

Subsidized Psychological Treatment for Nine Traumatic and Adverse Events

—Exploring the Characteristics of Help-Seeking Danes

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Abstract

Background: The Danish Health Care System (DHCS) provides financial subsidies for psychological treatment after nine types of traumatic and adverse events (e.g., accidents, sexual abuse, serious illness). **Objectives:** To investigate 1) What are the characteristics of the people using the public subsidy for psychological treatment compared with the general population? 2) Which social, somatic, and psychiatric differences exist between the patients from each of the nine referral categories compared with the general population? **Methods:** This study combines nationwide individual-level data from the DHCS with other administrative data and includes everyone who lived in Denmark and received subsidized treatment during 2014-2023. These individuals are compared with the general population living in Denmark. **Results:** In the ten-year period, 361,152 individuals used the DHCS for psychological treatment, 76% being women. Unexpectedly, a considerable decrease in the use of public subsidies was found among all trauma types. The categories with the most help-seeking individuals were bereavement, disabling disease, and having relatives with disabling diseases, constituting two-thirds of all contacts. In all categories, women used the subsidy more frequently than men. The number of treatment sessions received by the users was quite stable across referral categories. Although many predictors were statistically significant, they did not explain much of the variation, except for treatment seekers who had attempted suicide or experienced childhood sexual abuse. Anxiety and mood disorders were the most consistent predictors for seeking treatment across the 9 categories. **Conclusions:** Despite its universal coverage, the DHCS only subsidized psychologist treatment for a small and decreasing share of the population. Most users

of the health scheme have experienced loss and disabling illnesses. Demographic factors and preceding diseases were significant and common but weak predictors for all the referral categories.

Keywords

Trauma Types, Subsidized Therapy, National Health Scheme, Ten-Year Cohort, Risk Factors, Total Population Study

1. Introduction

1.1. Background

Potentially traumatic events are common [1]. Approximately 70% of people experience one or more traumatic events, and those exposed report an average of three potentially traumatic events during their lifetime [2]. The most common types of traumatic events are witnessing death or serious injury, experiencing the unexpected death of a loved one, being mugged or assaulted, being in a life-threatening traffic accident, and experiencing a life-threatening illness or injury [3].

Although many people recover naturally from these experiences, a significant proportion will be substantially affected and develop problems [1]. These problems include elevated levels of distress, significant problems in psychological functioning, and development of mental health disorders such as post-traumatic stress disorder (PTSD), complex PTSD (CPTSD), acute stress disorder, adjustment disorder, and complicated grief disorder [4]. The experiences may also impact social and occupational functioning, leading to sick leave, early retirement, or job loss [5] [6]. Additionally, people experiencing potentially traumatic events are at risk of developing long-term sequelae such as mental and physical health problems [7], and, consequently, consume a higher number of healthcare benefits and have an elevated risk of early mortality [8].

Due to the elevated risk for developing physical and mental health problems, we wanted to investigate the extent of such problems before the occurrence of exposure to the traumatic or adverse event. It is possible that people who are exposed to trauma *and* seek help might be challenged by already having physical and/or mental problems and therefore a larger need for treatment than people not suffering from pre-trauma health problems. This aspect is often ignored and tabooed because of fear of victim-blaming—stigmatizing victims who suffer from the trauma exposure.

The Danish Health Care System (DHCS) recognizes the need for treatment after a traumatic or adverse life event and is unique in providing public financial support to people who have had such experiences and fit a set of criteria for receiving treatment [9]. This means that patients can receive psychological treatment after a traumatic or adverse event if their general practitioner gives them a referral, and if they are able to pay 40% of the fee themselves. This study is also step one in a series,

where the next step is a study of the overall effects of the subsidized treatment, and the third step will compare the subsidized treatment scheme (STS) after specific events with available register data (e.g., death in the family).

1.2. The Public Subsidized Therapy Agreement and Other Trauma Services

After a two-year pilot period in 1994, a subsidized treatment scheme (STS) between the DHCS and the Danish Association of Psychologists (DAP) was agreed upon. Those who had been exposed to a traumatic or an adverse event could enter psychological treatment shortly after the event with the aim of getting them back to work as quickly as possible, avoiding a worsening of symptoms, and improving their overall quality of life. Seven specific events were listed as referral categories in the agreement; two more were added later [9].

STS began 35 years ago and had a large national impact as a recognition of trauma sequelae, that trauma can be toxic, the state wants to help you, and that you have the right to get proper treatment. The Danish STS is the only broad national trauma treatment scheme that we know of, and we want to examine the possible differences among the various trauma types.

After the introduction of the STS, many other trauma services have emerged. There are now *specialized Danish treatment centers* for rape victims, incest survivors, victims of stalking and interpersonal violence, and for child maltreatment. In addition, there are counselling services for victims of violence and suicidal people. The treatment centers are situated in the large cities in contrast to the STS that covers the whole country. Several of the centers have long waiting lists. The treatment of these center services is free, although it is sometimes restricted (e.g., 5 sessions for rape victims). The admission to the Child Advocacy Centers depends on the municipality accept and in the involvement of the police. The counselling services are mostly hotlines run by volunteers. There are often problems with access: e.g., in the national suicide hotline, it was recently found that only 25 people use 2/3 of the calls and 1/3 of the total telephone time [10]. *Private insurance* often covers violence, accidents and loss with a restricted number of sessions (4 - 5 times) and is a fast-growing market (see the Discussion). They usually do not have any waiting time and are served by psychologists.

1.3. Regulations and Criteria for Receiving Subsidized Therapy in Denmark

STS is open for all ages, and the access is based on the occurrence of the specified event and not on symptom level. To receive subsidized psychological treatment, patients need an electronic or written referral from their primary physician (general practitioner) within 12 months after experiencing a potentially traumatic event. Some exceptions are made regarding the time frame for victims of sexual abuse or sexual assault before the age of 18 years. The patients qualifying for a subsidy may receive a maximum of 12 sessions of psychological treatment [11].

Only private practice psychologists with a license under the agreement are eligible to provide psychological treatment. The private practice psychologist offering STS cannot be employed elsewhere for more than 15 hours per week; at the same time, there is also a STS income cap for each psychologist. By April 2024, 900 private practice psychologists had obtained a license under the agreement [12], serving a population of almost 6 million inhabitants [13].

The STS is a unique therapeutic agreement serving trauma survivors and victims of specified, adverse events. Since the initial evaluation of the STS [14], no studies have investigated the patients who receive STS after traumatic or adverse events. In April 2008, the STS was expanded to include individuals suffering mild to moderate depression or anxiety. Research since then has focused on these two categories [15]–[17].

1.4. Aims of This Study

We wish to investigate the subsidized treatment for traumatic and adverse events through two objectives:

- 1) What are the characteristics of the people using the public subsidy for psychological treatment (*i.e.*, gender, age, area of living, level of education, family type, and income) compared with the general population?
- 2) Are there social, somatic, and psychiatric differences between the people from each of the nine referral categories compared with the general population?

2. Method

2.1. Study Population

All individuals receiving STS between 2014–2023 ($N = 361,152$) were compared with the full Danish population, which increased from 5,632,466 to 5,944,001 during the decade (equaling 57,509,964 person years). We presuppose that the trauma exposure happens in the year of referral, unless for childhood sexual abuse. There is a general 12-month time limit from exposure to referral—see **Appendix A2**.

2.2. Data Protection and Approval

Data was obtained from: 1) the five regions of Denmark that administer the STS. In addition, 2) the national medical and social longitudinal registers provided data both for the STS sample and for the rest of the population. All Danes are assigned a unique civil registry number (CPR), which can be used to link information within and across the administrative Danish registers. The 10-digit CPR number was used to retrieve and merge individual data. The legal office at the University of Southern Denmark has approved that the study (#12,242) complies with the General Data Protection Regulation (GDPR) and Danish legislation.

2.3. Measures

Demographic data (*i.e.*, gender, age, area of living, and family status) was obtained from the Population register in Statistics Denmark. Area of living covers five cate-

gories based on the degree of urbanization. Level of education was obtained from Education Statistics. Information regarding income was obtained from the Income Statistics Register.

Somatic and psychiatric disease information from all hospital treatment was provided from the Danish National Patient Registry (DNPR) [18]. The somatic disorders covered cardiovascular, endocrinological, musculoskeletal, chronic obstructive pulmonary disease, and cancer. The psychiatric diagnoses included ten disorders: organic disorders, substance use disorders, schizophrenic disorders, mood disorders, neurotic disorders, eating disorders, personality disorders, bipolar affective disorders, depression, and PTSD. In addition, suicide attempts were also included. The demographic and disease information is based on the three years before the referral for each individual (see **Appendix A1** for ICD-10 codes).

Referral categories. To qualify for the subsidy, the patient must have been exposed to an event in at least one of the following nine (see **Appendix A2** for details):

Category 1: Victims of robbery, violence, or rape.

