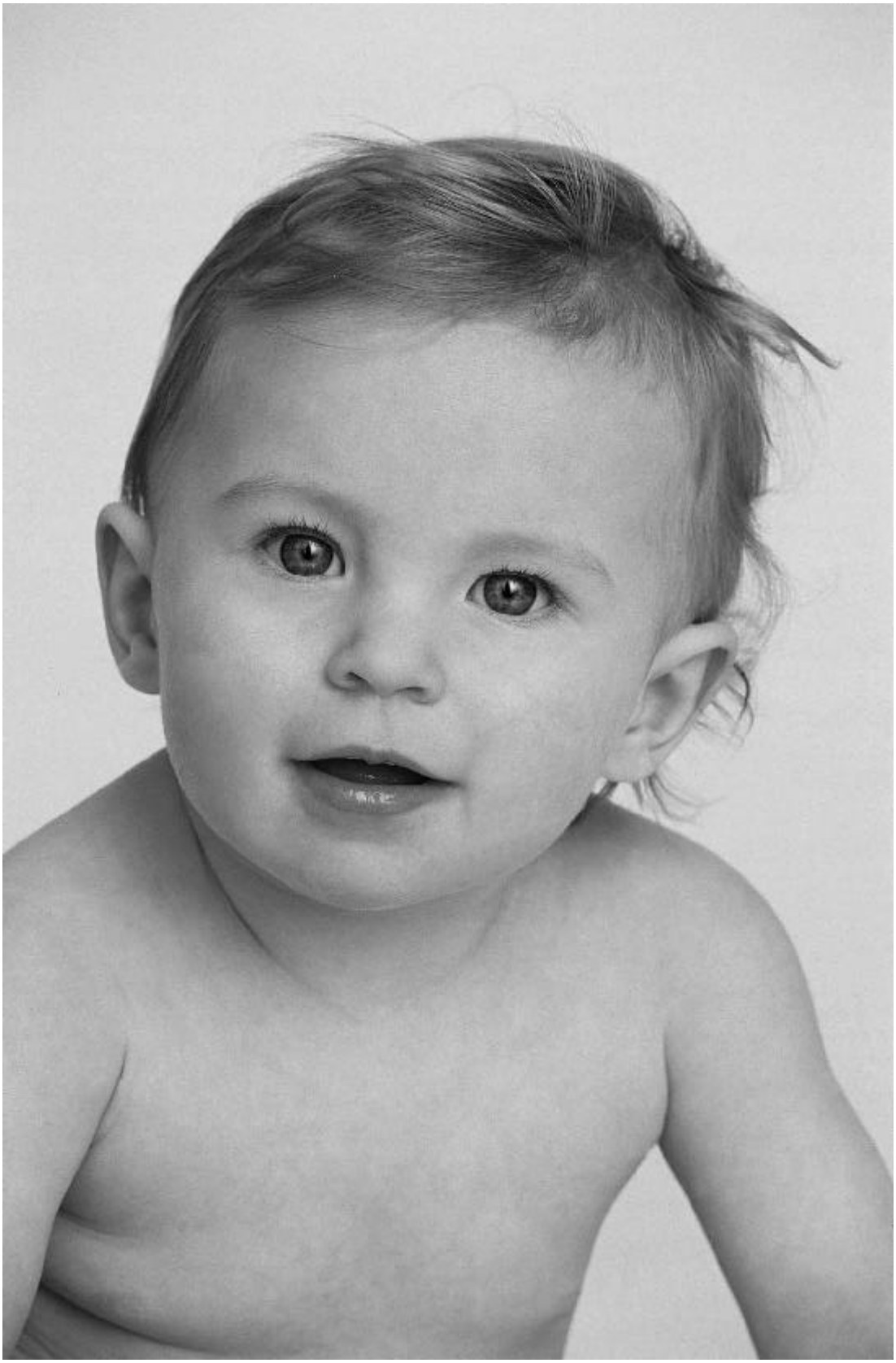
Habits Related to Oral and Dental Health



1. Introduction

The nature and frequency of oral health problems in Québec children under 5 years of age are still poorly known. Although the biological risk factors are well-understood, they do not completely explain the etiology of dental caries. Behavioural, psychosocial and socioeconomic factors are also associated, but their role has not been well documented. Information is also lacking on factors associated with other dental problems such as misalignment of teeth in young children. The above observations clearly indicate the need for characterizing the determinants of dental health in children under 5 years of age. Data derived from ÉLDEQ 1998-2002 will help do this, thereby contributing to the design of appropriate prevention programs. This will foster the application of the Loi sur la protection de la santé publique (L.R.Q., chapitre P-35) (Revised Statutes of Québec, Chapter P-35), in which the Health Minister must assure that preventive dental health services are in place. The results of the survey will also contribute to fulfilling one of the objectives of the *Politique de la santé et du bien-être*, which is to reduce by 50% the average number of decayed, missing or filled teeth in children 6 to 12 years of age, by the year 2002 (ministère de la Santé et des Services sociaux - MSSS, 1992).

