

# Pattern of dental caries in Mulago Dental School clinic, Uganda

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## ABSTRACT

Information on dental caries among patients attending Mulago Hospital is scarce. Yet knowledge of the pattern of caries can be used to plan preventive and treatment interventions. This study describes the pattern of dental caries (in terms of age group, tooth and tooth surface and gender) among patients attending the Public Health Dental Officers School Clinic, Mulago Hospital. **Methodology:** A review of patients' treatment records for the period 1995 to 1999 was done. A total of 1800 cards were reviewed for the diagnosis of dental caries, age, gender and the data was analyzed using EPI INFO 6 program. The patients were from both urban and peri-urban settings and were aged between 10-90 years.

**Results:** The results showed that the most frequently affected tooth surface was the occlusal (68.8%) followed by the interproximal (24%) and the least affected was the lingual/palatal (1.5%). The second molars were found to be the most affected of all teeth, with tooth 37(12%), 47(11%), 17(9.5%) and 27 (9.1%). The distribution of caries was higher in the lower than the upper jaw. There was a slight difference in sex predilection with females having 54.5% and males 45.5% of the lesions and the age group most affected was 20-29 years.

**Conclusion:** The results showed a high occurrence of occlusal surface caries in molars especially the second molars in the 20-29 age group in the patients attending the Public Health Dental Officers School Clinic, Mulago Hospital.

**Key words:** caries experience, tooth surfaces, occlusal.

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## INTRODUCTION

The pattern of caries among other things includes: the rate of attack, distribution, and progression of the disease within the population. This study looked at the pattern of caries among patients who attended the Public Health Dental Officers School Clinic, Mulago Hospital in relation to the type of tooth, tooth surfaces, age groups and gender most affected. Literature on oral health status in Uganda is limited. The available research<sup>1</sup> mainly focuses on epidemiological data with respect to incidence and prevalence. Little attention<sup>2</sup> has been paid to establish the pattern of dental caries on the individual teeth and surfaces. Data on teeth and surfaces at most risk is scarce in the African region. Yet knowledge about the most attacked teeth and surfaces can contribute to the design of preventive clinical procedures and community-based programmes. In this way resources can be targeted at teeth and surfaces at high risk. This is in line with the recommen-

dations of Ismail *et al*<sup>3</sup> who suggested that to counteract the potential increase in the prevalence of dental caries in developing countries, preventive and oral health promotion programmes should be planned and implemented and especially targeted at those at greatest risk.

Although caries was not taken to be a major problem in Africa<sup>4,5</sup>, there is now evidence of a rise<sup>6-9</sup> in prevalence of dental caries in the developing countries. This rise in dental caries places a further burden on the resources available for oral health. There is therefore, a need to study and understand the pattern of caries in Uganda in order to plan better for the appropriate allocation of these scarce resources. Pack<sup>10</sup>, in her paper on dental services and needs in developing countries, highlighted the need to focus on primary care, and prevention strategies to be designed and implemented urgently. These would have to be monitored and scientifically analyzed for effectiveness.

The aim of this study was to establish the pattern of dental caries among age groups, gender, tooth types and tooth surfaces in patients attending the Public Health Dental Officers School Clinic, Mulago Hospital.

## METHODS AND MATERIALS

This was a retrospective, cross-sectional study of the treatment records of patients who attended the Public Health Dental Officers School Clinic, Mulago Hospital. Students under supervision completed most of the patient record cards reviewed. Treatment records were used in this study because of the availability of the patients' information

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long after their treatment is completed. The patient records were reviewed for the following information: diagnosis of caries based on tooth and tooth surface affected<sup>11</sup>, age and gender. Any card without the above criteria was rejected. Mulago Hospital was used because of the big turnover of patients who come from mainly urban and peri-urban communities. A search of the records for the period 1995 to 1999 was done and 1,800 cards were reviewed. The data was then analyzed using the EPI INFO 6 programme.

## RESULTS

Table I shows the distribution of caries according to tooth surfaces. The sites considered were occlusal, interproximal, lingual and buccal. The most frequently affected site was the occlusal (68.8%) surface and the least affected sites were lingual/palatal (1.5%)

**Table I: Distribution of caries according to tooth surfaces**

Site	Number	%
Occlusal/ incisal	3896	68.8
Interproximal	1359	24
Buccal/labial	324	5.7
Lingual/palatal	84	1.5
<b>Total</b>	<b>5663</b>	<b>100</b>

Table II shows the number and percentage of teeth affected by caries on the occlusal surface. The results show that the molars were the most affected of all the teeth with 75.3%. The distribution of caries within the individual molars shows that the second molars contributed the highest (41.7%) and the first molars contributed the least (16.4%). Caries distribution was higher in the lower jaw (53%) than the upper jaw (47%).

