Return on Investment to Funding an Adult Dental Medicaid Benefit

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Research Team

Medicaid
Academia
Dental Public Health

Martha Dellapenna, RDH, MEd
Mary E. Foley, RDH, MPH

Donald Shepard, PhD
Yara Halasa, DMD, MS, PhD(c)
Cynthia Tschampl, PhD

Medicaid Budgets and Benefits

Mary Foley, RDH, MPH

Medicaid|Medicare|CHIP Services
Dental Association

mfoley@medicaiddental.org

DentaQuest Foundation: Oral Health 2020 Goals and Targets

Goal 3:

Mandatory inclusion of an adult dental benefit in publicly funded health insurance: Adult Medicaid

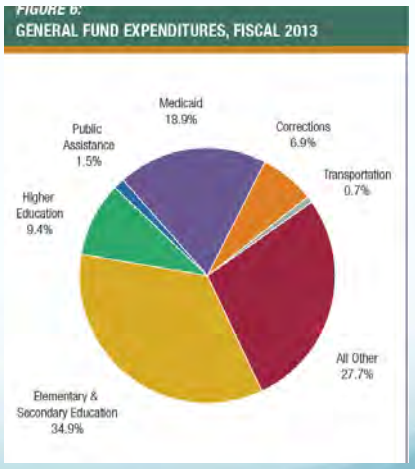
Charge

- Explore factors/indicators that states currently use to assess program cost-effectiveness;
- Study program models currently used by states to predict costs and return on investment;
- Study cost trends over the last 5 year as they relate to *traditional* indicators;
- Study *non-traditional* factors/indicators that may be impacted by by adding benefits;
- Propose and study *non-traditional* factors that could impact overall state budgets and/or communities and programs; and
- Develop a conceptual model for states to use in budget preparations and policy making

2012-2014 State Expenditures Report

Top Budget Busters

1. Medicaid
2. Corrections
3. Transportation
4. Higher Education
5. Elementary & Secondary Education
6. Public Assistance
7. All Other



National Association of State Budget Officers

Medicaid

Entitlement Program: Federal + State Partnership

Children

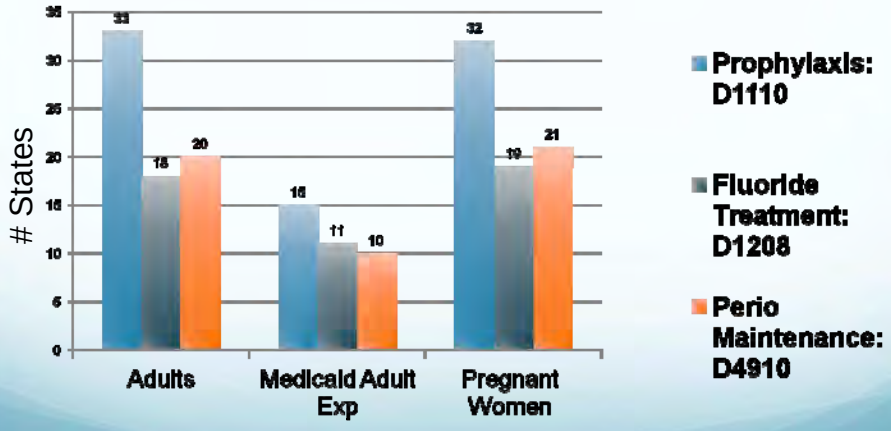
- Ages 0 to <21 Years
- Minimum income eligibility established by Federal Gov.
- States may expand
- EPSDT Program
- Mandated Medical & Dental Benefits
- "Medically Necessary"
- No limit/No co-pay

Adults

- Ages 21+
- Minimum income eligibility established by Federal Gov.
- Mandated Medical benefits
- Dental benefits optional
- Significant variability across states
  - ✓ Eligibility
  - ✓ Benefits
  - ✓ Payment

