



EKIV Newsletter 2/2010

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Editorial

This is the first issue of the English version of EKIV Newsletter. The English version appears as an abbreviated version of the German version of EKIV Newsletter. The original German version has been published quarterly from the beginning of 2009. All current and back issues in German – as well as future issues in English – can be downloaded from our website (<http://www.ekiv.org/en/newsletter-archiv.php>).

Our newsletter's main topic is the evaluation of *Gesundes Kinzigtal* Integrated Care (GKIC). GKIC is an innovative, population-based integrated care system, founded in late 2005 and located in the Southwest of Germany, between Strasbourg and Freiburg. GKIC is managed by *Gesundes Kinzigtal Ltd.*, an integrated care management company founded in 2005 by the regional physicians' network in the Kinzigtal and by Optimedis AG, a company with a background in medical sociology, management of integrated care solutions and health economics. In 2006 the two statutory health insurers AOK Baden-Württemberg (AOK BW) and LKK Baden-Württemberg (LKK BW) contracted with *Gesundes Kinzigtal Ltd.* so as to offer their assureds to enrol in GKIC. The contracts may be terminated at the earliest from the end of 2014. This demonstrates the long term character of the cooperation. About 60.000 people live within the service area of GKIC, and slightly more than half of them (31.000) are insured by AOK BW (29.300 assureds) and LKK BW (1.700 assureds). More details on GKIC and on the evaluation studies related to GKIC can be found on our website (<http://www.ekiv.org/en/index.php>).¹

In the last issue of EKIV Newsletter (no. 1/2010) we reported on some new interim results from the evaluation project „Identification and reduction of over-use, under-use, and misuse of health services: health service evaluation through analysis of health insurers' administrative data (claims data)“. This project is conducted by PMV research group (head: Dr. Ingrid Schubert) at Cologne University. The research question is whether morbidity, utilization of health services, and service quality in the Kinzigtal region develop in a different manner compared with the surrounding „normal care system“ in the rest of Baden-Württemberg. In the last issue of our newsletter we focused on generic indicators such as prevalence of multi-morbidity, multi-medication, proportion of generic drugs, or prevalence of problematic drug prescriptions (such as long-term prescription of benzodiazepines).

In this issue we start reporting on interim results regarding *indication-specific* indicators. Today we focus on indicators with respect to osteoporosis and osteoporosis management. Osteoporosis is a disease which will become more relevant as the demographic characteristics of our post-industrial societies change. Frequent consequences of osteoporosis are fractures, most often occurring as vertebral body fractures and fractures of the femur neck.

On page 9 we document – as we always do in our newsletter – current data on GKIC such as the current number of enrolled assureds or the number of participants in certain disease management or preventive programmes.

Your feedback or questions regarding our newsletter are always welcome. We will be happy to answer your email (info@ekiv.org or ekiv@medsoz.uni-freiburg.de) as soon as possible.

with best regards,
Achim Siegel & Ulrich Stoessel

¹ Recently an article about the operative aspects of GKIC has been published in English in the *International Journal of Integrated Care* vol. 10/2010 (available online as <http://www.ijic.org/index.php/ijic/article/view/539/1051>).

Evaluation of *Gesundes Kinzigtal* Integrated Care:

Health service evaluation through analysis of health insurers' administrative data (claims data), part II: indicators on osteoporosis management

In this article we report on some interim results of the evaluation project „Identification and reduction of over-, under-, and misuse of health services: health service evaluation through analysis of health insurers' administrative data (claims data)“. As mentioned in the editorial, this study is conducted by PMV research group (head: Dr. Ingrid Schubert) at Cologne University.

Aims and design of the OUM study

The study design conforms to the rules of a quasi-experimental, population-based controlled trial. Its central question is whether

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

are (or become) comparatively less or more prevalent in the intervention region (*Kinzigtal* region) compared with “normal care”.

