

# PREVALENCE AND FACTORS ASSOCIATED WITH DENTAL CARIES IN ART EXPERIENCED AND ART NAÏVE HIV INFECTED PERSONS ATTENDING THE MULAGO ISS CLINIC IN UGANDA

DR. KALANZI DUNSTAN  
NURTURE FELLOW

---



- Lecturer, Department of Dentistry, Makerere University College of Health Sciences
- Awarded the NURTURE fellowship in 2016
- No cost extension award period





# PROBLEM STATEMENT: No local data in HIV patients

---

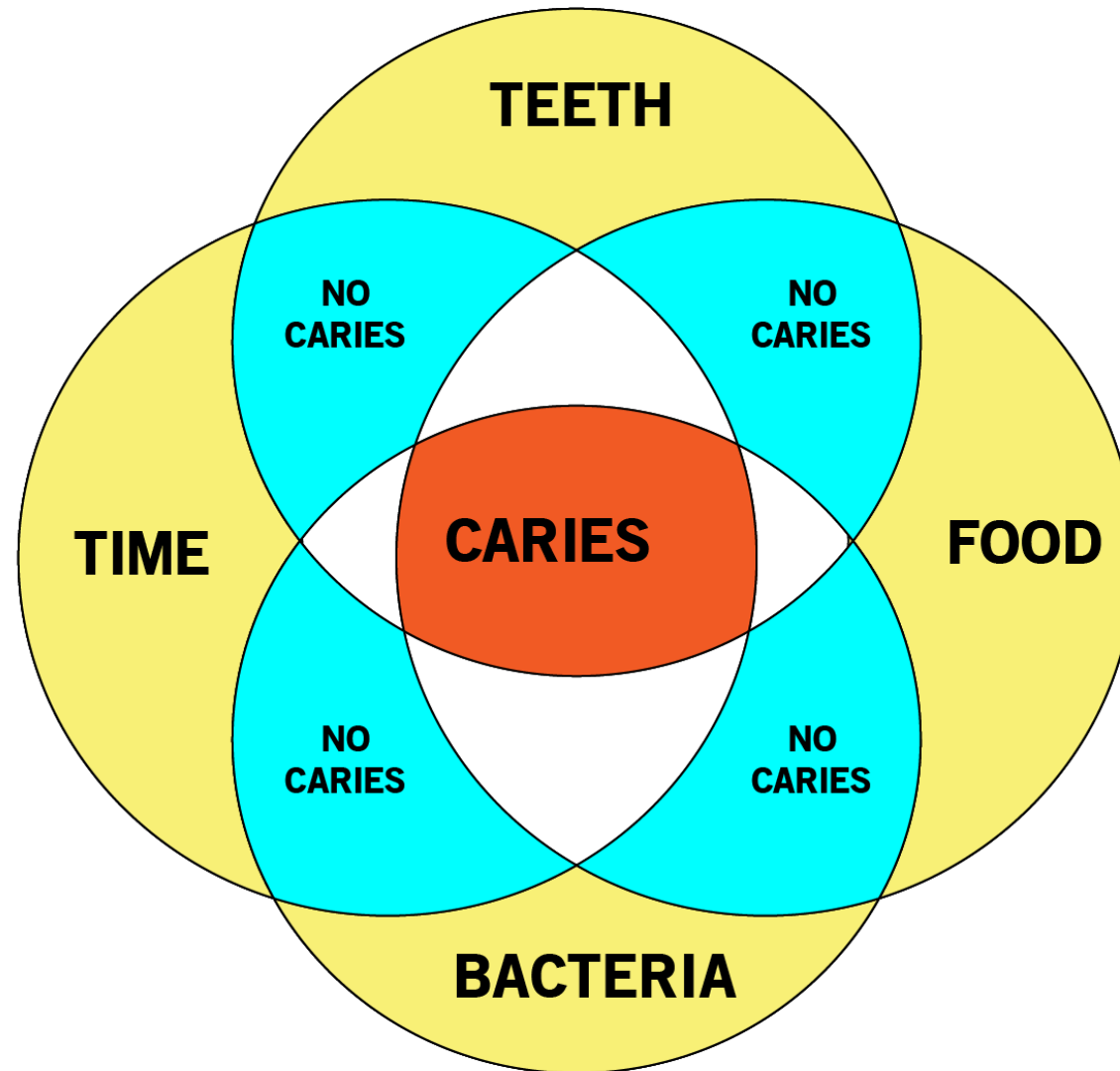
The prevalence of HIV/AIDS is estimated at 7.3% (1.5M) in the general population<sup>1</sup>

Antiretroviral therapy (ART) is the cornerstone of HIV treatment and a key element in prevention

