CLINICAL TRIALS

Inequalities in Dental Attendance throughout the Life-course

S. Listl

Appendix

Measurement of Regular Dental Attendance in SHARELIFE

In a first question, study participants were asked to answer the question "*Have you ever gone to a dentist regularly for check-ups or dental care?*" If respondents had answered "yes" to the above question, more detailed information about the time spells of regular attendance was obtained by asking the question "*Did you start going regularly to the dentist during your childhood (that is, from when you were born up to and including age 15)?*" In case the latter question was answered with "no", the following question was stated: *"In which year did you start going regularly to the dentist for check-ups or dental care?*" In reference to the time at which respondents had started going regularly to the dentist, respondents were asked the following question: "*Since then, have you always gone regularly to the dentist for check-ups or dental care?*" Finally, if the answer to this question was "no", study participants were asked to specify the periods in which they did not go to a dentist regularly for check-ups or dental care. The answer alternatives were defined as "*When I was between 0 and 15 years old*", "*When I was between 16 and 25 years old*", "*When I was between 26 and 40 years old*", "*When I was between 41 and 55 years old*", "*When I was between 56 and 65 years old*", "*When I was between 66 and 75 years old*", and "*When I was older than 75 years*".

International Standard Classification of Education [ISCED] (UNESCO, 1997) include:

- ISCED level 0: pre-primary education;
- ISCED level 1: primary education or first stage of basic education;
- ISCED level 2: lower secondary education or the second stage of basic education;
- ISCED level 3: (upper secondary education) covers the first level of post-compulsory and the final stage of secondary education in most OECD countries;
- ISCED level 4: post-secondary non-tertiary education includes programs that overlap the boundary between upper secondary and post-secondary education in the international context;
- ISCED level 5: first stage of tertiary education; certification from ISCED levels 3 and 4. Cumulative duration of four to six yrs at level 5 is more common;
- ISCED level 6: second stage of tertiary education; leads to the award of an advanced research qualification.

The Concentration Curve as a Graphical Correlate to the Concentration Index (CI)

The concentration curve plots the cumulative proportion of a health sector variable against the cumulative proportion of the population ranked by socio-economic status (Wagstaff *et al.*, 1991). The Appendix Fig. illustrates the concept of the concentration curve by means of a hypothetical example in which "number of doctor visits" represents the health sector variable and "household income" represents the socio-economic measure. The concentration curve, hence, plots the share of doctor visits by income quantiles. The diagonal (45°) represents the line of perfect equality, *i.e.*, the expected location of the concentration curve if there would be identical shares in the number of doctor visits for all income quantiles. Since the concentration curve in the Appendix Fig., however, is located below the diagonal, it indicates a higher utilization of doctor visits by persons from higher income quantiles in comparison with individuals from lower income quantiles. In contrast, a localization of the concentration curve above the diagonal would indicate a higher utilization of doctor visits by persons from lower income quantiles in comparison with

DOI: 10.1177/0022034512447953. University of Heidelberg, Department of Conservative Dentistry, Im Neuenheimer Feld 400, 69120 Heidelberg, Germany; and Munich Center for the Economics of Aging, Max-Planck-Institute for Social Law and Social Policy, Munich, Germany; stefan.listl@med.uni-heidelberg.de

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individuals from higher income quantiles. Conventionally, the CI is defined as twice the area between the concentration curve and the diagonal (Wagstaff *et al.*, 1991). If there is no inequality, the CI is zero. Moreover, the CI takes a positive (negative) value when the concentration curve lies below (above) the diagonal, indicating a disproportionate concentration of the utilization variable at the upper (lower) end of the socio-economic scale. Note that the value of the CI is bounded between – 1 and +1.

Formula 1: The Concentration Index (CI)

$$CI = \frac{2}{\bar{h}} * \mathrm{cov}(h_i, r_i)$$

where

$\bar{h}$ = the mean of dental attendance

h_i = dental attendance by individual i

r_i = the fractional socio-economic rank of individual i

Appendix References

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Appendix Table 1.

