

# The value of caries preventive care among 19-year olds using the contingent valuation method within a cost–benefit approach

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Abstract - Objectives: The aim of this study was to explore adolescents with high and no caries experience and their preferences for caries preventive dental care. Their willingness-to-pay (WTP) for preventive dental care was elicited using the contingent valuation method (CVM) within a cost-benefit approach. Methods: Eighty-two individuals (19-year olds) agreed to participate in an exploratory case-control study. Thirty individuals with high caries experience formed the test group. The control group consisted of 52 individuals with no caries experience, selected randomly from a caries-free population. Using personal questionnaires in combination with the CVM, we elicited respondents' WTP for preventive dental care. The data were used to: (a) compare WTP between study groups, and (b) calculate net social benefit (NSB) in cost-benefit analysis (CBA). Results: The result shows a mean yearly WTP for the high- and low-risk group of 1405 SEK and 1087 SEK (7.70 SEK = US\$1; July 2005), respectively. Two variables were associated with the differences between the groups: caries risk (i.e. group designation) and housing. Using these WTP values, the CBA showed positive NSB values for both study groups. Conclusions: Through use of the CVM, 19-year olds' WTP for caries preventive measures was elicited. An NSB >0 was found, which means that benefits exceeded the costs for prevention. Despite the small sample size and restriction to one Swedish county, the results indicate that the methods used in this study are suitable for further testing and analyses.

In any economic analysis (health services included) costs are compared with the consequences of different activities. The main objective is to determine whether the value of health benefits exceeds the costs of obtaining those benefits. Paretian welfare theory provides the conceptual foundation to cost–benefit analysis (CBA), which can be used to evaluate healthcare programmes, where both costs and utility (i.e. benefits) are measured in monetary units (1, 2). CBA is also based on individual preferences for the value of increased (decreased) health as a trade-off against other goods and

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Key words: contingent valuation method; cost–benefit analysis; costs and cost analysis; preventive dentistry; willingness to pay

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services. Three approaches to the monetary valuation of health outcomes exist (3, 4): 'human capital' (involving measurement of the value of health improvements as increased earning and decreased healthcare costs), 'revealed preferences' (involving observation of individuals' choices in real-market situations, i.e. actual purchases), and 'stated preferences' of willingness-to-pay (WTP; involving contingent valuation, a hypothetical investigation of individuals' expressed WTP for improved health). The contingent valuation method (CVM), developed in environmental economics (5), is a common survey-based, hypothetical, direct method that makes it possible to elicit monetary values (i.e. WTP) for welfare changes caused, for instance, by the implementation of healthcare technologies (6, 7). CVM has also been used to value risk reductions in traffic (8–11).

As early as 1996, O'Brien and Gafni (2) indicated the growth of CVM as an application in health care, an interest that can be seen in recent years in general medical health care (12–16). While this interest is also visible in dental care, only a few CBA using the CVM have been published to date. The method has been used to elicit individuals WTP for orthognatic treatment (17, 18), for an anaesthetic gel (19) and for different periodontal therapy options (20). Aside from a water fluoridation study by Dixon and Shackley (21), to our knowledge, no CBA has been published in preventive dentistry that analyses individuals' WTP using the CVM.

The Swedish taxation system provides free subsidised dental health care for children and adolescents up to the age of 19 years. The majority (>90%) receive their dental care through the public dental service. A capitation principle is used for youth dental care, and dental clinics receive an annual amount of approximately 900–1000 SEK per child. For the young adults in this study, 2005 is the last year that they will receive free dental care. In 2006, they must pay for their dental services. Nineteenyear olds with high and low caries experience have taken differential advantage of dental services (i.e. restorative and preventive dental care) throughout their lives. Use to date of dental services have influenced their attitudes towards dental/oral health and dental healthcare services, and may also impact on their future dental healthcare consumption.

The aim of this study was to undertake a CBA of a preventive dental programme for adolescents by measuring their WTP and the programme cost.

# Materials and methods

The study was approved by the Human Research Ethics Committee of Umeå University.

## Subjects

#### High-risk group

We used an epidemiological database of all adolescents in a Swedish county who were 19 years old and born in 1986, and who had a DMFT score >8, of which at least three teeth had proximal lesions or fillings. A second criterion was that during the last year they had not undergone orthodontic treatment or demonstrated symptoms of jaw or other oral diseases besides caries. The latter criterion was confirmed by studying their patient records. Thirty-seven individuals fulfilled the criteria.

