
Integrated Diabetes Care in Germany: Triple Aim in Gesundes Kinzigtal

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Introduction

The German health system is based upon a compulsory, “statutory health insurance” (SHI). The contribution fee is based on income, although employees with incomes above a certain threshold, and the self-employed, can opt out of the SHI and insure themselves privately. Contrary to the terminology, the SHI is not “insurance” – where premiums are risk-based – but rather a fund, into which members have to pay. Consequently, health fund would be the more appropriate term. Three pillars make up the SHI budget:

1. Contributions based exclusively on income from gainful employment, pensions or unemployment benefits, but currently not savings, capital gains or other forms of unearned income. Since 2005, employees have been

required to contribute 8.2% of their gross income; employers pay 7.3% [1];

2. Tax financed subsidies: in 2012 this was about 4.8% [1, pp 115] to 7.38% [2] of the SHI income;
3. Additional contribution fees, on average about 0.9% of gross income [1]. This effectively means that parity financing has to date been given up.

This health care funding faces an enormous increase in healthcare system expenditure as a result of a range of demographic changes. An analysis of the Robert Koch-Institute (RKI) from 2012 shows that more than 50% of German people over 65 years suffer from at least one chronic disease, approximately 50% suffer from two to four chronic diseases, and over a quarter suffer from five or more diseases [3]. This growing rate of chronic diseases and multi-morbidity in the ageing population coupled with the comparatively high life expectancy in Germany, in a setting of high-quality care standards and the universal provision (regardless of income), a broad range of medical services, medicines and medical aids have contributed significantly to an increase in Germany’s public health sector expenditure [4–6]. Currently the public sector covers the majority (77%) of health expenditures in Germany [7]. An important driver of expenditure is the provision of hospital services which is about 77.0 billion € (26.04%) in 2011 rising to 82.4 billion € (26.1%) in 2013 [8]. If we take all

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forms of inpatient care into account it is 36.6% of all expenditures, increasing to 37.6% in 2013. These recent changes in healthcare in Germany are leading to new challenges requiring new approaches to healthcare. Amelung summarizes the following aspects, which should be considered in combination for the development of new forms of care [9]:

1. Competition regarding quality and financial contribution as a regulatory policy objective;
2. Opening of the healthcare market for new providers;
3. Breaking rigid structures in healthcare sectors through new forms of care;
4. Meeting new challenges in healthcare caused by chronic diseases and multi-morbidity;
5. Developing strategies against underutilization, especially in regions difficult to supply;
6. More flexible work models for female physicians;
7. Restructuring of care processes through targeted incentives to promote and reward health maintenance.

According to a survey of insured patients in Germany, which was performed by the Commonwealth Fund in 2013, 58% of the respondents perceived that the German health system fundamentally needed to be reformed or completely rebuild [10]. The current organization of the health system is characterized by a strict sectorial segregation. This makes it difficult to implement interdisciplinary, cooperative and cross-sectoral network, efficient communication and information provision between inpatient-, outpatient-, rehabilitation care and adequate public health services. This is particularly the case in the care of the increasing number of patients with chronic diseases. To provide an efficient, effective and high-quality health system in Germany, a redesign seems to be inevitable, but depends on how to reorganize the care of patients with complex needs and diseases [5].

In recent years, various models were initiated to guarantee cross-sectoral and integrated care and to facilitate more competitive health insurance in Germany. Reorganization started with the

reform of the German statutory health insurance (GKV) law in 2000, the establishment of medical care centres (§ 95 SGB V), GP-supporting care concepts and GP-centred care (§ 73b SGB V), implementation of Disease-Management Programmes (DMP; § 137f-g SGB V), the enactment for Integrated Care Solution (§ 140a-d SGB V) and the care structure law (Versorgungsstrukturgesetz; § 87b SGB V). The traditional model of collective contracts between health insurance companies and healthcare providers were superseded by allowing selective contracting between particular institutions [11, 12].

The first approaches towards integrated healthcare were introduced in Germany in 2002 through Disease-Management Programmes. These structured treatment programmes were designed to ensure integrated, cross-sectoral and evidence-based treatment and care for chronically ill people diagnosed with asthma, breast cancer, chronic obstructive pulmonary disease (COPD), coronary heart disease, Type-1-diabetes mellitus (T1DM) and Type-2-diabetes mellitus (T2DM). The DMP's aimed to avoid chronic disease complications and associated excess hospitalization, to reduce over- and underutilization of care, and thereby ensuring efficient care nationally [13]. Currently there are 7,566,191 patients registered in a DMP in Germany, of which 3,969,019 patients are enrolled in the DMP for T2DM. This programme was introduced in July 2002. Participation in a DMP is voluntary and at no personal cost [14]. Although perceived to have positive effects on DMP patient survival, evaluations has been limited and divergent [13]. Integrated care solutions have been regulated by law in Germany since 2004 and resulted from reforms of the Statutory Health Insurance (SHI) Modernization Act (GMG). Financial support was promoted from 2004 onwards by the standard care budget and by governmental regulated start-up funding for integrated care projects up to 2009 [15]. Despite the introduction of these measures and a relatively good level of healthcare provision in Germany, the treatment and care of chronically ill people is faced with historically evolved, "system resistance" that hinders optimal

integrated care. This is due to strict cross-sectoral boundaries between outpatient and inpatient care, public health services and insufficient cooperation in care processes [5].

