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Section: International comparison of health determinants

Relationship between caries prevalence and fissure sealants among 12-year-old German children at three educational strata

Summary

Objectives: To investigate the relationship between caries prevalence and fissure sealants among 12-year-old German children at three educational levels.

Methods: In 1998 a cross-sectional investigation which comprised 60 % of the 12-year-old children was performed in Heidelberg, Germany. The children attended three types of schools: Gymnasium, Hauptschule, and Realschule. The children received a dental examination. Teeth with caries experience were recorded according to WHO criteria, and teeth with a fissure sealant were also noted.

Results: The mean number of fissure sealed teeth per child was 2.49 (Gymnasium), 2.31 (Realschule) and 1.17 (Hauptschule). In children who attended a Gymnasium the mean DMFT scores were the lowest (0.87 in children with fissure sealant and 1.31 in children without fissure sealant). The corresponding values for children who attended a Realschule were distinctly higher. The highest mean DMFT scores (2.14 and 3.48, resp.) were observed in children who attended a Hauptschule. The proportion of caries-free children was higher in all three types of school when fissure sealants were present.

Conclusion: In spite of a high prevalence of fissure sealants there is an unequal caries experience among 12-year-old children from different educational strata. To improve this situation, persons important to promotion of dental health should do all their part to ensure that fissure sealants are applied to permanent teeth as early as possible, especially when children have caries experience in their primary dentition.

Keywords: **Caries prevalence – Fissure sealants – Socio-economic status – Educational level – Germany.**

In recent years, caries prevalence among children and adolescents from Western and Northern Europe has been observed to decline due to a number of preventive measures, such as more widespread use of fluorides or the application of fissure sealants (Marthaler et al. 1996; Vrbic 2000). It has also been determined that the caries experience of children and adolescents in the same age group is very unequally distributed (Schulte et al. 1989; Truin et al. 1998; Pieper 2001; Källestal & Wall 2002; Pitts et al. 2002; van Nieuwenhuysen et al. 2002). Caries prevalence among children and adolescents of high socio-economic status is distinctly lower than among those of low status (Truin et al. 1998; Schiffner et al. 2001; Källestal & Wall 2002; van Nieuwenhuysen et al. 2002).

In Germany, it has hitherto rarely been possible to show that caries prevalence among children and their socio-economic status are related while taking into account their parents' professional position (Schiffner et al. 2001). When examining children and adolescents in Germany, it is very difficult to obtain permission to request socio-economic indicators, such as their parents' educational level, income or profession. Nevertheless, public health dentists employed by the communities in this country have the right to perform a dental examination on school age children and adolescents aged 6–18 years in school. For many years, this fact has been making it easier to conduct scientific examinations in German schools aimed at determining caries prevalence. The association between socio-economic status and caries prevalence is especially easy to demonstrate for children attending a secondary school simply by using the attended school type as an indicator of the criterion of educational success. In most of Germany's federal states, children attend primary school when they are between 6 and 10 years of age. Subsequently they change to secondary school. In general, the children can choose between three types of

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schools, depending on their level of academic performance: the *Gymnasium*, the *Realschule* and the *Hauptschule*. Furthermore, some regions or towns have *Gesamtschulen* which integrate these three school types. Academic performance is expected to be high in the *Gymnasium*, medium in the *Realschule* and low in the *Hauptschule*. To date, official data on the socio-economic status of the parents of children attending the various school types are not available. In Germany, a much higher proportion of children attending a *Gymnasium* are generally assumed to come from families of high socio-economic status than children attending a *Realschule* or a *Hauptschule*. Apparently, Manz et al. (2001) are the only ones to have investigated and confirmed this association so far. It has regularly been shown that children attending a *Gymnasium* exhibit a distinctly lower caries prevalence than children attending a *Realschule* or a *Hauptschule* (Schulte et al. 1989; van Steenkiste et al. 1993; Schulte et al. 1993; Pieper 2001).

Although the availability of fluorides has improved, dental fissures located on the chewing surfaces of children's and adolescents' molars and premolars have proven to be very susceptible to caries (Steiner et al. 1994). Sealing these fissures, especially on permanent molars, is regarded to be very important in preventing caries (Staehle 1994; Heinrich-Weltzien et al. 1998). Sealing a fissure is performed in 2 steps. First, the dental enamel in the fissure area is cleaned and conditioned. Then, a special composite resin is applied and cured with the aid of light. In an investigation, which was conducted by ourselves, a clear association between fissure sealants and low caries experience was demonstrated (Schulte et al. 2001). The most important indication of the need to seal children's fissures is when they have an increased risk of developing caries (Staehle 1994). It is also recommended to apply fissure sealants to molars that have deep and jagged fissures, because these are very difficult to keep clean even when good oral hygiene is practiced.

