

# Impact of a campaign on the public's attitudes towards depression

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## Abstract

A public campaign was launched in 2000 as part of the four-level community-based intervention 'Nuremberg Alliance Against Depression' (NAD) in Nuremberg, Germany. Evaluation results will be presented. A baseline survey was done before the campaign in Nuremberg and Wuerzburg (control region), two surveys followed 10 and 22 months after the implementation. Multiple regression analyses were performed, with time, place and the interaction of time and location as independent and the corresponding items as dependent variables. For the general population, the campaign was successful in creating awareness for the NAD. For persons who reported experience with depression and persons aware of the NAD, analyses showed positive desirable effects: more awareness of depression and the NAD. In addition, among those aware, more positive attitudes towards medication treatment and antidepressants developed and also 'lack of self-discipline' declined as causal explanation as did the notion 'pull yourself together' as treatment option. The campaign induced relevant changes mainly in persons aware of the NAD and persons who

reported to have had experience with depression. The fact that many of the changes in the general population declined in the second year of the campaign, when activities were done with lower intensity, illustrates the need for permanent depression awareness action.

## Introduction

Depression affects ~121 million people worldwide [1] and unipolar depressive disorder is the leading cause of the burden of disease, measured in disability-adjusted life-years in high-income countries [2]. Depression is associated with a high degree of personal suffering and reduced quality of life [3–7]. Furthermore, depression is associated with a high risk of relapse, the risk of becoming chronic as well as an increased mortality because of suicidal behaviour and suicide and an overall increased mortality [8]. Also, the illness has far reaching consequences from the perspective of health care policy and national economics: For instance, depression is increasingly becoming the cause of early retirement due to a reduced ability to work and is associated with high direct and indirect cost [9–18].

Yet, 50–60% of affected individuals do not seek treatment [19–21], World Health Organization even states that <25% of those affected (in some countries <10%) receive treatment [1], even though effective pharmacological and psychotherapeutic treatments are available [22–26]. Many different reasons keep people from seeking treatment, among them fear, shame, financial barriers [27], stigma [28–30], hopelessness and not enough energy to seek help, general reservations and concerns about

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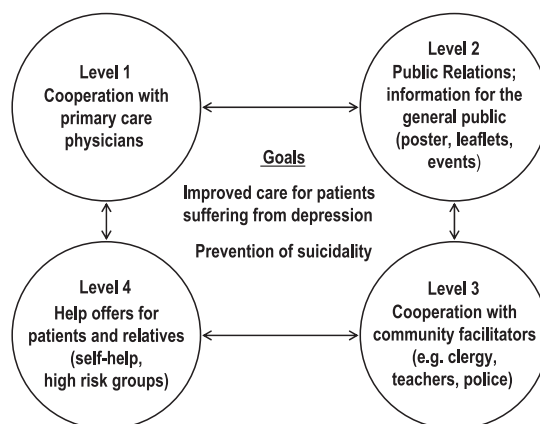
psychotherapy, pharmacotherapy and psychiatry, lack of availability of providers and treatments [31], but also lack of knowledge [32] resulting, for instance, in a failure to recognize the symptoms, the underestimation of severity [33] and false assumptions about causes, symptoms and available treatment of depression.

Early diagnosis of depression and an optimized provision with care and health services could help to reduce and prevent personal suffering, increased mortality and economic cost. Informing the public not only that depression is a serious illness, which can affect anyone regardless of their social background, financial situation or age, but also that effective treatments are available could help to diminish some of the barriers described above and could pave the way to early diagnosis and treatment. If fear, shame, stigma as well as lack of knowledge about causes, symptoms and available treatments are reduced, the high number of people who do not receive treatment may be reduced.

### The Nuremberg Alliance against Depression—increasing the public’s knowledge and raising awareness of depression

Different initiatives have been started to change false assumptions, to raise awareness and increase the public’s knowledge and, ideally, also to alter attitudes and treatment-seeking behaviour. Among them are the Defeat Depression Campaign in the United Kingdom [34, 35], the ‘beyondblue’ initiative in Australia [36–38] and the ‘Nuremberg Alliance Against Depression’ (NAD) [39]. The latter initiative was launched by these authors in the city of Nuremberg in Germany in 2001 as a four-level community-based project, including interventions with primary care physicians, a public campaign, interventions with community facilitators and interventions with depressed persons, suicide attempters and their relatives (see Fig. 1). The concept and outcomes of the NAD have been described in more detail elsewhere [26, 39, 40].

One of the main results of the careful evaluation of the NAD with respect to a 1-year baseline and the



**Fig. 1.** Graphical representation of the 2-year 4-level intervention ‘Nuremberg Alliance Against Depression’ (NAD).

control region (Wuerzburg) was that the number of suicidal acts (completed suicides + suicide attempts as primary outcome) in Nuremberg decreased significantly (–24%) during the intervention as compared with an increase in the control region of Wuerzburg (+7.1%) [39]. Based on these primary results, the NAD concept has spread in Germany since 2002 and since 2004 also in 17 European countries (<http://www.eead.net/>; [41, 42]).

Looking at the strong change in suicidality during the intervention, the question arises as to which of the measures of the four intervention levels (see Fig. 1) has contributed most to this effect. Although effects of measures at the single levels cannot be separated from each other, because a strong synergistic effect has to be assumed [39], the present article is focused on intermediate outcomes of the public campaign. The guiding question to be answered is: Have awareness of depression, beliefs about causes and attitudes towards depression and its treatment changed as a result of the campaign?