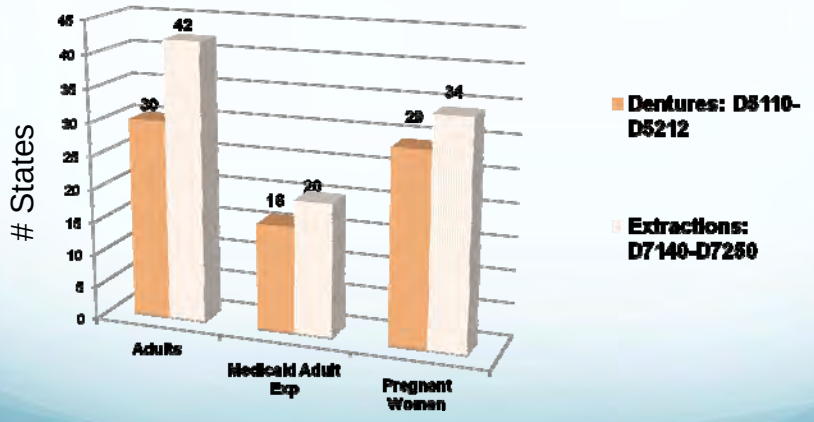
Adult Dental Benefits

Preventive Services

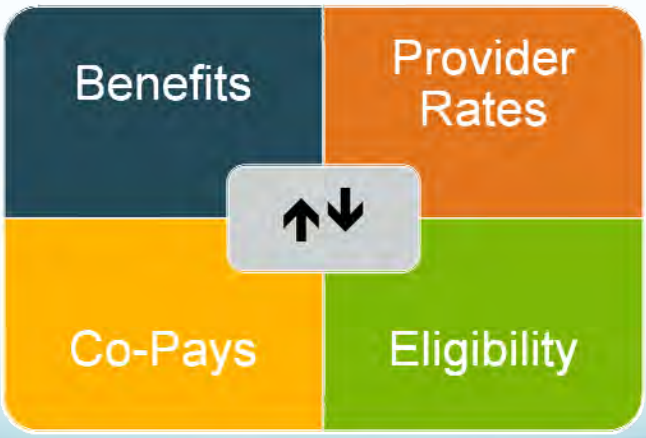


Adult Dental Benefits

Dentures and Extractions



Cost Drivers



Impact of Limited Adult Medicaid Dental Benefits

Impact on Individual

Impact on Society

Economic Impact

Impact on the Individual

No Dental Insurance

- ↑ Use of ER for dental care
- ↑ Co-morbidity
- ↑ Out-of-pocket healthcare costs
- ↓ Disposable income
- ↓ Social and other activities

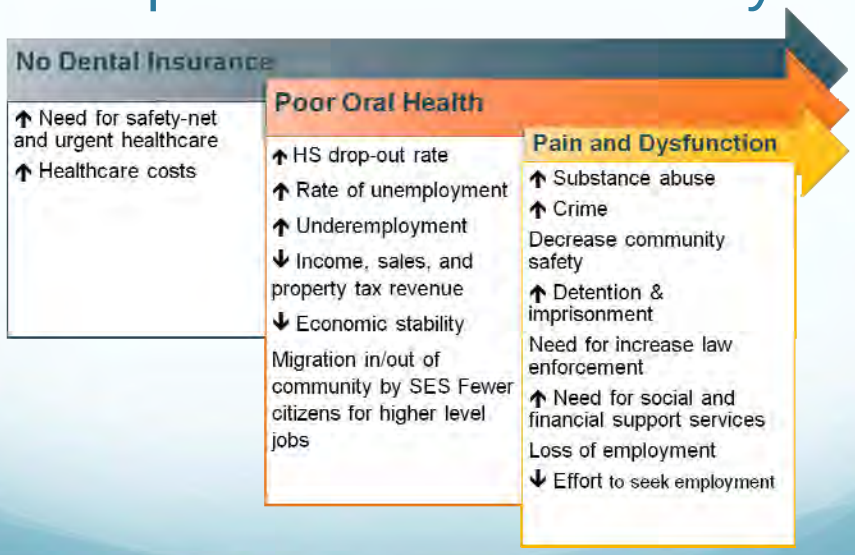
Poor Oral Health

- Poor aesthetics
- Diminished self-esteem
- ↓ Employment opportunity
- Unemployment
- Underemployment
- Limited social mobility
- Discrimination

