Dental Caries In the permanent Dentition

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Outline

- Predisposing factors
- Pattern of caries
- Management and Prevention
- Prevalence and Trends

Period of dentition:

- “Primary dentition” from 4-6 month until about 5-6 years
- “Mix dentition” between age 6 to12 years
- “Permanent dentition” when all the primary teeth replace by permanent successors

Permanent and mixed dentition caries patterns…

- Those patterns of caries that are noted in the mixed and permanent dentitions of children aged 5-18 years
- Distinctive caries patterns occur with ECC
- Some subpopulations may be susceptible to specific predisposing factors that are unique or predominant within this age group

Predisposing Factors

- Access to dental care/advice
- Socio-demographic factors
- Lifestyle and dietary factors
- Medical factors
- Oral / dental factors

Socio-demographic factors

- Greater toothache experience in children of lower socio-economic groups (*Slade 2001)*
- Higher levels of untreated decayed teeth in patients in rural locations (*Brennan et al 2000)*

Lifestyle and dietary factors

- Oral hygiene habits
- Frequency and type of food
- Dietary advice has to be **personal, practical** and **positive**

Dietary advice can be given at two levels:

- General advice
- Detailed dietary advice

Medical factors

- Children with special needs
- Use of special medication
- Medically compromised
- Disturbance of salivary flow (e.g. Xerostomia after Radiation therapy)

Oral/Dental factors

- Saliva
- Oral flora (*Streptococcus Mutants)*
- Anatomic characteristic of the teeth
- Arrangement of the teeth in the arch
- Present of restoration and appliance

