

Oral Health and Frailty: An analysis of cross- sectional data from the Canadian Longitudinal Study on Aging.

Carol Bassim

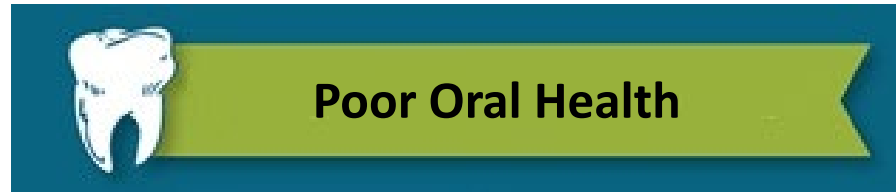
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Background: Oral Health is Essential to Health

Dysfunction

- Chewing and eating problems
- Altered eating patterns, nutritional risk, underweight and obesity



Symptomatic

- Pain and discomfort
- ER visits, pain medication and antibiotic use, loss of work time

Systemic Health

- Associations with cardiovascular disease, diabetes, and respiratory diseases
- Independent risk factor for morbidity and mortality

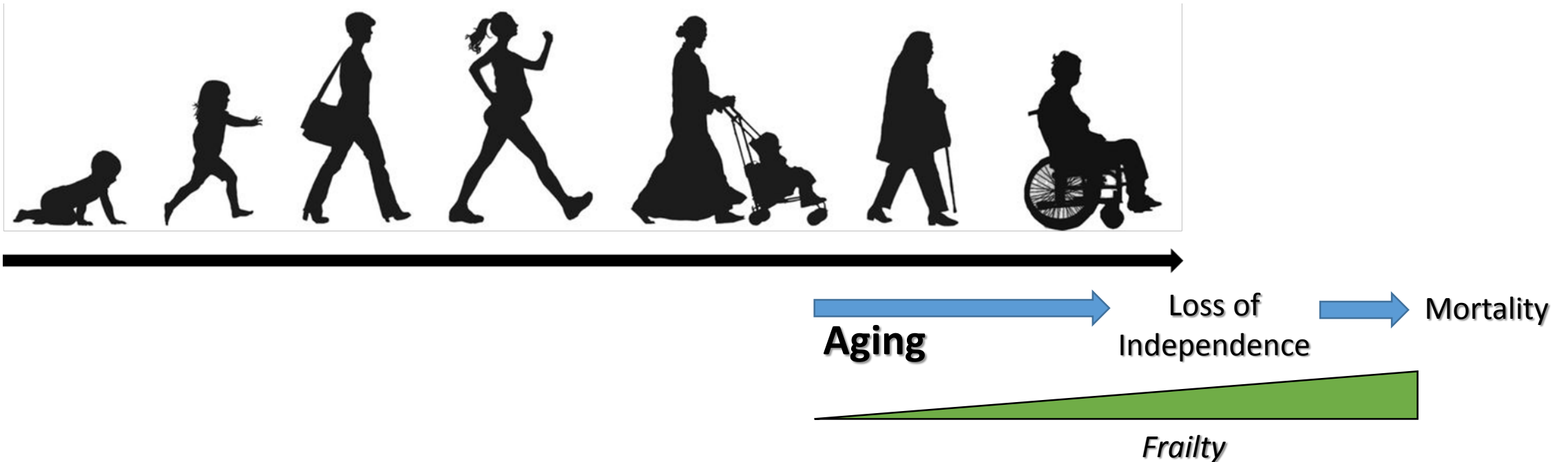
Psychosocial

- Concerns with smiling or speaking
- Social aspects of eating
- Stigma for health inequities