## Methods

### The public campaign of the NAD

The key campaign messages were ‘depression can affect everybody’, ‘depression takes many forms’

and 'depression is treatable' [26]. The messages appeared on 'posters' (see Fig. 2) together with the appeal to get more information on the website of the NAD or to go and seek professional help. The messages were also pictured on the cover of >100 000 'leaflets' and 25 000 'information brochures' about depression. The leaflets and brochures contained information about depressive disorders, warning signals and symptoms, causes and treatment options and also listed addresses of doctors, psychotherapists, a crisis telephone line and other sources and services where people would find help for themselves or a relative or friend affected by depression. The leaflets and brochures were distributed and handed out during 'public events', including presentations, photo exhibitions, readings, road shows and panel discussions, but were also distributed in pharmacies. Furthermore, a 'cinema spot' was shown in a multiplex cinema in Nuremberg. A website was established ([www.kompetenznetz-depression.de/](http://www.kompetenznetz-depression.de/)) and a half-hour 'video' for patients was produced. Another important element of the public campaign was the establishment of close ties and co-operation with the 'local media' (radio, TV and print media in Nuremberg), to put depression on the public agenda and to counteract negative media reporting by defining standards for reporting on suicides in the region. Finally, all activities of the NAD shared

an important visual element: a 'logo' for re-identification. The logo (see Fig. 3) had a presence at all public events and activities and was printed on all information materials.

The measures of the public campaign described above were done with different intensity across the 2-year period of the NAD, with a lower intensity in the second year of the campaign. For instance, large format posters were displayed in Nuremberg with high intensity around the time of the first survey in October 2001, but none was displayed around the time of the second survey. Also, in October 2001, there were 52 press reports as compared with 17 in October 2002. Finally, the rate of participants in road shows was much lower in the second year (-25%).

### The evaluation

To evaluate the effect of the campaign on attitudes and knowledge about depression, a baseline survey was done 2 months before the start of the public campaign in October 2000 in Nuremberg and Wuerzburg (see Fig. 4). Two surveys followed 10 and 22 months after the implementation of the campaign. In the pretest (baseline survey), data on the public's attitudes towards depression in Nuremberg (intervention region) and the control region (Wuerzburg) were collected. A pre-test and post-



**Fig. 2.** Posters used during the information campaign (key messages from left to right: depression can affect everybody, depression takes many forms, depression is treatable).



**Fig. 3.** Logo of the NAD.

Activities	2000	2001	2002
Baseline survey	▲		
Public campaign in Nuremberg			
2nd and 3rd survey		▲	▲
Evaluation			

**Fig. 4.** Timetable of data collection and evaluation.

test comparison, including three intervention groups and three control groups (2000, 2001 and 2002), was done to find out whether beliefs and attitudes have changed as a result of the campaign.

### Data collection and questionnaire

Computer-assisted telephone interviews (CATIs) were done in Nuremberg and Wuerzburg. Random samples of telephone numbers of private households were taken from the CD-ROM based telephone directory 'KlickTel' in 2000 and 2001.

A fully structured standardized questionnaire with the following key areas was used during the telephone interviews. 'Awareness of an increased discussion of depression in the public': 'Have you got the impression that depression has recently been discussed in more detail in the public?' 'Noticing the campaign': 'Have you ever heard of the NAD?' 'General attitudes towards depression': Here, the severity of depression in comparison to other illnesses was assessed as well as respondents' agree-

ment with existing prejudices: 'How severe do you rate the following illnesses: influenza, hey fever, back pain, diabetes, cancer, caries, depression, AIDS?' How much do you agree to the following statements: 'Depression is not really an illness'; 'If you have a depression, then it is your own fault'; 'You have to pull yourself together to get rid of a depression'; 'If you have a depression, you are rendered helpless without outside support' and 'Depression is an illness like diabetes; it needs to be treated by a doctor or psychotherapist'. 'Beliefs about causes, symptoms and treatment of depression—causes': respondents were presented with different response options and were asked to assess the importance or suitability of each of these options. The causes given were 'wrong lifestyle', 'problems with other people', 'metabolism brain deficiency', 'blow of fate', 'inheritance', 'bad nutrition', 'environmental poisons', 'information overload by the media', 'today's achievement-orientated society', 'lack of self-discipline' and 'weakness of character'. Response options for 'symptoms' included 'joylessness', 'compulsive cleaning', 'hallucinations', 'physical symptoms' and 'feelings of guilt'. 'Treatment': Which of the following things do you consider to be suited to do something against depression?: 'talk to friends', 'go on holidays', 'sleeping pills', 'psychotherapist', 'doctor', 'pull yourself together', 'sweets', 'light therapy', 'medication', 'meditation', 'doing sports' and 'naturopath'. 'Side effects of antidepressants': Questions like 'Do antidepressants have side effects?', 'Are antidepressants addictive?', 'Do they change a person's character?' and 'Do they change one's personality?' were used to find out what the public knows and thinks about negative effects of antidepressant treatment. 'Experience with depression': 'Has someone from your family or a (close) friend ever been treated for depression?' Finally, 'socio-demographic data' were collected, including age, gender, educational and familial background, etc.

### Sample

The following statements refer to the original (unweighted) data. In a cross-sectional survey, a total of 2746 persons living in Nuremberg or Wuerzburg, aged between 18 and 99, were contacted in 2000

(pretest). A total of 1426 ( $N = 1426$ ) persons participated in this pretest (response rate: 52%). In 2001, a second independent sample of 2203 persons was contacted and  $N = 1507$  persons participated, reflecting a response rate of 68%. In 2002, a third independent sample of  $N = 1423$  respondents participated from a total of 2475 persons contacted (response rate 57%). For a sampling procedure where the official telephone directory was used, response rates between 40 and 60% have been reported for CATIs done in Germany [43, 44]. Thus, this study's response rate is quite typical for Germany.

