

Reasons for elderly patients GP visits: results of a cross-sectional study

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Objective: The aim of this study is to describe the frequency of reasons for elderly patients visits to a general practice (GP) setting.

Subjects and methods: Cross-sectional data from 8,877 randomly selected patients were assessed during a 1-year period by 209 GPs in the German federal state of Saxony. The reasons for visits, performed procedures, and results of visits were documented. In this study, the data of patients aged 65 years and older are analyzed and the procedural and nonprocedural reasons for visits are described.

Results: In all, 2,866 patients aged 65 years and older were included. The majority of patients (1,807) were female. A total of 4,426 reasons for visits were found, distributed on 363 International Classification of Primary Care-2 codes. In the mean, there were 1.5 reasons for a GP visit from each patient. The top five nonprocedural reasons for visiting the GP were: cough (1.8%), back complaints (1.6%), shoulder complaints (1.3%), knee complaints (1.1%), and dyspnea (1.0% of all reasons for visit). The top five procedural reasons for visiting the GP included follow-up investigations of cardiovascular or endocrine disorders and immunizations. The top 30 nonprocedural reasons for visits covered 21.9% of all reasons for visiting. The top 30 procedural reasons covered 54.3% of all reasons for visits.

Conclusion: The current work indicates that people aged 65 years and older consult the GP more frequently for procedural than for nonprocedural reasons. The top 30 procedural and nonprocedural reasons for visits cover ~75% of all reasons for visits in these patients.

Keywords: elderly, geriatric, general practice, primary care, reason for visit, reason for consultation

Introduction

Today, ~25% of the German population is older than 65 years and this percentage will increase further. Recent data suggested that the risk of nursing home administration has not changed over the last years and brought no evidence for a decrease in morbidity.¹ It becomes conclusive that more elderly will visit German GPs' during consultation hours. There are some studies that investigated the reasons for GP visits in Germany²⁻⁴ and other European⁵⁻⁷ and non-European⁸ countries. Data regarding the top 20 reasons for visits from elderly patients are published in the German CONTENT-study.⁴ However, in that investigation, the results are presented for two summarized groups of elderly patients: the 65- to 74-year-olds and those 75 years and older. The reasons given in the CONTENT-study reflect no symptom codes and no procedural codes of the International Classification of Primary Care (ICPC-2),⁴ this makes it hard to depict the reasons for visits in the narrow sense. Therefore, a cross-sectional review of general practice access for patients 65 years of age and older may provide an interesting perspective. Identifying and describing needs and trends in care could

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be very helpful for funding sources (eg, government, health insurances, and Medicaid/Medicare) as well as for streamlining care priorities.

The Saxon Epidemiological Study in General Practice (SESAM 2) was planned to characterize the consultation frequency, the management, and the results of visits/differential diagnoses and the significantly more frequent comorbidities of patients visiting a typical setting of mostly single-handed general practices in Germany, covering both urban and more rural areas. The registration of the contacts of elderly people was a minor part of the study. The aim of the current investigation is to describe for what reasons elderly patients visit the GPs' during consultation hours in order to illustrate their health care needs and the related demands on the GPs.

Subjects and methods

The Saxon Society of General Practice (Sächsische Gemeinschaft für Allgemeinmedizin [SGAM]) contacted all GPs in Saxony by mail. They received no incentive for the participation. The study was set out to document reasons, diagnostic and therapeutic procedures, and the results of visit (chosen diagnosis). The study design was reviewed by the Saxon Medical Association prior to the data estimation. According to the Model Professional Code for Physicians,⁹ no specific vote of an ethics committee was necessary.

Of the 2,510 physicians contacted, 270 GPs agreed to participate and 209 cooperated during the complete duration (1 year). Cross-sectional data were collected from October 1, 1999 to September 30, 2000. Case recording was carried out on 1 day a week. The day of recording for the respective week was determined by the Department of General Practice (Monday to Friday), and the choice between morning or afternoon consultation hours was made by the Department of General Practice at random. The tenth consultation of the consultation hour was selected and documented by the respective general practitioner. Multiple recording of the same patient was avoided. House calls were not taken into consideration. A total of 8,877 patients (5,050 [56.9%] female, 3,824 [43.1%] male, and three not specified) were randomly selected from the general practice offices, and 13,632 reasons for visit were encoded. In all, 2,866 of the randomly selected patients met the criterion (age 65 years or older) to be analyzed for this investigation.