T2DM and its complications have become a growing health, social and economic burden in Europe and worldwide. An estimated number of 56.3 million people are living with diabetes in Europe [16]. According to a recent RKI study (“Studie zur Gesundheit Erwachsener in Deutschland”; DEGS), 4.6 million adults between 18 and 79 years old (7.2%) in Germany are estimated to have been diagnosed with either T1DM, T2DM or gestational diabetes [17]. The lifetime-prevalence of diabetes has increased noticeably due to ageing. The total healthcare expenditures of diabetes are currently estimated by 30 billion € per year [18, 19]. In light of these changes and challenges, there is an urgent need for action, especially in chronic disease such as T2DM. It seems inevitable that meeting the increasing needs of this health burden will require optimized integration and coordination of chronic care [20]. Comprehensive healthcare reforms should initiate the development of integrated and coordinated care solutions, ensure good cooperation of healthcare providers and facilitate a more efficient approach to healthcare provision. One step towards a better healthcare system in Germany was the integrated care initiative “Gesundes Kinzigtal” (GK) which was launched on 1st November 2005 in Haslach, Germany.

“Gesundes Kinzigtal”: A German Approach for a Fully Integrated Care System

The healthcare network and management company “Gesundes Kinzigtal Ltd” described as a “flagship-project” among integrated care approaches in Germany, is located in the affluent rural Kinzigtal region (population 69,000) that lies in the southwest of the federal state Baden-Wuerttemberg, close to Freiburg in Germany (Fig. 10.1) [21]. The integrated healthcare system GK was introduced here in 2005 [22–27].

Strategic Framework and Objectives of Gesundes Kinzigtal

The main strategic framework of GK is based on the Triple Aim Approach, developed in 2008 by Berwick et al. in cooperation with the Institute for Healthcare Improvement (IHI) [28]. Berwick et al. take a United States perspective, that a responsible, sustainable and high-quality healthcare system has to address [28]:

1. Improvement in individual experience of care;
2. Improvement in population health;
3. Reduction in the per capita costs of care for populations.

These three dimensions are displayed below (Fig. 10.2) in accordance of the Triple Aim Model of Berwick et al. [28, 29].

Derived from this approach, there are several objectives of GK [30]:

1. Financial success with an innovative shared health gain approach (see the section on Financing Model in this chapter);
2. Development of better organized healthcare for the population in Kinzigtal, in cooperation with the patient, the other local health partners and health insurance companies;
3. Increasing the attractiveness of the Kinzigtal region for the regional population through development of additional services and ensuring local long-term healthcare;
4. Securing an appropriate number of providers in the area;
5. Increasing the attractiveness of the Kinzigtal region for young health professionals in medicine and increasing job satisfaction of physicians;
6. Use of latest scientific findings for prevention and treatment created in close association with all those involved in GK;
7. Introducing innovations in the organization and delivery of healthcare.

These objectives were expected to be achieved by improved cross-sectoral management, more

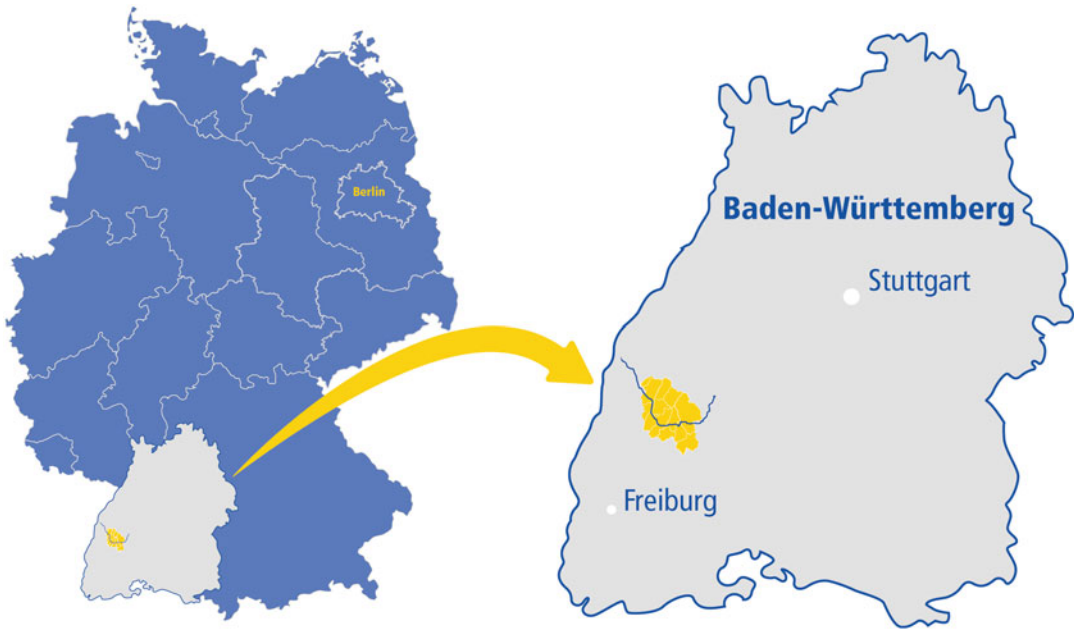


Fig. 10.1 Region of Kinzigtal in Baden-Wuerttemberg, Germany



Fig. 10.2 The Triple Aim Model

efficient cooperation by healthcare providers between different care sectors, a reduction in morbidity, especially in chronically ill people, and favourable conditions for purchasing external products such as medication [22, 31]. On the one hand, the Triple Aim dimensions form the basis for the actions and decision-making processes of GK with the political authorities, the

insured patients, the health insurance companies and society. On the other hand, they offer optimized leadership for healthcare in the region [32]. Combining the knowledge and experience of medical healthcare providers with those of Health Sciences and Management was expected to lead to improved cooperation and achieving the GK objectives.