### Statistical analysis

Given that the socio-demographic characteristics of our sample deviated from those of the public in Nuremberg and Wuerzburg (as presented by the federal statistics bureau), a decision was made to provide age- and sex-adjusted weights for each participant. Thus, the weighted percentages reported in this article represent estimates of the population of these two cities.

Multiple regression analyses were performed with time (2000, 2001 and 2002), place (Nuremberg and Wuerzburg) and the interaction of time and place as independent variables and the corresponding items (e.g. relevance of lack of self-control as

cause of depression) as dependent variables. In case of three ascending item categories (e.g. not important, somewhat important and important), ordinal regression analyses were calculated. Binomial logistic regression analyses were chosen for dichotomous dependent variables (yes versus no). All statistical analyses were performed with SPSS 12.0. The statistical tests were two tailed and a  $P$ -value of  $\leq 0.05$  was considered to be statistically significant.

## Results

### Sample characteristics

Generally, there were more women than men in the sample. The average age of the weighted Nuremberg sample was significantly higher than that of the Wuerzburg sample. The Nuremberg sample had fewer university graduates than Wuerzburg, but more persons with normal school-leaving certificate. The Nuremberg sample also had more blue-collar workers and more persons whose mother tongue was not German (see Tables I and II).

### Campaign effects

In the following, results of the evaluation of the public campaign are presented. The focus will be

**Table I.** Characteristics of the Nuremberg sample

Variables	2000 ( $N = 713$ )	2001 ( $N = 740$ )	2002 ( $N = 709$ )	Statistics
Age (years) (mean $\pm$ SD)	48.32 $\pm$ 18.66	48.66 $\pm$ 18.20	48.72 $\pm$ 18.78	$F(22, 158) = 0.095$ ; $P = 0.91^a$
Female [ $n/N$ (%)]	369/713 (51.8)	383/740 (51.8)	372/709 (52.5)	$\chi^2(2) = 0.097$ ; $P = 0.95^b$
Occupational status [ $n$ (%)]	$N = 684$	$N = 719$	$N = 687$	$\chi^2(10) = 17.6$ ; $P = 0.06^b$
Employed	371 (54.2)	380 (52.9)	369 (53.7)	—
Retired <sup>c</sup>	194 (28.4)	207 (28.8)	185 (26.9)	—
Trainee/student	51 (7.5)	57 (7.9)	59 (8.6)	—
Unemployed	10 (1.5)	10 (1.4)	24 (3.5)	—
Homemaker	46 (6.7)	39 (5.4)	35 (5.1)	—
Others	12 (1.8)	26 (3.6)	15 (2.2)	—

In order to adjust for deviations of the three samples from socio-demographic characteristics of the public in Nuremberg as reported by the federal statistics bureau, weights were provided for each subject. The weighted numbers and percentages presented in this table represent estimates of the population of Nuremberg.

<sup>a</sup>Results based on univariate analysis of variance.

<sup>b</sup>Results based on a chi-square test for independent samples.

<sup>c</sup>Including preterm retirees.

**Table II.** Characteristics of the Wuerzburg sample

Variables	2000 (N = 710)	2001 (N = 750)	2002 (N = 707)	Statistics
Age (years) (mean $\pm$ SD)	46.79 $\pm$ 19.37	46.49 $\pm$ 19.27	46.18 $\pm$ 19.22	$F(22, 164) = 0.18$ ; $P = 0.84^a$
Female [n/N (%)]	388/710 (54.6)	408/750 (54.4)	390/707 (55.2)	$\chi^2(2) = 0.09$ ; $P = 0.96^b$
Occupational status [n (%)]	N = 674	N = 718	N = 688	$\chi^2(10) = 20.87$ ; $P = 0.02^b$
Employed	306 (45.4)	357 (49.7)	346 (50.3)	—
Retired <sup>c</sup>	167 (24.8)	187 (26.0)	164 (23.8)	—
Trainee/student	115 (17.1)	107 (14.9)	120 (17.4)	—
Unemployed	22 (3.3)	9 (1.3)	14 (2.0)	—
Homemaker	58 (8.6)	44 (6.1)	34 (4.9)	—
Others	6 (0.9)	14 (1.9)	10 (1.5)	—

In order to adjust for deviations of the three samples from socio-demographic characteristics of the public in Wuerzburg as reported by the federal statistics bureau, weights were provided for each subject. The weighted numbers and percentages presented in this table represent estimates of the population of Wuerzburg.

<sup>a</sup>Results based on univariate analysis of variance.

<sup>b</sup>Results based on a chi-square test for independent samples.

<sup>c</sup>Including preterm retirees.

on specific effects in the general population and in the subgroups, also taking into account socio-demographic characteristics, which may have a moderating effect on the results.

## General population

### *Awareness of an increased discussion of depression in the public*

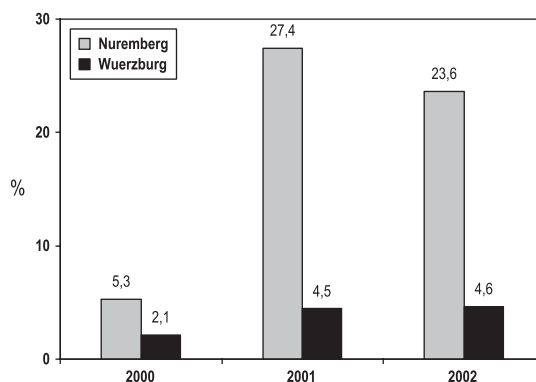
The percentage of the population in Nuremberg who perceived an increased discussion of depression increased from 29.4% in 2000 to 45.9% in 2002. As expected, the control region of Wuerzburg showed no significant changes (2000: 35.2%, 2001: 34.3% and 2002: 37.7%). The interaction of the factors 'town' and 'year' is significant ( $P < 0.001$ ).

