

TRENDS IN THE AD/HD EPIDEMIC IN NORWAY (1992–2011)

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Abstract

At the heart of many debates about AD/HD in Norway lies the question whether *too many* or *too few* individuals are currently diagnosed with AD/HD or treated with AD/HD medications. Such debates often make use of figures that are not particularly significant when treated and handled in isolation from a meaningful context.

The purpose of this article is to present a form of epidemiological picture of how the AD/HD concept has developed in Norway. The plan is to account for relevant figures, concepts and tendencies, so that they can be applied, commented on and assessed in relation to various questions and relevant discussions. Distinctive trends in the development are discussed and analysed with the help of models and perspectives from relevant sociological theories. A main argument put forward is that the AD/HD epidemic is a part of an increased medicalisation in society in general.

Keywords: Attention Deficit Hyperactivity Disorder (AD/HD), diagnostics, medication, epidemic, trends

Introduction

AD/HD – a controversial diagnosis

Attention Deficit Hyperactivity Disorder (AD/HD) was described in 1988 in the official American diagnostic manual *Diagnostic and Statistic Manual of Mental Disorders* (DSM III R). Since that time, the occurrence of the AD/HD diagnosis has increased significantly both in terms of spreading to new areas (globalisation) and in terms of incidence (the number of registered cases) in the population. In Norway, the development over the past couple of decades has seen the same tendency. Norway uses the World Health Organisation's diagnostic manual, *International Classification of Mental Disorders* (ICD 10) as its official classification system. In this manual, the diagnosis has been given the name *Hyperkinetic disorders* and the classification *F90*. Amongst the general public, the term AD/HD is nevertheless the most familiar – and the term is also used in many contexts by professionals. During the period in question, certain structural changes were made in respect of the diagnosis which may perhaps be observable in the data material presented in this article. Firstly, it was resolved (by consensus) in 1995 that AD/HD is a lifelong condition. As a result, the criteria were changed such that adults could also be given the diagnosis – as opposed to only children and youngsters under the age of 18, as had been the case previously. This extension of the diagnosis was not, however, followed by any changes in the description of the diagnostic symptoms, which are still primarily associated with the state and daily life of children (particularly boys). Secondly, in 2005, adults received the same access as children and young people to medical treatment with psychostimulants, which presumably has contributed to both examination and diagnosis becoming more readily meaningful to adults. In the same year, 2005, the first edition of the Norwegian-language guide *Veileder i diagnostikk og behandling av AD/HD* was also issued. By means of this publication,

diagnostic experts addressed themselves – via the highest professional political authority in Norway – primarily to specialists, patients and their families. The authors point out that both AD/HD interest groups, nursery and school staff, employees in the public authorities dealing with children, young people and families, the health service and the public work and welfare sectors, as well as government bodies and politicians, may find the guide useful (Sh-dir.2006).

Despite its substantial growth, however, AD/HD remains relatively controversial, both as a diagnosis and as a condition. The diagnosis itself is established on the basis of registering certain clinical symptoms. In the manuals, these are defined and represented by descriptions of in all 18 different clinical signs of the three core symptoms: hyperactivity, impulsiveness and failure of concentration. The clinical signs consist of 18 concrete descriptions of different types of behaviour. In other words, the registering of clinical signs will to some extent always be based on subjective assessments. With reference to the strong growth, critical questions are constantly being asked in various quarters about the etiology and existence of the diagnosis and condition. Critics point to the lack of clear and objective diagnostic symptoms, with the consequent risk of over or under-diagnosing. As an extension of this, criticism arises of possible damaging long-term effects of the medicinal treatment with psychostimulants. As early as 2006, Gisela Wieser, an AD/HD-medicines specialist from INCB, which is the UN's Narcotics Control Board, made the following statement to the Norwegian television channel TV 2:

“We were earlier worried about developments in the USA, because they had the highest level of use. We now see that Norway is the country in Europe which most clearly follows the American trend in the use of methylphenidates [*e.g. Ritalin and Concerta, authors comment*] in the treatment of AD/HD. And this concerns us.”¹