Category 2: Victims of traffic accidents and other accidents.

Category 3: Relatives of severely mentally ill individuals.

Category 4: Individuals suffering from a severely disabling disease or illness.

Category 5: Relatives of individuals suffering from a severely disabling disease or illness.

Category 6: Bereaved individuals.

Category 7: Individuals who have attempted suicide.

Category 8: Individuals who have undergone an abortion past week 12 of their pregnancy.

Category 9: Victims of sexual abuse or sexual assault prior to the age of 18 years (CSA).

2.4. Data Analysis

We first explored the characteristics of people and degree of utilization within each category using descriptive statistics. We then compared service users to the remaining general population regarding age, gender, family type, income, educational level, and area of living using descriptive statistics. To answer the second aim, we investigated possible predictors for use of the subsidized treatment through nine four-step hierarchical logistic regression analyses, one for each category of events, controlling for varying levels of covariates. We applied hierarchical logistic regressions in order to explore the impact of different covariates separately. Step 1 includes demographic factors (age, gender, family type), while step 2 adds salient socioeconomic features: income, area of living, and educational level. Further, steps 3 and 4 include somatic and psychiatric comorbidity from hospital records: In Step 3, diagnoses of five somatic diseases up to three years prior to the use of the STS are added, while Step 4 includes suicide attempts and ten psychiatric disorders up to three years before using the subsidy. While there may be some redundancy in steps 3 and 4 due to overlapping diseases, we considered the use of hospital diagnoses to be the most precise adjustment for comorbidity. Alterna-

tively, the presence of hospital-treated disease could have been included as dichotomous variables, thus overlooking the specific significance of, *inter alia*, suicide attempts.

3. Results

Table 1 shows the numbers of people using each referral category of services between 2014-2023. The right-hand column displays the total number of person years for each category for comparison. During this period, 361,152 people¹ have used the STS. The two referral categories with the highest number receiving services were individuals suffering from a severely disabling disease (22.5%) and bereaved individuals (22.5%), followed by relatives of individuals suffering from a severely disabling disease (20.0%). These categories made up 2/3 of the users of the STS. The referral categories with the fewest individuals receiving services were late abortion (0.5%), and attempted suicide (0.9%). We found a remarkably small variation in the number of sessions across referral categories (mean 4.85, range 4.53 to 5.33). Another unexpected finding was a decrease in use across all referral categories over the period 2016-2023 (**Figure 1**). The magnitude of the decrease varied between 17% and 54% (**Table 1**).

Concerning *age*, **Table 1** also reveals that young adults (26 - 49 years) were overrepresented in all categories of the STS compared to the proportion of young adults in the general population. Conversely, very few young people (<18 years) received subsidized treatment; the exception being treatment after suicide attempt, where the proportion of children and adolescents was like that of the general population in Denmark under 18 years. The age group 18 - 25 years was overrepresented in three categories: violence, childhood sexual abuse, and suicide attempts. Among the 50+ age group, disabling disease and bereavement were relatively more prevalent.

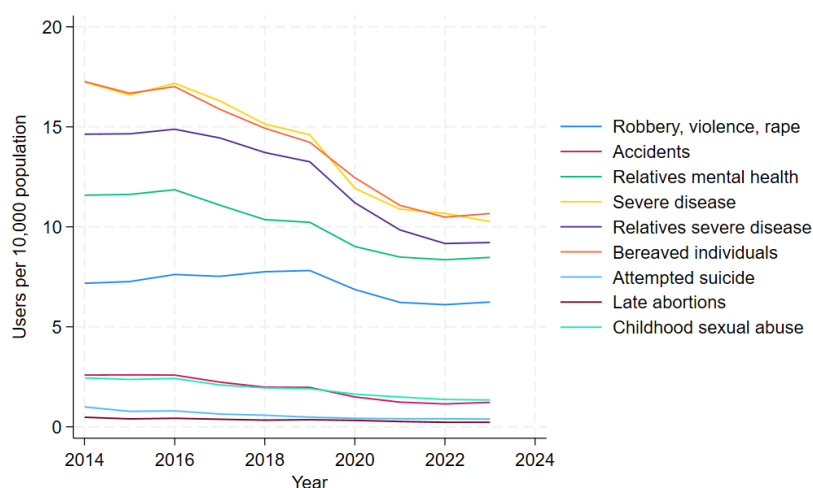


Figure 1. People with contact to psychologist, rate per population.

¹The figure encompasses few individuals who have had more than one referral in a calendar year.

Table 1. Number of people using the services, 2014-2023.

People using the services											Person years, people not using the services ^c
	Violence	Accidents	Relatives' mental disease	Disabling disease	Relatives disabling disease	Bereaved	Suicide attempt	Abortion	Childhood sexual abuse	Total	Total
N	40,822 (11.3%)	10,990 (3.0%)	58,374 (16.2%)	81,260 (22.5%)	72,162 (20.0%)	81,191 (22.5%)	3397 (0.9%)	1975 (0.5%)	10,981 (3.0%)	361,152 (100.0%)	57,509,964 (99.4%)
Age group											
Under 18	3026 (7.4%)	790 (7.2%)	4008 (6.9%)	4605 (5.7%)	4345 (6.0%)	4000 (4.9%)	720 (21.2%)	34 (1.7%)	809 (7.4%)	22,337 (6.2%)	11,603,979 (20.2%)
18 - 25	8297 (20.3%)	1730 (15.7%)	6279 (10.8%)	6253 (7.7%)	6217 (8.6%)	8740 (10.8%)	700 (20.6%)	236 (11.9%)	2261 (20.6%)	40,713 (11.3%)	5,972,689 (10.4%)
26 - 49	20,550 (50.3%)	5198 (47.3%)	29,306 (50.2%)	33,107 (40.7%)	34,073 (47.2%)	36,664 (45.2%)	1222 (36.0%)	1693 (85.7%)	5685 (51.8%)	167,498 (46.4%)	17,476,721 (30.4%)
50+	8949 (21.9%)	3272 (29.8%)	18,781 (32.2%)	37,295 (45.9%)	27,527 (38.1%)	31,787 (39.2%)	755 (22.2%)	12 (0.6%)	2226 (20.3%)	130,604 (36.2%)	22,456,575 (39.0%)
Male	9793 (24.1%)	3664 (33.4%)	11,706 (20.1%)	23,734 (29.3%)	14,611 (20.3%)	18,262 (22.5%)	1299 (38.3%)	32 (1.6%)	1377 (12.6%)	84,478 (23.4%)	28,658,105 (49.7%)
Female	30,849 (75.9%)	7299 (66.6%)	46,575 (79.9%)	57,408 (70.8%)	57,432 (79.7%)	62,752 (77.5%)	2089 (61.7%)	1935 (98.4%)	9558 (87.4%)	275,898 (76.6%)	28,794,194 (50.3%)
Civil status											
Married/ cohabiting	14,505 (35.5%)	5249 (47.7%)	31,538 (54.0%)	45,471 (56.0%)	44,341 (61.5%)	38,374 (47.3%)	959 (28.2%)	1417 (71.8%)	4111 (37.4%)	185,964 (51.5%)	26,016,193 (45.2%)
Living alone	14,995 (36.7%)	3221 (29.3%)	16,549 (28.4%)	24,931 (30.7%)	17,259 (23.9%)	30,077 (37.0%)	1018 (30.0%)	288 (14.6%)	3800 (34.6%)	112,138 (31.1%)	13,917,103 (24.2%)
Under 26 y.	11,323 (27.7%)	2520 (22.9%)	10,287 (17.6%)	10,858 (13.4%)	10,562 (14.6%)	12,740 (15.7%)	1420 (41.8%)	270 (13.7%)	3070 (28.0%)	63,050 (17.5%)	17,576,668 (30.6%)
Area of living											
Capital city	11,118 (27.2%)	2764 (25.2%)	16,285 (27.9%)	20,651 (25.4%)	19,901 (27.6%)	22,886 (28.2%)	713 (21.0%)	745 (37.7%)	2239 (20.4%)	97,302 (26.9%)	15,773,523 (27.4%)
Big city	5800 (14.2%)	1575 (14.3%)	9500 (16.3%)	11,180 (13.8%)	11,153 (15.5%)	11,740 (14.5%)	386 (11.4%)	320 (16.2%)	1838 (16.7%)	53,492 (14.8%)	7,546,952 (13.1%)
Province	8643 (21.2%)	2525 (23.0%)	13,252 (22.7%)	18,441 (22.7%)	15,815 (21.9%)	17,839 (22.0%)	865 (25.5%)	400 (20.3%)	2628 (23.9%)	80,408 (22.3%)	13,148,611 (22.9%)
Surrounding area	5806 (14.2%)	1829 (16.6%)	8975 (15.4%)	13,804 (17.0%)	11,752 (16.3%)	12,713 (15.7%)	555 (16.3%)	243 (12.3%)	1716 (15.6%)	57,393 (15.9%)	9,274,082 (16.1%)
Countryside	9455 (23.2%)	2297 (20.9%)	10,362 (17.8%)	17,184 (21.1%)	13,541 (18.8%)	16,013 (19.7%)	878 (25.8%)	267 (13.5%)	2560 (23.3%)	72,557 (20.1%)	11,766,796 (20.5%)
Mean income (SD) ^a	327,347 (241,461)	364,571 (362,545)	390,838 (259,625)	371,374 (1,016,854)	388,749 (822,423)	376,032 (318,689)	313,271 (193,711)	370,633 (164,992)	299,117 (178,495)	371,167 (643,764)	395,975 (259,067)
Educational level ^b											
Primary education	6347 (15.6%)	1596 (14.5%)	5212 (8.9%)	11,877 (14.6%)	7634 (10.6%)	11,957 (14.7%)	657 (19.3%)	135 (6.8%)	2169 (19.8%)	47,584 (13.2)	13,173,167 (22.9%)
Secondary + vocational education	15,583 (38.2%)	4299 (39.1%)	19,093 (32.7%)	30,431 (37.5%)	24,922 (34.5%)	30,530 (37.6%)	1446 (42.6%)	503 (25.5%)	4273 (38.9%)	131,080 (36.3%)	21,807,807 (37.9%)
Further education	18,892 (46.3%)	5095 (46.4%)	34,069 (58.4%)	38,952 (47.9%)	39,606 (54.9%)	38,704 (47.7%)	1294 (38.1%)	1337 (67.7%)	4539 (41.3%)	182,488 (50.5%)	22,528,990 (39.17%)
Decrease 2016-2023 ^d	17%	54%	25%	40%	35%	37%	53%	46%	44%		