Stakeholder Involvement in *Gesundes Kinzigtal*

GK consists of several organizations that cooperate with each other. The shareholders of this company are local physicians “Physicians’ Network in Kinzigtal Region” (MQNK) and the health sciences based OptiMedis AG in Hamburg. Two health insurance companies (sickness funds) partnered with the project in 2006: AOK Baden-Wuerttemberg (AOK BW) in 2005 and the Social Security of Agriculture, Forestry and Horticulture (SVLFG; previously LKK Baden-Wuerttemberg). AOK BW and SVLFG cover the less educated part of the population who also experience higher morbidity and are more “vulnerable”. A 10-year

contract was in place 2005–2015, in accordance with §§140a-d SGB V. The contract is currently under renegotiation for unlimited extension. About 33,000 patients, nearly half of the Kinzigtal population, are insured either by the AOK BW (about 31,600 members) or SVLFG (about 1,400 members). Since July 2006, these patients have been invited to enrol in GK generally, or in specific healthcare programmes, to take advantage of the additional healthcare services of GK. Approximately 30% of insured individuals (mainly the elderly and those with greater morbidity) under the two participating health insurance companies have enrolled in GK until December 2014. With the exception of dental care, all healthcare sectors are covered by the GK company [13, 22, 23, 25–27, 32, 33].

GK is also supported by several other partners covering many services including psychotherapists, physiotherapists, general physicians and specialists, paediatricians, hospitals, rehabilitation centres, nursing homes, nursing services, pharmacies and welfare centres. Sports and cultural clubs, gyms, podiatrists and wellness facilities provide further services for the wellbeing of the patient and to increase and support healthy lifestyles [34]. The insured patients enrolled in GK also have additional medical time to achieve treatment objectives and ensure intensive and patient centred outpatient care [23].

A Patients Advisory Committee (PAC) was established to strengthen cooperation in the community and to mediate between enrolled patients, the company and service providers should problems arise with GK or practices. PAC supports patients with chronic disease to develop their own vision for personal health, striving for goals with the agreement of their family doctor. The Committee consists of five patients who are participating in GK and one ombudswoman who supports the PAC if complaints arise [34].

Financing Model of Gesundes Kinzigtal

There are no incentives for risk-selection by healthcare providers under the GK contract.

Instead, the cooperation agreements within GK are based on a new and innovative shared health gain approach for healthcare financing: “shared-savings” contracts similar to Accountable Care Organization (ACO)-models in the US healthcare system [25–27, 32, 33]. The intention is to create greater efficiency (balance between expenditure and health benefits) through optimizing the Kinzigtal health system. The financing of GK is achieved by the two health insurance companies making advance payments of expected savings, which are then invested into improvement activities. Savings are calculated yearly in retrospect as the financial difference between (i) the actual total costs of care of all patients in the region of Kinzigtal compared with (ii) their expected mean costs, derived from the German morbidity-oriented risk structure compensation system (morbiditytaetsorientierter Risikostrukturausgleich) and income to the health insurance companies. The contribution margin (Δ , delta) of the insured patients in Kinzigtal is the defining characteristic of the financial model, and is used as the indicator of financial success (Fig. 10.3) [26, 27, 32, 33]. Remuneration for collaborating parties and for GK comes from lower healthcare costs for the regional population. Sustainable and increasing health benefits for patients is expected to be achieved by GK, through patient-centred activities, support of self-management and targeted prevention [27].

Figure 10.3 illustrates the development of the risk-adjusted expected costs in Germany (blue line – indexed in 2005), actual costs in GK (green line), the surplus contribution margin (Δ , delta) and the number of AOK BW-insured patients enrolled in GK (light grey bars) from 2005 to 2013.

Care Management of Gesundes Kinzigtal

As with other countries, there have been questions over the sustainability of the financing of the German healthcare system with the ageing population. The predominant type of financing currently is for the number of health services ren-

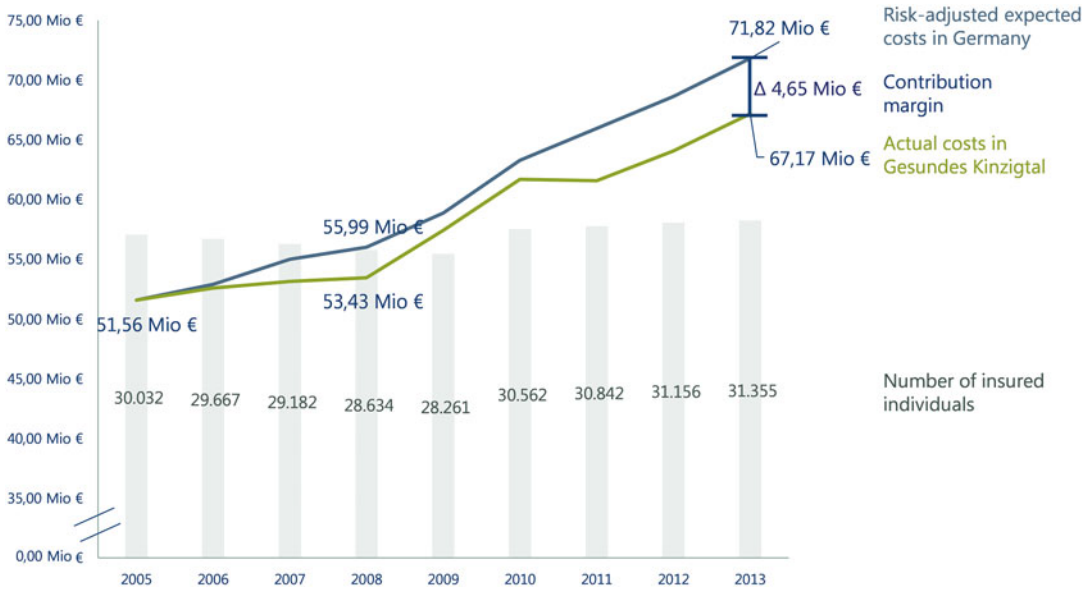


Fig. 10.3 Development of expected costs in Germany, actual costs in GK, contribution margin and number of insured individuals of the participating health insurance companies

dered (retrospective fee-for-service payments), rather than for preventive aspects of healthcare [23]. Associated partners of GK cooperate to close this gap by initiating goal-setting agreements between physicians and patients, developing individual treatment plans on the basis of a shared decision-making process and supporting self-management, through coaching and individual care (especially for those with a chronic disease). In addition, communication and patient information flow is assured through a system-wide electronic patient record. This enables all participating partners to provide effective, efficient and cross-sectoral healthcare [25].