A number of studies have been conducted on the dental health of children in Québec. However, they were mostly cross-sectional and were conducted on older children (Brodeur *et autres*, 1999; Payette *et autres*, 1991; Payette *et autres* , 1987). Their results show that, similar to what has been observed elsewhere in industrialized countries, dental caries is declining, notably in children 7-8 years of age. Tooth decay is not uniformly distributed in the population, but is concentrated in a defined group of children considered at high risk. Major socioeconomic factors associated with higher risk of caries in primary dentition are: income below the poverty line, low educational level of the father and mother, low occupational category of the father or mother, and the fact that the family is receiving social assistance (welfare). In light of these, the unequal distribution of caries seems to match social inequality. Other explanatory factors related to socioeconomic status are specific health behaviours such as not having visited a dentist for one year, having visited a dentist for curative treatment only, or having poor oral hygiene (Payette *et autres*, 1991). Data collected on school children in the Montérégie region of Québec showed that approximately 40% of 5 to 6-year-olds already had caries (Corbeil *et autres*, 1996). With regards to the frequency of tooth alignment problems, approximately 15% of Québec children 7-8 years of age have an obvious need for orthodontic treatment (Payette *et autres*, 1991).

Disparity in dental health status is being observed while the range of dental services is far from being completely covered by Québec Medicare. Furthermore, the vast majority of towns in Québec do not have fluoridated water, so children cannot benefit from its protective effects. The *Programme de services dentaires pour les enfants* (Dental Program for Children), administered by the *Régie de l'assurance-maladie du Québec - RAMQ* covers diagnosis and treatment but does not cover preventive services in private practice. Moreover, the age of eligibility is limited to children 9 years of age and under, and the number of annual dental examinations covered was reduced in 1997 from two to one. Only 18% of children under 4 years of age took advantage of this program in 1997 (*RAMQ*, 1998).

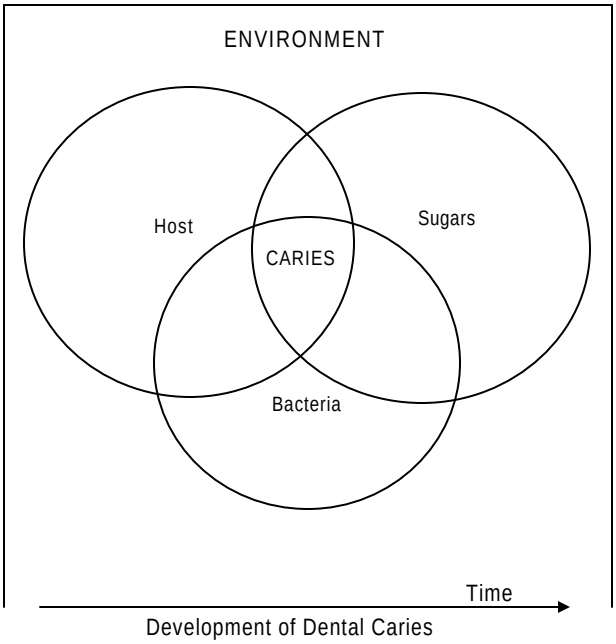
To compensate for these restrictions in dental services, in 1982 the *Ministère de la Santé et des Services sociaux du Québec (MSSS)* mandated the *Directions de la santé publique* and CLSCs (Community Health Centres) to provide free preventive services to children. The *Programme public de services dentaires préventifs* (Public Program of Preventive Dental Services) (*MSSS*, 1990) was thus implemented, targeting children 0-12 years of age. Although this program is mainly organized in schools, particularly for children with a high risk of caries, all the CLSCs in 1994-1995 also conducted promotional and preventive interventions among pre-school children. However, these interventions varied by CLSC, and did not reach all parents and children (Durocher & Brodeur, 1998). In addition, recent Montréal data indicate that their frequency would probably be reduced, given the lack of human and financial resources (Généreux, 1998).

The dental health of children under 5 years of age proceeds directly from preventive practices and parenting attitudes and behaviours. To address these, the *Ordre des dentistes du Québec - ODQ* (Québec Order of Dentists) (ODQ, 1999) and the Canadian Dental Association (CDA, 1999) have put forth recommendations for parents before and when their children's first teeth erupt. With regards to preventing caries, it is recommended to clean the baby's gums before the first teeth appear, brush the

teeth twice a day with a fluoride toothpaste, give fluoride supplements when drinking water has not been fluoridated, not to let the baby fall asleep with a bottle of anything other than water, and to limit the frequency of consumption of sugary foods. To prevent tooth alignment problems, parents are advised to control the sucking habits of the children under 5 years of age. To complement these personal guidelines, parents are advised to take their child for his first visit to the dentist by the age of one. It should be noted that the parents of the target infants in this first year of the survey may have been exposed to varying messages, given the inherent delay between current scientific knowledge and the publication of updated information in documents destined for the public. For example, the guide From Tiny Tot to Toddler is free and given to all mothers who give birth to a baby in a hospital or birthing centre in Québec, so parents may have read varying editions (Doré & Le Hénaff, 1998).

