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In this issue:

Editorial

In the preceding issues of EKIV Newsletter (no. 1/2010 and 2/2010) we reported on current interim results of the evaluation project „Identification and reduction of over-use, under-use, and mis-use of health services: health service evaluation through analysis of health insuerers' administrative data (claims data)". This project is conducted by PMV research group (head: Dr. Ingrid Schubert) at the University of Cologne, Germany. The research question is whether morbidity, utilisation of health services, and service quality in the Kinzigtal region develop in a different manner than in the „normal care system" in the rest of Baden-Württemberg.

In the last issue of our newsletter we focused on osteoporosis-related indicators.[1] In this issue we report on interim results of that project with respect to another health indication: dementia. Similar to osteoporosis, dementia is a disease affecting first of all people who are in their higher age, and it is a disease which will become more and more relevant to our "aging" European societies.

On page 10 we present current data on *Gesundes Kinzigtal* Integrated Care (GKIC) including current numbers of enrolled assureds and the number of participants in GKIC's preventive programmes.

Questions on the topics of our newsletter – as well as any kind of feedback – are always welcome. We will be happy to answer your email (to info@ekiv.org or ekiv@medsoz.uni-freiburg.de) soon.

With best regards,

Achim Siegel & Ulrich Stoessel

[1] Cf. EKIV Newsletter 2/2010: http://www.ekiv.org/pdf/EKIV-Newsletter_2-2010_English_version.pdf.

Evaluation of *Gesundes Kinzigtal* Integrated Care (GKIC):

Health service evaluation through analysis of health insurers' administrative data (claims data), part III: indicators on dementia-related services

In this article we report selected interim results of the evaluation study „Identification and reduction of over-, under-, and mis-use of health services: health service evaluation through analysis of health insurers' administrative data (claims data)." Hereafter we refer to this study as the „OUM study" or „OUM project". As already mentioned in the editorial, the OUM study is conducted by PMV research group (head: Dr. Ingrid Schubert) at the University of Cologne. The responsibility for the selection and interpretation of the following interim results lies with the editors and authors of this newsletter.

Aim and design of the OUM study

In the preceding issue of EKIV Newsletter (no. 2/2010) we described the aim and design of the OUM study in detail.[2] For this reason a short summary will do enough here. The central research question of the study is whether

- certain diseases,
- selected health service utilisation figures indicating service quality, and
- over-, under-, and misutilisation of services

are (or become) less or more prevalent in the intervention region (Kinzigtal region) compared with "normal care". The study design conforms to the rules of a quasi-experimental, population-based controlled trial: The intervention group consists of all those people living in the Kinzigtal region who are insured by health insurers AOK BW or LKK BW (about 30.000 people). The control group consists of a random sample of AOK BW and LKK BW assureds (about 500.000 people) from the rest of Baden-Württemberg. Baden-Württemberg (abbreviated hereafter as BW) is a German *Bundesland* in Southwest Germany.

When comparing global indicators or prevalences (Kinzigtal region vs. BW), the results of the BW control group are standardized with respect to age and sex according to the age and sex distribution of the Kinzigtal group (intervention group). In order to compare disease-specific indicators, for every Kinzigtal assured with the concerning disease a sample of five BW assureds with the same disease and the same age and sex (matched pairs) is randomly selected from the overall BW sample.

The following results contain the data of AOK BW and LKK BW assureds *with continuous insurance during each single year of that period* or of AOK BW and LKK BW assureds *who have deceased during the year*. That means the data of those assureds who changed their residence during the year and e.g. moved from the Kinzigtal region to another part of Germany (or vice versa) or who contracted out from AOK BW or LKK BW during the year are not considered.

Selected interim results on dementia and dementia-related quality indicators[3]

As reported in the last issue of EKIV newsletter, the number of LKK BW assureds in the Kinzigtal region (as well as in the whole of Baden-Württemberg) is considerably smaller than the number of AOK BW assureds. For example, around 1.700 LKK BW assureds live in the service area of GKIC compared to about 29.300 AOK BW assureds. When conducting analyses with respect to LKK BW assureds – or even subgroups of them –, we regularly encounter the problem of very small numbers. Therefore we will only refer to AOK BW assureds in the following paragraphs. The following results are based on data concerning the period 2004-07; 2004 is conceived as the baseline year.

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[2] Cf. EKIV Newsletter 2/2010 (http://www.ekiv.org/pdf/EKIV-Newsletter_2-2010_English_version.pdf), p. 3.

