Trends in dental health of 35- to 44-year-olds in West and East Germany after reunification

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Abstract

Objectives: The German reunification (1990) resulted in huge social upheavals in East Germany involving changes in health-care systems. We aimed to assess the changes of dental health between 1989 and 2005, hypothesizing that dental health converged in West and East Germany.
Methods: We evaluated data from 855 East and 1,456 West Germans aged 35-44 years from the cross-sectional German Oral Health Studies (*Deutsche Mundgesundheitsstudien*) conducted in 1989/92, 1997, and 2005. Regression models were applied to assess associations between region, survey year, their interactions and variables assessing dental disease status [number of decayed (DT), missing (MT), and filled teeth (FT), the DMFT-index, the probability of having ≤20 teeth and the number of sound teeth (ST)], adjusting for potential risk factors for caries.
Results: After a slight increase of MT between 1989/92 and 1997 (West: 3.6 to 3.6; East: 4.5 to 4.9), numbers of MT considerably decreased between 1997 and 2005 (West: 3.6 to 2.2; East: 4.9 to 3.1). East Germans had consistently more MT. Numbers of FT, DT, ST, and the DMFT-index equalized at the latest in 2005. The East German DMFT-index increased between 1989/92 and 1997 and slightly decreased between 1997 and 2005, whereas the West German DMFT-index steadily decreased between 1989/92 and 2005.
Conclusions: Dental health converged in West and East Germany, but the higher number of MT in 2005 indicates that East Germany was not able to catch up completely with West Germany.

Introduction

Before the reunification in 1990, both the former Federal Republic of Germany (FRG) (old Federal States, referred to as West Germany) and the former German Democratic Republic (GDR) (new Federal States, referred to as East Germany) had completely different political, economic, and health-care systems. Until now, these inequalities decreased due to huge efforts made after reunification to bring East Germany into line with the West German social market economy. To develop a modern infrastructure and to promote a competitive economy, the rebuilding of East Germany was financed with high amounts of transfer payments. This led to an increase of the East German gross domestic product to 71 percent of the West German average in 2008 (1). Although economic differences diminished over time, East Germans remained socioeconomically deprived; in 1997 the unemployment rate was 19.1 percent in East and 10.8 percent in West Germany (2).

In other fields of medical research the impact of these changes on health had already been explored. Between 1991 and 2007, a decrease and steady approximation of mortality rates related to prostate and cervix cancer were observed in West and East Germany (1). Over the same period, cardiovascular mortality rates decreased and converged in both German parts, but East Germans still had a higher risk in 2007. We hypothesized that similar trends might also be observed regarding dental health.

An international collaborative study (3) focused on the impact of health-care systems on oral health, comparing data

for Hannover, FRG (1973), and Leipzig, GDR (1979). For 35- to 44-year-olds, a higher DMFT-index and a higher number of missing (MT) and filled teeth (FT) were reported in Hannover, whereas the number of decayed teeth (DT) was higher in Leipzig. Before reunification, the health-care system of the GDR fundamentally differed from its Western counterpart. In the GDR, almost all dentists were salaried employees, not receiving any commissions beyond their salaries. In contrast, the FRG had a system of reimbursement, in which health insurances paid dentists for each treatment.

In the last decades a parallel decline of caries was reported in most of the industrialized countries (4). It can be assumed that both West and East Germany show similar improvements in dental health. Furthermore, the broader range of fluoridated toothpastes after reunification might have positively influenced dental health in East Germany. Factors that might have negatively influenced dental health in East Germany comprehend cessations of water fluoridation, which was mandated by law and led to complete abandonment of water fluoridation until 1993 (5), and the necessary process of familiarization with new health-care services accompanied by possible inhibitions to utilize them (6).

The time period after reunification is of particular interest as East Germany adopted the West German health-care system. In 1989/92, 1997, and 2005 the German Oral Health Studies [*Deutsche Mundgesundheitsstudien* (DMS)] were conducted in West and East Germany. The repetition of cross-sectional studies allows for evaluation of time-lag differences (7), which are differences between individuals of the same age in different survey years and can aid in determining both period and cohort effects. Period effects represent the impact of events on people at a particular time point, common to people of all ages. Cohort effects describe the phenomenon that members of one cohort sharing common life experiences (e.g., growing up in the 1960s) can be separated from a second cohort (e.g., growing up in the 1970s) due to the presence of different environmental circumstances. The aim of this study was to evaluate the dental health of 35- to 44-year-olds in West and East Germany between 1989/92 and 2005 and to assess the degree to which dental health converged during that period.