#### Low-risk group

Using the same database, we identified 63 individuals born in 1986 (of a total of 614 individuals) who had a DMFT score of 0 and were classified by dentists to have an extremely low caries risk. These patients were selected randomly using a computerized randomizing technique. The same criteria in respect of orthodontics, jaws and other oral symptoms were used as for the high-risk group. A total of 100 individuals were identified and invited to participate in the study.

#### Data collection procedures

In April 2005, an information letter was sent to all 100 individuals. The letter outlined the objectives of the study, data collection procedures, high confidentiality in handling the data and responsible persons. The letter also mentioned that the individuals would be offered a small gift as compensation for participating, that they would be contacted within 2 weeks and that if they agreed to participate, a place and time for a personal interview would be arranged. Two, 35-year-old women with personnel/behaviour-related education and with no professional dental background were recruited as interviewer/survey administrator. They were trained prior to the study and instructed to strictly follow the interview guide. The interviews and questionnaires were completed at a neutral meeting place and with the respondent and interviewer placed on opposite sides of a table. All interviews were finished by the end of May 2005.

## The questionnaire

The questionnaire was previously tested in an interview situation with the interviewer/survey administrator and a total of five 19-year olds, which resulted in some small changes mainly on background variables. The questionnaire was designed to be completed in about 30 min by the respondents without help from the interviewers. The questionnaire was divided into three sections. Section 1 contained questions about demographic

and socioeconomic factors such as gender, school/ or employment status, type of living area. Socioeconomic level was determined from the type of household and the occupation(s) of the parent(s), as identified by the individual, in accordance with the classification system reported by Statistics Sweden (1995) (22).

Section 2 included questions about the individual's own caries risk estimation and WTP for dental treatment. The question about their caries risk estimation was worded as follows: 'How great is your risk of developing caries, cavities in your teeth, within the next two years, in your opinion? Great risk (close to 100%); Quite a great risk (about 50%); Quite a small risk (about 25%); Almost no risk at all (close to 0%)'. For descriptive analyse reason, the question was dichotomised to 'estimated low risk' = 1, including almost no risk and quite a small risk, or 'estimated high risk' = 2, including great risk and quite a great risk.

Section 3 contained questions from two Oral Health Related Quality of Life (OHRQOL) instruments (23, 24) and a question about global rating of oral well-being. After the interviews, respondents sealed their questionnaires in coded envelopes. Each individual was compensated with a gift voucher equivalent to the value of 100 SEK (US\$12.98) for their time and effort associated with participation.

#### Elicitation of WTP and CBA

Willingness to pay was elicited using the CVM, in the context of compensating variation according to the definition described by O'Brien & Gafni (2).

Respondents were asked about their WTP monthly for participation in a caries-preventive healthcare strategy. For later comparison with the costs of averting a decayed tooth in a CBA, the preventive programme implied a hypothetical risk reduction (expected effectiveness) for a decayed tooth within the immediate following years. WTP was elicited in two steps: first, respondents were given a single bid and secondly, respondents were asked for their maximum WTP (see Fig. 1). The interviewers read the hypothetical scenario and questions, and assessed the individuals' comprehension of the question both prior to and after answering by requesting that they briefly summarize the context. If the respondents had answered with zero values, they were asked if this reply corresponded with their preferences in order to avoid misunderstandings or missing values.

Estimation of the cost of participating in a prevention programme derives from a study by Oscarson et al. (25). The benefit–cost function, described in Drummond et al. (3), can be expressed as follows:  $NSB_i$  = net social benefit of project *i* (discounted)

$$NSB_i = \sum_{t=1}^n \frac{b_i(t) - c_i(t)}{\left(1 + r\right)^{t-1}}$$

where  $b_i(t)$  = benefits (in monetary terms) derived in year t,  $c_i(t)$  = costs (in monetary terms) in year t, 1/(1 + r) = discount factor at annual interest rate rand n = lifetime of project.

