



Eastern Health Board

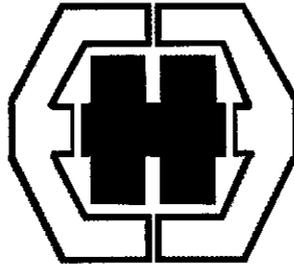
Oral Health of Children

1997

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Eastern Health Board

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FOREWORD

'Shaping a Healthier Future', the national strategy for effective health care in the 1990s emphasises quality and accountability.

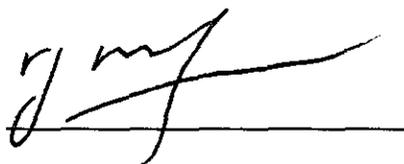
The principal areas targeted for change were highlighted by the subsequent development of Action Plans, the first of which, published in 1994, was the Dental Health Action Plan. This was the first time that clear aims and objectives were set down for the dental services.

The key aims of the public dental service are to:

- Reduce the level of dental disease in children.
- Improve the level of oral health in the population overall.
- Provide adequate treatment services to children and to all Medical Card holders.

The Action Plan set specific targets to be achieved by the year 2000. The epidemiological survey of the oral health of children in the Eastern Health Board region reported here was undertaken with the specific aim of measuring how close we are in 1997 to meeting the targets set for childrens' dental health.

The valuable information provided by this report will help us to further focus our resources over the coming years so as to ensure that we meet or exceed these targets in respect of all groups and areas throughout the Eastern Health Board region.



P. J. Fitzpatrick,
Chief Executive Officer.

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EXECUTIVE SUMMARY

The government health strategy *Shaping a Healthier Future* identified 'information, research and evaluation' as key elements in the management of health services. This is a report on the oral health status of children in the EHB which has been produced in response to the health strategy.

The data presented provide current information which adds to the picture of changes in the oral health status of children in the EHB over the last 36 year period. The Oral Health database has been standardised since 1984.

These data offer

- ongoing monitoring of the effectiveness of oral health services
- better identification of needs to be addressed
- information for planning of specific strategies to address these needs.

This report addresses these issues through the reporting of the oral health status, among a representative sample of 5- and 12-year-old children in the EHB. Knowledge, attitudes and behaviour of the participants about factors that affect oral health and the uptake of the existing oral health services were also measured.

Findings

- Since 1961 there has been a considerable decrease in tooth decay levels amongst 5- and 12-year-olds in the Eastern Health Board.
- Children who live in areas with water fluoridation have less tooth decay than those in non-fluoridated areas.
- Children whose parents are Medical Card holders have higher levels of tooth decay than those children whose parents are not Medical Card holders.
- One in eight children damaged their front teeth due to trauma.
- Approximately one-third of 12-year-olds require to be referred for Orthodontic care.
- Most 5- and 12-year-olds reportedly brush their teeth twice a day.
- Frequent consumption of sweet snacks between meals is common.



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SURVEY TEAM

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INTRODUCTION

In 1994 the government launched a national health strategy for the 1990s in a document entitled "Shaping a Healthier Future. A strategy for effective healthcare in the 1990s". The main theme of the Health Strategy was to focus the health services on improving health and quality of life for all. The strategy was underpinned by three principles, equity, quality of service and accountability. To ensure equity in the delivery of service, people whose needs are the greatest must be identified. Quality of service can be measured by determining health gain and consumer satisfaction. Health gain and consumer satisfaction are important measures for health services managers to enable them to be accountable to both the purchasers and the providers of the health care services.

The need for more detailed information for the management of the oral health services has been recognised. With a view to obtaining data for the ongoing monitoring, evaluation and future planning of the oral health services in the Eastern Health Board, the Oral Health Services Research Centre, University College Cork, was approached in 1996 to direct a survey of oral health in the Eastern Health Board in 1997.

The aims of the survey were

- To compare the levels of oral health among 5- and 12-year-old children in the Eastern Health Board in 1997 with the national goals set for the year 2000 for those age groups in "Shaping a Healthier Future".
- To measure levels of oral health among 5- and 12-year-old children in the Eastern Health Board in 1997 and to make comparisons with the 1961, 1984 and 1993 data.
- To measure levels of oral health in Dublin, Kildare and Wicklow in 1997.
- To update a standardised database on the oral health of children in the Eastern Health Board.
- To provide information on the oral health gain in children in the last 36 years.
- To assess the effectiveness of water fluoridation.
- To compare levels of oral health among children of Medical Card holders and non-Medical Card holders.
- To assess oral health knowledge, attitudes and behaviour amongst children and their parents.
- To assess the availability, accessibility and acceptability of the oral health services to children and their parents.
- To provide information for the monitoring, evaluation and future planning of the oral health services.

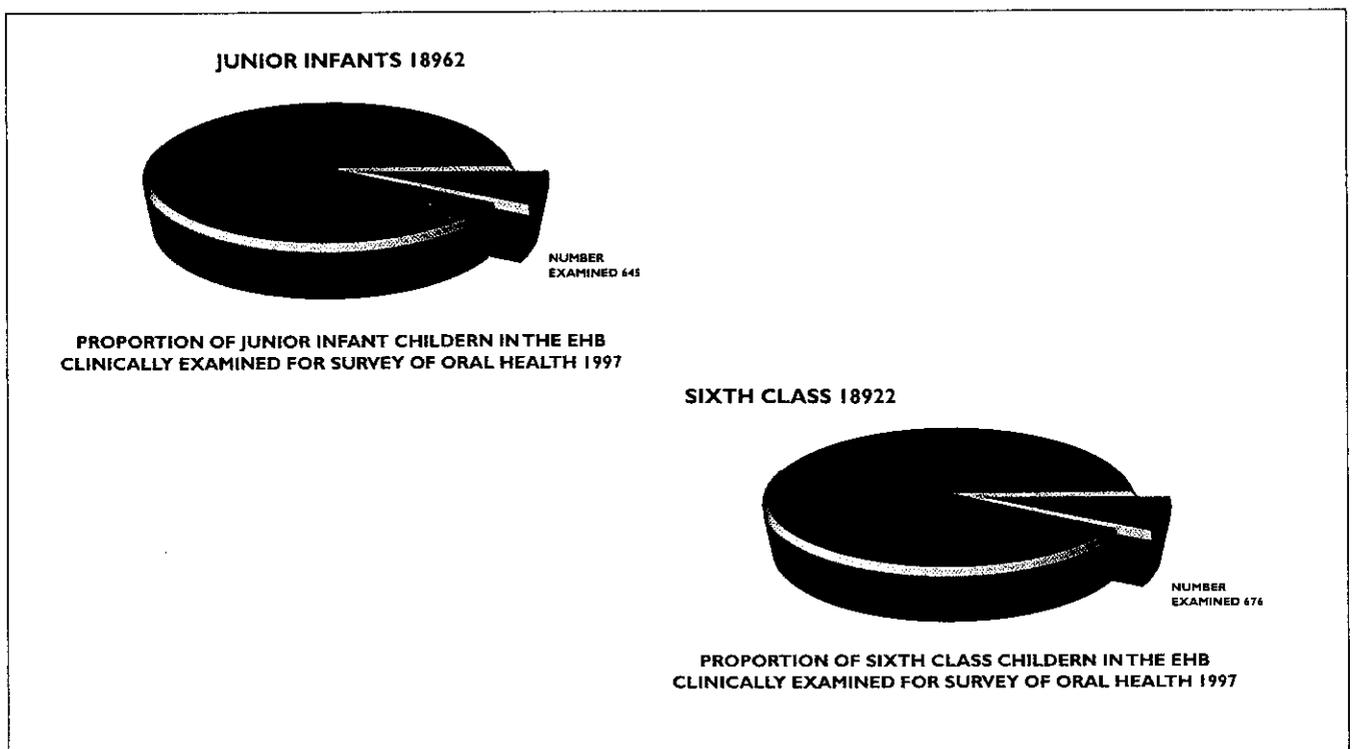
SAMPLE SELECTION

A dental examination was carried out on 1,321 children during the course of this study.

Children were selected on the basis of age, gender, geographical location of the school attended, and whether they attended a school with a fluoridated or non-fluoridated water supply. Selection of children on the basis of age was essential because dental diseases progress with age and the number and type of teeth present in the mouth change with age. For example, children in Junior Infants are on average 5 years old, have all their deciduous or milk teeth and no second or permanent teeth. By the time children are in 6th class (12-year-olds) the teeth present in the mouth are mainly permanent ones.

The Department of Education provided information on numbers of children in different classes, in schools in the region.

This allowed the random selection of schools for inclusion in the survey. A representative sample of school children was carefully chosen in each of two age groups for inclusion in the study. The groups chosen were Junior Infants and Sixth Class. The age groups are comparable with earlier Irish studies and with international research. These diagrams illustrate the proportion of the total number of children examined in both age groups in the Eastern Health Board.



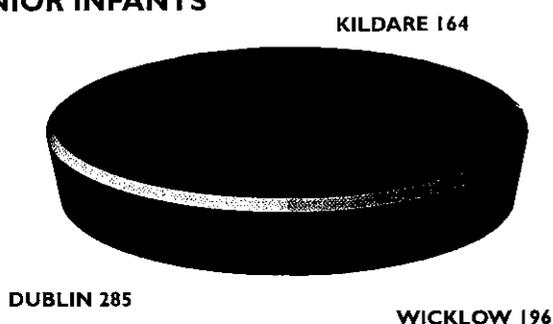
GEOGRAPHICAL DISTRIBUTION OF CHILDREN EXAMINED

A representative sample of Junior Infant and Sixth Class children was chosen from counties Dublin, Kildare and Wicklow so that all areas were represented in the study and results would be available for each county separately. Approximately equal numbers of boys and girls were selected to balance the sample. Approximately one third of the parents of the children examined in both age groups were Medical Card Holders. Of the Junior Infant group, 285 children were examined in Dublin, 164 in Kildare and 196 in Wicklow. Of the 6th class group, 283 were examined in Dublin, 186 in Kildare and 207 in Wicklow.