A standardized data collection form was used.⁹ It was developed by GPs (Leipzig Medical School and Saxon Society of General Medicine). The form was tested and evaluated during a pilot trial (SESAM 1). Each patient's reasons for consulting, symptoms, diagnostic procedures, recent

diagnoses, and general morbidity were documented along with therapeutic procedures. As far as possible, data were documented verbatim (according to the study instructions): either as told by the patients (eg, reasons for consultation) or in the words of the physician (eg, chronic diagnoses). Owing to the random selection, the information was documented in a feasible amount of time. Only completely filled-in forms were considered.

As described elsewhere, the SESAM 2 study provides independent and unbiased cross-sectional data from a typical primary care setting.¹⁰ Because total morbidity was estimated, there is no selection bias and the data can be assumed to be representative. The ICPC-2 was used to code the reasons for the visit.¹¹ Coding with the ICPC-2 is not a standard in the German health care system. The assessed information was documented verbatim, and the coding was performed at our department to save the participating GPs' time and to ensure correct coding.

For the current work, data from all the patients who participated in the SESAM 2 study and who were 65 years and older were analyzed. Statistical analyses of the data were performed using Statistical Packages for Social Sciences (SPSS 15.0; SPSS Inc., Chicago, IL, USA).

Results

Of all the patients, 2,866 were aged 65 years or older. The majority of these elderly patients were female (1,807; 63.0%) and came at an appointed time (1,768; 61.8%). The percentage of the elderly among general practice patients is twice their percentage in the population (Table 1).

In all, 4,426 reasons for visiting were found distributed across 363 different ICPC 2-codes in the assessed patients. The mean number of reasons for visit per patient was 1.5 (Table 1). Half of the patients (1,549; 54.0%) visited for one reason, 1,017 (35.5%) for two, 271 (9.5%) for three, and 29 (1.0%) for four reasons.

Approximately half of the 30 most frequent reasons for visits were procedural. Overall, the top 30 nonprocedural and the top 30 procedural reasons for visits represent 75% of all reasons for visit in the elderly. Table 2 summarizes the 30 most frequent nonprocedural reasons for visit. The top five were cough, back complaints, shoulder complaints, knee problems, and shortness of breath. The 30 most frequent procedural reasons for visit are presented in Table 3.

Discussion

It was found that the elderly patients consult their general practitioner for procedural reasons more frequently than for

Table 1 The percentage of a respective age group in the total sample of general practice patients, the percentage of a respective age group in the German population, and the mean number of RFV per patient

Age group (years)	Male patients (n)	Female patients (n)	Ratio (M/F)	Percentage among all patients (%)	Percentage among the population ^a (%)	Sum of all RFV	Number of different reasons for visit	RFV/patient
65–69	386	478	0.81	9.73	5.3	1,302	242	1.51
70–74	333	495	0.67	9.34	4.4	1,277	231	1.54
75–79	204	418	0.49	7.00	3.4	987	192	1.59
≥80	135	416	0.32	6.21	3.9	860	189	1.56
Total	1,058	1,807	0.58	32.28		4,426	363	1.55

Notes: ^aData are based on the age distribution of the population at the end of the year 2001. Data from: <https://www-genesis.destatis.de/genesis/online>.²⁸

Abbreviations: RFV, reasons for visit; M, male; F, female.

nonprocedural reasons. The recent investigation indicates that cough, complaints of the back, the shoulder, the knee and dyspnea were the most common nonprocedural reasons for visits in the elderly patient.

The frequency of cough as a reason for visit decreased in the elderly compared to young people and adults.¹²

As supported by Ponka and Kirlew, it was found that, even in the elderly, infections of the airways are the most common cause for cough (data not shown).¹³ Macfarlane et al reported that older patients were more likely to consult for lower back pain and that the prevalence of severe lower back pain continues to increase with age.¹⁴ Furthermore,

Table 2 The 30 most common nonprocedural RFV in the total sample of patients 65 years old or older and their relative frequency (%) in different age groups[#]