[3] The following results have been excerpted from PMV research group's original study report: Koester I, Ihle P & Schubert I (2010): Evaluationsmodul der IVGK "Identifizierung und Abbau von Über-, Unter- und Fehlversorgung. Erster Zwischenbericht für Gesundes Kinzigtal GmbH, hier: AOK-Daten", Cologne: unpubl. ms.

Administrative prevalence of dementia

In table 1 we present the administrative prevalence of dementia among AOK BW assureds who live in the Kinzigtal region (intervention group) and in the rest of BW (random sample BW, control group). The standardisation refers only to the assureds from 18 years and older because data on younger assureds are not available in the BW sample. When calculating the administrative prevalence of dementia, PMV research group refers to assureds with an *internally validated case of dementia*. The following results are based exclusively on internally validated cases. A case of dementia (ICD-10 codes F00, F01, F02, F03, F05.1 or G30) is considered internally valid if one of the following three conditions has been met in the concerned assured's claims data:

(1) hospital stay in a given year with an ICD-10 dementia code (as specified above) as the principal discharge diagnosis;
(2) an ICD-10 dementia code in at least two quarters of a given year;
(3) at least two prescriptions of specific antidementive drugs[4] in a given year, prescribed by the diagnosing clinician in that quarter in which the diagnosis was made.

Table 1: Proportion of AOK BW assureds with dementia

	Patients with an internally validated case of dementia								
	Kinzigtal					age >= 18 years			
	IC assureds		non-IC assureds		total	Kinzigtal	stand.BW*	change (2004 = 100)	
year	number	%	number	%	%	%	%	Kinzigt.	stand.BW*
2004	15	0.8	454	1.8	1.7	2.1	2.0	100	100
2005	27	1.4	485	1.8	1.8	2.2	2.3	105	115
2006	25	1.2	515	1.9	1.9	2.3	2.4	110	120
2007	38	1.9	515	2.0	2.0	2.4	2.6	114	130

*) sample BW standardised with respect to the age and sex distribution of the Kinzigtal population of a given year

As can be seen from table 1, the administrative prevalence of dementia in 2007 is slightly lower in the adult Kinzigtal population (2.4%) compared with the BW sample (2.6%). Similarly, the prevalence in the Kinzigtal region has increased at a somewhat lower rate compared to the BW control sample (14% vs. 30% in 2004-07). When interpreting these data it should however be kept in mind that dementia – particularly in its initial stage – is not always detected in clinical routine; for this reason the *administrative* prevalence of dementia may *not adequately* reflect its *true* prevalence.

Distribution of patients according to type of dementia

As is commonly known, the generic term „dementia" comprises several types of diseases, each one having a characteristic etiology; combinations are possible. Post-mortem examinations revealed the following distribution of dementia types (among all patients with a dementia syndrome): [5]

- Alzheimer's disease: 60%
- vascular dementia: 16%
- Alzheimer's disease in combination with vascular dementia: 8%
- Alzheimer's disease in combination with Parkinson's disease: 8%
- other causes[6] of dementia syndrome: 8%.

[4] The following substances have been included here: cholinesterase inhibitors (ATC code N06DA), memantine (N06DX01).
[5] Cf. Koester et al. 2010: 147. The quotation is based on the following guideline: Arzneimittelkommission der deutschen Ärzteschaft (AkdÄ): Empfehlungen zur Therapie der Demenz. Arzneiverordnung in der Praxis, Bd. 31. Update 12.2004.
[6] Among these are, e. g., depression, hypothyroidism, vitamin B 12 deficiency or adverse drug reactions.

In clinical routine it is often difficult – if not impossible – to make a valid diagnosis of the type of dementia in a given patient. This concerns first of all the diagnosis of Alzheimer's disease for which until now there are no sufficiently sensitive and specific diagnostics available in clinical routine.

Therefore the distribution of the various types of dementia appears different if we refer to health insurers' administrative data which reflect the diagnoses made in clinical routine contexts. In the OUM study the following distribution was found (table 2):

Table 2: Distribution of patients with dementia in 2007 according to the diagnosed type of dementia

	proportion of patients (in %) with diagnosis				
	Kinzigtal			age >= 18 years	
diagnosis	IC assureds	non-IC assureds	total	Kinzigtal	stand.BW*
Alzheimer's disease (AD)	19.0	18.9	18.9	18.9	18.5
vascular dementia	25.9	14.6	15.5	15.5	23.4
AD + vascular dementia	1.7	2.5	2.5	2.5	5.0
solely other diagnoses	53.4	63.9	63.2	63.1	53.1

Table 2 demonstrates that in 2007 Alzheimer's disease was solely diagnosed in about 19% of patients with dementia in both the intervention group and the control sample. Significantly, in more than half of all patients with dementia there was no clear, defined diagnosis at all ("solely other diagnoses"); this concerns 63% of all dementia patients in the intervention region and 53% in the BW sample. Moreover, the validity of the remaining diagnoses – i.e., e.g., Alzheimer's disease or vascular dementia – is doubtful, for reasons that have been outlined above.