The development of dental caries is a process of infection that requires three simultaneous factors over time - a susceptible host, bacteria and sugars (see Figure 1.1). It is an infectious disease mediated by diet, hygiene and host resistance, the latter increasing with optimum intake of fluoride. Caries can affect speech, such as pronunciation, and facial aesthetics, such as smiling, both of which can have a psychological impact on a child. Caries can also affect mastication, possibly resulting in poor diet and stunted growth (Lacroix *et autres*, 1997). A particular manifestation of morbidity, called baby bottle or early childhood caries, has been observed in very young children. It is characterized by very rapid destruction of tooth structure (Ismail, 1998; Reisine & Douglass, 1998; Ripa, 1988). It is considered a social problem because it specifically afflicts ethnic minorities and immigrant populations as well as families with low incomes (Ismail, 1998; Weinstein, 1998; Weinstein *et al.*, 1996a). Many observers suggest it results from ignorance of the deleterious effects of constantly letting a child fall asleep with a bottle containing breast milk, cow's milk, formula, or juice. Prolonged exposure of the teeth to the sugars in these liquids can increase the risk of caries. Others suggest that breast feeding on demand, for example, throughout the night, constitutes another risk factor (Matee *et al.*, 1994). Though the habit of giving a pacifier (soother) dipped in a sweet substance such as honey or sugar to calm the baby is another risk factor (Eronat & Eden, 1992), little information exists on its prevalence in Québec.

Figure 1.1



Source: *Institut de la statistique du Québec, ÉLDEQ 1998-2002.*

According to a review of 12 studies on the use of the baby bottle (Reisine & Douglass, 1998), 18% to 85% of parents reported that their baby was taking or had taken a bottle to bed. The large variability observed in the results of these studies is undoubtedly related to differences in the methods used. For example, the concept of having the bottle in bed is not a constant among the studies so that the prevalence could vary according to the definition used. Another important measurement problem is the retrospective nature of 8 of the 12 studies, which makes them subject to memory bias (Albert *et al.*, 1988; Derkson & Ponti, 1982; Febres *et al.*, 1997; O'Sullivan & Tinanoff, 1993; Powell, 1976; Schwartz *et al.*, 1993; Serwint *et al.*, 1993; Weinstein *et al.*, 1992). Moreover, it was these retrospective studies that reported the highest prevalences. Furthermore, the child populations studied were almost all older than 5 months, and their age groups had a wider range than the babies targeted by Year 1 (1998) of ÉLDEQ 1998-2002. Certain studies also suffer from serious selection bias related to the sampling of a very specific, homogeneous population, such as patients of a specific dental practice or medical clinic (Febres *et al.*, 1997; Powell, 1976; Schwartz *et al.*, 1993; Serwint *et al.*, 1993), or were conducted on particular ethnic groups (Albert *et al.*, 1988; Godson & Williams, 1996; Weinstein *et al.*, 1992). However, the results of two

of these studies (Hinds & Gregory, 1995; Kaste & Gift, 1995) seem more valid because they studied current use of the bottle when putting the child to bed in a random sample representative of a general population. They reported prevalences of 18% and 20% in children aged 6 to 60 months and 30 to 42 months respectively. Reisine & Douglass (1998) note that using a bottle at bedtime was as frequent in children free of caries as it was in those with caries, indicating the importance of conducting studies on the etiology and population prevalence of this disease. As to breast feeding on demand, these authors report that few epidemiological studies have been conducted. However, they refer to a Canadian study showing that, among pre-school children with caries, 22% had been exposed to prolonged breast feeding through the night at 6 months of age, whereas in children without caries, only 6% had been exposed (Derkson & Ponti, 1982). They also cite studies showing that caries can develop in children being breast fed exclusively (Al-Dashti *et al.*, 1995; Holt *et al.*, 1982; Roberts *et al.*, 1993; Silver, 1992).

Chronic sucking habits often lead to tooth alignment problems that are generally reversible in primary dentition, but are associated with malocclusions in permanent dentition (Buithieu & Dubé, 1996). A normal physiological reflex in newborns, sucking is nutritive when it is applied to breast feeding, bottle feeding or both. It is considered non-nutritive when applied to a digit, pacifier or other object. It is often related to a psychological need for comfort and reassurance. This habit usually begins at the age of 3 or 4 months and can affect dentition (Massler, 1983) depending on its intensity, duration and frequency (Morley & McIntyre, 1994; Popovich & Thompson, 1973). The pacifier seems easier for parents to control and easier for the child to abandon than the thumb (Shein *et al.*, 1991; Turgeon-O'Brien *et al.*, 1996). Its effects on the development of malocclusions may be less than those associated with sucking a finger (Nowak, 1991; Vadiakas *et al.*, 1998). The most-often observed effect of non-nutritive sucking is the displacement of dento-alveolar structures in the anterior segment of the maxilla (Bruun *et al.*, 1991). For this reason, it can affect appearance, swallowing and speech in some children. The results of a study conducted on children in the first grade (between 6 and 8 years of age) showed that chronic thumb-sucking may impede acceptance of a child by his peers, at a critical age for social development (Friman *et al.*, 1993). The prevalence of thumb-sucking may be approximately 30% in children 1 year of age (Turgeon-O'Brien *et al.*, 1996).