ICPC	RFV*	Total (n=4,426)	65–69 years old (n=1,302)	70–74 years old (n=1,277)	75–79 years old (n=987)	≥80 years old (n=860)
R05	Cough	1.76	1.46	2.34	1.20	1.99
L02	Back symptoms/complaints	1.65	1.99	1.36	1.45	1.86
L08	Shoulder symptoms/complaints	1.29	1.59	1.56	1.13	0.58
L15	Knee symptoms/complaints	1.06	0.93	1.10	1.20	1.03
R02	Shortness of breath/dyspnea	0.99	1.00	0.84	0.88	1.28
A04	General weakness/tiredness	0.88	1.26	0.65	0.88	0.70
S06	Local redness/erythema/rash	0.86	0.60	1.10	0.69	1.03
L01	Neck symptom/complaint excluding headache	0.81	1.26	0.71	0.63	0.58
H82	Vertiginous syndromes	0.79	0.80	0.39	0.38	1.86
D01	Generalized abdominal pain/cramps	0.77	1.00	0.52	0.63	0.96
P06	Disturbances of sleep/insomnia	0.77	0.53	0.71	1.13	0.83
L03	Low back complaint excluding radiation	0.75	0.93	0.78	0.63	0.58
L04	Chest symptoms/complaints	0.75	1.00	0.65	0.38	0.96
L14	Leg/thigh symptoms/complaints	0.70	0.60	0.84	0.69	0.58
D02	Stomach pain/ache	0.68	0.80	0.65	0.88	0.32
A80	Accident/injury not otherwise specified	0.63	0.40	0.39	0.88	1.03
N17	Vertigo/dizziness (excluding H82)	0.63	0.40	0.65	0.69	0.96
L86	Lumbar disc lesion/radiation	0.59	0.86	0.65	0.32	0.45
R21	Symptoms/complaint throat	0.56	0.60	0.71	0.38	0.45
D06	Other localized abdominal pain	0.50	0.60	0.26	0.69	0.45
P01	Feeling anxious/nervous/tense	0.50	0.46	0.71	0.38	0.32
L17	Foot and toe symptoms/complaints	0.47	0.80	0.39	0.38	0.26
S02	Pruritus (excluding D05 X16)	0.47	0.33	0.39	0.69	0.58
K01	Pain attributed to heart	0.45	0.46	0.32	0.38	0.70
K07	Swollen ankles/edema	0.45	0.33	0.52	0.38	0.58
D11	Diarrhea	0.43	0.66	0.26	0.32	0.45
N01	Headache (excluding N02 N89 R09)	0.43	0.66	0.45	0.19	0.26
U01	Painful urination	0.43	0.40	0.26	0.88	0.26
A03	Fever	0.41	0.53	0.06	0.32	0.83
L12	Hand and finger symptoms/complaints	0.41	0.46	0.52	0.50	0.00
Sum		21.87	23.69	20.77	20.17	22.68

Notes: [#]Relative frequency is always related to all RFV (procedural and nonprocedural) as indicated by the absolute number (n) given for each age group in the head of the table. *Codes used in this column are ICPC codes.

Abbreviations: RFV, reasons for visit; ICPC, International Classification of Primary Care.

Table 3 The 30 most common procedural RFV in the total sample of patients 65 years old or older and their relative frequency (%) in different age groups[#]