Pain and Dysfunction

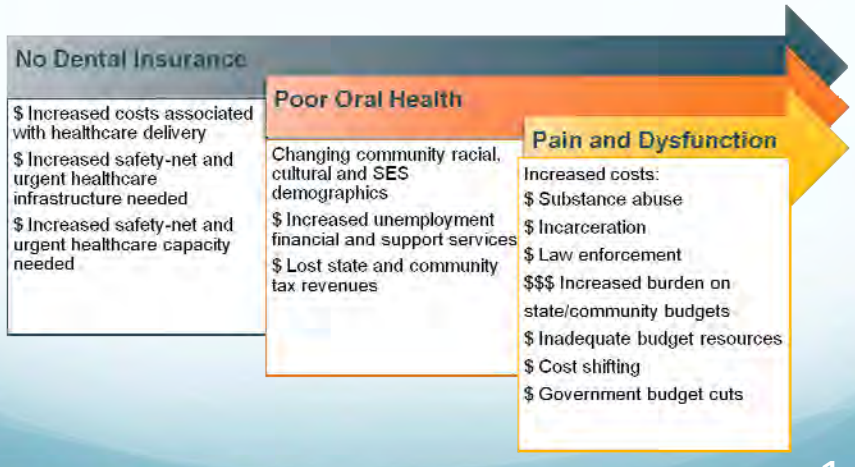
- ↓ productivity
- Substance abuse
- ↑ Crime
- ↑ Incarceration
- ↑ Need for social services
- Loss of employment
- Diminished effort to seek employment

Impact on the Community



Economic Impact

Costs to Community and State



Economic Impact of Adult Oral Diseases

Donald Shepard, PhD
Brandeis University
shepard@brandeis.edu

Outline

- Importance of the problem and context
- Analytical framework

Dental Expenditures in Context of Health Expenditures (2014)*

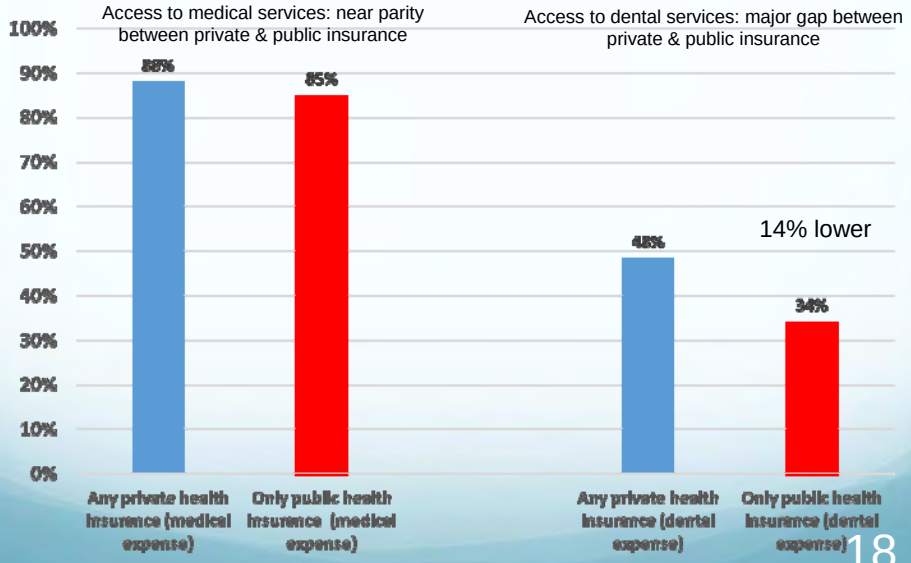
US Health Expenditures:
$9,523/per person
($3.0 Trillion)

Dental Services:
$362 per person
3.8% of health expenditures
($113.5 billion)