Methods

Study design

The Institute of German Dentists [*Institut der Deutschen Zahnärzte* (IDZ)] conducted four national cross-sectional surveys of oral health in the German resident population (DMS): in 1989 (DMS I, only West Germany), 1992 (DMS II, only East Germany), 1997 (DMS III), and 2005 (DMS IV). The first two surveys (1989/92) were merged (8) to achieve comparability with the last two studies.

Random cluster samples stratified by Federal State and by community category were drawn, altogether of 80 (DMS I), 40 (DMS II), 90 (DMS III), and 90 (DMS IV) municipalities. Random samples were selected from the records of registration offices from each of these municipalities. East Germans were oversampled. Informed consent was obtained from all subjects entered into the study.

Analyses were restricted to 35- to 44-year-olds, who were continuously sampled in all four studies. Study participants were born in 1945-1954, 1948-1957, 1953-1962, and 1961-1970, respectively. Participation rates averaged 56 percent, 72 percent, 56 percent, and 52 percent, respectively (Table 1). Design, sampling and nonresponse analyses were described in detail elsewhere (9,10).

Dental examinations

In DMS I/II caries status was assessed by a sharp probe (11). In DMS III and IV caries status was examined as recommended by the World Health Organization (WHO) (12); caries status was assessed only visually and not by probing with a sharp probe. A blunt probe was used for the removal of plaque. The utilization of a sharp probe did not lead to a better detection of caries, thus the different methods did not have consequences for the results (13). Numbers of DT, MT, and FT were determined and the DMFT-index was calculated. Number of sound teeth (ST) was calculated as the difference between 28 and the DMFT-index. Subjects were stratified into those with more versus less than or equal to 20 teeth; this threshold is based on a recommendation of WHO, which describes as global goal for oral health to increase the

Table 1 Information on Sampling Design for DMS I-IV

Survey name	Birth cohort	Survey year	Age (year)	Sampling size	Number of invited subjects	Participation rate (%)
DMS I	1945-1954	1989	35-54*	1,700*	1,544*	858 (56)*
DMS II	1948-1957	1992	35-54*	1,039*	1,014*	731 (72)*
DMS III	1953-1962	1997	35-44	1,260	1,179	655 (56)
DMS IV	1961-1970	2005	35-44	1,980	1,774	925 (52)

* Information was only available for the cohort aged 35-54 years. For the analysis, only the cohort aged 35-44 years was considered.

number of individuals with functional dentitions (>20 natural teeth) aged 35-44 years until 2020 (14). All dental examinations excluded wisdom teeth.

Examinations were carried out by 80 dentists in private practices in DMS I, two mobile teams (calibrated dentist, interviewer, and contact person) in DMS II and three mobile teams (calibrated dentist, interviewer, and contact person) in DMS III and IV. Regarding DMS I, a double-stage calibration method was applied with five Federal calibrators who trained six local calibrators. Together with at least one Federal calibrator, these local calibrators trained the study dentists.

For DMS II, the study dentists of the two mobile teams took part in a 1-day calibration session before the start of the study, for which the Federal calibrators of DMS I served as the gold standard. This session was repeated during and at the end of the study. Similarly, the three mobile teams of DMS III and DMS IV were intensively trained by experts before each survey in one and a half day sessions.

Regarding the DMFT-index, inter-rater correlations between dentists and experts were high; for DMS I, II, III, and IV Pearson's correlation coefficients were 0.98, 0.98, 0.99, and 0.85, respectively.

Covariates

Socioeconomic variables were retrieved from questionnaires, including gender, age (continuously), school education (<10/10/>10 years), and marital status (married/single/divorced or widowed). Further, utilization of dental services (regular/irregular), number of snacks (no snacks/once or twice/≥three times daily), using dental floss/tooth sticks (no/yes) were used. In addition, the time of the last dental visit (last 12 months/last 2 years/less frequent) was reported, which not only pictures the regularity but also visits because of pain. Only socioeconomic variables similarly collected across survey years were included in our analyses. All interviews were conducted as verbal and personal face-to-face interviews by specially trained interviewers.

Statistical analyses

Chi-square tests and Wilcoxon rank-sum tests were applied to analyze differences in variables assessing oral health behavior between East and West Germany. Including the categorical variable for survey years as a continuous variable in linear models delivers *P* values for linear trends (see Table 2).