Evaluation of Gesundes Kinzigtal

Since its inception in 2005, the GK has continuously been evaluated: externally through an independent scientific research institution, and internally by the shareholding OptiMedis AG.

The external evaluation of GK is led by the coordinating institution for evaluation of integrated care (EKIV; www.ekiv.org) which has been implemented by the Department of Medical

Sociology at the University of Freiburg in Germany. EKIV is accountable for the provision of an evaluation plan, currently with four modules, which have been agreed upon from GK, AOK BW and SVLFG [25, 26]. The internal evaluation aims to show the effects of integrated care (among GK enrolled patients) on the dimensions of the Triple Aim Approach, and to assess whether the objectives of GK have been achieved through a range of parameters and quality indicators relating to, e.g., diabetes, heart failure and dementia [13, 32]. Central evaluation-relevant parameters and quality criteria for the external evaluation, which are compared with conventional care, include, e.g., improved patient empowerment, patient- and care giver satisfaction, development of patients' health status, indications for over-, under- or misutilization of health services, interdisciplinary cooperation and economic, high-quality healthcare [25, 35].

Both, the health insurance partners AOK BW and SVLFG and the shareholding OptiMedis AG in Hamburg, evaluate the financial impact of the approach. OptiMedis also provides feedback reports for providers and performs potential analyses to assess the impact of planned healthcare

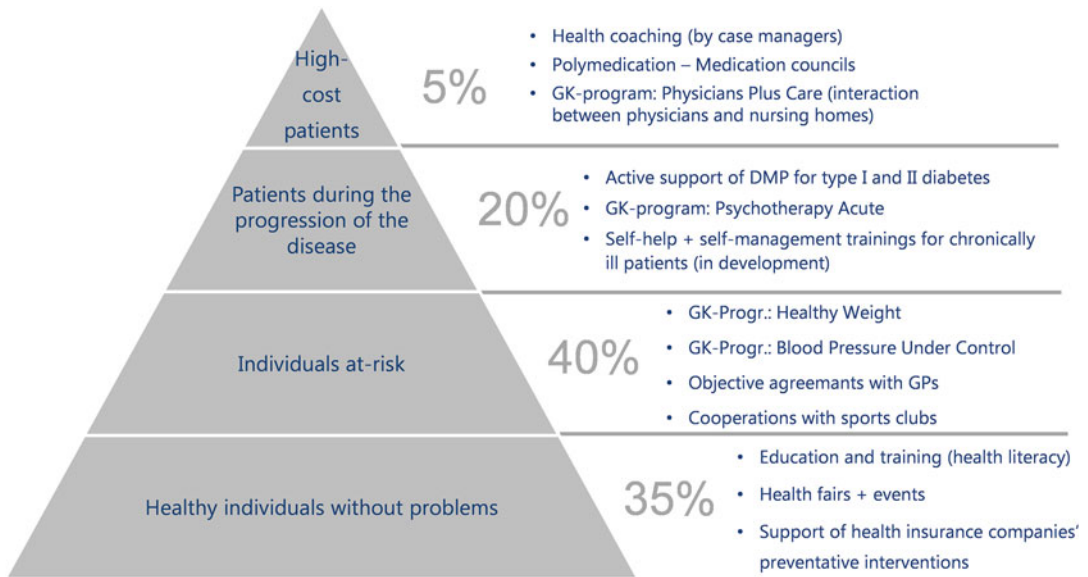


Fig. 10.4 Interventions of GK in the Context of Diabetes

programmes, health-economic evaluations of implemented interventions and several risk analyses [32].

Gesundes Kinzigtal Interventions in the Context of Diabetes

GK follows a holistic approach to optimize care for chronically ill patients with T2DM (Fig. 10.4). A whole cascade of interventions is being offered, depending on the risk level and the needs and comorbidities of the patients. In this chapter, the development and implementation of a Kinzigtal-specific healthcare programme “Healthy Weight” for at-risk individuals is described.

Background of the Programme “Healthy Weight”: The Deadly Quartet

The interaction of different factors – visceral obesity, hypertension, hyperglycaemia and dyslipidaemia-constitutes the metabolic syndrome (also known as “Deadly Quartet”). Since 2007, GK has offered a secondary prevention

programme called “Healthy Weight” to reduce the development of risk factors related to the metabolic syndrome, the development of T2DM and cardiovascular diseases. The International Diabetes Federation (IDF) criteria are used by the programme to define central obesity (waist circumference: men ≥ 94 cm; women ≥ 80 cm) with at least two of the following measures [36] (Table 10.1).

