

# **Global Burden of Oral Diseases**

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# **Global Burden of Diseases (GBD) 2010 Study**

## **Aim:**

**To systematically review all epidemiological data available and produce a worldwide comprehensive and comparable assessment of the magnitude of 291 diseases and injuries and their associated 1160 sequelae in 1990, 2005 and 2010.**



# GBD 2010 Study

- **Prevalence/incidence**
- **Disability weights**
- **Years of Life Lost (YLL)**
- **Years Lived with Disabilities (YLDs)**  
(YLDs=prevalence x disability weight)
- **Disability-Adjusted Life Years (DALYs)**  
(DALYs=YLLs + YLDs)



# GBD 2010 Study: Systematic Review

## Prevalence:

- **Systematic reviews (data base)**
- **Estimates for all age-sex-country-year groups (data points)**
- **DisMod-MR, a Bayesian meta-regression tool**



# GBD 2010 Study: Systematic Review

## Case definition

- **The case definition of diseases has great implications for the estimation of the burden of diseases.**
  - **The broader the scope of the definition of a disease the more healthy people will be included within disease parameters.**
  - **The narrower the definition of disease the healthier the population would appear.**

# Prevalence of loss of periodontal attachment (LPA) and pocket depth (PD) in the US population: 13 years and older, 1988-1991

LPA	%		PD	
1 mm	92.5		4 mm	29.2
3 mm	39.7		6 mm	3.9
5 mm	14.7			



# GBD 2010 Study: Systematic Review

- **Untreated caries**

“teeth with unmistakable coronal cavity at dentin level, root cavity in cementum that feels soft or leathery to probing, temporary or permanent restorations with a caries lesion”

- **Severe Periodontitis**

“a Community Periodontal Index score of 4, a clinical attachment loss more than 6mm or a gingival pocket depth more than 5mm”

- **Severe Tooth Loss**

“having fewer than 9 remaining permanent teeth”



# GBD 2010 Study: Systematic Review

## Systematic search of literature:

- January 1980 and December 2010
- All ages, sexes, and areas of the world
- Published and unpublished studies
- Electronic and hand search
- No language restrictions
- MEDLINE via PubMed, EMBASE via OVID and LILACS via BIREME
- Validity assessment (STROBE checklist)





# GBD 2010 Study: Systematic Review

Number of studies identified and selected :

	Untreated caries	Severe periodontitis	Severe tooth loss
Number of articles Identified	12,143	6,394	5,618
Number after screening titles and abstracts for eligibility	1,682	513	333
Number after reading full text for quality assessment	431 (1,999)	93 (412)	53 (367)

*Figures in parenthesis are data points*

## Global prevalence of oral conditions:

	Rank	N (in thousands)	%
Untreated caries permanent dentition	1	2431636	35.29
Severe periodontitis	6	743187	10.79
Untreated caries of deciduous teeth	10	621507	9.02
Severe tooth loss	36	158284	2.3

**Oral conditions collectively affected 3.9 billion people**



# GBD 2010 Study: Disabilities Weights

- **Population-based surveys in five countries (USA, Peru, Tanzania, Bangladesh, and Indonesia)**
- **Open internet survey of more than 30,000 respondents**



# GBD 2010 Study: Disabilities Weights

- Untreated caries disability definition:  
“a toothache, which causes some difficulty eating”
- Severe Periodontitis disability definition:  
“bad breath, a bad taste in the mouth, and gums that bleed a little from time to time, but this does not interfere with daily activities.”
- Severe tooth loss disability definition:  
“great difficulty in eating meat, fruits, and vegetables”



# Global disability weights for oral health conditions:

Oral condition	Disability weights
Severe periodontitis	0.0079
Untreated caries	0.012
Severe tooth loss	0.073



# Global disability weights for oral health conditions:

The disability weight associated with severe tooth loss was between those reported for moderate heart failure and moderate consequences of stroke.