Table 2 Subjects' Characteristics according to Region and Survey Year

	DMS I/II			DMS III			DMS IV		
Variable	West	East	*P*	West	East	*P*	West	East	*P*
n	442	354		428	200		586	301	
Gender (ref. female)									
Male	47.7%	50.6%	0.43	50.7%	50.1%	0.88	50.7%	50.7%	0.99
Age, years	39.0 ± 2.9	38.3 ± 2.8	0.001	39.5 ± 2.8	39.6 ± 3.0	0.32	39.6 ± 2.8	39.8 ± 2.9	0.34
School education									
<10 years	57.0%	22.6%		36.0%	16.6%		28.1%	13.0%	
10 years	21.5%	51.4%		33.6%	54.1%		34.5%	61.8%	
>10 years	21.5%	26.0%	<0.001	30.4%	29.3%	<0.001	37.4%	25.2%	<0.001
Marital status									
Married	80.8%	85.0%		76.3%	76.4%		70.2%	69.7%	
Single	12.2%	9.3%		13.6%	10.1%		21.9%	22.2%	
Divorced/widowed	7.0%	5.7%	0.28	10.1%	13.5%	0.27	7.9%	8.1%	0.99
Utilization of dental services (ref. irregular)									
Regular	69.9%	76.6%	0.04	79.4%	85.0%	0.10	85.9%	92.1%	0.01
Number of snacks									
No snacks	27.4%	9.3%		6.1%	6.3%		6.7%	6.2%	
Once or twice daily	59.5%	65.3%		50.4%	64.1%		51.1%	63.3%	
≥three times daily	13.1%	25.4%	<0.001	43.5%	29.6%	<0.01	42.2%	30.5%	<0.01
Use of dental floss/tooth sticks (ref. no)									
Yes	34.8%	13.3%	<0.001	35.4%	15.7%	<0.001	58.1%	48.3%	<0.01
Last dental visit within									
Last 12 months	82.3%	85.3%		85.3%	88.0%		90.0%	92.1%	
Last 2 years	10.2%	8.5%		7.6%	7.5%		6.5%	6.3%	
Less frequent	7.5%	6.2%	0.53	7.1%	4.5%	0.49	3.5%	1.6%	0.35

Data are presented as percentages or mean with standard deviation. Data were weighted.
n, number of subjects.

Regression models were applied to assess associations between region, survey year, their interactions and variables assessing dental disease status (number of MT, FT, DT, the DMFT-index, the probability of having ≤20 teeth and ST), adjusting for potential risk factors for caries. Negative binomial regression models were applied for the highly positively skewed counts of DT and MT. Multiple linear regressions were used to model the number of FT and ST and the DMFT-index. Logistic models were applied to model the probability of having ≤20 teeth. Because East Germans were oversampled, analyses were weighted. To assess effects of region within specific survey years, linear combinations of estimators were tested using Wald tests.

Results were considered statistically significant at $P < 0.05$. Statistical analyses were performed with STATA/SE 11.0 (15) and R 2.12.1 (16).

Results

Utilization of dental services improved over time (Table 2). In West Germany, 69.9 percent of study participants of DMS I/II reported a regular utilization of dental services, in contrast to 85.9 percent in DMS IV. The corresponding numbers increased from 76.6 percent to 92.1 percent in East Germany. Additionally, differences in oral health behavior between East and West Germany diminished. The difference in the use of dental floss or tooth sticks was reduced from 21.5 percent in DMS I/II to 9.8 percent in DMS IV.

Dental health considerably changed across survey years (Table 3). In both German regions, the numbers of MT and DT and the probability of having ≤20 teeth showed significant downward trends ($P_{trend} \leq 0.001$, respectively; based on linear models). The number of FT revealed significant upward trends in both regions (West: $P_{trend} = 0.03$; East: $P_{trend} < 0.001$). Regarding the number of ST, we found a significant upward trend in West and a significant downward trend in East Germany ($P_{trend} < 0.001$, respectively). The DMFT-index showed a significant downward trend in West and a significant upward trend in East Germany ($P_{trend} < 0.001$, respectively).

