

Variation in Back Pain Between Countries

The Example of Britain and Germany

Heiner Raspe, PhD, MD,* Christine Matthis, MD,* Peter Croft, PhD, MD,†
Terry O'Neill, MD‡ and the European Vertebral Osteoporosis Study Group§

Study Design. Cross-sectional survey with personal interviews.

Objective. To study national differences in subjective health, back pain, and self-perceived disability between the United Kingdom and Germany.

Summary of Background Data. Back pain is a leading health problem in most Western populations, causing enormous costs to the national health systems. Different prevalence rates were reported from many countries, but rarely as a result of a direct comparison based on an identical study design.

Methods. A total of 6,235 male and female participants 50 to 79 years of age (population-based stratified random samples) were recruited in 6 British and 8 German study centers. The interviewer administered standardized questionnaire included a section about presence and severity of back pain.

Results. Past and current back pain was more frequent among German participants and different between East and West German centers. The differences in back pain prevalence rates could not be explained by less favorable risk profiles among German respondents.

Conclusions. Intercultural differences in perceiving or reporting back pain can be hypothesized as the most

likely explanation of the markedly different prevalence rates of the disorder in the United Kingdom and East and West Germany. [Key words: back pain, subjective health, cross-sectional study] **Spine 2004;29:1017–1021**

Back pain is universal, but few studies have attempted to compare the prevalence of this condition directly between different countries and cultures.^{1,2} Our former comparison of East and West Germany suggested markedly lower back pain prevalences in the East but was based on separate studies in two regions.³ In this study, we used data collected in a multicenter multinational European study of osteoporosis (EVOS) to compare the prevalence of back pain in British and German subjects based on a common survey instrument.^{4,5}

EVOS studied prevalence, risk factor, and impact of vertebral deformities among and across various populations. Among impact variables, back pain and back-related disability played a major role. Analyzing the association between vertebral deformities and impact variables, we found a consistent difference in back pain prevalence between British and German centers.⁶ The present publication describes, analyzes, and discusses these differences in greater detail.

■ Materials and Methods

A cross-sectional interview and examination survey of vertebral osteoporosis took place in 19 European countries between 1990 and 1992, and involved 17,342 subjects.⁷ Six U.K. and eight German centers contributed 2,255 and 3,980 subjects, respectively, 50 to 79 years of age, representing 39% of all cases in the full study sample with complete data sets (Table 1). Participating centers in both countries included general hospitals as well as different types of university departments (*i.e.*, for internal medicine, orthopaedics, radiology, public health, social medicine).

The sampling frames were National Health Service (NHS) patient lists in Britain and population registries in Germany. All participants were interviewed by trained personnel using a common standard schedule. The questionnaire had been translated into 14 European languages and subsequently back translated by professional language specialists.⁵ The final section of the interview included questions on perceived health status (1 = very good to 5 = poor), back pain (current, past year, and ever; yes/no), pain intensity of the most recent back pain (numerical rating scale, 0 = no pain to 10 = most severe pain), and a back pain-related disability questionnaire (the Hanover scale, 12 items).⁸ The latter assessment resulted in a score of functional capacity ranging from 0% (“unable” to perform any of the 12 items) to 100% (able to perform all items “without difficulty”). Current back pain was graded by a combination of

From the *Institute for Social Medicine, Medical University of Lubeck, Lubeck, Germany; †School of Postgraduate Medicine, Industrial & Community Health Research Centre, Keele University, Keele, Germany; and ‡ARC Epidemiology Unity, University of Manchester, Manchester, U.K. The European Vertebral Osteoporosis Study Group consists of: *Project Management Group*: D. Agnusdei (Siena, Italy), K. Bergmann (Berlin, Germany), C. Cooper (Southampton, UK), J. Dequeker (Leuven, Belgium), D. Felsenberg (Berlin, Germany), J. A. Kanis (Sheffield, UK), G. Kruskemper (Bochum, Germany), H. Raspe (Lubeck, Germany), A. J. Silman (Project Leader; Manchester, UK). *German Data Co-ordinating Centre (Lubeck)*: C. Matthis, H. Raspe. *Participants*: Germany: Berlin Steglitz, D. Felsenberg; Berlin Potsdam, D. Banzer; Berlin Charité, S. Kirschner, W. Reisinger; Bochum, J. Janott, H. Schatz; Erfurt, J. Franke; Heidelberg, C. Scheidt-Nave, R. Ziegler; Jena, K. Abendroth, B. Felsch; Lubeck, C. Matthis, H. Raspe; United Kingdom: Aberdeen, D. M. Reid; Bath, A. K. Bhalla, F. Ring; Cambridge, C. Todd, R. Williams; Harrow, J. Reeve; Sheffield, R. Eastell; Truro, A. D. Woolf.

