

# The Effects of Early Preventive Visits on Use, Costs and Oral Health Status

Oral Health and Prevention: Rebranding the Profession  
Institute for Oral Health  
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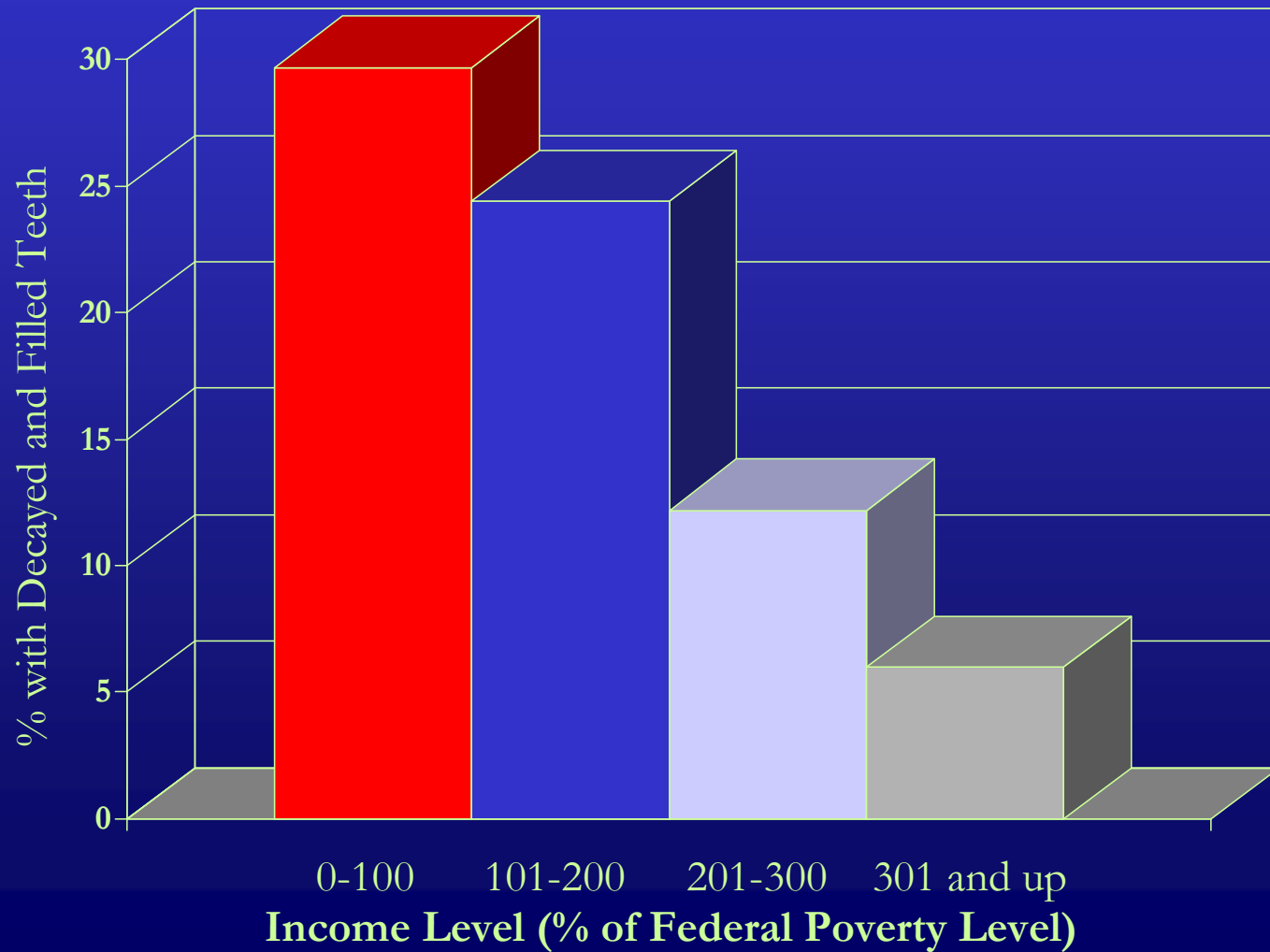
# Overview

- Epidemiology of the Disease
- Consequences of Early Childhood Caries
- Reported Demand for Dental Services by Caregivers
- Utilization of Dental Services
  - Preventive services
  - Treatment provided in the operating room
- Effects of Early Preventive Dental Services
  - Age 1 dental visit
- Effects of Periodicity of Preventive Dental Services

# Early Childhood Caries (ECC)

- Data from NHANES reports that 41% of children aged 2-11 have experienced dental caries in primary teeth, 42% of those aged 6-19 had caries in their permanent teeth and 25% of this is untreated dental decay
- Prevalence of dental caries in children aged 2-5 years is on the increase: 24% in 1988-1994 compared to 28% in 1999-2004. This represents a 15% increase in dental disease for this segment of the population.