This implies an important limitation for all analyses of dementia-related service quality which we report hereafter: Because evidence-based guidelines recommend different treatments for patients with different types of dementia respectively, many of the following analyses are based on less than half of all patients with dementia. Furthermore, as the validity of specific diagnoses (of a given type of dementia) made in clinical routine has to be rated as doubtful, the results based on these diagnoses should be interpreted with great caution. This should be kept in mind during the following sections.

Problems with indicators demonstrating a potential under-use of health services

Since many years the treatment of patients with Alzheimer's diseases is controversial: Advocates of a treatment with antidementive drugs (such as anticholinesterase inhibitors or memantine) suggest that treatment is effective which leads them to derive a blatant under-use of antidementive drugs. Sceptics, however, point to contradictory study results, doubting the efficacy of antidementive drugs for the bulk of patients. In any case it is a fact that not all antidementive drugs are admitted for all forms of dementia; restrictions hold in particular in case of severe forms. Furthermore, it is evident that not all patients respond to antidementive drugs. For these reasons PMV research group has refrained from constructing a regular *quality* indicator on this aspect. Instead, by calculating the proportion of patients with Alzheimer's disease who receive antidementive drugs, the research group proposes a kind of "background information" which, however, does not imply a statement on service quality.

Correspondingly, in the Kinzigtal region 34% of patients with a diagnosed Alzheimer's disease received at least one prescription of antidementive drugs in 2007. Among the control group (BW sample) this holds for 42% of all patients with a diagnosis of Alzheimer's disease.

More conclusive seems to be a quality indicator reflecting the relative frequency of follow-up examinations when a treatment with antidementive drugs has been started. According to treatment

guidelines, follow-up examinations are to provide the necessary evidence for individual treatment decisions by testing patients' treatment response. Such an indicator would illustrate the proportion of those patients (with Alzheimer's disease and with at least one antidementive drug prescription year) whose treatment response was tested in at least one follow-up examination in the given year.
In the OUM project the following results were found: In 2004 – the baseline year – the proportion of patients with follow-up examination was rather low in both populations (below 30%); in the Kinzigtal region it was somewhat higher (28%) than in the BW control sample (24%). In 2007 the proportion had slightly increased in the control sample (26%) but had decreased in the Kinzigtal region, amounting to only 20%. Irrespective of the very low number of cases, these results would – in principle – indicate that service quality in the Kinzigtal region had deteriorated in this respect both in absolute and comparative terms. However, when in 2009 we discussed this topic with clinicians from the Kinzigtal region we learnt that in the preceding years out-patient physicians in the Kinzigtal had proceeded to rely more and more on cognitive tests and examinations made by some of the nursing homes in the region (which had become partner organisations of GKIC in the meantime) which was obviously the reason why physicians tended to discontinue their own follow-up examinations. As tests and examinations made by nursing homes are usually not contained in health insurers' administrative data, the new cooperation pattern between out-patient physicians and nursing homes in the Kinzigtal region would lead us to underrate the prevalance of follow-up examinations in the region. For this reason we can neither rely on this indicator for quality assessments.

Which indicators might then be used for assessing dementia-related health service quality in the OUM study?

Dementia-related indicators demonstrating a potential over- or mis-use of health services

From health insurers' administrative data one can still construct some indicators reflecting a potential over- or mis-use of certain health services. Thus, e. g., treating patients with Alzheimer's disease with nootropics represents an over- or even mis-use of nootropics according to evidence-based recommendations.[7] Correspondlingly, one may calculate the proportion of patients with Alzheimer's disease who received nootropics in a given year. The higher this proportion, the more proncouned is the over- or mis-use of nootropics in this domain. In the OUM study the following results were found:

Table 3: Proportion of patients with Alzheimer's disease treated with (non-recommended) nootropics[8]

	Patients with an internally validated case of dementia, here: patients with Alzheimer's disease, thereof with nootropics						
	Kinzigtal			age >= 18 Jahre		change (2004 = 100)	
year	IC assureds** %	non-IC assureds** %	total %	Kinzigtal %	contr.BW* %	Kinzigt.	contr.BW*
2004	0.0	4.0	3.9	3.9	3.9	100	100
2005	0.0	3.8	3.7	3.7	3.9	95	100
2006	0.0	1.5	1.5	1.5	2.5	38	64
2007	0.0	0.8	0.7	0.7	3.0	18	77