In these diagrams we see the geographical distribution of children examined in both age groups.

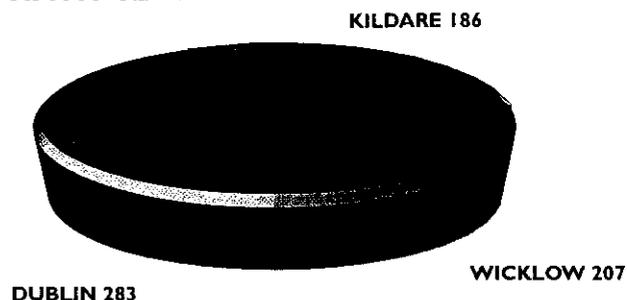


JUNIOR INFANTS



Distribution of 645 Junior Infant Children Examined in the Counties of the EHB

SIXTH CLASS

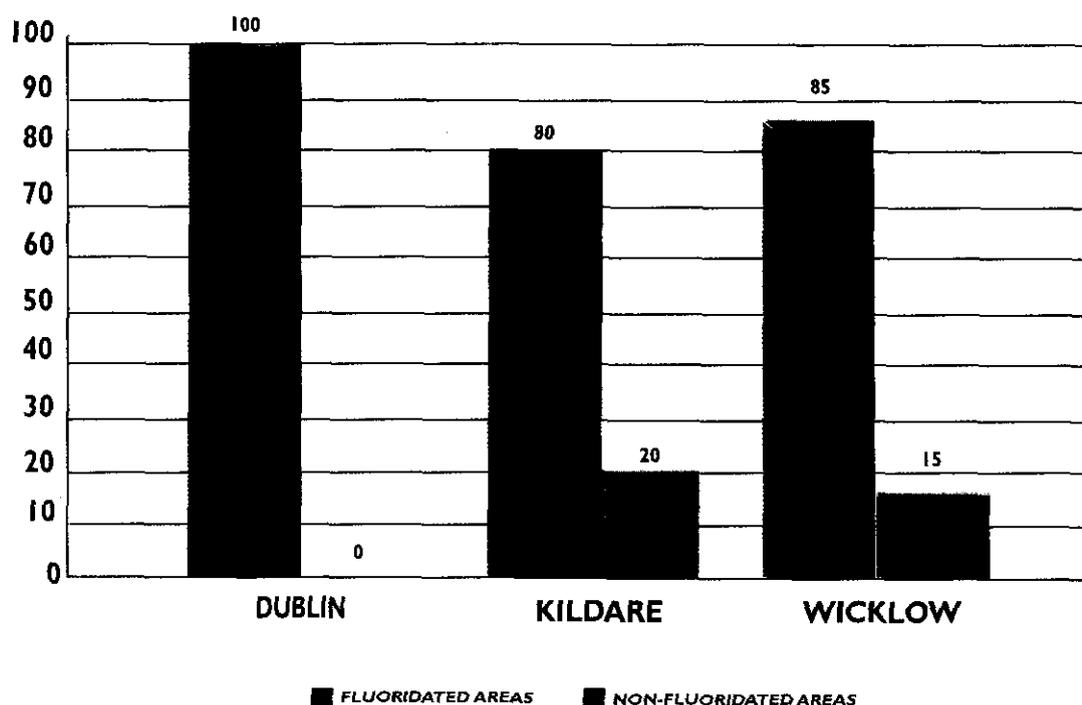


Distribution of 676 Sixth Class Children Examined in the Counties of the EHB

EXTENT OF FLUORIDATED AND NON-FLUORIDATED WATER SCHEMES

As a result of the Health (Fluoridation of Water Supplies) Act 1960, 73% of the population in the Republic now has fluoridated domestic water supplies. Previous studies show that this public health measure has been a resounding success in reducing tooth decay in the population. In County Dublin almost all children reside in communities served with fluoridated water supplies. Hence, when selecting children to participate in this survey only children who resided in fluoridated communities in Dublin were included. In Counties Kildare and Wicklow 80 and 85 per cent of the children examined resided in fluoridated communities.

PERCENTAGE OF 5 & 12 YEAR OLDS SURVEYED WHO WERE LIVING IN FLUORIDATED AND NON-FLUORIDATED AREAS



EHB TOOTH DECAY LEVELS FOR 5 AND 12 YEAR OLD CHILDREN

Children were examined for tooth decay which had resulted in cavities in their teeth. Tooth decay levels in children are best described using a measurement called the DMFT index. This measurement counts the number of teeth decayed [D], missing, that is extracted due to decay [M], and filled due to decay [F]. The diagrams overleaf show how decay levels have changed over the 13 year period since 1984. The figures for 5-year-olds (dmft) shown in this report refer to baby teeth only and the figures for 12-year-olds (DMFT) refer to permanent teeth.

The blackened teeth represent the number of teeth which were either decayed, missing or filled due to decay. It is clear that not only are teeth healthier in children who get fluoride in their water supply but decay levels are much lower in 1997 than they

were in 1984 in both fluoridated and non-fluoridated areas.

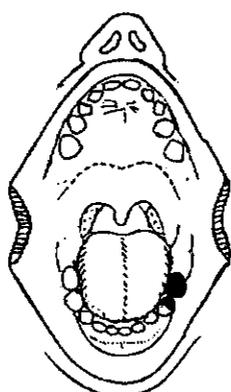
There are two likely reasons for the improvements in oral health in non-fluoridated areas. The first reason is the almost universal use of fluoride toothpastes by children in 1997. These toothpastes first came on the market in the early 1970s. The second factor is the consumption in non-fluoridated areas of foods and drinks which contain fluoride due to their being processed with fluoridated water in urban areas.

Teeth are healthier in children who get fluoride in their water supply and decay levels are much lower in 1997 than they were in 1984 in both fluoridated and non-fluoridated areas.

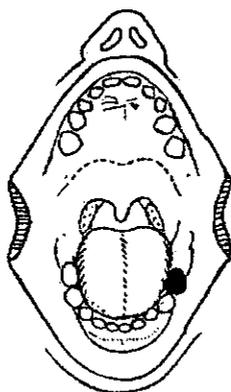


EHB 5 Year Olds

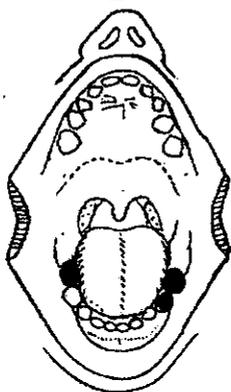
1984
Fluoridated
Water Supply
dmft = 1.3



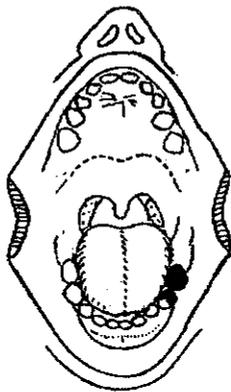
1997
Fluoridated
Water Supply
dmft = 1.0



1984
Non Fluoridated
Water Supply
dmft = 2.9

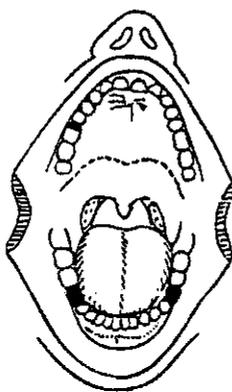


1997
Non Fluoridated
Water Supply
dmft = 1.7

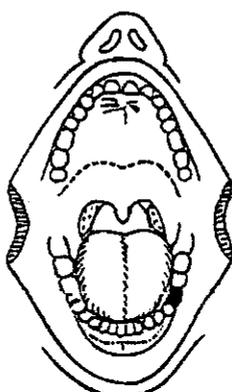


EHB 12 Year Olds

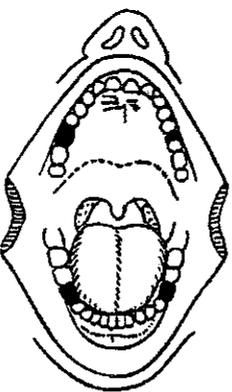
1984
Fluoridated
Water Supply
DMFT = 2.2



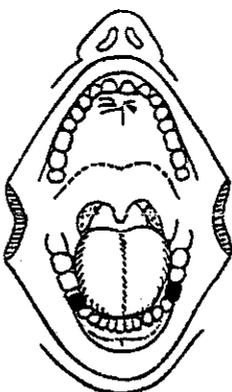
1997
Fluoridated
Water Supply
DMFT = 1.1



1984
Non Fluoridated
Water Supply
DMFT = 3.4



1997
Non Fluoridated
Water Supply
DMFT = 1.8



Children living in fluoridated areas have better oral health than those in non-fluoridated areas for both age groups.