Note: The reported frequencies in the table are based on the total number of subsidies. An individual may thus appear several times if they have used more than one subsidy. ^aFor children under the age of 18, the mean income numbers are based on both parents' mean income; income is converted to 2022-prices in DKK using the net price index from Statistics Denmark. ^bFor people under the age of 25, the educational level is based on the highest completed educational level for either parent. ^cPopulation consists of number of living people in Denmark each year for the ten-year period. ^dDecrease compared with 2014-2015.

We observed a difference in treatment pattern along *marital status*, where violence, bereavement, suicide attempts, and childhood sexual abuse were relatively more prevalent among people living alone, while disabling disease (own or relatives') and late abortion were relatively more common in people who are married or cohabiting.

Regarding *gender*, women more often used the STS after all types of events than men and constituted more than 3/4 of all referrals. The pattern was most pronounced in the categories of late abortion and CSA and less pronounced for suicide attempts and accidents. People not using the scheme overall had a higher *income* than those who used the STS. Low level of *education* was associated with a higher probability of treatment after suicide attempts, while high level of education was associated with higher probability of treatment after a late abortion. STS after suicide attempts was relatively more used in the countryside, in contrast to late abortion, where use of the STS was lowest in the countryside and highest in the capital city.

Table 2. Model 4 large ORs (>1.3) within the nine categories (from **Tables A1-A9**).

	Violence	Accidents	Relatives' mental disease	Disabling disease	Relatives disabling disease	Bereaved	Suicide attempt	Abortion	Childhood sexual abuse
Female	2.789	1.856	3.583	2.137	3.583	3.109		46.073	5.966
M./cohabiting								4.213	1.477
Living alone	3.190	1.699	1.575		1.335	2.412	2.226	2.593	2.932
Big city									1.610
Province							1.411		1.631
Surrounding area		1.481					1.547		1.796
Country	1.597	1.503					1.894		2.132
Cardiovascul.				1.953					
Endocrinology				1.645					
Musculoskelet.	1.331	1.993		1.533			1.366		1.333
Cancer				3.216					
Suicide							5.960	1.786	
Substance							1.333		
Schizophrenic				1.560					1.583
Mood		2.666	1.389	1.494	1.349	1.479	1.678		1.598
Neurotic	3.040		2.630	3.420	2.635	2.492	13.064	2.413	3.206
Eating			1.376	3.200	1.425				1.515
Personality	1.407						1.443		1.933
Bipolar	1.321		1.566	1.809			1.374		1.559
Depression	1.432	1.496	1.423	1.605	1.320	1.313	2.150	1.314	
PTSD	5.899	6.067	1.485	1.740	1.332	1.501		1.828	5.419
McFadden R²	0.078	0.032	0.058	0.062	0.053	0.056	0.158	0.104	0.101

The second research aim was to examine which social differences exist between the patients from each of the nine categories when compared with the general

population. To answer this, we ran a four-step hierarchical regression analysis for each of the nine referral categories. The predictors include 26 variables and are presented in nine tables (Tables A1-A9) placed as supplementary appendixes. Most variables were significant, mostly due to the large sample; the adjusted R^2 values were, however, small in most of the analyses. Adjusted R^2 is commonly offered as a model diagnostic in logistic regressions and ranges from 0 to 1. The low values should be interpreted as the main reason for contact (exposure) not being included in the models. A summary of large ORs is given in Table 2.

Being a woman significantly predicted use of all referral categories, although the odds ratio was smaller for suicide attempts. Marital status (*living alone*) was a predictor for all categories except disabling disease. *Cohabiting* was a predictor only for late abortion and CSA, indicating that there could be subgroups within these two categories. Area of living (*countryside*) was a predictor for violence, accidents, suicide attempts, and CSA, followed by more populated areas of living for the latter three areas. Living in the capital city was the reference group that used the STS less than the other four categories of area.

Among the *somatic diseases*, *musculoskeletal disorders* were a predictor for violence, accidents, suicide attempts, CSA, and disabling disease. *Cardiovascular and endocrinological diseases* were, together with *cancer*, predictors only for the disabling disease category. *Organic disorders and chronic obstructive pulmonary diseases* were not predictors for any of the categories. *Suicide attempts* were a predictor for new suicide attempts and for late abortions.

Prior diagnoses of *PTSD and neurotic/anxiety disorders* were also prevalent, accompanying predictors in almost all categories. There are two remarkable exceptions: with accidents, there were high ORs for PTSD (>6), and neurotic/anxiety disorders were not a predictor; the opposite was the case with suicide attempts. *Mood disorders/depression* were predictors for almost all categories but less strong than neurotic/anxiety disorders. Depression was strongest with suicide attempts ($OR > 2.15$), and mood disorders with accidents ($OR > 2.66$). *Bipolar disorders* were predictors for five categories (violence, relatives' mental disease, own severe disease, suicide attempts, and CSA). *Eating disorders* were predictors for four categories (relatives' mental disease, own severe disease, relatives' disabling disease, and CSA). *Personality disorders* were predictors for violence, suicide attempts, and CSA. *Schizophrenic disorders* were predictors for disabling disease and CSA.

4. Discussion

The STS represents a national, trauma-based, prophylactic approach to reduce suffering and help potentially traumatized survivors back on their feet. Despite the co-payment of 40%, the scheme has a considerable number of users, of whom women constitute more than three-quarters. Within each category, women outnumber men with a similar proportion, except for suicide attempt and accidents, where the overrepresentation of women is smaller; for CSA and late abortion, the proportion of women is very high (respectively 87.4% and 98.4%).

The STS is available all over the country and used equally in all areas of living. However, living in the capital city means using the STS less than in the other four categories of area. Hypothetically, the capital might have fewer adverse and traumatic events, but we are inclined to believe that the inhabitants generally have more resources and apply other available help offers more often (see the Introduction). Not knowing the true prevalence of traumatic and adverse events in the population, we notice several differences among the help-seeking people. There is a pronounced underrepresentation of adolescents using the STS in contrast to the group of younger adults (25 - 49 years) who are frequent users. This might be because of differences in exposure, higher relevance of some categories for the younger adults, and more knowledge about the STS. This age group has higher income, more often established families, and more resources (education, social capital) to invest in recovery after adverse or traumatic events.

Extant research provides evidence that trauma exposure and PTSD are quite common in Danish adolescents [19]. Therefore, one possible structural explanation for the underrepresentation of adolescents might be limited resources and dependence on parents or other adults for driving and paying the salary. Another aspect is the prevalence of trauma events: we do not expect that disabling disease, late abortion or being burdened with the disease of relatives to be as common at young age as it is a decade or two later in life. However, when it comes to suicide attempts, the adolescent group is represented similarly to their age in the whole population. In three categories, people with lower income appear to be overrepresented: CSA, suicide attempts, and violence. In 2025, the first-time individual fee is €62, dropping to €51 for the next sessions, which may probably be an economic challenge for many young people.