* controls BW: for every Kinzigtal assured with Alzheimer's disease, five controls of the same age and sex and with Alzheimer's disease were randomly selected from the overall BW sample (matching ratio: 1:5)

** IC assureds and non-IC assureds: less than 10 cases in at least some years

Table 3 demonstrates that in 2004 the level of over-use/mis-use of nootropics amounted to exactly the same level (3.9%) in the intervention group and the control group. In the course of the following three

[7] Cf. Koester et al. 2010: 161f.
[8] Drugs with the following ATC codes are covered by the generic term „nootropics": N06BX03, N06DX13, N06DX07, N06DX57.

years 2005-07, the level of over-use/mis-use decreased in the intervention group at a considerably higher rate compared with the control group: In 2007, the level of 2004 had been reduced by 82% in the Kinzigtal region and by 23% in the control sample. However, the very low number of cases limits the relevance of this statement.
A further indicator reflects a potential over-use/mis-use with respect to the treatment of patients with vascular dementia: the proportion of patients with vascular dementia who receive specific anti-dementive drugs in a given year (table 4). According to the available evidence, treating patients who suffer from vascular dementia with anticholinesterase inhibitors or memantine is rated as ineffective.[9]

Table 4: Proportion of patients with vascular dementia treated with (non-recommended) antidementive drugs

	Patients with an internally validated case of dementia, here: patients with vascular dementia, thereof with antidementive drug prescription							
	Kinzigtal				age >= 18 years			
	IC assureds**	non-IC assureds		total	Kinzigtal	contr.BW*	change (2004 = 100)	
year	%	number	%	%	%	%	Kinzigt.	contr.BW*
2004	0.0	26	21.0	20.2	20.3	11.4	100	100
2005	8.3	25	20.2	19.1	19.1	10.9	94	96
2006	0.0	15	15.0	13.5	13.5	11.1	67	97
2007	7.7	10	11.0	10.6	10.6	12.3	52	108

* controls BW: for every Kinzigtal assured with vascular dementia, five controls of the same age and sex and with vascular dementia were randomly selected from the overall BW sample (matching ratio: 1:5)

** IC assureds: less than 10 cases in at least some years

As can be grasped from table 4, the proportion found in the baseline year 2004 in the Kinzigtal region (20.3%) almost halved until 2007 (10.6%). Thus, the level of over- or mis-use of antidementive drugs in this domain could be considerably reduced in the Kinzigtal region. On the other hand, the proportion in the control group remained largely constant in 2004-07, amounting to 12.3% in 2007.

A common problem in treating people with dementia is reflected in the high prevalence of long-term treatments with psycholeptics, i.e. psycholeptics prescriptions containing more than 180 defined daily doses (DDD) per year. Although it is difficult to differentiate clearly – with administrative data only – between prescriptions that are necessary and those prescriptions reflecting a clear mis-use (or over-use) of psycholeptics, one thing seems to be obvious: Patients with longer-term prescriptions of psycholeptics represent in any case a risk group – be it only with respect to their higher risk to fall and suffer from a resulting fracture.

As to long-term prescriptions of psycholeptics, the following results were found in the OUM study: The proportion of patients with dementia who received long-term prescriptions of psycholeptics (> 180 DDD per year) was considerably smaller in the Kinzigtal region in 2007 (7.2%) compared with the BW control sample (11.1%), indicating a smaller specific risk population in the Kinzigtal region.

Prevention of fractures in patients with dementia

As suggested in the preceding paragraph, people with dementia represent a group running a higher risk of falling and suffering from bone fractures. Elaborating this idea, one might construct a ratio indicating the effectiveness of the prevention of bone fractures in this high risk population such as the

[9] Cf. Koester et al. 2010: 161f.

proportion of patients with dementia who suffered a fracture in a given year. The results are illustrated in table 5.