Patterns of caries attack

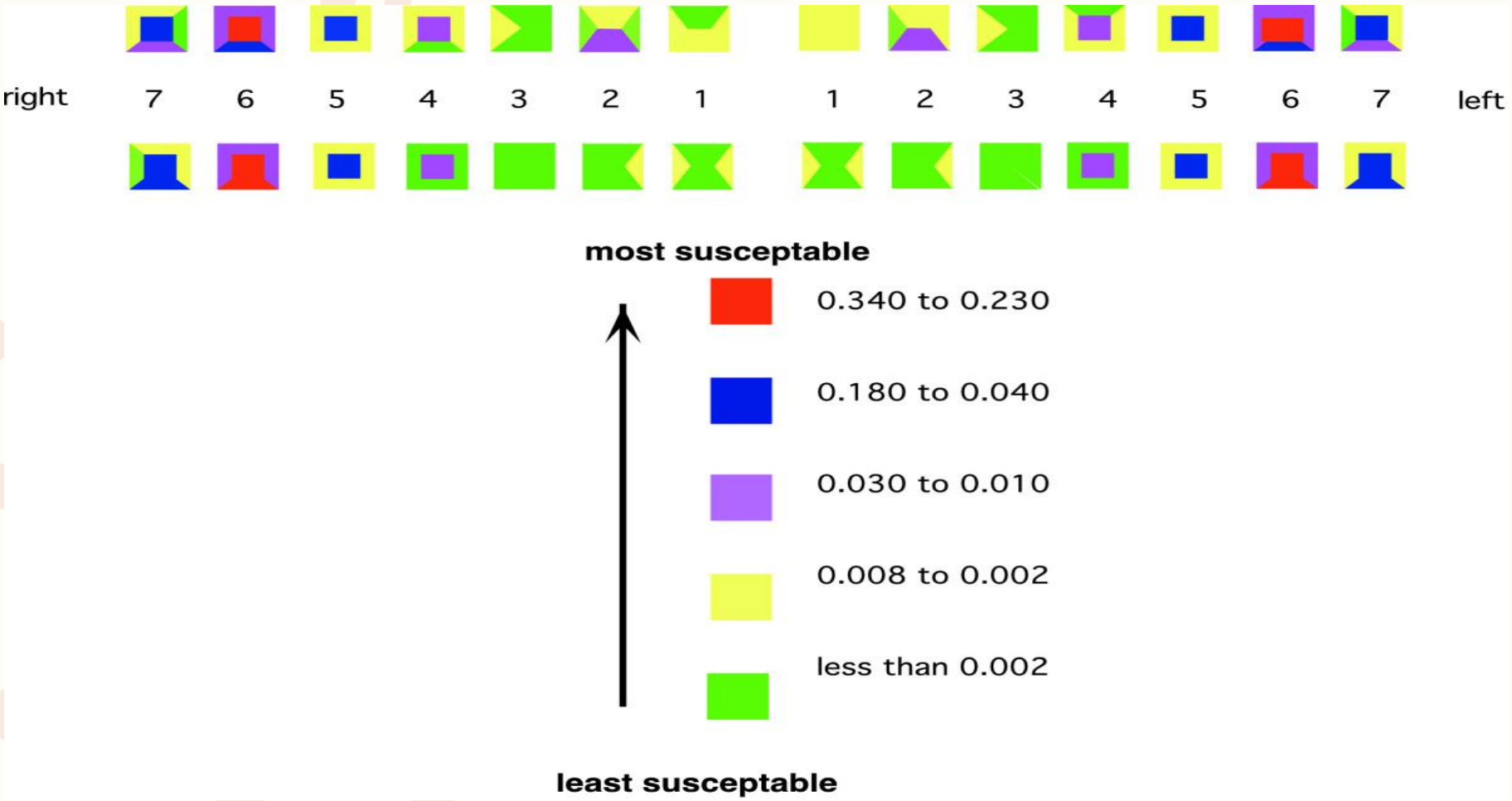
Order of susceptibility

- First permanent molars
- Second molars
- Premolars
- Upper lateral incisors
- Canines and lower Incisors (the least)

Berman and Slack (1972) (11-13 year olds)

Batchelor and Sheilham (2004) 4 year longitudinal study (5-16 y.o.)

Distribution of probabilities of site susceptibilities



Patterns of caries attack

- When caries levels are low the majority of lesions occur on cclusal surfaces or in pits and fissures
- As DFS increases number of proximal lesions increases
- Caries reducing effect of fluorides is greater for proximal surfaces and smooth surfaces than for pits and fissures .McDonald and Shilam (1992)

Caries Correlation – Primary Dentition

- 84% of children caries free in the primary dentition remained so in the mixed dentition
  Greenwell et al (1990)
- Children with primary teeth caries are 3x more likely to develop caries in their permanent teeth
  Li and Wang (2002)
- ECC is a high-risk indicator for future caries development in the permanent dentition
  Peretz et al (2003)
- Caries in permanent teeth – 94% experienced caries in their primary teeth

Pattern of symmetry: clinical relevance

- Presence of caries on one side warrants a careful clinical and radiographic examination on the contralateral side
- Maxilla vs Mandible
- Additional preventive efforts

Caries Correlation – Primary Dentition

- Distal caries on E's → 15x ↑ risk of caries on the mesial surface of 6's
- Mesial surfaces of 6's – colonized by bacteria from the caries lesion of the E's
- ↑age, ↑ time of mesial surfaces of 6's exposure to carious the …distal surfaces, ↑ probability of developing caries. Vanderas et al (2004)

Strategies to prevent caries progression

- Prevention of further caries in primary teeth
- Eliminate carious lesions already established

Presence of caries on one side/site

- Clinical and radiographic examination
- Additional preventive measures

- Hidden or occult caries

Best management by early detection, use of radiographs

Caries prevalence in UAE

1. **In a sample 803, 11–17 year old schoolchildren in Sharjah, UAE the mean DMFT was 3.19 and 75% had dental caries.** ***FA Kadri , Gopinath VK et.al 2018***
2. **Children aged 2, 4 and 5 years were examined for dental caries in the Emirate The mean dmft at age 5 years was 8.4 in Abu Dhabi, 8.6 in Al Ain and 5.7 Western region.** ***Al-Hussani & Rugg-Guun ,1998***
3. ***The prevalence of dental caries among 5 and 6 years old was high 76.1%. The average dmfs score 10.2.***
   Hashim R, et al 2006

Prevalence and trends

- Caries prevalence reached its peak in Australia in the 1950s
- 12y.o.mean DMFT = 9.3
- < 1% population caries-free
- Caries rates so high, prophylactic extraction of 6's soon after eruption. Zurich, 1960's

Prevalence and trends -Australia

- 1960's
  - Coinciding with increase water fluoridation
  - 1977 – 12y.o. mean DMFT = 4.8
  - 1999 -12y.o. mean DMFT =0.8
- South Australia
  - 1990 – 12y.o. mean DMFT = 1.27
  - 1996 – 12y.o. mean DMFT = 0.47

Prevalence and trends – other nations

Reasons for decline:

- Public health measures
- Changing living conditions, lifestyles and improved self-care practices

Reversed trend

- Caries experience after mid 1990's increased
- After 1996 there is a consistent increase in caries prevalence to 2002 and beyond
- 12 year old DMFT 1996 – 2002

  76.6% increase.
- Reason for trend is unclear
- South Australian Dental Service – trend in the late 90's of decreased application of fissure sealants

The World Oral Health Report 2003

"Oral diseases qualify as major public health problems owing to their high prevalence and incidence in all regions of the world, as for all diseases, the greatest burden of oral diseases is on disadvantaged and socially marginalized populations. The impact in terms of pain and suffering, impairment of function and its effect on quality of life must also be considered."