ICPC	RFV*	Total (n=4,426)	65–69 years old (n=1,302)	70–74 years old (n=1,277)	75–79 years old (n=987)	≥80 years old (n=860)
K63	Follow-up visit unspecified	12.47	11.08	12.92	12.98	13.39
T63	Follow-up visit unspecified	5.92	5.97	5.84	5.55	6.28
K31	Medical examination/health evaluation partial	4.29	4.31	4.15	3.66	5.25
K39	Physical function test	4.16	3.98	3.83	4.54	4.42
A44	Immunization/preventive medication	3.93	4.31	4.02	3.72	3.46
T34	Blood test	3.66	2.85	3.83	4.16	4.10
K50	Medication/prescription/injection	3.10	2.79	2.92	3.84	3.01
A63	Follow-up visit unspecified	3.07	2.99	2.99	3.47	2.88
A50	Medication/prescript/injection	1.97	1.39	1.62	1.70	3.59
A30	Medical examination/health evaluation complaint	1.29	1.13	1.23	1.45	1.41
S56	Dressing/compression/packing	1.24	1.13	1.49	1.51	0.70
K34	Blood test	1.15	1.06	1.49	1.32	0.58
T50	Medication/prescript/injection	1.15	1.33	1.43	1.13	0.58
T31	Medical examination/health evaluation partial	0.79	0.93	1.04	0.63	0.45
L31	Medical examination/health evaluation partial	0.59	0.53	0.71	0.82	0.26
B34	Blood test	0.56	0.53	0.84	0.50	0.26
R31	Medical examination/health evaluation partial	0.50	0.86	0.26	0.38	0.45
R63	Follow-up visit unspecified	0.45	0.20	0.39	0.82	0.45
T61	Results of examination/procedures from other providers	0.45	0.53	0.45	0.50	0.26
T60	Results of test/procedures	0.43	0.53	0.39	0.63	0.13
K58	Therapeutic counseling/listening	0.38	0.33	0.45	0.69	0.00
K61	Results of examination/procedures from other providers	0.38	0.40	0.26	0.50	0.45
L63	Follow-up visit unspecified	0.36	0.13	0.65	0.32	0.32
A61	Results of examination/procedures from other providers	0.32	0.46	0.39	0.32	0.00
A31	Medical examination/health evaluation partial	0.29	0.20	0.26	0.63	0.13
A60	Results of test/procedures	0.29	0.13	0.32	0.63	0.13
D61	Results of examination/procedures from other providers	0.29	0.40	0.06	0.50	0.26
A62	Administrative procedure	0.27	0.40	0.32	0.13	0.26
L50	Medication/prescript/injection	0.27	0.53	0.00	0.32	0.26
D63	Follow-up visit unspecified	0.25	0.13	0.32	0.19	0.32
Sum		54.29	51.56	54.92	57.54	54.01

Notes: [#]Relative frequency is always related to all RFV (procedural and nonprocedural) as indicated by the absolute number (n) given for each age group in the head of the table. *Codes used in this column are ICPC codes.

Abbreviations: RFV, reasons for visit; ICPC, International Classification of Primary Care.

the frequency of shoulder complaints increases with age. Shoulder complaints were found in a comparable frequency (1.3% of all reasons for visit and 2.0% of all elderly who consulted) as has been reported by others (0.7%,¹⁵ 1.7%,³ and 2.4%¹⁶). As previously reported, data from the SESAM 2 study and the Dutch Transition Project suggest that dyspnea occurs more frequently among the elderly as a recurrent symptom of chronic diseases.¹⁷

It is not surprising that the reasons for visit of elderly patients differ from those of younger people and from those of the total number of patients visiting a daily general practice setting.^{3,5,6,12,18} Procedural reasons for visit were at a rate of twice the frequency of nonprocedural reasons for visit in elderly patients. The most common reason was the monitoring of cardiovascular or endocrine disorders (Table 3). The frequency of procedural reasons for visit reflects the long-term care that GPs provide for their elderly patients. This is

in accordance with the results of others who reported that the frequency of patients who visit for symptoms or complaints decreases with age.^{2,3}

The average number of reasons for visit per patient did not differ significantly between children,¹² adults (data not published), or the elderly (Table 1) in the SESAM 2 study. However, this finding should be interpreted with care since the reasons for visit were documented by the GPs according to what the patients said and patients were not explicitly asked for all their reasons for visit. Furthermore, the estimation of reasons for visit can be different among GPs, that is, dependent on the sex of the general practitioner.¹⁹ It was reported from a Croatian group that most patients visit for one reason.²⁰ In diabetic patients, a mean of 2.1 reasons for visit per consultation was reported.⁶

In the current investigation, the sample size was relatively small. This limits the information regarding the frequency of

rare reasons for visit as well as the information with respect to the spectrum of reasons for visit. Regarding the spectrum of different reasons for visit, it should also be taken into account that home visits were not taken into consideration. Since it is likely that it is the more mobile or healthier elderly who visit the general practitioner's office, the estimated patient sample is not representative for the whole practice population of elderly patients and does not reflect the complete spectrum of health care needs in that context.

Strengths of the recent investigation

The total morbidity was assessed from randomized patients in a daily general practice setting during a 1-year period. This avoided attention bias toward specific reasons for visit. In contrast to comparable general practice studies,^{3,21,22} a high absolute number of GPs participated in this study. This makes the data resistant toward, for example, practice-to-practice variations of the underlying patient population (eg, sociodemography, morbidity) and the physicians' behavior (eg, therapeutic approaches, coding), which is a relevant difference to other studies that assessed reasons for visit in different countries.^{3,21,22}

Weaknesses of the recent investigation

It has to be critically mentioned regarding the underlying patient sample that there is hardly any information documented with regard to the sociodemographic background. However, with regard to other investigations in a similar setting, it should be considered that the age distribution of patients is similar and that the SESAM 2 study is based on a comparatively large number of GPs.²³ Another limitation is that a total estimation of all consulting patients was not possible; therefore, sequence effects in the structure of the consultation hour could have influenced the results. The data were not estimated by specific investigators (eg, by extracting the information from video-taped consultations) but by the instructed GPs.