Table 3 Distribution of Dental Health Variables according to Region and Survey Year

	West Germany			
Variable	DMS I	DMS III	DMS IV	P_{trend}
Number of MT	2 (1; 5)	3 (1; 5)	1 (0; 4)	<0.001
Number of FT	12 (8; 15)	12 (9; 15)	12 (9; 15)	0.03
Number of DT	1 (0; 3)	0 (0; 0)	0 (0; 0)	<0.001
DMFT-index	17 (14; 21)	17 (13; 20)	15 (11; 19)	<0.001
≤20 teeth	15.6%	14.3%	7.7%	<0.001
Number of ST	11 (7; 14)	11 (8; 15)	13 (9; 17)	<0.001
	East Germany			
Variable	DMS II	DMS III	DMS IV	P_{trend}
Number of MT	3 (1; 6)	4 (2; 7)	2 (1; 4)	<0.001
Number of FT	8 (5, 11)	10 (7; 14)	12 (9; 15)	<0.001
Number of DT	0 (0; 1)	0 (0; 1)	0 (0; 0)	<0.001
DMFT-index	14 (10; 17)	17 (12; 21)	16 (12; 19)	<0.001
≤20 teeth	17.5%	21.5%	7.6%	0.001
Number of ST	14 (11; 18)	11 (7; 16)	12 (9; 16)	<0.001

Data are presented as median with percentiles (25%; 75%) or as percentages.

Post hoc tests after regression modeling revealed statistically significant differences in the mean number of MT and the probability of having ≤20 teeth ($P < 0.05$) between West and East Germany for each survey year (Figure 1a,e). Thus, we did not observe any convergence for the number of MT and for the probability of having ≤20 teeth. East Germans had consistently more MT and a higher probability of having ≤20 teeth than West Germans. Between 1989/92 and 1997, the number of MT was constant in West Germany and slightly increased in East Germany and considerably decreased in the entire republic between 1997 and 2005. Numbers of FT and DT strongly equalized (Figure 1b,c); the effect of region was significant in 1989/92 and 1997 ($P < 0.05$) but disappeared in 2005 ($P > 0.05$). The number of ST and the DMFT-index had already converged in 1997 ($P > 0.05$, Figure 1d,f).

Discussion

We described trends in dental health in 35- to 44-year-old German adults between 1989/92 and 2005. In West Germany, the DMFT-index decreased during this period. In East Germany, the DMFT-index increased between 1989/92 and 1997 and decreased between 1997 and 2005. Numbers of MT and the probability of having ≤20 teeth considerably decreased between 1997 and 2005 in the whole republic. Numbers of FT, DT and ST and the DMFT-index equalized between West and East Germany at the latest in 2005.

In 1989, the IDZ conducted DMS I as a national representative cross-sectional study of dental health of the FRG. Because of the unforeseen reunification in 1990, data of DMS I suddenly became incomplete. Consequently, only 2 years after reunification, DMS II was conducted in 1992, methodologically and content-wise based on DMS I. Despite this time lag, we assume that data of DMS II reflect dental health of the GDR. This raises, however, the question of the impact of selective migration during the transition period. Between January 1989 and June 1992, a total of 1.127 million out of 16.675 million East Germans emigrated from East to West (17,18). After subtraction of immigrants into East Germany, the net out-migration was estimated to be about 955,000. Emigrants were more often young, men, employable and well-educated (19). Presumably, those with a higher risk for