Goals of the Healthcare Programme “Healthy Weight”

GK supports and motivates members to change their lifestyle through specialized comprehensive medical care, nutrition counselling and sports activities, with a special focus on obese patients. Reaching these targets is based on the biopsychosocial model, developed by Engel during the 1970s [37]. The approach involves considering the biological, psychological and social conditions involved during the development and progression of a (chronic) disease. The biopsychosocial model emphasizes the active role of the individual in the protection and promotion of their own health [37]. Supporting an

Table 10.1 The IDF consensus worldwide definition of the metabolic syndrome

Raised triglycerides	≥150 mg/dL (1.7 mmol/L)
	Or specific treatment for this lipid abnormality
Reduced high density lipoprotein (HDL-cholesterol)	<40 mg/dL (1.03 mmol/L) in males
	<50 mg/dL (1.29 mmol/L) in females
	Or specific treatment for this lipid abnormality
Raised blood pressure (BP)	Systolic BP ≥130 or
	Diastolic BP ≥85 mmHg
	Or treatment of previously diagnosed hypertension
Raised fasting plasma glucose (FPG)	(FPG) ≥100 mg/dL (5.6 mmol/L)
	Or previously diagnosed T2DM
	If above 5.6 mmol/L or 100 mg/dL,
	OGTT is strongly recommended but is not necessary to define presence of the syndrome

active patient role is a key part of the “Healthy Weight” programme.

Enrolment in the Programme “Healthy Weight”

“Healthy Weight” covers a period of 15 months and can be extended for further 15 months if the patients fulfil predefined criteria (vide infra).

Inclusion and Exclusion Criteria

The two main criteria to include patients in the healthcare programme “Healthy Weight” are registration in GK, and either a BMI of ≥30 kg/m² or waist circumference of ≥88 cm in women and ≥102 cm in men. A “positive risk status” is another important requirement for the participation in this programme. The following flowchart (Fig. 10.5) illustrates the enrolment procedure for “Healthy Weight.” Insulin treated patients are

excluded: such patients can participate in the specialized DMP for T2DM (see Chap. 1).

Risk Status and Goal-Setting Agreement

The nominated doctor fills in a risk status questionnaire for GK members during the registration process, estimates the individual health status of the patient and then invites patients to select different healthcare programmes. At the same time, the nominated doctor develops a goal-setting agreement together with the patient. This agreement is an essential tool for shared decision-making and motivation of the patient, with the intent to promote lifestyle changes and enhance self-management [32]. The agreement includes definition and steps to achieve individual goals along with a previously agreed date to ensure sustainability.

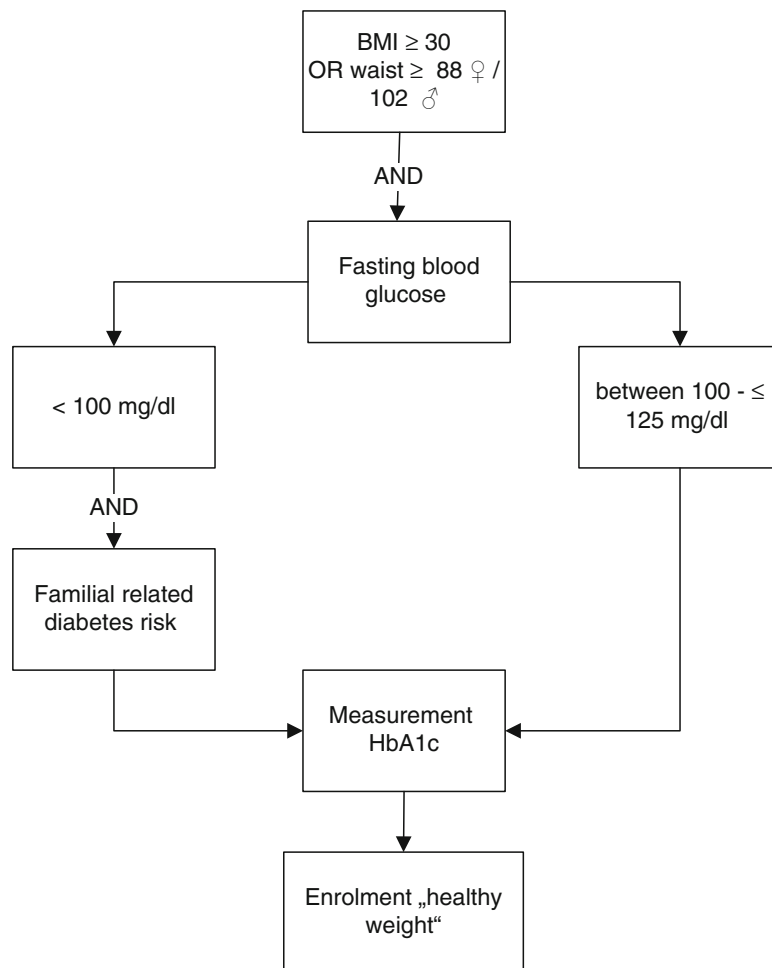
Three Standardized Programme Modules

The programme is based on close guidance of the patient and a combination of three standardized programme modules: medical care, nutrition counselling and sporting activities. “Actors” in the programme are the patient, the nominated doctor, the medical assistant, specialists, psychologists, dietitians, sports clubs, GK and the participating health insurances companies.

Medical Care in Context of “Healthy Weight”

The 15-month-intervention “Healthy Weight” includes regular contact with the nominated doctor and the medical assistant through six medical examinations: one during the enrolment, one every quarter and a final examination. At each visit, the following patient-related parameters are asked, measured and documented:

Fig. 10.5 Enrolment procedure for “Healthy Weight”



- Size and height
- BMI and waist circumference
- HbA1c, FPG, BP, Cholesterol, Triglycerides
- Diabetes mellitus (yes/no)
- Insulin treatment (yes/no)
- Oral antidiabetics (yes/no)
- Frequent hypoglycaemia (yes/no)
- Family-related diabetes risk (yes/no)

These parameters are evaluated regularly by GK (see section in this chapter on Evaluation) and used to improve and revise healthcare programmes when deemed necessary.