Pacifier use appears to be more widespread. A study conducted in the United States on 1,235 babies 6 weeks to 12 months of age showed that at 6 months, 59% of babies were using a pacifier (Levy *et al.*, 1998). However, a convenience sample was studied and the use of the pacifier was not defined. In a study conducted on Cambodian mothers with at least one child of pre-school age born in the US, only 20% of the 186 mothers interviewed indicated having ever given their baby a pacifier, given the negative beliefs they associated it with (Rasbridge & Kulig, 1995). In Québec, 89% of 1,937 primiparous mothers with a 6-month-old baby reported in interviews having already offered a pacifier to their child; however, in 16% of cases, the infant had refused it (Lepage & Moisan, 1998).

The same authors (Lepage & Moisan, 1998) reported that 18% of infants approximately 6 months of age had already taken fluoride supplements.

Year 1 (1998) of ÉLDEQ provided data on many habits related to the oral health of 5-month-old infants. Using a baby bottle to help the infant fall asleep at bedtime and/or for naps during the day, and the contents of the bottle were investigated. Breast feeding on demand, however, was not documented. Though one of the practices recommended in Québec to lengthen the period of breast feeding (Doré & Le Hénaff, 1998) and associated with growth spurts in babies, it is difficult to measure its exact frequency. For example, breast feeding at will throughout the night is hard to evaluate.

Although the use of the pacifier is among the non-nutritive habits of sucking, the data collected on the 5-month-old infants did not provide a precise estimate of its prevalence. This habit, whether the infant is awake or asleep, will be studied in future years of the longitudinal survey. In Year 1, only the availability of the pacifier (alone or in association with another object) as a transitional object for falling asleep was examined.

Taking vitamins and/or minerals containing fluoride was studied, given that the infants were approaching the age at which it is recommended to take these supplements. Studying the compliance with this recommendation was pertinent, since in the majority of municipalities in Québec, children do not benefit from the protective effects of fluoridated water.

In the analysis that follows, certain characteristics of the baby such as birth order, premature status, low birth weight and sleep habits are examined in light of using the bottle in bed and availability of the pacifier for falling asleep. In the literature, the results of a study on children of pre-school age demonstrated an association between caries and birth order in the family, the lowest risk being in the second and third children (Kinirons & McCabe, 1995). The fact of being prematurely born with low birth weight can foster the use of the baby bottle, increasing the risk of caries (Fadavi *et al.*, 1993). In young children between 2 and 4-and-a-half years of age, sleep problems were a behavioural risk factor associated with using the bottle at night (Shantinath *et al.*, 1996).

With regards to socioeconomic characteristics, variables were retained for this analysis that have previously been associated with caries in Québec children, namely insufficient family income (to meet basic needs), low educational level of mother or father, and the family being on social assistance (welfare) (Payette *et autres*, 1991). Being foreign-born has also been associated with inappropriate use of the bottle by parents of Canadian children 19 months of age (Weinstein *et al.*, 1996b).

ÉLDEQ 1998, conducted on a sample of 2,223 infants representative of 5-month-old babies, has provided, for the first time in Québec, data on habits related to dental health at an early age. Parenting practices could therefore be documented without the bias associated with retrospective studies conducted on older children. Other practices related to oral hygiene, diet and sucking habits of the child will be examined in future years of ÉLDEQ 1998-2002. By monitoring these habits and parenting practices, it will be possible to gain a better understanding of their role in the etiology of oral and dental health problems.

2. Using the Bottle in Bed to Help the Baby Fall Asleep at Night

The ÉLDEQ 1998 results shown in Table 2.1 indicate that nearly 8% of 5-month-old infants were taking a bottle to bed several times a week or every night (weekly frequency). Among the latter, 18% kept it with them while sleeping, comprising 1.3% of all infants (data not shown).