The function calculates the net benefit and costs adjusted for time by discounting. Evaluation was

If yes, what is the maximum you would be willing to pay for this?	SEK
□ No	
If no, what is the maximum you would be willing to pay for this?	SEK

In about a year, you will have to pay for your dental care yourself. It will then cost you money to have your teeth examined and fixed. In this county, the filling of one tooth or two teeth will cost about 600 or 1100SEK\* respectively. By preventive care, you will reduce the risk for needing fillings and you will increase the chance to keep your teeth and gums healthy. More preventive efforts will decrease the risk for subsequent damage. Preventive care means that dental staff, often a dental hygienist, will advice you on how you should look after your mouth in the best way and will clean and fluoridize your teeth. A preventive care programme may involve about 3 times a year. Preventive dental care will also cost you money. These questions will help us assess your interest and the interest of other young people in preventive care. Therefore, we would like to ask you how much you would be willing to pay for preventive dental care. Your willingness to pay will measure your interest in this kind of care. We would now like you to answer some questions on how much you would be willing to pay per month for decreasing the risk of tooth cavities by preventive dental care, considering what you think you could afford. Would you be willing to pay SEK 75 per month to decrease your risk for a tooth filling by at least half (50%) within the next two years? □ Yes

performed from both a broad societal perspective and a dental healthcare perspective, as although the societal perspective is the one more commonly used in evaluation of health care (5), it can also be argued that the narrower perspective of dental health care is the one that the individuals will have in mind when considering WTP. Thus net social benefit (NSB), was calculated for both the societal perspective and the dental healthcare perspective.

Estimates for participation cost were taken from the study by Oscarson et al. (25). From the dental healthcare perspective, this cost is solely the treatment cost ( $C_1$ ), while from the societal perspective it includes both treatment cost ( $C_1$ ) and patient and family-related costs ( $C_2$ ) such as travel, time, and out-of-pocket expenses. Total cost (C) is calculated by subtracting the cost savings (S) of averted disease from the participation costs; again the two perspectives result in two variables,  $S_1$  and  $S_2$ , which mirror the cost variables  $C_1$  and  $C_2$ . In both cases the derived benefits, B, represent the monetary value of the expected outcome and were defined as the mean yearly WTP for reducing the risk of a decayed tooth surface.

#### Differential timing of costs and consequences

Allowances must be made for different timing of costs and benefits. In the present study, outcome (benefits) measured as the yearly WTP was obtained in 2005. Costs were obtained from the study by Oscarson et al. (25), a 4-year caries preventive programme, in which both costs and benefits were discounted to the time for study start 1995. To compare those costs with the outcome (benefits) in the present study the calculated and discounted yearly costs from 1995 were adjusted for inflation to 2005 prices.

## Statistical analysis

All data from the questionnaires were collected and transferred to a computer. The statistical package SPSS 12.0.1 for Windows was used. Descriptive statistics were generated for the outcome variables and used to characterise the individuals in the study.

Determinants for the individuals' WTP were analysed in a linear multiple regression model. WTP served as the dependent variable, and independent variables were gender, parents' occupation, type of housing and caries risk (study group belonging). Statistical significance was considered to be present at the 5% level.

# Results

The study had a total falling-off rate of 18% (18 individuals: seven in high-risk group and 11 in low-risk group). Nine individuals did not accept the invitation to the study. The main reasons for not participating in the study were vacations and preoccupation with senior high-school examinations. Another nine individuals were excluded because they just had begun dental treatment (mainly fixed orthodontic appliances), and did not fulfil the inclusion criteria. Eighty-two individuals participated in the study, 30 in the high-risk group and 52 in the low-risk group. The internal loss (failure rate for completion of all questions) were very low. Only two individuals missed questions related to parental occupation and type of housing.

Table 1 shows the distribution frequency of values for demographic, housing and socioeconomic variables in the two groups. Both the groups contained more girls. The low-risk group had a 63.5% female population. Most of the individuals in both the high-risk and the low-risk group lived in owned houses, especially in the low-risk group. Among individuals in the high-risk group, living in a rented flat was about as common as in an owned house. However, individuals in the high risk group lived more frequently in rented flats than those in the low-risk group. The socioeconomic variable parents' occupation indicated that workers were more common in the high-risk group homes than in the low-risk group. Civil servants dominated the low-risk group.