What makes the above quotation particularly interesting in this context is that it describes developments in Norway and justifies the UN's concerns about them by making a comparison with an equivalent development in another country (the USA). In other contexts, it is a common feature of similar debates about AD/HD that different figures and measures are referred to and commented quite divorced from any context that might contribute to more meaningful assessments and analyses. In 2011, for instance, altogether 30 525 users of AD/HD medicines were registered in Norway². The figure 30 525 quite simply expresses a quantity (in this case, users of AD/HD medicines) which in itself cannot be described as especially high or low. One of the purposes of this presentation is therefore to present a collected and systematic overview of actual quantities and tendencies – based on available data – as a basis for future discussion about how this can be explained and understood.

Medicalisation in society

In a historical perspective, the AD/HD diagnosis can be regarded as typical of social development in the period in question, rather than as a curiosity. A comparison of the editions of the diagnostic manual shows, for instance, that the number of alternative diagnoses rose from 106 when the first edition came out in 1952 to nearly 400 in the most recent edition, from the year 2000 (Hannås, 2010). What is perhaps the most substantial criticism that has been levelled against the AD/HD diagnosis, and against the dominant medical perspective on

¹ See also “FN bekymret over AD/HD-medisinerer” on: <http://pub.tv2.no/TV2/magasiner/dokument2>: accessed 26.02.06. In addition, David Coven noted that the same trend, to a varying extent, was apparent in Canada, Australia, New Zealand, Switzerland, Sweden, Denmark, the UK, Germany, the Netherlands, Israel, Spain and Taiwan. He also noted that both France and Italy, where there has traditionally been a greater resistance against treating children with psychostimulants, also appeared to be following (Stead, *et al.*, 2006). There are also indications that the same diagnostic practice is in the course of spreading in Africa (Aase, 2007).

² See Nasjonalt reseptbasert legemiddelregister (Prescriptions Register), <http://www.reseptregisteret.no>

which it is based, springs from a more generalised criticism of the broader social development. In the professional literature this is often described as the theory of medicalisation in society. The term “medicalisation” indicates that there has been, and still is, an apparent tendency to constantly identify new forms of human behaviour and conditions that are defined as deviant or sick, and which thereby are primarily understood and treated as medical issues (Conrad, 1975). Within the theory of medicalisation, this is regarded as a consequence of the fact that medicine, in competition with and at the expense of other subjects, has succeeded in expanding the boundaries of its own field’s domain and jurisdiction (Conrad & Potter, 2000). An implication of this development is that many people today are prescribed treatment with medicines or other forms of medical intervention in relation to problems that, according to the theory of medicalisation, are not inherently medical, but which rather can be attributed to issues that are external to the individual concerned. In the case of psychiatric diagnoses, AD/HD included, the main purpose of treatment is to modify challenging – but normal – variants of human behaviour and human conditions. In research and in the literature, the AD/HD diagnosis is often used as a concrete example of the medicalisation in society. It reflects the fact that AD/HD has distinguished itself over a long period as that diagnosis that has attained the most rapid growth and the greatest recruitment in terms of the number of diagnosed persons (Brante, 2006).

The theory of medicalisation describes psychiatric and medical diagnoses as a product of social and historical conditions. In this connection, the significance of the activities of specific interest groups is particularly emphasised. New diagnoses rarely arise as a result of new scientific discoveries. Studies have shown that various agencies such as self-help groups and other groups of various types of interests, social movements, health-related organisations, pharmaceutical companies, researchers and clinicians have all played a central role in the formation of new diagnoses. Similarly, the same factors are apparent and influential in connection with expanding or disseminating an already-existing diagnostic category (Conrad & Potter, 2000).

The diagnoses have an interactive function in society. They are influenced by, but also influence, the society of which they are a part. At the same time as the AD/HD diagnosis can be regarded as, amongst other things, an expression of the position of medicine and the state of knowledge at a given point in time, it will also itself affect the general perception of where the boundaries should be drawn for what is to be regarded as normal, reasonable and acceptable behaviour. By this means, diagnoses function as a formula that contribute to the classification and structuring of our perception of reality, and thus also affect the interaction of a number of every-day relationships and situations (Bowker & Star, 1999). An interesting point regarding the general function of diagnoses, pointed out by Bowker and Star amongst others, is that at the same time as the categories (diagnoses) help focus on distinct aspects of the condition that they describe, they also inevitably contribute to placing other aspects of the same condition in the shadow of those that are highlighted: “Each standard and each category valorizes some point of view and silences another.” (*ibid*:5).