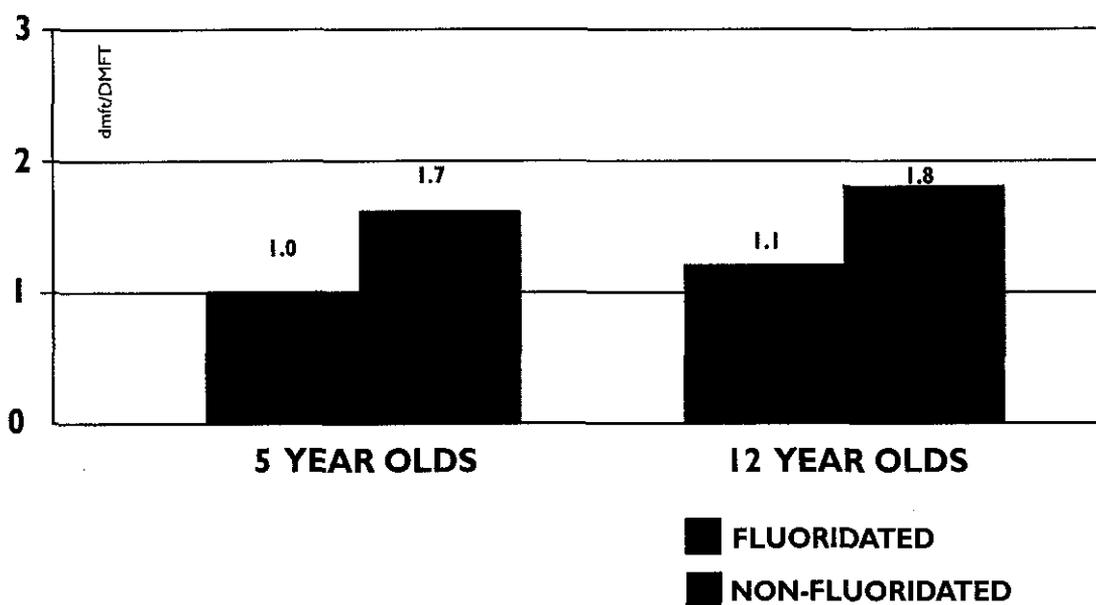
The decrease in tooth decay levels in both age groups since 1961 has been dramatic. This improvement is due to the introduction of water fluoridation following the Health (Fluoridation of Water Supplies) Act 1960 and to the introduction of fluoridated toothpaste in the early 1970s.

Over the last 36 year period since 1961, oral health for 12-year-olds has continued to improve in both fluoridated and non-fluoridated areas. The National target for the year 2000 for 12-year-olds is an average

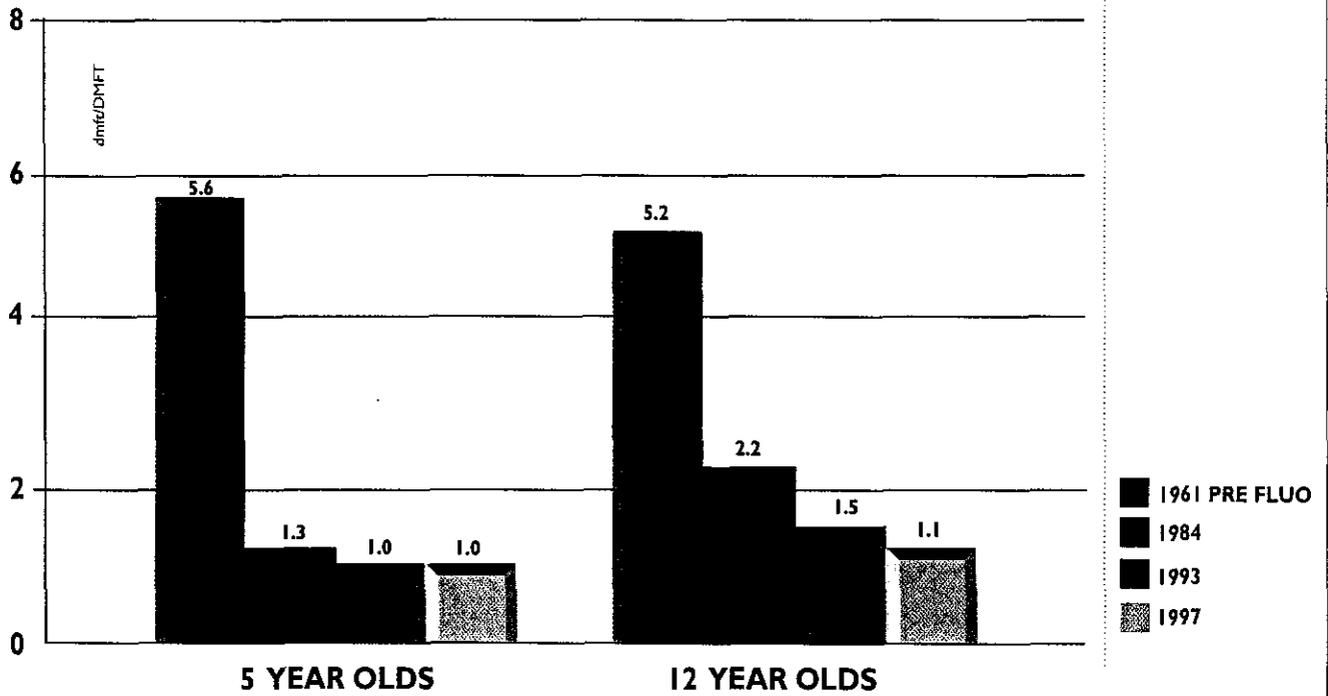
of no more than one decayed tooth in fluoridated areas and no more than two in non-fluoridated areas. The EHB has achieved this latter target.

In the case of 5-year-olds the 1997 data indicate that the prevalence of tooth decay is levelling out at about one decayed tooth per child in fluoridated areas. The percentage of 5-year-olds who were caries free in the EHB in 1997 was 67%. In 1993, 70% of 5-year-olds studied were caries free. The goal set in "Shaping a Healthier Future" was for 85% of this age group to be caries free by the year 2000. Strategies to achieve this aim will require further consideration.