In 2018, the age group 18 - 20 was granted free-of-charge access to psychologist treatment for anxiety and depression under the DHCS. This arrangement has been expanded to include all 18 - 24-year-olds, albeit only for anxiety and depression. Considering the comorbid status of anxiety and depression in trauma patients, the rationale for this distinction seems unclear, as a traumatic event often precedes or exacerbates the development of anxiety and depression that are well-known comorbid disorders to follow post-traumatic stress disorder [20]. This said, a recent study of the free-of-charge scheme for young people [17] found an increase in clients from low socioeconomic backgrounds who profited well from the treatment. In addition, the study found that the rate of suicide attempts dropped significantly compared to younger and older age groups. At the same time, the number of young people who were referred based on the nine STS categories dropped dramatically when the free-of-charge option was introduced, rendering STS with 40% co-payment less attractive.

It is noteworthy that there has been a marked decline in the number of individuals utilizing the scheme. This decline commenced in 2016 and accelerated in 2020-2022, amounting to approximately 25% (Table 1). Three hypotheses concerning the decline are 1) the COVID-19 pandemic, which involved nationwide lockdowns

and extensive restrictions on social interaction, 2) the expansion of private health insurance, which now covers 3 million Danes (half of the population) and increased by 200,000 from 2022 to 2023 alone [21]. In 2023, approximately 700,000 individuals accessed private health insurance [22]. The majority of these policies are collective schemes tied to employment contracts, though a substantial portion consists of privately purchased insurance. Among mental health domains, psychological support related to stress has seen the most pronounced increase in demand [23], and 3) the increase of the two disorders, anxiety and depression, that are outside the event-based referral categories, but still a referral opportunity of the STS. And as mentioned above, the free-of-charge initiative very likely moves people away from the nine categories and to the free ones.

A critical concern regarding the STS is the considerable waiting time for services, which conflicts with the political intention of providing a prompt response to trauma [24]. These delays primarily stem from two systemic limitations: the relatively low number of providers and the service cap, effectively preventing providers from increasing the number of patients [25].

Initially, the majority of those referred to the STS were individuals experiencing bereavement or a disabling disease, followed by relatives to individuals with physical illness and to individuals with mental illness [14]. The psychological burden experienced by relatives in such contexts can be considerable, often leading to exhaustion and relational strain. It is therefore encouraging that many individuals who may be at risk of secondary traumatization are receiving support through the scheme.

In evaluating the relative proportions of these categories, it would be beneficial to have reliable data on the incidence of the various trauma-related and adverse events. Currently, such incidence data are only available for bereavement, as all deaths are officially registered. In Denmark, approximately 60,000 deaths occur annually, and around 8000 referrals to the STS are related to bereavement. For other categories, the true incidence rates remain unknown, and reliance must instead be placed on estimates or population-based surveys.

Overall, the adjusted R^2 values for all nine categories are notably low: four fall below 0.06, and the remainder do not exceed 0.158. While most values are statistically significant due to the large sample sizes, the corresponding odds ratios (ORs) are generally small, indicating low effect sizes. This is particularly striking given that a wide range of demographic variables were included, alongside prevalent somatic and psychiatric disorders.

Only a limited set of factors appeared to meaningfully predict help-seeking behavior following a potentially traumatic event. Few predictors demonstrate both conceptual relevance and statistical strength. Also, here one must have in mind the huge size of the comparison group, being the Danish population with full data for a decade.

One possible interpretation is that the STS operates in a manner where it does not systematically favor or exclude specific populations or subgroups. While indi-

viduals access the scheme following a defined event, their motivation to seek help may be driven less by structural or diagnostic factors and more by subjective experiences of psychological distress, difficulties in coping, or struggles to make sense of what has occurred. Additional contributing factors may include perceived social norms, differences regarding needs for emotional expression, and the availability of economic and social resources.

Rather than being strongly determined by background characteristics or pre-existing health conditions, help-seeking behavior may instead be conceived as a kind of “consumer” selection process, where the referral in some cases may be the suggestion of the general practitioner as an alternative to medical treatment and in other cases a demand of the individual who does not have the means to pay the full salary for the therapy.

5. Limitations and Perspectives

Many of the presented studies have described the problems and predictors of the various traumatic or adverse events. Little is known about the true incidence of traumatic and adverse events. Few large studies have focused on help-seekers. The help-seeking situation constitutes a kind of bias, representing a strong selection effect compared with everyone who has been exposed. In this study, the trauma-exposed individuals who seek help represent people with an income level that matches the general population; they accept the waiting lists and can afford to pay the fee. However, for violence, childhood sexual abuse, and suicide attempts, people with less than mean income are represented. Due to lack of resources, we have not included people who use the STS more than once, even though it would have been interesting add-on research. Would the “repeaters” get the same referral category the second time or would a new category be used? If we had included the depression and anxiety categories, we would be able to see how many would come back to treatment for a possible subsequent diagnosis.

The study is based on administrative data. There are, however, also shortcomings to this type of data: 1) we have selected a restricted number of diseases; 2) the diseases are diagnosed at hospitals. Some diseases are not treated in hospitals but at the GP (e.g., arthritis, depression), so the true prevalence of several diagnoses is likely to be underreported; and 3) we focus on help-seeking behavior and not the actual trauma.

It can be argued that trauma occurs at random: disease, loss, and accidents can happen to anyone without notice. However, other trauma events are strongly associated with social conditions. A limitation of the current study is the lack of documentation of the true trauma exposure in the general population. Also, we lack information about the time of exposure for the actual trauma. We consider it likely that most traumas occur within 12 months prior to the first consultation, while the time from exposure is much longer for CSA. The STS is supposed to bring exposed people back to work and normal social life fast, so that personal suffering can be diminished and sick leave and impairment can be avoided [26]. A planned follow-up study will analyze if the scheme works the way it was origi-

nally designed to. Serena [27] showed that STS for anxiety and depression for patients aged 18 - 37 decreased psychiatric hospital contacts, physical health care use, and suicide attempts, while there were no effects on employment and disability pension. Whether this finding extends to trauma and adverse event-related STS has yet to be studied.

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Data Availability Statement

Data are available from the Danish Regions.

Author Contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Elklit Ask, Marie Kruse and Lindekilde Nanna. The first draft of the manuscript was written by Banzon Trine and all authors commented on previous versions of the manuscript. All authors read and approved of the final manuscript.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix

Appendix A1: ICD-10 Codes for Psychiatric and Physical Diseases Used in the Study

Psychiatric diseases that have been diagnosed at Danish hospitals [28] (present/not present):

- Organic disorders (DF00 - DF09)
- Substance use disorders (DF10 - DF19)
- Schizophrenic disorders (DF20 - DF29)
- Mood disorders, (DF30 - DF39), including separate analysis of bipolar affective disorder and depression
- Neurotic disorders (DF40 - DF48), including separate analysis of PTSD
- Eating disorders (DF50)
- Personality disorders (DF60)
- Suicide attempt (data from the Register for Suicide attempts)

Chronic somatic disorders (present/not present):

- Cardio vaskular (codes DI20 - DI25; DI150; DI160 - DI164)
- Endocrinological, including type 2 diabetes (codes DE00-DE90, type 2 diabetes: DE11)
- Musculoskeletal (codes: DM54, DM15 - DM19)
- Chronic obstructiv pulmonary disease, code DJ44.
- Cancer codes (DC15 - DC26; DC30 - DC39; DC50; DC00 - DC14), as these codes refer to cancer types that can be related to health behavior.

Appendix A2: Details for the Nine Categories of the Danish Subsidized Treatment Scheme

Category 1: Victims of robbery, violence, or rape

A person may qualify if they are the primary victim of a robbery, violence, or rape. Relatives to victims may also qualify if they have experienced real danger either physically or psychologically (towards the quality of life, development, or general well-being). People who assist victims during an event may also qualify, but witnesses to an event do not. The perpetrators also do not qualify. In this category, both physical and psychological violence are included, and there is no minimum requirement of the level of abusiveness of violence. An incident of domestic violence also qualifies, unless the violence has occurred for more than 12 months. Encompassed and qualifying in this category is also rape, as well as other sexual assaults or attempts of sexual assaults. There are no requirements of police reports or convictions of the robbery, violence, or rape necessary to qualify for this category [29].

Category 2: Victims of traffic accidents and other accidents

This category includes those who are directly or indirectly involved in an accident, regardless of who caused it. Any incidents other than traffic accidents are also included in this category under the definition of “other accidents”. However, completely trivial accidents with only minor injuries are not covered by the agree-

ment [29].

Category 3: Relatives of severely mentally ill individuals

The term “relatives” covers the immediate family, made up of the spouse/partner, siblings, parents, and children. Typically, half-siblings and stepparents will also be included. As a result, under the agreement, both biological parents and stepparents of the same child will be eligible for subsidized treatment. In-laws and more distant relatives will normally not be covered, unless they are the only family [29].

The phrase “severely mentally ill” suggests that the mental disorder must be one that significantly affects the individual’s behavior and level of functioning and does not refer to a specific diagnosis. The determining criteria are whether the consequences of the mental disorder influence the behavior and interpersonal relations of the individual suffering from the disorder. To ascertain if the individual’s relatives qualify, each case is evaluated individually by the GP. The 12-month limit for the STS is not calculated from the diagnosis of a mental disorder but takes effect from the time when the relative starts being affected [29].