- Moderate heart failure (0.068)
- **Severe tooth loss (0.073)**
- Moderate consequences of stroke (0.074)



# GBD 2010 Study: Years Lived with Disabilities (YLDs)

- YLDs due to oral conditions were calculated as the product of prevalence (frequency) times the disability weight (severity) of the associated sequelae times the duration of symptoms.



# **GBD 2010 Study: Years Lived with Disabilities (YLDs)**

- Oral conditions accounted for more YLDs than 25 of 28 categories of cancer**
- Only stomach, liver and trachea, bronchus and lung cancers ranked higher than oral conditions**





# GBD 2010 Study: Disability-Adjusted Life Years (DALYs)

- DALYs due to oral conditions were calculated as the product of prevalence (frequency) times the disability weight (severity) of the associated sequelae times the duration of symptoms (DALYs=YLDs).

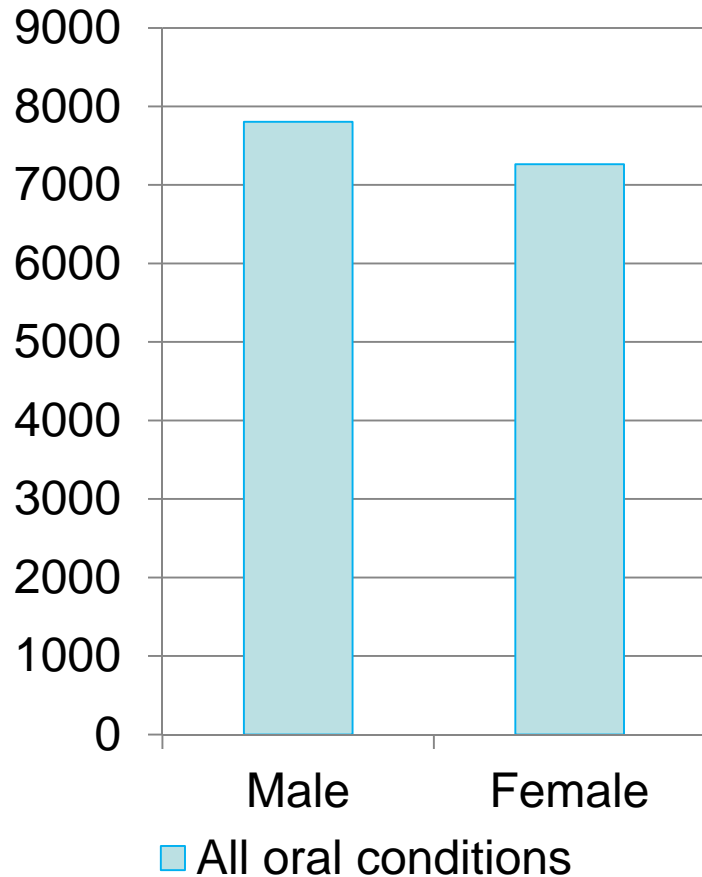


## Global DALYs Mean Rank (95% UI)

Rank	95% UI	Condition
01	(1-2)	Ischemic heart disease
02	(1-3)	Lower respiratory infections
03	(2-5)	Cerebrovascular disease
04	(4-8)	Diarrheal diseases
05	(4-9)	HIV/ AIDS
06	(3-11)	Malaria
07	(3-11)	Low back pain
08	(5-11)	Preterm birth complications
09	(5-11)	Chronic Obstructive Pulmonary Disease
10	(4-11)	Road injuries
77	(50-116)	Severe periodontitis
80	(56-115)	Untreated caries in deciduous and permanent teeth
81	(61-103)	Severe tooth loss