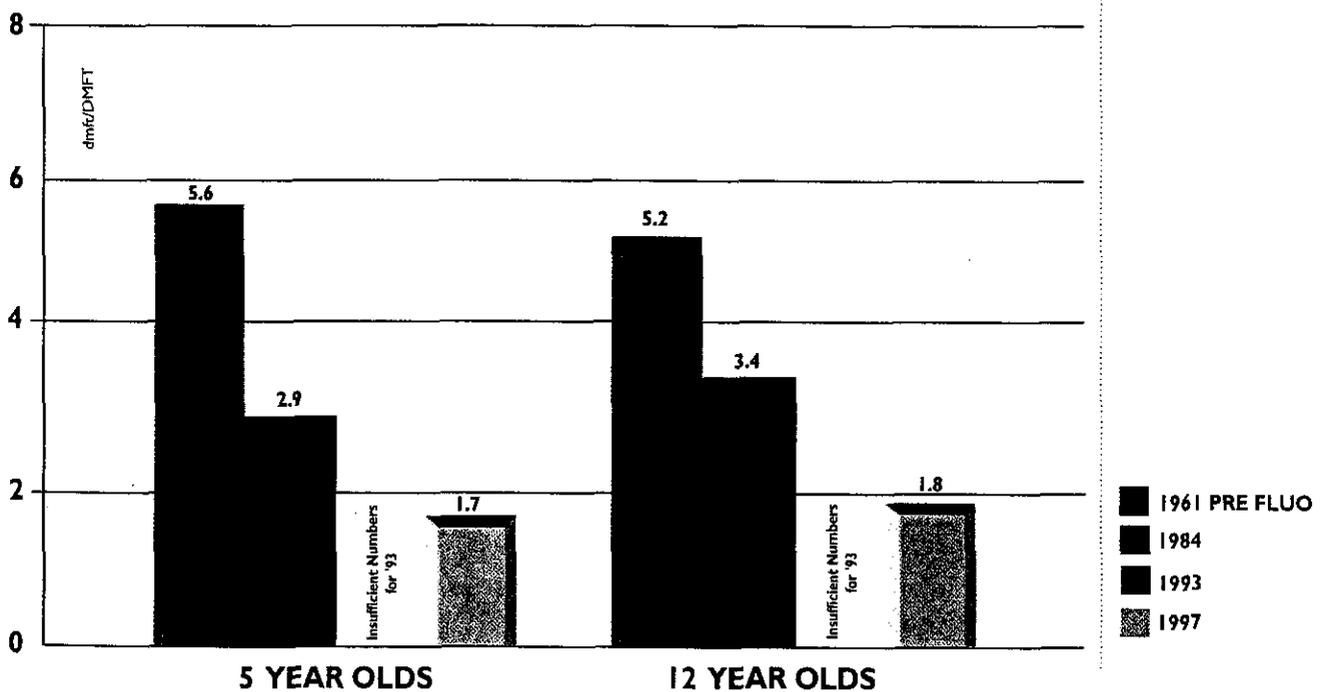
TOOTH DECAY IN 5 & 12 YEAR OLDS BY FLUORIDATION STATUS IN THE EHB



**CHANGE IN TOOTH DECAY 1961 - 1984 - 1993 - 1997
IN 5 & 12 YEAR OLDS
IN FLUORIDATED AREAS IN THE EHB**



**CHANGE IN TOOTH DECAY 1961 - 1984 - 1993 - 1997
IN 5 & 12 YEAR OLDS
IN NON-FLUORIDATED AREAS IN THE EHB**

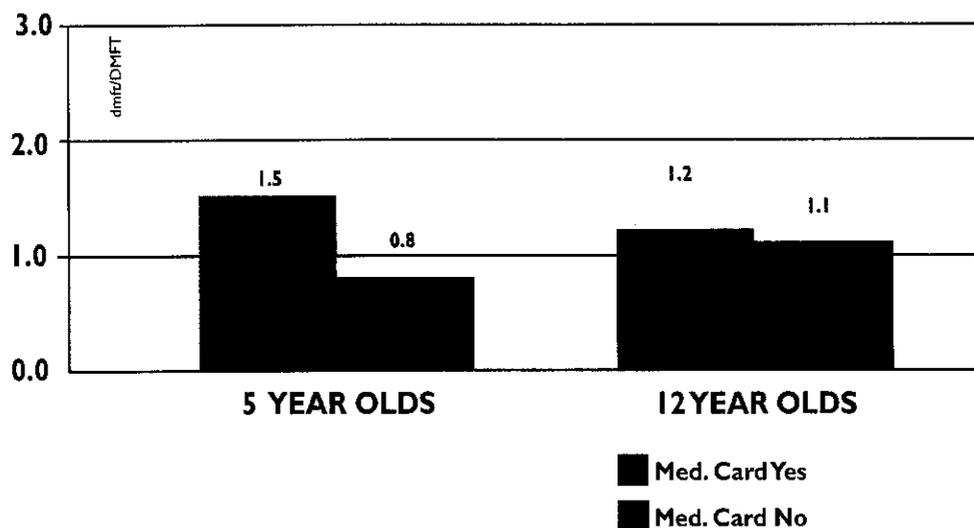


MEDICAL CARD STATUS

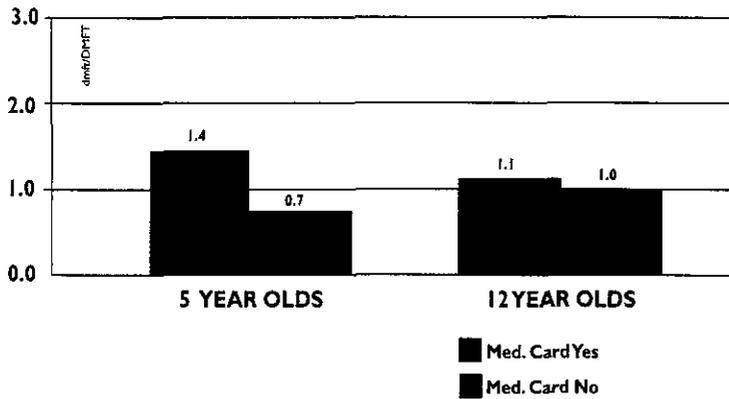
In the Eastern Health Board as a whole and in each of the three counties, decay levels were higher in children whose parents were Medical Card Holders when compared with children whose parents were non Medical Card Holders. This difference is particularly striking amongst 5-year-olds in Dublin where the level of tooth decay in baby teeth of children whose parents

possess a Medical Card is twice as high as the level found amongst children whose parents do not possess a Medical Card. Since almost all children in Dublin benefit from water fluoridation the higher decay levels amongst children of Medical Card Holders could in part be due to the less frequent use of fluoride toothpaste.

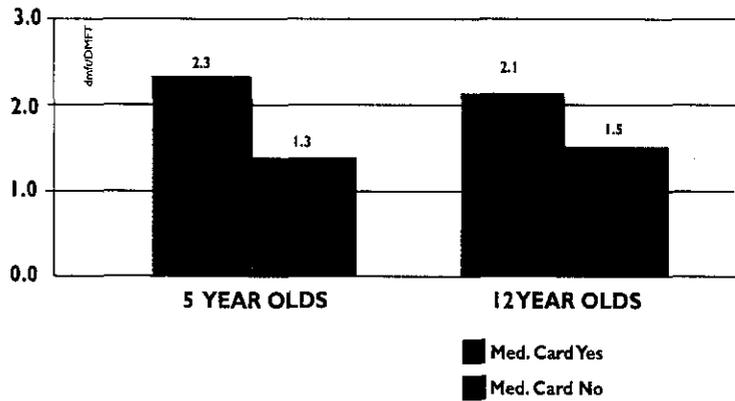
**TOOTH DECAY IN 5 & 12 YEAR OLDS
BY MEDICAL CARD STATUS
IN ALL COUNTIES OF THE EHB**



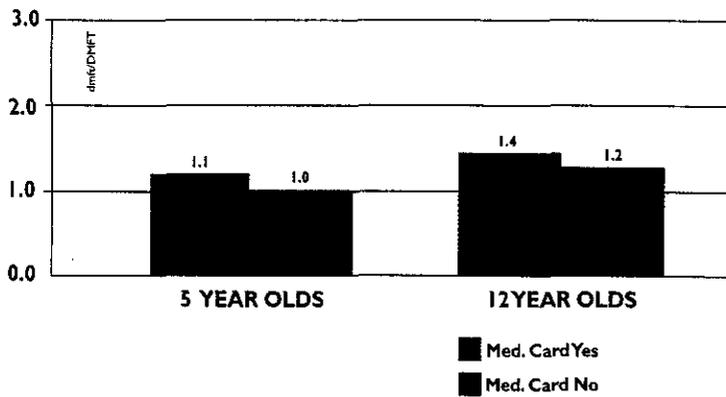
**TOOTH DECAY IN 5 & 12 YEAR OLDS
BY MEDICAL CARD STATUS
IN DUBLIN**



**TOOTH DECAY IN 5 & 12 YEAR OLDS
BY MEDICAL CARD STATUS
IN KILDARE**



**TOOTH DECAY IN 5 & 12 YEAR OLDS
BY MEDICAL CARD STATUS
IN WICKLOW**



FIVE YEAR OLD CHILDREN

COMPONENTS OF dmft BY MEDICAL CARD STATUS

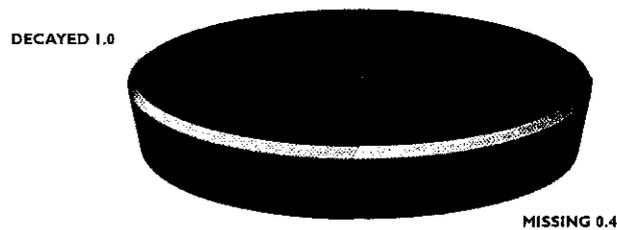
The size of the decayed component of the dmft (decayed, missing or filled teeth) shows how much of the decay is untreated, the missing (extracted) and filled portions indicate treated decay. The figures are shown for children whose parents possess or do not possess a Medical Card.

A high proportion of the decay experience in 5-year-old children is untreated decay.

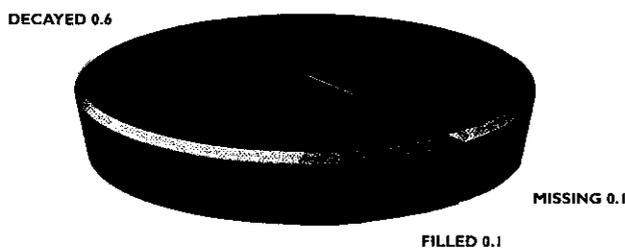
This is in line with many other European Countries where resources are targeted at the permanent teeth of older children.

In the diagrams which follow it can be seen that at least 80 percent of the dental decay found in 5-year-olds in all three counties is either untreated cavities or teeth missing due to extractions.

ALL COUNTIES with MEDICAL CARD dmft=1.5



ALL COUNTIES without MEDICAL CARD dmft=0.8



Numbers in pie charts may not add to the total dmft/DMFT because of rounding to one decimal place.

DUBLIN with MEDICAL CARD dmft=1.4

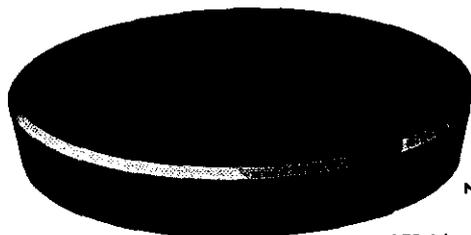
DECAYED 0.9



MISSING 0.4

DUBLIN without MEDICAL CARD dmft = 0.7

DECAYED 0.5



MISSING 0.1

FILLED 0.1

KILDARE with MEDICAL CARD dmft = 2.3

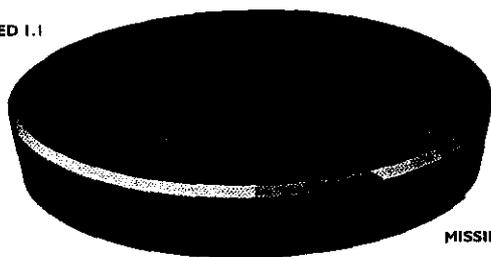
DECAYED 1.9



MISSING 0.4

KILDARE without MEDICAL CARD dmft = 1.3

DECAYED 1.1



MISSING 0.1

FILLED 0.1

WICKLOW with MEDICAL CARD dmft = 1.1

DECAYED 0.9



MISSING 0.1

FILLED 0.1

WICKLOW without MEDICAL CARD dmft = 1.0

DECAYED 0.7



MISSING 0.1

FILLED 0.2

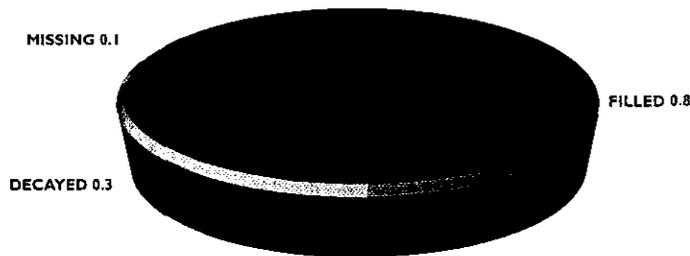
TWELVE YEAR OLD CHILDREN

COMPONENTS OF DMFT BY MEDICAL CARD STATUS

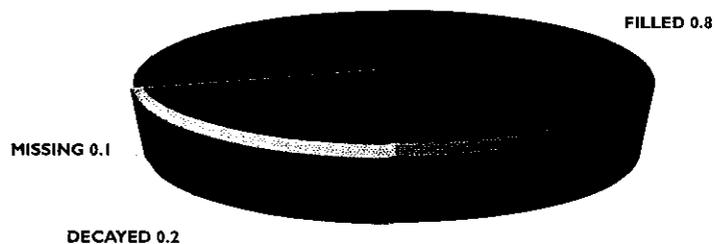
In the Eastern Health Board as a whole, one-fifth of the decay experienced by 12-year-olds was untreated. Seven-tenths of the decay was filled. Extraction of permanent teeth was relatively rare, accounting for

one-tenth of the decay. The highest level of untreated decay was found amongst 12-year-old children in Kildare whose parents were Medical Card Holders (38%).