Category 4: Individuals suffering from a severely disabling disease or illness

A severely disabling disease or illness encompasses more than just situations in which a person is rendered instantly and severely disabled; it also includes conditions where a diagnosis might trigger a crisis for an individual. Illness covers diagnoses such as AIDS, cancer, stroke, joint arthritis, sclerosis, muscular dystrophy, and similar. The 12-month time frame usually begins when the individual is diagnosed. If an individual has previously received a subsidy in the same category, they may still be eligible for additional treatment if the diagnosis is new (e.g., two separate illnesses) or if the illness worsens or moves to a different location (e.g., recurrence of cancer after a period of recovery). If the illness progresses in severity but it is expected (e.g., a cancer patient enters a terminal stage) the individual does not qualify for additional subsidized treatment [29].

Category 5: Relatives of individuals suffering from a severely disabling disease or illness

Relatives are defined the same way as in Category 3. A severely disabling disease or illness is defined as in Category 4 [29].

Category 6: Bereaved individuals

The individuals qualifying for a subsidy in this category are relatives, as defined in Category 3. Parents of a stillborn child or parents suffering a miscarriage past week 19 of the pregnancy may also qualify under this category [29].

Category 7: Individuals having attempted suicide

In this category, individuals who have attempted suicide are qualified for a subsidy [29].

Category 8: Individuals who have undergone an abortion past week 12 of their pregnancy

The subsidized treatment may start before the abortion takes place, as soon as permission for the procedure has been granted [29]. Before 2025, a woman needed

a permission to be granted abortion after week 12. Recently, this limit has been pushed to week 18. In many cases, the embryo has a serious illness or genetic defect.

Category 9: Victims of sexual abuse or sexual assault prior to the age of 18 years (CSA)

The 12-month timeframe does not apply in this category. A person may be referred to psychological treatment at any point in their lifetime, although the incident must have happened in childhood before the age of 18 [29].

Table A1. Four-step hierarchical regression analysis for Category 1 (Robbery, violence and rape¹) (N² = 5,881,313).

Variables	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI
Demographics			+ Socioeconomics			+ Somatic			+ Psychiatric			
Age	0.940***	0.002	0.936 - 0.945	0.942***	0.003	0.937 - 0.947	0.942***	0.003	0.937 - 0.947	0.966***	0.003	0.960 - 0.972
Gender (Female)	3.026***	0.041	2.947 - 3.108	2.958***	0.041	2.879 - 3.038	2.941***	0.040	2.862 - 3.021	2.789***	0.039	2.714 - 2.866
Family type (Living together)	1.299***	0.034	1.234 - 1.368	1.266***	0.033	1.202 - 1.333	1.273***	0.034	1.209 - 1.341	1.287***	0.034	1.222 - 1.355
Family type (Living alone)	3.388***	0.055	3.281 - 3.498	3.620***	0.060	3.505 - 3.739	3.630***	0.060	3.514 - 3.749	3.190***	0.053	3.088 - 3.296
Income				0.986***	0.002	0.982 - 0.990	0.984***	0.002	0.980 - 0.989	0.995*	0.002	0.991 - 0.999
Educational level				1.010***	0.000	1.009 - 1.010	1.010***	0.000	1.009 - 1.010	1.012***	0.000	1.011 - 1.012
Area of living (Big city)				1.048*	0.024	1.002 - 1.096	1.050*	0.024	1.004 - 1.098	1.073**	0.025	1.026 - 1.122
Area of living (Province)				1.127***	0.021	1.086 - 1.169	1.124***	0.021	1.084 - 1.166	1.134***	0.021	1.093 - 1.176
Area of living (Surrounding area)				1.288***	0.024	1.241 - 1.336	1.282***	0.024	1.235 - 1.330	1.276***	0.024	1.229 - 1.324
Area of living (Country)				1.606***	0.028	1.553 - 1.661	1.598***	0.028	1.545 - 1.653	1.597***	0.028	1.544 - 1.653
Cardiovascular							0.825***	0.034	0.760 - 0.895	0.825***	0.034	0.760 - 0.895
Endocrinological							1.001	0.044	0.918 - 1.092	0.950	0.042	0.870 - 1.036
Musculoskeletal							1.466***	0.027	1.413 - 1.521	1.331***	0.025	1.283 - 1.381
Chronic obstructive pulmonary disease							0.438***	0.030	0.383 - 0.501	0.447***	0.031	0.390 - 0.511
Cancer							0.528***	0.025	0.482 - 0.579	0.562***	0.026	0.513 - 0.615
Suicide attempt										0.840**	0.049	0.749 - 0.943
Organic disorders										0.478***	0.036	0.413 - 0.553
Substance use disorders										1.219***	0.049	1.127 - 1.318
Schizophrenic disorders										1.203***	0.045	1.119 - 1.294
Mood disorders										1.217***	0.041	1.139 - 1.300
Neurotic disorders										3.040***	0.057	2.930 - 3.155
Eating disorders										1.203***	0.067	1.078 - 1.343
Personality disorders										1.407***	0.047	1.318 - 1.501
Bipolar affective disorder										1.321***	0.072	1.187 - 1.469
Depression										1.432***	0.043	1.351 - 1.518
PTSD										5.899***	0.178	5.560 - 6.258
Overall model evaluation	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.

Continued

Model coefficients	16043.59 (4)	<0.001	18428.37 (10)	<0.001	19272.03 (15)	<0.001	28303.56 (26)	<0.001
McFadden R ²	0.043		0.051		0.053		0.078	

Note: ¹Sample size of the category—see **Table 1**. ²Total N refers to the number of person years from the full population not using the STS. * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$.

Table A2. Four-step hierarchical regression analysis for Category 2 (Traffic and other accidents¹) (N² = 5,860,548).

Variables	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI
Demographics			+ Socioeconomics			+ Somatic			+ Psychiatric			
Age	1.012**	0.005	1.003 - 1.022	1.020***	0.005	1.010 - 1.030	1.002	0.005	0.991 - 1.013	1.018**	0.006	1.007 - 1.029
Gender (Female)	1.932***	0.046	1.845 - 2.024	1.947***	0.047	1.857 - 2.041	1.917***	0.046	1.828 - 2.010	1.856***	0.045	1.769 - 1.946
Family type (Living together)	1.082	0.046	0.995 - 1.176	1.078	0.046	0.991 - 1.173	1.089*	0.047	1.001 - 1.185	1.096*	0.047	1.007 - 1.192
Family type (Living alone)	1.632***	0.042	1.552 - 1.717	1.813***	0.047	1.722 - 1.908	1.835***	0.048	1.743 - 1.932	1.699***	0.045	1.613 - 1.790
Income				1.015***	0.003	1.009 - 1.022	1.014***	0.003	1.007 - 1.020	1.018***	0.003	1.011 - 1.024
Educational level				1.010***	0.001	1.009 - 1.012	1.011***	0.001	1.009 - 1.012	1.012***	0.001	1.011 - 1.014
Area of living (Big city)				1.196***	0.051	1.100 - 1.301	1.206***	0.052	1.019 - 1.312	1.216***	0.052	1.118 - 1.322
Area of living (Province)				1.262***	0.045	1.178 - 1.353	1.257***	0.044	1.173 - 1.348	1.261***	0.045	1.177 - 1.352
Area of living (Surrounding area)				1.493***	0.053	1.392 - 1.601	1.484***	0.053	1.384 - 1.591	1.481***	0.053	1.381 - 1.588
Area of living (Country)				1.510***	0.052	1.412 - 1.614	1.499***	0.051	1.402 - 1.603	1.503***	0.051	1.406 - 1.607
Cardiovascular							0.928	0.062	0.815 - 1.057	0.916	0.061	0.805 - 1.044
Endocrinological							0.862	0.073	0.731 - 1.017	0.837*	0.070	0.709 - 0.987
Musculoskeletal							2.125***	0.066	2.000 - 2.257	1.993***	0.061	1.876 - 2.117
Chronic obstructive pulmonary disease							0.376***	0.050	0.289 - 0.488	0.382***	0.051	0.294 - 0.497
Cancer							0.538***	0.044	0.458 - 0.631	0.558***	0.046	0.475 - 0.654
Suicide attempt										0.762	0.115	0.566 - 1.025
Organic disorders										0.858	0.092	0.695 - 1.059
Substance use disorders										0.902	0.089	0.743 - 1.094
Schizophrenic disorders										0.740**	0.076	0.605 - 0.905
Mood disorders										1.072	0.082	0.923 - 1.246
Neurotic disorders										2.666***	0.109	2.462 - 2.888
Eating disorders										1.218	0.162	0.938 - 1.580
Personality disorders										0.857	0.080	0.715 - 1.028
Bipolar affective disorder										0.999	0.138	0.762 - 1.310
Depression										1.496***	0.096	1.318 - 1.697
PTSD										6.067***	0.380	5.366 - 6.860
Overall model evaluation	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.
Model coefficients		1274.81 (4)	<0.001		1756.65 (10)	<0.001		2436.47 (15)	<0.001		3850.43 (26)	<0.001
McFadden R ²	0.010			0.015			0.020			0.032		

Note: ¹Sample size of the category—see **Table 1**. ²Total N refers to the number of person years from the full population not using the STS. * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$.