The medical care is also important for goal-setting and motivation of the patient. In the context of “Healthy Weight” the physician takes over

the role of a coach and supports patients in achieving their individual goals (see section in this chapter on Risk Status and Goal Setting Agreement). Moreover, conversations between physicians and patients are valuable for checking the current status and the development of the programme.

Nutrition Counselling

Dietary change is an important component of “Healthy Weight.” The nominated doctor strongly advises patients to participate in nutritional courses and dietary consulting. GK offers, in cooperation with AOK BW, different courses and consulting services for their members and, in particular, for “Healthy Weight” participants.

One-to-One Consultation

In cooperation with GK, AOK BW offers consultations for different subjects, e.g., dietary counselling. The GP or specialist prescribes a “prevention recommendation” for a one-to-one consultation with a dietician. The consultation is oriented towards the standards of the German Nutrition Society (Deutsche Gesellschaft fuer Ernaehrung e.V., DGE) and contains a case history, coaching and a nutrition protocol. The therapy is individually adjusted and takes four sessions on average. On top of the one-to-one consultation, AOK BW offers online programmes to support their members [38].

Nutritional Education in Groups

Group nutritional education consists of eight units, which are presented by three lecturers with different backgrounds. Nutrition training forms the basis of the course and covers four units. This part is taught by a nutritionist who is a trained diabetes advisor. Core learning includes food ingredients, different diets, causes for overweight and purchasing training. Additionally, a unit with a qualified psychologist takes place to discuss the psychological components of obesity and poor nutrition. Learning is enhanced through practice sessions during two cooking evenings. To connect nutrition and exercise, the course includes an introductory session on Nordic walking or gymnastics exercises. This session is used to introduce the participants to the topics of sports and exercise.

Sporting Activities

Another significant module of the healthcare programme involves encouraging patients to join sports activities. The aim of “Healthy Weight” is to provide ongoing courses and to integrate their members into sports clubs and societies, where they become part of a social network. GK refunds up to 150 € of the costs to enable everyone to participate in sports activities.

The built environment in rural areas like Kinzigtal, including their lack of sports activities, is a problem, especially for obese patients with severe diseases like T2DM. For this reason, GK established sports courses for the target group in cooperation with some sports clubs, a rehabilita-

tion centre and qualified trainers. Health lectures are integrated within the sporting activities to combine theory and practice. Collaboration with self-help groups is supported by GK. The exercise programme is adjusted to the individual needs of the participants. The nominated physician observes the evolving patient health status during medical examinations.

Results of Internal Data Analysis Concerning Diabetes Care in Gesundes Kinzigtal

The results presented in this chapter are mostly part of the internal evaluation. All GK healthcare programmes are broadly supported by different datasets, including evaluations and feedback reports. The two participating SHI (AOK BW and SVLFG) provide their regional claims data to GK, which then tasks the shareholding OptiMedis AG with data analysis. These data are held within data warehouse architecture and used for different kinds of analyses. The whole GK integrated care system and most of its disease-specific interventions are also evaluated scientifically using the same data and supplementary data from another comparable region (see section on Evaluation in this chapter or www.ekiv.org).

In the following section some results from the analyses are presented, including the prevalence of T2DM in the region of Kinzigtal, the mean healthcare costs of this population and their most common co-morbidities. Some preliminary results of the evaluation of the “Healthy Weight” programme are then described, using a controlled cohort study design with matched pairs.

Potential Analysis of People with Diabetes in the Region of Kinzigtal

These analyses include inpatient and outpatient data from patients with T2DM from the region of Kinzigtal. Patients with ZIP-codes of the region and the ICD-10-GM diagnosis “E11.*: Type 2 diabetes” were selected. In 2013 (the latest year with complete claims data) the diabetes preva-

lence in the region of Kinzigtal was 9.2% based upon healthcare provider consultation coding for 2860 patients who are members of the two participating SHI. This reflects a significant growth since the first year in 2006 when the prevalence was 7.0%. The mean age of the T2DM-cohort in 2013 was 71.2 years and 53.5% were women. In 2013 the top 5 co-morbidities of patients with T2DM were essential hypertension (78.3%), dyslipidaemia (50.5%), disorders of refraction and accommodation (38.2%), back pain (33.8%) and obesity (33.3%). Their top 5 hospital discharge diagnoses were heart failure (3.6%), cerebral infarction (1.9%), T2DM (1.8%), angina pectoris (1.6%) and atherosclerosis (1.0%).

T2DM in Kinzigtal was associated with mean expenditure of 5,935.70 € per person in 2013 (not necessarily only for diabetes care) including 40% from inpatient stays, 24% from drug prescriptions, 19% from physician remuneration in ambulatory care and the rest from remedies and adjuvants (e.g., insulin pen systems, wheelchairs, physiotherapy, etc.), work incapacity or rehabilitation. In 2013, the net mean loss for the two SHI from all diabetes patients in the Kinzigtal region was -172.00 € per patient; however, it already improved by +299.20 € per patient per year compared to the initial year of the integrated care project in 2006. The normal improvement rate for all insured persons in the same period of time was +21.40 € per year. To put these results into perspective it has to be considered that in 2009 the German risk adjustment scheme has been changed for all patients in any SHI, allocating more money to patients having specific diseases including (among others) T2DM, so that part of the improvement of the contribution margin of the T2DM population is system-based, which is why more detailed evaluations are performed in GK concerning the intervention participants.