The representativeness of this study might be limited to some extent by the relatively low rate of participating GPs. Although participation was at a usual rate in the field of general practice research, it is likely that the relatively high demands of the study (reporting cases during 1 year, giving no incentives for participation) were deterrent for many potential participants. Unfortunately, there is no data basis that would allow comparison of the participating GPs in detail with respect to representativeness to all GPs in Saxony. However, it should be considered that there is no necessary link between a low response rate and a response bias.^{24,25}

The SESAM 2 study was based on single consultations and not on episodes of care. As a result, there are no follow-up data. Since every patient was recorded only once, the burden of recurring or chronic health problems in the consultation hour may have been underestimated. Moreover, the results reported here may underestimate the current workload for the care of elderly patients since the data were estimated years ago and the mean age of the Saxon population increased from 42.6 years in 1999 to 46.6 years in 2013 during that time.^{26,27}

Conclusion

The current work indicates that people aged 65 years and older consult the GP more frequently for procedural than for nonprocedural reasons. It highlights the importance of the GP in the treatment of common cardiovascular or endocrine disorders in the elderly. The top 30 procedural and nonprocedural reasons for visit cover ~75% of all reasons for visit in these patients.

As a practical implication, the present results may be used to determine and prioritize important educational contents concerning the education and training of GPs and general practice residencies. All physicians working in general practice settings should be familiar with the common reasons for visit among the elderly patients and its management. Furthermore, there are several implications for future research. Since the reported data were estimated some time ago, future studies should investigate possible changes regarding the frequencies of the common reasons for visit among the elderly patients in a general practice setting. Also comparisons to data from other populations would broaden the perspective regarding this topic. Future research should also describe the related episodes of care more deeply (eg, by reporting procedures, results of visits, follow-up data) to provide a comprehensive view on the care of elderly patients in the consultation hour of GPs.

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Disclosure

The authors report no conflicts of interest in this work and that there are no familial relationships between authors.

