra: ABS.

ABS {Australian Bureau of Statistics}(1998a).
1991 Socioeconomic indexes for area (SEIFA).
Sydney, NSW: ABS. Unpublished data.

ABS {Australian Bureau of Statistics}(1998b).
Australian demographic statistics, June quarter 1998. Catalogue No.3101.0.
Canberra: ABS.

ACDH {Australian Commonwealth Department of Health}(1987).
Dental health of children in Australia 1977-1986.
Canberra: Australian Government Publishing Service. 110-104.

ADA {Australian Dental Association Inc.}(1994).
Schedule of dental service; Supplement to ADA News Bulletin.
Sydney: ADA Inc.

AGPS {Australian Government Publishing Services} 1978.
A discussion paper on paying for health care.
Canberra: Commonwealth of Australia.

AIH {Australian Institute of Health}(1988).
Australia's health; The first biennial report by the Australian Institute of Health, 1988.
Canberra: Australian Government Publishing Service.

AIHW {Australian Institute of Health and Welfare}(1993a).
Newsletter: Vol IV(1), May 1993.
Adelaide: The University of Adelaide. DSRU.

AIHW {Australian Institute of Health and Welfare}(1993b).
A research database on dental care in Australia. Final report.
Adelaide: The University of Adelaide. DSRU.

AIHW {Australian Institute of Health and Welfare} (1993c).
Dental care for adults in Australia.
Adelaide: The University of Adelaide. DSRU.

AIHW {Australian Institute of Health and Welfare} (1994a).
Newsletter: Vol V(1), May 1994.
Adelaide: The University of Adelaide. DSRU.

AIHW {Australian Institute of Health and Welfare} (1994b).
Australia's health 1994.
Canberra: Australian Government Publishing Service

AIHW {Australian Institute of Health and Welfare} (1995a).
Commonwealth dental health program, Research Report 1, March 1995.
Adelaide: The University of Adelaide. DSRU.

AIHW {Australian Institute of Health and Welfare} (1995b).
Commonwealth dental health program, Research Report 1, August 1995.
Adelaide: The University of Adelaide. DSRU.

AIHW {Australian Institute of Health and Welfare} (1995c).
Commonwealth dental health program, Baseline evaluation report, 1994.
Adelaide: The University of Adelaide. DSRU.

AIHW {Australian Institute of Health and Welfare} (1996a).
Newsletter: Vol VII (1), August 1996.
Adelaide: The University of Adelaide. DSRU.

AIHW {Australian Institute of Health and Welfare} (1996b).
Australia's health 1996.
Canberra: Australian Government Publishing Service

AIHW {Australian Institute of Health and Welfare} (1998a).
Newsletter: Vol IX (1), September 1998.
Adelaide: The University of Adelaide. DSRU.

AIHW {Australian Institute of Health and Welfare} (1998b).
Australia's health 1998.
Canberra: Australian Government Publishing Service

AIHW {Australian Institute of Health and Welfare} (1998c).
Australia's oral health and dental services.
Adelaide: The University of Adelaide. DSRU.

Abramson JH, Gofin R, Habib J, Pridan H, Gofin J (1982).
Indicators of social class – A comparative appraisal of measures for use in epidemiological studies.
Soc Sci Med 16: 1739-1746.

Ahlberg J, Tuominen R, Murtomaa H (1996).
Dental knowledge attitudes towards oral health care and utilisation of dental services among male industrial workers with or without an employer-provided dental benefit scheme.
Community Dent Oral Epidemiol; 24(6): 380-384.

Ainamo J (1980).
Relative roles of toothbrushing, sucrose consumption and fluorides in the maintenance of oral health in children.
Int Dent J 30: 54-66.

Albfleisch JD, Prentice RL (1980).
The statistical analysis of failure time data.
New York: John Wiley and Sons.

Andersen R, Smedby B, Andersen OW (1970).
Medical care use in Sweden and the United States: A comparative analysis of systems and behaviour. Center for Health Administration Studies, Research series No 27.
Chicago, Illinois: Univ Chicago Press.
Cited by: Gift HC (1984). Chapter 4. Utilization of professional dental services. In: Cohen LK, Bryant PS, eds, Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publish/FDI. 203-266.

Andersen R, Kravits J, Andersen OW (1975).
Equity in health services.
Cambridge, Massachusetts: Bellinger Publish Co.
Cited by: Gift HC (1984). Chapter 4. Utilization of professional dental services. In: Cohen LK, Bryant PS, eds., Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publish/FDI. 203-266.

Andersen R, Lion J, Andersen OW (1976).
Two decades of health services: Social survey trends in use and expenditure.
Cambridge, Massachusetts: Ballinger Publish Co.
Cited by: Gift HC (1984). Chapter 4; Utilization of professional dental services. In: Cohen LK, Bryant PS, eds., Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publish/FDI. 203-266.

Andersen RM, Glachello AL, Aday LA (1986).
Access of Hispanics to health care and cuts in services: a state-of-the-art overview.
Public Health Reports 101(3): 238-252.

Andersen R, Marcus M, Mahshigan M (1995).
A comparative system perspective on oral health promotions and disease prevention.
In: Cohen LK, Gift HC, eds. Oral health promotion: Socio-dental science in action.
Copenhagen: Munksgaard. 307-340.

Andersen R, Chen M, Barmes DE, Lyttle CS, Leclercq M-H (1997).
Conclusions and implications. In: Chen M, Andersen RM, Barmes DE, Leclercq M-H, Lyttle CS. Comparing oral health care systems; A second international collaborative study.
Geneva: WHO. 235-252.

Anderson R (1981).
The changes in the dental health of 12-year-old schoolchildren in two Somerset schools.
Br Dent J 150: 354-356.

Anderson R, Newman J (1973)
Societal and individual determinants of medical care utilisation in the US.
Millbank Memorial Fund Quarterly 51(1): 95-124.

Anderson R, Bradnock G, James PMC (1981).
The changes in the dental health of 12-year-old schoolchildren in two Shropshire.
Br Dent J 150: 278-281.

Anderson R, Treasure ET, Whitehouse NH (1998a).
Oral health systems in Europe, Part I: Finance and organisation.
Community Dent Health 15: 145-149.

Anderson R, Treasure ET, Whitehouse NH (1998b).
Oral health systems in Europe, Part II: The dental workforce.
Community Dent Health 15: 243-247.

Antoft P (1983).
Utilisation of the Danish youth dental care scheme among 1655, 16-22 year-old males and female.
Community Dent Oral Epidemiol 11: 18-24.

Armitage P, Berry G (1994).
Survival analysis.
In: Statistical methods in medical research.
Cambridge: Blackwell.

Arnljot HA, Barmes DE, Cohen LK, Hunter PBV, Ship II, eds (1985).
Oral health care systems: An International Collaborative Study.
London: WHO/Quintessence Publish.

Ashford JR (1978).
Regional variations in dental care in England and Wales.
Br Dent J 145: 275-283.

Atchison KA, Schoen MH (1990).
A comparison of quality in dual-choice dental plan: Capitation versus fee-for-service.
J Public Health Dent 50 (3): 186-193.

Avnet HH, Nikias MK (1967).
Insured dental care: A research project report.
New York: Group Health Dental Insurance.
Cited by: Gift HC (1984). Chapter 4. Utilization of professional dental services. In: Cohen LK, Bryant PS eds. Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publish/FDI. 203-266.

Bailit HL, Clive J (1981).
The development of dental practice profiles.
Med Care 19: 30-46.

Bailit HL, Kolowsky M, Valluzzo P (1974).
Satisfaction of the patient and provider: evaluation by questionnaire.
J Public Health Dent 34(3): 188-194.

Bailit Hl, Raskin M, Reisine S, Chiriboga D (1979).
Controlling the cost of dental care.
Am J Public Health 69: 699-703.

Bailit HL, Balzer JA, Clive J (1983)
Evaluation of focused dental utilisation review system
Med Care 21: 473-485.

Bailit Hl, Brook R, Kamberg C, Goldberg G, Spolsky V, Masthay P, Cantrell C, Hanley J, Black A, Newhouse J (1984).
The effect of cost sharing on the quality of dental care
Presented at the annual meeting of The Robert Wood Johnson Foundation Dental Services Research Scholars Program, Princeton, NJ.
Cited by: Gotowka TD (1985). In: Insurance effects on dental fees and case mix.
J Dent Educ 49(11): 763-768.

Bailit Hl, Newhouse J, Brook R, Duan N, Goldberg G, Hanley J, Kamberg C, Spolsky V, Black A, Lohr K (1985).
Does more generous dental insurance coverage improve oral health?
J Am Dent Assoc 110: 701-707.

Barenthin I (1976).
Dental insurance and equity of access to dental services.
Community Dent Oral Epidemiol 4: 215-220.

Bareum P, Arnjolt H (1976).
Oral health care in Norway.
Int Dent J 26(3): 340-345.

Baric L, Blinkhorn AS, MacArthur C (1974).
A health education approach to nutrition and dental health education.
J Health Educ 33: 79-90.

Barmes DE (1978).
A progress report on adult data analysis in the WHO/USPH International Collaborative Study.
Int Dent J 28(3): 348-360.

Barnard PD (1956).
Dental survey of State schoolchildren in New South Wales, Special report series No 8.
Canberra: National Health and Medical Research Council

Barnard PD (1976).
Dental conditions in high school students, Sydney 1972.
Aust Dent J 31: 14-22.

Barnard PD (1981).
Utilisation of dental services by first year students, the University of Sydney, 1978
Aust Dent J 26(2): 82-85.

Barnard PD, ed. (1993).
National oral health survey Australia 1987-88. Department of Community Services and Health.
Canberra: Australian Government Publishing Services.

Barnard PD (1996).
Dental fees survey. September 1995.
ADA News Bulletin 231: 20-22.

Barnard PD (1999).
Australian dental practice survey 1997.
ADA News Bulletin 266: 13-21.

Bauer JC, Pierson AP (1978).
Factors which affect utilisation of dental services.
Maryland: US Department of Health Education and Welfare

Beal JF (1973).
The dental health of five-year-old children of different ethnic origins resident in an inner Birmingham area and a nearby borough.
Archs Oral Biol 18: 305-312.

Beal JF (1990).
The dental health of minority ethnic groups. In: Estein F, edr. Good practices in the health care of black and minority ethnic groups. Public health report, Occasional papers No 2.
USA: Yorkshire Health Authority.

Beal JF (1996).
Social factors and preventive dentistry.
In: Murray JJ ed. Prevention of oral disease.
Oxford: Oxford Univ Press. 217-233.

Beal JF, Dickson S (1974).
Social differences in dental attitudes and behaviour in West Midland mothers.
Public Health 89: 19-30.

Beazolou GJ, Guay AH, Heffley DR (1988).
Capitation & fee-for-service dental benefit plan: economic incentives, utilization and service mix.
J Am Dent Assoc 116: 483-487.

Beazoglou T, Brown LJ, Heffley D (1993).
Dental care utilization over time.
Soc Sci Med 37(12): 1461-1472.