### *Noticing the campaign*

The percentage of people from Nuremberg who noticed the NAD increased considerably from 5.3% in 2000 to 23.6% in 2002. There was no such increase in the Wuerzburg sample. The interaction of the factors town and year showed a trend to be significant ( $P = 0.095$ ) (see Fig. 5).

### *Beliefs about causes*

Looking more closely at the first intervention year, the percentage of population in Nuremberg who



**Fig. 5.** Perception of the 'NAD' in the general population in the baseline year (2000) and the two intervention years (2001, 2002).

saw 'lack of self-control' as being of importance for the genesis of depression reduced significantly as compared with the baseline survey (2000: 30.7% and 2001: 16.3%, year  $\times$  town interaction:  $P = 0.004$ ). In the following year, this number increased again to 24.2%; however, it was still lower than at baseline. Also, the stigmatizing causal attribution weakness of character had become less popular in the first intervention year in Nuremberg than in the control region [ $\Delta$ 2000–2001: Nuremberg, 6.9%; Wuerzburg, 3.1%; year  $\times$  town interaction (2000–2001):  $P = 0.07$ ]. In the second year, this

number increased to 23.3% and was even higher than at baseline. A similar effect was found in the control region, where it was less pronounced (Table III). The differences between Nuremberg and Wuerzburg in changes of this variable were significant at the 5% level (year  $\times$  town interaction:  $P = 0.04$ ).

### Beliefs about treatment

Responses to these questionnaire items are of particular interest as they are indirectly related to one of the key messages of the campaign: 'depression

can be treated'. In the first intervention year, a significantly higher number of people from Nuremberg thought that 'visiting a doctor' was well suited in the treatment of depression (2000: 64.7% and 2001: 73.7%, time effects at Nuremberg:  $P = 0.001$ ). In the second intervention year, this number dropped below baseline (57.3%) and the interaction with the control region failed to meet significance (year  $\times$  town interaction:  $P = 0.11$ ). The same applies to the role of psychotherapists for depression treatment: their role was more frequently seen as important after 10 months of the

**Table III.** Beliefs about causes and treatment of depression in the public of Nuremberg and Wuerzburg

	Baseline (2000)	Intervention (2001)	Intervention (2002)	Regression <sup>a</sup> ( $P$ value)		
	Important (%)	Important (%)	Important (%)	Time	Location	Interaction time $\times$ location
<b>Causes of depression<sup>b</sup></b>						
Lack of self-control						
Nuremberg	30.7	16.3	24.2	0.10	0.003	0.02
Wuerzburg	23.4	18	18.8			
Weakness of character						
Nuremberg	21	14.1	23.3	0.04	0.003	0.04
Wuerzburg	17.5	14.3	18.2			
	Well suited (%)	Well suited (%)	Well suited (%)			
<b>Treatment of depression<sup>c</sup></b>						
Visiting a doctor						
Nuremberg	64.7	73.7	57.3	<0.001	0.21	0.11
Wuerzburg	67.4	71.3	59.1			
Taking antidepressants						
Nuremberg	29	32.9	30.2	0.90	0.03	0.34
Wuerzburg	34.1	37.4	34.5			
Visiting a psychotherapist						
Nuremberg	75.4	80.2	74.2	0.92	0.09	0.98
Wuerzburg	78.7	79.7	78.7			
Pulling yourself together						
Nuremberg	20.4	15.5	20.7	0.89	0.095	0.94
Wuerzburg	15.7	15.0	16.5			
Meditation						
Nuremberg	62.5	62.9	57.9	0.88	0.46	0.26
Wuerzburg	55.9	59.0	56.0			

In order to adjust for deviations of the three samples from socio-demographic characteristics of the public in Nuremberg and Wuerzburg as reported by the federal statistics bureau, weights were provided for each subject. The weighted percentages presented in this table represent estimates of the population of Nuremberg and Wuerzburg.

<sup>a</sup>Results of ordinal regression analysis in case of three item categories and results of binomial logistic regression analysis in case of two-item categories (dichotomous variables: yes/no).

<sup>b</sup>Question wording: 'If someone suffers from a depression, it can be attributed to different causes. What do you think: How important are the following causes?'

<sup>c</sup>Question wording: 'Which of the following possibilities do you consider to be suited to do something against depression?'

campaign; however, in the second year, this effect declined again and the comparison to the control region was not significant. A positive trend also showed with regard to medication. A total of 32.9% agreed in the first intervention year that taking antidepressants is well suited (2000: 29% and 2002: 30.2%). The place  $\times$  time interaction for the whole intervention period, however, was not significant (year  $\times$  town interaction:  $P = 0.34$ ). The percentage of persons who agreed that ‘pulling yourself together’ is suited to do something against depression was reduced in the first year of the campaign by almost one-fourth. In the second year, this effect declined and the comparison with Wuerzburg was not significant. Finally, agreement to the notion that meditation is well suited for the treatment of depression declined in Nuremberg and increased in Wuerzburg; however, the changes were not significant (Table III).

For questionnaire items from the sections ‘general attitudes towards depression, beliefs about symptoms and beliefs about side effects of antidepressants’, there were no significant changes in Nuremberg in comparison to the control region.