Twenty-one individuals (70%) in the high-risk group estimated their own caries risk as high

Table 1. Frequency distribution for demographic/social background variables

	Group			
Variable	High-risk $(n = 30)$ (%)	Low-risk $(n = 52)$ (%)		
Gender				
Male	13 (43.3)	19 (36.5)		
Female	17 (56.7)	33 (63.5)		
Housing				
Rented flat	11 (36.7)	11 (21.2)		
Condominium	6 (20.0)	9 (17.3)		
House	13 (43.3)	32 (61.5)		
Parents' occupation				
Worker	10 (33.3)	10 (19.6)		
Civil servant	17 (56.7)	38 (74.5)		
Businessman/farmer	3 (10.0)	3 (5.9)		

Individuals' estimation of their own caries risk



*Fig.* 2. Individuals' own estimation of their risk for caries progression.

compared with seven individuals (13%) in the lowrisk group. Forty-five individuals (87%) in the lowrisk group estimated their risk as low compared with nine (30%) in the high-risk group (Fig. 2).

#### Elicitation of WTP and CBAs

The independent variables tested were gender, caries risk (i.e. study group designation), parents' occupation and housing. When all variables were analysed, the only two that significantly influenced WTP were caries risk (i.e. group designation) and housing (Table 2). Girls were willing to pay 18.12 SEK less than the boys (not significant). The individuals in the high-risk group were willing to pay 26.54 SEK more than the individuals in the low-risk group. The mean monthly WTP for the high-and low risk groups was 117.12 SEK (US\$15.21) and 90.58 SEK (US\$11.76), respectively. This yields a yearly WTP of 1405.44 SEK (US\$182.52) and 1086.96 SEK (US\$141.16). Individuals in rented flats and condominiums were willing to pay 39.93 SEK (US\$5.19)and 15.26 SEK (US\$1.98) more than the individuals in owned houses.

Table 2. Willingness to pay (WTP<sup>b</sup>) per month in SEK for some scenarios within a caries preventive strategy

	Parameter estimate	SE	<i>P</i> -value <sup>a</sup>	
Intercept	90.58	17.79		
Gender				
Male	-18.12	12.18	0.141	
Female				
Risk (i.e. group designation)				
Low risk	26.54	12.22	0.033	
High risk				
Housing				
Own house				
Condominium	15.26	15.93	0.341	
Rented flat	39.93	12.18	0.006	

<sup>a</sup>*P*-values from linear multiple regression (significance level P < 0.05).

<sup>b</sup>WTP is given in SEK; 7.70 SEK = US\$1 (July 2005).

Table 3. Net social benefit (NSB) for high- and low-risk groups

	B	C <sub>1</sub>	C	NSB <sub>1</sub>	NSB <sub>2</sub>
	(SEK)	(SEK)	(SEK)	(SEK)	(SEK)
Group	1.405	2	<b>F</b> (0)	1000	0.4.4
High-risk	1405	366	560	1039	844
Low-risk	1087	366	560	721	527

B = benefit; yearly WTP in Swedish krona (SEK). 7.70 SEK = US\$1 (July 2005). Costs in SEK (inflation adjusted). C = total costs, C<sub>1</sub> = dental treatment costs. NSB<sub>1</sub> = dental health care perspective, NSB<sub>2</sub> = societal perspective.

Table 3 describes the yearly benefit-to-cost function. The value of the NSB showed positive values for both the high- and low-risk groups. The net benefits were positive independently if total cost or just dental treatment costs were used. From a dental healthcare perspective, NSB<sub>1</sub> equalled 1039 SEK (US\$134.94) and 721 SEK (US\$93.64) for the high- and low-risk groups, respectively. From a societal perspective, NSB<sub>2</sub> equalled 844 SEK (US\$109.61) and 527 SEK (US\$68.44) for the highand low-risk groups, respectively. Thus the goal of finding a project where the NSB >0 was fulfilled and yielded positive preferences for the preventive approach.

#### Discussion

Cost-benefit analysis has theory-based appeal for economists given its strong foundation in welfare economics (2–4). It also appeals to decision-makers, because of the possibility of measuring the net benefit of costs and consequences. However, valuing health in monetary units has historically been distasteful to many non-economists. Consequently to date cost-effectiveness analyses, which measure outcomes in non-monetary units, have outnumbered CBAs in the healthcare sector (12).