The study relies exclusively on administrative data of the concerned statutory health insurers AOK Baden-Württemberg (AOK BW) and LKK Baden-Württemberg (LKK BW): Of all assureds living in the *Kinzigtal* region, a person-related (but pseudonymous) dataset was delivered to the PMV research group, containing assureds'

- basic claims data (age, sex, residence, periods of insurance),
- data on diagnosis and services in ambulatory care,
- data on prescriptions made by office-based physicians,
- hospital data (admission/discharge diagnosis, further diagnoses, length of stay, OPS, DRG etc.),
- sick leave data,
- data on therapeutic appliances, and
- data on nursing care/long term care.

An analogous dataset has been made available by AOK BW and LKK BW for a large random sample of assureds living outside the *Kinzigtal* region, i.e. in the rest of Baden-Württemberg (abbreviated hereafter as “BW”). This latter sample is used for the purpose of comparison, reflecting “normal care”. The data of the year 2004 are conceived as the baseline data as they reflect the state of affairs before the *Gesundes Kinzigtal* Integrated Care (GKIC) intervention started; the years 2005–2011 are considered as follow-up years reflecting a gradually growing “dose” of integrated care intervention by *Gesundes Kinzigtal* GmbH (Ltd.). The following preliminary results are based on data concerning the period 2004–2007.

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.

When comparing global indicators or prevalences (*Kinzigtal* 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 as well as the same age and sex (matched pairs) is randomly selected from the overall BW sample.

Selected interim results² on osteoporosis prevalence and osteoporosis management

As reported in the last issue of EKIV newsletter, the number of LKK BW assureds in the Kinzigtal (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 responsibility for the selection and interpretation of the following interim results lies with the editors and authors of this newsletter.

Administrative prevalence of osteoporosis

In Table 1 we present the administrative prevalence of osteoporosis among AOK BW assureds who live in the Kinzigtal region (intervention group) and in the rest of Baden-Württemberg (sample BW, control group). The standardization only refers to the assureds from 18 years and older (as data on younger assureds are not available in the BW control sample).

Table 1: Proportion of AOK BW assureds with osteoporosis

year	Osteoporosis: assureds with osteoporosis diagnosis (incl. cases of limited evidence)								
	Kinzigtal					age >= 18 Jahre			
	IC assureds number	%	non-IC assureds Anzahl	%	total %	Kinzigtal %	stand.BW*	change (2004 = 100) Kinzigt.	stand.BW*
2004	225	11.4	1.376	5.3	5.7	7.0	7.4	100	100
2005	245	12.4	1.403	5.3	5.8	7.1	7.3	101	99
2006	263	13.1	1.405	5.3	5.8	7.1	7.4	101	100
2007	280	14.0	1.386	5.4	6.0	7.2	7.5	103	101

year	Osteoporosis: assureds with internally validated case of osteoporosis								
	Kinzigtal					age >= 18 Jahre			
	IV-Versicherte Anzahl	%	Nicht-IV-Versicherte Anzahl	%	total %	Kinzigtal %	stand.BW*	change (2004 = 100) Kinzigt.	stand.BW*
2004	174	8.9	1.044	4.0	4.4	5.3	5.0	100	100
2005	190	9.6	1.090	4.1	4.5	5.5	5.0	104	100
2006	204	10.2	1.085	4.1	4.5	5.5	5.1	104	102
2007	226	11.3	1.099	4.2	4.8	5.8	5.2	109	104

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

The first part of table 1 demonstrates the prevalence of osteoporosis that results whenever an ICD-10-code referring to osteoporosis (ICD-10: M80, M81) has been detected within a given insured's data of a given year, including cases of limited diagnostic evidence. The second part of table 1 however contains only those diagnoses of osteoporosis which have been validated with the aid of additional information: A case of osteoporosis has been counted as “internally valid” if one of the following three conditions has been met in the concerned insured's data:

² These interim results have been selected from the following study report: PMV research group (2010): Evaluationsmodul der IVGK „Identifizierung und Abbau von Über-, Unter- und Fehlversorgung“. 1. Zwischenbericht für Gesundes Kinzigtal GmbH, hier: AOK-Daten“, Cologne, unpubl. Ms.