Table A3. Four-step hierarchical regression analysis for Category 3 (Relatives of severely mental ill individuals¹) (N² = 5,889,959).

Variables	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI
Demographics			+ Socioeconomics			+ Somatic			+ Psychiatric			
Age	1.028***	0.002	1.024 - 1.032	1.080***	0.003	1.075 - 1.085	1.092***	0.003	1.087 - 1.098	1.111***	0.003	1.105 - 1.117
Gender (Female)	3.741***	0.047	3.649 - 3.835	3.732***	0.048	3.640 - 3.827	3.702***	0.048	3.610 - 3.797	3.583***	0.046	3.494 - 3.675
Family type (Living together)	1.010	0.020	.972 - 1.049	1.017	0.020	.978 - 1.057	1.021	0.020	.982 - 1.061	1.028	0.020	0.989 - 1.069
Family type (Living alone)	1.462***	0.017	1.429 - 1.496	1.660***	0.020	1.622 - 1.699	1.665***	0.020	1.627 - 1.704	1.575***	0.019	1.538 - 1.612
Income				1.014***	0.002	1.012 - 1.017	1.012***	0.002	1.009 - 1.015	1.015***	0.002	1.012 - 1.018
Educational level				1.025***	0.000	1.024 - 1.026	1.025***	0.000	1.024 - 1.025	1.025***	0.000	1.024 - 1.026
Area of living (Big city)				1.238***	0.023	1.195 - 1.283	1.236***	0.023	1.192 - 1.281	1.246***	0.023	1.202 - 1.291
Area of living (Province)				1.222***	0.019	1.185 - 1.260	1.217***	0.019	1.180 - 1.254	1.216***	0.019	1.179 - 1.254
Area of living (Surrounding area)				1.283***	0.021	1.243 - 1.324	1.274***	0.021	1.235 - 1.316	1.264***	0.021	1.224 - 1.305
Area of living (Country)				1.251***	0.020	1.213 - 1.290	1.242***	0.020	1.204 - 1.281	1.238***	0.020	1.200 - 1.277
Cardiovascular							0.735***	0.026	.685 - 0.788	0.732***	0.026	0.683 - 0.786
Endocrinological							0.686***	0.031	.627 - 0.750	0.673***	0.031	0.615 - 0.736
Musculoskeletal							1.166***	0.019	1.129 - 1.205	1.126***	0.019	1.090 - 1.163
Chronic obstructive pulmonary disease							0.392***	0.025	0.347 - 0.443	0.393***	0.025	0.348 - 0.445
Cancer							0.572***	0.020	0.534 - 0.613	0.581***	0.020	0.542 - 0.622
Suicide attempt										0.591***	0.050	0.500 - 0.699
Organic disorders										0.231***	0.021	0.194 - 0.276
Substance use disorders										0.735***	0.042	0.656 - 0.823
Schizophrenic disorders										0.809***	0.041	0.733 - 0.892
Mood disorders										1.389***	0.047	1.299 - 1.484
Neurotic disorders										2.630***	0.052	2.530 - 2.733
Eating disorders										1.376***	0.076	1.235 - 1.532
Personality disorders										1.296***	0.052	1.198 - 1.402
Bipolar affective disorder										1.566***	0.082	1.412 - 1.736
Depression										1.423***	0.045	1.337 - 1.515
PTSD										1.485***	0.083	1.331 - 1.657
Overall model evaluation	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.
Model coefficients		15118.29 (4)	<0.001		21224.65 (10)	<0.001		22120.94 (15)	<0.001		26040.76 (26)	<0.001
McFadden R ²	0.033			0.047			0.049			0.058		

Note: ¹Sample size of the category—see **Table 1**. ²Total N refers to the number of person years from the full population not using the STS. * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$.

Table A4. Four-step hierarchical regression analysis for Category 4 (Individuals suffering from a severely disabling disease or illness¹) (N² = 5,905,918).

Variables	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI
Demographics			+ Socioeconomics			+ Somatic			+ Psychiatric			
Age	1.122***	0.002	1.118 - 1.126	1.143***	0.002	1.139 - 1.148	1.068***	0.002	1.063 - 1.073	1.093***	0.002	1.088 - 1.098
Gender (Female)	2.253***	0.021	2.212 - 2.295	2.246***	0.021	2.205 - 2.289	2.241***	0.022	2.199 - 2.284	2.137***	0.021	2.096 - 2.178
Family type (Living together)	0.931***	0.015	.902 - 0.962	0.931***	0.015	0.901 - 0.962	0.943***	0.016	0.913 - 0.974	0.951***	0.016	0.920 - 0.982
Family type (Living alone)	1.134***	0.011	1.113 - 1.155	1.249***	0.012	1.226 - 1.272	1.279***	0.012	1.256 - 1.303	1.135***	0.011	1.114 - 1.157
Income				1.001	0.001	0.998 - 1.003	1.007***	0.001	1.005 - 1.010	1.014***	0.001	1.011 - 1.016
Educational level				1.014***	0.000	1.014 - 1.015	1.016***	0.000	1.015 - 1.016	1.016***	0.000	1.016 - 1.017
Area of living (Big city)				1.097***	0.018	1.062 - 1.132	1.113***	0.018	1.078 - 1.149	1.132***	0.018	1.097 - 1.169
Area of living (Province)				1.134***	0.015	1.105 - 1.164	1.142***	0.015	1.112 - 1.172	1.146***	0.015	1.116 - 1.176
Area of living (Surrounding area)				1.250***	0.017	1.217 - 1.284	1.265***	0.017	1.232 - 1.300	1.264***	0.017	1.230 - 1.298
Area of living (Country)				1.259***	0.016	1.227 - 1.291	1.277***	0.017	1.245 - 1.310	1.282***	0.017	1.249 - 1.315
Cardiovascular							1.974***	0.033	1.910 - 2.040	1.953***	0.033	1.890 - 2.019
Endocrinological							1.713***	0.036	1.643 - 1.786	1.645***	0.035	1.578 - 1.715
Musculoskeletal							1.607***	0.019	1.570 - 1.644	1.533***	0.018	1.498 - 1.569
Chronic obstructive pulmonary disease							0.857***	0.025	0.810 - 0.906	0.834***	0.024	0.789 - 0.883
Cancer							3.104***	0.044	3.019 - 3.190	3.216***	0.046	3.128 - 3.307
Suicide attempt										0.669***	0.037	0.599 - 0.746
Organic disorders										0.932*	0.032	0.871 - 0.997
Substance use disorders										0.976	0.035	0.911 - 1.046
Schizophrenic disorders										1.560***	0.046	1.472 - 1.652
Mood disorders										1.494***	0.037	1.423 - 1.569
Neurotic disorders										3.420***	0.052	3.319 - 3.524
Eating disorders										3.200***	0.115	2.982 - 3.434
Personality disorders										1.265***	0.040	1.189 - 1.346
Bipolar affective disorder										1.809***	0.068	1.681 - 1.947
Depression										1.605***	0.038	1.532 - 1.740
PTSD										1.740***	0.070	1.608 - 1.882
Overall model evaluation	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.
Model coefficients		13399.85 (4)	<0.001		15022.68 (10)	<0.001		24183.26 (15)	<0.001		36003.76 (26)	<0.001
McFadden R ²	0.021			0.025			0.040			0.062		

Note: ¹Sample size of the category—see **Table 1**. ²Total N refers to the number of person years from the full population not using the STS. * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$.

Table A5. Four-step hierarchical regression analysis for Category 5 (Relatives of individuals suffering from a severely disabling disease or illness¹) (N² = 5,899,110).