# Percentage of Preschool Children with Decayed and Filled Teeth by Income Level

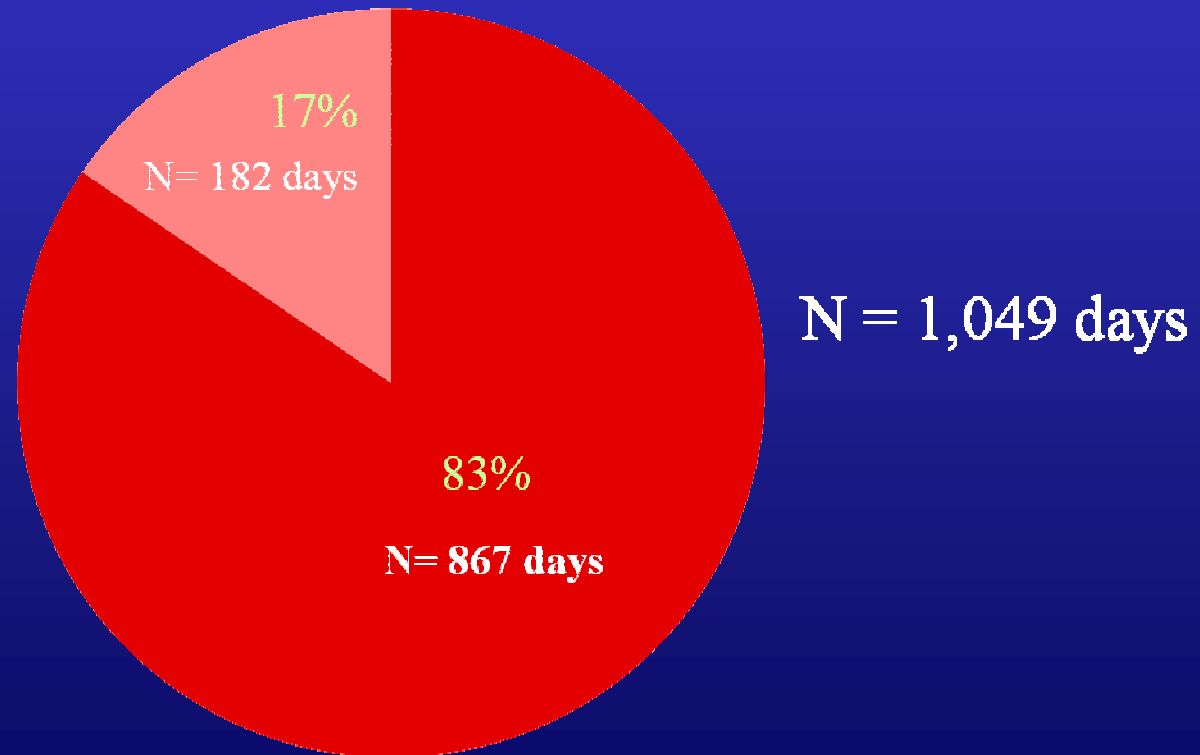


# Consequences of ECC

- Significantly more likely to weigh less than 80% of their ideal body weight and suffer from failure to thrive.
- Children's hours lost from school and parents' hours lost from work.
- The lost hours disproportionately burden lower income, minority, and non-insured children.

## School Days Missed for Dental Reasons Sample Size: 2,120 subjects

■ Routine care ■ Dental Pain and Infection



<b>Health Insurance Status</b>		
Public/Medicaid/Carolina ACCESS/IHS	512	24.2
Private/Health Choice	1,291	60.9
Military/Other	189	8.9
Uninsured	128	6.0
<b>Oral Health Status</b>		
Excellent/Very good	1,577	73.2
Good/Fair/Poor	543	26.8
<b>General Health Status</b>		
Excellent/Very good	1,744	82.1
Good/Fair/Poor	376	17.9
<b>School Performance</b>		
Mostly A's and B's	1,494	70.5
Mostly C's, D's, and F's	288	13.6
No letter grading	228	15.9
<b>School Absence due to Routine Dental Care</b>		
1 Day	273	13.0
2 Days	127	5.9
3 or more Days	64	2.7
No Days	1,656	78.4
<b>School Absence due to Dental Pain</b>		
1 Day	50	2.2
2 Days	18	0.9
3 or more Days	21	0.8
No Days	2,031	96.1