Background: Frailty

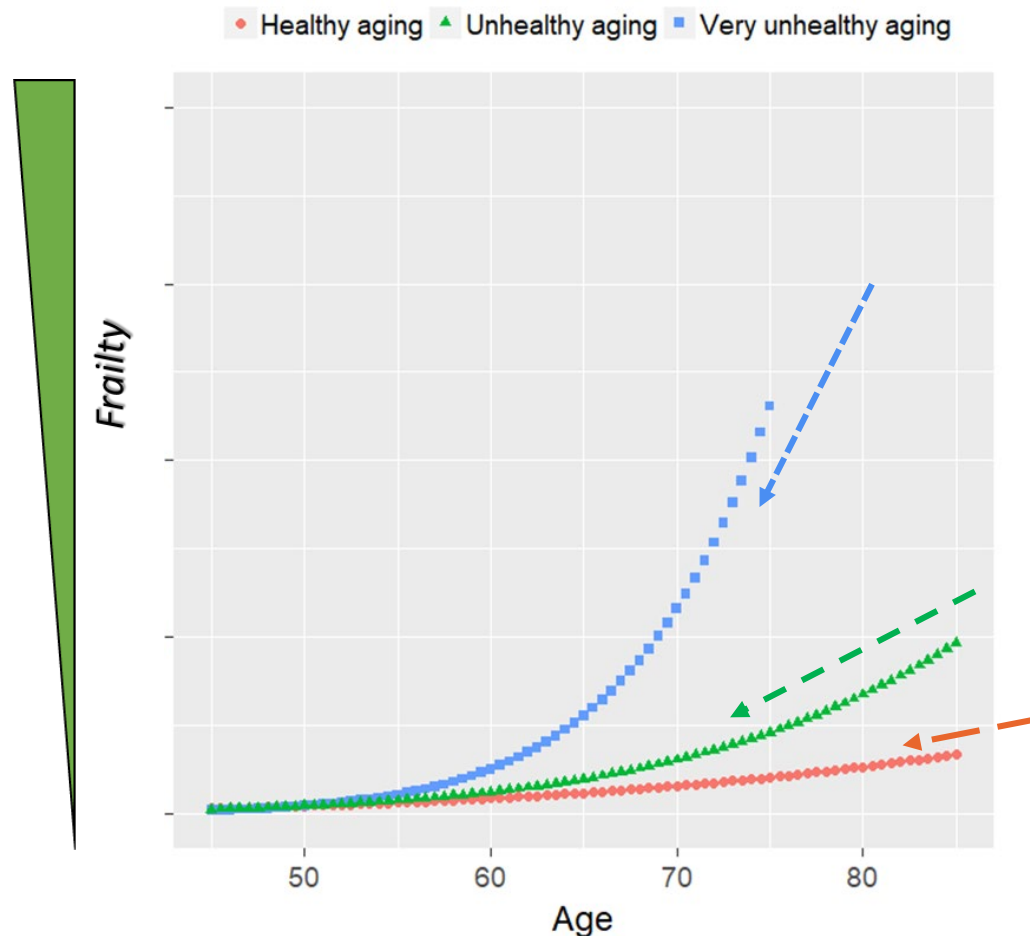
“Frailty is a clinical state in which there is an increase in an individual's **vulnerability for developing increased dependency and/or mortality when exposed to a stressor**”

– Morley et al., 2013: JAMDA



Objective

Assess the association of poor oral health and frailty at the baseline wave of the CLSA.



- Age (age groups 45-54, 55-64, 65-74, 75-85)
- Sex (male and female)
- Income (<50K, 50-100K, >100K)
- Social support (Social Support Availability (SSA))
- Physical activity (Physical Activity Scale for the Elderly (PASE))
- Smoking (current, previous, never)
- Servings of fruits and vegetables per day

Methods



- 30,097 Comprehensive/In-Person Interview

28,789 (96%) completed
Oral Health questionnaire



Canadian Longitudinal Study on Aging
Étude longitudinale canadienne sur le vieillissement

Frailty Index in the CLSA

- Deficits were selected based on literature and discussion with an expert panel to form the index of 76 items
 - Physical function tests (5 items)
 - Self-rated general health
 - Self-rated mental health
 - Eyesight rating
 - Hearing rating
 - Depressive symptoms (CES-D 10) (10 items)
 - Cognitive function tests (4 items)
 - Activities of daily living (OARS scale) (14 items)
 - Social participation prevented by health
 - Body mass index
 - Chronic conditions (32 items)
- Calculating the Frailty Index (0=No deficits, 100=All possible deficits)
 - Sum of deficits in the individual, divided by the number of potential deficits