Beck JD, Cons N, Ettinger R, Willard D, Field H, Jakobsen J (1981).
Iowa survey of dental health: Utilisation behaviour. (Paper presented at the 59th IADR general meeting, March 1981, Chicago, Illinois.)
J Dent Res 60: Abstr 1231.

Berger P, Luckmann T (1967).
The social construction of reality.
Harmondsworth, UK: Penguin.

Berkanovic E (1974).
Lay conceptions of the sick role. Social Forces: 51.
Cited by: Davis P (1980). The social context of dentistry.
London: Croom Helm.

Billie J (1980).
Dental caries in a group of 20-years-olds after previous participation in public child dental health services in Copenhagen, Denmark.
Community Dent Oral Epidemiol 8: 27-32.

Birch S (1988).
The identification of supplier-inducement in a fixed price system of health care provision.
J Health Economics 7: 129-150.

Blaxter M (1983).
Health services as a defence against the consequences of poverty in industrialised societies.
Soc Sci Med 17: 1139-1148.

Blinkhorn AS, Davies RM (1996).
Caries prevention. A continued need worldwide.
Int Dent J 46 (3):119-125.

Bloom B, Gift HC, Jack SS (1992).
Dental services and oral health; United States, 1989. National Center for Health Statistics.
Vital Health Stat 10(183).
Cited by: Petersen PE, Holst D (1995). Utilisation of dental services.
In: Cohen LK, Gift HC eds. Disease prevention and oral health promotion.
Copenhagen: Munsgaard. 341-386.

Bonito AJ, Donnelly CJ, Klieger WA (1978).
The oral health of adults in the Baltimore SMSA study area.
Int Dent J 28(3): 365-374.

Booth V, Ashley F (1989).
The oral health of a group of 15-17 year-old British school children of different ethnic origin.
Community Dent Health 6: 195-205.

Bordeur J, Demers M, Simard P, Kandelman D (1988).
Need perception as a major determinant of dental health care utilisation among the elderly.
Gerodontics 4: 259-264.

Bradnock G, Marchment MD, Anderson RJ (1984).
Social background, fluoridation and caries experience in a 5-year-old population in West Midlands.
Br Dent J 156: 127-131.

Bradshaw JS (1972).
A taxonomy of social need.
In: McLachlan G ed. Problem and progress in medical care.
England: Oxford Univ Press. 69-82.

Brennan DS (1997).
Dental services provision in private general practice: patterns and trends. Thesis, Master of Public Health. South Australia: Univ Adelaide.
Cited in: Carter KD, Brennan DS, Stewart JF (1998). Adult access to dental care-migrants.
AIHW Catalogue No DEN 33
South Australia: AIHW DSRU.

Brennan DS and Stewart J (1993).
Chapter 6: Use of dental care.
In: Dental care for adults in Australia. Proceedings of a workshop.
Adelaide: AIHW DSRU, 37-42.

Brennan DS, Spencer AJ, Slade GD (1996).
Provision of public dental services in urban, rural and remote locations.
Community Dent Health 13: 157-162.

Brennan DS, Spencer AJ, Szuster FSP (1997).
Insurance status and provision of dental services in Australian private general practice.
Community Dent Oral Epidemiol 25: 423-428.

Brennan DS, Spencer AJ, Szuster FSP (1998).
Rates of dental service provision between capital city and non-capital locations in Australian private general practice.
Aust J Rural Health 6: 12-17.

Brennan DS, Ryan P, Spencer AJ, Szuster FSP (2000).
Dental service rates: age, period and cohort effects.
Community Dent Oral Epidemiol 17: 70-78.

Brenthin I (1976).
Dental insurance and equity of access to dental services.
Community Dent Oral Epidemiol Nov; 4(6): 215-220.

Brotherton PC, Kolter T, Hamond SB (1979).
Development of Australian Index of Social Class.
Australian Psychologist 14 1: 77-82.

Brown LJ, Caldwell SB, Eklund SA (1995).
How fee and insurance changes could affect dentistry: results from a microsimulation model.
J Am Dent Assoc 126: 449-459.

Brown LJ, Lazar V (1999).
Dental care utilization: How saturated is the patient market?
J Am Dent Assoc 130: 572-580.

Bulman JS, Richards ND, Slack GL, Willcocks AJ (1968).
Demand and need for dental care. A socio-dental study.
London/New York: Oxford Univ Press.

Burnley IH (1992).
Mortality from respiratory system cancer in New South Wales and Sydney.
Aust J Public Health 16: 251-61.

Burt BA (1985).
The future of the caries decline.
J Public Health Dent 45: 261-269.

Burt BA, Eklund SA (1992).
Chapter 2. The public served by dentistry.
In: Dentistry, dental practice and the community, 4th edn.
Mexico: WB Saunders. 11-22.

Burt BA, Eklund SA (1997).
Chapter 7. Community-based strategies for preventing dental caries.

In: Pine CM ed. Community oral health.
Oxford: Wright. 112-125.

Byth K, McIntosh JH, Piper DW (1992).
A note on sex-specific mortality and social class in Sydney, 1979 to 1983.
Aust J Public Health 16: 321-3.

CACI Market Analysis Division (1983).
ACORN Todays approach to market analysis.
London: CACI.
Cited in: Elley KM, Langford JW (1993). The use of a clarification of residential neighbourhoods (ACORN) to demonstrate differences in dental health of children resident within the South Birmingham health district and of different socio-economic backgrounds.
Community Dent Health 10: 131-138.

Carey V, Vimpani G, Taylor R (1993).
Childhood injury mortality in New South Wales: Geographical and socio-economic variations.
J Paediatr Child Health, 29: 136-140.

Carmichael CL (1985).
Inner-city Britain a challenge for the dental profession.
A review of dental and related deprivation in Inner-city Newcastle upon Tyne.
Br Dent J 159: 24-27.

Carstairs V, Morris R (1989).
Deprivation and mortality: an alternative to social class?
Community Med 11: 210-219.

Carter KD (1995).
National dental telephone interview survey 1995.
Adelaide: AIHW DSRU, The University of Adelaide.

Carter K, Stewart J, Davies M, Szuster F P, Allister JH, Slade JH, Spencer AJ (1994).
National dental telephone interview survey 1994.
Adelaide: AIHW DSRU, The University of Adelaide.

Charlton M, Openshaw S, Wymer C (1985).
Some new classifications of census enumeration districts in Britain: a poor man's ACORN.
J Econ Soc Measur 13: 69-96.

Chen M (1995).
Oral health of disadvantaged populations.
In: Cohen LK, Gift HC eds. Disease prevention and oral health promotion.
Copenhagen: Munsgaard.

Chen M, Andersen RM (1997).
Chapter 3: Oral health behaviour. Chapter 4. Oral health behaviour by social group
In: Chen M, Andersen RM, Barmes DE, Leclercq M-H, Lyttle CS, eds.
Comparing oral health care systems; A second International Collaborative Study.
Geneva: WHO.

Chen M, Andersen RM, Barmes DE, Leclercq M-H, Lyttle CS, eds. (1997).
Comparing oral health care systems; A second International Collaborative Study.
Geneva: WHO.

Cheung CWE (1993).
Survey of dental service utilisation by year six students in Western Sydney area.
Sydney: The University of Sydney. MDSc Thesis.

Clayton S (1983).
Social need revisited.
J Social Policy 12: 215-234.

Cohen LK (1978).
Dental care delivery in seven nations: the International Collaborative Study of dental manpower systems in relations to oral health status.
In: Ingle JI, Blair P eds. International dental care delivery systems, issue in dental health policies.
Cambridge: Ballinger Publish. 201-214.

Cohen LK, Fusillo AE (1971).
Utilisation of professional care as reported by US adults.
J Public Health Dent 31(2): 141-145.

Conrad DA, Grembowski D, Milgrom P (1987).
Dental care demand: insurance effects and plan design.
Health Serv Res 22(3): 341-367.

Crawford AN, Lennon MA (1992).
Dental attendance patterns among mothers and their children in an area of social deprivation.
Community Dent Health 9: 289-294.

Curtis S (1990).
Use of survey data and small area statistics to assess the link between individual morbidity and neighbourhood deprivation.
J Epid Community Health 44: 62-68.

DPIE & DHSH {Department of Primary Industries and Energy and Development of Human Services and Health} (1994).
Rural, remote and metropolitan areas classification 1991 census edition.
Canberra: Australian Government Publishing Service.

Dahlgren G (1991).
Strategies for health financing in Kenya- the difficult birth of a new policy.
Scand J Soc Med 46: 67-81.

Damiano PC, Shugars DA, Johnson JD (1992).
Expanding health insurance coverage and the implications for dentistry.
J Public Health Dent 52(2): 52-58.

Daniel A (1984).
The measurement of social class.
Community Health Studies 8(2): 218-22.

Davies AR, Ware JE (1981).
Measuring patient satisfaction with dental care.
Soc Sci Med 15(6): 751-760.

Davies AR, Balit HL, Holtby S (1985).
Oral health status in the United States. Will improved health lead to decreased demand for dental services?
J Am Dent Assoc 110: 895-902.

Davies AR, Allen HM, Manning WG et al (1987).
Explaining dental utilisation behaviour RAND publication No R-3528-NCHSR.
California: RAND.

Davies M (1993).
Chapter 3. Social inequalities and oral health.
In: AIHW. Dental care for adults in Australia.
Adelaide: The University of Adelaide. DSRU.

Davies WIR, Schwarz E (1994).
The Hong Kong adult oral health survey 1991 - Executive Summary.
Community Dent Oral Epidemiol 22: 347-50.

Davis P (1980).
The social context of dentistry.
London: Croom Helm. 61-80.

Davis P (1987).
Introduction to the sociology of dentistry: a comparative perspective.
New Zealand: Univ Otago Press.

Dickson S (1968).
Class attitude to dental treatment.
J Sociol 19: 206-211.

Dimatteo MR, McBride CA, Shugars DA (1995).
Public attitudes towards dentists: a U S household survey.
J Am Dent Assoc 126: 1563-1570.

Domoto PK, Weinstein P Melnick S, Ohmura M, Uchida H, Ohmachi K, HoriM, Okazaki Y, Shimamoto T, Matsumura S, Shimono T (1988).
Results of a dental fear survey in Japan: implication for dental public health in Asia.
Community Dent Oral Epidemiol 16: 199-201.

Donovan J (1995).
Health in Australia. What you should know.
Australia: AIHW, AGPS.

Dooland M (1992).
Improving dental health in Australia. Background paper No 9.
Canberra: National Health Strategy. Aust Society Publish Co.

Douglas BL, Wallace DA, Lerner M, Coppersmith SB (1971).
The impact of fluoridation on patterns of dental treatment.
J Public Health Dent 31: 225-240.

Douglas CW (1971).
A socio-psychological view of health behaviour for health services research.
Health Serv Res 6: 6-14.

Douglas CW, Cole KO (1979).
Utilisation of dental services in the United States.
J Dent Educ 43 (4): 223-238.