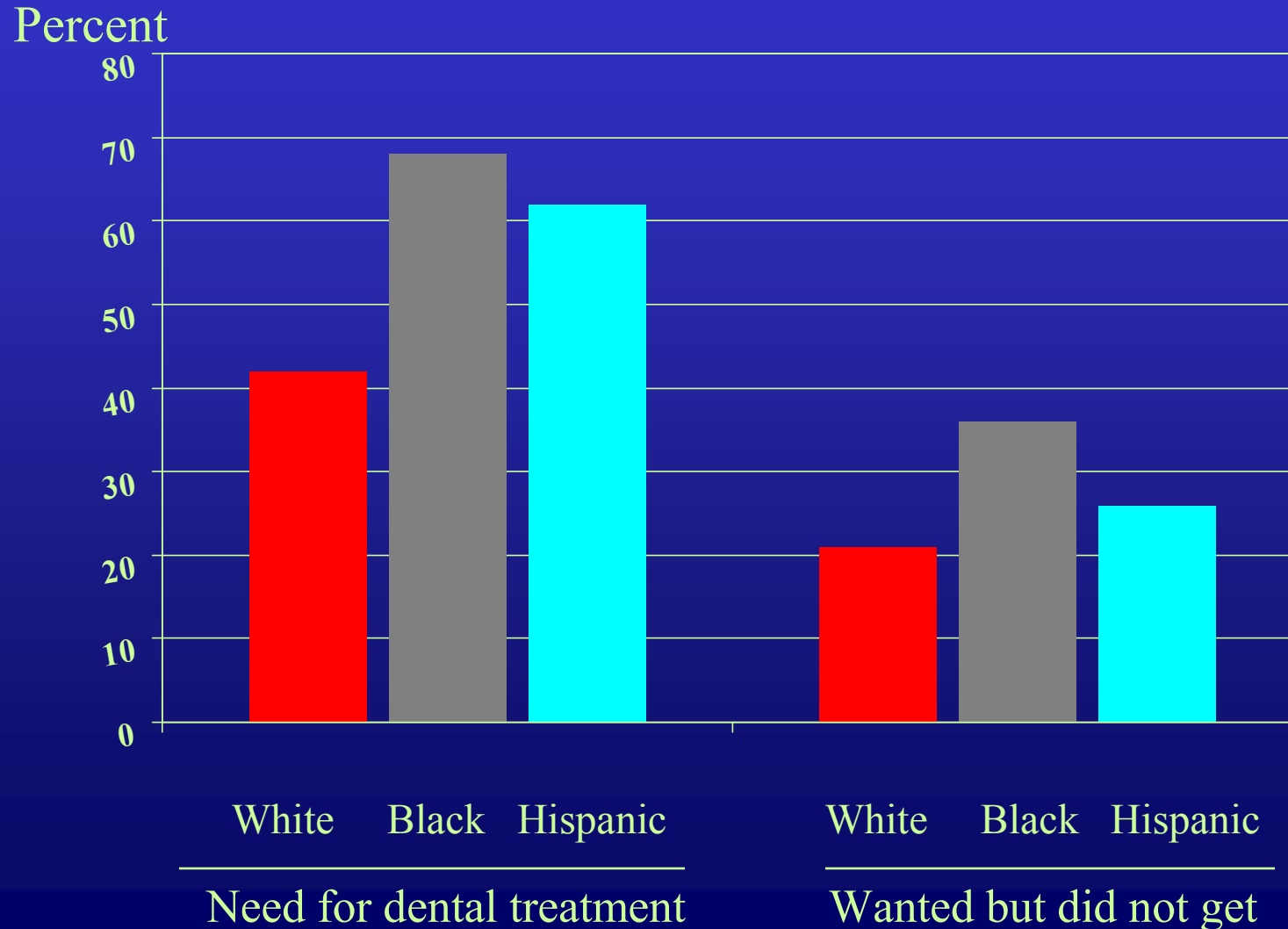


# **Caries and pain experience in children**

24% of children in kindergarten-third grade had experienced dental pain in their lifetime (NC OHS, 2004).

31% of children grades 4-12 had experienced dental pain at least once in the last three months (NC OHS, 2004).

# Percent of Parents Reporting Dental Need for Child and Demand by Race



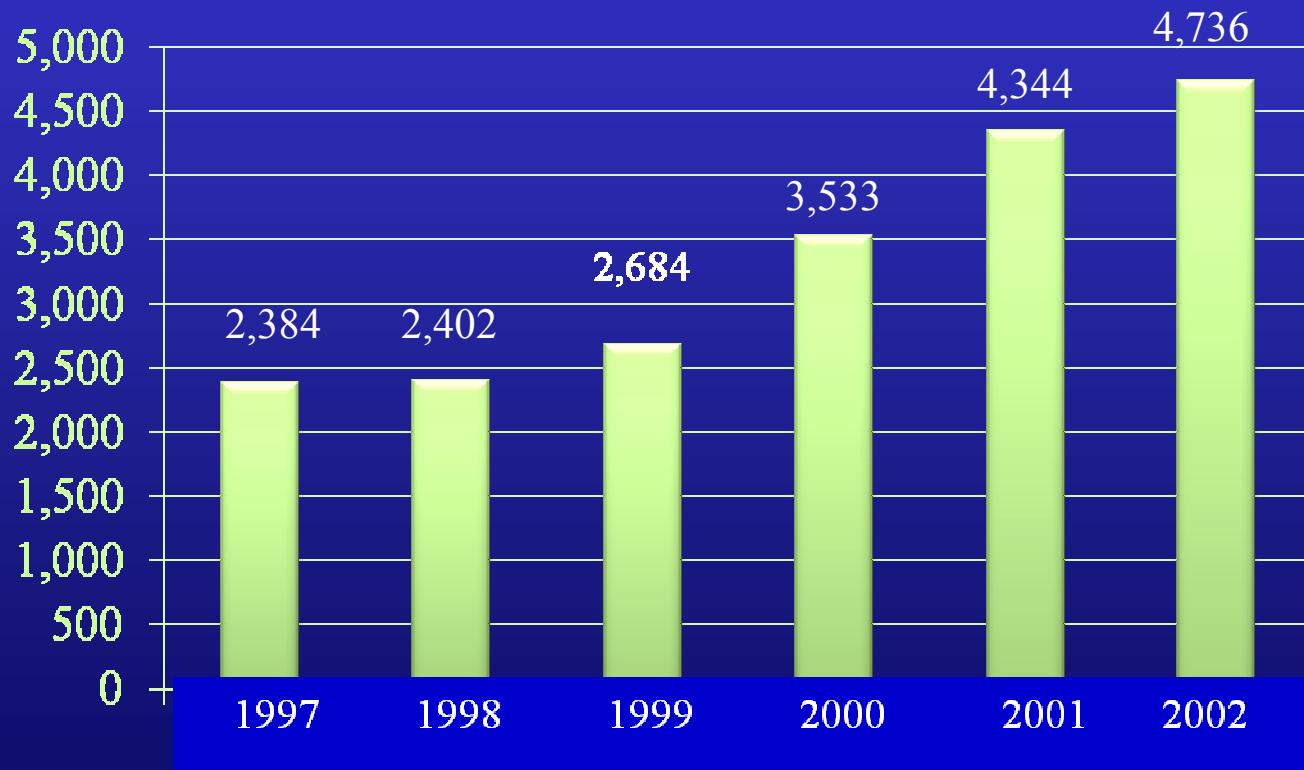
# Treatment of ECC

Treatment of ECC can be costly:

