

Scientific article

**Dental injuries in Swiss children – an analysis of Swiss national health insurance data from the year 2019**

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**Keywords**

Dental trauma, Insurance, Accident prevention

## Abstract

This study, the first to analyze accident data from a major compulsory Swiss health insurer (Concordia), reviewed 5,063 dental accident reports of 122,370 children under the age of 16. The predominant cause of injury was a "fall," with "playing" being the foremost activity mentioned and "ground" identified as the primary object of impact. The analysis of the involved objects showed that dental injuries occur most frequently with scooters, bicycles, and stairs. In 2019, 8.14% of children aged one and insured by Concordia suffered a dental injury. By age 16, 58.8% of all children had experienced a dental injury. 0.72% had suffered a primary dentition crown fracture with pulp involvement. Regarding their permanent teeth, 0.21% suffered an avulsion, 0.84% another luxation injury, 0.65% a crown fracture with pulp involvement, and 0.16% a root fracture. A significant increase in injuries per day was observed after the summer holidays. On weekends, there were 28% fewer injuries per day on average than on weekdays. Despite differences among the cantons, the dataset can be considered to be representative for Switzerland. Accident descriptions were often too brief for detailed prevention strategies. Detailed accident information is essential for effective structural measures, which are more effective than promoting behavioural changes. A detailed recording could also be used to draw up a list of the objects frequently involved in accidents. An updated insurance form with an improved nomenclature, the option of digital submission, photo uploads and AI-supported data recording could greatly improve the quality and interpretability of injury data.

## Introduction

Dental injuries occur frequently, and mainly affect children and adolescents (1). The healing process and the required treatment may be challenging and complex, depending on the severity of the injury. With children in particular, the dentition changes from primary to permanent, and the growth of the jaw must be considered during treatment to avoid lasting consequences. Dental injuries may also lead to psychosocial problems that negatively affect the everyday quality of life of children (2, 3).

Most epidemiological investigations of dental injuries in Switzerland are based on surveys (4–22), or (more rarely) on data from clinics (23, 24) or private practices. Because dental injuries usually are not reported to the regular dentist, systematic recording is challenging (23). Questionnaires and interview studies enable findings regarding specific sports or professions, but the information is primarily based on the patients' memories. Insurance information is a more useful source because all reports are recorded in a centralised manner. In the only such study in Switzerland to date, Brunner et al. 2009 investigated the frequency of injuries using the data of the largest Swiss accident insurer (SUVA), which provides accident insurance to the majority of the working population. The study found that less than 1% of adults experience a dental trauma per year (18).

In Switzerland, the costs of accidents are covered by the accident insurance, as outlined in the Federal Act on Accident Insurance (Bundesgesetz über die Unfallversicherung, UVG). This, in turn, falls under the scope of the Federal Act on the General Aspects of Social Security Law (Allgemeiner Teil des Sozialversicherungsrechts, ATSG). In cases where no accident insurer available – for example, for the unemployed, the elderly, or children not engaged in work-based training – the Swiss Health Insurance Act (Krankenversicherungsgesetz, KVG) steps in to cover these costs. According to the statistics on compulsory health insurance published by the Swiss Federal Office of Public Health (Bundesamt für Gesundheit, BAG), in 2019 there were 50 health insurance companies in Switzerland. Of the 1,623,681 compulsorily insured children in Switzerland in 2019 (0 to 18 years), 55% were insured with the six largest health insurers (25). For a health insurer to handle a dental claim, injuries must be reported. This occurs through the parents submitting a notification of the accident and the treating dentist filling out the KVG insurance form and sending it to the respective health insurer.

This present paper is the first to investigate the absolute numbers of dental injuries in children in Switzerland using the data from one of the largest compulsory Swiss health insurers. The aim of the study was to analyse the frequency of dental injuries, the times at which they occurred, and their circumstances. The intention was to use this information to derive recommendations for prevention measures in order to reduce the frequency of dental injuries in children and adolescents.

## Materials and methods

Concordia, in 2019 the fourth-largest compulsory Swiss health insurance company, provided its data on all dental injuries reported in 2019 for this study. The anonymised data was released in accordance with Art. 84a clause 5 lit. a KVG and was submitted to the data protection officer of the insurance company for inspection and approval. The detailed study design and its use of the data was then checked and approved by the data protection officer. The legitimate interest in processing the data, pursuant to Art. 84 a, is illness prevention. This aligns

with Art. 19 clause 1 KVG, aiming to derive action recommendations to prevent future dental injuries.