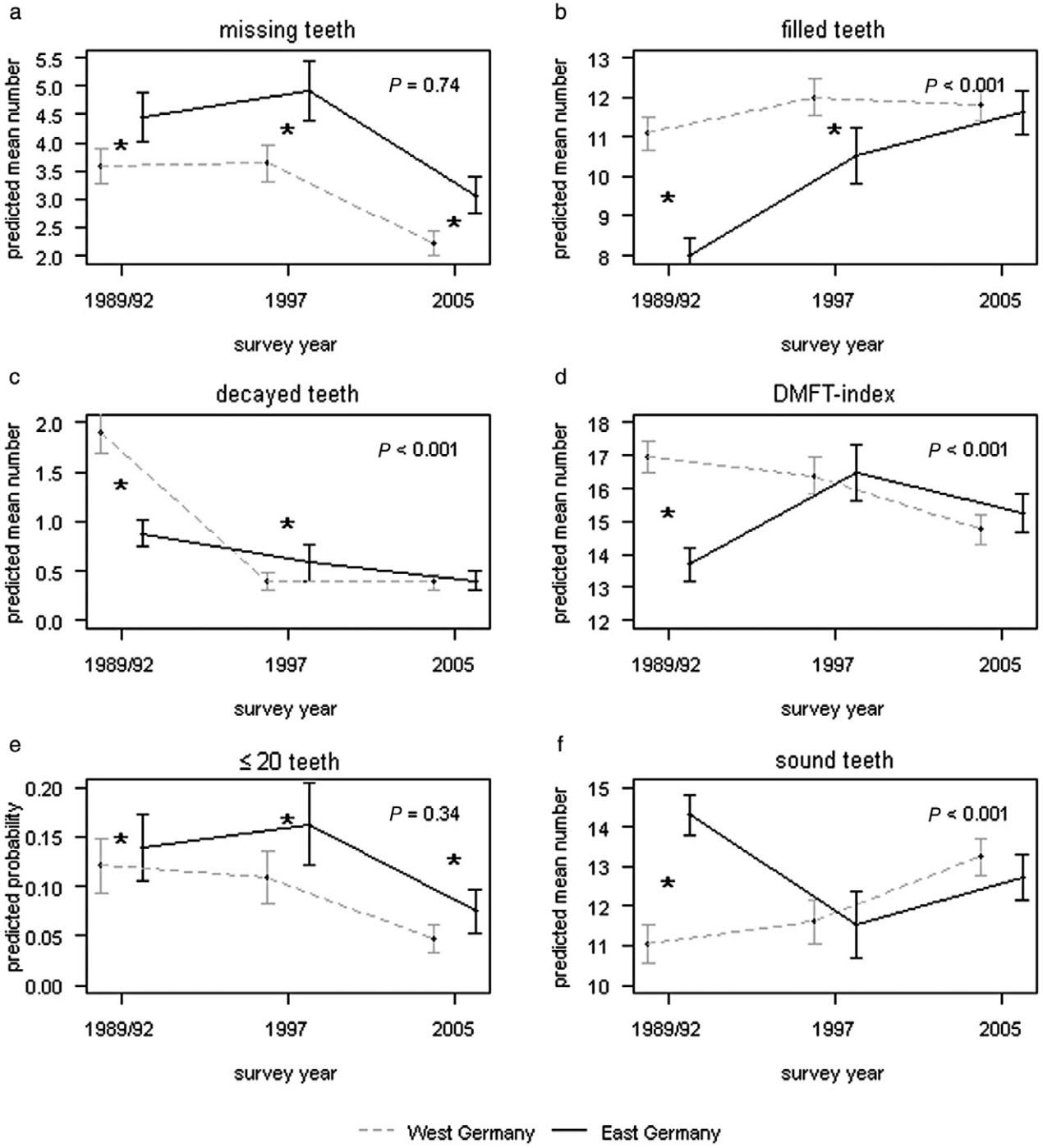

Figure 1 Trends in dental health variables [(a) number of MT, (b) number of FT, (c) number of DT, (d) DMFT-index, (e) predicted probability of having ≤20 teeth, (f) number of ST] according to region and survey year; * indicates $P < 0.05$ for differences between West and East Germany within survey years received from regression post hoc tests. *P* values are given for overall test of significance of interaction terms between region and survey year. Analyses were weighted and adjusted for gender, age, marital status, utilization of dental services, number of snacks, use of dental floss/tooth sticks, and the last dental visit, using the following types of regression: negative binomial regression (a, c), linear regression (b, d, f), and logistic regression (e). Whiskers denote 95 percent confidence intervals.

oral diseases were left behind. A case study in Saxony (former GDR) revealed that the East–West migration could have affected the decline in life expectancy between 1989 and 1990 by about 3 percent in men and 9 percent in women (20). Conclusively, the impact of selective migration on the dental variables might be negligible.

At about the same time as the reunification, the health-care reform in 1989, which introduced co-payments for medical treatments, affected dentists and patients both in West and East Germany. The observed decrease of MT both in West and East Germany between 1997 and 2005 is contrary to the hypothesis that patients allowed more teeth to be extracted as a consequence of the health-care reform. Thus, we think that the health-care reform might have had an unremarkable impact on oral health. Furthermore, there was not only one health-care reform but many other additional reforms in the 1990s, which makes a discussion of the impact of these various reforms on oral health even harder.

It is crucial to take the age cohorts' life experiences into consideration because MT and FT mainly describe past caries experience. Economically, FRG and GDR diverged after World War II. Particularly the European Recovery Program ("Marshall Plan") led to an economic boost in the FRG in the postwar era. The Soviet Union demanded huge amounts of reparations payments from the GDR, inhibiting economic growth and leading to a deprived economy.