Oral Health in the CLSA

Categorical PCA Oral Health Problems: 5 categories

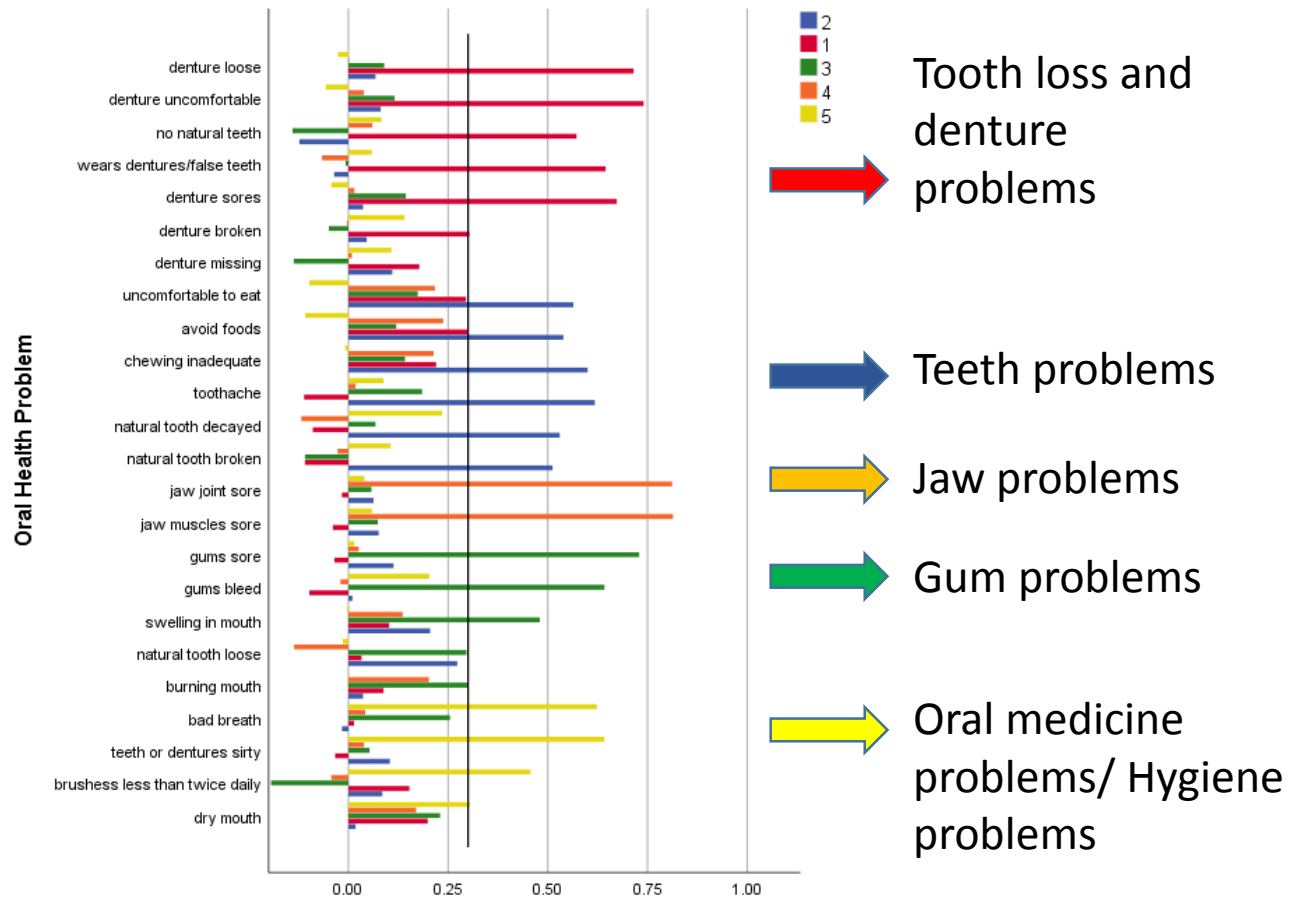


Figure. Factor loading plots for oral health problem patterns. Bars indicate loadings; line indicate threshold of 0.3 for identifying parameters that load on each factor.