Douglas CW, Furino A (1990).
Balancing dental services requirements and supplies: epidemiologic and demographic evidence.
J Am Dent Assoc 121: 587-592.

Downer MC (1970).
Dental caries and periodontal disease in girls of different thnic groups: a comparison in a London secondary school.
Br Dent J 128: 379-385.

Duncan DD (1961).
A socio-economic index for all occupations.
In: Ross AV ed. Occupations and social status.
New York: Free Press.

Dunning JM (1986).
Principles of dental public health, Fourth edn.
England: Harvard Univ Press.

Durward CS, Wright FAC (1989).
Dental knowledge attitudes and behaviours of Indo-Chinese and Australian-born adolescents.
Community Dent Oral Epidemiol 17: 14-18.

Dworkin SF, Ference TP, Giddon DB (1978).
The perceived need of dental care. (Chapter 5)
In: Behavioural science and dental practice.
USA: Mosby.

Eddie S, Davis JA (1985).
The effect of social class on attendance frequency and dental treatment received in the General Dental Service in Scotland.
Br Dent J 159: 370-372.

Eklund SA, Pittman JL, Smith RC (1997).
Trends in dental care among insured Americans: 1980 to 1995.
J Am Dent Assoc 128: 171-178.

Elliot JL (1972).
Cultural barriers to the utilisation of health services.
Inquiry 9: 28-35.

Elley KM, Langford JW (1993).
The use of a clarification of residential neighbourhoods (ACORN) to demonstrate differences in dental health of children resident within the South Birmingham health district and of different socio-economic backgrounds.
Community Dent Health 10: 131-138.

Eriksen TE and Hakansson J (1982).
Frequency of dental visits in Sweden during 1974-77.
Community Dent Oral Epidemiol 10: 242-248.

Ettinger R, Beck J (1982).
The new elderly: what can the dental profession expect?
Geriatric Dentistry 2: 62-69.

Evans RG (1981).
Incomplete vertical integration: the distinctive structure of the health care industry.
In: van der Gaag J, Perlman M eds. Health economic and health economies: Proceeding for the world congress on health economics.
Leiden: 339-354

Evashwick C, Conard D, Lee F (1982).
Factors related to utilisation of dental services by the elderly.
Am J Public Health 72: 1129-1135.

Evashwick C, Rouer G, Diehr P, Branch L (1984)
Factors explaining the use of health care services by the elderly.
Health Serv Res 19 (3): 357-382.

FDI (1986).
Improving access to oral health care.
Int Dent J 36: 113-114.

FDI (1998).
FDI Statement: Improving access to oral health care.
Int Dent J 48: 549-551.

Fanchette S (1974).
Social indicators: Problems of methodology and selection.
In: UNESCO. Social indicators: problems of definition and of selection. No 30.
France: UNESCO Press.
Community Dent Health 9 (Suppl 1): 1-220

Faulkner EJ (1959).
The role of health insurance. In: Greg DW ed. Life and health insurance handbook.
Homewood, Ill: Irwin. 523-532.

Feinstein JS (1993).
The relationship between socio-economic status and health: a review of the literature.
Millbank Quarterly 71: 279-322.

Feldman JL (1966).
The dissemination of health information.
Chicago, Illinois: Aldine Publ.

Feldstein PJ (1973).
Financing dental care: An economic analysis.
Massachusetts: Lexington Books.

Festinger L (1957).
A theory of cognitive dissonance.
Evanston (IL): Row Peterson.
Cited in: Petersen PE, Holst D (1995). Utilization of dental health services. In: Cohen LK, Gift HC eds (1995). Disease prevention and oral health promotion: Socio-dental science in action.
Copenhagen: Munsgaard/FDI. 341-386.

Finch H, Keegan J, Ward K, Sen BS (1988).
Barriers to dental care.
London: Social Community and Planning Research.
Cited by: Anderson RJ, Morgan JD (1992).
Marketing Dentistry: A pilot study in Dudley.

Freeman HE and Lambert Jr C (1965).
Preventive dental behaviour of urban mothers.
J Health Human Behaviour 6: 141-147.

French AD, Carmichael CL, Furness JA, Rugg-Gunn AJ (1984).
The relationship between social class and dental health in 5-year-old children in the north and south of England.
Br Dent J 156: 83-86.

Friedman JW (1970).
The dental care program of the Los Angeles Hotel-Restaurant Employers-Union Welfare Fund: Summary report of an evaluaton.
California: Los Angeles School of Public Health, University of California.
Cited by: Gift HC (1984). Chapter 4. Utilization of professional dental services. In: Cohen LK, Bryant PS eds. Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publish/FDI. 203-266.

Frohlich N, Mustard C (1996).
A regional comparison of socioeconomic and health indices in a Canadian province.
Soc Sci Med 42(9): 1273-1281.

Furino A, Douglass CW (1990).
Balancing dental service requirements and supplies: the economic evidence.
J Am Dent Assoc 121: 685-692.

Gacia JA, Juarez RZ (1978).
The utilisation of dental health services by Chicanos and Anglos.
J Health Soc Behav 19(4): 428-436.

Galginaitis C, Gift HC (1980).
Dental health characteristics of the insured and uninsured population in the United States.
Chicago, Illinois: Am Dent Assoc {unpublished paper}.
Cited by: Gift HC (1984). Chapter 4. Utilization of professional dental services. In: Cohen CK, Bryant PS eds. Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publish/FDI. 203-266.

Gambucci JR, Martens LV, Meskin LH, Davidson GB (1986).
Dental care utilisation patterns of older adults.
Gerodontics 2(1): 11-15.

Gaughwin A, Spencer AJ, Brennan DS, Moss J (1999).
Oral health of children in South Australia by socio-demographic characteristics and choice of provider.
Community Dent Oral Epidemiol 27: 93-102.

Geerston HR, Gray RM (1970).
Familistic orientation and inclination toward adopting the sick role.
J Marriage and Family 32: 644.
Cited by: Davis P (1980). The social context of dentistry.
London: Croom Helm.

Gerson LW (1972).
Expectations of 'sick-role" exemptions for dental problems.
Can Dent Assoc J 10: 370-372.

Gibson DM, Broom DH, Duncan-Jones P (1984).
Access to dental care amongst the aged.
Community Health Studies 8(1): 62-74.

Gibson R, Waldo D (1981).
National health expenditures.
Health Care Finance Rev 31: 1-54.
Cited by: Hay JW, Bailit H, Douglas A, Chiriboga DA (1982). The demand for dental health.
Soc Sci Med 16: 1285-1289.

Giddon DB, Silberman SL, Prassad L, Bikofsky CG (1978).
A behavioural science analysis of preventive dentistry.
In: Ward HO ed. A preventive point of view.
Springfield: Charles C Thomas.

Gift HC (1984).
Chapter 4. Utilization of professional dental services In: Cohen CK, Bryant PS eds. Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publish/FDI.

Gift HC (1993).
Social factors in oral health promotion.
In: Schou L, Blinkhorn AS eds. Oral health promotion.
USA: Oxford Univ Press.

Gift HC (1996).
Enhancing outcomes of oral health research: value of quality methods. Abstract No. 1875.
San Francisco, CA: 74th meeting of the International Assoc of Dent Research.
Cited in: Gift HC (1997). Chapter 3: Oral health outcomes research-Challenges and opportunities. In: Slade GD. Measuring oral health and quality of life.
North Carolina: Univ of North Carolina. 25-46.

Gift HC (1997).
Oral health outcomes research-Challenges and opportunities (Chapter 3).
In: Slade GD. Measuring oral health and quality of life.
North Carolina: Univ of North Carolina. 25-46.

Gift HC, Newman JF (1979).
Socialisation and children's use of dental services: the impact of predisposing, enabling, and need factors. (Paper presented at the 107th annual meeting of the APHA, New York)
Cited by: Gift HC (1984). Chapter 4. Utilization of professional dental services. In: Cohen CK, Bryant PS eds. Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publish/FDI.

Gift HC, Newman JF (1992).
Oral health activities of US children: Results of a national health interview survey.
J Am Dent Assoc 123: 96-106.

Gift HC, Newman JF, Loewy SB (1981).
Attempts to control dental health care costs: The US experience.
Soc Sci Med 15A: 767-779.

Gift HC, Gerbert B, Kress GC, Reisine ST (1990).
Social, economic and professional dimensions of oral health care delivery systems.
Annals Behavior Med 12: 161-169.

Gift HC, Andersen RM, Chen M (1997).
The principles of organisation and models of delivery of oral health care.
In: Pine CM ed. Community oral health.
Oxford: Wright.

Glass RI ed. (1982).
The first international conference on the declining prevalence of dental caries.
J Dent Res 61 (Sp issue): 1301-1383.

Glasser MA, Hoffman WS (1981).
Demand for care; the effects of prepayment on the utilisation of dental services.
In: Bawden JW, DeFriese GH eds. Planning for dental care on a statewide basis; the North Carolina dental manpower project.
North Carolina: Chapel Hill Dental Foundation. 49-68.

Gluck GM (1993).
Geriatric dental health.
In: Jong AW ed. Community dental health.
USA: Mosby. 105-120.

Gordon I, Christie D, Robinson K (1989).
Social class as indicated by area of residence: A mortality study within an Australian industrial population.
Community Health Studies 13(2): 170-176.

Gotowka TD (1985).
Insurance effects on dental fees and case mix.
J Dent Educ 49(11): 763-768.

Grant C, Lapsley HM (1993).
The Australian health care system 1992.
Australia: School of Health Services Management, The University of New South Wales.

Greatrix D, Taylor GO, Lennon MA (1990).
Mother's dental attendance patterns and their children's dental attendance and dental health.
Br Dent J 168: 441-443.

Grembowski D, Andersen RM, Chen M (1989).
A public health model of the dental care process.
Med Care Review 46 (4): 439-496.

Grembowski D, Conrad D, Milgrom P (1985).
Utilization of dental services in the United States and an insured population.
Am J Public Health 75: 87-89.

Grembowski D, Conrad D, Weaver M, Milgrom P (1988).
The structure and function of dental care markets.
Med Care 26: 132-147.

Grembowski D, Conrad D, Milgrom P (1997).
Factors influencing the appropriateness of restorative dental treatment; an epidemiologic perspective.
J Public Health Dent 57(1): 19-30.

Grembowski D, Milgrom P (1988).
The influence of dentist supply on the relationship between fluoridation and restorative care among children.
Med Care 26: 907-917.

Grytten J (1991)
The effect of supplier inducement on Norwegians dental services: some empirical_findings based as a theoretical model.
Community Dent Health 8: 221-231.

Grytten J (1991a)
The effect of the price of dental services on their demand and utilisation in Norway.
Community Dent Health 8: 303-310.

Grytten J (1992)
Supplier inducement - its relative effect on demand and utilisation.
Community Dent Oral Epidemiol 20: 6-9.

Grytten J, Lund E (1999).
Future demand for dental care in Norway; a macro-economic perspective.
Community Dent Oral Epidemiol 27: 327-330.