By the greater portion of published studies of fissure sealants have evaluated improvements in the respective materials and application techniques in vitro (Garcia-Godoy & Borba de Araujo 1994; Bottenberg et al. 1996; Kersten et al. 2001; Reinhardt et al. 2004). Furthermore, a number of prospective clinical studies have been conducted to assess the survival rate of fissure sealants which had been applied by one or two dentists (Wendt & Koch; 1988; Vehkalahti et al. 1991; Forss et al. 1994; Koch et al. 1997; Perreira et al. 2001). By comparison, the prevalence of fissure sealants in the adolescent population has been investigated in only a few cross-sectional studies (Vrbic 2000; Schulte et al. 2001; Pitts et al. 2002). In Germany, children can receive fissure sealants only from private dental practices or university dental clinics. In 1993, the German social security system extended its range of services. Since that time, they have been paying for the application of fissure sealants to the permanent molars of children and adolescents aged 6–18 years. This change was one of the main reasons for the increase in the prevalence of fissure sealants in this age group (van Steenkiste et al. 1993; Irmisch et al. 1994; Schulte et al. 2001). Yet no study in Germany has investigated whether this preventive measure has benefited children of all educational levels. It was therefore the objective of the present study to investigate the relationship between fissure sealants and caries experience in 12-year-old children at three different educational levels.

Materials and methods

The German city of Heidelberg has a population of about 130000. In 1998, the number of 12-year-old children attending a school in Heidelberg was 1204. According to their academic performance children attended either a *Gymnasium* (secondary school with high academic level), a *Realschule* (secondary school with medium academic level) or a *Hauptschule* (secondary school with low academic level). A small percentage of the children attended a *Gesamtschule* (integrated secondary school). All Heidelberg secondary schools were asked to participate in the present cross-sectional investigation whereof only a small number could not do so due to organisational reasons. On the whole, 864 children representing 72% of the 12-year-olds attending a school in Heidelberg were examined (Schulte et al. 2001).

Prior to the begin of the study, the dentist performing the examinations (R.R.) was calibrated by a dentist with great experience in caries epidemiology (A.S.). The results of these examinations were 98% in agreement (Kappa 0.93). The study was conducted on 12-year-old children in Heidelberg schools from October to December 1998. A 12-year-old child was defined as anyone who had completed the eleventh but had not yet begun the thirteenth year of life on the day of the examination. The intra-oral examination was performed with the aid of plane dental mirrors, dental probes and artificial light. DMFT values were determined according to World Health Organization criteria (WHO 1997). The letters DMFT stand for D = decayed (carious), M = missing, F = filled, T = tooth/teeth. Carious lesions confined to enamel and thus not requiring dental therapy were not taken into consideration. Teeth were only considered to fulfill the criteria for "missing" and "filled" if caries had been the reason for this diagnosis or dental treatment. The presence of fissure sealants was recorded, regardless of whether the sealant was complete or not.

Table 1 Proportion of children with at least one fissure sealed tooth and mean number of fissure sealed teeth in relation to the attended school type

	All children	Children attending a Gymnasium	Children attending a Realschule	Children attending a Hauptschule	p-value
Number of children examined	721	441	191	89	
Proportion of children with at least one fissure sealed tooth	62.9%	67.3%	62.8%	41.6%	< 0.05* > 0.05**
Mean number of fissure sealed teeth, all children	2.28	2.49	2.31	1.17	< 0.05***
Mean number of fissure sealed teeth, children with fissure sealants only	3.62	3.69	3.67	2.80	< 0.05***

* Chi-square test was applied to find out whether the proportions of children with at least one fissure sealant differed significantly between Realschule and Hauptschule

** Chi-square test was applied to find out whether the proportions of children with at least one fissure sealant differed significantly between Realschule and Gymnasium.