Prevalence of Oral Health Problems

Oral Health Problem within the previous 12 months	Prevalence ^a	95% Confidence Interval	
	%	Lower	Upper
Wears dentures/has false teeth	22.2	21.7	22.8
Brushes teeth less than twice daily	21.5	20.9	22.1
Dry mouth	16.0	15.5	16.5
Natural tooth decayed ^b	14.4	13.8	14.9
Toothache ^b	14.2	13.6	14.7
Gums bleed	12.4	11.9	12.9
Natural tooth broken ^b	10.9	10.4	11.3
Uncomfortable to eat ^c	10.6	10.0	11.3
Gums sore	8.9	8.5	9.4
Bad breath	8.5	8.1	9.0
Chewing inadequacy	8.1	7.7	8.5
Avoids eating foods ^c	6.6	6.1	7.2
Jaw joint pain	6.2	5.9	6.6
No natural teeth	5.7	5.4	6.0
Jaw muscle sore	5.7	5.3	6.0
Natural tooth loose ^b	5.7	5.4	6.1
Swelling inside of mouth	4.9	4.6	5.2
Dentures loose ^d	19.4	17.4	21.5
Dentures uncomfortable ^d	18.8	16.8	21.1
Denture sores ^d	16.6	14.7	18.7
Dentures broken ^d	3.2	2.3	4.3
Teeth or dentures dirty	3.0	2.8	3.3
Burning mouth	1.7	1.5	1.8
Dentures missing ^d	1.2	0.6	2.3

a: Weighted data used for prevalence estimates.

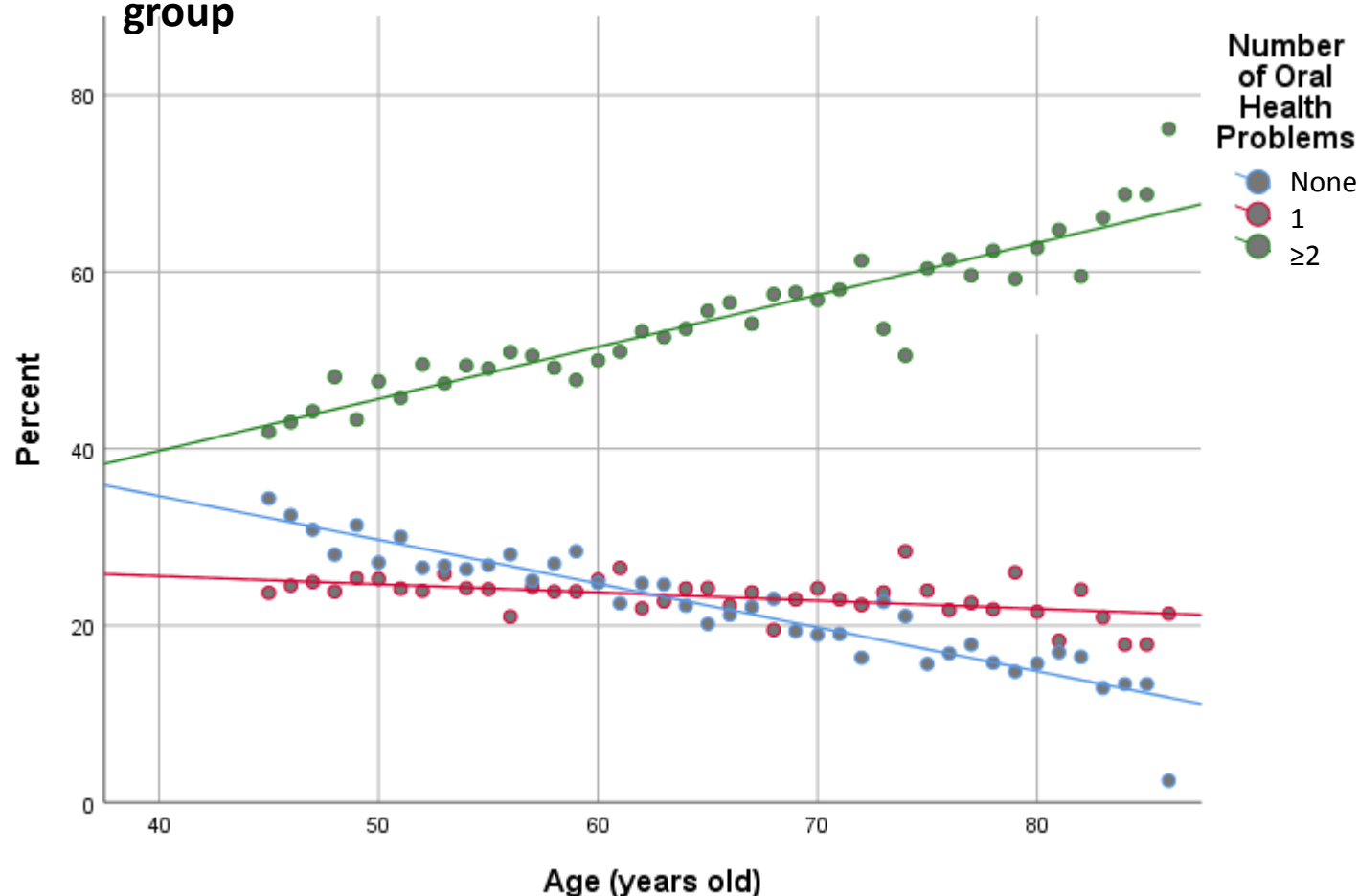
b: Prevalence among those with natural teeth.

