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REPORT ON THE FIRST EVALUATION OF A
PILOT DENTAL PREVENTIVE PROJECT IN FIJI - 1981

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PRECIS

This report constitutes the first annual evaluation of a pilot preventive dental project initiated in two urban areas in 1980 and designed to run for three years. There is evidence that the incidence of dental decay amongst participating children has decreased by over 30 per cent although improvement in oral hygiene is marginal.

These results are very encouraging.

I. INTRODUCTION

1. A dental survey of urban school children carried out in the six main centres of Fiji in 1978 showed that dental decay rates in the non-fluoridated areas had reached a 'moderate' level and that oral hygiene was generally poor.¹ The project described in this report is aimed at reducing the incidence of dental caries and improving oral hygiene. It was introduced on a pilot basis into certain schools in the Nausori and Lautoka areas of the island of Viti Levu in February and March 1980.²

2. Three techniques were employed: brushing six times a year with 10 per cent stannous fluoride paste (SnF_2), brushing three times a year with 1.23 per cent acidulated phosphate fluoride gel (APF) followed immediately by 10 per cent SnF_2 paste, and rinsing fortnightly during school term time with 0.2 per cent sodium fluoride solution (NaF).

3. All three techniques were applied under the direct supervision of dental service personnel and in the two brushing groups parents were invited to attend the sessions and to help in the procedure.

4. Each technique has its own particular advantages and disadvantages and a secondary objective of the project is to see which if any is most appropriate in Fiji's particular situation. In all, the project covers approximately 5000 children and is designed to run initially for a period of three years.

II. METHODS OF EVALUATION

5. At the initiation of the project (1980) one in five of the children at the schools involved was randomly selected and examined. Data on their dental caries³ and oral hygiene status were recorded and subsequently entered onto the SPC computer. Twelve months later after the techniques (outlined in the introduction) had been applied, a second examination was carried out on the same children. Excluded from this second examination were children who had left the schools permanently or who were absent for any reason on the day of the examination. At the same time one in five children who had just started school were included for their first examination.

6. Age specific comparisons were then made between mean dental caries rate (DMFT) and mean modified oral hygiene indices (MOHI) in 1980 and 1981. Only those children who had been examined in 1980 and 1981 were included for purposes of comparison.

III. RESULTS

7. Number of children examined: (Table 1). Overall, the number of children examined in both 1980 and 1981 decreased by approximately 24 per cent. Losses were highest in the youngest age group and amongst the 11, 12, 13 and 14 year-olds.

8. Ethnic composition of the sample: (Table 2). Although there was some variation in individual age groups the overall proportions in the number of the sample remained the same in 1980 and 1981; 51 per cent were Fijian, 45 per cent were Indian and 4 per cent 'Others'.

9. Dental caries: Tables 3, 3a, 3b and 3c. The changes in mean age specific caries rates between 1980 and 1981 for all groups combined are shown in Table 3. There was some variation between the different age groups but overall they averaged out to reductions of 0.6 DMF teeth per child with an overall percentage reduction of 37.5 per cent.

10. Similar comparisons between 1980 and 1981 for the group brushing six times a year with 10 per cent SnF₂ paste are given in Table 3a. In this instance the overall reductions were 0.6 DMFT or 34.4 per cent.

11. The group brushing three times a year with APF and SnF₂ (Table 3b) showed overall reductions of 0.8 DMFT or 41.4 per cent.

12. The NaF rinsing group showed reductions of 0.5 DMFT or 33.7 per cent (Table 3c).

13. Changes in oral hygiene status: These details are shown in Tables 4, 4a, 4b and 4c. For all groups combined there is a difference of almost 14 per cent. The SnF₂ brushing group showed a reduction of approximately 8 per cent, the group brushing with SnF₂ and APF showed a reduction of about 13 per cent whilst the rinsing group showed a reduction of approximately 15 per cent.

IV. DISCUSSION

14. It is inevitable that with the passage of time some children will drop out of the project as they leave primary school to go on to secondary. This is shown in the increasing reductions in the numbers of children from eleven years onward. Losses in the younger age groups, either through temporary absence or transfers to other schools, are particularly important since they reflect either a complete cessation of the protection afforded by the fluoride or a reduction in the frequency of application. This is an aspect of the project which should be given further attention at the next evaluation (1982) since preliminary examination of the records that are being kept would seem to indicate that the frequency of application in some cases is falling below that envisaged in the original protocol. (See, for example, Report on a visit to French Polynesia, 1-9 May 1980, by J.D. Speake. Noumea: South Pacific Commission, 1980.)

