

STATISTICAL STUDY OF THE PRIMARY CAUSES OF EXTRACTIONS¹

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This study was undertaken in an attempt to evaluate the relative importance of the common dental disorders. Caries and pyorrhea are considered the most common dental diseases, but the literature is somewhat confusing as to their comparative importance. Caries is said to be the most prevalent of all diseases (1), even more common than the common cold (2). Very few individuals escape its attack, its occurrence ranging from 75% to 95% in the civilized nations (3). Yet the fact has been emphasized that periodontal disease is extremely prevalent (4), with an estimated prevalence of 80% among adults (2). And it has been suspected as the cause of more extractions than any other disease (5). It is hoped that this study will present a clearer picture of the problem.

METHOD

The investigation consisted of the study of 1,167 consecutive registrants at the University of Michigan dental school clinic. About one-third of these underwent extractions. Using the diagnoses as made by staff members, the primary causes of extractions were divided into 8 groups:

1. *Caries*. All extractions in which caries was the primary factor, inoperable pulpal involvements due to caries, teeth fractured due to extensive caries, pulpless teeth (as a result of caries) with apical pathosis, etc. All but 5 of the pulpal involvements were due to caries.

2. *Periodontal disease (pyorrhea)*. All teeth lost as a result of periodontal disease.

3. *Impaction*. Extractions indicated by complete or partial impaction (non-eruption).

4. *Prosthetic correction*. Teeth sacrificed solely to facilitate better prosthetic restoration.

5. *Orthodontic correction*. Teeth (except supernumerary) which were extracted for correction or prevention of malocclusion.

6. *Supernumerary teeth*.

7. *Traumatic causes*. Pulpal pathosis due to trauma, and teeth fractured (without caries) beyond safe restoration.

8. *Surgical involvement*. Teeth involved secondarily in maxillo-facial surgery.

These 8 causal groups provide the 1,424 teeth in this study. The grouping is patterned after Brekhuis' report on the causes of extractions (6). However, it is felt that primary factors are more significant for present purposes than secondary causes used by Brekhuis.

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Table I presents the distribution of extractions as to cause, sex, and age. *Fig. 1* indicates the percentage of extractions in each causal group. From these two charts, it is evident that caries and periodontal disease, together, accounted for almost 90% of the teeth lost, the remaining 10% being distributed among the 6 minor causes (Table II).

TABLE I
Distribution of extractions

AGE	SEX	NO. EXT.	NO. CASES	CARIES		PYOR-RHEA		IMPAC-TION		PROS-THET.		ORTHO-DONT		SUPER-NUM		TRAU-MATIC		SURGI-CAL			
				Ext.	Cases	Ext.	Cases	Ext.	Cases	Ext.	Cases	Ext.	Cases	Ext.	Cases	Ext.	Cases	Ext.	Cases	Ext.	Cases
1-10	M	21	7	19	5							1	1								
	F	42	15	35	10							5	3	2	2						
11-20	M	85	63	59	44	1	1	12	8			10	7			3	3				
	F	29	20	13	9	0	0	10	6			6	5			0	0				
21-30	M	154	68	127	45	1	1	21	17	0	0	3	3	2	2			0	0		
	F	135	49	81	29	20	3	15	11	13	3	1	1	2	1			3	1		
31-40	M	163	30	52	18	102	7	5	3	0	0			1	1	3	1				
	F	67	18	49	14	16	2	1	1	1	1			0	0	0	0				
41-50	M	107	16	63	11	44	5			0	0										
	F	153	19	40	6	104	12			9	1										
51-60	M	152	12	2	2	135	9			15	1										
	F	119	15	68	8	51	7			0	0										
61-70	M	89	9	34	3	51	4			2	1							2	1		
	F	18	3	9	2	9	1			0	0							0	0		
over 70	M	61	5	37	3	24	2														
	F	29	4	7	2	22	2														
Total....	M	832	210	393	131	358	29	38	28	17	2	14	11	4	4	6	4	2	1		
	F	592	143	302	80	222	27	26	18	23	5	12	9	4	3	0	0	3	1		
		1424	353	695	211	580	56	64	46	40	7	26	20	8	7	6	4	5	2		

Fig. 2 represents the total extractions classified according to age and sex. *Fig. 3* and Table III presents total extractions, caries-extractions, and pyorrhea-extractions, in each age group.