c: Because of problems with mouth or teeth.

d: Prevalence among those wearing dentures/false teeth.

Number of Oral Health Problems

Number of oral health problems increases comparing higher age group



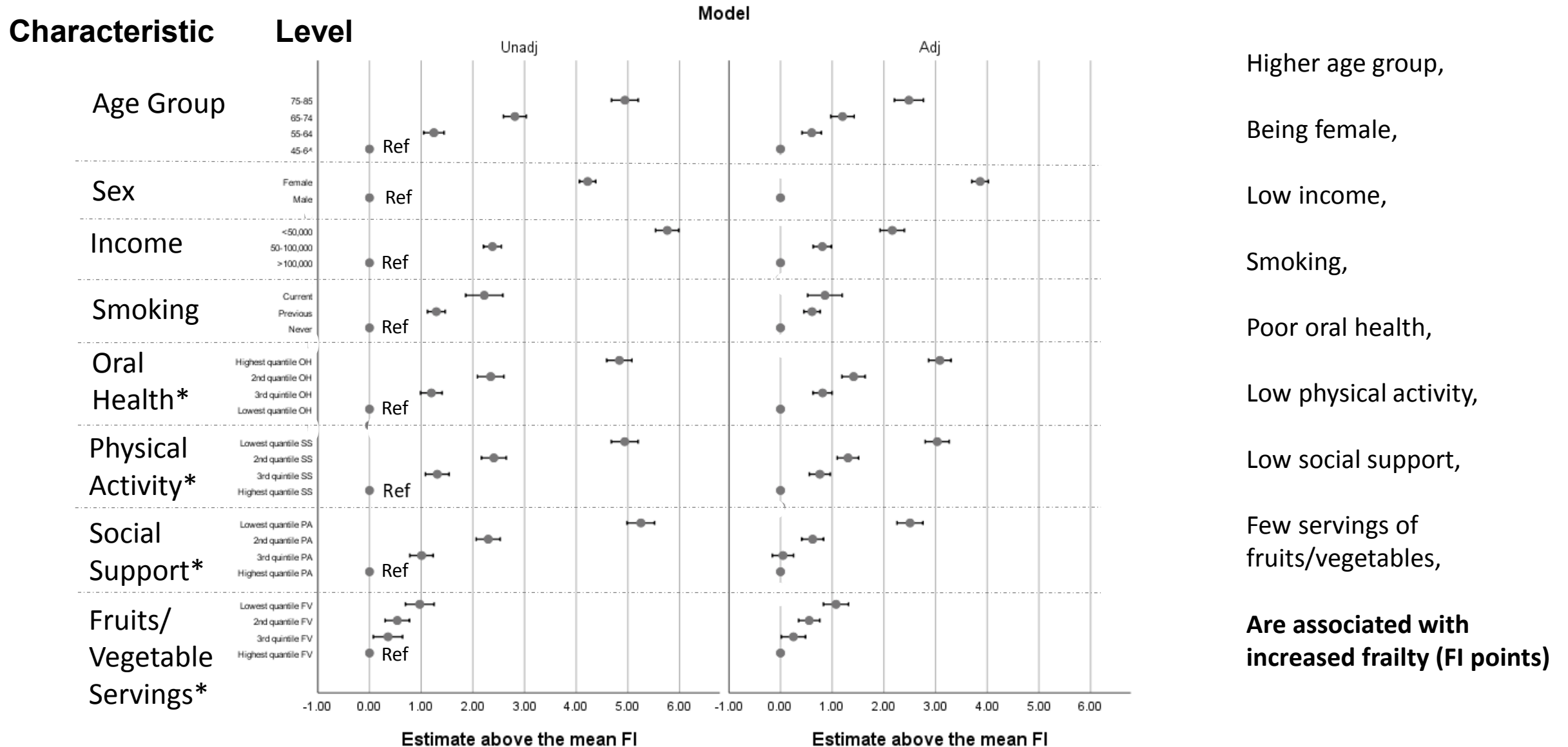
Accumulation of oral health problems across the life span.