HRA (Health Resources Administration), Public Health Service, US Department of "Health, Education and Welfare (1976).
Checklist of Non-economic factors linked to utilisation of dental care.
Publication No. (HRA) 75-62.
Washington D C: Government Publishing Office.

HRA (Health Resources Administration), (1977).
A decade of dental service utilisation 1964-1974. DHHS Publication no (HRA) 80-56.
Cited in: Kiyak HA (1993). Age and culture: Influences on oral health behaviour.
Int Dent J 43: 9-15.

Hawe P, Degeling D, Hall J (1990).
Evaluating health promotion A health worker's guide.
Australia: MacLennan & Petty Pty Ltd.

Hay JW, Bailit H, Douglas A, Chiriboga DA (1982).
The demand for dental health.
Soc Sci Med 16: 1285-1289.

Hayden WJ, Marcus M, Lewis CE (1989).
Developing population profiles from dental claims data for conceptualising effectiveness of care.
J Dent Educa 11: 619-628.

Hayward RA, Meetz HK, Shapiro MF, Freeman HE (1989).
Utilization of dental services: 1986 patterns and trends.
J Public Health Dent 49(3): 147-152.

Heidmann J, Christensen LB (1985).
Immigrants and public oral health care services for children in Denmark.
Community Dent Oral Epidemiol 13: 125-127.

Heloe LA (1973).
Utilisation of dental services in a disadvantaged rural population.
Acta Odont Scand 31: 3-12.

Hicks N (1981).
A sociological analysis of the differential use of dental services.
Community Health Studies 5(2): 117-125.

Holst D (1982).
Third party payment in dentistry. An analysis of the effect of a third party system and of system determinants. Thesis. Univ Oslo.
Cited in: Sogaard AJ (1993). Theories and models of health behaviour.
In: Schou L, Blinkhorn eds. Oral health promotion.
USA: Oxford Univ Press.

Holtman AG, Olsen EO (1976).
The demand for dental care: a study of consumption and household production.
J Human Resources 11: 4.

Holtzman JM, Berkey DB, Mann J (1990).
Predicting utilisation of dental services by aged.
J Public Health Dent 50(30): 164-171.

Honkala E (1993).
Oral health promotion with children and adolescents.
In: Schou L, Blinkhorn AS eds. Oral health promotion, 169-187.
New York: Oxford Univ Press

Honkala E, Kuusela S, Rimpela A, Rimpala M, Jokela J (1997).
Dental services utilisation between 1977 and 1995 by Finnish adolescents of different socioeconomic levels.
Community Dent Oral Epidemiol 25: 385-390.

Hoskin GW, Slade GD, Spencer AJ (1994).
Use of dental services by older adults. {Abst 37}.
J Dent Res 73(4): 741.

House DR (1978).
Barriers to access to dental care: an economic examination.
J Am Coll Dent 160: 169-188.

Howards I, Brehm H and Nagi S (1980).
Disability: From social problem to federal program.
New York: Praeger Special Studies.
Cited by: Gift HC (1984). Chapter 4. Utilization of professional dental services. In: Cohen CK, Bryant PS eds. Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publish/FDI.

Hughes ML, Legler DW (1979).
Trends in utilisation of a prepaid dental insurance program.
J Dent Res 58 (A). Abstr 919.

Infante PF, Owen GH (1975).
Dental caries and levels of treatment for school children by geographical region, socio-economic status, race and size of community.
J Public Health Dent 35; 19-27.

Ingle JI, Blair P eds. (1978).
International dental care delivery systems.
Massachusetts: Ballinger Publish Co.

Ismail AI, Szpunar SM (1990).
Oral health status of Mexican-Americans with low and high acculturation status.
J Public Health Dent 50: 24-31.

Jaafar H, Razak IA (1988).
Reasons for seeking dental care in a Malaysian urban adult population. An analysis by sex and ethnic group.
Community Dent Oral Epidemiol 16: 75-78.

Jackson D, Murray JJ, Fairpo CG (1973).
Regular dental care in the dentate persons.
B Dent J 135: 59-63.

Janovsky ed. (1996).
Health policy and systems development; An agenda for research.
Geneva: WHO.

Jarman B (19783).
Identification of underpriviledged areas.
Br Med J 286: 1705-1709.

Jeffers JR, Bognanno MF, Bartlett JC (1971).
On the demand versus need for medical services and the concept of "shortage".
Am J Public Health 61: 46-63.

Jenkins PM, Feldman BS, Stirrups DR (1984a).
The effect of social factors on referrals for orthodontic advice and treatment.
Br J Orth 11: 24-26.

Jenkins PM, Feldman BS, Stirrups DR (1984b).
The effect of social class and dental features on referrals for orthodontic advice and treatment.
Br J Orth 11: 185-188.

Jenny J (1979).
Basic social values, structural elements in oral health systems and oral health status.
Int Dent J 30 (3): 276-285.

Jenny J, Frazier PJ, Bagramian RA, Proshek JM [1973].
Parent's satisfaction and dissatisfaction with their children's dentist.
J Public Health Dent 33: 211-215.

Jenny J, Frazier PJ, Bagramian RA, Proshek JM (1975).
Dental health status of third grade children and their families within the context of a community's dental health care system.
Med Care 13(2): 174-186.

Jensen K (1974).
Dental care practices and socioeconomic status in Denmark.
Community Dent Oral Epidemiol 2: 273-281.

Jones JA, Fedele DJ, Bolden AJ, Bloom B (1994).
Gains in dental care use not shared by minority elders.
J Public Health Dent 54(1): 39-46.

Jong AW ed. (1993).
Community dental health. 3rd edn.
USA: Mosby.

Kasl S, Cobb S (1966).
Health behavior, illness behavior and sick-role behavoir.
Arch Environmental Health 12: 246-266.

Kawamura M, Iwamoto Y (1999).
Present state of dental health knowledge, attitudes/behaviour and perceived oral health of Japanese employees.
Int Dent J 49: 173-181.

Kegeles SS (1961).
Why people seek dental care: A review of present knowledge.
Am J Public Health 51: 1306-1311.

Kegeles SS (1963a).
Why people seek dental care: A test of conceptual formulation.
J Health Human Behav 4: 166-173.

Kegeles SS (1963b).
Some motives for seeking preventive dental care.
J Am Dent Assoc 67: 90-98.

Kegeles SS (1974).
Why and how people use dental services.
Int Dent J 24: 347-351.

Kelly J, McAllister I (1983)
Modern sociology and the analysis of the class.
Search 14: 249-252.

Kenealy P, Shaw W (1989).
The effects of social class on uptake of orthodontic treatment.
Br J Orth 16: 107-111.

Kington R, Rogowski J, Lillard L (1995).
Dental expenditures and insurance coverage among older adults.
Gerontologist 35(4): 436-443.

Kirscht JP et al (1966).
A national study of health beliefs.
Public Health Rep 7: 248.
Cited by: Sheiham A (1981). Planning for manpower requirments in dental public health.
In: Slack GL ed. Dental public health. An introduction to community dentistry. 2nd edn.
Bristol: Wright.

Kiyak HA (1980).
Age difference in oral health attitudes and dental service utilisation.
Paper presented at the Symposium on barriers to dental care for the elderly. Gerodontological Society, Sandiego, California.

Cited by: Gift HC (1984). Chapter 4. Utilization of professional dental services. In: Cohen LK, Bryant PS eds. Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publs/FDI. 203-266.

Kiyak HA (1981).
Dental beliefs, behaviours and health status among Pacific Asians and Caucasians.
Community Dent Oral Epidemiol 9: 10-14.

Kiyak HA (1986).
Explaining patterns of dental service utilisation among elderly.
J Dent Educ 50: 679-687.

Kiyak HA (1989).
Reducing barriers to older persons' use of dental services.
Int Dent J 39: 95-102.

Kiyak HA (1993).
Age and culture: Influences on oral health behaviour.
Int Dent J 43: 9-15.

Kiyak HA, Miller RR (1982).
Age differences in oral health attitudes and dental service utilisation.
J Public Health Dent 42: 29-41.

Kovar MG, Jack S, Bloom B (1988).
Dental care and dental health.
Am J Public Health 78(11): 1496-1497.

Kravits J, Schneider J (1975).
Health care need and actual use by age, race and income.
In: Andersen R, Kravits J, Anderson OW eds. Equity in health services.
Cambridge, Massechusetts: Ballinger Publis. 169-187.

Kressin NR (1996).
Self-reported assessments of oral health outcomes. Abstract No. 2727.
San Francisco, CA: 74th meeting of the International Assoc of Dent Research.
Cited in: Gift HC (1997). Chapter 3. Oral health outcomes research-Challenges and opportunities. In: Slade GD. Measuring oral health and quality of life.
North Carolina: Univ of North Carolina. 25-46.

Kriesberg L, Treiman BR (1960a).
Public attitudes toward prepaid dental care plans.
Chicago: National Opinion Research Center. Report No 76.
Cited by: Gift HC (1984). Chapter 4. Utilization of professional dental services. In: Cohen LK, Bryant PS eds. Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publs/FDI. 203-266.

Kriesberg L, Treiman BR (1960b).
Socioeconomic status and the utilisation of dentist's services.
J Am Coll Dent 27: 147-165.

Kriesberg L, Treiman BR (1962).
Preventive utilisation of dentist's service among teenagers.
J Am Coll Dent 29: 28-45.

Kronenfield J (1979).
Access to dental care: a comparison of medicine/dentistry and the role of a regular source.
Med Care 17(7): 1000-1011.

Kutzin J, Barnum H (1992).
Institutional features of health insurance programmes and their effects on developing country health systems.
Int J Health Planning Management 7: 51-72.

Lahti S, Tuutti H, Hausen H, Kaariainen R (1992).
Dentist and patient opinions about the ideal dentist and patient- developing a compact questionnaire.
Community Dent Oral Epidemiol 20: 229-234.

Last J (1963).
The clinical iceberg: completing the clinical picture in general practice.
The Lancet 2: 28-31.
Cited by: Locker D (1989). Illness behaviour: need and demand for dental care.
In: An introduction to behavioural science and dentistry.
New York: Routledge. 102-116.

Le Grand J (1987).
Inequalities in health: some international comparisons.
European Econom Rev: 31: 182-191.

Lee J, Kiyak HA (1992).
Oral disease, beliefs, behaviours and health status of Korean-Americans.
J Public Health Dent 52: 131-136.

Legler DW, Hughes ML, Bradley EL (1979).
Utilisation of prepaid dental health care by students in health professional schools.
Am J Public Health 69: 1017-1020.

Leverett DH, Jong A (1970).
Variation in use of dental care facilities by low income white and black populations.
J Am Dent Assoc 80: 137-140.

Leverett DH, Hooper SD, Russel WN (1977).
Variations in utilisation of a multi-state company dental plan.
Am J Public Health 67: 1173-1177.

Lewis DW (1981).
Research into dental manpower in Ontario- A summary of concerns and findings.
Canada: Dental Care Services Research Unit, University of Toronto.
Cited by: Gift HC (1984). Chapter 4. Utilization of professional dental services. In: Cohen LK, Bryant PS eds. Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publs/FDI. 203-266.