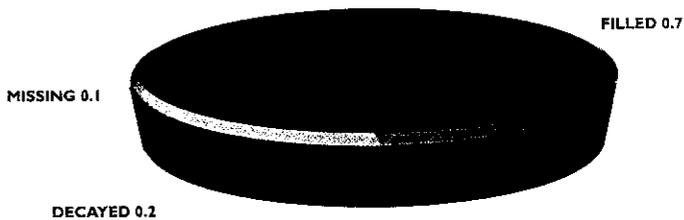
ALL COUNTIES with MEDICAL CARD DMFT=1.2



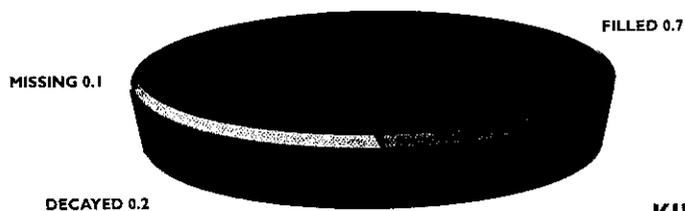
ALL COUNTIES without MEDICAL CARD DMFT = 1.1



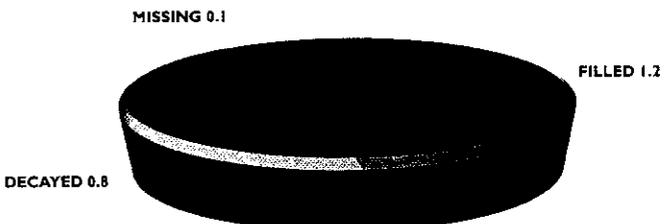
DUBLIN with MEDICAL CARD DMFT = 1.1



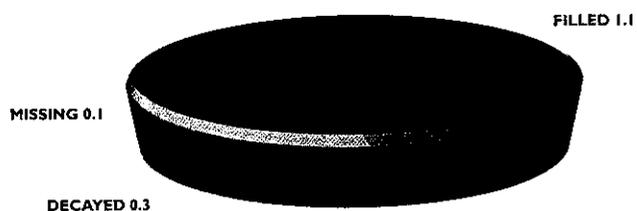
DUBLIN without MEDICAL CARD DMFT = 1.0



KILDARE with MEDICAL CARD DMFT = 2.1



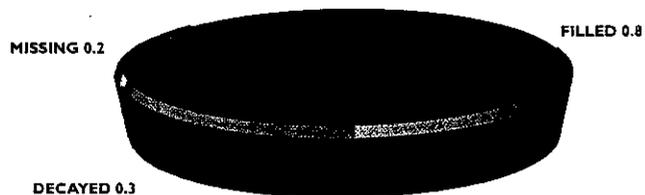
KILDARE without MEDICAL CARD DMFT = 1.



WICKLOW with MEDICAL CARD DMFT = 1.4



WICKLOW without MEDICAL CARD DMFT = 1.2



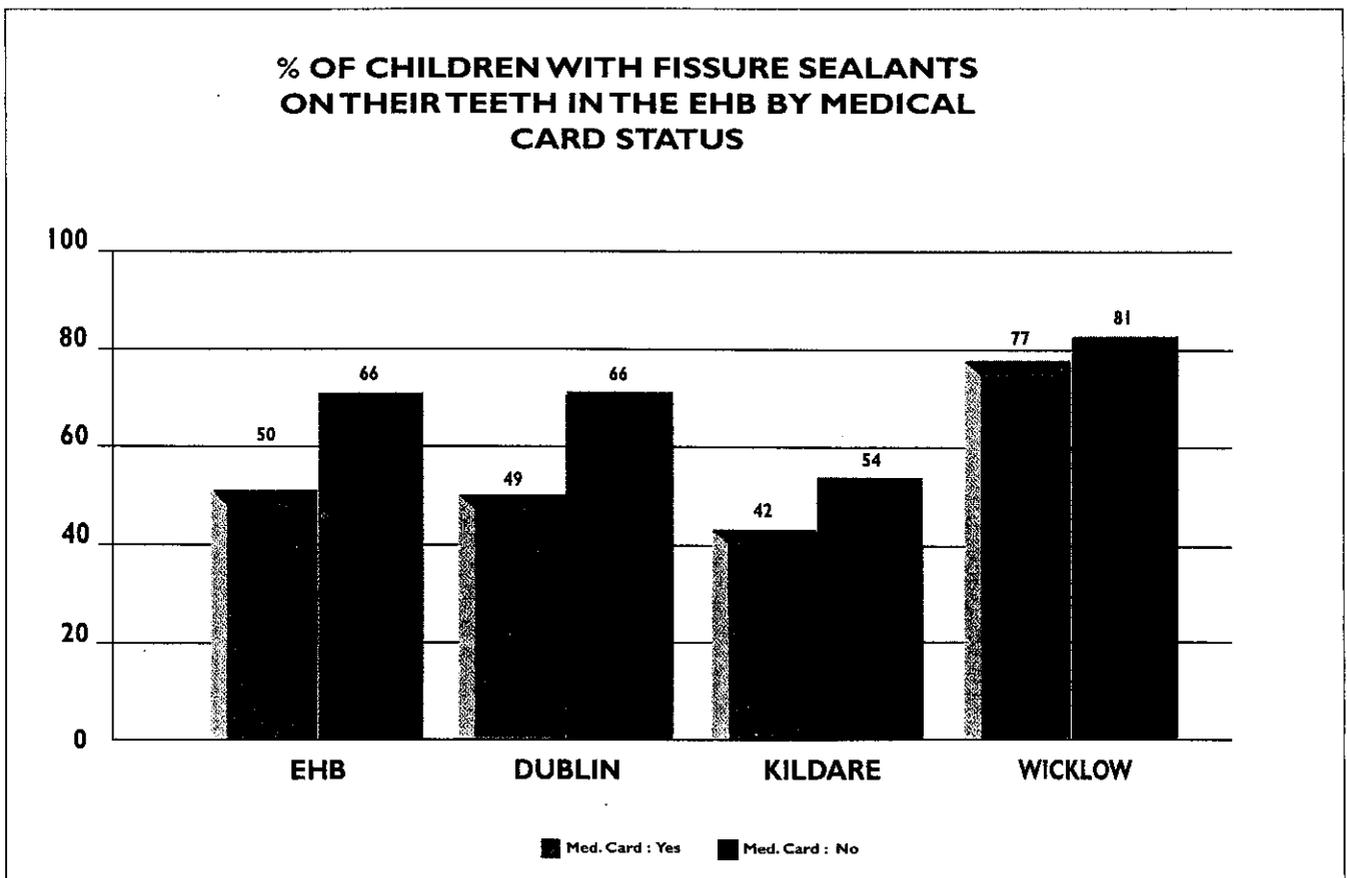
FISSURE SEALANTS

Teeth have two types of surface, smooth surfaces which are particularly well protected from tooth decay by fluoride, and pitted or fissured chewing surfaces. Most of the decay in children is now concentrated on the chewing surfaces of the back teeth. Since the 1970s a technique called fissure sealing (plastic coating) has been widely available to prevent decay on these surfaces. The technique can be used by either dentists or dental hygienists and it can be very effective in preventing decay. The teeth which benefit from fissure sealing first appear in the mouth at approximately six years of age. Once the teeth are fully established, the sooner they are sealed the better. If too much time elapses the teeth

may decay before they have been sealed.

Overall in the Eastern Health Board 60% of 12-year-olds had some fissure sealants on their teeth at the time of the study. Use of fissure sealants was highest in Wicklow (80%) and lowest in Kildare (50%).

In all three counties the percentage of children with at least one first or second permanent molar sealed was highest amongst children whose parents did not possess a Medical Card. In Dublin, for example, where overall 59% of children had one or more sealed permanent molars, the figure for children whose parents did not possess a Medical Card was 66% compared with 49% for children whose parents did possess a Medical Card.