The study was registered with the Ethics Committee for Northwestern and Central Switzerland (Ethikkommission Nordwest- und Zentralschweiz, EKZN) under project ID Req-2021-00646. The Ethics Committee ruled that the study is not subject to the Swiss Human Research Act (Humanforschungsgesetz), as it exclusively uses anonymised data.

The database consisted of all “injury reports” related to incidents that occurred in 2019, submitted by insured individuals, and all dental injury insurance forms (“Zahnschäden gem. KVG”) submitted by treating dentists for which the insured person was 16 years old or younger (born 2004, 2005, ...). All submitted injury reports were stored in Concordia’s internal system according to the date of the accident provided by the patient. They were then manually assigned the tag “dental”. This enabled distinguishing them from documents for other injuries.

Concordia’s data protection officer did not allow the authors to directly access the database. A Concordia employee bound by a duty of confidentiality viewed all the injury reports and entered the data into an Excel entry mask specifically designed for this task by the authors. Reports marked with “no read permission” — primarily those of employees in the insurance company — were removed. The year of birth, canton of residence, postal code, language, and gender were added to the generated entries. The data underwent a manual cross-check sampling and inspection at Concordia. The authors checked all injury reports for transmission errors, double entries, proper formatting, mistakes, or other irregularities. Any discrepancies found were corrected through four written exchanges with Concordia.

In each case, a keyword was entered for each of the categories established by the authors as part of the study design: “activity”, “incident”, “contact object” and “involved object”.

The authors conducted the descriptive statistical analysis, focusing on frequency and distribution, using Excel. An external statistician provided assistance with the inferential statistics. The chi-squared test was used to analyse the distribution of age by years, gender, causes, severity, and affected teeth. The Kruskal-Wallis analysis of variance was applied to compare injury distribution over time of day, number of affected primary and permanent teeth and total number of affected teeth. A 5% error tolerance on both sides was selected as the significance level. Because of the explorative nature of the study, no adjustment of the significance level due to multiple testing was performed. All analyses were carried out using the statistics software R Version 4.3.0 (R Core Team 2021) (26).

## Results

In 2019, Concordia insured 122,370 children under the age of 16, representing 6.25% of Switzerland’s children in this age group (25). A total of 5,063 dental injury reports were recorded in 2019, of which 106 (2.1%) were excluded because they were double entries, 42 (0.8%) due to “no read permission”, and 9 (0.2%) because of “conflicting reports”. A total of 4,906 (96.9%) of the recorded reports could thus be used for the analysis. The dataset included the reports of 59.4% boys (N = 2913) and 40.6% girls (N = 1991), with no gender indication for two insured individuals. In 2019, one insured person reported five dental injuries, 75 reported three and 279 reported two. 15.2% of all injury reports did not contain a KVG insurance form, implying that no visit to a dentist or general practitioner occurred.

### Causes of injury

The most frequent cause of injury was “fall” (68%, N = 3334), followed by “impact” (14%), “collision” (8%), “crash” (7%), “no information” (1%) and 20 other incidents. The most frequently given activity was “playing” (22%, N = 1055), followed by “no information” (12%), “walking” (7%), “scooter ride” (7%) and 191 other activities. The most frequently mentioned object of impact was “ground” (39%, N = 1972), followed by “no information” (4%) and 677 other objects.

On average, more primary than permanent teeth were affected (4 primary teeth vs. 3 permanent teeth,  $P < 0.001$ ). Primary teeth were affected in 44.9% of injuries, permanent teeth in 30.8%, and both primary teeth and permanent teeth in 6.4% of cases. Boys were significantly more affected than girls (60.5% vs. 39.5%,  $P < 0.001$ ).

