Research Letter

Care Dependency Factors

Analyses of Assessment Data from the Medical Service of German Statutory Health Insurance Providers

In view of the current life expectancy, most of the population of Germany can expect to be dependent on care in old age. According to the BARMER care report, 75% of women and 60% of men who died in 2017 were care dependent before their death (1). Those affected, their immediate living environment, and increasingly also the care-related services structures and professional care providers are confronted with substantial quantitative and qualitative challenges. Efforts therefore need to be strengthened to reduce demand for care services by preventing, alleviating, or delaying the need for care. This requires identifying important factors influencing the development of care dependency and describing these in their interactions (2, 3).

In the context of funding from the Central Federal Organization of Health Insurance Funds, the opportunity has arisen for the first time to analyze extensive assessment data from the Medical Service of German Statutory Health Insurance providers (MDK) to ascertain care dependency. Of 72 680 applications for initial care assessments in 2017 in the federal states of Berlin and Brandenburg for persons aged between 50 and 99, 57 572 persons (80%) were assigned to a care-level category. Of these people, 48 827 were living in their own homes. What follows is the description of exclusively the results of this partial group, as the focus was on living conditions and social constellations in people's own homes. All analyses are based on assessment data from the MDK. The stratification into care categories is based on a points system defined in the German Social Code (SGB) XI, whose cut-off values are often rated as overly restrictive by critics (4).

Method and results

Characteristics of first-time applicants

As Table 1 shows, 60.1% of applicants assigned to a care-level category were women and 39.9% men. The average age was 78.2 years. About half (50.2%) of this group were living with at least one other person in their own household. About one third (34.4%) were living alone in their own home, but received social support—for example, from, partners, children, or neighbors (information from free text fields in the assessments of assistance received). 15.4% were living alone and without social support in their own household. Most of the care-level recommendations for people living at home fell into category 2 (46%) followed by category 1 (37.5%). 14.0% received a recommendation for care-level category 3 and 2.5% for category 4 or 5.

The influence of medical diagnoses

Among the top 10 diagnoses necessitating care, dementias were the most common, followed by primary generalized polyarthrosis, heart failure, chronic obstructive pulmonary disease (COPD) and cerebral infarction (Table 1).

We used adjusted ordinal regression models to analyze which diagnoses were most likely to be associated with a recommendation for a higher care-level category (Table 2). Patients with dementia (odds ratio [OR]: 10.71; 95% confidence interval [7.79;

TABLE 1

Characteristics of first-time applicants with a recommended care-level category, by care-level category

Recommended care-level category	Care-level category				Total
	1	2	3	4 (4+5)	
N (%)	18 331 (37.5)	22 459 (46.0)	6 831 (14.0)	1 206 (2.5)	48 827
Sex					
Women, n (%)	11 791 (6540)	13 348 (9111)	3 620 (3211)	583 (623)	29 342 (60.1 %)
Men, n (%)					19 485 (39.9 %)
Age in years, mean (SD)	77.6 (10.3)	78.6 (10.1)	78.3 (10.1)	77.2 (10.6)	78.2 (10.2)
The 10 most common initial diagnoses*					
F00, F03, G30	4.1	8.8	21.3	16.8	9.0
M15	6.5	6.2	2.5	1.2	5.7
I50	5.0	5.5	3.5	2.3	4.9
J44	5.6	4.4	2.3	0.9	4.4
I63	3.4	3.9	5.6	9.0	4.1
F06	2.7	3.9	6.0	3.7	3.7
M19	4.2	3.8	1.4	0.3	3.5
M54	4.5	2.9	1.1	0.4	3.2
G20	1.7	2.8	3.9	2.8	2.6
C34	1.2	2.2	3.4	6.9	2.1

* Percentages of diagnosis in all applicants with a recommendation for the respective care-level category; sorted by cumulative proportion across all care-level categories; the basis for diagnoses is the ICD-10: F00 = dementia in Alzheimer's disease, F03 = unspecified dementia and G30 = Alzheimer's disease; M15 = primary generalized polyarthrosis; I50 = heart failure; J44 = chronic obstructive pulmonary disease (COPD); I63 = cerebral infarction; F06 = other mental disorders due to known physiological condition; M19 = other and unspecified osteoarthritis; M54 = dorsalgia; G20 = Parkinson's disease; C34 = malignant neoplasm of bronchus and lung; SD = standard deviation

