

Clinical Study on the Oral Health of Québec Elementary School Students in 2012-2013



KEYS MESSAGES

December 2015

Chantal Galarneau and Sophie Arpin

At the request of the Ministère de la Santé et des Services sociaux, the Institut national de santé publique du Québec conducted a study entitled *Étude clinique sur l'état de santé buccodentaire des élèves québécois du primaire 2012-2013 (ÉCSBQ)* [clinical study on the oral health of Québec elementary school students in 2012-2013]. This study assessed the oral health status of Grade 2 and Grade 6 students in Québec and highlighted trends in their oral health since the late 1990s.

Key messages

For the first time in Québec, ÉCSBQ 2012-2013 used a new visual assessment system, making it possible to study not only non-reversible dental caries, which have been the focus of attention to date, but also reversible dental caries. Reversible dental caries, also known as non-obvious dental caries, are lesions that are limited to the early stages of the disease and that can be reversed through preventive action. As for non-reversible dental caries, they occur in three forms: untreated later-stage lesions (also called obvious dental caries), teeth that have been extracted due to caries and fillings on teeth due to caries.

There has been no significant improvement in the health of Grade 2 students' primary teeth.

- In 2012-2013, 53% of Grade 2 students had non-reversible dental caries on their primary teeth, compared to 56% in the late 1990s.

There has been a substantial improvement in the health of Grade 6 students' permanent teeth.

- In 2012-2013, 36% of Grade 6 students had non-reversible dental caries on their permanent teeth, compared to 59% in the late 1990s.

Many more Grade 6 students now have sealed permanent teeth.

- In 2012-2013, 58% of Grade 6 students had at least one sealed permanent tooth, compared to only 29% in the late 1990s.

Almost all students in Grades 2 and 6 have reversible dental caries on their primary and/or permanent teeth.

- In 2012-2013, 85% of Grade 2 students and 89% of Grade 6 students had reversible dental caries on at least one primary or permanent tooth.

Most non-reversible dental caries are observed among a minority of students in Grades 2 and 6.

- In 2012-2013, nearly one quarter of Grade 2 students had 76% of non-reversible dental caries observed on the primary teeth of students in that grade.
- In 2012-2013, just over one tenth of Grade 6 students had 63% of non-reversible dental caries observed on the permanent teeth of students in that grade.
- Like other health problems, non-reversible dental caries are encountered more frequently among students in less privileged socioeconomic groups.

In light of these findings, it is important to note that:

- Dental caries on primary teeth can have numerous short- and long-term consequences. In addition to causing pain, they can have an adverse effect on pronunciation and the positioning of permanent teeth. In severe cases, they can cause infections and even slow a person's growth by affecting his or her diet. Moreover, dental caries are very costly to repair. Therefore, they must be attended to.
- The improvement in the health of Grade 6 students' permanent teeth can be explained partly by the large proportion of students who have at least one sealed tooth. Dental sealant is a thin layer of plastic that protects a tooth's uneven surfaces and helps to prevent decay.
- Reversible dental caries are common. However, affected teeth can become healthy again through preventive action by individuals, dentists and dental hygienists or even preventive measures targeting the general public.
- To reduce social inequalities in oral health, authorities must continue to take socioeconomically vulnerable populations into account in implementing public dental health measures.
- To preserve the gains achieved and to continue making progress in oral health, steps should be taken to strengthen effective action aimed at:
 - ensuring optimal exposure to fluoride, available in various forms;
 - reducing consumption of sugar in food and beverages;
 - ensuring the use of dental sealants among elementary and secondary school students;

- promoting good oral hygiene habits at home;
- finding ways to make tooth brushing feasible in childcare facilities and elementary and secondary schools.

Summary

The most recent Québec studies on oral health that have included a clinical component were conducted in the late 1990s (1, 2). Therefore, at the request of the Ministère de la Santé et des Services sociaux, the Institut national de santé publique du Québec carried out the Étude clinique sur l'état de santé buccodentaire des élèves québécois du primaire 2012-2013 (ÉCSBQ 2012-2013). The general objective of the study was to assess the oral health status of Grade 2 and Grade 6 students in Québec. More specifically, ÉCSBQ 2012-2013 provided a picture of dental caries, dental sealants, gingivitis (gum disease), oral hygiene quality, dental trauma and dental fluorosis. It also enabled a comparison of the prevalence of dental caries at different stages of the disease. Lastly, it highlighted trends in the oral health of students in Grades 2 and 6.

Methodological considerations

The goal of the ÉCSBQ 2012-2013 was to be representative across Québec. The target population was made up of all Grade 2 and Grade 6 students enrolled in public and private, French- and English-language elementary schools in the province. Between November 2012 and June 2013, 16 dentists who had received training in order to standardize their clinical assessments examined the teeth and gums of 3 844 Grade 2 and 4 117 Grade 6 students at their elementary schools, for a total of 7 961 students. The rate of participation in the study was about 60%, which was deemed satisfactory.