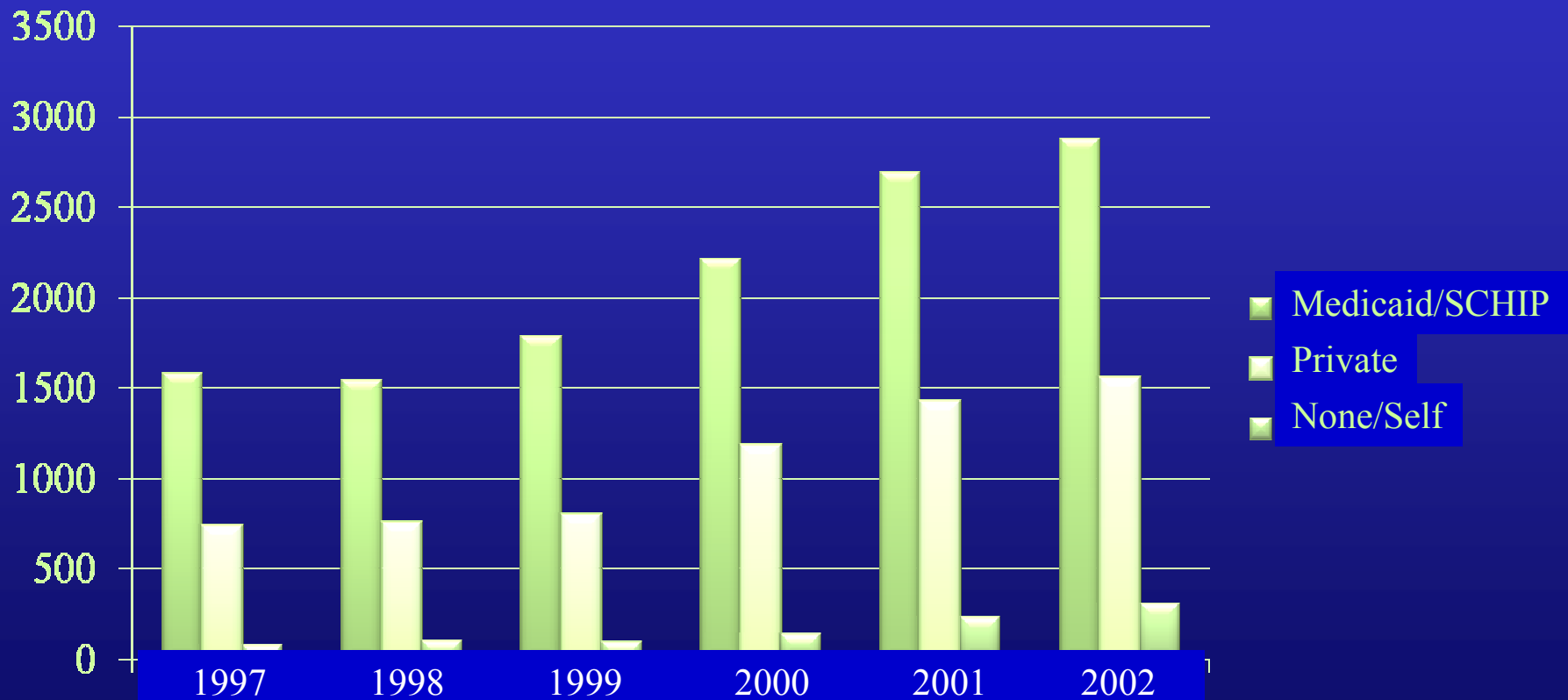
- general anesthesia
- sedation
- traditional and/or IRT