## Global Oral DALYs, in thousands by gender

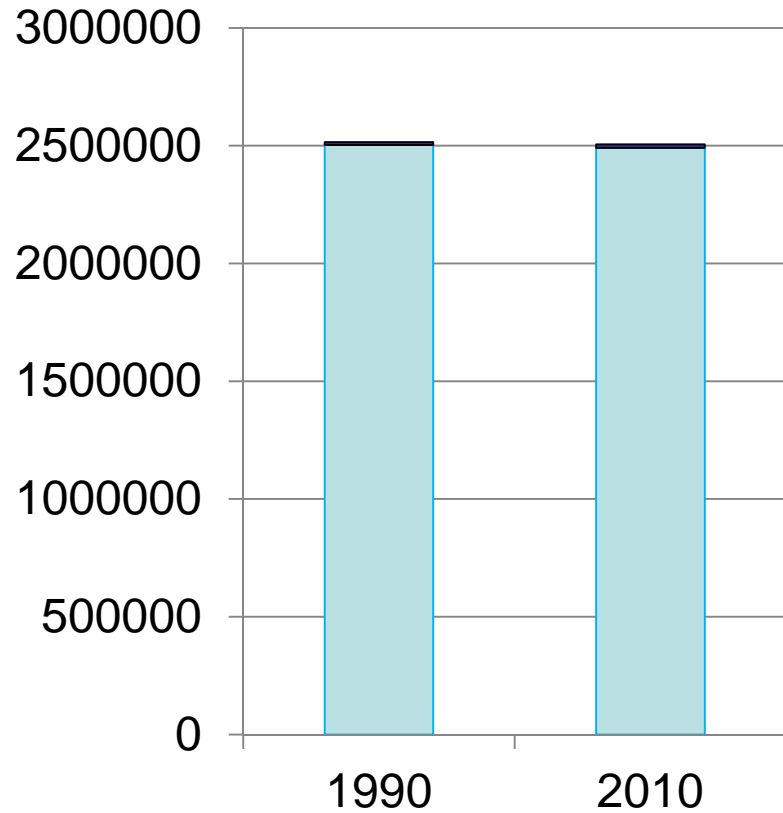


	DALYs in thousands
Male	7805
Female	7265

The difference in DALYs between women and men was not statistically significant .



# Changes in Global DALYs in thousands between 1990 and 2010



■ All oral conditions    ■ All conditions

Condition	% differences 1990-2010	
	DALYs in thousands	DALYs per capita
All conditions	-0.5	-7.6
All oral conditions	20.8	-23

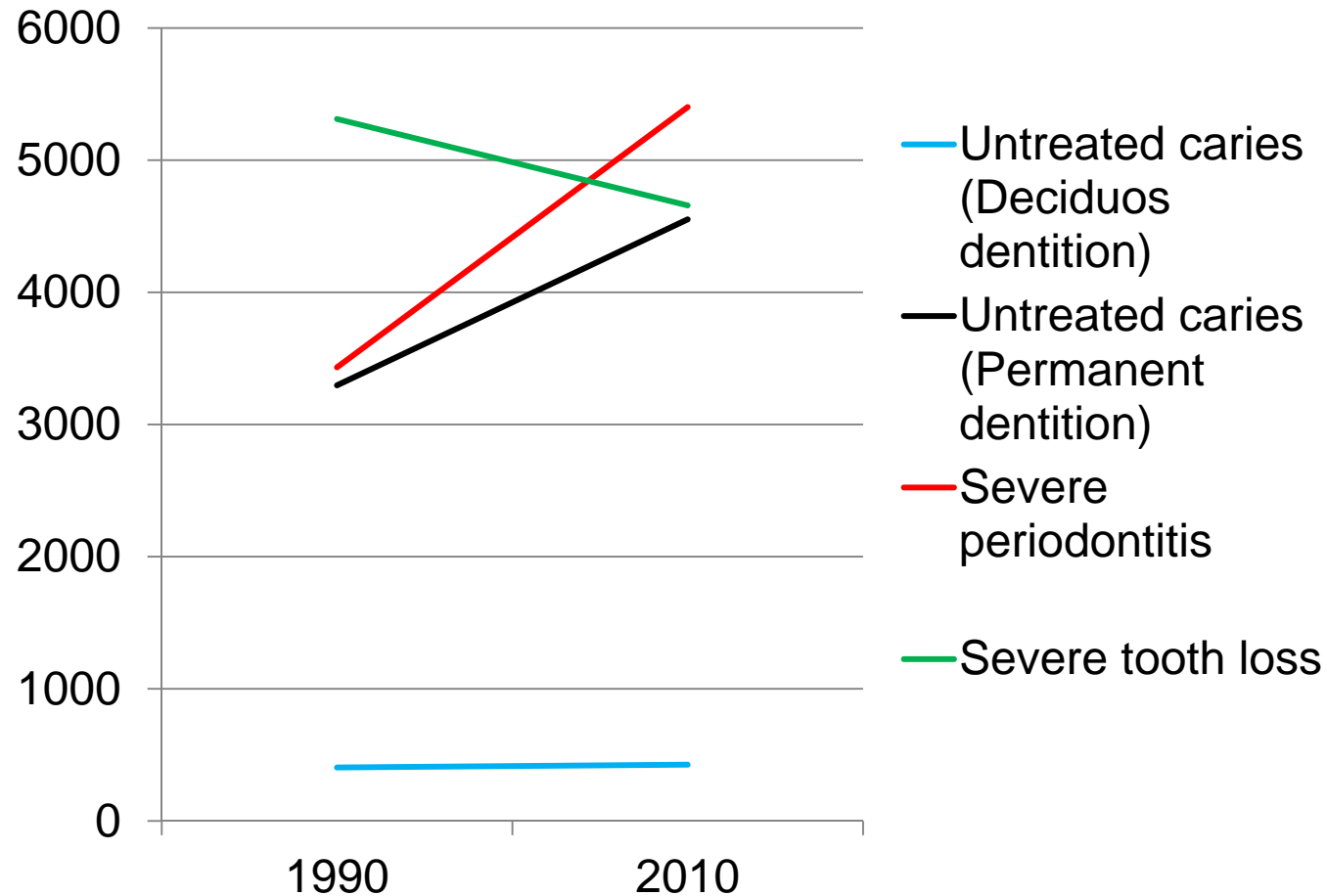
# Changes in Global DALYs in thousands between 1990 and 2010