Table 2.1
Distribution of Infants by Use of Bottle to Fall Asleep at Night, Certain Sleep Habits and Feeding Methods, 1998

	Bottle to fall asleep at night[1]		x^2
	Never	Sometimes or every night	
	%		
Sleeps through the night			
Yes	94.3	5.7	p < 0.001
No	86.9	13.1	
Time to fall asleep			
Less than 30 minutes	93.1	6.9	Not signif
30 minutes or more	87.5	12.5**	
Breast feeding			
Currently	98.2	1.8**	p < 0.001
Never or had stopped	89.6	10.4	
Total	**92.5**	**7.5**	**--**

** Coefficient of variation (CV) higher than 25%; imprecise estimate for descriptive purposes only.
1. Weekly frequency.

Source: *Institut de la statistique du Québec, ÉLDEQ 1998-2002.*

Most of the bottles contained infant formula (78%), with cow's milk (17%) comprising a distant second. Other contents reported accounted for 1% or less each - formula with cereal or Farlay's type biscuits, breast milk, water, juice or other unspecified products (data not shown).

2.1 Frequency of Bottle Use at Bedtime by Certain Characteristics of the Baby

It could be expected that parents' behaviours would differ for the firstborn or vary with certain health characteristics of the baby. However, the results of ÉLDEQ 1998 revealed that use of the bottle for falling asleep at night was not associated with birth order. This was also the case for premature status and low birth weight, characteristics for which different parenting practices might be expected (data not shown).

In terms of the possible association with health status of the infant as perceived by the mother, babies described as having less than optimum health status, namely acceptable to very good, were twice as likely to have a bottle to fall asleep at night than those perceived in excellent health (11% vs. 6%). Health problems, even minor or occasional, could therefore be associated with this practice (data not shown).

As shown in Table 2.1, there was an association between this behaviour and certain sleep habits. The proportion of infants who fell asleep at night sometimes or always with the help of a bottle but were not sleeping through the night (13%) was more than twice that of those who were sleeping through the night (6%).[7] In the same vein, parents seemed more likely to give the baby the bottle in bed (13%) when he was taking 30 minutes or more to fall asleep than when he took less then 30 minutes to do so (7%). This result, however, was not significant at the 0.05 threshold.

Only 1.8% of infants being fed mother's milk at the time of the survey, either breast fed or in the bottle, exclusively or in combination with cow's milk or formula, were put to bed with the bottle, compared to 10% whose mother had never breast fed or had ceased to do so. Moreover, the 17% of babies who were being exclusively breast fed had a very low frequency (0.5%) of being put to bed with the bottle (data not shown).

7. As reported by the mother (see No. 4, "Sleep," in this series of analytical papers).

2.2 Sociodemographic Characteristics Associated with Use of the Bottle to Fall Asleep at Night

As an exploratory measure, analyses were conducted on sociodemographic characteristics of the fathers living in the household related to the practices being studied. Since the results were comparable to those obtained for the mothers, they are not presented here. However, it should be emphasized that virtually all respondents to the Paper Questionnaire Completed by the Interviewer (PQCI) were the biological mothers of the infants.

The sociodemographic characteristics presented in Table 2.2 show that the age group of single or both parents was not associated with the practice of putting the baby to sleep with a bottle at night, sometimes or every day. Mothers who had not completed high school (14%), however, were more likely to do this compared to those who had a high school or vocational/technical school diploma (8%), or college or university degree (4.4%).

Immigration status of the mother was also associated with use of the baby bottle to help the baby fall asleep at night. This practice was more than three times higher in non-"European" immigrant mothers (19%) than in non-immigrant or "European" immigrant ones (6%). It can be construed that these mothers were using practices based on the beliefs and values of their country of origin. For example, in a study of Cambodian mothers of children born in the US, the bottle was not only used for feeding, but was also seen as an effective means of calming the baby. Coming from a culture where breast feeding on demand is a predominant value, it is not surprising however that half of these mothers reported giving the baby a bottle in bed to fall asleep and leaving it with him for the whole night (Rasbridge & Kulig, 1995).

The frequency of giving a bottle to fall asleep at night was higher in households below the low-income cut-off (poverty line, see Note 2, Table 2.2), namely 14% compared to 5% above. An infant was also twice as likely to be given the bottle in a single-parent household than in a two-parent one (15% vs. 7%). Therefore, this strategy could be the result of ignorance on the part of mothers who have low socioeconomic status, or the constraints of being a single mother (exhaustion related to lack of support, priorities primarily focused on everyday survival).

Table 2.2
Distribution of Infants by Use of Bottle to Fall Asleep at Night and Certain Sociodemographic Characteristics, 1998

	Bottle to fall asleep at night[1]		x^2
	Never	Sometimes or every night	
	%		
Age group of parents			
Single parent or both parents under 25 yrs of age	88.5	11.5*	Not signif.
At least 1 parent 25 yrs of age or over	93.1	6.9	
Education of mother			
No high school diploma	86.2	13.8	$p < 0.001$
High school, vocational/technical diploma	92.4	7.6	
College diploma or university degree	95.6	4.4*	
Immigration status of mother			
Non-immigrant or "European" immigrant	94.1	5.9	$p < 0.001$
Non-"European" immigrant	80.8	19.2	
Sufficient income[2]			
Yes	95.0	5.0	$p < 0.001$
No	85.6	14.4	
Family structure			
Two-parent	93.3	6.7	$p < 0.01$
Single-parent	84.9	15.1*	
Total	**92.5**	**7.5**	**--**

1. Weekly frequency.
2. Sufficient income (to meet basic needs) according to the low-income cut-off set by Statistics Canada (see No. 2 in this series of analytical papers).