14.72]), lung cancer (OR: 15.35; [10.71; 21.99]), and cerebral infarction (OR: 11.14; [7.95; 15.61]) had a higher probability of being assigned to a high care-level category (4/5) than patients with a diagnosis of dorsalgia (reference category). Furthermore, age and living situation were important factors influencing the recommended category. With each age decade, the probability of being assigned to a higher care-level category rose by up to 19%. Compared with people living on their own without social support (reference) the risk for being assigned to a higher care-level category on first application rose in people living with another person (OR range 5.43–14.38). This hints at possible protective effects of close social relationships (especially between partners), which may initially offset a growing need for support and care (2). Progressive health losses over the further course, however, lead to applications and first assignments to higher care-level categories, which reflect worse health and the limitations of social support potentials.

5% of the variance (Pseudo-R² = 0.0468) for a category recommendation to a care-level can be explained by means of the predic-

TABLE 2

Results of the regression analysis (main effects)—odds ratios [95% confidence intervals] of the multiple ordinal regression model of the care-level categorization in different diagnoses

	Results from ordinal partial model (proportional odds assumption met)	Results from multinomial partial model (proportional odds assumption not met)		
	ORs for a higher care-level category	CLC 2, 3, 4 versus CLC (ref)	CLC 3, 4 versus CLC 1, 2 (ref)	CLC 4 versus CLC 1, 2, 3 (ref)
Sex (male)	1.07 [0.96; 1.18]	—	—	—
Age (in decades)		1.19* [1.14; 1.25]	1.13* [1.08; 1.20]	1.14* [1.06; 1.23]
Living situation/support (ref living alone without assistance)				
Living alone with assistance	—	1.00 [0.65; 1.55]	1.24 [0.79; 1.94]	1.47 [0.85; 2.52]
Living at home with another person	—	5.43* [3.64; 8.10]	7.97* [5.28; 12.02]	14.38* [8.72; 23.96]
Diagnosis (ref M54)				
F00, F03, G30		5.50* [4.80; 6.31]	10.44* [9.05; 12.03]	10.71* [7.79; 14.72]
M15	1.51* [1.34; 1.71]	—	—	—
I50	1.89* [1.66; 2.14]	—	—	—
J44	1.29* [1.14; 1.47]	—	—	—
I63		2.44* [2.13; 2.81]	5.26* [4.48; 6.18]	11.14* [7.95; 15.61]
F06		3.01* [2.61; 3.48]	5.76* [4.90; 6.78]	5.46* [3.65; 8.18]
M19		1.40* [1.22; 1.61]	1.07 [0.84; 1.36]	0.40 [0.13; 1.71]
G20		2.97* [2.52; 3.49]	4.46* [3.72; 5.33]	4.50 [2.90; 6.95]
C34		3.90* [3.25; 4.67]	6.53* [5.44; 7.85]	15.35* [10.71; 21.99]

N = 48 827; R² = 0.0468; controlled for "other diagnoses"; *Odds ratios (ORs) where the 95% confidence interval does not include "1" (p < 0.001); ICD-10 codes, see footnote Table 1; CLC, care-level category; ref, reference

tors included in the ordinal regression model. A more detailed explanation requires in particular longitudinal data, so as to establish causal associations and interactions between losses in physical and mental functioning as well as personal and social constellations.

Conclusions

Altogether the findings support the argument that care dependency can be affected preventively and is not unavoidable in every case (5). This is supported on the one hand by the great variance in age when entering care dependency, together with the question of which resources enable a person to indicate a need for care and support at age 88 and not as early as age 78. This question is currently the subject of further study. At the same time, the data reveals that whenever a person is assigned to a care-level category, they are usually assigned to a moderate category at first; nearly 84% of applicants still living in their own home were assigned to categories 1 or 2, while only 2.5% were assigned to categories 4 or 5. Consistent rehabilitation measures and support for existing resources—especially support of the person in need of care by close social relationships—can lead to a situation where care-level categories—and therefore the need for assistance—remain constant for long periods of time. Last but not least, acknowledging the association between dementia and care dependency provides starting points for counteracting progressive cognitive losses in a targeted manner by adapting exercise training, in order to keep care dependencies at constant levels or even reduce them.

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Conflict of interest statement

The authors declare that no conflict of interest exists.

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