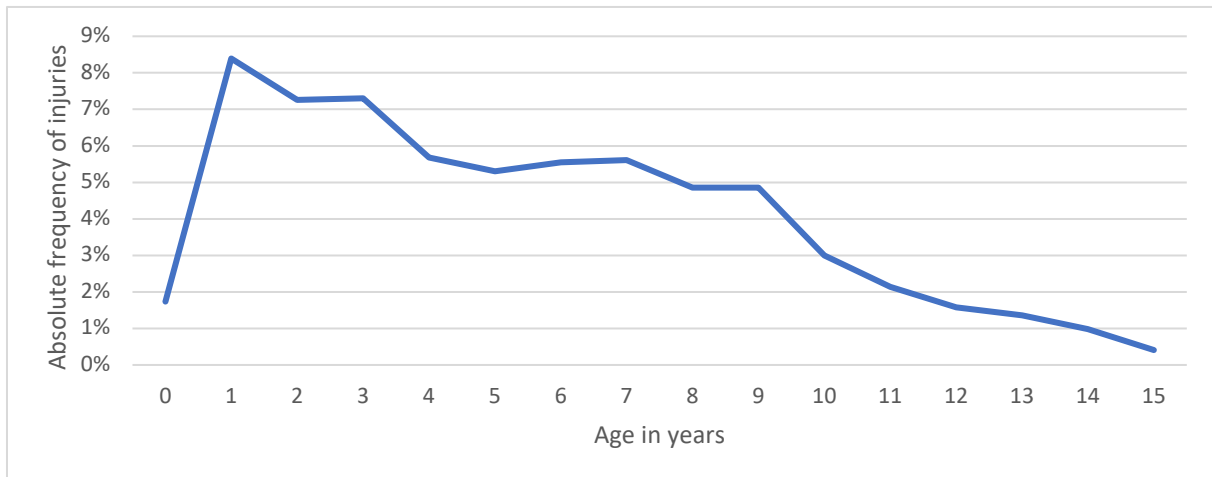
The analysis of the injury reports regarding involved devices or objects showed that dental injuries happen most frequently when riding scooters or bicycles or climbing stairs – with clear differences in age and injuries ( $P < 0.001$ ) (Tab. 1). Trampoline injuries, for instance, occurred at 7.6 years of age on average, with 50% of affected children between 5.9 and 9.7 years old. Avulsions were particularly frequent with this activity.

**Table 1.** The objects most frequently involved in accidents, in descending order of frequency. The average age of injured individuals is given for each. The interquartile range (IQR) shows the age range within which 50% of all injuries occur. The most common injury findings are also indicated.

Involved objects	Injuries (n)	Age (median/years)	IQR (years)	Most frequent injury findings
Scooter	335	7.6	4.7 - 9.2	
Bicycle	235	6.9	4.5 - 10	
Stairs	225	4.8	2.5 - 6.8	Root fracture
Swimming pool	158	9.2	6.5 - 11.0	
Table	146	3.5	1.6 - 5.9	
Football	136	10	8.2 - 11.9	
Physical education	124	7.8	6.3 - 9.7	
Trampoline	114	7.6	5.9 - 9.7	Avulsion
Bed	101	3.6	2.0 - 5.7	
Swing	74	5.7	3.6 - 7.9	
Sofa	71	3.7	2.5 - 5.2	Report without dental injury
Bathtub	68	2.8	1.4 - 5.3	Crown fracture with pulp involvement, root fracture
Slide	66	5.2	3.2 - 7.4	
Balance bike	60	2.9	2.3 - 3.4	
Chair	56	3.8	2.0 - 6.3	Luxation injury
Ski	53	8.9	7.1 - 11.6	
519 others	1605	6.3	3.0 - 9.2	
No information	1279	-	-	
<b>Total</b>	<b>4906</b>	<b>6.0</b>	<b>3.2 - 8.9</b>	