Variables	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI
Demographics			+ Socioeconomics			+ Somatic			+ Psychiatric			
Age	1.077***	0.002	1.073 - 1.081	1.124***	0.002	1.119 - 1.128	1.124***	0.002	1.119 - 1.129	1.141***	0.003	1.136 - 1.147
Gender (Female)	3.670***	0.041	3.590 - 3.752	3.701***	0.042	3.619 - 3.785	3.675***	0.042	3.593 - 3.759	3.583***	0.041	3.503 - 3.665
Family type (Living together)	1.111***	0.019	1.075 - 1.148	1.123***	0.019	1.086 - 1.161	1.129***	0.019	1.092 - 1.167	1.135***	0.019	1.098 - 1.173
Family type (Living alone)	1.248***	0.013	1.223 - 1.273	1.408***	0.015	1.380 - 1.437	1.418***	0.015	1.389 - 1.447	1.335***	0.014	1.328 - 1.384
Income				1.017***	0.001	1.015 - 1.020	1.016***	0.001	1.013 - 1.019	1.018***	0.001	1.015 - 1.021
Educational level				1.021***	0.000	1.021 - 1.022	1.021***	0.000	1.021 - 1.022	1.022***	0.000	1.021 - 1.022
Area of living (Big city)				1.162***	0.019	1.125 - 1.200	1.163***	0.019	1.125 - 1.201	1.170***	0.019	1.133 - 1.209
Area of living (Province)				1.129***	0.016	1.099 - 1.161	1.125***	0.016	1.094 - 1.156	1.124***	0.016	1.093 - 1.155
Area of living (Surrounding area)				1.241***	0.018	1.207 - 1.277	1.235***	0.018	1.201 - 1.270	1.226***	0.018	1.191 - 1.261
Area of living (Country)				1.183***	0.017	1.151 - 1.216	1.177***	0.016	1.145 - 1.209	1.173***	0.016	1.142 - 1.206
Cardiovascular							0.917**	0.025	0.869 - 0.967	0.911***	0.025	0.863 - 0.960
Endocrinological							0.863***	0.030	0.806 - 0.925	0.851***	0.030	0.794 - 0.911
Musculoskeletal							1.297***	0.018	1.263 - 1.333	1.259***	0.017	1.226 - 1.294
Chronic obstructive pulmonary disease							0.436***	0.022	0.395 - 0.480	0.434***	0.022	0.394 - 0.479
Cancer							0.746***	0.020	0.708 - 0.786	0.753***	0.020	0.715 - 0.793
Suicide attempt										0.637***	0.051	0.545 - 0.745
Organic disorders										0.398***	0.024	0.354 - 0.448
Substance use disorders										0.867**	0.043	0.786 - 0.956
Schizophrenic disorders										0.684***	0.035	0.619 - 0.756
Mood disorders										1.349***	0.043	1.267 - 1.436
Neurotic disorders										2.635***	0.048	2.543 - 2.731
Eating disorders										1.425***	0.076	1.284 - 1.581
Personality disorders										1.073	0.044	0.990 - 1.163
Bipolar affective disorder										1.118	0.063	1.000 - 1.249
Depression										1.320***	0.041	1.243 - 1.402
PTSD										1.332***	0.073	1.197 - 1.483
Overall model evaluation	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.
Model coefficients		18723.87 (4)	<0.001		23931.92 (10)	<0.001		24820.88 (15)	<0.001		28562.95 (26)	<0.001
McFadden R ²	0.034			0.044			0.046			0.053		

Note: ¹Sample size of the category—see **Table 1**. ²Total N refers to the number of person years from the full population not using the STS. * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.0010$.

Table A6. Four-step hierarchical regression analysis for Category 6 (Bereaved individuals¹) (N² = 5,907,700).

Variables	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI
Demographics			+ Socioeconomics			+ Somatic			+ Psychiatric			
Age	1.081***	0.002	1.077 - 1.085	1.106***	0.002	1.101 - 1.110	1.106***	0.002	1.101 - 1.110	1.125***	0.002	1.120 - 1.130
Gender (Female)	3.186***	0.032	3.124 - 3.250	3.205***	0.033	3.142 - 3.270	3.182***	0.033	3.119 - 3.246	3.109***	0.032	3.047 - 3.172
Family type (Living together)	1.463***	0.025	1.415 - 1.513	1.467***	0.025	1.419 - 1.517	1.475***	0.025	1.427 - 1.526	1.489***	0.025	1.440 - 1.539
Family type (Living alone)	2.261***	0.024	2.215 - 2.308	2.512***	0.027	2.460 - 2.565	2.526***	0.027	2.474 - 2.579	2.412***	0.026	2.362 - 2.464
Income				1.020***	0.001	1.017 - 1.022	1.018***	0.001	1.016 - 1.021	1.021***	0.001	1.019 - 1.023
Educational level				1.014***	0.000	1.014 - 1.015	1.014***	0.000	1.014 - 1.015	1.015***	0.000	1.014 - 1.015
Area of living (Big city)				1.066***	0.017	1.034 - 1.099	1.068***	0.017	1.036 - 1.101	1.077***	0.017	1.044 - 1.110
Area of living (Province)				1.112***	0.014	1.085 - 1.141	1.110***	0.014	1.082 - 1.138	1.110***	0.014	1.082 - 1.139
Area of living (Surrounding area)				1.198***	0.016	1.167 - 1.230	1.193***	0.016	1.162 - 1.225	1.185***	0.016	1.154 - 1.216
Area of living (Country)				1.201***	0.015	1.172 - 1.231	1.196***	0.015	1.166 - 1.226	1.193***	0.015	1.164 - 1.223
Cardiovascular							0.884***	0.022	0.842 - 0.928	0.877***	0.022	0.836 - 0.921
Endocrinological							0.885***	0.027	0.833 - 0.940	0.869***	0.027	0.818 - 0.923
Musculoskeletal							1.332***	0.017	1.300 - 1.365	1.284***	0.016	1.253 - 1.316
Chronic obstructive pulmonary disease							0.572***	0.022	0.531 - 0.616	0.567***	0.022	0.526 - 0.611
Cancer							0.707***	0.018	0.674 - 0.742	0.714***	0.018	0.680 - 0.750
Suicide attempt										0.687***	0.044	0.607 - 0.778
Organic disorders										0.380***	0.020	0.343 - 0.420
Substance use disorders										1.083*	0.041	1.006 - 1.166
Schizophrenic disorders										0.752***	0.031	0.694 - 0.814
Mood disorders										1.479***	0.040	1.402 - 1.559
Neurotic disorders										2.492***	0.041	2.414 - 2.573
Eating disorders										1.070	0.058	0.962 - 1.189
Personality disorders										1.152***	0.039	1.078 - 1.232
Bipolar affective disorder										1.139***	0.055	1.036 - 1.252
Depression										1.313***	0.035	1.246 - 1.383
PTSD										1.501***	0.067	1.376 - 1.638
Overall model evaluation	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.
Model coefficients		25784.21 (4)	<0.001		29041.01 (10)	<0.001		30069.03 (15)	<0.001		34914.65 (26)	<0.001
McFadden R ²	0.040			0.047			0.048			0.056		

Note: ¹Sample size of the category—see **Table 1**. ²Total N refers to the number of person years from the full population not using the STS. * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.0010$.

Table A7. Four-step hierarchical regression analysis for Category 7 (Individuals having attempted suicide¹) (N² = 5,855,238).

Variables	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI
Demographics			+ Socioeconomics			+ Somatic			+ Psychiatric			
Age	0.921***	0.008	0.905 - 0.936	0.896***	0.008	0.880 - 0.912	0.877***	0.009	.860 - 0.894	0.932***	0.011	0.912 - 0.953
Gender (Female)	1.659***	0.068	1.532 - 1.797	1.629***	0.067	1.503 - 1.767	1.623***	0.067	1.496 - 1.760	1.289***	0.055	1.185 - 1.401
Family type (Living together)	1.133	0.107	0.941 - 1.363	1.087	0.103	0.902 - 1.309	1.090	0.104	.905 - 1.313	1.066	0.101	0.885 - 1.285
Family type (Living alone)	3.726***	0.209	3.338 - 4.159	3.836***	0.218	3.432 - 4.287	3.861***	0.219	3.454 - 4.315	2.226***	0.132	1.982 - 2.499
Income				0.969***	0.008	0.954 - 0.984	0.969***	0.008	0.954 - 0.984	1.009	0.007	0.995 - 1.023
Educational level				1.000	0.001	0.997 - 1.002	1.000	0.001	0.998 - 1.003	1.006***	0.001	1.003 - 1.008
Area of living (Big city)				0.993	0.087	0.836 - 1.179	1.003	0.088	0.844 - 1.190	0.978	0.086	0.823 - 1.162
Area of living (Province)				1.463***	0.096	1.287 - 1.664	1.466***	0.096	1.289 - 1.667	1.411***	0.093	1.240 - 1.606
Area of living (Surrounding area)				1.696***	0.112	1.490 - 1.930	1.696***	0.112	1.490 - 1.931	1.547***	0.103	1.358 - 1.762
Area of living (Country)				2.087***	0.127	1.853 - 2.351	2.087***	0.127	1.852 - 2.351	1.894***	0.116	1.679 - 2.136
Cardiovascular							1.138	0.133	0.905 - 1.432	1.090	0.128	0.866 - 1.373
Endocrinological							1.235	0.159	0.960 - 1.589	0.993	0.128	0.770 - 1.279
Musculoskeletal							1.831***	0.110	1.628 - 2.060	1.366***	0.081	1.216 - 1.535
Chronic obstructive pulmonary disease							1.047	0.157	0.780 - 1.406	0.957	0.146	0.711 - 1.290
Cancer							0.526***	0.085	0.383 - 0.722	0.644***	0.105	0.468 - 0.887
Suicide attempt										5.960***	0.391	5.240 - 6.778
Organic disorders										0.671*	0.120	0.472 - 0.953
Substance use disorders										1.333***	0.103	1.146 - 1.550
Schizophrenic disorders										0.916	0.078	0.775 - 1.083
Mood disorders										1.678***	0.114	1.469 - 1.916
Neurotic disorders										13.064***	0.641	11.867 - 14.382
Eating disorders										1.149	0.156	0.881 - 1.498
Personality disorders										1.443***	0.101	1.258 - 1.654
Bipolar affective disorder										1.374**	0.153	1.105 - 1.709
Depression										2.150***	0.130	1.909 - 2.420
PTSD										0.910	0.117	0.707 - 1.171
Overall model evaluation	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.
Model coefficients		1076.94 (4)	<0.001		1435.92 (10)	<0.001		1551.55 (15)	<0.001		7025.91 (26)	<0.001
McFadden R ²	0.024			0.032			0.034			0.158		