### Subgroup analyses

Subgroup analyses allowed looking at specific groups of persons from the total sample. It is likely that the public campaign has had an effect particularly on the persons who were aware of the campaign and those who reported to have had experience with a family member’s or a friend’s depression. Table IV presents the percentage of persons being aware of the campaign and having reported to have had experience with a family member’s or a friend’s by depression.

The questionnaire item referring to the subgroup of people who were aware of the campaign was ‘Have you ever heard of the Nuremberg Alliance Against Depression?’. The subgroup of persons who have had experience with depression was identified by the questionnaire item: ‘Has someone in your family or a (close) friend ever been treated for depression?’. Thus, respondents were not assessed on their own depression.

In the following, evaluation results will be presented for the two subgroups and selected socio-demographic characteristics.

### *Persons who were aware of the campaign*

Analysis showed that persons in this group were more often female, had a higher level of education, more often had a person with depression in their family or circle of friends and were also more frequently employed in the health sector.

Looking more closely at the analysis of this subgroup, where persons aware of the campaign from Nuremberg are compared with the persons from Wuerzburg not aware of the NAD, the following campaign effects can be observed. Awareness of an increased discussion of depression in the public: Unsurprisingly, while the percentage of the persons from this subgroup who had the feeling that depression has been discussed more frequently increased from 28.9% (2000) to 64.2% (2002) in Nuremberg, there was no such increase in Wuerzburg (34.7–37.5%) (interaction of factors ‘place’ and year 2000 versus 2002:  $b = -0.87$ ;  $P < 0.001$ ). Furthermore, the percentage of those who had read or seen anything about depression recently increased from 38.1% (2000) to 80.1% (2002) in Nuremberg and from 41.1% (2000) to 49.2% (2002) in Wuerzburg ( $b = -0.99$ ;  $P < 0.001$ ). ‘Beliefs about causes’: While still 30.2% in Nuremberg in 2000 agreed that lack of self-discipline is an important cause of depression, in 2002 only 15.9% agreed to this view (Wuerzburg: 2000: 23.4% and 2002: 19.3%;  $b = 0.64$ ;  $P = 0.002$ ). ‘Beliefs about treatment’: Effects were also found for different treatment options: First, while in 2000, still 17.9% of the Nuremberg subgroup sample said that ‘you just have to pull yourself together’ when you are depressed, this figure decreased to 8.5% in 2002 [Wuerzburg: 13.3% in 2000 and 15.6% in 2002];  $b = 0.72$ ;  $P = 0.001$ ]. Second, taking medication was seen as very useful by 28.9% at the beginning of the campaign in Nuremberg. In 2002, this figure increased to 40.7%. There was no change in Wuerzburg (2000: 34.3% and 2002: 34.2%;  $b = -0.53$ ;  $P = 0.006$ ). ‘Beliefs about side effects of antidepressants’: The belief antidepressants are addictive was shared by 82.5%



**Table IV.** Percentage of persons who reported experience with a family member's or friend's depression and being aware of the campaign

Variables	Reported experience with depression <sup>a</sup> [n/N (%)]	Statistics	Awareness of the NAD [n/N (%)]	Statistics <sup>b</sup>
Age		$\chi^2 (2) = 30.35; P < 0.001$		$\chi^2 (2) = 6.15; P = 0.046^c$
18–30 years	133/304 (43.8)		65/205 (31.7)	
31–64 years	437/785 (55.7)		244/630 (38.7)	
≥65 years	106/278 (38.1)		58/190 (30.5)	
Gender		$\chi^2 (1) = 24.62; P < 0.001$		$\chi^2 (1) = 2.55; P = 0.11^c$
Female	409/734 (55.7)		212/558 (38)	
Male	268/634 (42.3)		155/467 (33.2)	
Family status		$\chi^2 (4) = 4.94; P = 0.29$	<i>N</i> = 1012	$\chi^2 (4) = 8.39; P = 0.08^c$
Married	321/619 (51.9)		194/490 (39.6)	—
Not married, but with partner	39/88 (44.3)		17/66 (25.8)	—
Separated, without partner	65/122 (53.3)		29/85 (34.1)	—
Widowed, without partner	58/125 (46.4)		27/94 (28.7)	—
Single	186/400 (46.5)		95/277 (34.3)	—
Highest educational level		$\chi^2 (4) = 15.0; P = 0.005$	<i>N</i> = 996	$\chi^2 (4) = 45.5; P < 0.001^c$
Pupil	1/7 (14.3)		5/10 (50)	—
Secondary modern school	177/395 (44.8)		65/284 (22.9)	—
Secondary school	185/381 (48.6)		99/301 (32.9)	—
High school	137/255 (53.7)		73/168 (43.5)	—
University/academy	167/294 (56.8)		115/233 (49.4)	—
Occupational status		$\chi^2 (5) = 10.25; P = 0.069$	<i>N</i> = 1003	$\chi^2 (5) = 20.8; P = 0.001^c$
Employed	331/662 (50)		221/568 (38.9)	—
Retired <sup>d</sup>	163/356 (45.8)		65/246 (26.4)	—
Trainee/student	75/160 (46.9)		32/82 (39.0)	—
Unemployed	17/32 (53.1)		8/18 (44.4)	—
Homemaker	65/104 (62.5)		16/61 (26.2)	—
Others	10/17 (58.8)		16/28 (57.1)	—
Employed in health sector		$\chi^2 (1) = 6.24; P = 0.013$		$\chi^2 (1) = 20.97; P < 0.001^c$
Yes	82/139 (59.0)		60/102 (58.8)	
No	326/688 (47.4)		191/549 (34.8)	
Non-German mother tongue		$\chi^2 (1) = 4.07; P = 0.04$		$\chi^2 (1) = 15.88; P < 0.001^c$
Yes	633/1255 (50.4)		12/79 (15.2)	
No	44/109 (40.4)		355/945 (37.6)	

In order to adjust for deviations of the three samples (2000, 2001 and 2002) from socio-demographic characteristics of the public in Nuremberg and Wuerzburg as reported by the federal statistics bureau, weights were provided for each subject. The weighted numbers and percentages presented in this table represent estimates of the population of Nuremberg and Wuerzburg.