The average extractions per patient in each causal group are given in *Fig. 4* and Table IV:

The averages for caries and periodontal disease seem significant. Data for the other groups are included merely for the sake of completeness. Their significance is questionable because of the small number of cases.

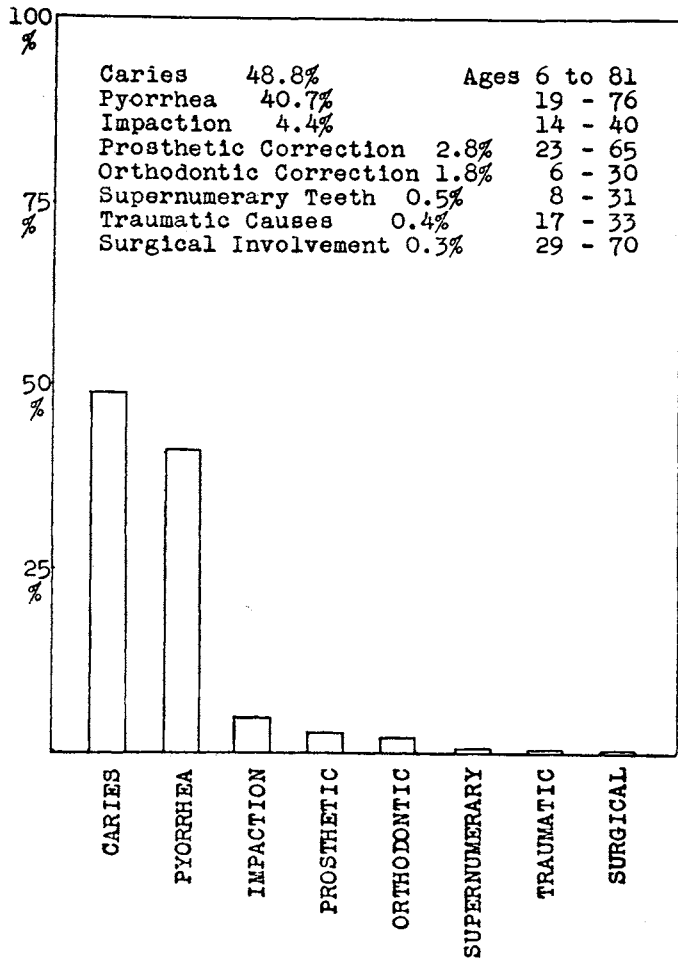


Fig. 1. Primary Causes of Extractions

TABLE II

	PER CENT	NUM. EXT.	AGE RANGE
Caries.....	48.8	695	6 to 81
Periodontal disease.....	40.7	580	19-76
Impaction.....	4.4	64	14-40
Prosthetic correction.....	2.8	40	23-65
Orthodontic correction.....	1.8	26	6-30
Supernumerary teeth.....	0.5	8	8-31
Traumatic causes.....	0.4	6	17-33
Surgical involvement.....	0.3	5	29-70