* Coefficient of variation (CV) between 15% and 25%; interpret with caution.

Source: *Institut de la statistique du Québec, ÉLDEQ 1998-2002.*

Analyses conducted excluding infants who were being only breast fed revealed the same associations (data not shown).

3. Use of the Bottle to Fall Asleep at Nap Time(s) During the Day

The results presented in Table 3.1 indicate that approximately one in ten infants had the bottle to fall asleep at nap time(s) during the day, sometimes or every day. Twelve per cent of them (1.3% of all babies) kept it while they were sleeping (data not shown).

Similar to what was observed for the night, in 3 out of 4 cases, the bottles contained infant formula. Cow's milk was given to only 12% of infants at nap time, followed by juice diluted with water (2.5%), formula with cereal (2.4%) or Farlay's-type biscuits (0.7%), and water (1.9%). Other liquids each accounted for 1% or less, namely a mixture of cow's milk and infant formula, juice, water with honey, or breast milk (data not shown).

Table 3.1
Distribution of Infants by Use of the Bottle to Fall Asleep at Daytime Naps, Time to Fall Asleep and Feeding Method, 1998

	Bottle to fall asleep during the day[1]		x^2
	Never	Sometimes or every day	
	%		
Time to fall asleep			
Less than 30 minutes	90.2	9.8	$p < 0.05$
30 minutes or more	80.7	19.3*	
Breast feeding			
Currently	96.3	3.7*	$p < 0.001$
Never or had stopped	85.7	14.3	
Total	**89.3**	**10.7**	**--**

1. Weekly frequency.

* Coefficient of variation (CV) between 15% and 25%; interpret with caution.

Source: *Institut de la statistique du Québec, ÉLDEQ 1998-2002.*

3.1 Frequency of Use of the Bottle To Fall Asleep, by Certain Characteristics of the Baby

When we compare night and day times for infant to fall asleep, an association was observed between giving a bottle to the baby at night and at nap time. Among the 8% of babies who took the bottle to bed at night sometimes or every night, 60% did the same for falling asleep at nap time during the day. In contrast, this practice was much less likely for infants who never received a bottle for falling asleep at night (7%) (data not shown). Given this association, it is not surprising that similar trends were observed related to certain predisposing factors presented earlier. The results indicate that neither birth order, premature status or low birth weight were associated with using the bottle to fall asleep for daytime naps (data not shown).

With regards to sleep habits (Table 3.1), only the time it took for the infant to fall asleep was analyzed; this variable was significantly associated with using the bottle at nap time during the day. Infants who were taking 30 minutes or more to fall asleep were twice as likely to have the bottle than those who fell asleep more quickly (19% vs. 10%). In terms of feeding method, of infants who were being breast fed at the time of the survey (breast or bottle), exclusively or in combination with cow's milk or formula, 3.7% were given a bottle to fall asleep during the day compared to 14% of those whose mother had never breast fed or had stopped doing so. As expected, the 17% of babies who were being exclusively breast fed had a very low frequency of this practice (0.3%) (data not shown).

3.2 Sociodemographic Characteristics Related to Using the Bottle for Daytime Naps

As indicated in the Annex 1, the practice of giving the baby the bottle to fall asleep at nap time(s) during the day was more likely in cases where the single parent or both parents were under 25 years of age, in mothers not having completed high school, in non-"European" immigrant mothers, in households below the low-income cutoff, and in single-parent families. Analyses excluding infants who only had had breast milk revealed the same results.

However, the deviation increased with regards to immigrant status of the mother; 25% of non-“European” immigrants used this practice compared to 11% of other mothers (data not shown).

Irrespective of the categories of variables analyzed, the prevalence of giving the infant the bottle to fall asleep for naps during the day was higher than that for this practice at night. The only exception was ethnic background. Non-“European” immigrant mothers used this practice with virtually the same frequency day or night (Tables 2.2 and Annex 1).

4. Non-Nutritive Sucking - Availability of the Pacifier for Falling Asleep in Bed

The availability of the pacifier for falling asleep was measured in the section on sleep habits in the Self-Administered Questionnaire for the Mother (SAQM). The mother was asked if her baby had one or more specific objects in the bed to help him fall asleep. The pacifier, baby bottle, teddy bear, blanket, mobile etc. were studied as transitional objects for falling asleep without reference to day or night. Although use of the pacifier is a non-nutritive sucking habit, the data collected in 1998 do not provide a precise estimate of its prevalence awake or asleep. This will be studied when the ÉLDEQ children are older. Therefore, only the availability of the pacifier as a transitional object for falling asleep, alone or in association with another object, was analyzed in relation to various characteristics of the baby, mother and household.