Barriers to dental care and oral hygiene accumulate with increasing age.

Ramsey, et. al.* used concept of oral frailty.

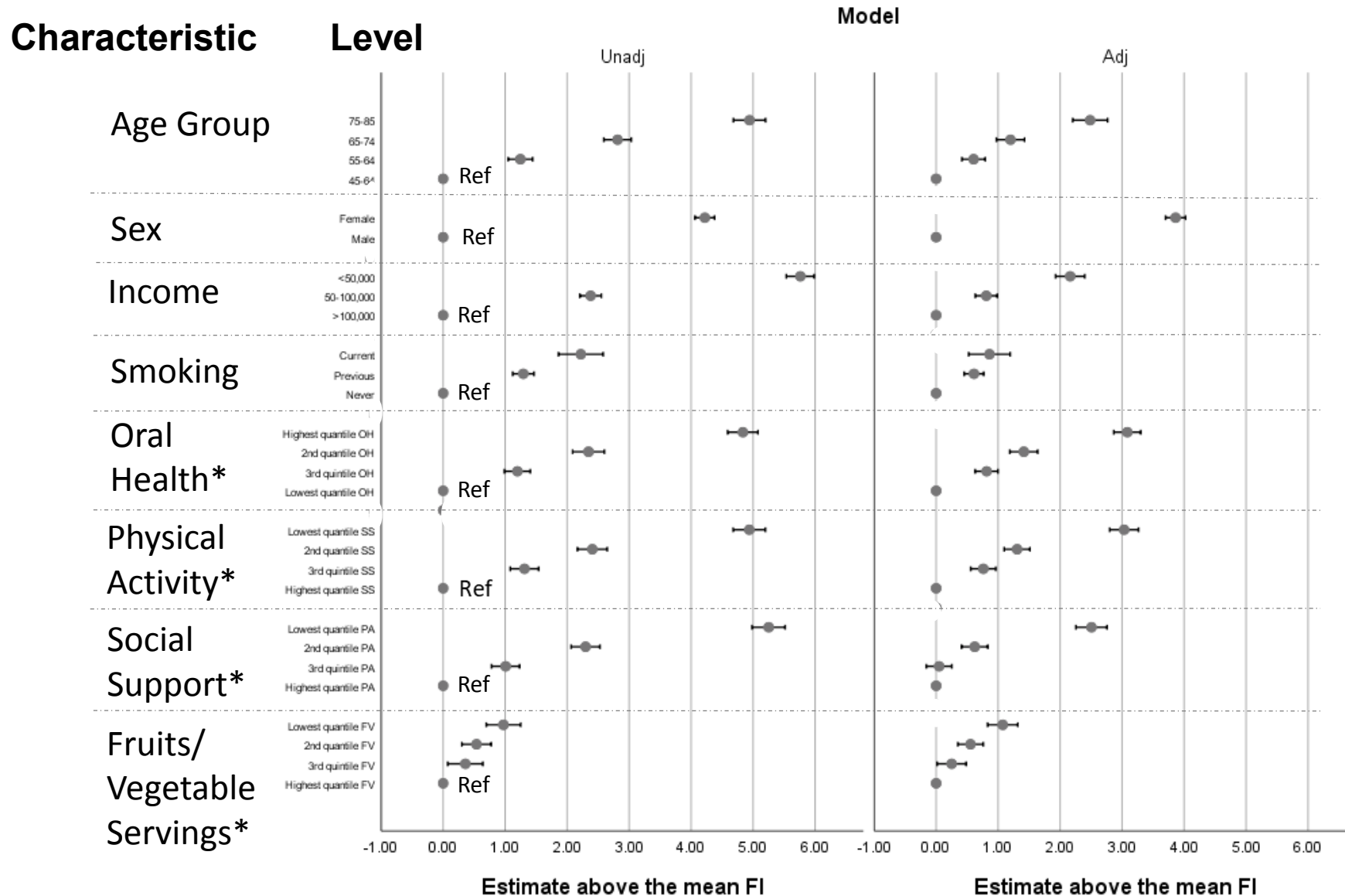
* Influence of Poor Oral Health on Physical Frailty: A Population-Based Cohort Study of Older British Men. J Am Geriatr Soc. 2018 Mar;66(3):473-479. doi: 10.1111/jgs.15175. Epub 2017 Dec 20.
Ramsay SE, Papachristou E, Watt RG, Tsakos G, Lennon LT, Papacosta AO, Moynihan P, Sayer AA, Whincup PH, Wannamethee SG.