<sup>a</sup>Subjects from Nuremberg and Wuerzburg at baseline.

<sup>b</sup>Subjects from Nuremberg who were not aware of the campaign at baseline (2000) + those subjects from Nuremberg who were aware of the NAD in 2001 and 2002.

<sup>c</sup>Results based on chi-square tests for independent samples.

<sup>d</sup>Including preterm retirees.

of this subgroup in Nuremberg in 2000 and by 66.9% in 2002. There was only a slight decrease in Wuerzburg (2000: 77.9% and 2002: 75.4%;  $b = 0.69; P = 0.007$ ) (see Table V).

#### *Persons who reported experience with family member's or friend's depression*

Between 38.1 and 55.7% of the respondents said that they have 'someone in their family or a friend

**Table V.** Specific effects of the NAD: results of subgroup analyses—persons who were aware of the NAD

	Baseline (2000), %	Intervention (2001), %	Intervention (2002), %	Regression <sup>a</sup> interaction time × location ( <i>P</i> value)
Have you got the impression that depression is an issue which has recently been discussed in more detail in the public? Yes.				
Nuremberg	28.9	71.9	64.2	<0.001
Wuerzburg	34.7	33.8	37.5	
If you have a depression, you have to pull yourself together to get rid of it. <sup>b</sup> I totally agree.				
Nuremberg	17.9	9.0	8.5	0.001
Wuerzburg	13.3	14.7	15.6	
Lack of self-discipline is an important cause of depression. <sup>c</sup>				
Nuremberg	30.2	9.2	15.9	0.002
Wuerzburg	23.4	18.4	19.3	
Have you read or heard something about depression recently? Yes.				
Nuremberg	38.1	80	80.1	<0.001
Wuerzburg	41.1	36.6	49.2	
Antidepressants are addictive. <sup>d</sup> Yes.				
Nuremberg	82.5	78.0	66.9	0.007
Wuerzburg	77.9	81.7	75.4	
Taking medication is very suited to do something against depression. <sup>e</sup> Yes.				
Nuremberg	28.9	35.2	40.7	0.006
Wuerzburg	34.3	36.5	34.2	

In order to adjust for deviations of the three samples from socio-demographic characteristics of the public in Nuremberg and Wuerzburg as reported by the federal statistics bureau, weights were provided for each subject. The weighted percentages presented in this table represent estimates of the population of Nuremberg and Wuerzburg.

<sup>a</sup>Results of ordinal regression analysis in case of three-item categories and results of binomial logistic regression analysis in case of two-item categories (dichotomous variables: yes/no).

<sup>b</sup>Question wording: 'Which of the following possibilities do you consider to be suited to do something against depression?'

<sup>c</sup>Question wording: 'If someone suffers from a depression, it can be attributed to different causes. What do you think: How important are the following causes?'

<sup>d</sup>Question wording: 'Among other treatments for depression, doctors use special medication, so called antidepressants. What do you think: Are antidepressants addictive?'

<sup>e</sup>Question wording: 'If you want to do something against depression, there are different things to do. Which of the following possibilities do you consider to be well suited, suited or not suited at all?'

who has been treated for depression'. This group had more women and more persons with a higher level of education than those who did not report to have had any experience with depression. The persons in this group were also younger and had more knowledge about depression, causes and treatment options (see Table IV). In the following, persons who reported experience with depression from Nuremberg and persons who reported experience with depression from Wuerzburg are compared and in a second step, persons without any experience with depression from Nuremberg are compared with persons without any experience with depression from Wuerzburg.

Three specific effects of the campaign on the persons who reported experience with depression

were found. Awareness of an increased discussion of depression in the public: At baseline, 40.2% of those experienced with depression in Nuremberg said that they had read or seen something about depression recently compared with 64% in 2002. In Wuerzburg, the corresponding figures were 49.5% in 2000 and 56% in 2002 ( $b = -0.35$ ;  $P = 0.002$ ). Furthermore, in 2000, 32.7% from Nuremberg perceived an increased discussion about depression. This number increased to 53.1% in 2002. In Wuerzburg, there was only a slight increase from 38.1% in 2000 to 42.5% in 2002. Noticing the campaign: The level of awareness of the NAD in Nuremberg increased considerably from 6.8% in 2000 to 32.8% in 2002. During the same period, the level of awareness in Wuerzburg only

increased from 3.3 to 4.2% ( $b = -0.62$ ;  $P = 0.003$ ) (see Table VI).

Finally, the comparison of persons who have had no experience with depression from Nuremberg to those without any experience from Wuerzburg showed that in Nuremberg, these persons were more aware of the NAD after 2 years (Nuremberg: 2000, 26.2%; 2002, 40.5% and Wuerzburg: 2000, 32.5%; 2002: 32.9%).

There were no specific changes in Nuremberg in comparison to the control region for the remaining questionnaire items.