First Results from the Internal Evaluation of the “Healthy Weight” Programme

The GK- “Healthy Weight” programme is continuously evaluated using a controlled cohort study design with an exact matching of age, sex

and programme specific inclusion diagnosis (T2DM, metabolic syndrome and obesity) in eight cost classes. People, who were not consistently insured at the time of the evaluation, including those who had died, were excluded. Each programme participant was matched in a ratio of 1:1 because of the limited data set. The non-attenders are insured persons from the two participating SHI who also live in the region of Kinzigtal, but who mainly visit providers that are not part of the integrated care system GK.

The evaluation was not performed per calendar year, but by number of years from enrolment. Controls had the same starting date as the index case in the “Healthy Weight” programme. A time period of 3 years follow-up was examined. To avoid bias, the latest date for enrolment was 31st of December 2010 because 2013 was the latest year with complete data. Analyses involved comparing the case-control difference before and after the intervention.

Of 149 individuals enrolled up to 31st of December 2010, 136 (91%) had a matched control. The small numbers allow only preliminary insights into the achievements of the programme to date. The mean ages of cases and controls were 56.3 and 56.4 years respectively. In both groups 106 individuals (78%) were female. One year before the start (baseline) of the programme “Healthy Weight” about 80% of cases and controls had diabetes, about 93% obesity and about 60% had dyslipidaemia.

Figure 10.6 shows the hospitalization rates in the two groups. While 24 patients (17.7%) from the “Healthy Weight” participants had been hospitalized (from any cause) in the year before enrolment, this was the case for only 12 control individuals (8.8%). All-cause hospitalization rates were similar in the first year, but continued to decrease to 16 patients (11.8%) in the third year of follow-up in cases, while rates remaining increased in controls. In a difference-in-difference analysis these reverse trends led to 16 less cases in the “Healthy Weight” group compared to the control group in the third year.

A comparison of the total annual difference in expenditure reveals a slower growth in the “Healthy Weight” cohort over the 3 years of follow-up resulting in -149.4 € less expenditure per

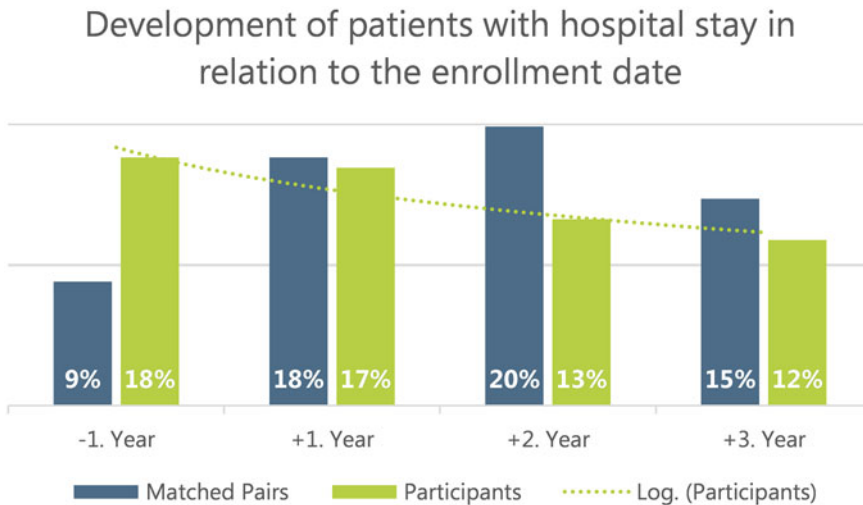


Fig. 10.6 Development of patients with hospital stay in relation to the enrolment date

capita and a difference-in-difference of -659.7 € per capita in the third year (Fig. 10.7).

Furthermore, the mean number of days off work for sickness were over 50% lower among participants than controls, particularly in the third year of follow-up (Fig. 10.8).

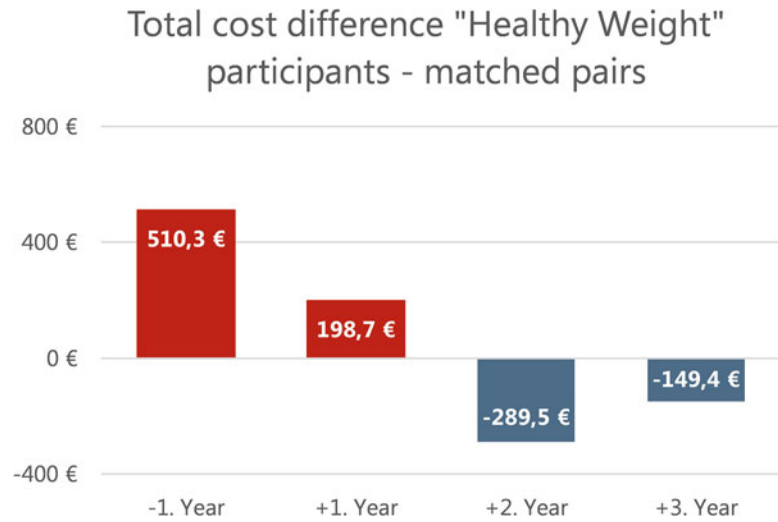
Results of the external evaluation supplement the results of the internal evaluation, although they have a longer time lag and take longer to perform due to database size and methodological issues. The most recent evaluation in May 2015 supported the internal evaluation and demonstrated another improvement in diabetes care. In 2011 only 2.3% of the GK-enrolled diabetes patients were admitted with “diabetes” compared to 4.0% among not-GK-enrolled patients. Statistical significance is barely missed, which is shown in Table 10.2 (in accordance with [39]).