*** Kruskal-Wallis test was applied to find out whether the mean number of fissure sealed teeth differed significantly between children attending a Gymnasium, a Realschule or a Hauptschule

Table 2 Mean DMFT scores for children with and without fissure sealants (FS) in relation to school type attended. SD denotes standard deviation

	All children	Children attending a Gymnasium	Children attending a Realschule	Children attending a Hauptschule	p-value
DMFT in children with and without FS	1.52 (SD 2.04)	1.01 (SD 1.41)	2.04 (SD 2.43)	2.92 (SD 2.71)	< 0.001*
DMFT in children with FS	1.16 (SD 1.72)	0.87 (SD 1.24)	1.57 (SD 2.13)	2.14 (SD 2.73)	< 0.001*
DMFT in children without FS	2.14 (SD 2.36)	1.31 (SD 1.68)	2.83 (SD 2.70)	3.48 (SD 2.57)	< 0.001*
p-value	< 0.001**	0.07**	< 0.001**	0.004**	

* Kruskal-Wallis test was used to find out whether there was a significant difference between the mean DMFT values of children attending a Gymnasium, a Realschule or a Hauptschule

** Kruskal-Wallis test was used to compare the mean DMFT of children with fissure sealants and without fissure sealants, respectively

For the evaluation presented here children who attended a *Gesamtschule* (n = 143), an integrated secondary school, were excluded from the sample because it was impossible to classify them according to the educational strata. So the data of 721 children, representing 60% of the 12-year-olds attending a school in Heidelberg were processed for the present study. Of these, 441 attended a *Gymnasium*, 191 a *Realschule*, and 89 a *Hauptschule*.

Statistical evaluation

The SAS statistics program was used for the descriptive and the analytic evaluation of the data presented in this paper. Chi-square test was applied to find out whether the proportions of children with at least one fissure sealant differed significantly between *Realschule* and *Hauptschule* or between *Realschule* and *Gymnasium*. Kruskal-Wallis test was applied to find out whether the mean number of fissure sealed teeth differed significantly between children attending a *Gymnasium*, a *Realschule* or a *Hauptschule*. Kruskal-Wallis test was also used to determine whether there was a significant difference between the mean DMFT values of children attending a *Gymnasium*, a *Realschule* or a *Hauptschule* as well as of children with fissure sealants and without fissure sealants, respectively. The applied tests were two-tailed. We considered $p<0.05$ to be statistically significant.

Results

Slightly more than 60% of all children examined had at least one tooth with a fissure sealant, (Tab. 1). Nevertheless, distinct differences were observed between the different educational levels. Compared to those attending a *Gymnasium* or a *Realschule*, the proportion of children with at least one fissure sealed tooth was significantly lower among those attending a *Hauptschule* (Tab. 1).

In addition, children attending a *Hauptschule* had a significantly lower mean number of fissure sealed teeth than did those attending a *Realschule* or a *Gymnasium* (Tab. 1). This was also held true when children without any fissure sealant were excluded from the calculation of the mean number of fissure sealed teeth (Tab. 1).

Children with at least one fissure sealant always had a distinctly lower mean caries experience than children without fissure sealants (Tab. 2). The difference between the DMFT

Table 3 Proportion of children with and without caries experience in children with and without fissure sealants, in relation to the school type attended

	All children		Children attending a Gymnasium		Children attending a Realschule		Children attending a Hauptschule	
	n	%	n	%	n	%	n	%
Caries-free (DMFT = 0) with and without FS*	322	44.7	233	52.8*	71	37.2	18	20.2
Caries-free (DMFT = O) with at least 1 FS	221	30.7	158	35.8	51	26.7	12	13.5
Caries-free (DMFT = O) without any FS	101	14.0	75	17.0	20	10.5	6	6.7
With caries experience (DMFT > 0) and at least 1 FS	233	32.1	139	31.5	69	36.1	25	28.1
With caries experience (DMFT > 0) without any FS	166	23.2	69	15.6	51	26.7	46	51.7
Total	721	100.0	441	100.0	191	100.0	89	100.0

* The figures in this row are not included in the calculation of the totals presented in the last row

scores of both of these groups was statistically significant for *Hauptschule* and *Realschule* pupils, but not *Gymnasium* pupils (Tab. 2).

Regardless of whether fissure sealants were present or not, the extent of the children's caries experience differed distinctly between the three educational levels (Tab. 2). The mean DMFT scores of children attending a *Gymnasium* were lowest, while those of children attending a *Hauptschule* were highest (Tab. 2).