- hospital stay in a given year with an osteoporosis ICD-10-code as principal discharge diagnosis code;
- an osteoporosis ICD-10-code in at least one quarter of a given year *plus* at least one prescription of a drug specifically designed for the treatment of osteoporosis³, prescribed by the diagnosing clinician in that quarter in which the diagnosis was made;
- an osteoporosis ICD-10-code in at least two quarters of a given year.

This differentiation of osteoporosis prevalence according to an internal validation implies that the assureds with internally validated osteoporosis codes (second part of table 1) are a subset of those assureds with osteoporosis codes without a further validation (first part of table 1). This implies that the prevalence of osteoporosis is generally lower in the second part of table 1 than in the first part of it.

When considering the results presented in table 1, it becomes obvious that the prevalence of osteoporosis among the adult Kinzigtal assureds (2007: 7.2%) seems to be slightly lower than among the standardized control sample (2007: 7.5%) *only in the first part of table 1*. On the other hand, if we determine the prevalence of osteoporosis by referring to internally validated cases, the prevalence seems to be higher among the Kinzigtal assureds (2007: 5.8%) as compared with the BW sample (2007: 5.2%).

When comparing the prevalence of osteoporosis among the Kinzigtal integrated care assureds („IC assureds“) with the Kinzigtal non-IC assureds (cf. table 1, left part), it becomes clear that the prevalence is considerably higher among the first group. (The prevalence figures of both groups are not standardized and may therefore not be subjected to a valid comparison.) This corresponds very well with the results reported in former issues of our newsletter: The GKIC has succeeded in enrolling first of all the „old and sick“ rather than the „young and healthy“. In EKIV Newsletter 1/2009 we have referred to (and explained) this as resulting from a conscious enrolment policy of GKIC.⁴

Prevalence of fractures among assureds with osteoporosis

An important ratio indicating the success of preventing and treating osteoporosis consists in the prevalence of fractures in people with osteoporosis. A precondition for comparing the ratio in two different populations is that the prevalence of fractures in general is comparable in both of these populations. In our study this is indeed the case: The general prevalence of fractures in the Kinzigtal population amounts to 5.6% in 2007 whereas in BW it is at 5.7% in 2007.⁵

In table 2 we present the proportion of patients with osteoporosis who suffered from at least one fracture during a given year.

³ The following active substances have been included here: vitamine D (ATC code A11CC), calcium (A12AA), combination of calcium with vitamin D (A12AX), climacteric therapeutic substances (G02CE), hormone replacement drugs (G03CA, G03CB, G03FA, G03FB), SERM (G03XC), bisphosphonates (M05BA) and combinations of bisphosphonates with calcium (M05BB).

⁴ Cf. EKIV-Newsletter 1/2009 (in German: http://www.ekiv.org/pdf/EKIV-Newsletter_2009-1.pdf), p. 10ff.

⁵ Schubert et al. (cf. footnote 1), p. 234f.

Table 2: Proportion of patients with fractures (in %) among all assureds with osteoporosis

year	osteoporosis: assureds with osteoporosis diagnosis (incl. cases of limited evidence), thereof with fractures								
	Kinzigal					age >= 18 years			
	IC assureds number	%	non-IC assureds number	%	total %	Kinzigal %	contr.BW*	change (2004 = 100)	
								Kinzigal.	contr. BW*
2004	28	12.4	316	23.0	21.5	21.5	24.0	100	100
2005	39	15.9	325	23.2	22.1	22.1	25.4	103	106
2006	46	17.5	320	22.8	21.9	21.9	25.7	102	107
2007	54	19.3	298	21.5	21.1	21.1	26.3	98	110

Year	osteoporosis: assureds with internally validated case of osteoporosis, thereof with fractures								
	Kinzigal					age >= 18 years			
	IC assureds number	%	non-IC assureds number	%	total %	Kinzigal %	contr.BW*	change (2004 = 100)	
								Kinzigal.	contr. BW*
2004	25	14.4	258	24.7	23.2	23.2	26.1	100	100
2005	30	15.8	274	25.1	23.8	23.8	27.6	103	106
2006	39	19.1	273	25.2	24.2	24.2	28.0	104	107
2007	45	19.9	258	23.5	22.9	22.9	28.7	99	110

*) controls BW: for every Kinzigal assured with osteoporosis, five controls of the same age and sex and with osteoporosis have been randomly selected from the BW sample (matching ratio 1:5).