Locker D (1989).
Chapter 7. Illness behaviour.
In: An introduction to behavioural science and dentistry.
New York: Routledge.

Locker D, Ford J (1996).
Using area-based measures of socioeconomic status in dental health services research.
J Public Health Dent 56(2): 69-75.

Locker D, Leake JL (1993).
Inequalities in health: dental insurance coverage and use of dental services among older Ontario adults.
Can J Public Health 84: 139-140.

Locker D, Leake J, Schabas R (1987).
The oral health status of persons aged 50 years and over in East York, Ontario.
Toronto: Faculty of Dentistry, University of Toronto.
Cited by: Locker D (1989). Chapter 7. Illness behaviour.
In: An introduction to behavioural science and dentistry.
New York: Routledge.

Locker D, Leake JL Lee J, Main PA Hicks T, Hamilton M et al (1991).
Utilization of dental services by older adults in four Ontario communities.
Can J Public Health 57: 879-886.

Locker D, Slade G, Leake JL, Wu A (1989).
Dental insurance and its effects among the elderly in Ontario.
J Can Dent Assoc Jul 55(7): 555-559.

Maizels J, Maizels A, Sheiham A (1991).
Dental disease and health behaviour: the development of an interactional model.
Community Dent Health 8(4): 311-321.

Mak KKY, Lind OP, Evans RW [1990].
Utilisation of the government dental services by Chinese civil servants in Hong Kong.
J Am Dent Assoc 110: 895-902.

Manga P, Charette A (1986).
The patterns and determinants of the utilisation of dental care services in Canada.
Can J Public Health 77: 119-123.

Manning WG, Phelps CE (1979).
The demand for dental care.
Bell J Economics 10: 503-525.

Manning WG, Bailit HL, Benjamin B, Newhouse JP (1985).
The demand for dental care: evidence from a randomised trial in health insurance.
J Am Dent Assoc 110: 895-902.

Manski RJ (1994).
How income, employment, insurance affect older Americans' dental care.
J Am Dent Assoc 125: 326-332.

Manski RJ, Magder LS (1998).
Demographic and socioeconomic predictors of dental care utilisation.
J Am Dent Assoc 129: 195-200.

Manski RJ, Moeller JF, Maas WR (1999a).
Dental services: use, expenditure and sources of payment, 1987.
J Am Dent Assoc 130: 500-508.

Manski RJ, Moeller JF, Maas WR (1999b).
A comparison of dental care expenditures and office-based medical care expenditures, 1987.
J Am Dent Assoc 130: 659-666.

Marmot MG, Kogevinas M, Elston MA (1987).
Social/economic status and disease.
Ann Rev Public Health 8: 111-135.

Mattin D, Smith JM (1991).
The oral health status, dental needs and factors affecting utilisation of dental services in Asians aged 55 years and over, resident in Southampton.
Br Dent J 170(10): 369-372.

McCarthy EG, Widmer GW (1974).
Effects of screening by consultants on recommended elective surgical procedures.
New England J Med 291: 1331-1335.

McGuire A, Henderson J, Mooney G (1988).
The economics of health care
London: Routledge.

McKeithen EJ (1966).
The patients image of the dentist.
J Am Coll Dent 33: 87-107.

McKinlay JB (1969).
Comment on 'class attitudes to dental treatment'.
Br J Sociol 20: 85-107.

McKinlay JB (1972).
Some approaches and problems in the study of the use of services: an overview.
J Health Soc Behav 13: 115-152.

McKinlay JB (1973).
Social networks, lay consultation and help-seeking behaviour.
Social Forces 53: 275-292.

McMichael AJ (1985).
Social class and mortality in Australian males in the 1970s.
Community Health Studies 9(3): 220-230.

Mechanic D (1968).
Medical sociology: a scientific view. Free Press.
Cited by: Locker D (1989). Chapter 7. Illness behaviour: Need and demand for dental care.
In: An introduction to behavioural science and dentistry.
New York: Routledge. 102-116.

Mechanic D (1978).
Sex, illness, illness behaviour and the use of health services.
J Soc Sci Med 12B.

Megas BF, Athanassouli TN (1989).
Dental caries prevalence in the permanent teeth in Greek schoolchildren related to age, sex, urbanization and social status.
Community Dent Health 6: 131-137.

Mellor AC, Blinkhorn AS, Hassall DC, Holloway PJ, Worthington HV (1997).
An assessment of capitation in the general dental service contract 2. Patterns of treatment provided to regularly attending patients.
Br Dent J 182: 460-464.

Meskin LH et al (1990).
Economic impact of dental service utilisation by older adults.
J Am Dent Assoc 120: 665.

Mikami Y, Croucher R, Hector M (1999).
Knowledge and reported behaviour concerning the prevention of caries in children: a questionnaire survey of Japanese parents resident in London, UK.
Int Dent J 49: 115-121.

Milen A, Tala H, Heinonen OP, Paunio I (1981)
Caries in primary dentition related to age, sex, social status and county of residence in Finland.
Community Dent Oral Epidemiol 9: 83-86.

Miller AJ (1973).
An epidemiological study of selected characteristics of utilizers and non-utilizers of dental services in a federally funded rural comprehensive care facility. Doctoral Dissertation.
Michigan: Ann Arbor University.
Cited In: Striffler DF, Young WO, Burt BA eds.
Dentistry, dental practice, & the community. 3rd edn.
Philadelphia: WA Saunders. 293-339.

Miller RR, Kiyak HA (1980).
Attitudes as predictors of dental service utilisation.
J Dent Res 59: Abstr 529.

Milone CL, Stacey DC , Schonfeld HK (1973).
The social sciences and dentistry: Patterns of utilisation of dental services in an urban neighbourhood health care center.
J Public Health Dent 33(3): 194-196.

Mooney G, Scotten R (1999).
Economics and Australian health policy.
Sydney: Allen and Unwin. 184-190.

Moosbruker J, Jong A (1969).
Racial similarities and differences in family dental care patterns.
Public Health Rep 84: 721-727.

Morehead MA, Donaldson R, Zanes A (1971).
Dental services at Teamster Comprehensive Care Program, Montefiore Hospital and Medical center.
J Am Dent Assoc 83: 608-613.

Mueller CD, Monheit AC (1988).
Insurance coverage and the demand for dental care: results for non-aged white adults.
J Health Econ 7(1): 59-92.

Mueller CD, Schur CL, Paramore LC (1998).
Access to dental care in the United States.
J Am Dent Assoc 129(4): 429-437.

Murray JJ (1993).
Efficacy of preventive agents for dental caries: systemic fluorides, water fluoridation.
Caries Res 27(Suppl 1): 2-8.

Murray JJ (1994).
Comments on results reported at the Second International Conference: Changes in caries prevalence.
Int Dent J 44: 457-458.

Murray JJ (1996).
Chapter 18. The changing pattern of dental disease.
In: Murray JJ ed. Prevention of oral disease. 3rd edn.
Oxford: Oxford Univ Press. 250-266.

Murray JJ, Naylor MN (1996).
Chapter 3. Fluorides and dental caries.
In: Murray JJ ed. Prevention of oral disease. 3rd edn.
Oxford: Oxford Univ Press. 33-67.

Murray JJ Rugg-Gunn AJ, Jenkins GN (1991).
Fluorides in caries prevention. 3rd edn.
Wright: Butterworth Heinemann.

NHS {National Health Strategy} (1991).
A healthy risk? Use of private insurance. Background Paper No 4.
Canberra: Australian Society Publishing Company. 47

NSW Health Dept (1997).
The health of the people of New South Wales: Report of the Chief Health Officer.
Sydney: New South Wales Health Dept.

Nash K (1994)
Measuring Dental Fees: Route to a truer practice
J Am Dent Assoc, 125; 148.

Nathanson CA (1977).
Sex roles as variables in preventive health behaviour.
Community Health 3.

Najman JM (1988).
The measurement of socioeconomic inequality and social class in Australia: A review of past practices and recent developments.
Community Health Studies 7(1): 31-41.

Newbrun E (1989).
Effectiveness of water fluoridation.
J Public Health Dent 49: 279-289.

Newhouse JP et al (1981).
Some interim results from a controlled trial of cost sharing in health insurance.
New England J Med 30: 1501-1507.
Cited by: McGuire A, Henderson J, Mooney G (1988).
Chapter 9. The utilisation of health care.
In: The economics of health care; An introductory text.
USA/Canada: Routledge, 167-181.

Newman JF (1971).
The utilisation of dental services.
Atlanta, Georgia: Emory University.
Cited by: Gift HC (1984). Chapter 4: Utilization of professional dental services. In: Cohen LK, Bryant PS eds. Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publs/FDI. 203-266.

Newman JF, Anderson OW (1972).
Patterns of dental service utilisation in the United States: a nationwide social survey. Research series No 30. Chicago: University Chicago, Center Health Administration Studies. 127p.
Cited by: Striffler DF, Young WO, Burt BA (1983).
Dentistry, dental practice, & the community. 3rd edn.
Philadelphia: WA Saunders.

Newman JF, Larsen A (1979).
A decade of dental service utilisation 1964-1974.
US Department of HHS, PHS<HRA> DHHS Publication No (HRA) 80-56.
Cited by: Gift HC (1984). Chapter 4. Utilization of professional dental services. In: Cohen LK, Bryant PS eds. Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publs/FDI. 203-266.

Nikias MK (1968).
Social class and the use of dental care under prepayment.
Med Care 6: 381-393.

Nikias MK (1969).
Prepaid dental care: Patterns of use and source of premium payment.
Am J Public Health 59: 1088-1103.

OECD (Organisation for Economic Co-operation and Development) 1995.
OECD health data: a software package for the cross national comparison of health systems, Version 3.6. Paris: OECD.
Cited in: AIHW {Australian Institute of Health and Welfare} (1996b).
Australia's Health 1996.
Canberra: Australian Government Publishing Service

Oberweis JA (1997).
Chapter 4. International dental health
In: Jong AW ed. Community dental health. 3rd edn. 79-104.
USA: Mosby.

O'Mullane DM, Robinson ME (1977).
The distribution of dentists and the uptake of dental treatment by school children in England.
Community Dent Oral Epidemiol 5: 156-159.

O'Shea RM, Gray SB (1968).
Dental patients' attitudes and behaviour concerning prevention.
Public Health Rep 83: 405.

Oslen E, Chetelat G (1979).
Dental capitation programs: a comparison of delivery systems.
Canada Dent Assoc J 7: 45-50.

PHIAC {Private Health Insurance Administration Council} (1995).
Annual report 1995-1996.
Canberra: Australian Government Publishing Service.

PHS (Public Health Service, US Department of Health, Education and Welfare (1963).
An experiment in dental payment: The Naismith Dental Plan. Publication No (PHS) 894
Washington DC: Gov Printing Office.
Cited by: Gift HC (1984). Chapter 4. Utilization of professional dental services. In: Cohen CK, Bryant PS eds. Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publish/FDI. 203-266.