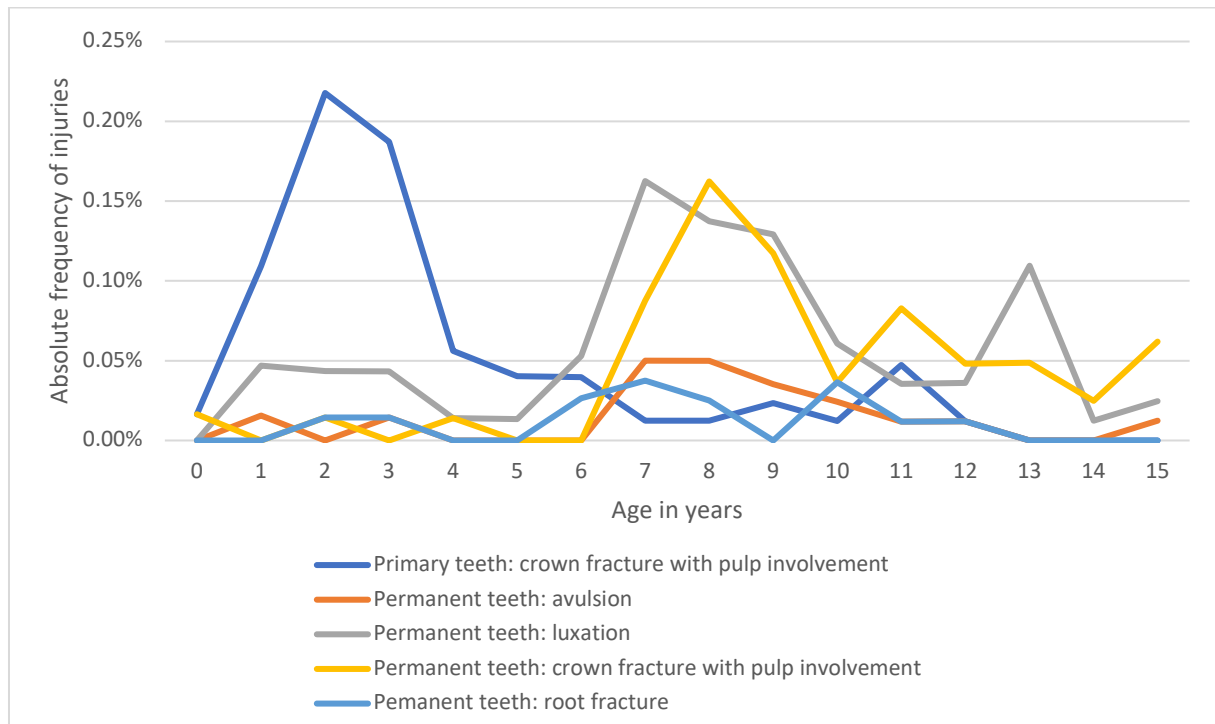
### Age

In 2019, 8.14% of all one-year-olds insured at Concordia experienced a dental injury. From age 9, the frequency of injuries dropped significantly with every additional year. Taking into account the 7.7% repeat injuries, a cumulative 58.8% of all children experienced a dental injury by the time they reached the age of 16 (Fig. 1).



**Figure 1.** Frequency of dental injuries reported to Concordia in 2019 by age.

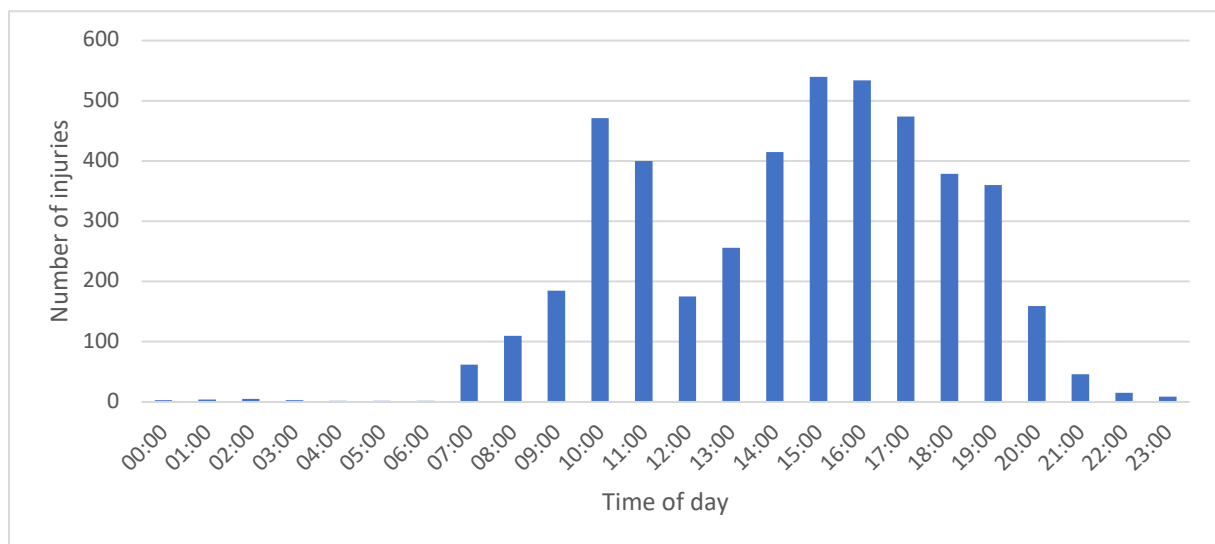
As a result of the dentition change, from 6 years of age injuries to permanent teeth increased significantly (Fig. 2). Dental luxation injuries occurred mainly between the ages of 7 and 9, while crown fractures with pulp involvement mostly occurred between the ages of 8 and 9. Root fractures had their high point between the ages of 7 and 10. Avulsions occurred most frequently in ages 7 and 8. By age 16, a cumulative 0.72% of all children experienced primary tooth crown fracture with pulp involvement. 0.21% experienced an avulsion in their permanent dentition, 0.84% another luxation, 0.65% a crown fracture with pulp involvement and 0.16% a root fracture.