# Trends in Operating Room Visits for Dental Treatment

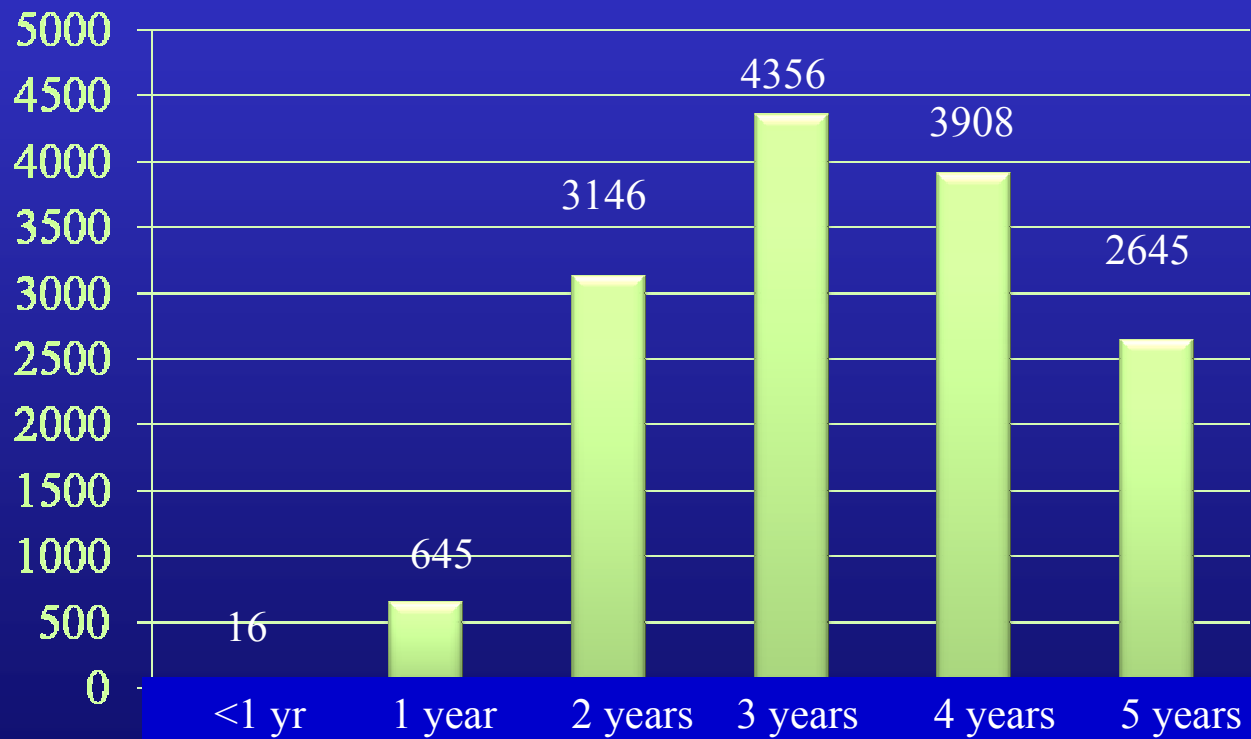
*White, Lee and Rozier: Pediatric Dentistry 2008*



# Operating Room Visits for Dental Treatment by Payer



# Operating Room Visits for Dental Treatment for Children 0-5 years



# Anticipatory Guidance

- **Definition:** process of providing practical developmental appropriate information about children's health to prepare parents for physical milestones
- Like well-child medical visits, one of the cornerstones of the infant dental visit is to prepare parents for future dental milestones and age specific needs

# Effects of Early Preventive Dental Visits

Savage, Lee, Kotch and Vann: *Pediatrics*, 2005

- Characterize the age of the first preventive dental visit in a large population of preschool children at high risk for dental caries
- Examine the effects of age of the first preventive dental visit on subsequent use of dental services
- Examine the effects of age of the first preventive dental visit on dentally-related costs Medicaid children born in 1992.

# Early Dental Visits Results in Cost-Savings

- In theory, early dental visits have the potential to reduce children's future dental risks and thus improve oral health and **reduce oral health costs**.
- The estimated annual dental bill in the US to restore decayed teeth exceeds **\$93 billion**
- **33% (\$30 billion)** of that was spent on children's oral health making it one of the single most expensive uncontrolled diseases of childhood.

# Early Dental Visits Results in Cost-Savings

- Children less than 6 years of age enrolled in Medicaid and treated for ECC in a hospital setting represent less than 5% of those receiving dental care but consume 25% to 45% of the **dental** resources.
- CMS reports that **\$53 million** were spent on hospitalizations for dentally related treatment.