The results presented in Table 4.1 indicate that over almost 50% of the babies had a pacifier available as a transitional object for falling asleep. Not having one can be explained by the infant's rejection of it, the presence of the bottle in the bed for this purpose (night and/or day), by whether the infant was being breast fed or by the parents deciding it was unnecessary. Some of these interpretations could be verified. Among babies who had the bottle to fall asleep at night, less than 4 in 10 (36%) had a pacifier, whereas it was available in half of those who did not have a bottle to fall asleep at night. The proportion of infants who had a pacifier in the bed was higher in those who had never been breast fed or had ceased to be at the time of the survey (56%) than in those who were being breast fed (38%). However, as previously shown, 50% of the infants being breast fed were also being fed cow's milk or formula, making it possible that they were among those whose parents were using the bottle for helping them fall asleep. Babies being exclusively breast fed (17%), however, were probably less likely to be put to bed with a pacifier, given the recommendation not to give it to them in the first few weeks of life to promote breast feeding, a habit which would then likely persist (Doré & Le Hénaff, 1998; Victora *et al.*, 1993).

Table 4.1
Distribution of Infants by Availability of Pacifier, Alone or in Association with Another Object, To Fall Asleep in Bed, by Various Characteristics, 1998

	Pacifier to fall asleep in bed		x^2
	No	Yes	
	%		
Bottle to fall asleep in bed at night[1]			
Never	49.2	50.8	$p < 0.01$
Sometimes or every night	63.9	36.1	
Breast feeding			
Currently	62.1	37.9	$p < 0.001$
Never or had stopped	44.2	55.8	
Time to fall asleep			
Less than 30 minutes	49.1	50.9	$p < 0.001$
30 minutes or more	68.2	31.8	
Immigration status of mother			
Non-immigrant or "European" immigrant	48.6	51.4	$p < 0.001$
Non-"European" immigrant	63.6	36.4	
Sufficient income[2]			
Yes	47.8	52.2	$p < 0.01$
No	56.8	43.2	
Family structure			
Two-parent	49.5	50.5	$p < 0.05$
Single-parent	59.7	40.3	
Total	**50.3**	**49.7**	**--**

1. Weekly frequency.
2. Sufficient income (to meet basic needs) according to the low-income cut-off set by Statistics Canada (see No. 2 in this series of analytical papers).

Source: *Institut de la statistique du Québec, ÉLDEQ 1998-2002.*

Table 4.1 shows that, in terms of the time taken to fall asleep, approximately half of the infants who were taking less than 30 minutes to do so had a pacifier, whereas only 32% of the other

infants had this habit. These data suggest that the pacifier may indeed have a soothing effect.

Infants whose mothers were non-"European" immigrants were less likely to be given a pacifier to fall asleep. Approximately 36% of them had a pacifier in their bed compared to 51% of infants whose mothers were non-immigrants or "European" immigrants (Table 4.1). It can therefore be construed that this habit may be less rooted in the culture of certain ethnic communities where, for example, there are negative beliefs about the practice (Rasbridge & Kulig, 1995).

Contrary to what was observed in terms of using the bottle to help the baby fall asleep, night or day, the pacifier was less frequently used in households below the low-income cut-off and in single-parent families, namely 40% compared to 52% in households with the opposite characteristics. Availability of the pacifier was not however, associated with age or educational level of the parents (data not shown).

5. Receiving Vitamin and/or Mineral Supplements Containing Fluoride

In the Paper Questionnaire Completed by the Interviewer (PQCI), the names of vitamin and/or mineral supplements given to the 5-month-old baby were collected. From these, a list of products known to contain fluoride was generated.

The results obtained indicate that 23% of the infants were receiving a vitamin and/or mineral supplement. Only 1.7% of all infants were taking one with fluoride (data not shown). Clearly, such a low frequency was not conducive to conducting detailed analyses of the characteristics of these babies.

However, it is not surprising that few infants were given supplements containing fluoride, given that the dental profession recommends these for children 6 months of age and over when the water supply is not fluoridated.

6. Discussion

Inappropriate use of the baby bottle, such as letting an infant fall asleep with one containing cow's milk, breast milk, formula or juice, results in prolonged exposure of the teeth to sugars, and can increase the risk of caries. This survey has brought to light certain factors which may predispose use of the bottle as a sleep aid in bed for 5-month-olds, at night or for daytime naps. The results of ÉLDEQ 1998 show that 8% of infants 5 months of age had, sometimes or every night, a bottle to fall asleep in bed. For daytime naps, 11% of the infants had a bottle for the same weekly frequency. Two previous studies investigating current use of the bottle at bedtime on random samples representative of the general population (Hinds & Gregory, 1995; Kaste & Gift, 1995) reported prevalences of 18% and 20% in children 6 to 60 months and 30 to 42 months of age respectively. It can be expected, therefore, that the prevalence will increase in the ÉLDEQ infants over the course of this longitudinal study. In Year 1 (1998), among infants who had a bottle to fall asleep day or night, 75% received formula, 15% cow's milk and 5% other liquids containing sugars. Although water is the only liquid recommended for the bottle as a sleep comforter, only less than 2% were given this.