### Campaign effects and socio-demographic characteristics

#### Gender

While the share of women who had the feeling that depression is being discussed more frequently in the public had increased significantly from 33.1% at the beginning of the campaign in Nuremberg to 50% in 2002 ( $c^2 = 29.22$ ; d.f. = 2;  $P < 0.001$ ), there were no significant changes for this item in Wuerzburg ( $c^2 = 1.31$ ; d.f. = 2;  $P = 0.52$ ). This difference is reflected in a statistically significant interaction of the factors place and year in the context of a binary logistic regression analysis ( $b = -0.35$ ; d.f. = 1;  $P = 0.001$ ). For men, specific effects of the NAD are

restricted to the view, 'problems with other people are an important cause of depression' (2000 versus 2002:  $b = 0.53$ ; d.f. = 1;  $P = 0.02$ ): While at the beginning of the campaign, 69.2% in Nuremberg agreed to this view, this figure sank to 61.4% in 2002 ( $c^2 = 31.83$ ; d.f. = 4;  $P < 0.001$ ). In Wuerzburg, this figure increased from 58.9% (2000) to 64.5% in 2002 ( $c^2 = 16.54$ ; d.f. = 4;  $P = 0.002$ ).

#### Age

In the group of persons aged  $\geq 60$  years, specific effects of the NAD were found for an increased perception of the discussion of depression (2000: 39.5%; 2002: 56.6%). In Wuerzburg, the corresponding figures were 44.3% (2000) and 38.6% (2002) [interaction of factors 'region' and year (2000 versus 2002):  $b = -0.47$ ;  $P = 0.002$ ]. Furthermore, there was also a decline in the percentage of people who agreed that blow of fate is an important cause of depression (Nuremberg: from 90.5% in 2000 to 73.4% in 2002). The figures for Wuerzburg indicate a much lower decline (2000: 87.2%, 2002: 82.1%;  $b = 0.85$ ;  $P = 0.041$ ).

#### Educational background

While in 2000, one-third of those with low-educational background (middle school, secondary

**Table VI.** Specific effects of the NAD: results of subgroup analyses—persons who reported experience with depression

	Baseline (2000), %	Intervention (2001), %	Intervention (2002), %	Regression <sup>a</sup> interaction time $\times$ location ( $P$ value)
Have you read or heard something about depression recently? Yes.				
Nuremberg	40.6	60.3	64.2	0.002
Wuerzburg	49.5	48.2	56	
Have you ever heard of the 'NAD'? Yes.				
Nuremberg	6.8	35.8	32.8	0.003
Wuerzburg	3.3	4.9	4.2	
Have you got the impression that depression is an issue which has recently been discussed in more detail in the public? Yes.				
Nuremberg	32.7	57.6	53.1	0.005
Wuerzburg	38.1	39.4	42.5	

In order to adjust for deviations of the three samples from socio-demographic characteristics of the public in Nuremberg and Wuerzburg as reported by the federal statistics bureau, weights were provided for each subject. The weighted percentages presented in this table represent estimates of the population of Nuremberg and Wuerzburg.

<sup>a</sup>Results of ordinal regression analysis in case of three-item categories and results of binomial logistic regression analysis in case of two-item categories (dichotomous variables: yes/no).

school, etc.) had perceived an increased discussion about depression; in 2002, almost half of this group were aware of the discussion. In Wuerzburg, almost half had perceived an increased discussion (47.4%) in 2000. This figure dropped to 33.3% (interaction of factors region and year (2000 versus 2002):  $b = -0.64$ ;  $P < 0.001$ ). In the group of persons with a high level of education (university degree, technical college, etc.), specific effects of the NAD were found for the item problems with other people are an important cause of depression (Nuremberg 68.5% in 2000, 54.2% in 2002). In Wuerzburg, the corresponding figures increased from 56.5% in 2000 to 65.3% in 2002 (interaction of factors region and year 2000 versus 2002:  $b = 0.88$ ;  $P = 0.007$ ). In addition, positive effects also showed in Nuremberg for the item 'depression is an illness which needs to be treated by a doctor or psychotherapist', with more persons agreeing to this view (Nuremberg 2000: 76.2%, 2002: 83.9%). In Wuerzburg, there was a decline in the agreement to this view (2000: 79.9%, 2002: 73.2%).

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## Discussion

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The effects of a public campaign on knowledge and beliefs about depression have been evaluated. Surveys were done before, during and after the campaign in Nuremberg and the control region of Wuerzburg. The guiding question was: Have 'awareness of depression and the NAD, beliefs about symptoms, causes and treatment of depression changed' as a result of the campaign? The concise answer to this question is that for the general population of Nuremberg, awareness of depression and the NAD have increased. Some prejudices changed in the course of the NAD. However, most of the changes declined again in the second year of the campaign. Subgroup analyses showed clearer campaign effects on the persons who had been aware of the NAD and on persons who reported to have had experience with a family member's or a friend's depression. As compared with the general population, many of these effects did not decline in the second year of the campaign. In the following,

the findings are discussed, also in the light of limitations of this study.

For the general population of Nuremberg, the awareness of depression and the NAD increased significantly. The campaign did not contribute to increasing the view that depression is a severe illness; however, some prejudices diminished. For instance, in comparison to the control region, less people named lack of self-control and weakness of character as possible causes of depression. This is in line with an increased acceptance of depression as an illness in the first year of the campaign. Other changes such as an increased trust in the treatability of depression or treatment options (visiting a doctor and 'taking antidepressants') were not significantly different from those observed in the control region or they declined again in the second intervention year. One possible explanation for this decline may be that in the second year of the campaign, measures were done with lower intensity; for instance, no large format posters were displayed around the time of the second survey and also fewer press reports were released.