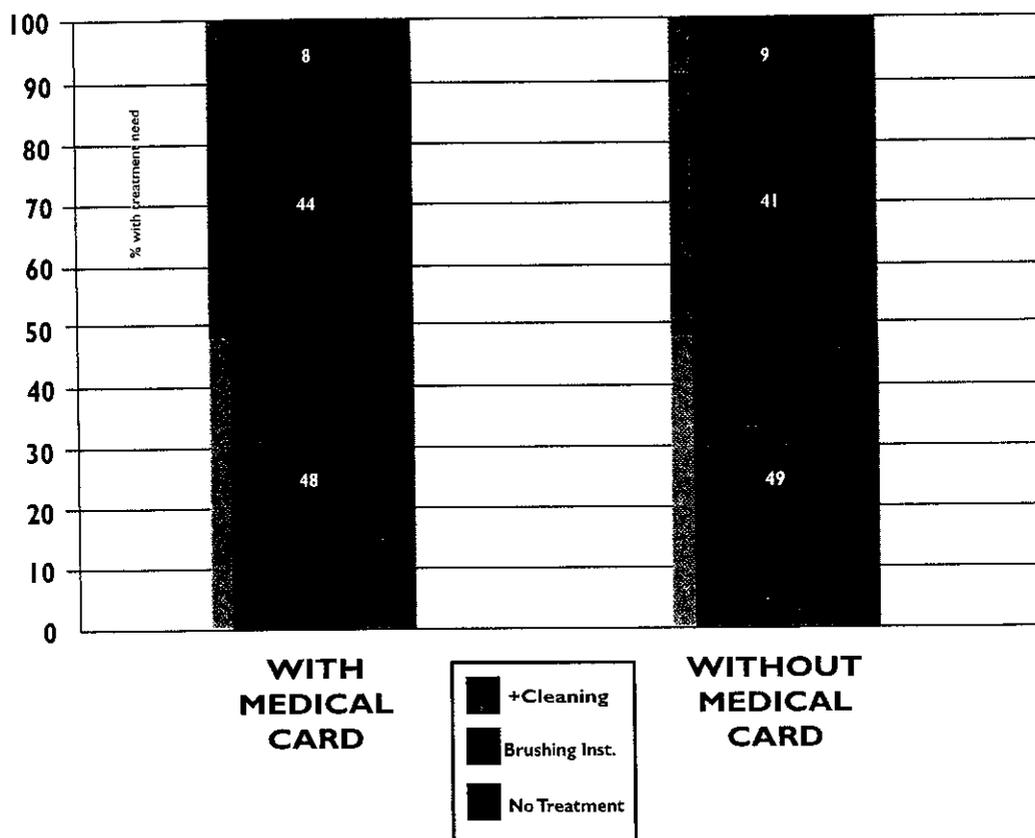


GUM DISEASE

Twelve-year-old children were examined to determine levels of gum disease and treatment required. Approximately two-fifths (42%) need to be instructed in toothbrushing and one in ten (9%) need both toothbrushing instruction and professional cleaning to remove tartar or calculus. Almost none required more advanced care. The treatment required for the management of gum disease was similar amongst 12-year-olds whose parents possessed or did not possess a Medical Card.

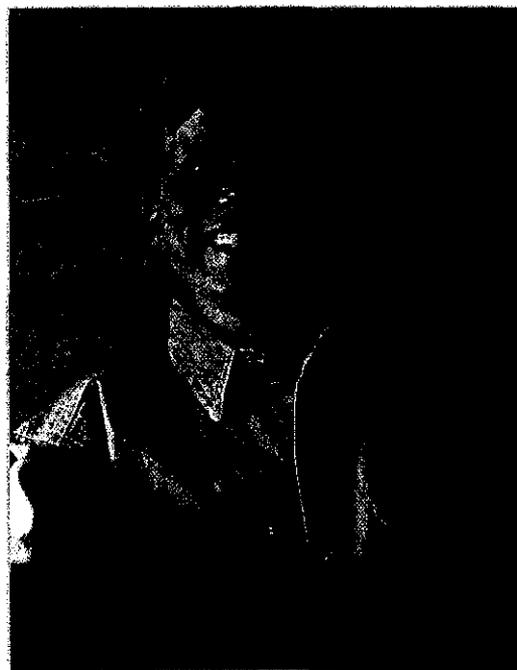


TREATMENT NEED FOR GUM DISEASE AMONGST 12 YEAR OLDS BY MEDICAL CARD STATUS

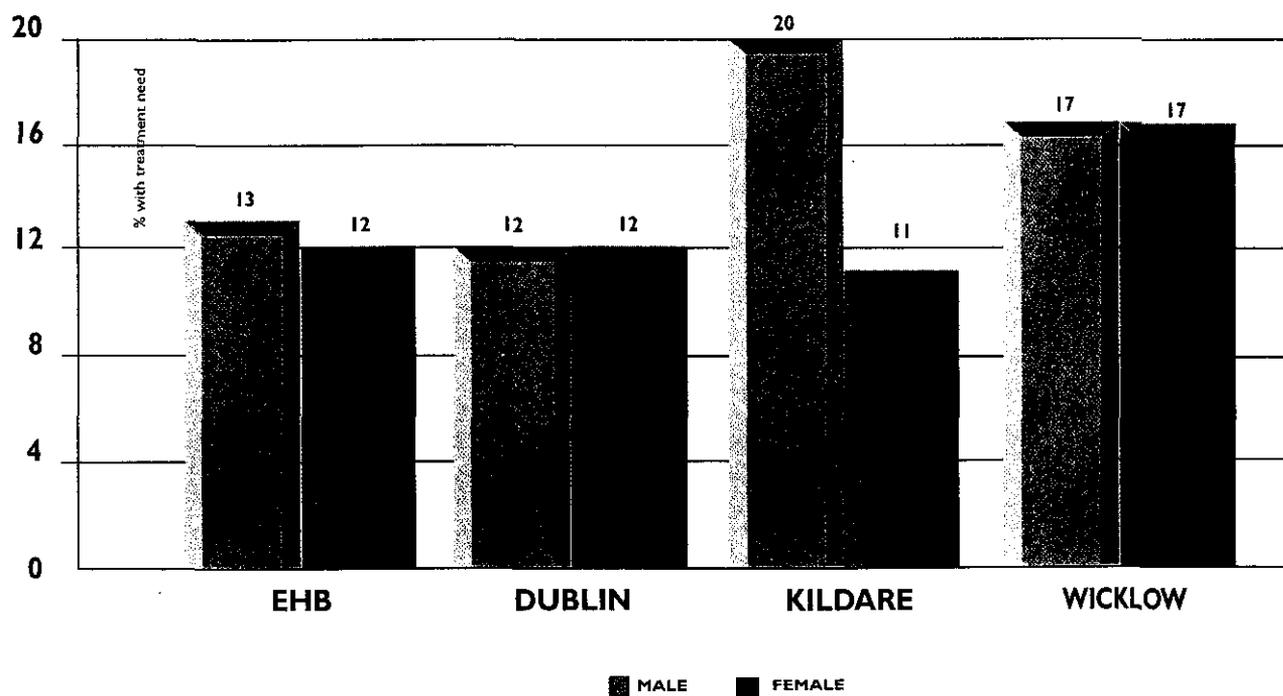


TRAUMA TO FRONT TEETH

Accidental damage to the front teeth due to injury is not uncommon and represents a considerable demand on the dental services. Overall in the Eastern Health Board approximately one-eighth of 12-year-olds (13%) have one or more damaged front teeth. There was a slight trend for boys to be more commonly affected than girls.



% OF 12 YEAR OLD CHILDREN WITH FRONT TEETH DAMAGED DUE TO TRAUMA



NEED FOR ORTHODONTIC TREATMENT

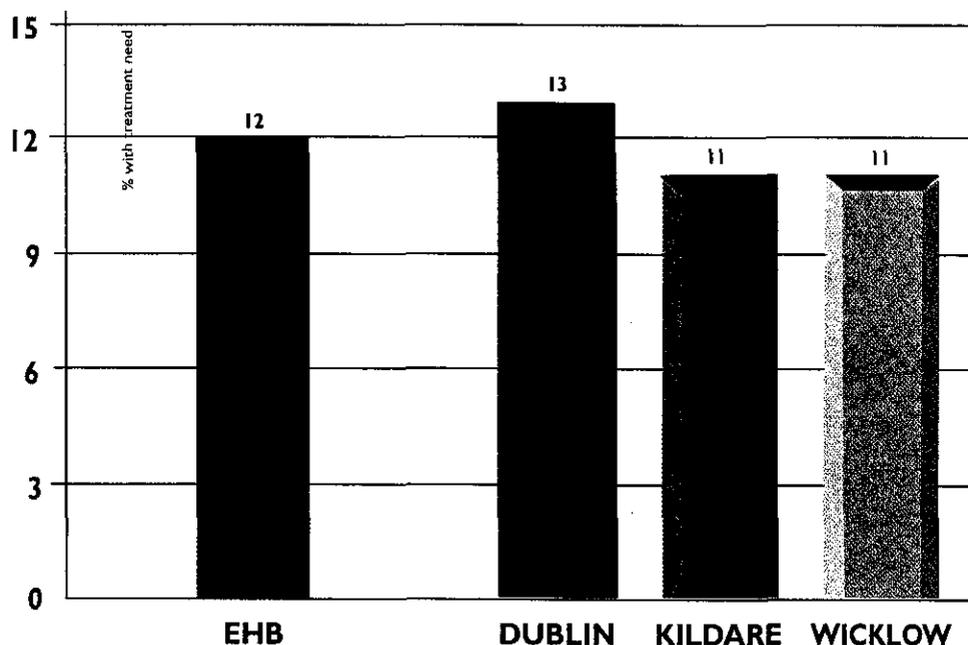
The need for orthodontic treatment amongst 12-year-olds in the Eastern Health Board was assessed using two criteria

- aesthetic considerations based on appearance.
- dental health considerations based on the alignment of the teeth and the relationship between the upper and lower teeth when the teeth were clenched.