Early preventive  
dental visits



## Dental Outcomes

Subsequent dental  
use

Dentally related costs

Oral health status

Early preventive  
dental visits



Dental Outcomes

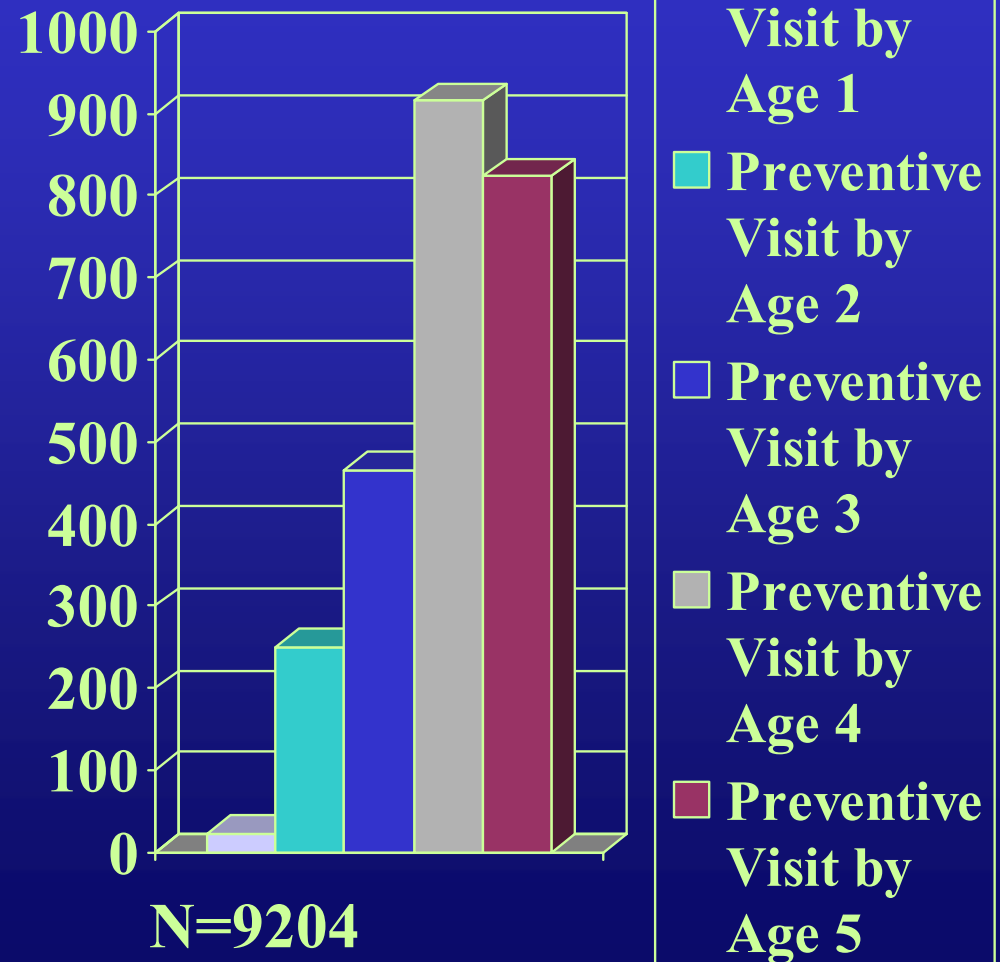
Subsequent dental  
use

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Oral health status

# Age of the First Preventive Dental Visit in High-Risk Preschool Children

- 23 children (0.24%) had their first preventive visit by age 1
- 249 children (2.7%) by age 2
- 465 children (5.1%) by age 3
- 915 children (9.9%) by age 4
- 823 children (8.9%) by age 5



# Effects of Age of the First Preventive Dental Visit on Subsequent Use of Dental Services

- Children who had an early preventive dental visit were more likely to use preventive services in the future.
- Children who utilized early preventive dental care incurred fewer dentally-related emergency visits and less restorative visits compared to those who began this care at a later time.

Early preventive  
dental visits



## Dental Outcomes

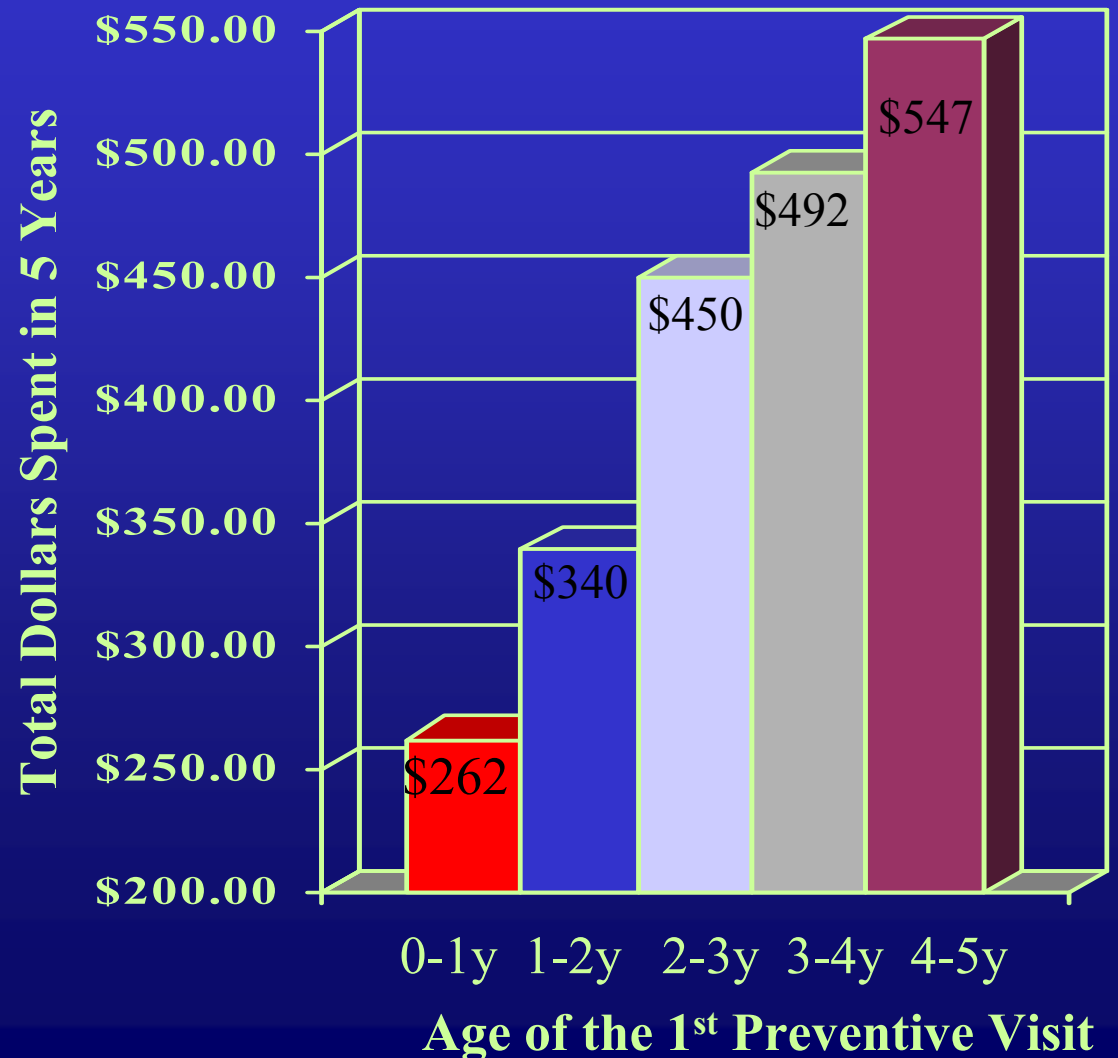
Subsequent dental  
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# Effects of Age of the First Preventive Dental Visit on Dentally-Related Costs

- Having had a preventive visit by age 1, 2, 3, 4, and 5 all had a significant effect on costs ( $P$ -value = 0.00).
- There was a trend for a reduction in total cost when high-risk children had the first preventive visit by age 1.