Age cohorts were born in 1945-1954, 1948-1957, 1953-1962, and 1961-1970, respectively (Figure 2). Participants of DMS I/II were born in the early postwar years. Across the decades after World War II, improvement of general health was reflected in the steady rise of life expectancies at birth in both FRG and GDR (Figure 2). Similarly, our results showed that the number of MT and the probability of having ≤20 teeth considerably decreased between 1997 and 2005 in the whole republic, revealing a strong impact of cohort effects on

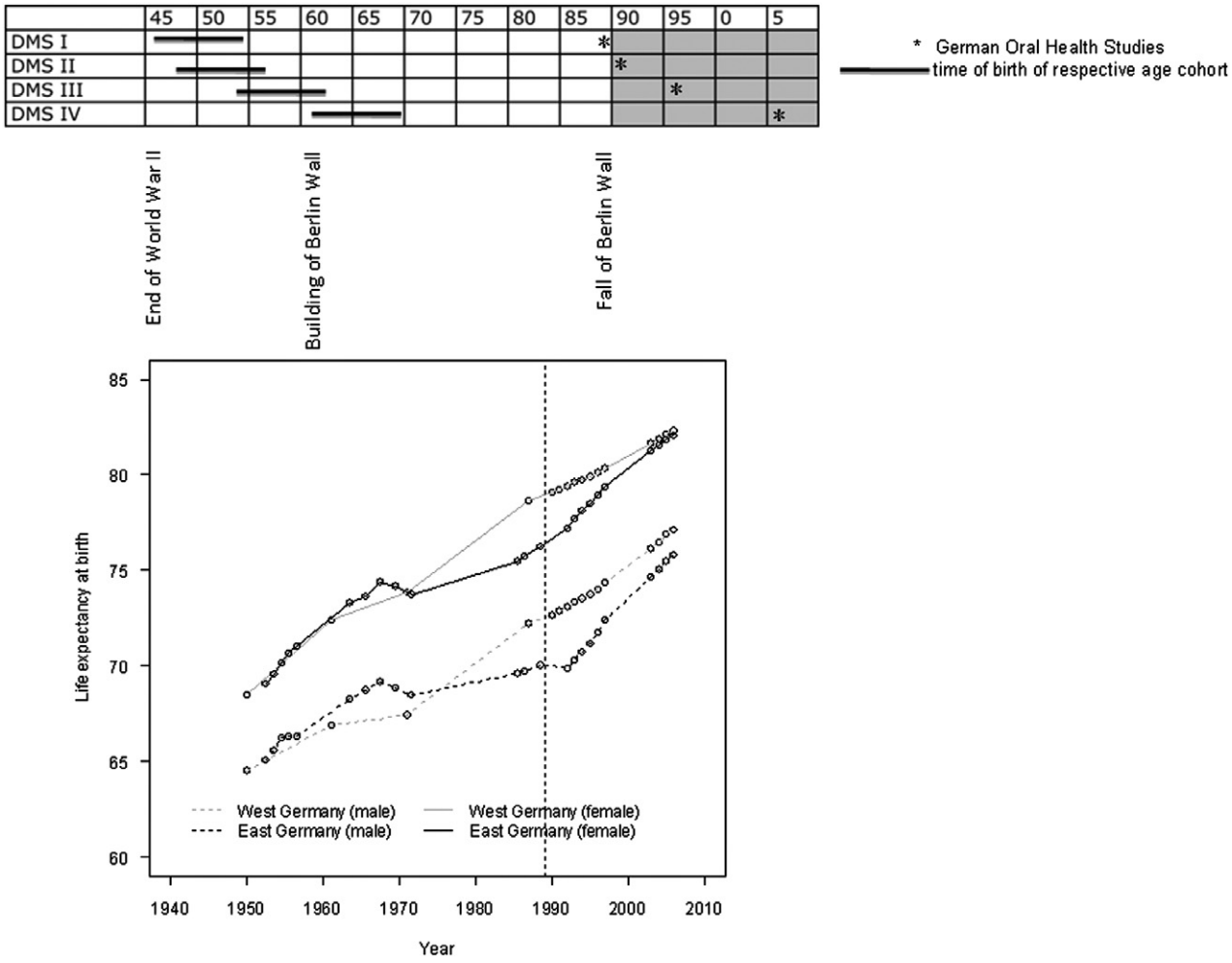

Figure 2 Period life expectancies at birth according to region and gender. Source: Human Life-Table Database (35). Vertical dashed line denotes the year of the fall of the Berlin Wall.

dental health. Improved oral health behavior might explain positive trends (Table 2).