Subgroup analyses showed impressive specific effects for the persons aware of the NAD and persons who reported to have had experience with depression (family member or friend has been treated for depression). For the persons aware of the NAD, these effects included an increased awareness of depression, the public discussion about depression and the NAD, a decline in the stigmatizing causal explanation lack of self-discipline, less agreement to the notion that 'you just have to pull yourself together to get rid of depression' and also a trend towards more positive beliefs about medication treatment and a reduction in the belief that antidepressants are addictive. In comparison to those who reported to have had experience with depression in Wuerzburg, persons experienced with depression in Nuremberg were more aware of the increased discussion about depression and the NAD and they more often had heard or read something about depression in the course of the campaign.

Taking a look at campaign effects and gender, age and educational level, some interesting findings can be reported. More women than men were aware

of the NAD and the increased discussion of depression. This is in line with earlier studies, where women were found to be more receptive when it comes to medical information [45]. In men, the campaign might have had the effect that depression is seen as a 'real' illness, which is not only caused by interpersonal conflicts, which is, for instance, but also reflected in a decline of the percentage of men agreeing that depression is caused by problems with other people. The influence of age on beliefs about depression is of great interest because depression is one of the most frequent illnesses in the elderly and because diagnosis and treatment deficits in old age are well known [46]. Apart from an increased awareness of the discussion about depression and a decline in the number of people agreeing that blow of fate is an important cause of depression, however, the campaign did not bring about any specific effects in the group of persons ages  $\geq 60$ . Finally, taking a look at respondents' educational level, specific effects showed for lower education and the perception of an increased discussion of depression on the one hand and for high level of education and a decline in the percentage of persons agreeing that problems with other people are an important cause of depression and more persons who thought that 'depression is an illness which needs to be treated by professionals' on the other. The fact that in the course of the campaign, fewer people with higher education saw problems with other people as a cause might be explained by the fact that it is easier for them to understand the difference between a cause and a trigger of depressive episodes. The increased perception of the discussion in persons with lower education may be due to the fact that before the campaign, depression may not have been of interest as a topic for this group of persons.

There are limitations of this study that must be addressed. First, Wuerzburg and Nuremberg are geographically close (distance 115 km). Thus, the campaign is likely to have crossed the borders of Nuremberg and the discussion about depression might have found its way into Wuerzburg and might have had an influence on people's awareness of depression. Second, in the survey, ques-

tions were asked about depression without presenting a vignette of a depressed patient. Therefore, people's responses were based on their ideas about depression. Results might have been different if we had asked what persons should do if they felt gloomy, had suicidal thoughts or could not sleep well at night, for instance. Third, respondents were not assessed on their own depression, but they were asked whether they have someone in their family or a (close) friend who has undergone treatment for depression; thus, it is unclear whether being depressed is a factor in the effectiveness of the campaign. For future campaign evaluations, it would be of great interest to find out whether beliefs about depression (for instance beliefs about the effectiveness of pharmacotherapy or psychotherapy) can be changed in persons who are or who have been themselves directly affected by depression (according to the International Classification of Disease-10 or the Diagnostic and Statistical Manual of Mental Disorders-IV). In order to do so, a depression screening instrument could be included in the questionnaire. Fourth, 'lack of self-control' for instance declined as a causal explanation in persons from the subgroup aware of the NAD; however, this does not relate to the general messages of the posters presented in Fig. 2 (depression can affect everybody, depression takes many forms and depression is treatable). Concrete knowledge and specific information about depression, symptoms, causes and treatment options were mainly provided in presentations or brochures, thus reaching only a small percentage of the population, mainly persons from the subgroups, who were interested in depression. Large-scale in-depth information of the general population was impossible in the light of the available financial resources. Thus, it must be assumed that greater exposure of people who reported to have had experience with depression and those aware of the NAD to more specific information had effects that went beyond the key messages transported via the posters. This may also explain why the campaign was more effective in changing beliefs about depression in the persons aware of the NAD than in the general population.

There are two main points to be learned from the evaluation of the public campaign: first, only small or short-lasting effects of the campaign were observed for the general population. This is not surprising as people's beliefs, opinions and behaviour have developed over years or decades in socialization processes and cannot be changed easily by a 2-year campaign. It appears that the general population had been aware that a depression campaign was going on, but the campaign did not change the public's beliefs about depression. Having in mind that no specific information about depression was provided to the broad public by posters, but by brochures or specific events—which had only been read or attended by a small part of the population (mainly persons aware of the campaign or persons who reported experience with depression)—this finding is hardly surprising. Second, however, this does not allow the conclusion that the public campaign has not been an effective measure within the four-level intervention of the NAD. Quite the contrary, seeing that for the subgroup of those who were aware of the campaign, clear changes were observed in Nuremberg as compared with the control region of Wuerzburg; there are reasons to assume that it was the most effective of the four levels of the NAD (see Fig. 1). This view is supported by personal communication with persons from Nuremberg, who said that they were depressed. They mentioned that the campaign has had a positive effect on their lives because they had the feeling that the stigma associated with depression has diminished, which, in turn, helped them to speak more openly about their illness. Also, they might have learned that there are many other affected people. This might have encouraged depressed persons to escape their isolation and to seek professional help [47]. Future evaluations of public campaigns targeting beliefs about depression should therefore put a focus on the behavioural and subjective effects on those directly or indirectly affected by depression.

In conclusion, the campaign was successful in creating awareness of depression and of the NAD but did not bring about profound and long-term changes in the general population of Nuremberg. For the latter to occur, permanent depression awareness initiatives with a higher frequency and

a broader outreach are necessary. This is in line with what health promotion researchers have pointed out: in order to achieve sustaining changes, it takes more than good projects or campaigns—health-promoting structures and policies and permanent action [48].

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### Conflict of interest statement

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None declared.

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