# Early Preventive Care and Costs

- A early preventive visit by age 1 shows a trend towards decreasing total cost over the five year study compared to a later preventive visit or no preventive visit at all.
- The average cost per child during the 5 year study for a first preventive visit by age 1 was \$262 compared to \$340 for a first preventive visit between 1 and 2, \$450 between ages 2 and 3, \$492 between ages 3 and 4, \$547 between ages 4 and 5.

# Reduction in Caries Related Txt 2000-2006

	Estimated Dental Treatments without IMB Visits	Estimated Dental Treatments with IMB Visits	Estimated Reduction in Dental Treatments	Percentage Reduction	95% Confidence Interval for Estimated Reduction*
Anterior teeth (0 vs 4+ IMB)	1049	911	<b>-137</b>	<b>13.2%</b>	(-224,-70)
Posterior teeth (0 vs 4+ IMB)	1501	1242	<b>-259</b>	<b>17.3%</b>	(-395,102)

\*Based on 1000 bootstrap iterations

# Effects of More Frequent Receipt of Preventive Dental Services on Subsequent Caries Related Dental Treatment

- Children with 4 or more preventive dental services had a 13% reduction in subsequent caries related treatment for anterior teeth.
- Children with 4 or more preventive dental services had a 17% reduction in subsequent caries related treatment for posterior teeth.
- Does not take into account preventable hospitalizations.

# Effects of Early Preventive Dental Visits On Health Status

Beil, Rozier, Stearns, Lee and Presser

Estimate the effect of an early preventive dental visit on the child's dental disease history at the time they were enrolled in kindergarten.

Early preventive  
dental visits



## Dental Outcomes

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use

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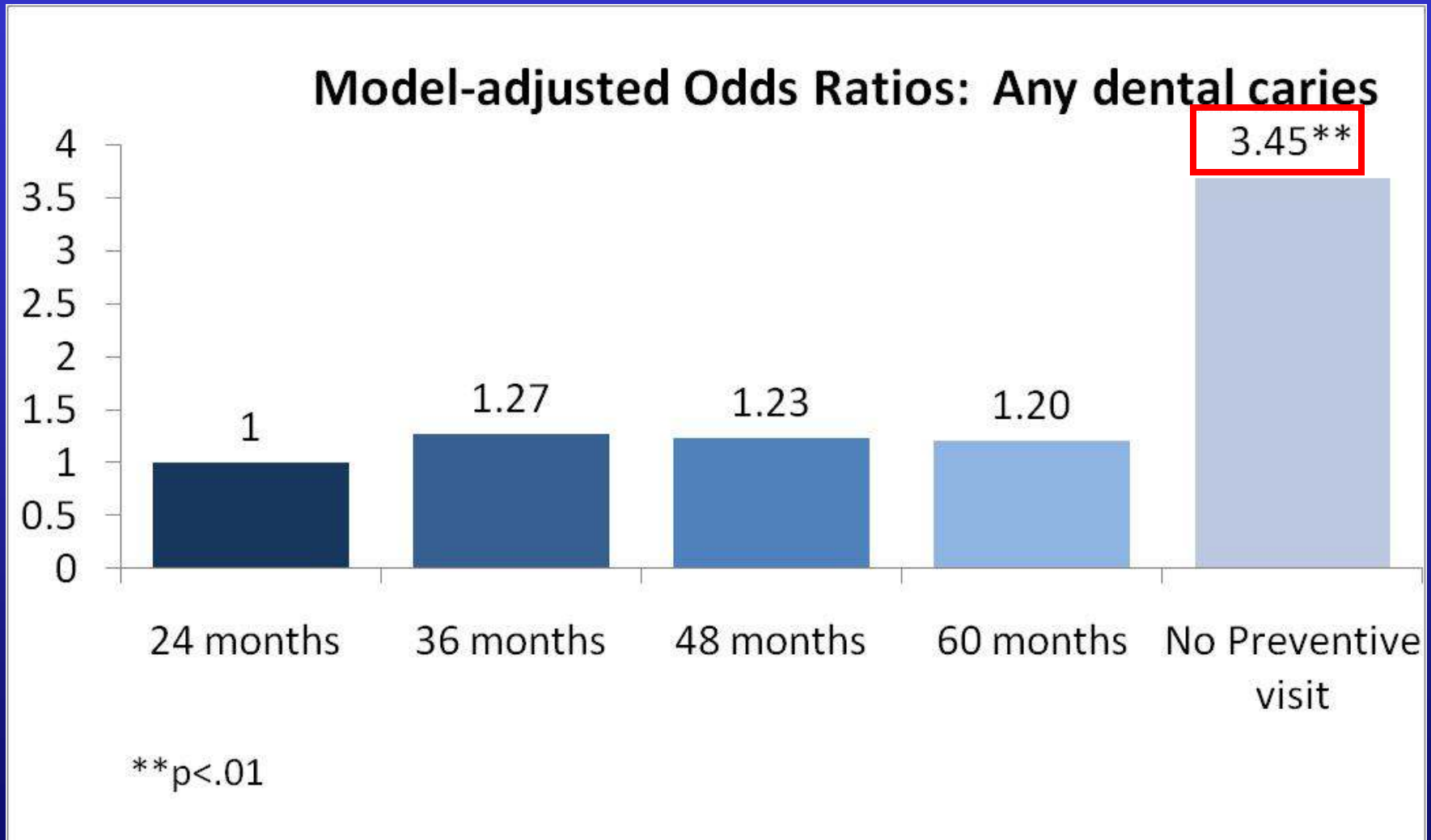
Oral health status

