Tooth decay is still one of the most common chronic childhood diseases in the world, even if during the last five decades measures to combat dental caries have been developed, tested and applied in many populations around the world, so that millions of people have benefitted from it. Avoiding the development of a global burden of dental cavities is possible only through education and prevention programmes for children and parents at all socio-economic levels.

World caries epidemiology

Dental caries is strongly linked to individual hygiene and dietary factors, which are closely related to the socio-economic status of the subject (education level, employment, etc.). The prevalence data provided by the World Health Organization confirm this hypothesis, showing a lower dmft/DMFT in the high-income group, compared to the middle-income group (Tables 1 and 2).

Even if the prevalence and mean dmft/DMFT figures remarkably decreased over time in all countries, a recent review [Frencken, 2017] shows that the most prevalent health condition across the globe in 2010 remained the untreated cavitated dentine carious lesions in permanent teeth, affecting 2.4 billion people, and that untreated cavitated dentine carious lesions in deciduous teeth constituted the 10th most prevalent health condition, affecting 621 million children worldwide.

Europe caries epidemiology

Oral health problems and access to primary oral health care, reveal very high disparities across Europe. The European WHO section quotes dental cavities as one of the most frequent oral diseases.

In European countries, tooth decay among 6-year-old children varies from 20% to 90%, depending on socio-economic determinants (Fig. 1).

The “Europe/WHO 2020 goal” regarding dental cavities aims to obtain a caries-free value of 80% in both 4- and 12-year-olds, which is why the Organization focuses on prevention as a first community intervention. “Health 2020” is the policy framework adopted by the Member States as an overarching value- and evidence-based guide for health and wellbeing.

The latest data available (Fig. 2) show that the goal is a long way off, but WHO/Europe is already working with the Member States to develop, improve and promote government-approved policies dealing with oral health.

First of all, dentists and all oral health care providers must give priority to prevention and oral health promotion.
### TABLE 1

<table>
<thead>
<tr>
<th>Country income</th>
<th>N</th>
<th>Prev %</th>
<th>Range %</th>
<th>N</th>
<th>dmft Median</th>
<th>Range %</th>
<th>N</th>
<th>d-comp %</th>
<th>Range %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>3</td>
<td>64.4</td>
<td>49.2–93.1</td>
<td>3</td>
<td>4.4</td>
<td>3.0–9.0</td>
<td>2</td>
<td>96.1</td>
<td>93.3–98.9</td>
</tr>
<tr>
<td>Lower-middle</td>
<td>12</td>
<td>83.4</td>
<td>64.0–88.6</td>
<td>16</td>
<td>4.1</td>
<td>1.4–8.0</td>
<td>9</td>
<td>96.4</td>
<td>91.3–100</td>
</tr>
<tr>
<td>Upper-middle</td>
<td>13</td>
<td>76.4</td>
<td>53.4–93.2</td>
<td>15</td>
<td>3.9</td>
<td>2.4–6.7</td>
<td>11</td>
<td>88.0</td>
<td>78.6–97.3</td>
</tr>
<tr>
<td>High</td>
<td>33</td>
<td>49.0</td>
<td>21.0–93.4</td>
<td>33</td>
<td>2.0</td>
<td>0.3–6.7</td>
<td>22</td>
<td>75.0</td>
<td>33.3–100</td>
</tr>
</tbody>
</table>

N number of countries

**TABLE 1** Median prevalence of cavitated dentine carious lesions (Prev) in 5- and 6-years-olds, median of mean dmft scores and range interval, and median proportion of D-component and range interval by category of country income, using the WHO databank data from 2000 to 2015 [Frencken, 2017].

### TABLE 2

<table>
<thead>
<tr>
<th>Country income</th>
<th>N</th>
<th>Prev %</th>
<th>Range %</th>
<th>N</th>
<th>DMFT Median</th>
<th>Range %</th>
<th>N</th>
<th>D-comp Median</th>
<th>Range %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>5</td>
<td>42.2</td>
<td>19.1–97.3</td>
<td>9</td>
<td>0.9</td>
<td>0.3–5.5</td>
<td>3</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Lower-middle</td>
<td>15</td>
<td>41.9</td>
<td>22.4–75.7</td>
<td>21</td>
<td>1.4</td>
<td>0.4–4.5</td>
<td>13</td>
<td>80.0</td>
<td>66.6–100</td>
</tr>
<tr>
<td>Upper-middle</td>
<td>20</td>
<td>69.4</td>
<td>37.0–87.0</td>
<td>27</td>
<td>2.1</td>
<td>1.1–4.9</td>
<td>16</td>
<td>79.0</td>
<td>36.4–94.1</td>
</tr>
<tr>
<td>High</td>
<td>36</td>
<td>46.6</td>
<td>22.3–84.0</td>
<td>44</td>
<td>1.3</td>
<td>0.4–4.8</td>
<td>27</td>
<td>45.5</td>
<td>0.0–92.9</td>
</tr>
</tbody>
</table>

N number of countries

**TABLE 2** Median prevalence of cavitated dentine carious lesions (Prev) in 12-years-olds, median of mean DMFT scores and range interval, and median proportion of D-component and range interval by category of country income, using the WHO databank data from 2000 to 2015 [Frencken, 2017].

**FIG. 1** DMFT index of children in European countries, 2011 (WHO, 21th Congress of the European Association of Dental Public Health, October 2016).
Dental caries can be prevented and defeated in many ways. Approaches include primary prevention, defined as interventions to prevent caries onset, for example by encouraging less consumption of sugar, and secondary prevention, defined as early disease detection and interventions to hinder the progression of early caries to cavitation. Occlusal surfaces of posterior teeth are the most susceptible sites for the development of caries because of their deep and narrow anatomy of pits and fissures which can host bacteria coming from plaque, unreachable during brushing [Beuchamp J, 2008]. Sealants act as a primary prevention barrier against plaque and acids, by forming a hard shield that prevents food and bacteria from getting into these vulnerable areas on the chewing surface of the tooth and causing decay. Current evidence indicates that sealants are also an effective secondary preventive approach when placed on early non-cavitated carious lesions, by inhibiting caries progression [Holmgren, 2014].

Wright reported that the risk of developing new carious lesions in primary or permanent molars decreased by 76% in children or adolescents who receive sealants in sound occlusal surfaces or non-cavitated pit and fissure carious lesions, compared with an unsealed control group after two years of follow up. Even after 7 or more years of follow-up, the caries incidence is about 29% in the experimental group, compared to a caries incidence of 74% in the control group [Wright JT, 2016].

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