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# Disease management programmes for patients with coronary heart disease—An empirical study of German programmes

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**Abstract**

*Objective:* To evaluate healthcare and outcomes of disease management programmes (DMPs) for patients with coronary heart disease (CHD) in primary care, and to assess selection of enrolment for these programmes.
*Methods:* A cross-sectional survey of 2330 statutorily insured patients with a history of acute myocardial infarction (AMI) was performed in 2006 by the population-based KORA Myocardial Infarction Register from the region of Augsburg, Germany. Patients enrolled in DMP-CHDs receive evidence-based care, with patients not enrolled receiving standard care. To control for selection bias, a propensity score approach was used.
*Results:* Main factors influencing DMP participation were age (OR 0.98, 95% CI 0.96–0.99), diabetes (OR 1.56, CI 1.25–1.95) and time since last heart attack (OR 0.98, CI 0.95–0.99). Significantly more patients enrolled in DMP-CHDs stated that they received medical counselling for smoking (OR 3.77, CI 1.07–13.34), nutrition (OR 2.15, 1.69–2.74) and for physical activity (OR 2.58, 1.99–3.35). Furthermore, prescription of statins (OR 1.58, CI 1.24–2.00), antiplatelets (OR 1.96, CI 1.43–2.69) and beta-blockers (not significant) were higher in the DMP group. With respect to outcomes, we did not see relevant differences in quality of life and body mass index, and only a minor reduction in smoking.
*Conclusions:* Enrolment into DMPs for CHD exhibits systematic selection effects. Participants tend to experience – at least on a short to medium term and for AMI patients – better quality of healthcare services. However, since DMP-CHDs were initiated only 2 years ago, we were unable to identify significant improvements in health outcomes. Only the reduction in smoking provides a first indication of better quality outcomes following DMP-CHD. Thus, policy-makers must provide appropriate incentives to sickness funds and physicians in order to ensure initiation and continuation of high quality DMPs.


*Keywords:* Disease management programme; Coronary heart disease; Germany; KORA; Empirical study

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## 1. Introduction

In the 1990s, health organisations in developed countries started to offer new models of healthcare for chronically ill patients – so-called disease management programmes (DMPs). These programmes intended to improve the quality and cost-effectiveness of healthcare for chronic conditions by implementing evidence-based guidelines and establishing clinical pathways [1–3]. Under the German statutory health insurance (SHI), the legal framework for sickness funds to implement DMPs was created in 2002 [4,5]. The first DMP started in January 2003. Up to September 2007, a total number of 14,000 DMPs[1] (17 regions, more than 200 sickness funds) were registered for various diseases (diabetes mellitus type 1 and 2, breast cancer, coronary heart disease and asthma/chronic obstructive pulmonary disease). In September 2007, the number of patients voluntarily enrolled in DMPs reached almost 3.6 million [7].

DMPs for coronary heart diseases (CHD) constitute a prominent share of all programmes. Cardiovascular diseases including CHD and chronic heart failure are the most common cause of death in industrialised countries, and impose a significant economic burden on the US and European healthcare systems [8,9]. The prevalence of CHD in Germany is about 7%, affecting almost 6 million people [10]. Healthcare costs of CHD in 2004 were approximately 7 billion EUR, and total costs (including productivity losses and informal care) were estimated at 13 billion EUR [11,12]. In Germany, deficits in medical care of patients with CHD, e.g., insufficiently prescribed standard medication, high percentage of CHD patients with increased blood pressure, smoking or adiposity, resulted in the introduction of DMP-CHDs in the middle of 2004 [13,14].

To date, no study has systematically compared DMP-CHDs (evidence-based treatment) with usual care (standard treatment) in Germany. This is despite the fact that the German sickness funds are obliged by the Social Security Code to evaluate DMPs. There may be two reasons for this: first, DMPs for CHD only started in 2004, leaving limited time for evaluation. Second, and more importantly, evaluation is difficult because of the regulatory linkage between certified DMPs and the risk adjustment system.[2] From this system, sickness funds receive higher payments for each patient who is enrolled in a DMP-CHD (in the case of CHD on average €1700/year for patients not enrolled and €4460/year for enrolled patients [17]). This has driven sickness funds to enrol potential candidates for the DMP as fast as possible, and thereby reduces the possibilities for recruiting control groups [6].

International investigations show positive as well as controversial effects of DMP-CHDs. A systematic review on DMPs for CHD concludes that, while those programmes can improve processes of care, reduce admissions to the hospital, and enhance patients' functional status, their "impact on survival and recurrent infarctions, and their cost-effectiveness, as well as the optimal mix of components remain uncertain" [18]. A recent study shows positive effects of DMP-CHDs on process and outcome quality [19]. The majority of studies were conducted in the US, and thus arise from a different system than the German social security system. Furthermore, as DMPs are set up in different ways, the effects of the programmes can vary. Thus, an evaluation of the German DMP-CHDs would complement the international discussion on these aspects.

Considering this background, the objective of this study is to evaluate the medical care of patients with acute myocardial infarction (a subgroup of persons with CHD) who are enrolled in DMP-CHDs, and compare this with patients with acute myocardial infarction who have not been enrolled in DMP-CHDs. In particular, the following research questions will be analysed:

(1) What differences can be found in characteristics of patients enrolled in DMP-CHDs compared with patients not enrolled (selection of enrolment)?
(2) Is medical care received by DMP-CHD enrolled patients more extensive and guideline-orientated than medical care for not enrolled patients (quality of healthcare services)?
(3) What differences in the results of medical care can be identified for DMP-CHD enrolled patients, as

[1] Despite the sheer number of DMPs they are highly standardised within each indication [6].

[2] During the 1990s, freedom of free consumer choice and a system of risk adjustment were introduced in the SHI. Until 2001, the risk adjustment system was based on age, sex and entitlement to invalidity pensions. This former system left sickness funds ample opportunities to select risks respectively, and these funds faced tremendous lack of financial incentives to actively manage care [15,16].