Palmer GR, Short SD (1989).
Health care & public policy an Australian analysis
Melbourne: Macmillan Educ Aust Pty Ltd. 53-77.

Parkin D, Yule B (1988).
Paitent charges and the demand for dental care in Scotland. 1962-1981.
Appl Econom 20: 229-242.

Paul PF, Bradnock G (1986).
The dental health of Asian and Caucasian four and five year-oldchildren resident in Coventry.
Community Dent Health 3: 275-285.

Pelton WJ (1972).
Dental health program of the University of Alabama in Birmingham: A summary of seven year's experience.
Am J Public Health 62: 671-675.

Penchansky R, Thomas J (1981)
The concept of access: definition and relationship to consumer satisfaction.
Med Care 19(2): 127-140.

Peninska KM (1993).
Government dental services in Australia. DPH Thesis.
Sydney: Univ Sydney.

Peninska KM, Barnard PD (1997).
Comparison of oral health status of indigenous Australians and non-Aborigines.
Poster session presentation in National Aboriginal & Torres Strait Islander health workers conference.
Sydney NSW.

Perkins PC (1981).
Dental caries in children of 9 and 14 years in three ethnic groups in North-West London.
Br Dent J 150: 194-195.

Perkins PC, Sweetman AJP (1986).
Ethnic differences in caries prevalence in 5-year-olds in North-West London.
Br Dent J 161:215-216.

Petersen PE (1981).
Dental health behaviour, dental status and treatment need among workers and staff members in a big Danish Industrial Firm. PhD dissertation.
Copenhagen: Inst for Community Dentistry and Graduate studies. Royal Dental College.

Petersen PE (1983).
Dental health among workers at a Danish chocolate factory.
Community Dent Oral Epidemiol 11: 337-341.

Petersen PE (1990).
Social inequalities in dental health. Towards a theoretical explanation.
Community Dent Oral Epidemiol 18: 153-158.

Petersen PE (1997).
Society and oral health.
In: Pine CM ed. Community oral health
Oxford: Wright, 20-37.

Petersen PE, Holst D (1995).
Utilization of dental health services. In: Cohen LK, Gift HC eds. (1995). Disease prevention and oral health promotion: Socio-dental science in action.
Copenhagen: Munsgaard/FDI. 341-386.

Petersen PE, Nortov B (1989).
General and dental health in relation to life-style and social network activity among 67-year old Danes.
Scand J Prim Health Care 7: 225-230.

Petersen PE, Nortov B (1994).
Evaluation of a dental public health program for old-age pensioners in Denmark.
J Public Health Dent 54: 73-79.

Petersen PE, Petersen KM (1984).
Socioeconomic demand model for dental visits.
Community Dent Oral Epidemiol, 12: 361- 365.

Phelps CE (1986).
Induced demand - can we ever know its extent.
J of Health Economics 52: 355-363.

Pine CM ed (1997).
Community oral health.
Oxford: Wright.

Plamping D, Bewley BR, Gelbier S (1985).
Dental health and ethnicity.
Br Dent J 158: 261-263.

Quine S, Lancaster PAL (1989).
Indicators of social class – relationship between prestige of occupation and suburb of residence.
Community Health Studies, 13(4): 510-518.

Rajala A, Rajala M, Paunio I (1978).
Utilisation of dental care in a Finnish Industrial population.
Community Dent Oral Epidemiol 6: 121-125.

Rayner JF (1979).
Socio-economic status and factors influencing the dental health practices of mothers.
Am J Public Health 60 (7): 1250-1258.

Redford M, Gift HC, Monroe-Cook E et al (1995].
Cited in: Gift HC (1997). Chapter 3. Oral health outcomes research - Challenges and opportunities.
In: Slade GD. Measuring oral health and quality of life.
North Carolina: Univ of North Carolina. 25-46.

Reisine S (1987).
A path analysis of the utilization of dental services.
Community Dent Oral Epidemiol 15: 119-124.

Richards ND (1971).
Utilisation of dental services. In: Richards ND, Cohen LK eds. Social Sciences and Dentistry: A critical Bibliography. Vol I.
Netherlands: FDI. 209-240.

Richardson J (1990).
Methods of medical remuneration.
New Data 53: 17-21.

Rickardson B, Hanson BS (1989).
Social network and regular dental care utilisation in elderly men. Results from the population study " Men born in 1941", Malmo, Sweden.
Swed Dent J 13: 151-161.

Rise J (1985).
Evaluation of social inequality of dental services in Norway.
Community Dent Oral Epidemiol, 13: 57-60.

Ritchie J, Jacoby A, Bone M (1981).
Access to primary health care.
London: HMSO.
Cited by: Anderson RJ, Morgan JD (1992).
Marketting Dentistry: A pilot study in Dudley. Community Dent Health 9(Suppl 1): 1-220.

Roberts-Thomson K, Brennan DS, Spencer AJ (1995).
Social inequality in the use and comprehensiveness of dental services.
Aust J Public Health, 19: 80-85.

Rogers SN (1991).
Dental attendance in a sample of women in the UK.
Community Dent Health 8(4): 361-368.

Roos NP, Flowerdew G, Wajdo, Tate RB (1986).
Variations in physicians hospitalisation practices: a propulation-based study in Manitoba, Canada.
Am J Public Health 76: 45-51.

Rosenstock IM (1967).
Why people use health services.
In: Mainland, ed: Health services research.
New York: Milbank Mem Fund Quarterly 44: 94-127.

Roth G, Wittich C eds. (1978).
Max Weber: Economy and society.
Berkeley: Univ California Press, 302-307.

Rovin S, Nash J (1982).
Traditional and emerging forms of dental practice cost, accessibility and quality factors.
Am J Public Health 72: 656-662.

SAS Institute (1990).
SAS/STAT User's guide. Vol. 2, Version 6.11, Cary.
North Carolina: SAS Institute.

SCARC (Senate Community Affairs References Committee) (1998).
Report on public dental services.
Canberra: Commonwealth of Australia.

SPSS Inc. (1988).
SPSS User's guide, 3rd edn.
Chicago: SPSS Inc.

Sarll DW, Whittle JG, Mackie IC (1984).
The use of a classification of residential neighbourhoods (ACORN) as a health related variable in service planning for dentistry.
Community Dent Health 1: 115-123.

Scarrott DM (1969).
Attitudes to dentists.
Br Dent J 127: 583-590.

Schamshula RG, Cooper MH, Adkins DE, Barmes DE, Angus HM (1980).
Oral conditions in Australian children of Aboriginal and Caucasian descent.
Community Dent Oral Epidemiol 8: 365-369.

Schaub RMH (1981).
Barriers to effective periodontal care.
USA: Dept of Soc Sc in Dentistry, University of Groningen.
Cited in: Gift HC (1997). Chapter 3. Oral health outcomes research-Challenges and opportunities. In: Slade GD. Measuring oral health and quality of life.
North Carolina: Univ of North Carolina. 25-46.

Schwarz E (1980).
Evaluation of a preventive program provided by private practitioners in Denmark.
(Paper presented at the 58th IADR general session, Osaka, Japan, June 5, 1980).
J Dent Res 59 (special issue B), Abstract No. 176.

Schwarz E, Hensen (1976).
Utilisation of dental services in the adult Danish population, 1975.
Community Dent Oral Epidemiol 4: 221-226.

Schwarz E, Lo ECM, Corbet EF, Holmgren CJ, Lim LP, Davies WIR (1994).
The Hong Kong adult oral health survey – 1991: background, study population, and methods.
Community Dent Oral Epidemiol 22: 351-357.

Scrambler A, Scrambler G, Craig D (1981).
Kinship and friendship networks and women's demand for primary medical care.
J Royal Coll Gen Prac 26: 746-750.

Seow WK, Amaratunge A, Bennett R, Bronsch D, Lai PY (1996).
Dental health of Aboriginal pre-school children in Brisbane, Australia.
Community Dent Oral Epidemiol 24: 187-190.

Sheiham A (1979).
The epidemiology of dental caries and periodontal disease
J Periodont 6(7): 7-15.

Sheiham A (1981).
Planning for manpower requirments in dental public health.
In: Slack GL ed. Dental Public Health. An introduction to community dentistry. 2nd edn.
Bristol: Wright.

Sheiham A (1984).
Changing trends in dental caries.
Int J Epidemiol 12(2): 142-147.

Sheiham A, Maizels J, Cushing A (1982).
The concept of need in dentistry.
Int Dent J, 32: 265-268.

Sheiham A, Maizels J, Cushing A, Holmes A (1985).
Dental attendance and dental status.
Community Dent Oral Epidemiol 13: 304-309.

Shuval JT (1970).
Social and psychosocial factors in Israel's dental health.
Public Health Dent 30: 179-193.

Silver DH (1987).
A longitudinal study of infant feeding practice, diet and caries, related to social class in children aged 3 and 8-10 years.
Br Dent J 163: 296-300.

Silver DH (1992).
A comparison of 3-year-olds' caries experience in 1973, 1981 and 1989 in a Hertfordshire town, related to family behaviour and social class.
Br Dent J 172: 191-197.

Silversin JB, Kornacki MJ (1984).
Controlling dental disease through prevention: individual, institutional and community dimension.
In: Cohen CK, Bryant PS eds. Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: FDI. 145-201.

Simnard PL, Brodeur JM, Gingras F, Sauvier A, Demero M (1988).
Effect of remneration on fee-for-service Dental Practice in a third-party payment program.
J Public Health Policy 9: 71-79.

Siskind V, Najman JM, Copeman R (1987).
Infant mortality in socioeconomically advantaged and disadvantaged areas of Brisbane.
Community Health Studies 11(1): 24-30.

Siskind V, Najman JM, Veitch C (1992).
Socioeconomic status and mortality revisited: an extension of the Brisbane area analysis.
Aust J Public Health 16: 315-320.

Sivaneswaran S, Allister JH, Barnard PD (1994).
Dental insurance and utilisation of dental services by Australians 35-44 years, 1987-88, (Abst 36).
J Dent Res 73(4): 741.

Sivaneswaran S, Allister JH, Barnard PD (1995).
Utilisation pattern and oral health of insured and non-insured elderly, (Abst 958).
J Dent Res (Special issue) 74: 520.

Sivaneswaran S, Taylor RJ, Barnard PD (1997).
Patterns of dental services provided in private practice for an insured population in Australia.
Sydney: Univ Sydney.

Sivaneswaran S, Taylor RJ, Lazarus R (1999).
Dental service provision in private general practice for an insured population in New South Wales, Australia.
Community Dent Health 16: 236-244.

Sjostrom O, Lind SO, Holst D (1998).
Pattern of attendance to dentists and hygienists in the county of Goteborgs and Bohus Ian during 1990-1992.
Community Dent Health 15: 77-81.

Slack GL ed (1981).
Dental public health An introduction to community dental health. 2nd edn.
Bristol: Wright.

Slade GD (1993).
Dental insurance. In: AIHW, Dental care for adults in Australia. Proceedings of a workshop.
Adelaide: AIHW DSRU. 53-59.