**Table II: Number and percentage of teeth affected by caries on the occlusal surface**

Tooth type $\phi$	Number	%
37	484	12.0
47	444	11.0
17	374	9.5
27	354	9.1
38	275	4.9
48	268	4.7
36	247	4.4
46	242	4.3
16	229	4.0
28	219	3.9
18	214	3.8
26	209	3.7
Others $\sigma$	996	24.7
<b>Total</b>	<b>4555</b>	<b>100</b>

$\phi$ Based on FDI nomenclature

$\sigma$ The rest of the dentition (incisors, canines and premolars)

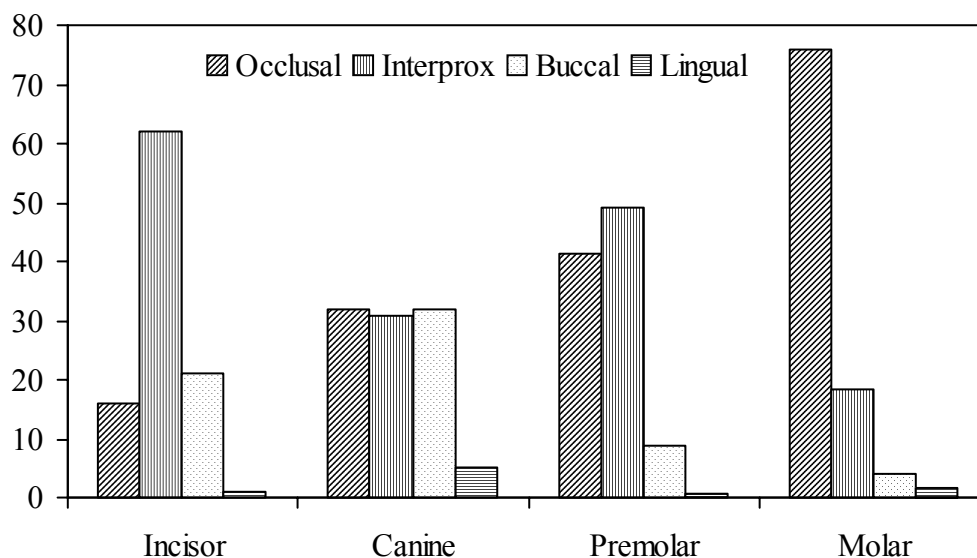
Table III shows the distribution of caries according to age groups. Patient attendance was highest in the 20-29 age group. However above this age group the attendance decreased with an increase in age. Females showed a higher incidence of (54%) attendance to the clinic compared to the males (46%).

**Table III: Distribution of caries according to age groups**

Age group	Number	%
10-19	459	25.5
20-29	966	53.6
30-39	232	12.9
40 and above	143	8.00
<b>Total</b>	<b>1,800</b>	<b>100.</b>

Figure I shows the distribution of caries on individual tooth surfaces. The incisors had a high frequency of interproximal lesions (62%). The molars had more occlusal lesions. Generally the frequency of caries on the lingual surfaces in all teeth was very low.

**Figure 1** Distribution of caries on individual tooth surfaces



## DISCUSSION

Treatment records were used in this study because of consistence in record keeping which facilitated easy retrieval of information. It is an inexpensive method of data collection. However, some background information like previous dietary habits and oral hygiene practices, which directly influence the development of caries, was not available on the record forms.

It was found that the most frequently attacked site was occlusal, 68.8% (Table I), of which the molars contributed 91%. Manji *et al*<sup>12</sup> had similar findings in 12-year-old urban children in East Africa. The anatomical form of molars (the pits and fissures) probably makes them more retentive to cariogenic food particles and plaque, and therefore more prone to caries attack. The high occurrence of occlusal surface caries in these teeth also indicates that there is a relative lack of preventive procedures like fissure sealing. The high occurrence of interproximal caries in the incisors (Fig. 1) further implies that preventive procedures like regular flossing is lacking in the population.

The most affected tooth in this study was the second molar both in the maxilla and mandible (Table II). This finding corroborates previous studies in Uganda<sup>2,13,14</sup> Zambia<sup>15</sup> and Nigeria<sup>16</sup>. Akpata<sup>16</sup> and Johnson<sup>17</sup> attributed these findings to rural-urban migration at a period when the first molar had reached a high degree of maturation before being exposed to an increased cariogenic challenge. At

the same time the second molar is erupting shortly before or during the onset of this challenge. Ismail *et al*<sup>3</sup> noted that the residents of urban areas in developing countries, regardless of social and economic status, consume sugar containing foods and drinks more frequently than those in rural areas. In contrast Manji *et al*<sup>12</sup> found the first molar to be affected most frequently in 12-year-old urban children in East Africa although the second molar contributed significantly.