15. Other factors arising from loss or absence from the project which must be taken into consideration are the ethnic differences in dental diseases status which recent oral health surveys have revealed.⁴ Fijian children on the average tend to have higher decay rates and higher oral hygiene indices than their Indian counterparts. There is also some difference in the structure of the education systems of the two major ethnic groups. Whereas Indian children in the main leave primary school at approximately eleven years and move on to secondary school, many Fijian schools retain a system where the children continue at the same school until fourteen years. The effects of these two factors are to some extent reflected in the data presented here. Clearly then ethnic proportions have to be taken into consideration when assessing the impact of the preventive techniques. Table 2 shows that for children examined in 1980 and 1981 the overall ratios have remained constant although there was some variation in some age groups.

16. It should also be stressed that this project has in fact no true cohort control group and that comparisons are being made on an age specific longitudinal basis. The reasons for this approach are that there was adequate evidence at the beginning of the project, from studies elsewhere, that all three techniques employed produce effective reductions in the incidence of dental decay and that the deliberate withholding of fluoride from any group could not be justified.⁵ Fortunately this approach in no way interferes with the secondary objective of the project which is to determine which of the techniques is most suitable in Fiji from the point of view of economics and convenience.

17. It may also be noted that some of the age sub-groups are quite small but this has been compensated for by combining them for each of the three techniques, adjusting appropriately for numbers in each age cell.

18. The evidence is that during the first year of the project the overall incidence of dental caries has been reduced by a little more than half a tooth per child (0.6 DMFT) on the average and that (expressed as a percentage) this reduction has been in the order of 38 per cent.

19. At this stage statistical tests of significance have not been performed but percentage reductions in caries are highest in the SnF_2 + APF brushing group and lowest in the NaF rinsing group.

20. Where oral hygiene is concerned, there is some very slight evidence of a reduction in indices taken overall between 1980 and 1981. This reduction is however only in the order of 14 per cent and it is very unlikely that it would be sufficient to bring about long-term benefits in the form of improved gingival or periodontal conditions. There appears to be no evidence at this stage, according to this particular survey, that the technique of brushing is superior to the technique of rinsing. Indeed the reverse seems to be the case.

21. To date, the project seems to be fulfilling its objective of reducing dental caries and of providing information on which rational decisions can be made concerning the most appropriate preventive methods for Fiji.

REFERENCES

1. Speake J.D., Singh D. and Ligani M. Caries, periodontal diseases and treatment requirements amongst urban school children in Fiji, Odontostomatologie tropicale: Tropical Dental Journal, 3(2) 1980 : 47-63.
2. Speake J.D. and McKegg R.N. Report on a visit to Fiji (February - March)1980 - Initiation of pilot dental preventive project (Noumea: South Pacific Commission, 1980).
3. Oral Health Surveys - Basic Methods, 2nd Edition (Geneva : World Health Organization, 1977).
4. Speake J.D., Singh D., Ligani M. and Pal V. Report on a dental survey of rural school children in Fiji - 1980 (Noumea: South Pacific Commission, 1981).
5. Naylor M.N. and Mainwaring P.J. Clinical trials of dentifrices Community Dentistry and Oral Epidemiology, 8(5) 1980: 273-277.

Table 1. Number of children examined in 1980 and 1981

Age	1980	1981	Difference	Percentage
6	168	133	-35	-21%
7	158	146	-12	- 8%
8	128	110	-18	-14%
9	135	118	-17	-13%
10	134	114	-20	-15%
11	112	68	-44	-39%
12	96	55	-41	-42%
13	64	23	-41	-64%
14	10	0	-10	-100%
Overall	1005	767	-238	-24%

Table 2. Ethnic groups expressed as percentage

	Age	7	8	9	10	11	12	13	Overall
INDIAN	1981	45	49	57	41	50	32	29	45
	1980	48	54	45	49	34	31	30	45
	Change	-3	-5	+12	-8	+16	+1	-1	0
FIJIAN	1981	49	47	41	57	48	61	65	51
	1980	48	43	53	49	59	65	65	51
	Change	+1	+4	-12	+8	-11	-4	0	0
OTHERS	1981	6	4	3	2	2	7	6	4
	1980	4	4	3	2	7	4	4	4
	Change	+2	0	0	0	-5	+3	+2	0

Table 3. Comparisons of mean age specific caries rates (DMFT)
1980 and 1981: all groups combined

Age	No.1981	DMFT 1980	DMFT 1981	Difference DMFT	Difference Percentage
7	131	0.8	0.3	-0.5	-62.5%
8	140	1.1	0.6	-0.5	-45.5%
9	113	1.3	0.9	-0.4	-30.8%
10	119	1.8	1.1	-0.7	-38.9%
11	118	2.1	1.9	-0.2	-9.5%
12	72	3.9	2.1	-1.8	-46.2%
13	51	4.4	3.7	-0.7	-15.9%
Overall	744	-	-	-0.6	-37.5%