Despite the increased interest in dentistry, the number of completed CBAs are few. Jönsson and Karlsson (26) reviewed cost-benefit studies for preventive programmes in dental health care and concluded that the monetary benefit of these programme is often measured as the savings in costs of treating carious lesions, often calculated as the fee for the treatment. This implicitly assumes that the fee is equal to the cost, which is not always the case, and that the value of savings made by preventive efforts is equal to the cost for restoration. Furthermore, these measurements of benefits do not include changes in quality of life and utility. Two different types of CBA have been conducted and described in the dental literature: studies that use future cost savings as alternative for a real CBA (27–32), and the recently published CBA where the monetary value of the outcome was measured using the CVM (17–21, 33).

The elicitation technique is crucial for the appraisal of WTP in CBA. O'Brien and Gafni (2) conclude that 'there are various value-elicitation methods, and each has strengths and weaknesses'. The WTP questions can be worded as open-ended or binary valuation. Even if open-ended questions are theoretically simple, it could be difficult for the respondent to answer easily, with the resulting risk of many non-responses. Three different techniques are described in the literature. A bidding game, introduced by Randall (34), resembles an auction. Payment cards are used to display a range of WTP values from which the respondent may choose. Finally, a binary valuation includes take-it-or-leave-it questions, as described by Johannesson et al. (4). Here the respondent is asked to accept or reject a single bid which they would have to pay in exchange for a programme or some improvement in health status. The elicitation technique is a challenge and a balancing procedure among validity as well as threats to validity (i.e. biases). As calculations are highly dependent on the WTP results, special attention has been drawn in the present study to the elicitation procedure.

## Elicitation of WTP and CBA

In the present study, biases could have occurred when respondents received information, processed information or reported their answers. Bayoumi (35) summarizes several possible biases in CVM, some of which must be discussed with respect to the present study. To avoid social desirability bias, precautions were taken. The interviewers were two highly educated academic women, recruited to be interviewers/survey administrators from an employment agency. Both had personnel- and behaviour-related training. They had no professional dental background and were not associated with the research project, which decreased the risk of their influencing respondents with conceivable preferences according to the research objectives. The interviewers read the WTP question thoroughly according to the interview guide, and repeated the question if something was unclear to the respondent. If the respondents wrote a zero value for the WTP, the interviewer asked if that corresponded with their true value in order to avoid non-responses or protest zero bias. As protest bias can also bids that obvious differ from the mean (outliers) be counted. However, no so-called obvious outliers existed in the present study. The interviews and questionnaires were also completed at a neutral meeting place, away from dental clinics. Properly handled, the precautions undertaken must be considered to have reduced the risk of biases. The interviews and meeting place required participants to commit time and effort to travelling. They were therefore offered a small compensation as encouragement which of course could have some effect, especially to increase participation. The risk that the compensation influenced the answers is not plausible.

This study was conducted in a single Swedish county. As the incidence and prevalence of caries are low, all individuals in the age group who fulfilled the criteria for the high-risk group were invited to participate. The individuals in the lowrisk group were not matched controls but selected randomly from 614 caries-healthy individuals who fulfilled the criteria. These facts in combination with the study sampling size may certainly have affected the differences in the demographic variables. Of course, these so-called *sampling biases* must be considered when discussing the external validity. It is possible that a larger sample could have generated different results.

Johannesson et al. (4) advocate the use of a binary technique when eliciting WTP. The present study used a binary question followed by an openended question. Several studies (2-5) discuss the risk of anchor-point (starting point) bias. Traditional binary contingent valuation questions give respondents only one bid belonging to a market situation since individuals are accustomed to deciding whether or not to buy a good at a specific price. The present study gave individuals the opportunity to reject or accept one bid in a binary contingent valuation approach, although we considered the sample size too small to divide and stratify the individuals into sub-samples (4) that would each be offered a different bid. Instead the individuals were given a second open-ended question to make it possible to calculate the mean WTP. While we must consider the risk of startingpoint bias but anyhow, we felt that the risk of non-responses would be greater with just a single open-ended question. The great variance within the distribution of the respondents' WTP results, above

and below the bid, shows that the respondents did make an active choice after all.