* Source: CMS, 2016

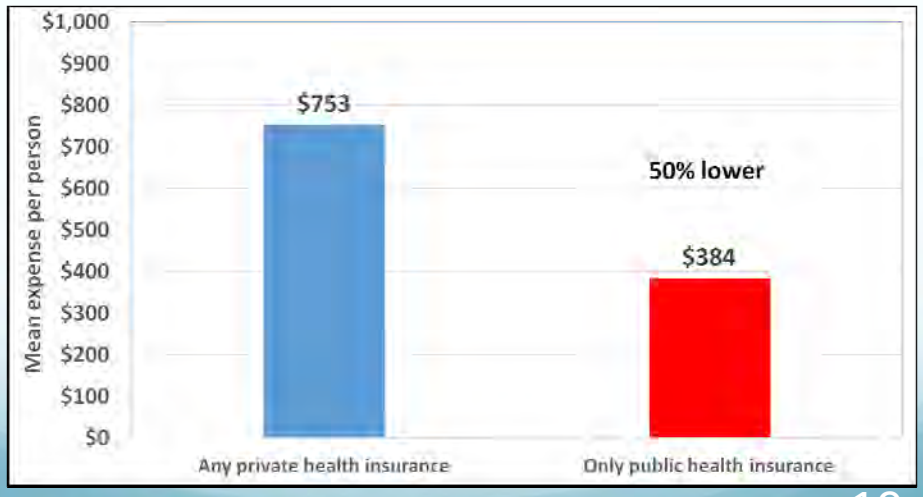
Access to Medical and Dental Services

% of Insurance Group Incurring an Expense in 2013



Source: AHRQ, Medical Expenditure Panel Survey (MEPS)

Extent of dental services
(Mean Expense by Insurance Group Among Persons Incurring an Expense in 2013)



Source: AHRQ, Medical Expenditure Panel Survey (MEPS)

Gaps in Insurance Coverage

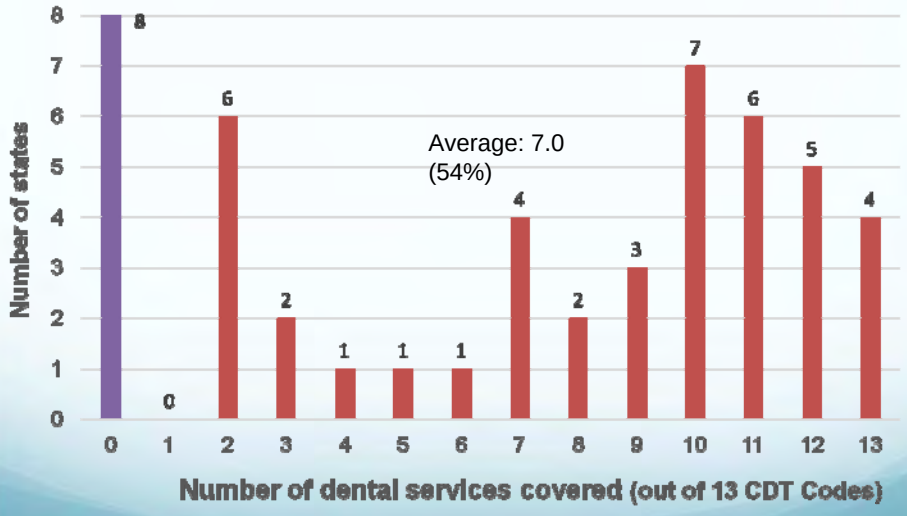
1. Access to dental services is less than access to medical services

2. Within dental services:
Access and extent of services for public coverage is less than private coverage

- These gaps have adverse consequences.
- Improved coverage would mitigate them.