Pairwise t Tests for Within-country Differences in Inequalities between Various Life Periods

Age (yrs)	0–15	16–25	26–40	41–55	56–65	66–75	> 75	
0–15		**–5.40**	**–6.30**	**–6.90**	**–7.33**	**–6.70**	**–5.15**	*Germany*
16–25	**2.56**		–0.77	–1.30	–1.87	–1.82	–1.58	
26–40	**2.34**	–0.26		–0.55	–1.17	–1.21	–1.16	
41–55	**2.42**	–0.17	0.09		–0.66	–0.79	–0.88	
56–65	**2.44**	–0.13	0.13	0.04		–0.24	–0.53	
66–75	1.93	–0.38	–0.15	–0.23	–0.26		–0.35	
> 75	1.71	–0.04	0.13	0.07	0.05	0.23		
	Austria							

Age (yrs)	0–15	16–25	26–40	41–55	56–65	66–75	> 75	
0–15		**–2.33**	**–2.08**	**–2.68**	–1.95	–0.30	0.96	*Netherlands*
16–25	1.36		0.29	–0.34	0.36	1.57	**2.33**	
26–40	**2.43**	1.04		–0.64	0.07	1.36	**2.18**	
41–55	**2.83**	1.30	0.41		0.69	1.84	**2.52**	
56–65	**3.28**	1.91	0.90	0.49		1.28	**2.12**	
66–75	**3.07**	1.79	0.86	0.50	0.06		1.09	
> 75	1.51	0.50	–0.23	–0.50	–0.81	–0.81		
	Sweden							

Age (yrs)	0–15	16–25	26–40	41–55	56–65	66–75	> 75
0–15		–0.26	–0.57	–1.81	**–2.28**	**–2.10**	–1.94
16–25	1.82		–0.33	–1.76	**–2.31**	**–2.07**	–1.85
26–40	**2.80**	1.01		–1.53	**–2.12**	–1.87	–1.68
41–55	**3.74**	**2.07**	1.13		–0.63	–0.53	–0.79
56–65	**4.64**	**3.15**	**2.34**	1.30		0.03	–0.43
66–75	**5.93**	**4.72**	**4.13**	**3.31**	**2.18**		–0.43
> 75	**5.66**	**4.57**	**4.04**	**3.42**	**2.62**	1.02	

Italy | *Spain*

Age (yrs)	0–15	16–25	26–40	41–55	56–65	66–75	> 75
0–15		**–4.24**	**–5.25**	**–5.42**	**–4.73**	**–2.40**	0.09
16–25	**4.23**		–0.97	–1.14	–0.55	1.10	**–2.61**
26–40	**5.50**	1.21		–0.17	0.39	1.87	**–3.13**
41–55	**5.52**	1.20	–0.02		0.55	**1.99**	**–3.22**
56–65	**5.51**	1.32	0.14	0.16		1.53	**–2.90**
66–75	**5.62**	1.94	0.95	0.97	0.82		–1.70
> 75	**2.92**	–0.12	–0.94	–0.93	–1.02	–1.53	

Denmark | *France*

Age (yrs)	0–15	16–25	26–40	41–55	56–65	66–75	> 75
0–15		**–4.00**	**–4.24**	**–4.41**	**–4.22**	**–2.21**	1.05
16–25	1.46		–0.07	–0.15	–0.11	1.13	1.27
26–40	**3.03**	1.61		–0.08	–0.04	1.22	1.33
41–55	**4.06**	**2.66**	1.03		0.04	1.30	1.38
56–65	**5.37**	**4.09**	**2.57**	1.64		1.24	1.35
66–75	**5.68**	**4.60**	**3.35**	**2.62**	1.30		0.46
> 75	**4.99**	**4.07**	**3.06**	**2.47**	**1.44**	0.39	

Switzerland | *Greece*

Age (yrs)	0–15	16–25	26–40	41–55	56–65	66–75	> 75
0–15		**–2.15**	**–3.53**	**–4.04**	**–4.47**	**–2.10**	–0.78
16–25	**4.19**		–1.34	–1.87	**–2.37**	–0.55	0.08
26–40	**5.68**	1.48		–0.55	–1.10	0.38	0.59
41–55	**6.15**	1.92	0.43		–0.57	0.76	0.80
56–65	**6.07**	1.93	0.48	0.06		1.15	1.01
66–75	**4.36**	0.77	–0.45	–0.81	–0.84		0.35
> 75	**2.58**	–0.21	–1.14	–1.40	–1.42	–0.74	