Slade GD, Spencer AJ, Locker D, Hunt RJ, Strauss RP, Beck JD (1996).
Variations in the social impact of oral conditions among older adults in South Australia, Ontario, and North Carolina.
J Dent Res 75(7): 1439-1450.

Slater SB, Shuval JT (1976).
How social surveys were conducted.
Int Dent J, 26: (3): 307-311.

Smith D, Taylor R, Coates M (1996).
Socio-economic differentials in cancer incidence and mortality in urban New South Wales, 1987-1991.
Aust NZ J Public Health, 20: 129-137.

Smith JM, Sheiham A (1980)
Dental treatment needs and demands of an elderly population in England
Community Dent Oral Epidemiol 8: 360-364.

So FHC, Schwarz E (1996).
Demand for and utilization of dental services among Hong Kong employees with and without dental benefit coverage.
Community Dent Oral Epidemiol 24: 201-206.

Sogaard AJ (1993).
Theories and models of health behaviour.
Cited in: Schou L, Blinkhorn eds. Oral health promotion.
USA: Oxford Univ Press.

Soh G (1992).
Racial differences in perception of oral health and oral health behaviour in Singapore.
Int Dent J 42: 311-327

Spencer AJ (1980).
The estimation of need for dental care.
J Public Health Dent 40: 311-327.

Spencer AJ (1986).
Trends in dental caries: Australian adolescents.
Aust Dent J 31: 262-267.

Spencer AJ (1993).
Cost of dental care (Chapter 9).
Affordability and hardship in purchasing dental care (Chapter 10). In: AIHW, Dental care for adults in Australia.
South Australia: Univ Adelaide. DSRU.

Spencer AJ (1997).
New pattern of dental disease. Caries activity of age cohorts in the Australian population.
Sydney: Aust Dent Assoc News Bulletin, June: 8-14.

Spencer AJ, Lewis JM (1988).
The delivery of dental services: information, issues and directions.
Community Health Studies 12(1): 16-30.

Spencer AJ and Lewis JM [1989]
Service-mix in general dental practice in Australia.
Aust Dent J 34: 69-74.

Spencer AJ, Brown T, Widdop F et al (1993a).
The impact of change in oral health status on dental education, workforce, practices and services in Australia.
Canberra: National Health and Medical Research Council.

Spencer AJ, Brennan DS, Szuster FSP, Goss AN (1993b).
Service-mix of oral and maxillofacial surgeons in Australia and New Zealand.
Int J Oral Maxillofac Surg 22: 310-313.

Spencer AJ, Davies M, Slade G, Brennan DS (1994a).
Caries prevalence in Australia.
Int Dent J 44: 415-423.

Spencer AJ, Brennan DS, Szuster FSP (1994b).
Trends in work effort among private general dental practitioners.
Int Dent J 44: 223-229.

Spencer AJ, Brennan DS, Szuster FSP (1994c).
Changing provision of restorative services in Australia.
J Dent 22: 136-140.

Spencer AJ, Szuster FSP, Brennan DS (1994d).
Service-mix provided to patients in Australian private practice.
Aust Dent J 39(5): 316-320.

Srikandi TW, Carey SE, Clark NG (1983).
Utilisation of dental services and its relations to the periodontal status in a group of South Australian employees.
Community Dent Oral Epidemiol 11: 90-94.

Strauss RP (1976).
Socio-cultural influences upon preventive health behaviour and attitudes towards dentistry.
Am J Public Health 66: 375-377.

Striffler DF (1983).
Chapter 11. Dental treatment need, demand and utilization. In: Striffler DF, Young WO, Burt BA eds. Dentistry, dental practice and the community. 3rd edn.
Philadelphia: WB Saunders Co. 293-339.

Strom T (1988).
Dentistry in the 80's: A changing mix of services.
J Am Dent Assoc 116: 617-624.

Stronks K, Van De Mheen, Looman CWN, Mackenbach JP (1998).
The importance of psychosocial stressors for socio-economic inequalities in perceived health.
Soc Sci Med 46 (4-5): 611-623.

Suchman EA, Rothman AA (1969).
The utilisation of dental services.
Milbank Mem Fund Q 47 (part 2): 56-63.
Cited by: Gift HC (1984). Chapter 4. Utilization of professional dental services. In: Cohen LK, Bryant PS eds. Social sciences and dentistry; A critical bibliography Vol II.
Great Britain: Quintessence Publish/FDI. 203-266.

Taylor R, Quine S, Lyle D, Bilton A (1992)
Socio-economic correlates of mortality and hospital morbidity differentials by Local Government Area in Sydney 1985-1988.
Aust J Public Health 16: 305-314.

Taylor R, Morrell S, Slaytor E, Ford P (1998).
Suicide in urban New South Wales, Australia 1985-94: Socio-economic and migrant interactions.
Sydney: The University of Sydney; Department of Public Health and Community Medicine, Faculty of Medicine.

Taylor R, Chey T, Bauman A, Webster I (1999).
Socio-economic, migrant and geographic differentials in coronary heart disease occurrence in New South Wales, Australia.
Aust NZ J Public Health 23(1): 20-26.

Todd JE (1975).
Children's dental health in England and Wales 1973.
London: HMSO.
Cited by: Beal JF (1996). Social factors and preventive dentistry.
In: Murray JJ ed. Prevention of oral disease.
Oxford: Oxford Univ Press. 217-233.

Todd JE, Dodd T (1985).
Children's dental health in the United Kingdom 1983.
London: HMSO.
Cited by: Beal JF (1996). Social factors and preventive dentistry.
In: Murray JJ ed. Prevention of oral disease.
Oxford: Oxford Univ Press. 217-233.

Todd JE, Lader D (1991).
Adult dental health 1988, United Kingdom.
London: HMSO .
Cited by: Beal JF (1996). Social factors and preventive dentistry.
In: Murray JJ ed. Prevention of oral disease.
Oxford: Oxford Univ Press. 217-233.

Todd JE, Walker JA, Dodd P (1982).
Adult dental health, United Kingdom 1978.
Vol 2: 49: Her Majesty's Stationary Office, London.
Cited by: Davis P (1987). Introduction of the sociology of dentistry: A comparative perspective.
Otago: Univ Otago Press: 13-94.

Townsend P, Phillimore P, Beattie A (1988).
Health and deprivation: Inequality and the North.
London: Croom Helm.

Trithart AH (1968).
Understanding the underprivileged child: Report of an experimental workshop.
J Am Dent Assoc 77: 880-883.

Tuominen R (1994).
Health economics in dentistry
Malibu, California: Med Ed.

USPHS (US Public Health Service) (1975).
Prepaid dental care: A glossary
Washington: US Gov Printing Office.

Valery TF, Goose DH (1971).
Dental caries in children of immigrants in Liverpool.
Br Dent J 130: 27-29.

Van Groenestijn MA, Maas-de Waal CJ, Mileman PA, Swallow JN (1980a).
The ideal dentist.
Soc Sci Med 14A: 533-540.

Van Groenestijn MA, Maas-de Waal CJ, Mileman PA, Swallow JN (1980b).
The image of the dentist.
Soc Sci Med 14A: 541-546.

WHO {World Health Organization} (1986).
Country profiles on oral health in Europe 1986.
Geneva: WHO.

Waldman HB (1988).
More children are using dental services in the second half of the 1980's.
J Dent Child 55: 216-219.

Waldman HB (1989a).
Dental insurance coverage and the use of dental services by children.
J Dent Child 56: 125-128.

Waldman HB (1989b).
Dentistry in the USA: a lesson in survival
J Dent 17: 124-131.

Wan TH, Yates AS (1975).
Prediction of dental services utilisation: A multivariate approach. Inquiry 12: 143-156.
Cited by: Gift HC (1984). Chapter 4: Utilisation of professional dental services.
In: Cohen LK, Bryant PS eds. Social Sciences and Dentistry: A critical bibliography. Vol II.
London: Quintessence Pub Co Ltd. 203-266.

Wennberg JE, Bunker BA, Zubkoff M (1982).
Professional uncertainty and the problem of supplier induced demand.
Soc Sci Med 16: 811-824.

Whittle JG, Davies KW (1992).
A classification of residential neighbourhoods (ACORN) in relation to dental health and dental health behaviours.
Community Dent Health, 9: 217-224.

Willcox S (1991).
A healthy risk? Use of private health insurance.
Canberra: National Health Strategy Issues, Paper No 4.

Williams SA, Gelbier S (1988)
Access to dental health? An ethnic minority perspective of the dental services
Health Educ J 47: 167-170.

Wilson AA, Branch LG (1986).
Factors affecting dental utilisation of elders aged 75 years or older.
J Dent Educ 50: 673-677.

Yang BM (1991).
Health insurance in Korea: opportunities and challenges.
Health Policy Planning: 6(2): 119-129.

Yule B, Parkin DW (1985).
The demand for dental care: an assessment.
Soc Sci Med 21(7): 753-760.

Zola IK (1973).
Pathway to the doctor: from person to person.
Soc Sci Med 7: 677-689.

8 APPENDICES

1. Schedule of dental services designated by Australian Dental Association **[ADA 1994].**

2. Dental fees Australia- September 1995 **[Barnard 1996].**

EMERGENCY TREATMENT		DIAGNOSTIC SERVICES		PREVENTIVE SERVICES		PERIODONTICS		ORAL SURGERY	
			Examinations		**Dental Prophylaxis**				**Extractions**
013	Emergency Exam	011	Initial exam	111	Removal of plaque	213	Treatment of acute periodontal	311	Removal perm tooth
061	Vitality test (per visit)	012	Periodic exam	112	Removal of supra gingival calculus		infection	312	Removal tooth fragment arising
165	Desensit. agent (per visit)	013	Emergency exam		and plaque	221	Periodontal Analysis		from 311, 313 at same appt.
171	Odontopasty - per tooth	014	Consultation	113	Recontour existing rest'n	222	Root planning and subgingival	313	Removal deciduous tooth
311	Exo perm tooth	015	Consultation extended (30mins)	114	Removal of supra and subgingival		curettage (<8 teeth)	316	Removal of additional teeth
313	Exo deciduous tooth	016	Consultation by referral		calculus and plaque (1st visit)	231	Gingivectomy, per segment of 8		at the same visit in adjacent area
329	Non-routine post-op care	017	Consultation by referral -	115	Removal of supra and subgingival		teeth or less		**Surgical Extractions**
398	Minor soft tissue surgery-		extended (30mins)		calculus and plaque (subsequent	232	Periodontal flap surgery, per	321	S/R of erupted tooth
	(eg electrosurgery)				visit)		segment of 8 teeth or less	322	S/R of UE or PE tooth - no bone
411	Direct pulp cap		**Radiographs**			233	Osseous surgery, per segment of 8		removal or tooth division
419	Extirpation of pulp - emergency	022	Single X-ray		**Topical Fluoride**		teeth or less	323	S/R of UE or PE tooth - requires
521	1 surf GIC	023	Two X-rays	121	Applic of topical fluoride	245	Periodontal surgery involving 1		removal bone OR tooth division
522	2 surf GIC	024	Each additional X-ray (up to 7)				tooth	324	S/R of UE or PE tooth-requires
523	3 (or more) surf GIC	025	Occlusal		**Other**	281	Course of non-surgical period		both removal of bone AND
572	Temp restoration	036	Ceph	131	Dietary advice		treatment		tooth division
574	Temp restoration using ortho band	037	OPG	141	Oral hygiene instruction	282	Contin. of periodontal treatment	325	S/R tooth frag (involves soft
651	Recement crown	038	Hand-Wrist	151	Mouthguard		or maintenance subsequent to item		tissue)
652	Recement bridge		**Other**		- JU - Junior (1 layer)		281.	326	S/R tooth frag (involves bone)
741	Adj to full denture	061	Pulp vitality test (per visit)		- SE - Senior (2 layer)			392	Incision/drainage of
742	Adj to partial denture	071	Diagnostic study models		- PR - Professional (3 layer)				abscess/cyst
911	Palliative emergency care	072	Photos intra oral	161	Fissure sealing (per tooth)			398	Minor soft tissue surgery- (eg
912	Sedative dressing	073	Photos - extra oral	165	Applic of desensit agent (per visit)				electrosurgery)
924	Drug prescription	081	Ceph analysis	171	Odontoplasty (per tooth)			912	Sedative dressing
961	Minor occlusal adj - per visit							924	Drug prescription
986	Post op care							942	Sedation - intravenous
								943	Sedation - inhalation