Increase in Frailty Index, by Characteristic

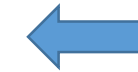


* Best quantile is the Reference category, compared with worsening quantiles.

Increase in Frailty Index, by Characteristic



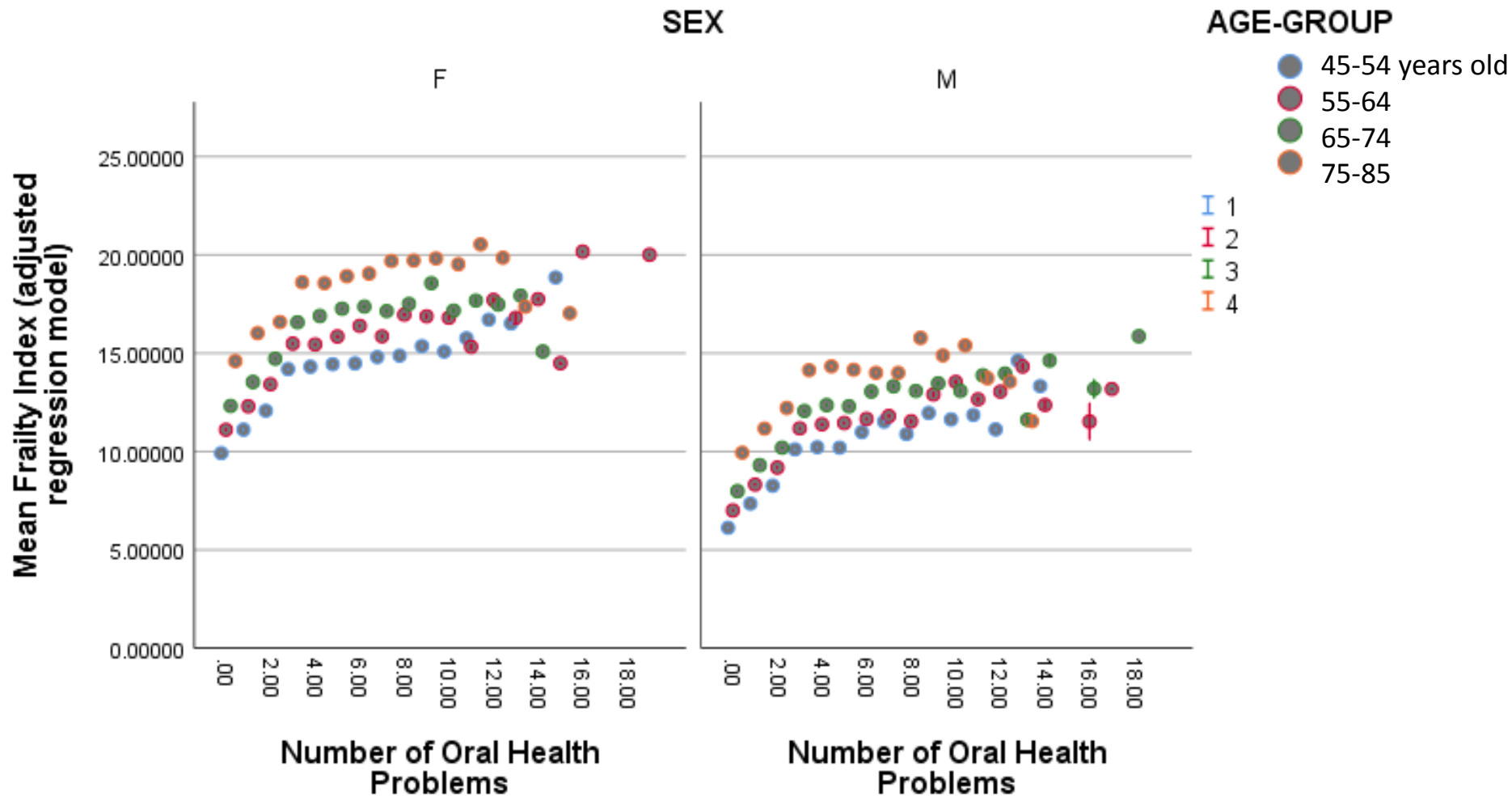
Comparing the effects of different characteristics on worsening frailty score:



In the fully adjusted model, poor oral health is associated with an increase of over 3 points on the frailty index, over the mean ($\beta_{adj} = 3.08$, 95%CI=3.87-3.30).

* Best quantile is the Reference category, compared with worsening quantiles.

Mean Frailty Score with number of oral health problem, by age-group and sex.



- Increased age-group and being female are associated with increased frailty score, at every number of oral health problems.
- Similar patterns across age-groups and between sexes for the association between increasing oral health problems and increasing frailty score.
- Each additional oral health problem is associated with over half a point on the Frailty Index ($\beta_{adj} = 0.66$, 95%CI=0.62-0.71).

Discussion

STRENGTHS

- Provides the latest and most comprehensive description of self-reported oral health problems across Canada for adults.
- Includes age groups that represent middle-aged people, older adults, and the elderly.
- Allows for the association of oral health and frailty to be placed in the context of important competing risk factors for frailty.

LIMITATIONS

- Baseline cross-sectional analysis.
- Participation in the CLSA is voluntary, and estimates may not be fully representative of population.



Discussion: Conclusions

1. Canadian adults age 45-85 years old complain of common oral health problems, including
 - tooth loss and denture problems
 - teeth problems and dental discomfort/pain
 - gum and jaw problems,
 - and oral medicine/hygiene concerns.
2. Oral health problems increase across increasing age groups.
3. Oral health problems are strongly and independently associated with frailty.
4. Supports theory that oral health could contribute to the etiology and progression of frailty.
5. Dental care at all age groups could help with healthy aging.



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Thank you.

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Poor Oral Health in the Baseline Wave of the CLSA.

Oral Health Measure		Prevalence (% , 95%CI)	
Oral Health†‡			
Self-reported Oral Health	Fair or Poor	7.4 (7.0-7.8)	
	Good	21.2 (20.6-21.8)	
	Very Good or Excellent	71.4 (70.8-72.1)	
			Odds Ratio for Fair or Poor Oral Health (age- and sex-, and sampling plan adjusted)
Edentulous	Yes	5.5 (5.2-5.8)	0.8 (0.6-1.0)
Eating Discomfort	Often or Sometimes	10.2 (9.8-10.7)	5.8 (5.2-6.5)
Chewing Inadequate	Yes	7.8 (7.4-8.1)	4.9 (4.4-5.6)
Natural Tooth Problem	Yes	24.3 (23.7-24.9)	3.2 (2.9-3.5)
Denture Problem	Yes	5.2 (4.9-5.4)	3.1 (2.7-3.6)
Gum Problem	Yes	16.4 (15.9-17.0)	2.3 (2.1-2.6)
Dry Mouth	Yes	15.4 (14.9-15.8)	2.3 (2.1-2.6)
Number of Oral Health Problems	0	51.9 (51.2-52.6)	REF
	1	26.8 (26.2-27.4)	1.1 (1.0-1.3)
	2	11.8 (11.4-12.3)	2.5 (2.2-3.0)
	3	5.6 (5.3-5.9)	4.9 (4.2-5.8)
	4-7	3.9 (3.5-.4.4)	12.7 (4.2-5.8)