Acknowledgment date: September 6, 2002. First revision date: July 14, 2003. Acceptance date: July 21, 2003.

Supported by a central coordination grant from the European Community's Concerted Action in Epidemiology Program. The central coordination was also supported by the World Health Organisation, the European Foundation for Osteoporosis and Bone Disease, and the UK Arthritis & Rheumatism Council. All centres were supported by national grants, in Germany from the Ministry for Education, Science, Research and Technology. Individual participating centres acknowledge the receipt of local support for their data collection.

The manuscript submitted does not contain information about medical device(s)/drug(s).

Federal funds were received in support of this work. No benefits in any form have been or will be received from a commercial party related directly or indirectly to the subject of this manuscript.

Address correspondence to Heiner Raspe, PhD, MD, Institute for Social Medicine, Beckergrube 43-47, D 23552 Lubeck; E-mail: heiner.raspe@sozmed.mu-lubeck.de

Table 1. Participants by Country, Age, and Sex

Country	50–54 years		55–59 years		60–64 years		65–69 years		70–74 years		75–79 years		Total	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
UK all	160	264	153	294	143	279	141	246	131	210	88	146	816	1439
West Germany	177	180	198	212	197	169	186	155	168	133	139	79	1065	928
East Germany	165	204	200	230	230	196	177	173	145	121	82	121	999	988
Germany all	342	384	398	442	427	365	363	328	313	254	221	143	2064	1916
Total	402	648	451	736	570	644	404	574	444	464	309	289	2880	3355

pain, pain intensity, and disability (Grade 0 = no current back pain, Grade 1 = current back pain with pain intensity below 5 and functional capacity above 70%, Grade 2 = current back pain with either pain intensity of 5 or more or functional capacity of 70% or less, and Grade 3 = current back pain with both, high pain intensity, and low functional capacity).⁹

In addition, demographic information (age, gender, marital status, educational level), height, and weight were recorded. The age cutoffs were 1 year lower in Germany compared with the United Kingdom. Height was classified as small, normal, and tall (males, <170 cm/170–180 cm/>180 cm; females, <160 cm/160–170 cm/>170 cm). Obesity was categorized on the base of the body mass index (BMI = weight in kg/(height in m²): BMI <20 = underweight, 20–25 = normal weight, >25–30 = obesity Grade 1, >30 = obesity Grade 2 or 3).

The complete questionnaire has been published elsewhere.⁵

All analyses were stratified by gender. Before comparison, crude back pain prevalence rates from both countries were standardized to the European standard population.¹⁰ The homogeneity across centers within each country was assessed by the likelihood ratio test. In view of a possible recall bias in data reflecting previous back pain experiences, all further analyses concentrated on current back pain. Frequencies and distributions of back pain and risk factors between countries/regions were compared using χ^2 test or one-way analysis of variance (data not shown). To control for confounding, separate logistic regression models were built for the two sexes with country, age, body height, obesity, heavy work load, and physical activity (sports) in two life periods (<25 years, 25–50 years), smoking and education (full models) as possible confounding fac-

tors.¹¹ Statistical significance was assumed if $P \leq 0.05$ and the 95% confidence interval around odds ratios did not include 1.

■ Results

The total sample size was 4,154 in Britain and 9,365 in Germany. The response rates to interview, adjusted for subjects who could not be contacted, was 54.2% and 51.0% in Britain and Germany, respectively.¹²

There was considerable variation in the prevalence of current back pain within each country or region, but the U.K. values were clearly lower than those from Germany (22% vs. 44.9% in women). The detailed breakdown is shown in Tables 2 and 3. Only intensity of current back pain (restricted to those with current back pain) showed no consistent difference between Britain and Germany.

In Table 4, the association between country/region and current back pain is summarized by odds ratios. West Germans carry a risk of back pain 2.5 to 3.5 times higher than Britains even after adjusting for several potential confounders.