Belgium — ***Czech Republic***

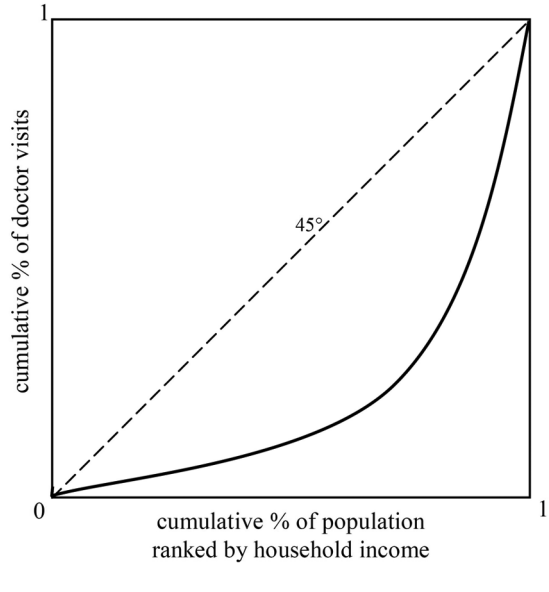
Age (yrs)	0–15	16–25	26–40	41–55	56–65	66–75	> 75
0–15							
16–25	1.01						
26–40	1.81	0.79					
41–55	1.00	0.01	–0.77				
56–65	1.06	0.12	–0.61	0.12			
66–75	1.10	0.42	–0.11	0.41	0.32		
> 75	–0.02	–0.47	–0.83	–0.47	–0.52	–0.68	

Poland

NB: Positive (negative) sign means inequality is higher for the life period in the column (line); arrays marked grey represent comparisons between subsequent life periods; values in **bold** indicate statistical significance at the 5% level.

Appendix Figure.

The concentration curve as a graphical correlate to the Concentration Index.



Appendix Table 2.
Pairwise t Tests for Cross-country Differences in Inequalities within Various Life Periods

	AT	GE	SE	NL	SP	IT	FR	DN	GR	SW	BE	CZ	PL	
AT		–1.36	**–2.63**	0.13	**7.28**	**4.10**	**2.75**	0.10	**7.33**	–1.04	**5.61**	**–2.59**	**5.58**	
GE	–0.26		–1.53	**2.14**	**8.73**	**5.72**	**4.99**	**2.15**	**9.46**	0.37	**8.52**	–1.47	**7.50**	
SE	**4.80**	**6.54**		**4.76**	**9.82**	**7.06**	**7.29**	**4.93**	**11.20**	1.90	**11.47**	0.09	**9.10**	
NL	1.61	**2.38**	**–5.61**		**8.02**	**4.75**	**3.64**	–0.05	**8.67**	–1.63	**7.59**	**–4.67**	**6.59**	
SP	**–6.26**	**–6.42**	**–9.62**	**–7.79**		**–3.61**	**–5.84**	**–8.08**	–1.36	**–8.45**	**–3.92**	**–9.78**	**–2.70**	
IT	–1.66	–1.60	**–5.62**	**–3.19**	**4.53**		**–2.15**	**–4.81**	**2.75**	**–5.40**	0.25	**–7.02**	1.17	
FR	**–3.08**	**–3.32**	**–10.54**	**–6.27**	**4.64**	–0.69		**–3.76**	**5.60**	**–4.50**	**3.30**	**–7.22**	**3.69**	
DN	0.60	1.11	**–7.40**	–1.66	**7.21**	**2.41**	**5.01**		**8.78**	–1.63	**7.79**	**–4.83**	**6.69**	
GR	**–5.74**	**–6.13**	**–11.38**	**–8.41**	**2.03**	**–3.36**	**–3.52**	**–7.51**		**–9.05**	**–3.11**	**–11.16**	–1.63	
SW	0.80	1.30	**–5.73**	–1.06	**7.19**	**2.50**	**4.85**	0.36	**7.36**		**7.93**	–1.83	**7.12**	
BE	**–5.49**	**–6.16**	**–14.21**	**–9.68**	**3.16**	**–2.63**	**–2.77**	**–8.39**	1.37	**–7.93**		**–11.40**	1.18	
CZ	**4.46**	**6.13**	–0.80	**5.05**	**9.43**	**5.36**	**10.18**	**6.88**	**11.11**	**5.26**	**13.89**		**9.05**	
PL	**–3.92**	**–4.17**	**–9.89**	**–6.57**	**3.61**	–1.64	–1.34	**–5.56**	**2.08**	**–5.46**	1.02	**–9.59**		