Slightly more than half of the *Gymnasium* pupils had even no caries experience at all (DMFT = 0), a score that could only be matched by 37.2% of the *Realschule* pupils and 20.2% of the *Hauptschule* pupils (Tab. 3). Furthermore, it was found that, regardless of educational level, caries-free children were twice as likely to have fissure sealants as not.

The great majority of children with caries experience (DMFT > 0) who attended a *Gymnasium* or a *Realschule* had a fissure sealant on at least one tooth, a fact which was only true of a minority of the children attending a *Hauptschule* (Tab. 3).

Discussion

The present cross-sectional study only comprised 12-year-olds because this age group represents a target group of the World Health Organization (WHO) with respect to oral health (FDI & WHO 1982). Hence there are plenty of international data available from cross-sectional studies of this particular age group (Marthaler et al. 1996; Vrbic 2000; Pieper 2001; Schulte et al. 2001; Pitts et al. 2002). As a rule, the objective of these studies was to determine whether due to preventive measures the mean caries experience in this age group was reduced and whether the goals of the WHO were obtained. However, the relationship between socio-economic status and caries experience was only evaluated on rare occasion (Truin et al. 1998; Schiffner et al. 2001; Källestal et al. 2002; Van Nieuwenhuysen et al. 2002). This is all the more surprising when it is considered that the WHO, within the scope of its "Health for all by 2000" campaign, has long been demanding that not only should the average prevalence of a disease be reduced, but also differences in prevalence within a population (WHO 1988).

It is important to note that, in all three groups examined, children with fissure sealants had caries half as often as did those without fissure sealants (Tab. 2). This can be taken to mean that fissure sealants not only reduce caries experience but may even help to keep caries from developing at all, at least up to the age of 12, the proportion of 12-year-olds with at least one fissure sealant. In this context, it is noteworthy to remind that the prevalence of fissure sealants has increased nearly tenfold since the social security system began paying for this measure and is currently more than 60% (van Steenkiste et al. 1993; Schulte et al. 2001). A similar success was observed in Australia once the application of fissure sealants was included in a health program (Manton & Messer 1995). Conversely, the low prevalence of fissure sealants found in French children can be explained by the fact that the French public health insurance program had not being paying for this measure until the year 2000 (Schulte et al. 2001). In view of the fact that public health insurance spends a great deal on fissure sealants, it should also be pointed out that some 12-year-olds succeed in having caries-free teeth without fissure sealant (Tab. 3). This was observed to be the case with *Gymnasium* pupils in particular (Tab. 3). This study makes no attempt to give reasons for this development. It can be assumed, however, that this is due to regular use of fluorides, among other things (Schulte et al. 2001).

Nevertheless, the present study shows also that there is still an unequal distribution of oral health among 12-year-old children in Germany. The fact that children attending a *Hauptschule* were found to have the highest caries experience and children attending a *Gymnasium* the lowest is in accordance to a number of other German cross-sectional studies (Schulte et al. 1989; Schulte et al. 1993; van Steenkiste et al. 1993; Heinrich-Weltzien et al. 1998; Pieper 2001). The differences observed between the three educational levels are of the same magnitude as has been found in studies where the parents' profession was used as criterion to determine the socio-economic status of the population examined (Truin et al. 1998; Schiffner et al. 2001; van Nieuwenhuysen et al. 2002). It is very important to note that other studies of the social aspects of medicine also discovered that comparable populations evinced distinct differences related solely to the level of school education. It has been shown, for instance, that the prevalence of cardio-vascular risk factors (smoking habits, obesity and lack of participation in sports) among young adults in Germany who graduated from a *Hauptschule* is much higher than among those who graduated from a *Gymnasium* (Helmert et al. 2001). These observations support the findings of Mielck and Bloomfield (2001) to the effect that it makes little difference whether socio-economic status is defined by educational achievement, occupational status or income.

The present investigation now allows to demonstrate that children of the same age in Germany do not benefit equally from a very important preventive measure, the fissure sealant. The proportion of children with at least one fissure sealant was the lowest for children attending *Hauptschule* (Tab. 2). This also shows that having the social security system assume the costs of sealing fissures does not automatically guarantee that this preventive measure will reach children of different educational levels to an equal extent. So it can be concluded that the expansion of fissure sealants did not reduce disparities in caries prevalence across groups with different educational level.

It is remarkable that, even in childhood, educational level should make such a significant difference in the way people maintain oral health and take advantage of preventive measures. This also raises the question – which cannot be answered here – regarding how long the educational level of the parents is the most decisive factor and at what point in time the educational level of the adolescents themselves begins to take on greater importance.