ENDODONTICS

Pulp Treatment

411	Direct pulp capping
412	Pulpotomy (decid. tooth)
414	Pulpotomy (perm tooth)
415	Extirpation of pulp (1st canal)
416	Extirpation of pulp (additional canals)
417	Root canal obturation (1st canal)
418	Root canal obturation (additional canals)
419	Extirpation of pulp - emergency
421	Pulpectomy & root canal filling (decid tooth)

Other Endodontic Services

441	Bleaching 1 tooth non vital
443	Bleaching 1 tooth vital
445	Explore calcified root
451	Removal of root filling (per canal)
452	Removal of post/crown
455	Additional irrigation/dressing
458	Interim therapeutic root filling

Bleaching

014	Consultation
015	Consultation extended (30mins)
072	Photos - intra oral
111	Removal of plaque
112	Removal of supragingival calculus and plaque
926	Bleaching tray - per arch

RESTORATIVE SERVICES

Amalgam Restorations

511	Amalgam fill - 1 surf
512	Amalgam fill - 2 surf
513	Amalgam fill - 3 surf or more
598	Complex coronal reconstruct in amalgam (add extra pins/post)
627	Amalgam core for crown

GIC & Composite Restorations

521	GIC - 1 surf
522	GIC - 2 surf
523	GIC - 3 surf or more
529	Adhesive restoration of non carious cervical lesion.
531	Comp resin - 1 surf Post
532	Comp resin - 2 surf Post
533	Comp resin - 3 (or more) surf Post
537	Comp resin - 1 surf Ant
538	Comp resin - 2 surf Ant
539	Comp resin - 3 (or more) surf Ant
599	Complex coronal reconstruction comp resin (direct)
628	Comp resin or GIC core for crown

Other Restorative Services

572	Temporary restoration
573	Temporary crown
574	Temporary restoration using orthodontic band
575	Pin retention (per pin)
577	Cusp capping (per cusp)
578	Restore incisal corner ant tooth
579	Temp bridge
582	Enamel bonded composite facing
597	Post-cast, wrought or preformed.

CROWN AND BRIDGE

Crowns

613	Porcelain jacket crown
615	Porcelain fused to gold crown
618	Cast gold crown
620	Three quarter cast gold crown
625	Cast core for crown including post
627	Amalgam core for crown
628	Comp resin or GIC core for crown

Bridges

642	Bridge pontic - gold (per pontic)
643	Bridge pontic - porcelain or porcelain fused to gold (per pontic)

Repairs and Other Services

071	Study models
171	Odontoplasty (per tooth)
571	Recement inlay
573	Temp crown
579	Temp bridge
651	Recement crown/veneer
652	Recement bridge/splint
655	Removal of crown
656	Removal of bridge/splint
659	Repair/replace broken facing crown/bridge

PROSTHODONTICS

New Dentures and Denture Components

711	Full upper
712	Full lower
719	Full upper AND lower
721	Partial upper denture - acrylic base.
722	Partial lower denture - acrylic base (Add 731, 732, 733, 734, 736 and 738 where applicable.)
727	Partial upper denture - cast CoCr base.
728	Partial lower denture -cast CoCr base (Add 733,734 or 736 where appropriate. 731, 732 only used where not an integral part of base.)
731	Each retainer
732	Occlusal rest - where not used as part of retainer
733	Each tooth
736	Immed tooth replacement - in addition to 711, 712, 719, 721, 725, or 727.
TPD	Temporary partial denture - a temporary acrylic denture only used prior to a CoCr denture.

Denture Maintenance (Not Associated with new dentures)

741	Adj full denture - not associated with new dentures
742	Adj partial denture - not associated with new dentures
743	Relining full denture
744	Relining partial denture
751	Relining full denture (direct)
752	Relining partial denture (direct)

Repairs and Other Services

761	Reattach undamaged tooth/clasp
762	Replace lost/broken clasp
763	Repair full denture base
764	Repair partial denture base
765	Replace tooth on full denture
766	Replace tooth on partial denture
768	Adding tooth to partial denture to replace extracted tooth - add 736 if immediate
769	Repair or addition to metal casting
771	Tissue conditioning prior to impressions
776	Imp for denture repair
926	Bleaching tray - per arch

Occlusal Therapy

961	Minor occlusal adjustment - per visit
965	Occlusal Splint
966	Adjustment of occlusal splint - at subsequent visit

Dental Fees Australia – September 1995

General Practitioners (Central 80% – 0's Responses †)

Item No.	Service	1995 Sample†	1995 $ Range	1995 $ St. Dev.	Mean Fee $ 1993	Mean Fee $ 1995	% change 1993-1995
$ hour	HOURLY RATE	1183	150-270	25	186	200	7
	DIAGNOSTIC SERVICES						
011	Initial oral examination	3057	21-45	5	27.50	30.40	11
012	Periodic oral examination	3016	20-34	4	24.20	26.50	9
014	Consultation, including examination	2818	22-40	4	27.40	30.30	11
022	Intraoral periapical or bitewing radiograph – single film	3101	20-30	3	22.40	24.20	8
023	Intraoral periapical or bitewing radiographs – two films	3092	30-48	4	36.40	39.50	9
024	Each periapical or bitewing radiograph (up to 7) additional to item 023	3012	10-20	3	14.30	15.70	10
037	Panoramic radiograph (OPG)	624	5-85	8	63.60	68.80	8
071	Diagnostic cast (single)	2374	20-50	8	29.00	30.90	7
	PREVENTIVE SERVICES						
111	Removal of plaque	2798	20-45	6	29.00	31.60	9
112	Removal of supragingival calculus and plaque	2975	35-65	7	45.30	49.00	8
121/111	Topical application of fluoride (one treatment including plaque removal)	2778	19-65	13	35.80	39.20	10
161	Fissure sealing – per tooth	2807	20-35	14	24.60	26.20	6
	PERIODONTICS						
222	Root planing and subgingival curettage, per segment of eight teeth or less	2075	40-100	16	64.00	70.40	10
232	Periodontal flap surgery, per segment of eight teeth or less	641	73-210	35	123	133	8
	ORAL SURGERY						
311	Removal of permanent tooth or part(s) thereof	3084	53-80	6	57.60	64.30	10
316	Removal of additional tooth or part(s) thereof complementary to and in the vicinity of a procedure described by item 311, 313 or other 316	3008	30-63	8	36.80	41.20	12
323	Surgical removal of unerupted or partly erupted tooth, requiring removal of bone or tooth division	2640	95-180	22	125	137	10
	ENDODONTICS						
*415	Complete chemo-mechanical preparation of root canal – one canal	2930	90-180	26	115	130	13
*416	Complete chemo-mechanical preparation of root canal – each additional canal	2862	35-90	12	48.20	54.50	13
417	Root canal obturation – one canal	2917	90-170	20	114	124	8
418	Root canal obturation – each additional canal	2870	31-90	14	48.30	52.50	9
	RESTORATIVE SERVICES						
511	Amalgam restoration – one surface – permanent tooth	2984	45-70	6	49.70	54.90	10
512	Amalgam restoration – two surfaces – permanent tooth	2991	57-85	7	61.20	67.80	11
513	Amalgam restoration – three or more surfaces – permanent teeth	2984	70-99	7	76.30	84.40	11
522	Glass ionomer restoration – two surfaces	2893	50-75	7	56.20	61.20	9
529	Adhesive restoration of non-carious cervical lesion (glass ionomer or composite resin)	2616	35-70	8	47.10	51.40	9
531	Composite resin restoration – one surface – posterior tooth	3019	54-85	8	61.30	68.30	12
532	Composite resin restoration – two surfaces – posterior tooth	3000	67-110	11	76.70	86.30	13
533	Composite resin restoration – three or more surfaces – posterior tooth	2928	80-140	15	93.60	106	13
537	Composite resin restoration – one surface – anterior tooth	3079	50-80	8	59.00	64.70	10
538	Composite resin restoration – two surfaces – anterior tooth	3075	63-94	8	70.30	77.20	10
573	Temporary crown	2199	50-120	17	72.00	79.40	10
575	Pin retention – per unit pin	2956	10-20	2	14.40	15.80	10
582	Enamel bonded composite resin facing (not covered by items 581 or 537)	2717	85-185	24	117	128	9
583	Porcelain laminate veneer facing	2367	320-580	63	406	442	9
	CROWN AND BRIDGE						
615	Porcelain fused to gold jacket crown	3056	650-942	70	747	793	6
643	Bridge – porcelain or porcelain fused to gold – per pontic	2848	495-900	112	652	680	4
	PROSTHODONTICS						
711	Complete maxillary denture	3047	450-700	53	505	547	8
719	Complete maxillary and mandibular dentures	3040	800-1200	98	898	962	7
721/ 733/731	Partial denture: acrylic base; six teeth; two free end saddles; two retainers	2903	350-600	61	418	452	8
731	Each retainer (for acrylic partial)	2055	15-40	5	21.90	23.60	8
*727	Partial denture, cast alloy framework – one or two teeth	3018	580-900	78	692	738	7
763	Repairing broken base of complete denture	2890	48-92	12	61.70	66.80	8
	ORTHODONTICS						
821	Active removable appliance – one arch	1397	250-580	71	366	395	8
834	Full arch banding – two arches	375	750-3000	734	1970	1967	0
	GENERAL						
912	Sedative dressing for emergency treatment	2916	28-57	7	35.20	39.90	13
961	Minor occlusal adjustment – per visit	2092	20-50	7	29.50	32.50	10

*These are the new definitions valid from 1.1.95. †Sample is central 80% of responses (excludes zeros) from general practitioners.