Life-years 16 to 25

Life-years 0 to 15

	AT	GE	SE	NL	SP	IT	FR	DN	GR	SW	BE	CZ	PL	
AT		**–2.67**	**–3.65**	–0.30	**6.19**	**2.60**	1.65	–0.78	**4.99**	–1.42	**4.03**	**–3.81**	**5.30**	
GE	**2.35**		–1.26	**3.72**	**9.45**	**5.94**	**5.70**	**3.23**	**8.72**	–1.62	**8.98**	–1.56	**8.35**	
SE	**3.59**	1.52		**6.05**	**10.58**	**7.22**	**7.59**	**5.77**	**10.13**	**3.03**	**11.38**	–0.49	**9.39**	
NL	0.03	**–3.51**	**–6.33**		**7.62**	**3.63**	**2.76**	–0.79	**6.57**	–1.70	**6.18**	**–6.12**	**6.52**	
SP	**–6.86**	**–9.46**	**–10.67**	**–7.92**		**–3.94**	**–5–51**	**–8.13**	–1.70	**–8.25**	**–3.50**	**–10.65**	–0.74	
IT	**–3.85**	**–6.64**	**–8.06**	**–4.72**	**3.36**		–1.36	**–4.21**	**2.47**	**–4.56**	1.04	**–7.32**	**3.07**	
FR	–1.52	**–4.94**	**–7.15**	**–2.19**	**6.32**	**2.95**		**–3.51**	**4.14**	**–3.92**	**2.94**	**–7.66**	**4.52**	
DN	0.81	**–2.55**	**–5.42**	1.31	**8.59**	**5.51**	**3.31**		**7.19**	–1.12	**7.10**	**–5.82**	**7.01**	
GR	**–5.71**	**–8.83**	**–10.43**	**–6.99**	1.82	–1.74	**–5.05**	**–7.83**		**–7.30**	–1.82	**–10.19**	0.87	
SW	1.46	–1.11	**–2.72**	**2.08**	**8.67**	**5.73**	**3.69**	1.11	**7.86**		**7.00**	**–3.24**	**7.19**	
BE	**–4.24**	**–8.46**	**–11.22**	**–5.99**	**4.21**	0.45	**–3.30**	**–7.26**	**2.53**	**–7.06**		**–11.32**	**2.54**	
CZ	**3.68**	1.68	0.28	**6.34**	**10.70**	**8.10**	**7.18**	**5.44**	**10.45**	**2.84**	**11.17**		**9.46**	
PL	**–4.47**	**–7.13**	**–8.43**	**–5.34**	**2.56**	–0.77	**–3.67**	**–6.08**	0.90	**–6.27**	–1.32	**–8.47**		