Table 3a. Comparison of mean age specific caries rates (DMFT)
1980 and 1981: brushing with SnF_2 x 6/year

Age	No.1981	DMFT 1980	DMFT 1981	Difference DMFT	Difference Percentage
7	34	0.8	0.4	-0.4	-50.0%
8	38	1.4	0.4	-1.0	-71.4%
9	28	1.3	1.1	-0.2	-15.4%
10	38	2.0	1.1	-0.9	-45.0%
11	23	2.5	2.9	+0.4	+16%
12	23	4.9	3.2	-1.7	-37.7%
13	25	5.0	4.6	-0.4	-8.0%
Overall	209	-	-	-0.6	-34.4%

Table 3b. Comparison of mean age specific caries rates (DMFT)
1980 and 1981: brushing with SnF₂ + APF x 3/year

Age	No.1981	DMFT 1980	DMFT 1981	Difference DMFT	Difference Percentage
7	54	0.8	0.3	-0.5	-62.5%
8	40	1.1	0.8	-0.3	-27.3%
9	39	1.2	0.8	-0.4	-33.3%
10	48	1.9	0.9	-1.0	-52.6%
11	55	2.1	1.7	-0.4	-19.0%
12	25	5.8	1.9	-3.9	-67.2%
13	5	-	-	-	-
Overall	266	-	-	-0.8	-41.4%

Table 3c. Comparison of mean age specific caries rates (DMFT)
1980 and 1981: Rinsing with NaF fortnightly (approximately
x 18/year)

Age	No.1981	DMFT 1980	DMFT 1981	Difference DMFT	Difference Percentage
7	43	0.8	0.3	-0.5	-62.5%
8	62	0.9	0.7	-0.2	-22.2%
9	46	1.4	0.8	-0.6	-42.9%
10	33	1.7	1.2	-0.5	-29.4%
11	40	1.7	1.5	-0.2	-11.8%
12	24	2.3	1.3	-1.0	-43.5%
13	21	3.8	2.8	-1.0	-26.3%
Overall	269	-	-	-0.5	-33.7%

Table 4. Comparison of mean modified oral hygiene indices (MOHI) 1980 and 1981: all groups combined

Age	No.1981	MOHI 1980	MOHI 1981	Difference MOHI	Difference Percentage
7	131	1.6	1.4	-0.2	-12.5%
8	140	1.6	1.3	-0.3	-18.8%
9	113	1.5	1.4	-0.1	-6.7%
10	119	1.5	1.3	-0.2	-13.3%
11	118	1.5	1.3	-0.2	-13.3%
12	72	1.4	1.2	-0.2	-14.3%
13	51	1.4	1.1	-0.3	-21.4%
Overall	744	-	-	-0.2	-13.8%

Table 4a. Comparison of mean modified oral hygiene indices (MOHI) 1980 and 1981: Brushing with SnF₂ x 6/year

Age	No.1981	MOHI 1980	MOHI 1981	Difference MOHI	Difference Percentage
7	34	1.4	1.6	+0.2	+14.3%
8	38	1.7	1.3	-0.4	-23.5%
9	28	1.5	1.6	+0.1	+6.7%
10	38	1.6	1.5	-0.1	-6.3%
11	23	1.6	1.1	-0.5	-31.3%
12	23	1.2	1.2	0	0
13	25	1.4	1.1	-0.3	-21.4%
Overall	209	-	-	-0.1	-8.2%

Table 4b. Comparison of mean modified oral hygiene indices (MOHI) 1980 and 1981 - brushing with acidulated phosphate fluoride and stannous fluoride (SnF_2 + APF) x 3/year

Age	No.1981	MOHI 1980	MOHI 1981	Difference MOHI	Difference Percentage
7	54	1.5	1.3	-0.2	-13.3%
8	40	1.5	1.2	-0.3	-20.0%
9	39	1.4	1.2	-0.2	-14.3%
10	48	1.4	1.2	-0.2	-14.3%
11	55	1.4	1.3	-0.1	-7.1%
12	25	1.2	1.0	-0.2	-16.7%
13	5	-	-	-	-
Overall	266			-0.2	-13.4%

Table 4c. Comparison mean modified oral hygiene indices (MOHI) 1980 and 1981 - rinsing with sodium fluoride (NaF) fortnightly in school term time

Age	No.1981	MOHI 1980	MOHI 1981	Difference MOHI	Difference Percentage
7	43	1.6	1.5	-0.1	-6.3%
8	62	1.6	1.4	-0.2	-12.5%
9	46	1.6	1.4	-0.2	-12.5%
10	33	1.6	1.3	-0.3	-18.8%
11	40	1.7	1.3	-0.4	-23.5%
12	24	1.5	1.2	-0.3	-20.0%
13	21	1.4	1.1	-0.3	-21.4%
Overall	269	-	-	-0.2	-15.3%