Source: AHRQ, Medical Expenditure Panel Survey (MEPS)

Covered Adult Medicaid Dental Services *



* 2014 data compiled by Medicaid | Medicare | CHIP State Dental Association

Adverse Consequences

Previous research confirmed:

- diabetes
- heart diseases
- lung disease
- stroke
- low birth weight
- premature births

But:

broader economic impacts need study

Return on Investment

Investments:

Expanded coverage for adult dental services to improve access and depth

New types of returns:

- Less crime
- Better employment

Five Costly Adverse Outcomes

- Unemployment expenses ($3,500 Million)
- 2,418-10,670 attributable opioid-related ED visits ($109-$489 Million)
- 2,355-10,394 attributable opioid-related property crimes ($30-$132 Million)
- 113-3,638 attributable end-stage renal disease cases, ($120-$523 Million)
- 4-77 attributable liver transplants ($7-$121 Million)

TOTAL $3,766-$4,765 Million (i.e., about $4 billion)

Framework for Each Adverse Outcome

Economic loss from adverse outcome	=	Baseline level of adverse outcome	x	Excess risk of adverse out-come	x	Economic cost per person with adverse outcome

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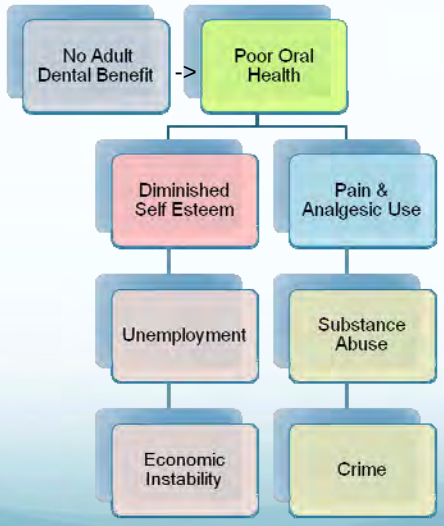
Economic loss from adverse outcome	=	Baseline level of adverse outcome	x	Excess risk of adverse outcome	x	Economic cost per person with adverse outcome
		↑ National Survey data		↑ Epidemiological Literature		↑ Economics Literature

Two Pathways:



Pathway #1

Broken Smiles: Effect of Untreated Oral Disease on Employment

Yara Halasa, DSS, PhD (c)
yara@brandeis.edu

Introduction

- The 2010 Patient Protection and Affordable Care Act (ACA) improved access to medical coverage, but smaller improvement for dental coverage
- Untreated dental diseases are often unsightly and may contribute to under-employment and unemployment

Untreated Oral Diseases and Employment

- Reduce participation in labor market: poor appearance and low self-esteem
- Reduce earning: lower wages due to poor appearance
- Reduce employability: frequent absences from work due to consequences of unmet dental needs

Selection of Job Applicants

Objective

Assess impact of unsightly oral aesthetics due to untreated dental disease:

- Job applicants' employability
- State and federal government budgets

Method: Index Development

- 2011-12 NHANES data
- 3,722 observations
- Working population (ages 21-64 years)
- Developed **Oral Health *Aesthetic* Index (OHAI: 0-100)**
  - Untreated dental disease
  - Tooth count/tooth surface condition variables
  - 12 upper/lower permanent anterior teeth
  - Maximum score: 100 - All 12 teeth are sound
  - Minimum score: 0 - All 12 teeth are missing

Oral Health Aesthetic Index (OHAI)

- NHANES 2011-12 data
- Each tooth was given a score
  - Sound tooth:10
  - Missing tooth replaced with fixed restoration: 9
  - Permanent root tip with restorative replacement: 8
  - Missing tooth replaced with removable restoration: 6
  - Tooth with surface condition: 5
  - Tooth with untreated caries: 3
  - Missing tooth: 0

Methods: Modeling

- OHAI score for person with recent routine dental visit
- OHAI score for a demographically-matched person who did not have such a visit
- Probability of being employed

Methods: Estimate Impact

- Predicted the increased probability of employment associated with having a recent routine dental visit
- Estimated the net fiscal benefit of a recent routine visit to state and federal governments as
  - Additional tax revenue and
  - Savings on unemployment benefits
  - Saving on Medicaid enrollment

Results

- Average OHAI Score:
  - **83** for those who had a recent routine dental visit
  - **78** adults who did not have dental visit
- Controlling for demographics and family status
- Each 1 point increase in OHAI score was associated with a **0.77**% point increase in probability of employment (p=0.010)
- Incremental probability of employment was 0.88% point higher for working age adults who had a recent routine dental visit.