This study demonstrated that caries activity continues throughout life and is not confined to any period of life, although the incidence decreases with an increase in age. A similar conclusion was made by Manji<sup>18</sup>. Assuming that the rate of progression of caries takes 3-4 years before it gets to pulpitis, (which is the trigger for seeking services), and considering that the age group most affected is 20-29 (Table III), it is probable that the initial attack occurred in their teens. It is therefore beneficial to target the 10-19 age group with preventive programmes.

Of the 1,800 cases reported the ratio of females to males was 54.5%: 45.5%, suggesting females are more prone to caries than males. This could have been due to a number of reasons, which include early teeth eruption that is associated with girls compared to boys, different attitudes towards dental attendance between men and women due to lack of financial independence on the part of the females and difference in dietary pattern between housewives and working men<sup>19</sup>.

## CONCLUSION

In conclusion the results showed a high occurrence of occlusal surface caries in molars especially the second molars in the 20-29 age group in the patients attending the Public Health Dental Officers School Clinic, Mulago Hospital. There is a need to carry out a national survey to verify these findings with the Ugandan population in order to plan better for the appropriate allocation of the scarce resources.

## REFERENCES

1. Tiromwe F, Ekoku Y, Baelum V, Fejerskov O. Oral health in Uganda: results of the national survey, 1987. Ministry of Health. Uganda/Kenya Medical Research Institute, Nairobi. 1988
2. Rwenyonyi CM, Birkeland JB, Haugejorden O, Bjorvatn K. Dental caries among 10- to 14-year-old children in Ugandan rural areas with 0.5 and 2.5mg fluoride per litre in drinking water. *Clin Oral Invest* 2001; 5:45-50
3. Ismail AL, Tanzer JM, Dingle JI. Current trends of sugar consumption in developing societies. *Community Dent Oral Epidemiol* 1997; 25: 438-445.
4. Adegbembo AO, El-Nadeef MAI, Adeyinke A. National survey of dental caries status and treatment needs in Nigeria. *Int Dent J* 1995; 45: 35-44.
5. Cleaton-Jones P, Fatti P. Dental caries trends in Africa. *Community Dent Oral Epidemiol* 1999; 27: 316-320.
6. Manji F, Baelum V, Fejerskov O. Tooth mortality in an adult rural population in Kenya. *J Dent Res* 1998; 67 (2): 496-500
7. Baelum V, Fejerskov O. Tooth loss as related to dental caries and periodontal breakdown in adult Tanzanians. *Community Dent Oral Epidemiol* 1986; 14: 353-357.
8. Denloye OO, Docsumu OO, Arotiba JT. Causes and pattern of tooth extraction in children treated at the University College Hospital, Ibadan. *West Afr J Med* 1999; 18 (4): 261-264.
9. Francken JE, Sithole WD, Mwaenga R, Htoon HM, Simon E. National Oral Health survey Zimbabwe. *Int Dent J* 1999; 49 (1): 3-9.
10. Pack ARC. Dental services and needs in developing countries. *Int Dent J* 1998; 48 (Suppl 1): 239-247
11. Sturdevant CM, Barton RE, Sockwell CL, Strickland WD. *The Art and Science of Operative Dentistry*. Second edition. C.V Mosby Company. 2000: 85-266
12. Manji F, Mosha H, Frencken J. Tooth and surface patterns of dental caries in 12-year-old urban children in East Africa. *Community Dent Oral Epidemiol* 1986; 14: 99-110
13. Okullo I, Astrom AN, Haugejorden O, Rwenyonyi CM. Variations in caries experience and sugar intake among secondary school students in Urban and rural Uganda. *Acta Odontol Scand* 2003; 61:197-202
14. Jensen K, Kizito EK, Langeback J. Dental caries, gingivitis and oral hygiene among school children in Kampala, Uganda. *Community Dent Oral Epidemiol* 1973; 1: 74-83.
15. Westwater K. A study of the relative caries prevalence in the first and second permanent molars of rural Zambian school children. *J Dent* 1977; 5: 42-46.
16. Akpata ES, Jackson D. Caries vulnerability of the first and second molars in Urban Nigerians. *Arch Oral Biol* 1978; 23: 795-800
17. Johnson SA, Gjermo P. Pattern of caries experience in permanent molars in 15-year old African population. (*ORCA*) *Caries Res* 1989; 423-426
18. Manji F, Fejerskov O, Baelum V. Pattern of Dental caries in an adult rural population. *Caries Res* 1989; 23: 55-62.
19. Silverstone LM, Johnson NW, Hardie JM, Williams RAD. *Dental caries, Aetiology, Pathology and Prevention* 1<sup>st</sup> ed. London: Macmillan Press, 1981; 26-27.