Note: ¹Sample size of the category—see **Table 1**. ²Total N refers to the number of person years from the full population not using the STS. * = p < 0.05, ** = p < 0.01, *** = p < 0.0010.

Table A8. Four-step hierarchical regression analysis for Category 8 (Abortion past week 12 of the pregnancy¹) (N² = 5,854,183).

Variables	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI
Demographics			+ Socioeconomics			+ Somatic			+ Psychiatric			
Age	0.916***	0.010	0.896 - 0.936	0.987	0.012	0.963 - 1.011	1.019	0.013	0.994 - 1.045	1.030*	0.014	1.004 - 1.057
Gender (Female)	50.038***	9.231	34.856 - 71.833	47.480***	8.766	33.064 - 68.181	47.388***	8.571	32.998 - 68.054	46.073***	8.511	32.078 - 66.175
Family type (Living together)	4.214***	0.354	3.574 - 4.968	4.210***	0.355	3.569 - 4.966	4.209***	0.355	3.568 - 4.965	4.213***	0.355	3.572 - 4.970
Family type (Living alone)	2.489***	0.183	2.155 - 2.875	2.751***	0.203	2.380 - 3.180	2.734***	0.202	2.365 - 3.161	2.593***	0.193	2.240 - 3.000
Income				0.985	0.009	0.967 - 1.003	0.982*	0.009	0.964 - 1.000	0.985	0.009	0.967 - 1.003
Educational level				1.036***	0.002	1.032 - 1.040	1.035***	0.002	1.031 - 1.039	1.036***	0.002	1.032 - 1.040
Area of living (Big city)				0.993	0.086	0.837 - 1.177	0.984	0.085	0.830 - 1.167	0.986	0.086	0.831 - 1.169
Area of living (Province)				0.906	0.070	0.780 - 1.054	0.902	0.069	0.775 - 1.048	0.896	0.069	0.770 - 1.042
Area of living (Surrounding area)				1.058	0.083	0.908 - 1.234	1.050	0.082	0.900 - 1.224	1.035	0.081	0.887 - 1.206
Area of living (Country)				0.953	0.075	0.817 - 1.111	0.944	0.074	0.809 - 1.101	0.932	0.073	0.799 - 1.088
Cardiovascular							0.263**	0.108	0.117 - 0.589	0.266**	0.110	0.119 - 0.597
Endocrinological							0.938	0.237	0.571 - 1.539	0.925	0.234	0.564 - 1.518
Musculoskeletal							0.759*	0.084	0.611 - 0.944	0.734**	0.081	0.591 - 0.913
Chronic obstructive pulmonary disease							0.064**	0.064	0.009 - 0.455	0.065**	0.066	0.009 - 0.466
Cancer							0.244***	0.078	0.131 - 0.457	0.250***	0.080	0.134 - 0.468
Suicide attempt										1.786*	0.506	1.025 - 3.111
Organic disorders										0.250*	0.145	0.080 - 0.779
Substance use disorders										0.844	0.274	0.447 - 1.596
Schizophrenic disorders										0.536*	0.166	0.292 - 0.984
Mood disorders										1.061	0.207	0.724 - 1.556
Neurotic disorders										2.413***	0.238	1.989 - 2.928
Eating disorders										1.093	0.279	0.663 - 1.802
Personality disorders										1.095	0.222	0.735 - 1.630
Bipolar affective disorder										0.850	0.307	0.419 - 1.725
Depression										1.314	0.216	0.952 - 1.814
PTSD										1.828*	0.487	1.084 - 3.081
Overall model evaluation	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.
Model coefficients		2249.50 (4)	<0.001		2691.83 (10)	<0.001		2775.98 (15)	<0.001		2893.7 6 (26)	<0.001
McFadden R ²	0.081			0.098			0.100			0.104		

Note: ¹Sample size of the category—see **Table 1**. ²Total N refers to the number of person years from the full population not using the STS. * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.0010$.

Table A9. Four-step hierarchical regression analysis for Category 9 (Sexual abuse or sexual assault prior to the age of 18 years¹) (N² = 5,859,944).

Variables	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI	OR	SE	95% CI
	<i>Demographics</i>			<i>+ Socioeconomics</i>			<i>+ Somatic</i>			<i>+ Psychiatric</i>		
Age	0.933***	0.005	0.924 - 0.942	0.920***	0.005	0.911 - 0.930	0.921***	0.005	0.910 - 0.931	0.954***	0.006	0.943 - 0.965
Gender (Female)	6.767***	0.234	6.324 - 7.240	6.482***	0.226	6.053 - 6.940	6.444***	0.225	6.018 - 6.900	5.966***	0.210	5.568 - 6.391
Family type (Living together)	1.487***	0.075	1.348 - 1.641	1.427***	0.072	1.292 - 1.575	1.435***	0.073	1.300 - 1.585	1.477***	0.073	1.311 - 1.598
Family type (Living alone)	3.413***	0.112	3.201 - 3.639	3.533***	0.117	3.311 - 3.769	3.540***	0.117	3.318 - 3.777	2.932***	0.098	2.745 - 3.131
Income				0.944***	0.005	0.934 - 0.954	0.941***	0.005	0.931 - 0.951	0.962***	0.005	0.953 - 0.972
Educational level				1.006***	0.001	1.005 - 1.008	1.006***	0.001	1.004 - 1.007	1.008***	0.001	1.007 - 1.010
Area of living (Big city)				1.542***	0.071	1.409 - 1.689	1.547***	0.072	1.413 - 1.693	1.610***	0.075	1.470 - 1.763
Area of living (Province)				1.606***	0.063	1.487 - 1.734	1.603***	0.063	1.484 - 1.731	1.631***	0.064	1.510 - 1.762
Area of living (Surrounding area)				1.810***	0.072	1.674 - 1.957	1.802***	0.072	1.667 - 1.949	1.796***	0.072	1.660 - 1.942
Area of living (Country)				2.139***	0.079	1.989 - 2.200	2.128***	0.079	1.979 - 2.288	2.132***	0.079	1.982 - 2.294
Cardiovascular							0.791**	0.068	0.669 - 0.935	0.803*	0.069	0.679 - 0.950
Endocrinological							1.056	0.092	0.890 - 1.252	0.973	0.085	0.820 - 1.154
Musculoskeletal							1.511***	0.055	1.407 - 1.623	1.333***	0.048	1.242 - 1.432
Chronic obstructive pulmonary disease							0.510***	0.063	0.400 - 0.650	0.520***	0.065	0.407 - 0.663
Cancer							0.425***	0.042	0.350 - 0.515	0.462***	0.046	0.381 - 0.561
Suicide attempt										0.945	0.085	0.792 - 1.128
Organic disorders										0.439***	0.064	0.329 - 0.584
Substance use disorders										1.224**	0.089	1.061 - 1.412
Schizophrenic disorders										1.583***	0.095	1.407 - 1.780
Mood disorders										1.598***	0.088	1.435 - 1.780
Neurotic disorders										3.206***	0.113	2.992 - 3.435
Eating disorders										1.515***	0.131	1.279 - 1.795
Personality disorders										1.933***	0.101	1.745 - 2.140
Bipolar affective disorder										1.669***	0.141	1.414 - 1.971
Depression										1.184**	0.065	1.063 - 1.319
PTSD										5.419***	0.292	4.877 - 6.022
Overall model evaluation	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.	Stat.	χ^2 (df)	Sig.
Model coefficients		6646.34 (4)	<0.001		7477.04 (10)	<0.001		7742.48 (15)	<0.001		11276.09 (26)	<0.001
McFadden R ²	0.058			0.067			0.069			0.101		

Note: ¹Sample size of the category—see Table 1. ²Total N refers to the number of person years from the full population not using the STS. * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$.