The results presented in table 2 may be summarized as follows: In every year considered here, the prevalence of patients with fractures among all assureds with osteoporosis was at least 10% lower in the Kinzigal group as compared with the controls. When comparing the development of this prevalence in the course of time (2004-07), it becomes obvious that the prevalence remained essentially constant in the Kinzigal group, whereas the prevalence of patients with fractures increased in the control group by around 10% between 2004 and 2007. These results are independent of the method by which a case of osteoporosis is determined (internally validated cases only vs. all cases including those with limited evidence). These results indicate, then, that the prevention of fractures among people with osteoporosis has been more effective in the Kinzigal group compared with the controls in 2004-07.

Proportion of patients treated with specific therapies among all patients with osteoporosis and fractures

Common guidelines recommend specific therapies for patients with manifest osteoporosis such as therapies with bisphosphonates, strontium ranelate (ATC M05B), SERM (G03XC), teripatide (H05AA02) or parathyroid hormone (H05AA03), unless there are contraindications.⁶ Table 3 demonstrates the proportion of patients with osteoporosis and fractures who received a specific therapy in a given year.

⁶ Cf. e.g. the German *DVO-Leitlinie 2009 zur Prophylaxe, Diagnostik und Therapie der Osteoporose bei Erwachsenen*. Langfassung, Dachverband Osteologie e.V., version as of December 15, 2009 (last access: September 14, 2010): http://www.dv-osteologie.org/dvo_leitlinien/dvo-leitlinie-2009.

Table 3: Proportion of patients with osteoporosis and fracture receiving a specific therapy

Year	assureds with osteoporosis diagnosis (incl. cases of limited evidence) and with fracture, thereof with specific therapy								
	Kinzigal			age >= 18 Jahre					
	IC assureds number	%	non-IC assureds number	%	total %	Kinzigal %	contr.BW*	change (2004 = 100)	
								Kinzigal.	contr.BW*
2004	17	60.7	103	32.6	34.9	34.9	33.4	100	100
2005	23	59.0	132	40.6	42.6	42.6	34.7	122	104
2006	29	63.0	122	38.1	41.3	41.3	36.6	118	110
2007	27	50.0	117	39.3	40.9	40.9	38.4	117	115

Year	assureds with internally validated osteoporosis diagnosis and with fracture, thereof with specific therapy								
	Kinzigal			age >= 18 Jahre					
	IC assureds number	%	non-IC assureds number	%	total %	Kinzigal %	contr.BW*	change (2004 = 100)	
								Kinzigal.	contr.BW*
2004	17	68.0	98	38.0	40.6	40.6	38.8	100	100
2005	22	73.3	128	46.7	49.3	49.3	39.7	121	102
2006	28	71.8	114	41.8	45.5	45.5	41.6	112	107
2007	25	55.6	112	43.4	45.2	45.2	42.9	111	111

*) controls BW: for every Kinzigal assured with osteoporosis and with at least one fracture, five controls of the same age and sex, with osteoporosis and with at least one fracture have been randomly selected from the BW sample (matching ratio 1:5).

The results presented in table 3 demonstrate a slightly higher proportion of patients with specific therapies in the Kinzigal group compared with the controls, regardless of how a case of osteoporosis has been determined (internally validated cases only vs. all cases including those with limited evidence).