60% (898,197) of people living with HIV (PLHIV) were active on treatment<sup>1</sup>

In Uganda, the prevalence of dental caries is 32.5% in children and 66.7% in adults<sup>2</sup>

# ETIOLOGY OF CARIES



# DMFT: CARIES SCORE

---

D component: Decayed Teeth

M component: Missing teeth due to caries

F component: Filled due to caries (no secondary or recurrent caries)<sup>4</sup>

No tooth must be counted more than once, D, M, F or sound

1- For individual

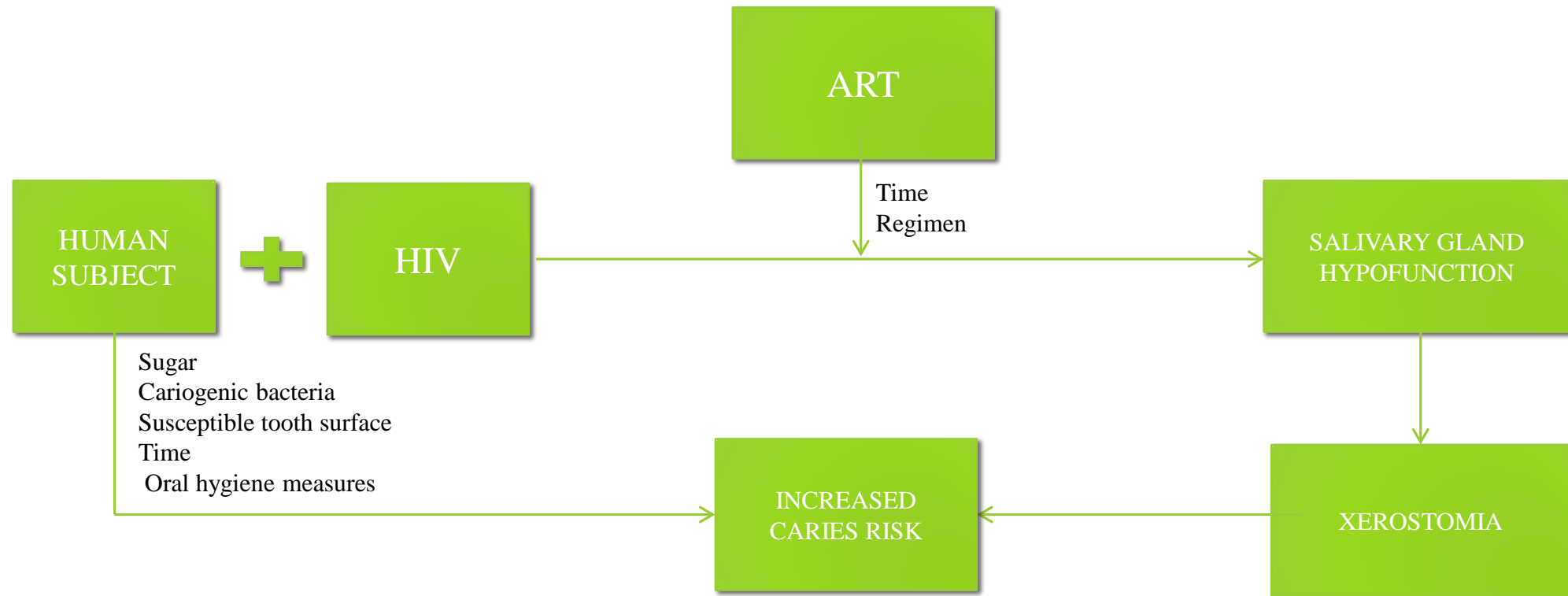
$$DMF = D + M + F$$

2- For population

$$\text{Mean DMF} = \frac{\text{Total DMF}}{\text{Total No. of subjects}}$$

Total No. of subjects

# CONCEPTUAL FRAMEWORK: Increased caries risk in HIV



# GENERAL OBJECTIVE

---

To establish the prevalence and factors associated with dental caries in ART experienced and ART naïve HIV infected adults attending the Mulago ISS clinic in Uganda



# SPECIFIC OBJECTIVES

---

To determine the prevalence and factors associated with dental caries in ART experienced and ART naïve HIV infected adults attending the Mulago ISS clinic in Uganda

To compare the prevalence of dental caries in ART experienced and ART naïve HIV infected adults attending the Mulago ISS clinic in Uganda

To determine the impact of HIV and ART on salivary production and function among HIV infected adults attending the Mulago ISS clinic in Uganda