**Figure 2.** Frequency of selected dental injuries requiring extensive treatment by age.

*Time of day*

The analysis of the time of day in which the injuries occurred revealed that most incidents occurred between 10:00 - 12:00 and 14:00 - 20:00 (Fig. 3).



**Figure 3.** Number of injuries by time of day.

1.4% of dental injuries occurred early in the morning, 25.3% in the late morning, 3.8% at noon, 37.8% in the afternoon, 31.1% in the evening and 0.6% at night. 6% of reports had no time indication. The age groups varied significantly: in the early morning, the patients were mainly children aged 7 to 10 (46.9%), the most frequent patients in the late morning were one-year-

olds (14.2%), while children aged between 1 and 5 were the most frequent patients for dental injuries at night (64.3%) ( $P < 0.001$ ).

At different times of day, the objects associated with the injury also vary. In the early morning, scooters, bicycles, and stairs were most frequently involved in the injury (31.9%). In the late mornings, physical education classes (8.7%) and stairs (7.9%) were the most frequent causes of injury. At noon, most dental injuries again occurred on scooters or bicycles, but also involving tables (32.1%). Injuries associated with scooters, bicycles, and stairs as well as swimming pools dominated in the afternoons and evenings (32.5% and 30%, respectively). At night, the bed was the most frequently involved object (48%) ( $P < 0.001$ ).

The severity of the dental injuries varied by time of day: crown fractures with pulp involvement were the most common injury during the day (29.5%) as well as at night (32.1%), followed by concussion (28.2%) during the day ( $P = 0.012$ ). There were no significant differences in gender or in whether the primary or the permanent dentition was affected in relation to the time of day.

The frequency of dental injuries varies slightly throughout the year, with a significant per-day increase after the summer holidays. There were 28% fewer incidents on average on Saturdays and Sundays than on weekdays.

## Discussion

### *Dataset*

The advantage of the dataset used in this study is that all dental injuries of each person were recorded, regardless of the place of initial or subsequent treatment, as all reports are centrally reported to the insurance company. This enabled analyses of the frequency of dental injuries in absolute numbers. The dataset only required slight adjustments; only 3.1% of entries had to be removed due to double entries, no read permission, or inconsistencies. 15.2% of all injury reports lacked a KVG insurance form, implying that these accidents were minor and resulted only in notifications to the insurance company without visits to a dentist or general practitioner. The data for accidents in 2019 was collected from November 2021 to August 2022. Since long-term effects might not become apparent until years later, some incidents without any claim may be missed.

One limitation was the incident descriptions, which were often too brief; in 26% of cases, no conclusion could be drawn on the device or object involved in the incident.

All significance tests carried out during this study fell under the category “overall tests”. This means that the statistical deviation of just one group from another leads to the entire test being classified as significant. With such a large sample size ( $N = 4906$ ), the smallest differences quickly become significant.

In 2019, Concordia had a share of 8.9% of the Swiss market, but with large differences across the cantons. In that year it had up to 30% market share in the inner Swiss cantons of OW/NW/UR/LU, compared to 3% in BE/GE/GR (25). Since activities such as Swiss wrestling or alpine sports are not evenly distributed across the regions, this may affect the transferability of the data to the whole of Switzerland. Nonetheless, a market share of 8.9% is considered representative for the entire Swiss population, assuming that the choice of insurance company is random. Despite the free choice of health insurance in Switzerland, the customer groups of the various insurers differ somewhat. In 2019, Concordia had about 3% to 10% more



children between the ages of 5 and 15 than the general population, while the number of 0-4-year-olds was 10% to 20% lower than the general population (27).

### *Recording of the incidents*

The description of the incidents was frequently too brief to enable recommendations to be derived (23). The study by Brunner et al. (2009) had already found that the location of the incident is rarely recorded fully in the SUVA reports (18).

A fully digital processing of the incident reports would be preferable. Today insured persons can claim online, but the KVG insurance form for dental offices is still in paper form. In the best case, it can be filled out using the dentists' software and then usually has to be printed out and mailed. The terms used in this form are also obsolete and should be replaced by a nomenclature and terminology that better reflect treatment and prognosis (28). In particular, the "description of the incident" section should be enhanced, including an option for photo uploads. Dentists would upload two photographs taken from two perspectives for a better interpretation of dental luxation injuries (29). Meanwhile, parents should have the option to upload an image of the involved object with their claim. Depending on the information provided, additional compulsory fields could appear from which to select options in order to enable a comprehensive report including the involved objects. Artificial intelligence and speech recognition could help obtain organised information on the incident. The European Accident report for car accidents, while not digital, provides a good template, with its selection fields for an improved recording of the circumstances of the incident (30).