Furthermore, the results presented in table 3 demonstrate that the proportion of patients with specific therapies both in the Kinzigal group and among the controls increased almost at the same rate in 2004-07 (11% in both groups in case of internally validated cases). Whereas the proportion among the BW controls increased steadily year after year, the increase in the Kinzigal group was rather discontinuous. Whether the more continuous development among the control group may be principally explained by its considerably bigger number (the control group contains five times as many cases as the Kinzigal group) and, consequently, its lower susceptibility to yearly fluctuations, we do not know at present.

Summary and preliminary conclusions

To determine the prevalence of osteoporosis in a given population by health insurers' administrative data may lead to fuzzy results because of common diagnostic problems. As to results presented here, the prevalence of osteoporosis seems to be slightly lower among the AOK BW assureds living in the Kinzigal region as compared with the control group (2007: 7.2% in the Kinzigal region vs. 7.5% in the control group) if a case of osteoporosis is counted whenever a corresponding ICD-10-code – including cases of limited evidence – has been documented in a given assured's diagnostic data. If, however, the prevalence of osteoporosis is determined by referring to internally validated cases only, osteoporosis seems to be slightly more prevalent among the Kinzigal assureds (5.8%) compared with the (age- and sex-standardized) control group (5.2%).

A first ratio, reflecting the proportion of patients with at least one fracture among all assureds with osteoporosis in a given year (table 2), indicated the effectiveness of fracture prevention in people

with osteoporosis in 2004-07: the lower this proportion, the more effective the prevention of fractures. Already in 2004 this proportion was about 10% lower in the Kinzigtal group compared with the control group. Moreover, during 2004-07 the proportion remained constant in the Kinzigtal group whereas it increased among the controls by around 10% (2007 vs. 2004). These results persist regardless of the method by which a „case of osteoporosis“ is determined (internally validated cases only vs. all cases including those with limited evidence). This indicates, then, that fracture prevention among people with osteoporosis was more effective in the Kinzigtal region in 2004-07 compared with the control region BW.

At the end of the article we presented the proportion of assureds with osteoporosis and at least one fracture who received a specific therapy as recommended by evidence-based treatment guidelines (table 3). This proportion increased in the Kinzigtal group and among the controls at the same rate in 2004-07. The proportion was slightly higher among the Kinzigtal group compared with the controls.

At present we await new results from the years 2008 and 2009. These new results will be very interesting because in 2008 the preventive programme „strong muscles, strong bones“ started in the Kinzigtal region (original name in German: „starke Muskeln, feste Knochen“).⁷ This programme was designed specifically for patients who are at risk of osteoporosis. Until now the programme is one of the most popular preventive programmes in the service area of GKIC (cf. page 9 in this issue). Therefore we expect that the indicators have further improved in the intervention region.

Achim Siegel, Ulrich Stoessel

⁷ Cf. the article (in English) by Hildebrandt et al. (2010): <http://www.ijic.org/index.php/ijic/article/view/539/1051>, p. 9.

Current data on *Gesundes Kinzigtal* Integrated Care (as of: September 23, 2010)

Number of actively enrolled assureds	7059
- thereof AOK BW assureds	6654
- thereof LKK BW assureds	405

Number of patients at higher risk of morbidity	4586
- thereof AOK BW assureds	4287
- thereof LKK BW assureds	299

GKIC preventive programmes and extended national disease management programmes (DMPs)	no. of participants
AGil (Active health promotion in the elderly)	511
Smoking Cessation Programme	137
Prevention/treatment of congestive heart failure (CHF)	68
Lifestyle intervention for patients with metabolic syndrome	136
Prevention of osteoporosis and osteoporotic fractures	512
Early intervention by psychotherapists/psychiatrists in cases of acute personal crises	153
Medical care for the elderly in nursing homes	41
„Better tuned“ – a programme for people with depression (established in late August 2010)	1
DMP diabetes mellitus type II	878
DMP coronary heart disease	294
DMP breast cancer	15
DMP asthma	108
DMP COPD	165

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 ⁸	5

⁸ These physiotherapists cooperate with GKIC without having a provider contract.