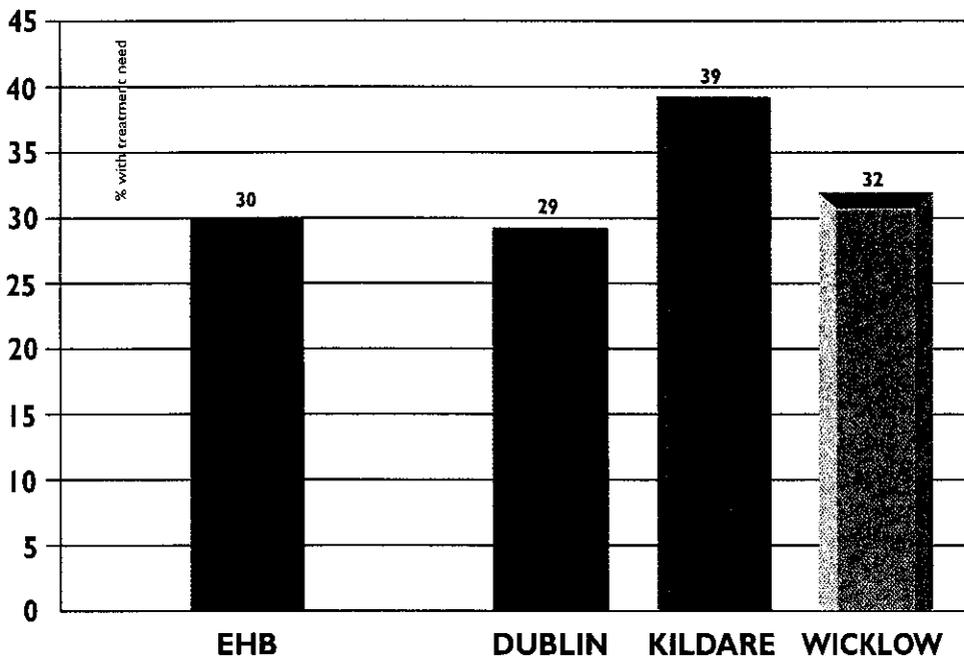
Based on appearance, one-eighth of 12-year-old children (12%) were considered to require referral to an orthodontist. Approximately one-third of 12-year-olds required referral on dental grounds.

Using a combination of both aesthetic and dental considerations it was found that one third of 12-year-olds in the Eastern Health Board were regarded as having a definite need to be referred to an orthodontist. The percentage requiring referral was somewhat higher in Kildare (40%).

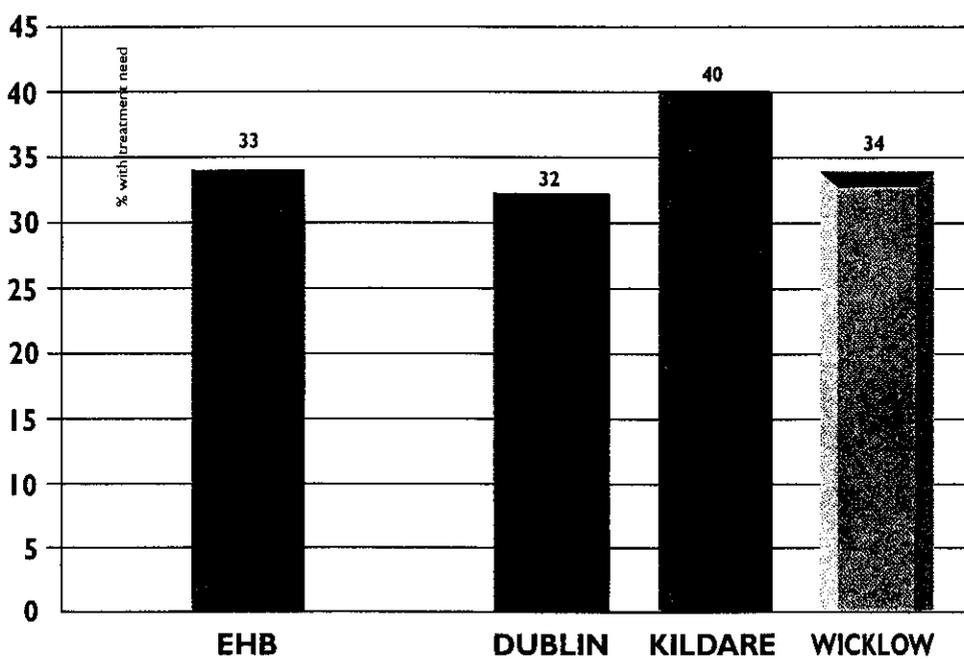
% OF 12 YEAR OLD CHILDREN WITH NEED FOR ORTHODONTIC TREATMENT - AESTHETIC CONSIDERATIONS



**% OF 12 YEAR OLD CHILDREN WITH NEED FOR
ORTHODONTIC TREATMENT - DENTAL HEALTH
CONSIDERATIONS**



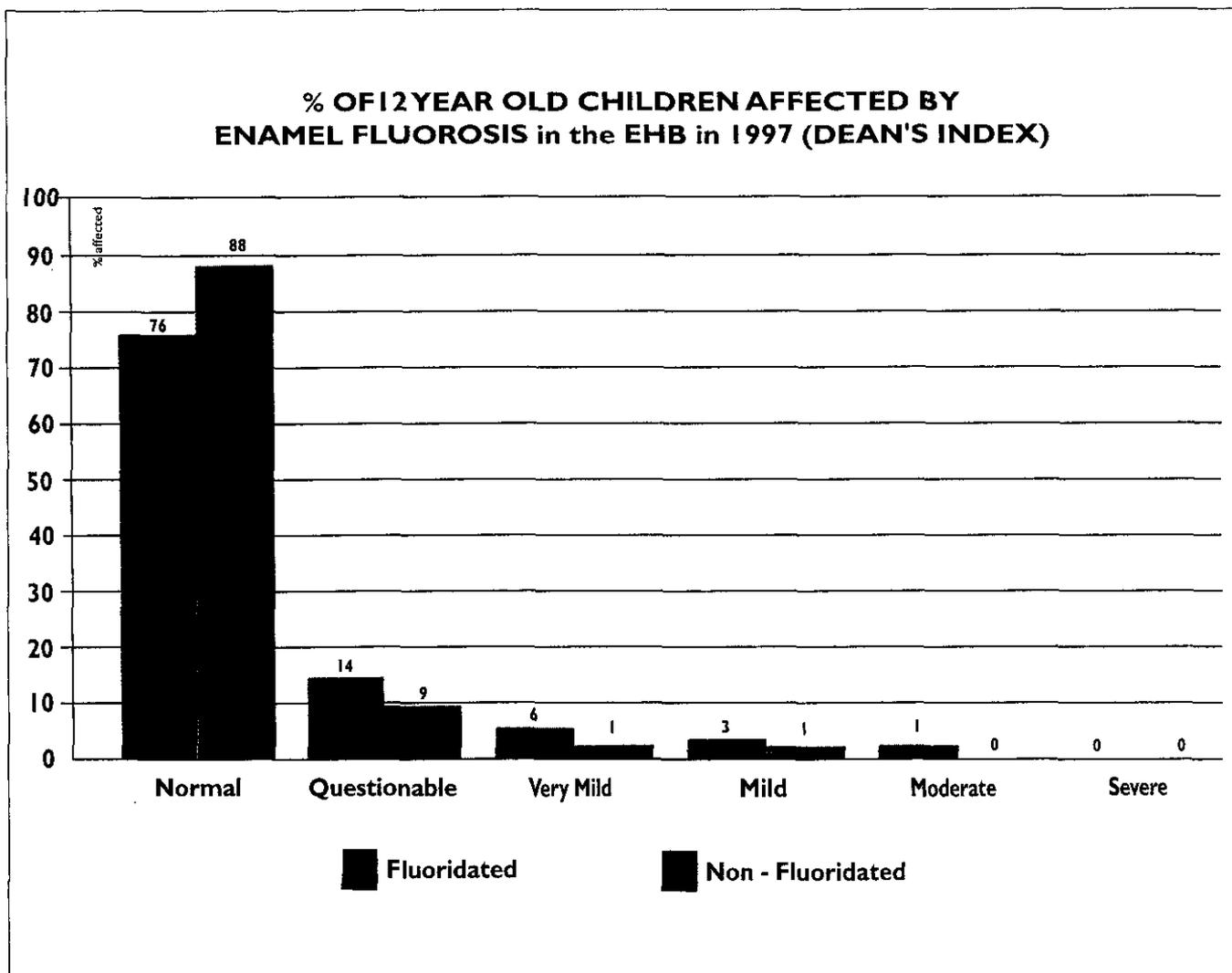
**% OF 12 YEAR OLD CHILDREN WITH NEED FOR
ORTHODONTIC TREATMENT - AESTHETIC OR
DENTAL HEALTH CONSIDERATIONS**



ENAMEL FLUOROSIS

Measurement of enamel fluorosis is a recognised method of monitoring intake of fluoride from different sources. Over 90% of 12-year-olds in the Eastern Health Board were regarded as having normal or questionable enamel. The percentages with very mild or mild fluorosis were 6% and 3% in fluoridated groups respectively and 1% and 1% respectively in non-fluoridated areas. The figures for very mild and mild fluorosis were higher in Dublin (9%) than in Wicklow (4%) and Kildare (5%).

In 1984, 98% of 8-year-olds and 97% of 15-year-olds in fluoridated areas had normal or questionable enamel. For both age groups in non-fluoridated areas in 1984 these figures were 100%. The current levels of fluorosis are lower than those predicted by Dean in his studies in the 1940s. However the prevalence appears to be increasing, hence careful monitoring of dental fluorosis amongst Irish children is important for the future.



ORAL HEALTH PRACTICES

A questionnaire was given to parents of 5-year-old and 12-year-old children participating in this survey.