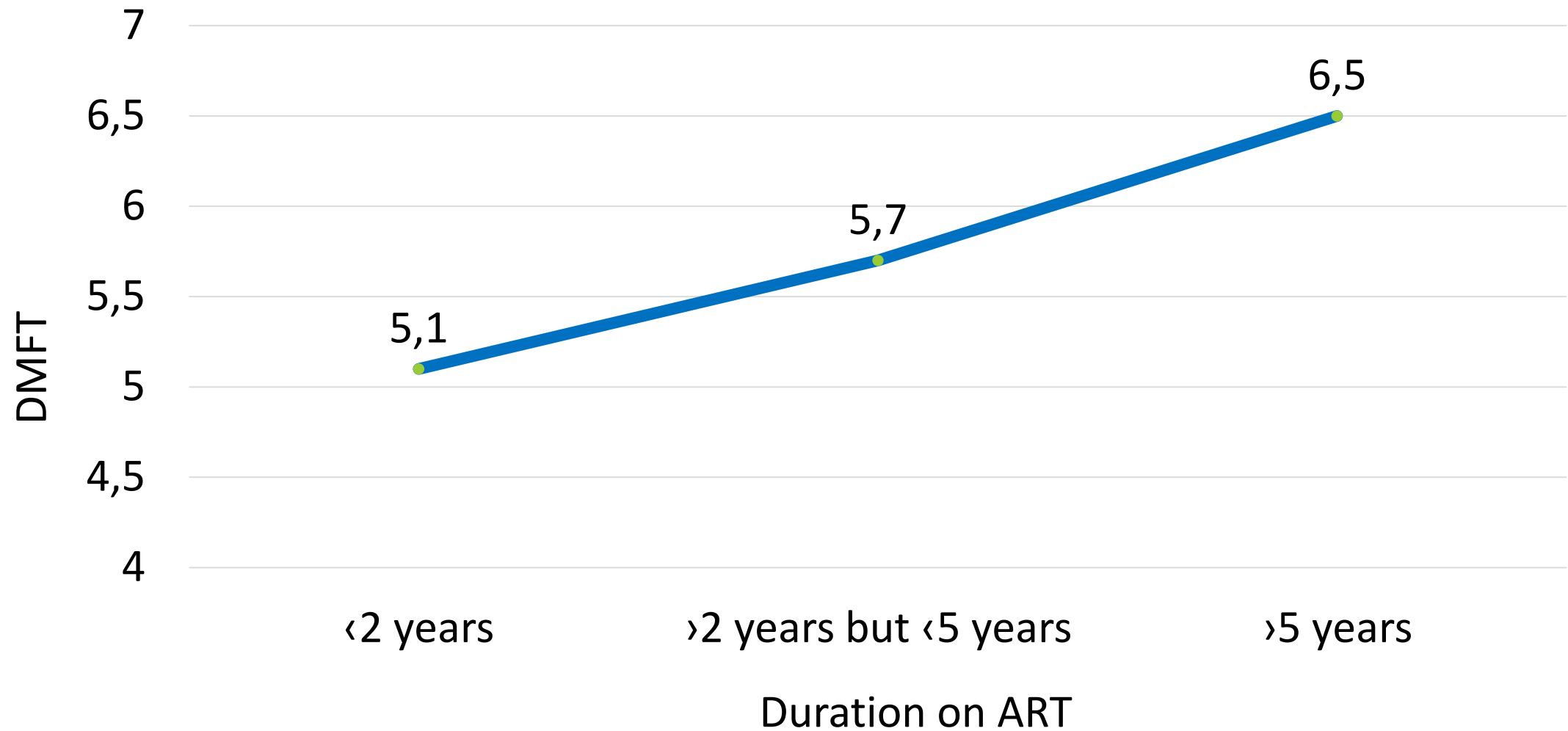
# BASELINE STATISTICS

Characteristic		Number (%) 673 (100)
Age in years: mean (SD)		39.1 (9.4)
Sex	Male	230 (34.2)
	Female	443 (65.8)
Residence	Urban	153 (22.7)
	Periurban	281 (41.8)
	Rural	239 (35.5)
Education level	No formal education	47 (7.0)
	Primary	449 (66.7)
	Secondary	128 (19.0)
	Tertiary	49 (7.3)
Years on ART	Less than 6 months	100 (14.9)
	More than 6 months but less than two years	66 (9.8)
	More than two years but less than five years	106 (15.8)
	More than five years	401 (59.6)