Caucasian Female, Age 42 – 14 Years of Education
Single Adult with Children Household

OHAI Score= 33
Prob. Of Employment= 55.58%

OHAI Score= 100
Prob. Of Employment= 67.73%

Probability of employment increased by 12.15%

Picture source: Portland Dentures and Dental Implants. http://portlanddentures.com/dentures-portland-gresham-beaverton-oregon/denture-before-and-after-pictures/home-page-picture/

Caucasian Male, Age 39, 14 Years of Education
Single Adult Household

OHAI= 4
Prob. of employment= 66.15%

OHAI= 100
Prob. of employment= 80.40%

Prob. of employment increased by 14.25%

Picture source: Parrock Dental and Implant Centers. http://www.parrockdental.co.uk/dental-implants-kent-gravesend/

Conclusions: Social Impact

- Improved access to routine dental care would improve the appearance of anterior teeth
- Of the 4.1% of Americans who were looking for a job in 2011, 69.3% did not have recent routine dental visit
- If all applicants had a routine dental visit, received preventive/restorative services, their **expected employment** would increase by **40,100 adults**, of whom **10.4%** were likely Medicaid enrollees

Conclusions: Cost Impact

Net annual fiscal contribution of $3.6 billion:

- $3.5 billion from reduced unemployment benefit payments (98.1%)
- A conservative $0.054 billion from increased tax revenue (1.5%)
- $0.014 billion savings from reduced Medicaid enrollment (0.4%)

Improving Access to Dental Care

Mend a Smile ☺

Generate long term savings to the states and federal government $

Improve the economy

Pathway # 2

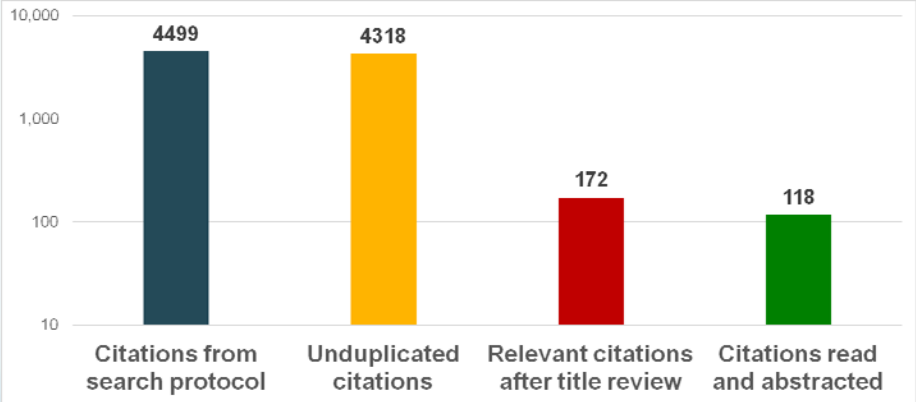
Downstream Impacts of Analgesic Use and Misuse, Secondary to Chronic Orofacial Pain

Cynthia Tschampl, PhD
tschampl@brandeis.edu

Literature Review: Non-opioids

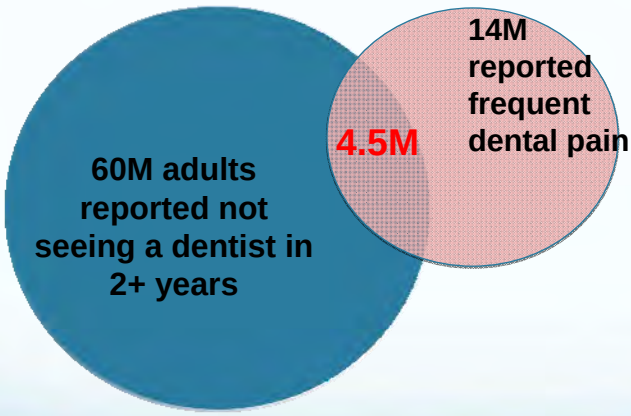
- Systematic review focused on NSAIDs
- Identified most significant impacts
- 28 articles read and extracted
- Focus narrowed to end-stage renal disease (ESRD) and liver transplant based on combined importance and data availability