Even though on a province-wide scale, few infants were using the bottle to fall asleep at night or during the day, the trends observed suggest certain targets for intervention. The proportion of infants who fell asleep at night sometimes or always with the help of a bottle was higher in those who were not sleeping through the night, whereas taking 30 minutes or more to fall asleep was only associated with use of the bottle for daytime naps. Babies being breast fed (receiving mother's milk from the breast or the bottle) at the time of the survey (34%), exclusively or in combination with cow's milk or formula, had a lower frequency of having the bottle in bed, day or night, compared to those whose mother had never breast fed or had ceased to do so. The practice was more frequent in mothers who did not have a high school diploma, were non-"European" immigrants, had household income below the low-income cut-off or were single parents. Unfortunately, due to the low numbers in certain categories of variables, the confounding effect of various factors on the associations could not be controlled for, by either multiple stratified analyses or multivariate models.

Using a pacifier is a non-nutritive habit that can have an effect on dentition, depending on the intensity, duration and frequency. It should be noted that the data collected in 1998 did not permit a precise estimate of the prevalence of pacifier use, awake or asleep. This will be done in future 'volets" of ÉLDEQ 1998-2002. The results did, however, reveal that one in two infants had a pacifier in bed, alone or in association with another object, as a transitional object for falling asleep. In a previous study conducted in Québec, 89% of mothers of firstborns 6 months of age had already offered their infant a pacifier; one in six, however, had refused it (Lepage & Moisan, 1998).

In contrast to the bottle, having a pacifier as a sleep aid was more frequent in infants who were taking less than 30 minutes to fall asleep. There is likely either a soothing effect observed with the pacifier or a tendency to offer it less frequently than the bottle to infants who take longer to fall asleep. The proportion of infants who had a pacifier in bed was higher in those whose mother had never breast fed or who had ceased to do so at the time of the survey. The recommendation not to give a pacifier in the first few weeks of life to encourage breast feeding could possibly have resulted in the latter persisting as habit to the age of approximately 5 months (Doré & Le Hénaff, 1998; Victora et al., 1993).

Infants whose mothers were non-"European" immigrants had a lower frequency of having a pacifier to fall asleep. The availability of a pacifier was also less frequent in households below the low-income cut-off.

The former may suggest that there is a sociocultural effect related to using the bottle or the pacifier for soothing the baby while falling asleep. It could be surmised that when non- "European" immigrant mothers use the bottle to feed their baby, they reproduce feeding practices related to the beliefs and values of their countries of origin. Using a bottle to help the baby fall asleep may also signify concern for the baby's well-being by making sure he eats enough, instead of simply offering a pacifier (Rasbridge & Kulig, 1995). It can also be postulated that there is a lack of information on the deleterious effects of using a bottle to help the baby fall asleep because of language or cultural barriers.

Greater use of the bottle may also be the result of ignorance or choice in parents who are young, have a low educational level or a disadvantaged background, or constraints related to single-

parent status. However, it should be noted that parents can acquire new practices in the transition from breast feeding to using infant formula.

Very few of the infants in the 1998 survey were taking fluoride supplements. This indicates that the parents seemed to be following the recommendation to start these only after a baby is 6 months old if there are no other sources of fluoride. However, an increase in the proportion of infants receiving fluoride supplements is foreseen in the coming years of this longitudinal study. It has been observed that 18% of a sample of Québec firstborns had already taken these by the age of 6 months (Lepage & Moisan, 1998).

Few results presented here lend themselves to be compared with those in the literature, given the unique character of Year 1 of the longitudinal study, which was conducted on infants before the eruption of teeth and the appearance of oral and dental health problems. ÉLDEQ 1998-2002 is indeed providing data on many habits related to dental health at a very early age. We can therefore document current parenting practices without the bias associated with retrospective studies of older children. Although it does not provide all the answers to many questions, the knowledge generated by this first year of the longitudinal study can serve to guide prevention and promotion interventions in oral and dental health. For example, intervention tools could be developed to target specific groups such as young, less educated, non-"European" immigrant, and/or low income parents. Other beneficial interventions could be integrated into parenting programs targeting the feeding and sleep behaviours of young children.

Subsequent years of this study, while monitoring the practices previously described, will be examining other determinants of dental health, such as oral hygiene, eating and sucking habits, use of dental services and general health status of the child. Additional factors likely to influence parenting practices related to dental health will also be explored, such as sleep habits, temperament and the child's overall development. Finally, a clinical examination of all the children might be conducted, which along with the other data collected, should help us better understand the etiology of oral and dental health problems in Québec children of pre-school age.