# CARIES PREVALENCE AND DMFT

Characteristic		Prevalence (%) N=673	DMFT	
			Mean (SD)	P-value t-test/ANOVA
Overall		83.7	6.0 (5.7)	
Sex	Male	78.7	5.1 (4.8)	0.02
	Female	86.2	6.5 (6.0)	
Education level	No formal education	85.1	5.7 (5.3)	0.875
	Primary	82.4	6.1 (5.8)	
	Secondary	86.0	5.9 (5.4)	
	Tertiary	87.8	6.6 (5.1)	
Years on ART	Less than 6 months	88.0	5.5 (4.9)	0.025
	More than 6 months but less than two years	84.9	4.5 (4.0)	
	More than two years but less than five years	81.1	5.7 (5.5)	
	More than five years	83.0	6.5 (6.1)	

# DMFT VS ART DURATION



# Adjusted results

Characteristic	Crude coefficients (95% CI)	P-value	Adjusted coefficients (95% CI)	P-value
Overall				
Sex				
Male	1		1	
Female	1.40 (0.51,2.30)	0.002	<b>0.90 (0.85,1.71)</b>	<b>0.030</b>
Years on ART				
Less than 6 months	1		1	
More than 6 months but less than 2 years	-0.95 (-2.70,0.80)	0.568	-0.79 (-2.34,0.76)	0.320
More than 2 years but less than 5 years	0.30 (-1.24,1.83)	0.707	0.44 (-0.93,1.81)	0.526
More than 5 years	1.08 (-0.15,2.32)	0.085	0.85 (-0.26,1.96)	0.133
Tooth brushing habits				
Seldom brush	1		1	
Once a day	-0.09 (-3.51,3.33)	0.012	0.26 (-2.92,3.44)	0.874
Twice or more	1.07 (-2.31,4.44)	0.536	0.90 (-2.25,4.05)	0.576
What drug people use to brush				
Tooth paste	1		1	
Other (i.e. Paste flour)	0.77 (-0.61,2.14)	0.275	0.45 (-0.87,1.76)	0.503
Ever visited a dentist				
Yes	1		1	
No	-5.84 (-6.67, -5.01)	<0.001	<b>-5.71 (-6.54,-4.88)</b>	<b>&lt;0.001</b>
Sugar Intake (Honey, Biscuits, Soda)				
Less	1		1	
More (Several times a week and more)	-0.36 (-1.32,0.60)	0.463	-0.24 (-1.12,0.63)	0.585

# SALIVA FLOW RATE IN ML/MINUTE

Group	Mean	SD	N
HIV Negative	0.90	0.53	45
HIV+ on ART $\leq$ 3 months	0.83	0.42	45
HIV+ on ART $>$ 3 months	0.82	0.47	78
	0.85	0.48	168

# COMPOSITION

---

Electrolytes: sodium, chloride, potassium and calcium ions  
(pending)

Antimicrobial peptides: Human  $\alpha$  and  $\beta$  defensins and cathelicidins  
(pending)

Microbiome: Await sequencing results

# BASIC PERIODONTAL EXAM (BPE)

Score	Frequency	Percentage
0	2	0.33
1	36	6.02
2	388	64.88
3	110	18.39
4	27	4.52
5	35	5.85
	598	

99.7% required some kind of periodontal therapy



# FUTURE PERSPECTIVES

---

RO1: Dental Caries and Periodontal disease in people living with HIV/AIDS (PLHIV) in Uganda (Mechanisms)

Interventions

Submitted case report and writing manuscripts of our work

# Acknowledgements

---

- Grant Number D43TW010132 supported by:
  - Office Of The Director
  - National Institutes Of Health (OD)
  - National Institute Of Dental & Craniofacial Research (NIDCR)
  - National Institute Of Neurological Disorders And Stroke (NINDS),  
National Heart, Lung, And Blood Institute (NHLBI)
  - Fogarty International Center (FIC)
  - National Institute On Minority Health And Health Disparities (NIMHD).

NURTURE partner institutions: Makerere University, JHU, CWRU

NURTURE PIs, mentors and fellows

---

# REFERENCES

---

1. Uganda AIDS Commission. The Uganda HIV and AIDS Country Progress Report July 2015-June 2016. 2016.
2. Kutesa, A., Kasangaki, A., Nkamba, M., Muwazi, L., Okullo, I., & Rwenyonyi, C. M. (2015). Prevalence and factors associated with dental caries among children and adults in selected districts in Uganda. *Afr Health Sci*, 15(4), 1302-1307. doi: 10.4314/ahs.v15i4.33
3. Hajishengallis, E., Parsaei, Y., Klein, M. I., & Koo, H. (2015). Advances in the microbial etiology and pathogenesis of early childhood caries. *Mol Oral Microbiol*. doi: 10.1111/omi.12152
4. WHO Oral Health Surveys Basic Methods 5<sup>th</sup> Edition 2013

---

THANK YOU FOR YOUR KIND ATTENTION