The purpose of this questionnaire was to obtain information about the knowledge, attitudes and behaviour of children regarding factors that affect oral health. Questions were asked about toothbrushing, snacking and visiting the dentist. Two of the main oral health messages which are used to guide the public on the prevention and control of oral diseases are:

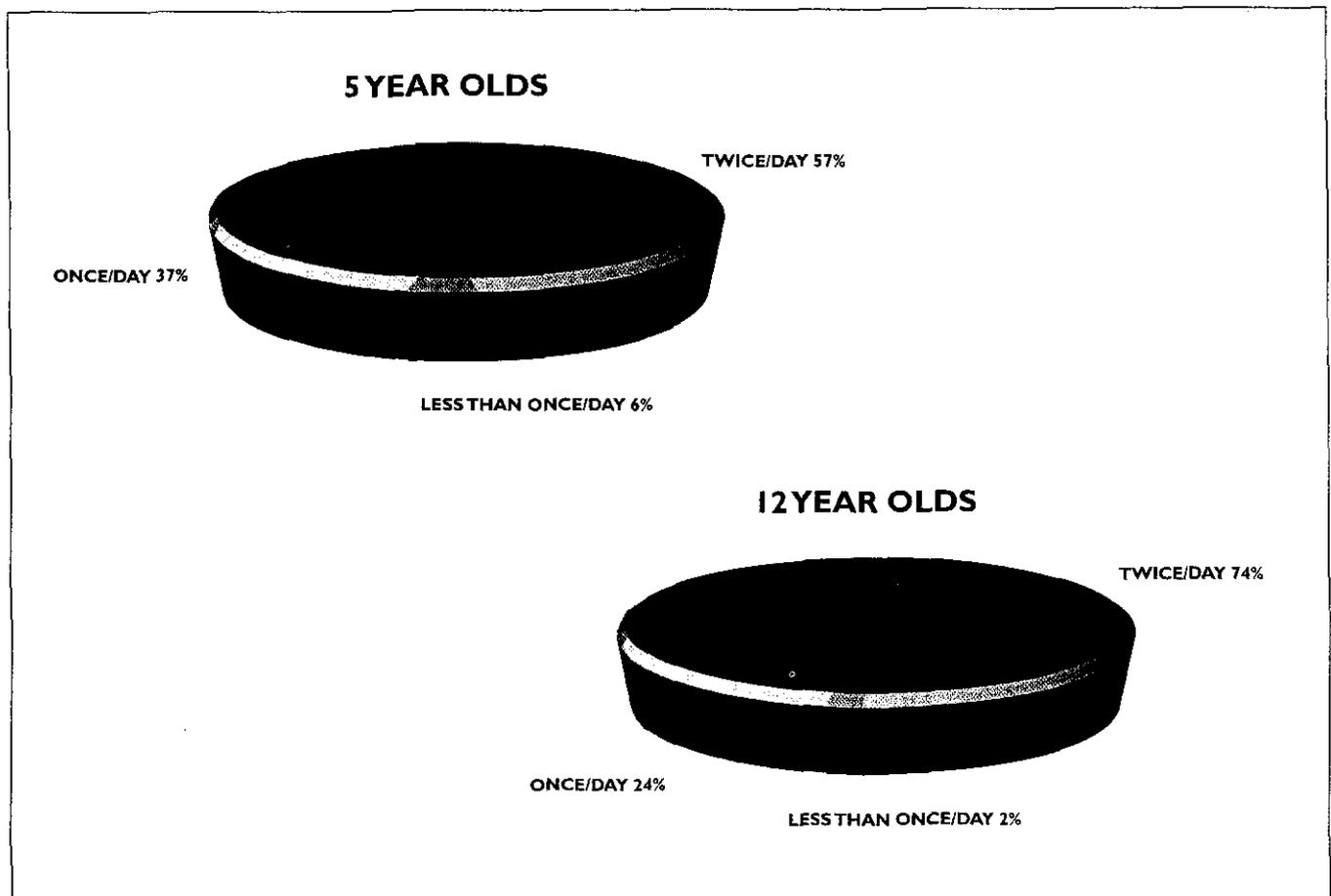
- *Brush your teeth thoroughly at least twice a day with a fluoride toothpaste.*
- *Reduce the frequency of eating sweet foods and drinking sweet drinks between meals.*



FREQUENCY OF TOOTHBRUSHING

Parents of 5-year-olds and 12-year-olds answered questions about toothbrushing frequency. The most common routine was brushing the teeth twice a day, with parents reporting that approximately three-fifths of 5-year-olds (57%), and three quarters (74%) of 12-year-olds brush this often. Although the fluoride in the toothpaste is useful in preventing decay, levels of gum disease indicated the need to teach children to brush their teeth more thoroughly.

The most common routine was brushing the teeth twice a day.



FREQUENCY OF EATING SWEET SNACKS BETWEEN MEALS

Every time sugar, either in its natural form or incorporated into foods such as biscuits, sweets, cakes, soft drinks etc., is consumed, acid is produced which can cause tooth decay. People are advised therefore, to reduce the frequency of between meal snacks or drinks and where possible to take sugar-containing foods only at mealtimes. Ninety-eight percent of respondents were aware that snacking between meals was damaging to oral health. However, over one quarter (28%) of 5-year-olds and almost one-third (31%) of 12-year-olds reported

taking sweet snacks three times or more a day, between meals. This frequency of snacking is considered as being likely to cause tooth decay.

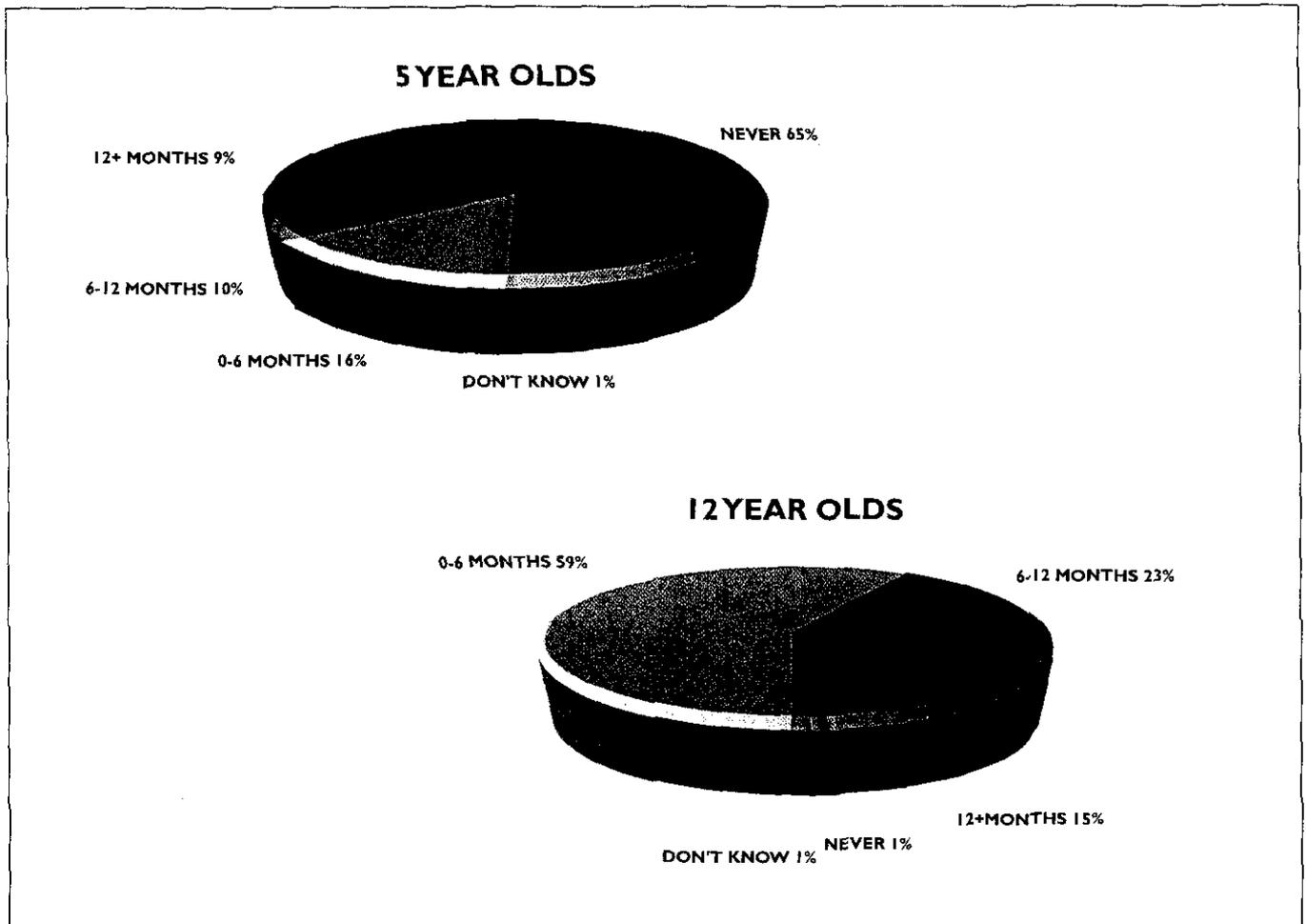
One-quarter of 5-year-olds and one-third of 12-year-olds reported taking sweet snacks three times or more a day, between meals.



VISITS TO THE DENTIST

Parents of 5- and 12-year-olds were asked when the child had last visited the dentist. Sixty-five percent of 5-year-olds had never visited the dentist whilst a total of 26% had attended the dentist during the last twelve months. In the case of 12-year-olds a total of 82% had attended the dentist in the last year. These figures reflect the different levels of availability of oral health services to both groups. In some areas the 12-year-olds would have been targeted by the services within the previous 12 months.

Four-fifths of 12-year-olds had attended the dentist within the previous 12 months.



ACKNOWLEDGMENTS

The Eastern Health Board Survey Team wishes to thank the parents and children in the region, without them this survey would not have been possible.

The co-operation of the chairpersons of the school boards of management, school principal teachers and class teachers who facilitated the conduct of the clinical examination was much appreciated. The assistance of the Department of Education in providing data for the sample frame is also acknowledged.

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