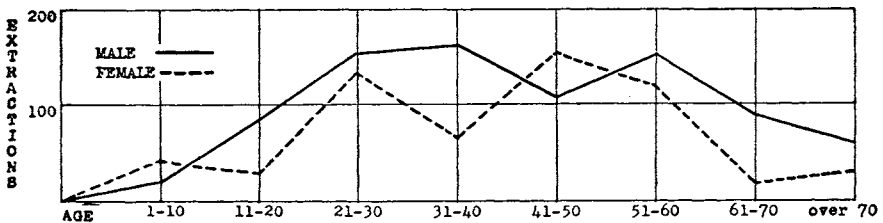


Fig. 2. Age-Sex Factor in Total Extractions

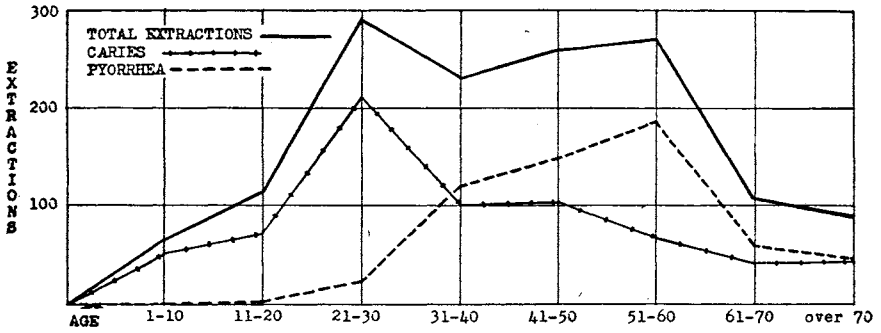


Fig. 3. Age Factor in Caries- and Pyorrhea-Extractions

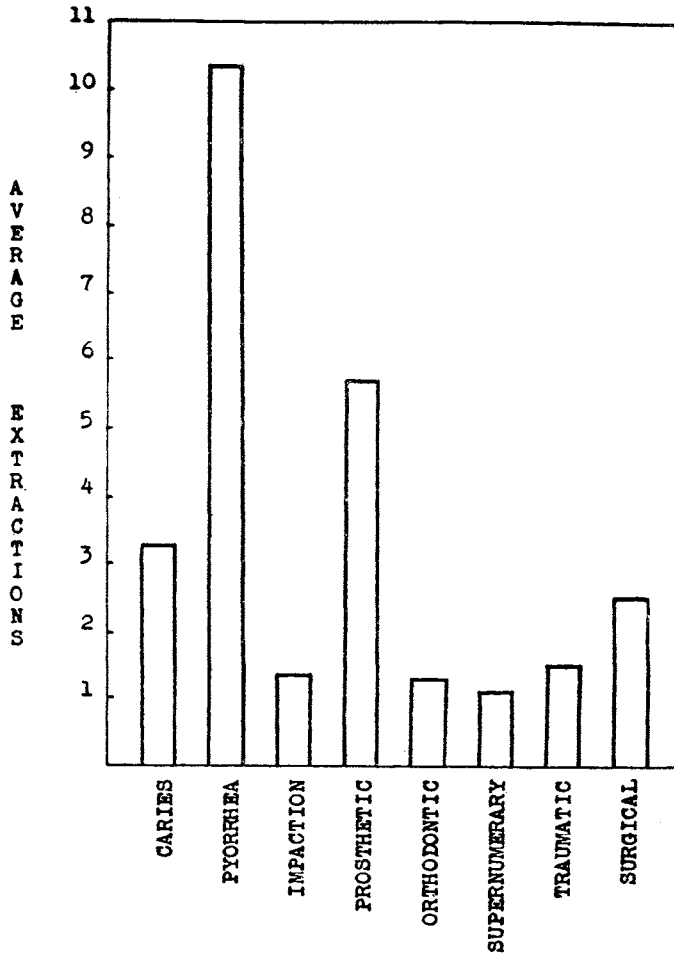


Fig. 4. Average Extractions per Patient

SUMMARY

An analysis was made of the causes of extraction of 1,424 teeth. In 59% of the patients studied, teeth were extracted as a result of caries. This comprised 48.8% of all extracted teeth. Each patient averaged 3.29 extractions. The caries group ranged in age from 6 to 81 years, the only causal group that appeared in all ages. Males outnumbered female patients, 3 to 2.

Those in the periodontal disease group comprised 13% of all patients, and 40.7% of all extractions. Each patient averaged 10.35 extractions. Numbers of male and female patients were nearly equal.

Impacted (unerupted) teeth constituted the third largest group, 4.4% of all teeth extracted, involving 3 age groups, from 14 to 40 years. Extractions for

TABLE III

AGE GROUP	CARIES EXT.	PYORRHEA EXT.	TOTAL EXT.
1-10	54	—	63
11-20	72	1	114
21-30	208	21	239
31-40	101	118	230
41-50	103	148	260
51-60	70	186	271
61-70	43	60	107
over 70	44	46	90

TABLE IV

Caries.....	3.29
Periodontal disease.....	10.35
Impaction.....	1.39
Prosthetic correction.....	5.71
Orthodontic correction.....	1.30
Supernumerary teeth.....	1.14
Traumatic causes.....	1.50
Surgical involvement.....	2.50

prosthetic correction made up the fourth group, with 2.8% of all extractions, but with less than 1% of the total patients. Supernumerary teeth accounted for 0.5% of all extractions, traumatic causes for 0.4%, and surgical involvement, 0.3%.

From this data, the most notable fact seems to be the relative importance of caries and periodontal disease. Almost one-half the extractions were due to caries, and about 40% were due to pyorrhea. Yet caries-extractions averaged approximately 3 per patient, and periodontal disease-extractions were approximately 10 per patient. Although extraction statistics such as these are entirely inadequate in determining the incidence of dental disease and disorders, they do indicate the relative importance of the various disorders in terms of oral health.

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