Life-years 41 to 55

Life-years 26 to 40

	AT	GE	SE	NL	SP	IT	FR	DN	GR	SW	BE	CZ	PL
AT		**–2.77**	**–3.32**	0.65	1.30	1.38	0.29	0.28	0.88	–0.31	**3.36**	**–2.67**	**2.75**
GE	**3.02**		–0.33	**4.65**	**3.76**	**4.53**	**3.69**	**4.34**	**3.35**	**2.86**	**7.46**	0.29	**4.71**
SE	**3.77**	0.77		**6.25**	**4.23**	**5.35**	**4.68**	**6.07**	**3.80**	**3.66**	**9.03**	0.77	**5.04**
NL	–0.18	**–4.86**	**–7.00**		0.95	1.01	–0.41	–0.53	0.47	–1.17	**3.51**	**–4.71**	**2.58**
SP	**–4.74**	**–8.06**	**–8.94**	**–5.46**		–0.13	–1.18	–1.28	–0.39	–1.67	1.45	**–3.69**	1.59
IT	**–2.01**	**–5.62**	**–6.67**	**–2.38**	**3.04**		–1.26	–1.43	–0.31	–1.86	1.93	**–4.50**	1.83
FR	–1.51	**–5.77**	**–7.28**	–1.86	**3.93**	0.76		–0.04	0.72	–0.69	**3.56**	**–3.65**	**2.71**
DN	0.40	**–4.21**	**–6.43**	0.94	**6.02**	**3.04**	**2.67**		0.80	–0.75	**4.08**	**–4.40**	**2.84**
GR	**–3.18**	**–6.68**	**–7.65**	**–3.74**	1.75	–1.31	**–2.15**	**–4.36**		–1.23	**1.96**	**–3.27**	1.93
SW	1.31	**–2.15**	**–3.20**	**2.11**	**6.44**	**3.72**	**3.45**	1.40	**4.90**		**4.19**	**–2.77**	**3.09**
BE	**–3.91**	**–9.06**	**–11.13**	**–5.21**	1.90	–1.70	**–2.86**	**–6.14**	–0.11	**–6.46**		**7.61**	0.65
CZ	**3.97**	1.20	0.67	**6.95**	**9.02**	**6.79**	**7.34**	**6.38**	**7.75**	**3.44**	**10.99**		**4.66**
PL	**–4.85**	**–7.82**	**–8.55**	**–5.45**	–0.41	**–3.27**	**–4.08**	**–5.95**	**–2.06**	**–6.37**	**–2.22**	**–8.64**	

Life-years 66 to 75

Life-years 56 to 65

	AT	GE	SE	NL	SP	IT	FR	DN	GR	SW	BE	CZ	PL
AT													
GE	1.75												
SE	1.61	–0.57											
NL	–1.34	**–3.97**	**–4.72**										
SP	–0.02	–1.42	–1.23	1.03									
IT	–0.63	**–2.29**	**–2.21**	0.47	–0.52								
FR	–1.51	**–3.95**	**–4.49**	–0.30	–1.18	–0.66							
DN	–1.43	**–4.13**	**–5.00**	–0.10	–1.09	–0.54	0.21						
GR	–0.43	**–2.08**	**–1.98**	0.71	–0.35	0.19	0.89	0.78					
SW	–0.35	**–2.37**	**–2.40**	1.07	–0,27	0.35	1.26	1.17	0.14				
BE	**–2.99**	**–5.59**	**–6.41**	**–2.24**	**–2.40**	**–2.04**	–1.83	**–2.19**	**–2.28**	**–2.91**			
CZ	1.17	–0.72	–0.35	**3.25**	0.96	1.77	**3.28**	**3.40**	1.56	1.73	**4.97**		
PL	**–2.55**	**–3.76**	**–3.73**	**–1.96**	**–2.33**	**–2.03**	–1.78	–1.92	**–2.17**	**–2.42**	–0.80	**–3.42**	

Life-years 75 +

NB: Positive (negative) sign means inequality is higher for the country in the column (line); values in **bold** indicate statistical significance at the 5% level; AT = Austria, GE = Germany, SE = Sweden, NL = Netherlands, SP = Spain, IT = Italy, FR = France, DN = Denmark, GR = Greece, SW = Switzerland, BE = Belgium, CZ = Czech Republic, PL = Poland.

Appendix Table 3.

Regression Parameter Estimates for Cross-country Socio-economic Influences on Inequality Level

Age (yrs)						
0–15	**16–25**	**26–40**	**41–55**	**56–65**	**66–75**	**> 75**
–0.151 (0.037)	**–0.118** (0.030)	**–0.104** (0.026)	**–0.090** (0.027)	**–0.073** (0.026)	–0.040 (0.025)	–0.021 (0.033)

NB: Standard errors in parentheses; values in **bold** indicate statistical significance at the 5% level; negative sign means inequality decreases with increasing socio-economic status; each parameter estimate is based on a univariate linear regression model for the respective life period; dependent variables correspond to CI values from Table 2 (see main paper); explanatory variables are number of books *per* household during childhood (life period 0-15) and educational attainment according to the International Standard Classification of Education (all other life periods); all measures are aggregated at the country level.