■ Discussion

Back pain reported in interviews was more frequent in a German population-based interview study than in a parallel British study, using identical instruments. This differ-

Table 2. Age-Adjusted Prevalences and Means of Subjective Health Indicators: Men

Country	Center	N	BP Ever (percent yes)	BP Last Year (percent yes)	BP Now (percent yes)	BP Intensity (mean \pm SD)	BP Grade 3 (percent yes)	Function (mean \pm SD)	Health (mean \pm SD)
Germany									
West	Berlin (S)	250	88	82	45	5.0 \pm 0.55	19	80 \pm 2.8	2.8 \pm 0.22
	Bochum	284	81	73	43	5.3 \pm 0.32	15	79 \pm 3.8	3.1 \pm 0.13
	Heidelberg	283	84	60	40	5.1 \pm 0.37	10	85 \pm 3.5	3.0 \pm 0.07
	Lubeck	248	85	67	29	5.5 \pm 0.58	9	84 \pm 1.8	2.8 \pm 0.14
	Total	1065	84	71	40	5.2 \pm 0.16	13	82 \pm 1.8	2.9 \pm 0.10
East	Berlin (P)	241	78	64	33	4.0 \pm 0.31	5	87 \pm 4.7	2.9 \pm 0.09
	Berlin (C)	222	77	63	21	6.1 \pm 0.73	8	85 \pm 6.0	2.8 \pm 0.27
	Erfurt	266	79	65	36	5.2 \pm 0.50	10	86 \pm 4.1	2.9 \pm 0.16
	Jena	270	77	67	25	4.2 \pm 0.60	5	89 \pm 3.8	2.8 \pm 0.17
	Total	999	78	65	29	4.8 \pm 0.17	7	87 \pm 3.7	2.8 \pm 0.10
UK	Aberdeen	282	58	29	12	4.6 \pm 0.54	1	94 \pm 2.3	2.2 \pm 0.13
	Bath	96	65	37	18	4.7 \pm 0.49	3	94 \pm 3.6	2.1 \pm 0.39
	Cambridge	128	56	27	13	5.7 \pm 1.1	3	91 \pm 3.8	2.3 \pm 0.12
	Harrow	117	64	40	19	4.1 \pm 0.70	3	93 \pm 3.5	2.1 \pm 0.29
	Truro	193	59	32	15	5.7 \pm 0.38	8	87 \pm 3.3	2.1 \pm 0.21
	Total	816	61	32	15	4.9 \pm 0.36	4	92 \pm 2.1	2.1 \pm 0.10

BP = back pain; (C) = Charite; (P) = Potsdam; (S) = Steglitz.

Table 3. Age Adjusted Prevalences and Means of Subjective Health Indicators: Women

Country	Center	N	BP Ever (percent yes)	BP Last Year (percent yes)	BP Now (percent yes)	BP Intensity (mean ± SD)	BP Grade 3 (percent yes)	Function (mean ± SD)	Health (mean ± SD)
Germany									
West	Berlin (S)	244	91	84	51	5.7 ± 0.49	27	71 ± 4.9	2.8 ± 0.24
	Bochum	225	85	80	52	5.5 ± 0.55	30	68 ± 7.1	3.1 ± 0.13
	Heidelberg	270	91	73	48	5.4 ± 0.49	24	74 ± 6.0	3.1 ± 0.09
	Lubeck	189	91	77	40	5.6 ± 0.67	18	74 ± 4.3	2.8 ± 0.18
	Total	928	89	78	48	5.6 ± 0.16	25	72 ± 4.2	3.0 ± 0.12
East	Berlin (P)	222	88	77	49	4.9 ± 0.89	16	76 ± 5.7	3.1 ± 0.14
	Berlin (C)	227	89	83	37	5.9 ± 0.31	16	75 ± 3.4	3.1 ± 0.15
	Erfurt	285	88	80	45	5.3 ± 0.62	20	72 ± 9.2	3.0 ± 0.23
	Jena	254	89	83	34	4.7 ± 0.53	10	79 ± 3.4	3.0 ± 0.21
	Total	988	89	42	42	5.2 ± 0.43	16	76 ± 5.0	3.0 ± 0.18
UK	Aberdeen	280	61	37	19	5.8 ± 0.59	6	87 ± 3.6	2.2 ± 0.11
	Bath	102	66	42	31	5.0 ± 0.65	6	86 ± 6.8	2.0 ± 0.26
	Cambridge	272	53	28	19	5.5 ± 0.88	6	87 ± 7.3	2.5 ± 0.18
	Harrow	227	74	52	29	5.0 ± 0.65	12	83 ± 5.8	2.2 ± 0.19
	Sheffield	342	69	54	22	4.9 ± 0.33	5	81 ± 7.3	2.4 ± 0.15
	Truro	216	64	37	17	5.8 ± 0.44	8	80 ± 6.3	2.2 ± 0.28
	Total	1439	64	42	22	5.3 ± 0.32	7	84 ± 5.5	2.3 ± 0.12

BP = back pain; (C) = Charite; (P) = Potsdam; (S) = Steglitz.