Tab. 5: Proportion of patients with dementia who suffered at least one bone fracture in a given year

	Patients with an internally validated case of dementia, thereof with at least one bone fracture diagnosis							
	Kinzigtal				age >= 18 years			
	IC assureds**	non-IC assureds		total	Kinzigtal	contr.BW*	change (2004 = 100)	
year	%	number	%	%	%	%	Kinzigt.	contr.BW*
2004	0.0	89	19.6	19.0	19.0	15.8	100	100
2005	0.0	75	15.5	14.6	14.6	14.5	77	92
2006	4.0	73	14.2	13.7	13.7	14.7	72	93
2007	5.3	78	15.1	14.5	14.5	14.5	76	92

* controls BW: for every Kinzigtal assured with (an internally validated) dementia, five controls of the same age and sex and with (an internally validated) dementia were randomly selected from the overall BW sample (matching ratio: 1:5)

** IC assureds: less than 10 cases

As can be seen from table 5, in 2007 the proportion of dementia patients suffering from fractures amounted to 14.5% in both groups, with the proportion remaining fairly constant over the years. Only in 2004 there is a notable deviation in the Kinzigtal region (19%) which, however, might be an outlier year as the proportion remained largely constant in 2005-07. Therefore one should not (yet) conclude a differing effectiveness in both populations as to the prevention of bone fractures among people with dementia.

Future analyses have to reveal whether – and to what extent – *Gesundes Kinzigtal Integrated Care* will successfully have established a more effective risk prevention strategy for dementia patients: GKIC's programme "specific medical and nursing care for the elderly in nursing homes" (cf. this newsletter edition, p. 10), launched at the end of 2009, aims to establish a better coordination of medical and nursing care for seniors living in nursing homes.

Summary and preliminary conclusions

Empirical research on dementia-related health service quality faces serious problems if research relies solely on health insurers' administrative data: Many patients with a dementia syndrome do not get a definite diagnosis of their disease – such as Alzheimer's disease or vascular disease – because sufficiently sensitive and specific diagnostics are still lacking in clinical routine. Thus, the OUM study revealed that more than half of all patients with dementia did not get a specific diagnosis of the concerning type of dementia. This poses a problem for analysing dementia-related health service quality because evidence-based guidelines recommend different treatments for different types of dementia respectively. Moreover, specific diagnoses (of a definite type of dementia) made in clinical routine give rise to doubts about their validity because diagnostic means are often insufficient; therefore any definite diagnosis of a specific type of dementia must be interpreted with caution. A further problem arises from the fact that there are still no efficacious therapies for most types of dementia; in case of Alzheimer's disease, e.g., controversies still linger as to whether (and to what extent) antidementive drugs are efficacious and useful.

In the OUM study context there remain, at the moment, two types of indicators with which service quality is to be addressed: (1) Indicators of a potential over-use or mis-use of health services; (2) indicators of the effectiveness of risk-prevention such as, e.g., the effectiveness of preventing dementia patients from falling and suffering bone fractures.

The interim results presented above show that the proportion of dementia patients with bone fractures is – until 2007 – exactly the same in the intervention and the control group. Moreover, in 2005-07 this proportion remained largely constant in both groups. On the other hand, differences are visible in both groups as concerns indicators reflecting an over-use/mis-use of services: With respect to treatment prevalence of (non-recommended) nootropics in patients with Alzheimer's disease as well as to treatment prevalence of (non-recommended) antidementive drugs among patients with vascular dementia, the Kinzigtal region has obviously succeeded in reducing both types of over-use/mis-use considerably – unlike the control group. It should however be kept in mind that these results are based on a rather limited number of cases.

Achim Siegel & Ulrich Stoessel

Current data on *Gesundes Kinzigtal* Integrated Care (as of December 03, 2010)

Number of actively enrolled assureds	**7228**
- thereof AOK BW assureds	6819
- thereof LKK BW assureds	409

Number of patients with higher morbidity risk	**4694**
- thereof AOK BW assureds	4391
- thereof LKK BW assureds	303

GKIC preventive programmes and extended national disease management programmes (DMPs)	**no. of participants**
AGil (Active health promotion in the elderly)	511
Smoking Cessation Programme	139
Prevention/treatment of congestive heart failure (CHF)	69
Lifestyle intervention for patients with metabolic syndrome	148
Prevention of osteoporosis and osteoporotic fractures	536
Early intervention by psychotherapists in cases of acute personal crises	171
Specific medical and nursing care for the elderly in nursing homes	58
„Better tuned“ – a programme for people with depression (established in late August 2010)	13
DMP diabetes mellitus type II	894
DMP coronary heart disease	295
DMP breast cancer	15
DMP asthma	113
DMP COPD	167

Physicians and other providers contracting with GKIC	**79**
- family physicians	22
- specialists	22
- pediatricians	5
- psychotherapists	3
- hospitals	6
- physiotherapists	5
- nursing homes	11
- outpatient nursing services	4
- social-therapeutic services	1
Other partners cooperating with GKIC	**48**
- pharmacies	14
- sports clubs	23
- fitness centres	6
- physiotherapists[10]	5

[10] These physiotherapists cooperate with GKIC without having a provider contract.