The present study demonstrates once again that, in Germany, it is mainly the children attending a *Hauptschule* who represent a disadvantaged group with respect to oral health, since they are provided with preventive dental treatment too late, if at all. The authors know from very many family dentists, public health dentists employed by the communities and teachers that they regularly observe that these children tend to visit a dentist only when the dental harm is so extensive that it cannot be overlooked or when they begin to suffer from pain. In addition, public health dentists report regularly to observe that the parents of *Hauptschule* pupils show very little interest in adequate oral hygiene, balanced nourishment and making use of preventive dental services. These observations explain why so many children at this educational level do not avail themselves of the preventive measure of sealing fissures early enough, that is, during the first months following the eruption of the first molars at the age of five to six years and the second molars at 11 to 12 years of age, respectively. Therefore many of these teeth become carious and can no longer be sealed. Another reason why this population group is at such a disadvantage is the fact that family dentists have difficulty identifying in time children whose permanent dentition is at a high risk of developing caries.

To improve this situation, we propose placing more importance than hitherto on whether there is any caries experience in the primary dentition when fissure sealants are applied. It is well known that children with caries experience in their permanent teeth had already suffered damage due to caries in their primary dentition (Peretz et al. 2003). Therefore public health dentists are recommended to examine first grade children as soon as possible and to refer those with caries experience in their primary dentition (DMFT > 1) to their family dentists to have fissure sealants applied. In addition, pediatricians should be provided with more detailed information regarding the advantages of fissure sealants. This would also enable pediatricians to target parents of children with caries or restorations in primary teeth with information on how important it is to apply fissure sealants as soon as possible following the eruption of the permanent molars.

If future studies should reveal that the desired result cannot be reached by such procedures, it could well become necessary to consider changing the caries prevention strategy involving fissure sealants. The current German system requires that children be brought by their parents or go themselves to a dentist in order to receive a fissure sealant. However, it has been pointed out that many children with high caries experience only visit a dentist when they are suffering distress. One possible solution could be to create conditions that would at least allow children with a high risk of caries to receive fissure sealants in school.

In the future, it still remains necessary to evaluate the success of various strategies in maintaining oral and dental health in the population. Attempts will also have to be intensified in this field to overcome disadvantages in health

associated with socio-economic conditions. To obtain this result, it will not be sufficient merely to describe differences using traditional socio-economic indicators. Possibilities will have also to be explored for changing behavior that could be detrimental to health. This will also require knowledge about "lifestyle", that is, the complex interactions between health-related behavior patterns, attitudes and relevant social resources in different population groups (Abel 1992).
It would be advisable specifically to address such persons disseminating caries preventive knowledge as public health dentists, family dentists, dental assistants working in prevention, nurses in kindergartens and teachers. These can greatly contribute to achieve a higher prevalence of fissure sealants and thus a lower caries prevalence in populations of low socio-economic status. In this context, it is interesting to take notice of a study from the German state of Bavaria. There the rate at which women availed themselves of examinations for early detection of breast cancer no longer revealed any differences related to socio-economic status (Röckl-Wiedmann et al. 2002). It is encouraging to see that differences due to socio-economic factors can be overcome in at least one small area of public health care.

Zusammenfassung

Beziehung zwischen Kariesprävalenz und Fissurenversiegelungen bei 12-jährigen deutschen Kindern aus drei Bildungsschichten

