Appendix

Effect of co-payment on dental visits: A regression discontinuity analysis

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Appendix Table 1. Comparing characteristics of missing informations related to outcome variables

| Characteristics | Treatment visits during past 12 months | | | | | | Check-up visits during past 12 months | | | | | |
| | Non missing (n = 7,374) | | Missing (n = 286) | | Total (N=7,660) | | Non missing (n = 7,235) | | Missing (n = 425) | | Total (N=7,660) | |
	n	Col%	n	Col%	N	Col%	n	Col%	n	Col%	N	Col%
Sex												
Male	3,495	47.4%	112	39.2%	3,607	47.1%	3,443	47.6%	164	38.6%	3,607	47.1%
Female	3,879	52.6%	174	60.8%	4,053	52.9%	3,792	52.4%	261	61.4%	4,053	52.9%
Household Income (million yen/ yr)												
<2	2,852	38.7%	100	35.0%	2,952	38.5%	2,800	38.7%	152	35.8%	2,952	38.5%
>=2 to <3	1,520	20.6%	44	15.4%	1,564	20.4%	1,508	20.8%	56	13.2%	1,564	20.4%
>=3 to <4	1,038	14.1%	22	7.7%	1,060	13.8%	1,028	14.2%	32	7.5%	1,060	13.8%
>=4	701	9.5%	27	9.4%	728	9.5%	693	9.6%	35	8.2%	728	9.5%
Missing	1,263	17.1%	93	32.5%	1,356	17.7%	1,206	16.7%	150	35.3%	1,356	17.7%
Number of remaining teeth												
No teeth	338	4.6%	26	9.1%	364	4.8%	332	4.6%	32	7.5%	364	4.8%
1 to 9	938	12.7%	43	15.0%	981	12.8%	909	12.6%	72	16.9%	981	12.8%
10 to 19	1,592	21.6%	47	16.4%	1,639	21.4%	1,544	21.3%	95	22.4%	1,639	21.4%
>= 20	4,386	59.5%	157	54.9%	4,543	59.3%	4,334	59.9%	209	49.2%	4,543	59.3%
Missing	120	1.6%	13	4.5%	133	1.7%	116	1.6%	17	4.0%	133	1.7%

Appendix Table 2. Comparing imputed covariates before and after imputation

| Variable | Before Imputation | | After Imputation | |
	n	Col%	n	Col%
Household Income				
<2	2,776	46.4%	3,353	46.8%
>=2 to <3	1,496	25.0%	1,784	24.9%
>=3 to <4	1,020	17.1%	1,214	17.0%
>=4	687	11.5%	810	11.3%
Total	5,979		7,161	
Number of remaining teeth				
No teeth	329	4.7%	334	4.7%
1 to 9	903	12.8%	918	12.8%
10 to 19	1,536	21.8%	1,562	21.8%
>= 20	4,278	60.7%	4,347	60.7%
Total	7,046		7,161	

Appendix Table 3: Comparison of overall f statistics for different functional forms of Z (outcome variable= check-up visits)

Model type	Linear		Linear interaction		Quadratic		Quadratic interaction	
	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
T	0.94	0.95	0.96	1.16***	1.23*	1.21***	1.49***	1.52***
	[0.73,1.21]	[0.77,1.16]	[0.80,1.16]	[1.15,1.18]	[1.02,1.47]	[1.19,1.23]	[1.44,1.54]	[1.47,1.56]
Z	1.11***	1.11**	1.07	0.93***	0.78*	0.88***	0.64***	0.63***
	[1.04,1.17]	[1.03,1.18]	[1.00,1.15]	[0.93,0.94]	[0.64,0.96]	[0.86,0.89]	[0.62,0.66]	[0.61,0.65]
T#Z			1.07*	1.23***	1.73***	1.37***	1.92***	1.95***
			[1.00,1.15]	[1.21,1.26]	[1.27,2.34]	[1.33,1.41]	[1.85,1.99]	[1.88,2.01]
Z^2					0.93**	0.98***	0.88***	0.88***
					[0.88,0.97]	[0.97,0.98]	[0.87,0.89]	[0.87,0.89]
$T\#Z^2$							1.09***	1.10***
							[1.08,1.11]	[1.09,1.11]
F_mi value	**105.81**	**214.82**	**397.73**	**1285.88**	**7454.75**	**4795.42**	**4670.16**	**5928.08**
N	7,161	7,161	7,161	7,161	7,161	7,161	7,161	7,161

Exponentiated coefficients; 95% confidence intervals in brackets
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
# indicates interaction