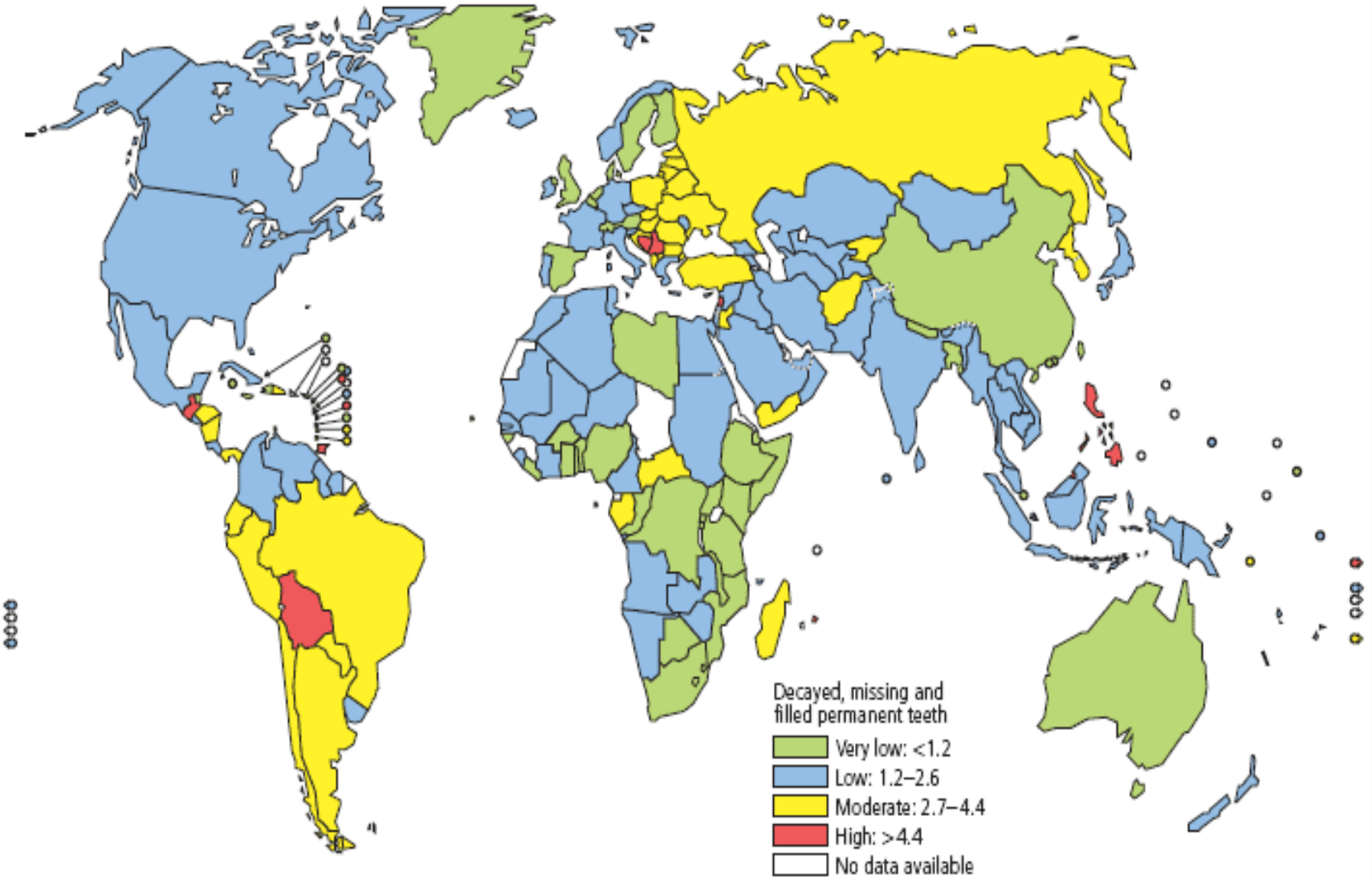
The World Oral Health Report 2003

"Dental caries is still a major oral health problem in most industrialized countries, affecting 60-90% of schoolchildren and the vast majority of adults. In light of changing living conditions, however, it is expected that the incidence of dental caries will increase in many developing countries particularly as a result of a growing consumption of sugars and inadequate exposure to fluorides". (WHO 2003)

WHO Report

- Dental caries experience among 12-year-old children in the WHO regions in the year 2003-2004, based on the DMFT (Decayed, Missing and Filled Teeth) Index, which measures the lifetime experience of dental caries in permanent dentition is shown in Fig.1

Fig. 1. **Dental caries levels (Decayed, Missing and Filled Teeth (DMFT) index) among 12-year-olds worldwide, December 2004**



Source: refs. *1–3*.

WHO 05.113

Summary

- Recent reversed trend – increase in caries experience in children (all ages)
- Majority of caries develop in pits and fissures
- WARNING SIGN: history or presence of caries in primary teeth

Management strategies

- Prevention and control of caries in the primary dentition
- Use of routine radiographs
- FISSURE SEALANTS for at risk children
- Targeting at risk population
- Can we ‘Re’ – reverse the recent trend?