One question of particular interest regarding content validity and the risk of hypothesis bias can be addressed as follows: Is it realistic for 19-year olds, still occupied with school studies and not financially self-sufficient, to engage in hypothetical monetary exercises? The interviewers were instructed to thoroughly elucidate the hypothetical scenario in the WTP questionnaire, to ensured that respondents understood that their own budget situation must be considered when giving their WTP value (see Fig. 1). In 2006, as 20-year olds, these individuals will have to make an active choice to pay with their own money for their dental health care. Even if Swedish adolescents have limited economical resources, most do have their own (but small) budgets, for example, for their mobile telephone accounts, leisure activities and clothing. Hence they are quite familiar with economical thinking and choices. However, in the context of social benefit it would have been of interest to also investigate their parents' WTP for the caries-preventive programme.

Willingness to pay has often been associated with ability to pay (1, 5). Variables that were associated with WTP were caries risk (i.e. group designation) and housing. The individuals with high caries experience also estimated their own risk as high, thus it is plausible that they showed higher preferences for preventive efforts than did the noncaries group. Though housing can be seen as a partially socioeconomic variable, the association in this study implies some relationship with wealth. As both housing and parents' occupation can be considered to express socioeconomic level, an internal correlation between those variables could be expected. Bivariate analysis of the association of these variables was performed using chi-squared test but such a correlation could not be confirmed. However, the individuals who lived in owned houses gave lower WTP scores compared with those who lived in rented flats. This finding may have been influenced by the fact that more cariesfree individuals lived in owned houses, which implies that caries also has a socioeconomic component. As shown earlier (5, 19, 33, 36), WTP is likely to be related to income. Yet that statement was not supported by Cunningham and Hunt (18) who did not find such a correlation in a study involving a number of students. Even if the mean WTP was lower in the low-risk group compared with the-high risk group, their valuation of the preventive strategy must be considered positive. This could perhaps be explained by their earlier positive experiences of preventive care, by the possibility that they actually rank healthy teeth highly, or that they estimated their own caries risk to be higher than the actual risk, a fact that the results of their own estimated risk implied for a couple of individuals. Nevertheless, the participants appeared to understand the presented hypothetical scenario, which is of potential importance in CVM studies (2, 37).

There is (as described above) significant mislabelling of CBA studies in the dental literature regarding the term 'CBA'. The lack of fully completed CBA studies in preventive dentistry makes comparisons with the present study impossible. One of the primary goals of CBA is to find projects where NSB >0 entails that individuals in both study groups gave positive preferences for the preventive approach. The benefit of the preventive programme exceeds its cost. Both the overall positive NSB values and the differences between the groups were of interest. Individuals in the highrisk group were prepared to pay 318.49 SEK (US\$41.36) more for a caries-preventive strategy than individuals in the low-risk group. The NSB in this study was calculated using the unit cost for a prophylactic nurse as responsible for the used preventive measure, as this category was employed in the intervention (38). Oscarson et al. (25) described unit cost for all dental caregivers (nurse, dental hygienist and dentist). Using the same calculation technique and total treatment time used for prevention, the use of dental hygienists also showed positive NSB values. For the high-risk group, NSB = 648 SEK (US\$84.16) from the societal perspective and 845 SEK (US\$109.74) from the dental care perspective. The NSB for dentists showed a positive but small NSB from the societal perspective, 15 SEK (US\$1.95), and 214 SEK (US\$27.79) from the dental care perspective. For the low-risk group, both NSB values were positive using dental hygienist and negative using dentist as responsible for the preventive efforts. Dental hygienists, with their higher competence directed towards prevention and health promotion and their better knowledge and interest about patient behavioural concerns, will be better suited to response for different preventive strategies. Using these prerequisites for increasing their own competence and contributing to research within this field, thus contributing to the overall development of more effective strategies for caries prevention,

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gives opportunities for an even more favourable outcome and positive NSBs.

Decision-making in health care involves several priority problems. While health economic evaluations are one way o provide a better base, one single measure may not be sufficient, depending on the existence of all the different characteristics of diseases and health problems. Quality of life analyses, as suggested by Bowling (39), combine clinical and effectiveness measurements with patient-oriented measures, on the one hand, and information about individuals' preferences and appreciation of the NSB for health and health programmes, on the other, to give a comprehensive base for decision-making.

# Conclusion

Through use of the CVM, 19-year olds' WTP for caries preventive measures was elicited. A NSB >0 was found, which means that benefits exceeded the costs for prevention. The individuals with high caries experience gave higher values for their mean yearly WTP compared to the individuals with no caries experience. Despite the small sample size and restriction to one Swedish county, the results indicate that the methods used in this study are suitable for further testing and analyses.

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