Appendix Table 4: Comparison of overall f statistics for different functional forms of Z (outcome variable= treatment visits)

Model type	Linear		Linear interaction		Quadratic		Quadratic interaction	
	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
T	0.97	0.97	0.99	1.14***	1.17*	1.15***	1.36***	1.38***
	[0.79,1.19]	[0.83,1.13]	[0.87,1.13]	[1.13,1.16]	[1.00,1.38]	[1.13,1.17]	[1.33,1.40]	[1.34,1.42]
Z	1.09**	1.09**	1.05	0.95***	0.85	0.94***	0.72***	0.71***
	[1.03,1.14]	[1.03,1.15]	[1.00,1.11]	[0.94,0.96]	[0.71,1.01]	[0.92,0.96]	[0.70,0.75]	[0.69,0.74]
T#Z			1.07*	1.19***	1.49**	1.21***	1.61***	1.62***
			[1.02,1.13]	[1.17,1.20]	[1.14,1.95]	[1.17,1.25]	[1.55,1.67]	[1.57,1.67]
Z^2					0.95*	1.00	0.91***	0.91***
					[0.91,0.99]	[0.99,1.00]	[0.91,0.92]	[0.90,0.92]
T#Z^2							1.08***	1.08***
							[1.07,1.09]	[1.07,1.09]
F_mi value	**181.55**	**372.80**	**843.35**	**2054.15**	**2489.94**	**3251.61**	**3349.30**	**3955.23**
N	7,161	7,161	7,161	7,161	7,161	7,161	7,161	7,161

Exponentiated coefficients; 95% confidence intervals in brackets
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
# indicates interaction

Appendix Table 5. Results of complete case analysis (logistic regression models predicting dental visits during past 12 months): N= 5,895

	Dental visits during past 12 months			
	Treatment visits		Check-up visits	
	OR		OR	
Variables	[95% CI]		[95% CI]	
	Unweighted	Weighted	Unweighted	Weighted
RD estimate (co-efficient of T)	1.24***	1.27***	1.39***	1.42***
	[1.20,1.28]	[1.22,1.32]	[1.35,1.44]	[1.38,1.47]
Age	0.83***	0.81***	0.69***	0.68***
	[0.80,0.86]	[0.78,0.84]	[0.67,0.72]	[0.65,0.70]
Eligibility (T) # Age	1.29***	1.31***	1.72***	1.75***
	[1.25,1.33]	[1.26,1.35]	[1.67,1.78]	[1.70,1.81]
Age^2 (2nd order polynomials)	0.94***	0.94***	0.90***	0.90***
	[0.94,0.95]	[0.93,0.95]	[0.89,0.91]	[0.89,0.90]
Eligibility (T) # Age^2	1.08***	1.10***	1.11***	1.11***
	[1.07,1.10]	[1.08,1.11]	[1.10,1.12]	[1.10,1.12]
Sex				
Male	Reference	Reference	Reference	Reference
Female	1.16**	1.23***	1.43***	1.53***
	[1.05,1.28]	[1.10,1.37]	[1.29,1.58]	[1.31,1.78]
Household income (yen/year)				
< 2 million	Reference	Reference	Reference	Reference
2 to 3 million	1.18	1.06	1.08	0.98
	[0.98,1.43]	[0.89,1.26]	[0.90,1.28]	[0.84,1.15]
3 to 4 million	1.22*	1.15	1.12	1.06
	[1.04,1.42]	[0.93,1.42]	[0.98,1.27]	[0.88,1.27]
≥ 4 million	1.20	1.02	1.16*	1.08
	[0.92,1.56]	[0.86,1.20]	[1.04,1.31]	[0.97,1.20]
Number of remaining teeth				
No teeth	Reference	Reference	Reference	Reference
1 to 9 teeth	3.53***	3.48***	3.50***	3.07***
	[2.69,4.64]	[2.71,4.46]	[2.59,4.74]	[2.32,4.04]
10 to 19 teeth	5.18***	4.84***	5.07***	4.45***
	[4.21,6.36]	[4.01,5.83]	[3.57,7.22]	[3.12,6.35]
More than 20 teeth	4.86***	4.86***	5.85***	5.44***
	[4.29,5.50]	[4.22,5.60]	[4.43,7.73]	[4.10,7.21]
N	5895	5895	5895	5895

OR: Odds Ratio; CI: Confidence interval

Standard errors are clustered around values of age-centered variable (cluster VCE)

$^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$

# indicates interaction