Table 4. Association Between Current Back Pain and Putative Risk Factors, Adjusted for Country, School Education and Age Group (Results of Logistic Regression)

Variable	Males (n = 2,737)		Females (n = 3,355)	
	OR	95% CI	OR	95% CI
Country				
UK	1		1	
West Germany	3.47†	2.71–4.44	2.43†	1.90–3.12
East Germany	2.41†	1.87–3.11	1.93†	1.49–2.49
Age group (yr)				
50–54	1.44*	1.02–2.05	1.43	0.97–2.12
55–59	1.21	0.86–1.70	1.22	0.85–1.75
60–64	1.31	0.94–1.83	1.21	0.84–1.74
65–69	1.14	0.81–1.61	1.00	0.70–1.45
70–74	1.22	0.86–1.73	0.90	0.62–1.31
75–79	1		1	
School education (8/9 years respectively versus more)	0.97	0.80–1.18	0.78*	0.64–0.95
Vertebral deformity	1.04	0.79–1.37	1.37*	1.03–1.82
Smoking				
Now	1.15	0.89–1.47	1.20	0.93–1.55
Past, but not now	1.08	0.87–1.36	1.03	0.82–1.29
Never	1.00		1.00	
Active in sports				
up to age 25	1.15	0.94–1.42	1.11	0.91–1.35
Age 25 to 50	1.04	0.85–1.26	1.05	0.83–1.33
Heavy work load				
up to age 25	0.98	0.80–1.20	1.23*	1.01–1.52
Age 25 to 50	1.41*	1.15–1.72	1.20	0.98–1.46
Body mass index				
Underweight	1.10	0.46–2.66	0.72	0.40–1.27
Normal weight	0.84	0.66–1.09	0.66†	0.52–0.84
Obesity grade 1	0.87	0.70–1.09	0.70†	0.56–0.88
Obesity grade 2/3	1		1	
Height				
Small	0.90	0.74–1.08	0.74†	0.62–0.90
Normal	1.00		1.00	
Tall	1.14	0.87–1.49	1.15	0.73–1.82
Early menopause (before age 45)			0.85	0.56–1.30
Interaction early menopause by country (West Germany)			1.58	0.89–2.80
(East Germany)			1.75	0.99–3.07

* $P < 0.05$.† $P < 0.01$.

ence was found for current, 1-year, and lifetime recalled prevalence, and was not explained by demographic, life-style, or educational or anthropomorphic factors. Further differences between West and East Germany, with a higher prevalence in the former, confirmed earlier observations.

Subjective overall poor health status and back pain-related disability were also more frequent in Germany, a result that confirms an earlier European telephone survey, which identified Germans as perceiving themselves as having more chronic disease and incapacity compared with a number of other European populations.¹³

Bias is possible. The British sample came from NHS patient lists, whereas the German sample was drawn from population registries. Although not supported by our data on school education, a higher proportion of British respondents from lower socioeconomic classes cannot be excluded. In view of the well-known inverse social gradient of back, this would, however, lead to an artificial increase of back pain in the U.K. sample, making the observed differences even more remarkable.¹⁴

Nonresponse bias must be considered. However, for this to have influenced the comparisons, it would have to be argued that any contrasting propensity to report back pain between responders and nonresponders in the British sample was different to any contrasts in the German sample. This seems unlikely since nonresponse analyses performed separately in 20 European centers (including 5 British centers)¹⁵ and in 5 German centers¹⁶ consistently showed that both British and German subjects with back pain were more likely to take part in the survey.

Additionally, risk factor differences between British and German responders do not explain the back pain prevalence figures. The British might be less inclined to report back discomfort as “pain”; however, this is unlikely given the similarities in pain severity reported in Britain and Germany. There are different notions of the “back” in Germany, with nothing equating to the “low back” concept found in Britain. The international interviewers’ instruction hence included a region of interest drawing with a (hatched) back between D1 and the gluteal folds. This does not totally exclude that a smaller area covered by the British notion of “back” led to the lower prevalence (although this would not explain the differences between East and West Germany). Against this there are studies that show a low prevalence of thoracic or upper back pain; in a postal survey in Lubeck, Northern Germany, only 17% of those who reported back pain had exclusively upper back pain according to shading on a back pain drawing (unpublished data). Corresponding results were reported in an epidemiological survey from the United States, where in 86% of all back pain cases the primary site was the lower back.¹⁷

And last, back pain was not the major aspect of EVOS, which focused on vertebral osteoporosis. So work-related factors and other risk factors like comorbidity and depression were not included in the study.