### *Causes of injuries*

Table 1 shows the objects that are often involved in dental accidents. The most valuable information, however, is the interquartile range, which indicates the age at which most accidents occur, allowing for targeted prevention strategies. The 535 objects involved in incidents were assigned into categories like "flew into or hit", "indoors or outdoors", "price", "material" and "weight". Despite this classification, no useful findings could be obtained on preventing accidents. It was found that accidents indoors were less frequent than outdoors. The attempt to categorise the objects into as large groups as possible yielded "no information on the device" (26.0%), "outdoor activities" (18.7%), and "furniture" (14.8%) as the largest groups but did not aid in developing prevention strategies.

If more detailed descriptions of the objects involved in the dental injuries were available, the Swiss Council for Accident Prevention (Beratungsstelle für Unfallverhütung, BFU), as an independent institution, could publish a list of devices with a high risk of dental injuries – a "negative hitlist". With enough data, one could even publish a positively formulated "safety score", similar to the "Nutri-Score" for foodstuffs, to serve as a purchase recommendation. A "safety check app" could identify safety issues in already purchased devices by comparing smartphone photos of the device with those in an accident photo database. If a high-risk device, for instance a specific scooter, is recognised, the app would warn of the risk of accident and provide safety tips.

## *Age*

The peak in dental injuries, as seen in Figure 1, occurs at 1 year of age, most likely due to the onset of walking. A cumulative 58.8% of all children experience a dental injury by the age of 16, a considerable figure. Fortunately, serious traumas occur in only 2.6% of cases.

The increased rate of avulsions of permanent teeth between the ages of seven and eight is attributed to the early dentition change. The growth of the affected teeth's roots is not yet completed, and the periodontal space is still wide, making the teeth more prone to luxation.

## *Time of day*

The majority of accidents occurred in the morning, around the mid-morning school break, and throughout the afternoon. This pattern correlates with periods of increased activity and free time. The finding of fewer accidents on weekends than on weekdays contradicts the findings of Schmid et al., who found more accidents on the weekend. However, this could be explained by their selective dataset: the children's hospital they investigated serves as an emergency paediatric clinic on weekends and so receives many accident patients. It can also be confirmed that there are generally fewer accidents during holidays (23). The increase in accidents after the summer holidays is likely explained by the start of the school year and the increased use of scooters.

## *General*

Numerous studies show that there is insufficient information on accident risks and that guidelines should be created (5-8, 13, 15, 16, 18-22). In order to raise awareness of these risks among parents and children, the BFU makes a wide range of information materials available: dossiers on various subjects, guidebooks, brochures, checklists and publications. Dentists who see children regularly as part of the annual checks in schools could play an important role in transmitting this information (7, 15, 16, 19-22, 24). Nonetheless, the effect of this awareness-raising effort has remained limited to date. One study found that in 56% of trampoline accidents, an adult was present but failed to prevent the accident. Supervision alone is inadequate; the only truly effective measure is to stop selling trampolines as toys for private use. Trampolines should be classified and sold solely as training devices, not as toys. (31).

In everyday circumstances, like the way to school on a scooter or climbing stairs, sufficient supervision is often not possible, and instructions are rarely followed to the letter. In such cases, structural construction measures may be more practicable than behavioural changes as they are permanent and do not require constant monitoring. However, defining effective guidelines for manufacturers requires detailed information on the involved objects.

Avulsed permanent teeth have a better prognosis for retention when placed in a tooth rescue box; unfortunately, this solution is not widely known, with strong regional differences in its availability (6, 14, 21). In the Basel-City and Basel-Country cantons, all primary schools have been equipped with a tooth rescue box for several years. When an avulsion occurs there, the response system is highly efficient, ensuring optimal treatment for the patient.

The use of a mouthguard is recommended in several studies, especially for sports (5, 6, 8, 11-14, 16, 19-22). But many dental injuries happen during everyday activities (on the way to school for instance), and recommending a mouthguard for these would not be feasible.

## **Conclusions**

To develop effective prevention measures, accident information should be recorded and analysed in more detail in the future. A transition to fully digital incident reporting is recommended, especially enhancing the “description of the incident” with guided, mandatory fields for gaining comprehensive details, such as involved objects. This system should also be designed to be quick and simple, meeting the needs of clinical settings.