References

- Braunseis F, Deutsch T, Frese T, et al. The risk for nursing home admission (NHA) did not change in ten years – a prospective cohort study with five-year follow-up. *Arch Gerontol Geriatr.* 2012;54(2):e63–e67.
- Schach E, Schwartz F, Kerek-Bodden H. *Die EYaS-Studie. Eine Erhebung über die ambulante medizinische Versorgung in der Bundesrepublik Deutschland.* [The EYaS-study. An assessment of ambulatory medical care in the Federal Republic of Germany]. Köln: Deutscher Ärzte-Verlag; 1989. German.
- Kühlein T, Laux G, Gutscher A, et al. *Kontinuierliche Morbiditätsregistrierung in der Hausarztpraxis – Vom Beratungsanlass zum Beratungsergebnis.* [Continuous registration of morbidity in general practice – from reason to result of encounter]. München: Urban & Vogel; 2008:48–57. German.
- Kühlein T, Laux G, Gutscher A, et al. *Versorgungsforschung in der Hausarztpraxis – Ergebnisse aus dem CONTENT-Projekt 2006–2009.* [Health service research in general practice – Results from the CONTENT-project 2006–2009]. München: Urban & Vogel; 2010:88–89. German.
- Nylenna M. Why do our patients see us? A study of reasons for encounter in general practice. *Scand J Prim Health Care.* 1985;3(3):155–162.
- Botica MV, Zelic I, Renar IP, et al. Structure of visits persons with diabetes in Croatian family practice – analysis of reasons for encounter and treatment procedures using the ICPC-2. *Coll Antropol.* 2006;30(3):495–499.
- Lamberts H, Oskam SK, Okkes IM. The clinical relationship between symptoms and the final diagnosis in general practice, determined by means of posterior probabilities calculated on the basis of the Transition Project. *Ned Tijdschr Geneesk.* 2005;149(46):2566–2572.
- Britt HC, Miller GC. The BEACH study of general practice. *Med J Aust.* 2000;173(2):63–64.
- Wockenfuss R. *Überprüfung der Reliabilität der ICD-10 in der Allgemeinmedizin.* [Checking the reliability of the ICD-10 in general medical practice] Leipzig: Medical Faculty; 2010:139–141. German.
- Wockenfuss R, Frese T, Herrmann K, et al. Three- and four-digit ICD-10 is not a reliable classification system in primary care. *Scand J Prim Health Care.* 2009;27(3):131–136.
- Soler JK, Okkes I, Wood M, et al. The coming of age of ICPC: celebrating the 21st birthday of the International Classification of Primary Care. *Fam Pract.* 2008;25(4):312–317.
- Frese T, Klauss S, Herrmann K, et al. Children and adolescents as patients in general practice – the reasons for encounter. *J Clin Med Res.* 2011;3(4):177–182.
- Ponka D, Kirlew M. Top 10 differential diagnoses in family medicine: cough. *Can Fam Physician.* 2007;53(4):690–691.
- Macfarlane GJ, Beasley M, Jones EA, et al. The prevalence and management of low back pain across adulthood: results from a population-based cross-sectional study (the MUSICIAN study). *Pain.* 2012;153(1):27–32.
- Jordan KP, Kadam UT, Hayward R, et al. Annual consultation prevalence of regional musculoskeletal problems in primary care: an observational study. *BMC Musculoskelet Disord.* 2010;11:144.
- Linsell L, Dawson J, Zondervan K, et al. Prevalence and incidence of adults consulting for shoulder conditions in UK primary care; patterns of diagnosis and referral. *Rheumatology (Oxford).* 2006;45(2):215–221.
- Frese T, Sobeck C, Herrmann K, et al. Dyspnea as the reason for encounter in general practice. *J Clin Med Res.* 2011;3(5):239–246.
- Mansson J, Nilsson G, Strender LE, et al. Reasons for encounters, investigations, referrals, diagnoses and treatments in general practice in Sweden – a multicentre pilot study using electronic patient records. *Eur J Gen Pract.* 2011;17(2):87–94.
- Harrison CM, Britt HC, Charles J. Sex of the GP – 20 years on. *Med J Aust.* 2011;195(4):192–196.
- Ozvacic Adzic Z, Katic M, Kern J, et al. Patient, physician, and practice characteristics related to patient enablement in general practice in Croatia: cross-sectional survey study. *Croat Med J.* 2008;49(6):813–823.
- Mansson J, Nilsson G. Reasons for encounters, investigations, referrals, diagnoses and treatments in general practice in Sweden – a multicentre pilot study using electronic patient records. *Eur J Gen Pract.* 2011;17(2):87–94.
- Kenter EG, Okkes IM, Oskam SK, et al. Tiredness in Dutch family practice. Data on patients complaining of and/or diagnosed with “tiredness”. *Fam Pract.* 2003;20(4):434–440.
- Frese T, Hein S, Sandholzer H. Feasibility, understandability, and usefulness of the STEP self-rating questionnaire: results of a cross-sectional study. *Clin Interv Aging.* 2013;8:515–521.
- Robertson J, Walkom E, McGettigan P. Response rates and representativeness: a lottery incentive improves physician survey return rates. *Pharmacoepidemiol Drug Saf.* 2005;14:571–577.
- McFarlane E, Olmsted MG, Murphy J, et al. Nonresponse bias in a mail survey of physicians. *Eval Health Prof.* 2007;30(2):170–185.
- Bevölkerungsstruktur des Freistaates Sachsen am 31. Dezember 1998 bis 2005. [Population structure of the Free State of Saxony on 31 December 1998 to 2005]. Available from: http://www.statistik.sachsen.de/download/010_GB-Bev/02_02_071_t_nZ.pdf. Accessed August 25, 2015. German.
- Bevölkerungsstruktur des Freistaates Sachsen am 31. Dezember 2006 bis 2014. [Population structure of the Free State of Saxony on 31 December 1998 to 2014] Available from: http://www.statistik.sachsen.de/download/010_GB-Bev/02_02_072_t_nZ.pdf. Accessed August 25, 2015.
- GENESIS-Online Datenbank [webpage on the Internet]. Available from: <https://www-genesis.destatis.de/genesis/online>. Accessed January 12, 2016. German.

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