Literature Review: Opioids



- Systematic review on orofacial pain and opioids
- Narrowed focus to crime and ED visits based on combined importance and data availability

Population at Risk & Risk Rates



- 2011-2012 National Health and Nutrition Examination Survey (NHANES)
- Risk rates generally came from the literature reviews

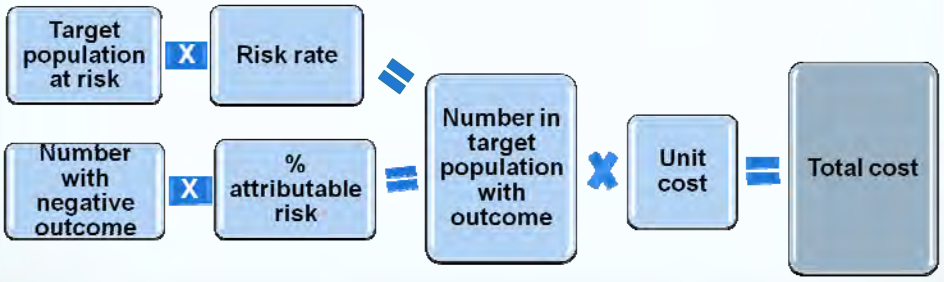
Linking Orofacial Pain to Outcomes

- Begin with assumption that chronic orofacial pain leads to analgesic use
- Linkages mapped after literature reviews
- Two stages of data extraction, then began calculations
- Population at risk estimated using NHANES
- Returned to literature to fill gaps in linkages and costs (n=27)

Negative Outcomes Found…

- Interim outcomes: alcohol and opioid use disorder
- NSAID-related downstream outcomes:
  - **End-stage renal disease**
  - **Liver transplant**
  - GI bleeding
  - Acute renal failure
  - Cardiac events
- Opioid-related downstream outcomes:
  - **Crime**
  - **ED visits**
  - Early death
  - HIV infection
  - Hepatitis infection
  - Lost productivity

Attribution and Costs



Overall risk rates for key steps (i.e., developing opioid use disorder, committing a property crime, making a drug-poisoning emergency department visit, and developing end-stage renal disease) were subtracted from specific risk rates in order to adjust for the fact that some people would have suffered the impact regardless of access to dental care. A similar adjustment was also made for liver transplants.

Preliminary Results: Incidence

Table 1. Total number of four negative outcomes preceded by chronic orofacial pain, US adults, 2014

Outcome	Minimum	Maximum
End-stage renal disease	113	3,638
Liver transplants	4	77
Opioid use disorder-related emergency department visits	2,418	10,670
Opioid use disorder-related crimes	2,355	10,394

Preliminary Results: Costs

Table 1. Total costs for four negative outcomes preceded by chronic orofacial pain, US adults, 2014, in millions of US$

Outcome	Medical cost (min)	Total societal costs (min)	Medical cost (max)	Total societal costs (max)
End-stage renal disease	$56.7	$120.0	$243.5	$522.5
Liver transplants	$3.2	$6.8	$56.4	$121.0
Opioid use disorder-related emergency department visits	$51.6	$109.2	$227.8	$488.8
Opioid use disorder-related crimes	$29.8	$29.8	$131.7	$131.7
Totals	$141	**$266 M**	$659	**$1,264 M**

Limitations

- Conservative estimate
  - Conservative estimate of prevalence of kidney disease
  - NHANES data does not include entire adult pop.
  - Some societal costs may not be captured
- Only includes costs for 4 of 11 negative outcomes identified

Next Steps

- Sensitivity analyses
- Prepare manuscript for submission to peer-reviewed publication
- Explore costs of other downstream impacts
- Incorporate into a broader cost-benefit analysis

Thank You

Questions?

2016 National Medicaid and CHIP Oral Health Symposium

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