	preventive visit by 24 months	preventive visit by 36 months	preventive visit by 48 months	preventive visit by 60 months	No preventive visit by 60 months
N	240	685	1479	1448	2077
	Mean (SE)/%				
Any disease (%)	45%	53%	50%	51%	62%
Caries history (mean dm <sub>(molar)</sub> ft, SD)	2.45 (3.59)	2.67 (3.54)	2.38 (3.31)	2.48 (3.45)	3.02 (3.45)
Untreated caries (mean d, SD)	0.48 (1.48)	0.46 (1.35)	0.54(1.40)	0.61(1.56)	1.01 (2.03)
# Months enrolled in Medicaid	64.66 (15.90)	66.95 (12.85)	67.58 (11.23)	66.84 (12.01)	63.78 (14.89)
Total # dental visits	5.55 (3.85)	5.81 (3.97)	4.83 (3.19)	4.11 (2.78)	2.99 (2.11)

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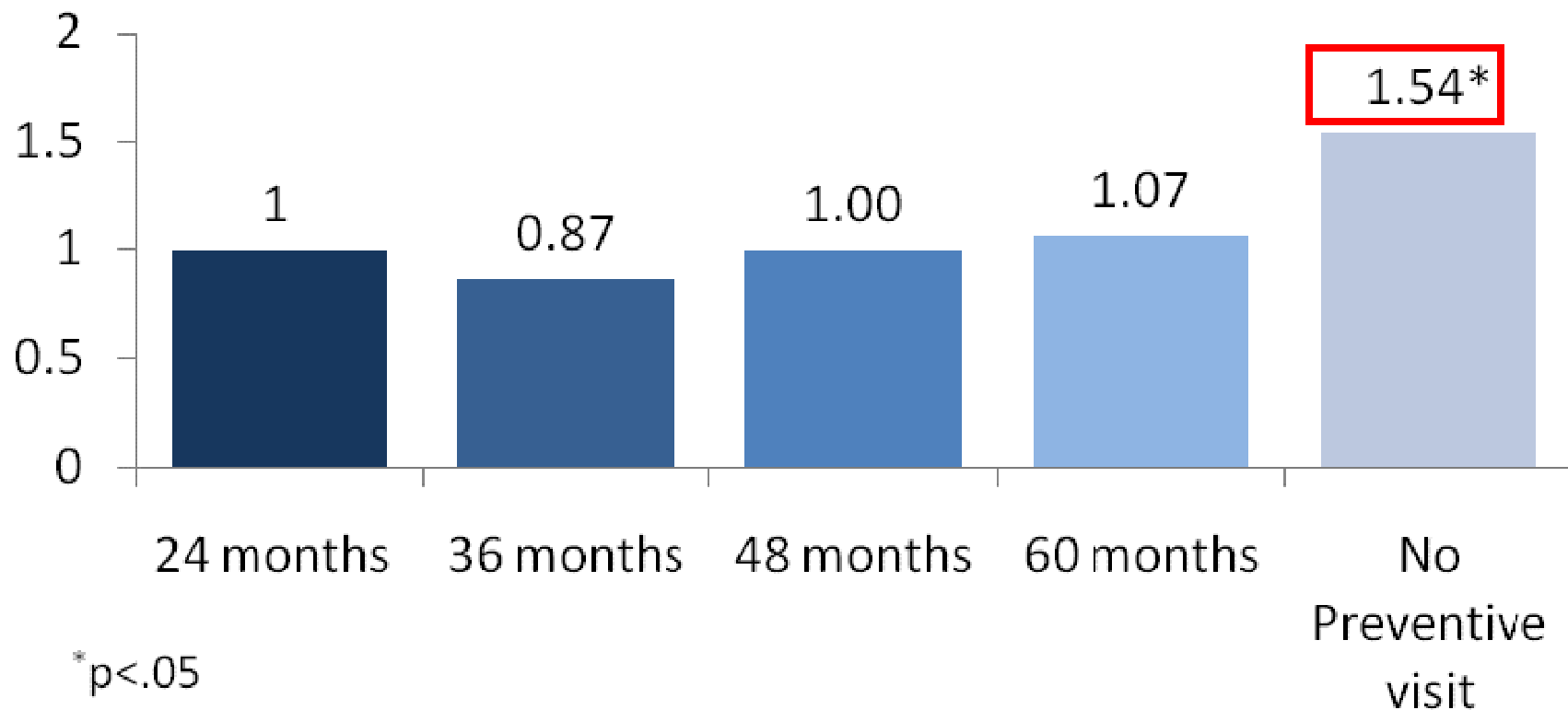
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## Odds of having any dental caries by age of first preventive visit



## Incidence Rate Ratios of Untreated Caries by age of first preventive visit

### Model-adjusted Incidence Rate Ratios: Untreated disease (d)



# Summary

- Prevalence of dental disease in children aged 2-5 years is increasing.
- Hospital/operating room visits for dental treatment is also on the increase, regardless of payer type.
- Early preventive dental visits is effective at reducing dentally related costs.
- Early and frequent preventive dental services reduces subsequent caries related dental treatment.

Thank you!