**Largest increases in DALYs 1990-2010:**

- **Eastern Sub-Saharan Africa = 51.8%**
- **Central Sub-Saharan Africa = 50.5%**
- **Oceania (47.5%)**



## Changes in Global DALYs in thousands between 1990 and 2010



**% Δ**  
**1990-2010**

**5.3**

**38.1**

**57.3**

**-12.3**



## Changes in Global DALYs in thousands between 1990 and 2010

Condition	% differences 1990-2010	
	Global	UK
All conditions	-0.5	-7.3
All oral conditions	20.8	-19.3



# GBD 2010 Study: Key findings

- **Untreated caries in permanent teeth was the most prevalent condition of all 291 conditions assessed in the GBD 2010 Study, collectively affecting 3.9 billion people.**
- **35% of the world population have symptomatic untreated caries in the permanent dentition.**





# GBD 2010 Study: Key findings

- **The disability weigh associated with severe tooth loss was between those reported for moderate heart failure and moderate consequences of stroke.**



# GBD 2010 Study: Key findings

- Oral conditions accounted for an average health loss of 224 years per 100,000 people.
- Oral conditions accounted for more YLDs than 25 of 28 categories of cancer.



# GBD 2010 Study: Key findings

- All oral conditions ranked among the top 100 detailed causes of DALYs.
- Oral conditions combined accounted for 15 million DALYs globally.



# GBD 2010 Study: Key findings

- **The burden of oral conditions increased with ageing.**
- **The burden of oral conditions was similar among women and men.**



# GBD 2010 Study: Key findings

- **DALYs due to oral conditions increased 20% between 1990 and 2010, mainly due to population growth and ageing**
- **The largest increases in the burden of oral conditions were observed in Eastern and Central Sub-Saharan Africa and Oceania.**



# GBD 2010 Study: Key findings

- **DALYs due to severe periodontitis and untreated caries increased, while those due to severe tooth loss decreased.**



# GBD 2010 Study: Conclusion

The findings of the GBD 2010 study highlighted that the organized social response to oral health problems must deal with a wide array of health care and public health priorities for action.

*Thank you for your attention*



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