Outlook

Against the background of rapidly increasing chronic diseases and a growing burden for patients to manage their disease, innovative approaches and holistic, patient-centred interventions are needed that fit into the realities of the daily lives of patients [40]. It is important to

address all dimensions of the Triple Aim (care, health and cost) and to commit all stakeholders to a process of healthcare delivery that target these dimensions as a whole. After 10 years of innovative healthcare practice, the management company GK now receives more in income than it spends. Up to 2011, all three dimensions of the Triple Aim Approach have developed positively within GK including its complex sub-interventions [41]. However, further studies are necessary before evidence of sustained success by GK can be described as proven [13, 20]. A critical success factor, already identified by the holistic, public health-related approach of GK, is the long lasting integrated care contract that is based on mutual trust between GK and the two health insurance companies. This facilitates investments in sustainable interventions with their long-term benefits, the support of a cultural change among physicians and patients, and the use of instruments like patient empowerment, shared-decision-making and coaching for the self-management of chronic conditions. Meanwhile, an ongoing sharing and analysing of data helps to identify strengths and weaknesses of interventions much quicker than in usual practice, and enables timely refinements of existing programmes.

Fig. 10.7 Total cost difference of “Healthy Weight”-participants: matched pairs



Development of the mean duration of incapacities for work in relation to the enrollment date

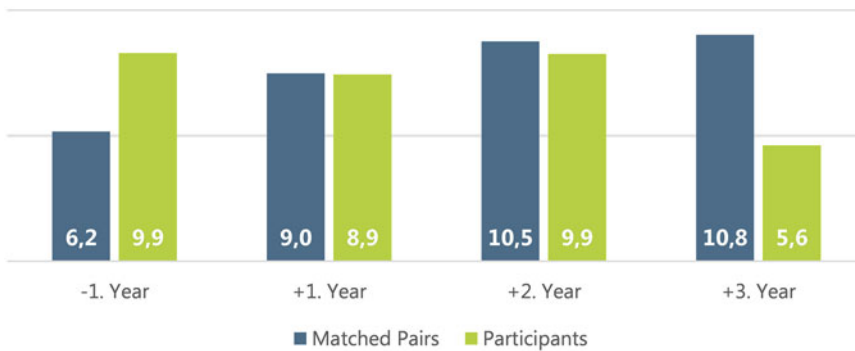


Fig. 10.8 Mean number of days off work for sickness since enrolment

Table 10.2 Comparison of enrolled (GK) and not-enrolled (Not GK) insured individuals of the AOK BW in the Kinzigtal region with diabetes and hospitalization due to diabetes (E10–E14)

Year	GK %	Not GK %	Overall %	Odds ratio	95 %-CI
2006	2.8	2.8	2.8	1.01	0.58–1.75
2007	2.3	3.5	3.1	0.61	0.35–1.08
2008	3.1	4.8	4.2	0.65	0.42–1.03
2009	2.0	3.4	2.9	0.59	0.35–1.01
2010	2.7	3.5	3.2	0.76	0.47–1.23
2011	2.3	4.0	3.3	0.62	0.38–1.02

GK has now made a “step abroad”. In 2015, the Dutch subsidiary “OptiMedis Nederland B.V.” based in Leiden was founded. Following the successful approach of their colleagues in Haslach in Germany, the next challenge is to improve the healthcare of the local population of 40,000 inhabitants of Nijkerk in the Netherlands [42]. Discussions with other health insurance companies are also currently taking place, in order to give other patients the opportunity to use the GK services for their healthcare and wellbeing [34]. A GK study revealed that almost all

respondents (92.1 %) would be willing to recommend the GK healthcare programme [32]. We feel that an integrated care system like GK can be beneficial within the current healthcare system in Germany, especially for people with chronic conditions, through its systematic use of its population health management approaches to optimize the quality of care. The current deficiencies in the regular healthcare system to address the Triple Aim goals adequately should strengthen movement towards more intelligent solutions such as the GK programme.

Abbreviations

AG	Incorporated Company [Aktiengesellschaft]
ACO	Accountable Care Organization
AOK BW	General Local Health Insurance Company in Baden-Wuerttemberg [Allgemeine Ortskrankenkasse Baden-Wuerttemberg]
BMI	Body mass index
BP	Blood pressure
CI	Confidence interval
COPD	Chronic obstructive pulmonary disease
DEGS	German Health Interview and Examination Survey for Adults [Studie zur Gesundheit Erwachsener in Deutschland]
DGE	German Nutrition Society [Deutsche Gesellschaft fuer Ernaehrung]
DMP	Disease Management Programme
EKIV	Coordinating Institution for Evaluation of Integrated Care [Evaluations-Koordinierungsstelle Integrierte Versorgung]
FPG	Fasting plasma glucose
GK	Gesundes Kinzigtal Ltd.
GKV	German statutory health insurance [Gesetzliche Krankenversicherung]
GMG	Health modernization act [Gesundheits-Modernisierungs-Gesetz]

GP	General practitioner
HDL	High density lipoprotein
ICD-10-GM	International classification of diseases 10th revision, German modification
IDF	International diabetes federation
IHI	Institute for healthcare improvement
LKK	Agricultural Health Insurance Company [Landwirtschaftliche Krankenkasse]
LTD	Limited Company
MQNK	Physicians' Network in Kinzigtal Region [Medizinisches QualitätsNetz Kinzigtal e.V.]
OECD	Organization for economic cooperation and development
OGTT	Oral glucose tolerance test
PAC	Patients advisory committee
RKI	Robert-Koch-Institute
SGB V	Book five of Germanys social security code
SHI	Statutory health insurance
SVLFG	Social security of agriculture forestry and horticulture [Sozialversicherung fuer Landwirtschaft, Forsten und Gartenbau]
T1DM	Type-1-Diabetes Mellitus
T2DM	Type-2-Diabetes Mellitus
US	United States
WHO	World Health Organization
ZIP-code	Zone improvement plan-code [Postleitzahl]

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