The improvement of MT and DT and the probability of having ≤20 teeth might be further explained by the period effect of a broader use of fluoridated toothpastes, especially in East Germany after 1990 (21). Between 1985 and 1989, only 15 percent of all toothpastes were fluoridated in the GDR, in contrast to 95 percent in the FRG. The sudden increase in fluoridated toothpastes from 15 percent to 90 percent between 1990 and 1994 may have contributed to the caries decline. Participants of DMS IV were longest exposed to fluoridated toothpastes and probably benefited the most.

Another possible period effect is water fluoridation, which was implemented only locally in the former GDR (8). In DMS II, samples were drawn from 40 East German municipalities, of which six sample points had water fluoridation: Schwerin, Magdeburg, Salzwedel, Cottbus, Chemnitz (former Karl-Marx-Stadt), and Flöha (8). However, in DMS II, water fluoridation did not affect the DMFT-index of children and adolescents significantly (8). Though water fluoridation was reported to be beneficial (22), caries prevalence did not increase after cessation of water fluoridation at the end of 1993 (5). In parallel, a national caries decline was observed (6), which was explained by improvements of oral health behavior and a broader use of preventive measures, such as fluoridated salt and fluoridated toothpastes (6).

In West Germany, 13.1 percent of study participants of DMS I/II reported to eat more than three times daily some kind of snack between meals, contrary to 42.2 percent in DMS IV. The corresponding numbers increased from 25.4 percent to 30.5 percent in East Germany. High sugar consumption is a risk factor for caries (23). After World War II sugar consumption steadily increased both in FRG and GDR until the early 1970s and remained constant after 1975 with a higher consumption in the GDR (39-42 kg/person/year up to 1991) (6,24). Similar results were reported by Kramer (25), who mentioned a sugar consumption of 32.8 kg for the FRG and 40.9 kg for the GDR in 1987. After reunification, sugar consumption in East Germany decreased to 35.1 kg, which might also be explained by changes in data sources. The Western Office of Statistics reported figures for glucose and isoglucose in addition to sugar consumption (4-5 kg/person/year), which were already included in the overall sugar consumption in the GDR. Thus, changes in data sources might limit informative value and possibly explains the supposed differences in sugar consumptions between FRG and GDR before reunification (6).

Despite the high sugar consumption, the number of DT decreased in the whole republic between 1989/92 and 2005. Studies in the GDR between 1959 und 1995 impressively showed that the prevalence of caries of 12-year-olds decreased in spite of high sugar consumption, when fluorides were present due to water fluoridation (6). Sugar and caries correlate in the absence of fluorides, but this correlation weakens in the presence of fluorides, as it is the case in most industrial countries (26). However, the unique historical situation of the reunification associated with the sudden appearance of a wide range of "Western food" might have contributed to the short-term increase of the East German DMFT-index between 1989/92 and 1997.

In 1989/92 the number of FT was much higher in West compared with East Germany (Figure 1b). Consistent results were reported for an international collaborative study conducted in Leipzig (GDR, 1973) and Hannover (FDR, 1979) (3). The explanation might be found in the completely different health-care systems. Before reunification, almost all East German dentists were salaried employees. Moreover, availability of material was often poor in the GDR. Although all services were free of charge for patients, it was of no use if the resources were unavailable. By the end of 1992, 88 percent of all East German dentists moved from salaried employment into private practices (27) and adopted the Western system of reimbursement. The attitude toward tooth extraction of East German dentists changed into a tooth-maintaining attitude because East German dentists realized that each filling was covered by insurance. Consequently, the high increase of FT in East Germany between 1989/92 and 1997 led to a deterioration of the DMFT-index (Figure 1b,d).

In 1989/92 the DMFT-index was much lower in East than in West Germany, which might have been mainly attributable to the well-developed system of specialist dentists for pediatric dentistry in the former GDR. Already in 1954, unified regulations for the pediatric dentistry implying annual serial and individual examinations with subsequent treatments were introduced (28). In addition, the installation of water fluoridation in several large cities in the GDR, at a time when other preventive measures such as fluoridated salt and fluoridated toothpastes were still not available, might have contributed to the lower DMFT-index in East Germany in 1989/92.