## Zusammenfassung

### *Einleitung*

Eine systematische Erfassung von Zahnunfällen ist schwierig, daher basieren die meisten Studien auf Umfragen. Zahnunfälle betreffen häufig Kinder und Jugendliche, diese sind in der Schweiz automatisch durch die obligatorische Grundversicherung für Unfälle versichert. Die vorliegende Untersuchung analysierte erstmals die tatsächlichen Unfallzahlen anhand der Daten einer der grössten schweizerischen Krankenpflegeversicherungen.

### *Material und Methoden*

Die Datengrundlage waren sämtliche gemeldete Zahnunfälle aus dem Jahr 2019 aller unter 16-Jährigen der Concordia. Die Datenherausgabe erfolgte gemäss den Datenschutzbestimmungen und mit dem Ziel, mögliche Präventionsmassnahmen zu entwickeln. Es wurde eine statistische Analyse zu Häufigkeit, Verteilung und Darstellungen der absoluten Zahlen durchgeführt.

### *Resultate*

2019 waren 122'370 Kinder bei der Concordia versichert, 5063 Zahnunfallmeldungen konnten ausgewertet werden. Bei einem Versicherungsnehmer wurden fünf, bei 75 Personen drei und bei 279 Personen zwei Zahnunfälle gemeldet. 15.2% aller Unfallmeldungen enthielten kein KVG-Formular. Das häufigste Unfallereignis war der «Sturz», die häufigste angegebene Aktivität war «Spielen» und das am häufigsten genannte Kontaktobjekt war der «Boden». Bei den beteiligten Objekten zeigte sich, dass Zahnunfälle am häufigsten beim Trottinettfahren, Velofahren und Treppengehen passierten.

2019 erlitten insgesamt 8.14% aller bei der Concordia versicherten Kinder im Alter von einem Jahr einen Zahnunfall, ab dem neunten Lebensjahr sank die Unfallohäufigkeit mit jedem weiteren Lebensjahr deutlich. Bis zum 16. Lebensjahr hatten 58.8% aller Kinder einen Zahnunfall. Davon erlitten 0.72% eine Milchzahnkronenfraktur mit Pulpaexposition. Im bleibenden Gebiss erlitten 0.21% eine Avulsion, 0.84% eine andere Dislokation, 0.65% eine Kronenfraktur mit Pulpaexposition und 0.16% eine Wurzelfraktur.

Die meisten Unfälle geschahen zwischen 10 und 12 Uhr sowie 14 und 20 Uhr. Zu verschiedenen Tageszeiten waren unterschiedliche Objekte an Zahnunfällen beteiligt: Frühmorgens führten vor allem das Trottinett, das Velo und die Treppe zu Zahnschäden. Vormittags waren der Turnunterricht und die Treppe die häufigsten Unfallursachen. Um die Mittagszeit ereigneten sich die meisten Zahnunfälle wiederum auf dem Trottinett, Velo und am Tisch. Nachmittags und abends waren es Unfälle mit dem Trottinett, dem Velo, auf der Treppe und im Schwimmbad. Nach den Sommerferien war ein deutlicher Anstieg an Unfällen pro Tag zu beobachten. An Wochenenden wurden durchschnittlich 28% weniger Unfälle pro Tag verzeichnet als an Werktagen.

### *Diskussion*

Der Concordia-Datensatz gilt trotz kantonaler Unterschiede als repräsentativ für die Schweiz, auch bei variierender Altersverteilung. Der verwendete Datensatz benötigte nur eine geringe Bereinigung, aber die Unfallbeschreibungen waren oft zu knapp für präzise Präventionsansätze. Ein aktualisiertes KVG-Formular mit verbesserter Nomenklatur, digitaler Einreichungsmöglichkeit, Fotoupload und KI-gestützter Datenerfassung könnte die Qualität und

Auswertbarkeit der Unfalldaten erheblich verbessern. Eine detailliertere Erfassung könnte zur Erstellung einer Liste häufig zu Zahnunfällen führender Geräte bzw. Gegenstände führen und eine App ermöglichen, die Sicherheitsrisiken identifiziert und Tipps gibt.

Studien zeigen einen Mangel an Bewusstsein für Unfallgefahren. Obwohl Informationsmaterial verfügbar ist, zeigen beispielsweise Unfälle auf dem Trampolin auch unter Aufsicht, dass die Sensibilisierung ihre Grenzen hat. Bauliche Massnahmen sind oft effektiver als Verhaltensänderungen. Der Gebrauch und das Wissen um Zahnrettungsboxen sowie Zahnschutz variieren stark. Die Entwicklung effektiver Präventionsstrategien erfordert eine genauere Erfassung und Analyse von Unfalldaten, insbesondere detaillierter Informationen zu den Unfallursachen.