A new caries assessment system, the International Caries Detection and Assessment System II (3), was used during ÉCSBQ 2012-2013. This visual assessment system provided, for the first time in Québec, data on dental caries as of the early stages of the disease and on the various materials used to repair teeth.

Dental caries

Dental caries observed in the mouth can be divided into two main categories: reversible dental caries and non-reversible dental caries. Reversible dental caries, also known as non-obvious dental caries, are lesions that are limited to the early stages of the disease and that can be reversed through preventive action. As for non-reversible caries, they occur in three forms: untreated later-stage lesions, (also called obvious dental caries), teeth that have been extracted due to caries and fillings on teeth due to caries.

There has been no improvement in the health of Grade 2 students' primary teeth. In 2012-2013, 53% of students had non-reversible dental caries, compared with 56% in the late 1990s. On average, Grade 2 students had 2.5 primary teeth affected by non-reversible dental caries in 2012-2013 and just over 2.5 primary teeth affected by such caries in the late 1990s.

There has been a substantial improvement in the dental health of Grade 6 students' permanent teeth. In 2012-2013, 36% of students had non-reversible dental caries, compared to 59% in the late 1990s. On average, Grade 6 students had nearly one permanent tooth affected by non-reversible caries in 2012-2013 and nearly 2 permanent teeth affected by such caries in the late 1990s.

To obtain a global picture of dental caries, it is interesting to consider data combining primary and permanent teeth. In 2012-2013, roughly half of students in Grades 2 and 6 had at least one primary or permanent tooth affected by non-reversible dental caries. On average, when both primary and permanent teeth are considered, Grade 2 students had nearly 3 teeth affected by such caries, while Grade 6 students had over 1.5 affected teeth.

It should be noted that all teeth look smooth, but some also have uneven surfaces. In ÉCSBQ 2012-2013, 75% of non-reversible dental caries on the permanent teeth of Grade 6 students were found on the teeth's uneven surfaces.

In addition, 86% of non-reversible dental caries observed on the primary and/or permanent teeth of Grade 2 and Grade 6 students had been repaired. Amalgam was the main material used to repair the

primary teeth of students in Grade 2, while aesthetic composite resin was rarely employed. Both materials were used to repair the permanent teeth of Grade 6 students.

The findings of ÉCSBQ 2012-2013 also revealed that almost all students in Grades 2 and 6 had reversible dental caries on their primary and/or permanent teeth. In fact, 85% of students in Grade 2 and 89% of students in Grade 6 had at least one primary or permanent tooth affected by reversible dental caries and needed preventive care. Reversible dental caries are thus very common. However, affected teeth can become healthy again through preventive action by individuals, dentists and dental hygienists or even preventive measures targeting the general public.

Generally speaking, at the elementary school level, nearly 20% of students in Grade 2 and over 10% of students in Grade 6 showed obvious need of caries-related treatment. In other words, they had a clinical condition requiring the intervention of a dentist. Moreover, in 2012-2013, most non-reversible dental caries were encountered among a minority of students in Grades 2 and 6. It is estimated that 23% of Grade 2 students had 76% of all non-reversible caries observed on the primary teeth of students at that level. As for non-reversible caries on permanent teeth, 63% of such caries were observed among 11% of Grade 6 students. Like other health problems, non-reversible dental caries are found more often among less privileged social groups. Indeed, populations that are more vulnerable socioeconomically are more likely to have non-reversible dental caries.

Dental sealants

Dental sealant is a thin layer of plastic applied to cover a tooth's uneven surfaces in order to prevent decay. Many more Grade 6 students have sealed teeth: in 2012-2013, 58% of students in Grade 6 had at least one sealed permanent tooth, compared to only 29% in the late 1990s. In 2012-2013, students who had undergone dental sealing had, on average, nearly 4 sealed teeth. The first permanent molars were the most commonly sealed teeth (79%), followed far behind by the second permanent molars (9%). In addition, sealed permanent teeth were encountered more often among Grade 6 students from more privileged socioeconomic groups.

Oral hygiene quality

The quality of oral hygiene is assessed on the basis of debris and tartar on teeth. According to the findings of ÉCSBQ 2012-2013, almost all Grade 2 students had debris on their teeth. Over 85% had average to high accumulation. However, tartar was rarely observed among Grade 2 students. In fact, slightly over 80% of students at that level had no tartar. Almost all students in Grade 6 had debris on their teeth, i.e., 96%. Slightly over three quarters of students at that level had average to high accumulation of debris. Seven out of ten Grade 6 students had no tartar accumulation.

Gum disease

Gingivitis is an inflammation of the gums caused mainly by dental plaque bacteria. Depending on its severity, gingivitis appears in the form of redness, bleeding and swelling. According to ÉCSBQ 2012-2013, elementary school students in Québec often have the disease. In 2012-2013, only 29% of Grade 2 students had no inflammation or bleeding of the gums. Nearly 50% displayed mild gingivitis and 20% had a moderate form of the disease. However, few students at the Grade 2 level had severe gingivitis. Bleeding of the gums was observed in over one out of five students.