The almost parallel curves of MT demonstrated that even East German participants of DMS IV, having lived 20-30 years in the GDR and 15 years in Germany as a whole, were not able to catch up with their Western counterparts. In the former GDR, teeth were more often extracted for caries reasons. The differences in the reasons for extractions between East and West Germany evened out just in the last 15 years (29). Only if oral prevention and operative dentistry starts early in life, a convergence of MT in West and East Germany will be achieved.

Between 1989/92 and 2005, we observed no complete convergence of dental health in West and East Germany. Similarly, other diseases also approximated without clear equality. After a peak in the early 1990s, mortality from ischemic heart disease decreased both in West and East Germany until 2000 without clear equalization (30). Unequal rates were explained by differences in cardiovascular risk factors. Hypertension is

one of the most important risk factors for cardiovascular diseases. In 1990/92, prevalence of hypertension for 25- to 69-year-olds were higher in East than in West Germany (1). This difference diminished but was still present in 1998. In addition, national health surveys in the time periods 1990-1992, 1997-1999, 2002-2003, 2003-2004, and 2004-2005 revealed higher prevalence of diabetes for East Germans than for West Germans for nearly all survey times (31). Further, life satisfaction was 1.5 points higher (of an 11-stage scale) in West Germany compared with East Germany after reunification (1). In the subsequent years, the difference reduced to 0.5 points in the mid-90s and remained constant afterward. Studies suggested that a complete convergence of general and dental health can only be expected for birth cohorts born after reunification.

Our study has strengths and limitations. The examination of trends in dental health over 16 years (1989-2005) with simultaneous consideration of socioeconomic variables is a unique feature offered by our study. One shortcoming is that smoking, alcohol drinking, and physical fitness were not consistently collected across surveys, possibly leading to residual confounding. Possibly, effects of region and survey year were slightly overestimated because controlling for smoking, for example, could have mitigated the effects. Another limitation is the potential selection bias due to the high percentage of nonresponders (28-44 percent). According to nonresponse analyses, based on a short questionnaire with basic questions sent to nonresponders, nonresponders were more often men and visited the dentist less frequently than study participants (32). However, differences were only marginal and might have only slightly affected selection bias. Potentially, disease prevalence was slightly underestimated. In addition, DMS I-IV were restricted to the German resident population because knowledge of the German language was needed to answer the questionnaires. The proportions of foreigners in the FRG were 8.0 percent in 1989, 8.2 percent in 1992, 9.0 percent in 1997, and 8.8 percent in 2005 (33). Again, disease prevalence might be slightly underestimated because migrants are more likely to suffer from dental diseases (34).

This study enlarges our understanding to which degree dental health of 35- to 44-year-olds converged in West and East Germany between 1989/92 and 2005. Solely the number of MT, which mainly describes past caries experience, did not equalize and only birth cohorts born after reunification might achieve complete convergence of oral health. Because the last study was conducted in 2005, more recent data are needed to assess the degree to which numbers of MT converge. To continue monitoring oral health in Germany, the Fifth German Oral Health Study (DMS V) is in the course of preparation and is expected to start in 2013. While maintaining all relevant examinations, this cross-sectional survey will again be representative for the German population and will sample those age groups defined by the WHO (12). Additionally, the age group >75 years will be included for the first time to collect data about morbidity and care nationwide for old and very old persons in Germany.

In summary, between 1989/92 and 2005 numbers of FT, DT, ST, and the DMFT-index converged in the 35- to 44-year-old age group. The East German DMFT-index increased between 1989/92 and 1997 and decreased slightly between 1997 and 2005, whereas the West German DMFT-index steadily decreased between 1989/92 and 2005. In addition, East Germans had consistently more MT in each survey year compared with West Germans, which indicates altogether that East Germany was not able to catch up completely with its Western counterpart.

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Supporting information

Additional Supporting Information may be found in the online version of this article:

Table S1 Incidence-rate ratios (IRR) from negative binomial regressions, coefficients (B) from multiple linear regressions and odds ratios (OR) from logistic regressions with 95 percent confidence intervals (CI) of dental health variables according to region and survey year. Analyses were weighted. X denotes the interaction term between region and survey year.
Table S2 Incidence-rate ratios (IRR) from negative binomial regressions, coefficients (B) from multiple linear regressions and odds ratios (OR) from logistic regressions with 95 percent confidence intervals (CI) of dental health variables according to region and survey year, adjusting for gender, age, marital status, utilization of dental services, number of snacks, use of dental floss/tooth sticks, and time of the last dental visit. Analyses were weighted. X denotes the interaction term between region and survey year.