## Résumé

### *Introduction*

La saisie systématique d'accidents dentaires étant compliquée, la plupart des études se basent sur des questionnaires. Les accidents dentaires concernent fréquemment les enfants et les adolescents, qui, en Suisse, sont automatiquement couverts par l'assurance accidents obligatoire. La présente étude est la première investigation du chiffre réel d'accidents dentaires sur la base des informations de l'un des plus grands assureurs-maladie en Suisse.

### *Matériels et méthodes*

La base de données inclut tous les accidents dentaires chez les moins de 16 ans déclarés à l'assureur Concordia en 2019. L'information a été communiquée selon les provisions gouvernant la protection des données, la finalité du traitement étant la possibilité de développer des mesures de prévention. Une analyse statistique de la fréquence, distribution et présentation des chiffres absolus fut effectuée.

### *Résultats*

En 2019, 122 370 enfants étaient assurés chez Concordia, et 5 063 déclarations d'accident dentaire ont pu être évaluées. Un assuré a déclaré cinq, 75 assurés ont déclaré trois et 279 personnes ont déclaré deux accidents dentaires. 15.2% des déclarations n'avaient pas de formulaire de lésions dentaires selon la LAMal (loi fédérale sur l'assurance-maladie). La cause d'accident la plus souvent déclarée était « la chute », l'activité la plus fréquente « le jeu » et l'objet le plus fréquemment percuté était « le sol ». Les objets les plus fréquemment impliqués dans les accidents dentaires étaient la trottinette, le vélo et l'escalier.

En 2019, 8.14 % des enfants assurés chez Concordia âgés d'un an ont subi un accident dentaire ; à partir de neuf ans, la fréquence d'accidents diminue rapidement avec chaque an supplémentaire. Jusqu'à l'âge de 16 ans, 58.8 % de tous les enfants ont subi un accident dentaire. Parmi eux, 0.72 % des enfants souffrent d'une fracture coronaire d'une dent de lait avec exposition pulpaire. Pour les dents permanentes, 0.21 % ont souffert une avulsion, 0.84 % une autre luxure, 0.65 % une fracture coronaire avec exposition pulpaire et 0.16 % une fracture radiculaire.

La plupart des accidents sont survenus entre 10 heures et midi et entre 14 heures et 20 heures. Des objets différents étaient impliqués selon l'heure : tôt le matin, c'est surtout la trottinette, le vélo et les escaliers qui étaient impliqués dans les accidents dentaires. Dans la matinée, le sport à l'école et l'escalier étaient les causes dominantes. Vers midi, la plupart des accidents

dentaires impliquaient la trottinette, le vélo et la table. L'après-midi et le soir, les accidents avec la trottinette et le vélo et à la piscine étaient les plus fréquents. Une croissance notable d'accidents par jour était observable après les vacances d'été. En moyenne, les fins de semaine voyaient 28 % d'accidents en moins que les jours de semaine.

### *Discussion*

Bien qu'elle affiche des différences entre les cantons, la base de données de Concordia est représentative pour la Suisse, malgré la distribution d'âge variable. La base de données ne nécessitait qu'un ajustement mineur. Par contre, la description des accidents était souvent trop brève pour permettre d'en développer des mesures de prévention. Un formulaire de lésions dentaires selon la LAMal actualisé, avec une nomenclature améliorée, la possibilité de le soumettre en ligne et de télécharger des photos, et une saisie des données facilitée par l'IA pourraient grandement améliorer la qualité et l'utilité des informations recensées sur les accidents. Une saisie plus détaillée pourrait servir à créer une liste d'objets fréquemment impliqués dans les accidents dentaires. Cette liste viendrait ensuite nourrir une application qui identifierait les risques et donnerait des conseils pour se protéger.

Des études ont démontré le manque de conscience des risques d'accident. Bien que l'information soit disponible, l'on voit à l'exemple des accidents de trampoline où des adultes étaient présents que la sensibilisation aux dangers a ses limites. Les mesures physiques d'aménagement sont souvent plus efficaces qu'essayer de changer les comportements. L'utilisation, et même la connaissance autour de boîtes de secours dentaire et de protège-dents, varie énormément. Le développement de mesures de prévention effectives nécessite une saisie plus détaillée et une analyse plus pointue des données d'accidents, et en particulier des informations détaillées sur les causes d'accidents.

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