In a recent review of literature (including our own data) the authors summarize that there is no *a priori* reason to expect any variation in the biologic basis or pathology of low back pain in the countries being compared.¹⁸ Turning to possible explanations of a real difference in back pain prevalences, there is at present no evidence for different pain thresholds in British and German subjects. Similar social security and benefit systems make it unlikely that the difference is driven solely by differences in benefit systems or welfare “stimuli.”

The remaining explanation—and the most attractive at this point—is that Germans are different in perceiving or reporting ill health, including back pain. To be substantiated, further studies with standardized pain stimuli could be helpful.

■ Key Points

- The frequency of back pain was compared in population samples of men and women in the United Kingdom and Germany.
- Past and current back pain was more frequent among German subjects with additional differences between subjects living in East and West Germany.
- Differences in the frequencies of back pain could not be explained by known risk factors.
- Intercultural differences in pain perception and/or pain reporting can be hypothesized.

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Point of View

Nortin M. Hadler, MD, FACP, FACR, FACOEM

The first authors of this paper hail from Lübeck. For some, the city conjures up images of the medieval Hanseatic League. For others, there are images of church organs that gloried in the genius of Bach. For me, it is the city that nurtured Thomas Mann. Thomas Mann was awarded a Nobel Prize in 1929 for his novel *Buddenbrooks*. But I am drawn to *The Magic Mountain*. Mann was moved to write this novel by his experiences visiting his tubercular wife in a sanitarium in Switzerland. He came to see disease as a metaphor for the spiritual ennui of those with the power to influence the sociocultural climate. That insight is relevant to this paper by Professor Raspe and his colleagues. All illness experiences are tempered by the “sociocultural influences” the authors postulate, and all narratives of distress reflect such. That truth facilitates musing on why so many more of the compatriots of Professor Raspe and Dr. Mathis feel blighted by backache than do the compatriots of the coauthors, Professor Croft and Dr. O'Neill.

Medicine is a driving force in fashioning “sociocultural influences” that perturb the illness experience. Medicine is never an independent driving force. It is subjected to sociopolitical constraints, many of which are legislated. Hence, there are important transnational differences in clinical decision-making and *pari passu* on illness experiences, including impressive differences between modern Germany and Britain. Such influence on the experience of illness is part of the process of medicalization.¹ The paper by Raspe *et al* is a window on this process.

From the Departments of Medicine and Microbiology/Immunology, University of North Carolina at Chapel Hill, and University of North Carolina Hospitals, Chapel Hill, NC.

The manuscript submitted does not contain information about medical device(s)/drug(s).

No funds were received in support of this work. No benefits in any form have been or will be received from a commercial party related directly or indirectly to the subject of this manuscript.

Address correspondence to Nortin M. Hadler, MD, Department of Medicine, 3330 Thurston Building, CB#7280, University of North Carolina, Chapel Hill, NC 27599-7280; E-mail: nmh@med.unc.edu

The Prussian template for a welfare monarchy (Reichsversicherungsordnung) at *fin de siècle* established rules for this dialectic and remains a social construction across the industrialized world a century later.^{2,3} Such ideas as national health insurance, Workers' Compensation Insurance, Social Security Disability Schemes, and impairment-based disability are a Prussian legacy. The post-World War II German economic boom (Wirtschaftswunder) took the principles of the welfare monarchy to extremes LaSalle or even Marx could not have imagined. Most economists focus on the 8 weeks of vacation as excessive. I have no problem if Germany can afford such indulgence. However, as a student of illness and its behaviors, I am long troubled by the German entitlement to rehabilitation. At the time Professor Raspe was surveying his compatriots a decade ago, this entitlement was for as much as a month each year of various forms of spa therapy for ailments that are common in the course of normal living, albeit commonly daunting. Medicalizing such ailments, while seemingly empathic, challenges anyone's concept of wellness. Any backache that might have been considered a nuisance is likely to be considered an illness worthy of recall if not redress. Backache in Germany became a burden people must endure pending spa therapy; elsewhere it remained more of an intermittent and remittent predicament with which one must cope. The results of the survey suggest that many German people inculcated a narrative of illness, of “Oh, my aching back,” between palliative visits to the spa. I can only hope that they have not been rendered resentful now that the German government has found the economic rationale to assault this entitlement.

Thomas Mann would have understood all this.

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