Is receipt of government benefits a useful predictor of caries among 5–10 year old children?

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Abstract
Objectives: To determine whether receipt of government health benefits is a useful predictor for caries development.

Methods: Data were collected in the South Australian component of the Child Oral Health Study, a prospective longitudinal study of 5-17 year-old children in various states in Australia in 2002-2005. Socio-demographic data and fluoride exposure were collected by a parent-completed questionnaire. Clinical data were collected by school dental therapists at routine examinations with up to 3 years follow-up. Risk factors for caries using incidence density examined associations among 5–10 year-old children. Logistic regression models of incidence density predicted odds of new caries using information about health card status and income, controlling for age at baseline, education of parent, aboriginality, location, employment of main carer, marital status, lifetime exposure to water fluoridation and baseline caries experience.

Results: Response rate for South Australia service was 69%, yielding 2385 5-10 year-olds with at least one follow-up visit. Thirteen percent of children were in receipt of government benefits. In the follow-up period deciduous caries developed in 38% and permanent caries in 17% of 5-10 year-old children. In logistic regression modeling government benefit status and income were not significant risk factors for caries development in either dentition. Risk factors for deciduous caries were aboriginality (OR 3.10, 95% CI 1.09–8.84) and baseline caries (OR 1.10, 95% CI 1.08–1.12). Risk factors for permanent caries were age (OR 1.19, 95% CI 1.09–1.30) and baseline caries (OR 1.06, 95% CI 1.04–1.08).

Conclusions: Receipt of government benefits was not a risk factor for caries development in 5-10 year-old children and should not be used as a rationing tool for care. Indigenous status in the deciduous dentition, age in the permanent dentition and baseline caries in both dentitions were risk factors for this age group. Supported by NHMRC.

Introduction
Most states in Australia have a history of a universal school dental service. This is currently under threat in many jurisdictions.

One option being considered is the restriction of the service to holders of government welfare benefits. A rationale being used to support this proposal is that children whose families receive government benefits are at higher risk of developing caries.

Evidence is needed as to the validity of that rationale.

Objectives
This study used data from one state to investigate whether receipt of government health benefits is a useful predictor for caries development.

Methods

- Study design: prospective, cohort study
- Sample: Children attending the School Dental Service in South Australia were randomly selected by date of birth
- Clinical data were collected by school dental therapists at routine examinations with up to 3 years follow-up
  - Baseline dmfs
  - Follow-up dmfs/DMFS
- Explanatory variables collected in a self-completed questionnaire
  - Age
  - Sex
  - Indigenous status
  - Household income
  - Reception of government benefits
  - Highest educational level of either parent
  - Employment status of main carer
  - Marital status
  - Residential history
  - Sources of water consumption

- Analysis: Incidence density was calculated - new caries per 100 surface years at risk.
  - Risk factors for caries using incidence density examined associations among 5–10 year-old children.
  - Logistic regression models of incidence density predicted odds of new caries using information about health card status and income, controlling for age at baseline, education of parent, aboriginality, location, employment of main carer, marital status, lifetime exposure to water fluoridation and baseline caries experience.

Results
Response rate for South Australia was 69%, yielding 2,385 5–10 year-olds with at least one follow-up visit.

Government-welfare recipients comprised 13% of the sample (Table 1)

The mean number of new carious surfaces per 100 surfaces at risk was 1.89 for deciduous dentition and 0.67 for the permanent dentition

Table 1: Per cent of respondents by socio-economic group

<table>
<thead>
<tr>
<th>Welfare recipient</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low income (&lt;$40,000)</td>
<td>290</td>
</tr>
<tr>
<td>Medium income ($40,000–$80,000)</td>
<td>624</td>
</tr>
<tr>
<td>High income ($80,000+)</td>
<td>1,033</td>
</tr>
<tr>
<td>Not in receipt</td>
<td>289</td>
</tr>
</tbody>
</table>

Bivariate analyses of caries incidence density by socio-economic status showed no significant differences between categories for either the deciduous (Figure 1) or permanent teeth (Figure 2).

Figure 1: Bivariate analyses of deciduous caries rate per 100 surface years at risk (95% CI) by socio demographic status

Logistic regression models showed that being a welfare recipient and income were not significant risk factors for caries development in either dentition. Risk factors for deciduous caries (Table 3) were Indigenous status (OR 3.16, 95% CI 1.11–9.00) and baseline caries (OR 1.10, 95% CI 1.08–1.12). Risk factors for permanent caries (Table 4) were age (OR 1.19, 95% CI 1.09–1.30) and baseline caries (OR 1.06, 95% CI 1.04–1.08).

Figure 2: Bivariate analyses of permanent caries rate per 100 surface years at risk (95% CI) by socio demographic status

Table 2: Mean number of caries incident surfaces

<table>
<thead>
<tr>
<th>Reference category</th>
<th>Odds ratio &amp; 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low income Welfare recipient</td>
<td>1.17 (0.83–1.64)</td>
</tr>
<tr>
<td>Moderate income Welfare recipient</td>
<td>1.07 (0.75–1.52)</td>
</tr>
<tr>
<td>High income Welfare recipient</td>
<td>0.93 (0.64–1.52)</td>
</tr>
<tr>
<td>Age at baseline</td>
<td>0.81 (0.76–0.86)</td>
</tr>
<tr>
<td>Indigenous</td>
<td>3.16 (1.11–9.00)</td>
</tr>
</tbody>
</table>

Table 3: Logistic regression for new caries in the deciduous dentition

Table 4: Logistic regression for new caries in the permanent dentition

References

- Controlled for sex, education of parent, marital status, area, lifetime exposure to water fluoridation and employment of main carer.

Conclusions
Receipt of welfare benefits was not a risk factor for caries development in 5–10 year-old children.

This study showed that socio-economic background is not a basis on which to ration child dental services if it is regarded as a measure of caries risk.

This study suggests that a universal school dental service is still the best system for child oral health service delivery.

If targeting is necessary identification of children with high caries prevalence at young ages should be considered as a criterion along with Indigenous status.

Acknowledgements
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