Fragestellung: Die Beziehung zwischen Kariesprävalenz und der präventiven Massnahme der Versiegelung von Zähnen bei 12-jährigen Kindern aus drei Bildungsschichten zu untersuchen.
Methoden: Im Jahr 1998 wurde eine Querschnittsstudie bei 60 % der 12-jährigen Kinder aus Heidelberg, Deutschland, durchgeführt. Die Kinder besuchten drei verschiedene Schultypen: das Gymnasium mit hohen, die Realschule mit mittleren oder die Hauptschule mit niedrigen akademischen Anforderungen. Die zahnärztliche Untersuchung der Kinder erfolgte in den Schulen. Dabei wurden sowohl die Zähne mit Karieserfahrung entsprechend der WHO-Kriterien als auch die Zähne mit einer Fissurenversiegelung registriert.
Ergebnisse: Die mittlere Zahl der fissurenversiegelten Zähne pro Kind betrug 2,49 (Gymnasium), 2,31 (Realschule) und 1,17 (Hauptschule). Bei den Gymnasialschülern wurde die niedrigste Karieserfahrung beobachtet. Hier betrugen die mittleren DMFT-Werte 0,87 (Kinder mit Fissurenversiegelungen) und 1,31 (Kinder ohne Fissurenversiegelungen). Deutlich höher waren die entsprechenden Werte bei den Realschülern. Die höchsten mittleren DMFT-Werte wurden mit 2,14 bzw. 3,48 bei den Schülern beobachtet, die eine Hauptschule besuchten. Der Anteil der kariesfreien Kinder war in allen Schultypen viel höher, wenn Fissurenversiegelungen vorhanden waren.
Schlussfolgerung: Trotz einer hohen Prävalenz von Fissurenversiegelungen ist die Karieserfahrung bei Kindern aus drei verschiedenen Bildungsgruppen ungleich verteilt. Zur Verbesserung dieser Situation müssen für die Förderung von Zahngesundheit relevante Personen von der Wichtigkeit überzeugt werden, dass bleibende Zähne vor allem bei Kindern mit Karieserfahrung im Milchgebiss so früh wie möglich versiegelt werden sollten.

Résumé

Relation entre la prévalence de la carie et les scellements des sillons des enfants allemands de 12 ans issus de trois niveaux d'enseignement différents

Objectifs: Examiner le rapport entre la prévalence de la carie et le scellement préventif des sillons chez des enfants allemands de 12 ans issus de trois niveaux d'enseignement différents.
Méthodes: Etude transversale réalisée à Heidelberg en 1998 auprès de 60 % des enfants de 12 ans, fréquentant trois types d'écoles: le *Gymnasium* (niveau scolaire supérieur), la *Realschule* (niveau scolaire moyen) ou la *Hauptschule* (niveau scolaire inférieur). Les enfants ont bénéficié d'un examen dentaire au sein de leurs écoles. Lors de cet examen, les dents cariées, obturées ou soignées pour cause de carie ont été enregistrées selon les critères de L'OMS. Les dents présentant des scellements des sillons ont également été enregistrées.
Résultats: Le nombre moyen de dents avec scellement des sillons était de 2,49 (*Gymnasium*), 2,31 (*Realschule*) et de 1,17 (*Hauptschule*). Les enfants fréquentant le *Gymnasium* présentaient la plus faible prévalence de caries. Dans ce type d'école, les indices CAO étaient de 0,87 (enfants présentant des scellements préventifs) et de 1,31 (enfants sans scellement préventif). Pour les enfants fréquentant la *Realschule*, les valeurs correspondantes étaient nettement plus élevées. Les moyennes les plus élevées de l'indice CAO (respectivement 2,14 et 3,48) se trouvaient parmi les enfants fréquentant la *Hauptschule*. Dans tous les types d'écoles, la proportion des enfants exempts de carie était plus élevée dans le groupe des enfants présentant des scellements préventifs.
Conclusions: Malgré une prévalence élevée de scellements des sillons, il existe une répartition inégale de la prévalence des caries dentaires chez les enfants de 12 ans appartenant à trois niveaux éducatifs différents. Pour améliorer cette situation, des intervenants importants pour la santé dentaire, doivent être convaincus qu'il est important de sceller les sillons des dents définitives le plus tôt possible, en particulier chez les enfants présentant des caries de leur dents de lait.

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Appendix

Table A1 Caries experience, expressed by decayed, missing and filled teeth due to caries (DMFT), in 12-year-old children, Heidelberg 1998

DMFT	n	P10	P25	P50	P75	P90	MEAN (SD)
All children with and without FS	721	0	0	1	2	4	1.52 (2.04)
Girls with and without FS	386	0	0	1	3	4	1.60 (2.05)
Boys with and without FS	335	0	0	1	2	4	1.42 (2.02)
Children attending a Gymnasium with FS	297	0	0	0	1	3	0.87 (1.24)
Children attending a Gymnasium without a FS	144	0	0	0	2	4	1.31 (1.68)
Children attending a Realschule with FS	120	0	0	1	2	4	1.57 (2.13)
Children attending a Realschule without a FS	71	0	0	2	5	6	2.83 (2.70)
Children attending a Hauptschule with FS	37	0	0	2	3	4	2.14 (2.73)
Children attending a Hauptschule without a FS	52	0	1	3	5	8	3.48 (2.57)