Less than 20% of Grade 6 students had healthy gums. Nearly 50% had mild gingivitis and 30% had a moderate form of the disease. Very few students had severe gingivitis. Bleeding of the gums was observed among almost one third of Grade 6 students. More boys than girls at that level had gingivitis, perhaps because they had a larger amount of debris on their teeth. In addition, gingivitis occurred more frequently in its moderate form among students from less privileged socioeconomic backgrounds.

Dental trauma

Dental trauma consists of damage to a tooth as a result of a fall or an accident. Depending on the severity, breakage can range from the loss of a small piece of tooth to the loss of an entire tooth. In 2012-2013, 7% of Grade 2 students had broken or lost at least one permanent incisor because of dental trauma, while nearly 25% of Grade 6 students had this condition. Dental trauma was observed less frequently among Grade 6 students who lived in the Greater Montréal area and

among those who attended socioeconomically privileged schools.

Dental fluorosis

Dental fluorosis is a condition that appears in the form of white, yellow or brown stains on permanent teeth, depending on the amount of fluoride ingested in childhood. According to ÉCSBQ 2012-2013, few Québec students have fluorosis. In fact, in 2012-2013, less than one in ten Grade 2 students had dental fluorosis on his or her upper permanent incisors. Generally speaking in Québec, roughly 8% of Grade 2 students had a very mild or a mild form of fluorosis, and very few had moderate or severe fluorosis. One in ten Grade 6 students had fluorosis on his or her upper permanent incisors. The very mild or mild form was observed among approximately 9% of students in Grade 6, while the moderate or severe form was observed among a negligible number of students at that level.

Conclusion

The findings of ÉCSBQ 2012-2013 provide a mixed picture of the oral health of students in Québec. Progress has been noted in some areas, while improvements are still needed in others. To preserve the gains achieved and to continue to make progress in oral health, a strategy aimed at taking action that is known to be effective must be deployed. The strategy must consist of five measures targeting better oral health. The first two measures should ensure optimal exposure to fluoride, which is available in various forms, and a reduction in the consumption of sugar in food and beverages, while the third measure should maximize the application of dental sealants by professionals among students in elementary and secondary schools. As for the last two measures, they should be based on promoting good oral hygiene habits at home and on finding ways, depending on the context, to make tooth brushing feasible in childcare facilities and elementary and secondary schools.

In conclusion, action targeting young people is the approach that should be taken in Québec to support the acquisition of good dietary and hygiene habits and encourage the maintenance of good oral health. It is also important that proposed public dental health measures take into account populations that are more vulnerable socioeconomically in order to reduce social inequalities in oral health.

References

1. Brodeur J.M., Olivier M., Benigeri M., Bedos C. and Williamson S. Étude 1998-1999 sur la santé buccodentaire des élèves québécois de 5-6 ans et de 7-8 ans. Ministère de la Santé et des Services sociaux. Québec: *Collection Analyses et surveillance* n°18; 2001.
2. Brodeur J.M., Olivier M., Payette M., Benigeri M., Williamson S. and Bedos C. Étude 1996-1997 sur la santé buccodentaire des élèves québécois de 11-12 et 13-14 ans. Ministère de la Santé et des Services sociaux. Québec: *Collection Analyses et surveillance* n°11; 1999.
3. Ismail A.I., Sohn W., Tellez M., Amaya A., Sen A., Hasson H. et al. The International Caries Detection and Assessment System (ICDAS): an integrated system for measuring dental caries. *Community Dent Oral Epidemiol.* 2007; 35(3):170-8.

Clinical Study on the Oral Health of Québec Elementary School Students in 2012-2013

AUTHORS

Chantal Galarneau, DMD, PhD, Dental Advisor, Principal Investigator
Sophie Arpin, DMD, PhD, Dental Advisor, Co-Investigator
Direction du développement des individus et des communautés

COORDINATORS

Christine Métayer, MAP, Assistant Head of the Scientific Unit
Johanne Laguë, MD, MSc, FRCPC, Head of the Scientific Unit
Direction du développement des individus et des communautés

CONTRIBUTOR

Kim Payette-Chapleau
Direction du secrétariat général, des communications et de la documentation

TRANSLATION

Alison McGain

LINGUISTIC REVISION

Michael Keeling

This document is available in French only in its entirety in electronic format (PDF) on the website of the Institut national de santé publique du Québec at: <http://www.inspq.qc.ca>.

Reproduction for the purpose of private study or research is authorized under Section 29 of the Copyright Act. Any other use must be authorized by the Government of Québec, which holds the exclusive intellectual property rights for this document. Authorization may be obtained by submitting a request to the central clearing house of the Service de la gestion des droits d'auteur of Les Publications du Québec, using the online form at the following address: <http://www.droitauteur.gouv.qc.ca/autorisation.php>, or by sending an email to: droit.auteur@cspq.gouv.qc.ca.

Information contained in the document may be cited provided the source is mentioned.

©Gouvernement du Québec (2015)

Publication N°. 2141-Summary

The translation of this publication was made possible with funding from the Public Health Agency of Canada.