With the help of Bruno Latour’s Actor-Network-Theory (ANT), the function of diagnosis as an independent social force can perhaps be illuminated and further highlighted (Latour, 1987). In this theory, the function of actor is not exclusively reserved for people; nor is it necessarily limited to any form of physical materiality. Actors that themselves cannot play the role of subjects – with a personal or independent intention – are termed either actors or actants by Latour. Because the AD/HD diagnosis functions in such a way as to affect our understanding of, and thus also change our behaviour within, the world, the diagnosis can within this perspective be termed an actor or an actant. One of the questions with which Latour was particularly concerned, and which the ANT model in this connection may also be

suited to illuminate, is how new knowledge is constantly confirmed and disseminated through a form of social network. When knowledge of a phenomenon is confirmed and disseminated, the network simultaneously grows such that it presently encompasses more agents or spokesmen for that particular type of knowledge. New agents are constantly recruiting new spokesmen and a specific understanding of a specific phenomenon is thereby disseminated through both local, regional and global networks. The ANT model also encompasses forces of resistance. If the latter win, the development of the networks that otherwise could have reinforced and further disseminated the relevant knowledge is hindered. The theory does not draw a complete picture or a firmly locked understanding of an eternal truth in respect of the phenomenon in question. On the contrary, each new reinforcement of a phenomenon contains a (potential) modification of the knowledge in question. Based on this theory, each new case that is identified as AD/HD can be regarded as a new reinforcement of the relevant knowledge of the diagnosis, which acts as a stage in a process that contributes to the dissemination of both the knowledge and the diagnosis to further individuals.

Ian Hacking (2004) is one of those who have studied and described the interactive function in society of various diagnoses. He points out that the diagnoses and conditions not only confirm each other, but that they also have a tendency to mutually reinforce one another. Hacking's work includes individual studies of the interaction between classifications and the people who are classified. On the basis of these studies he has described an interactive effect that he has called "the looping effect of classifying human beings" (2004:279). With the help of this, he shows how, as a result of the classification, people are first changed themselves before this in turn causes a modification of the very classification system that changed them. He points out that there is a dialectic relationship between classification systems and people. As a result of this dialectic – and dynamic – process, constantly new forms of groups or categories of people are created or formed.

Research questions and methodological approach

On the basis of the above introduction, we will now investigate, discuss and analyse the following three questions more closely:

- How many people in Norway have the diagnosis AD/HD?
- What developmental trends can be seen in the period 1992 to 2011?
- How can the results that emerge (quantities and tendencies) be explained?

The method employed in this article can be termed a meta-synthetic study based on earlier surveys and a data register. In order to highlight relevant aspects of the development prior to the establishment of a relevant data register, we refer to the results of a survey by Reigstad *et al.* (2004) covering the period 1992–2002. To examine the development during the following period, in other words 2004 to 2011 inclusive, we use statistics from the *Reseptregisteret* (the prescription-based medications register of the Norwegian national public-health institute). In discussing relevant alternative explanations for the tendencies that are presented, we will also refer to and use information from individual findings in a qualitative survey carried out in connection with an earlier doctoral project concerning AD/HD (Hannås, 2010). Significant results from the survey will be discussed and analysed with the help of the sociological theories and models mentioned in the introduction above.

A study of developments in Norway from 1992 to 2011

This section addresses the question of what appear to be the characteristics of the development in terms of the extent and regularity of the diagnosis in Norway from 1992 to the present day. The presentation is divided into two sub-sections; the first dealing with the period 1992–2002 and the second with developments in the period 2004–2011.

Development characteristics in the period 1992–2002

To gain an impression of the relevant development trends before 2004, when the current data registration began, we will start by presenting relevant results from an investigation that has surveyed the background for referrals and requests for assessments by child and youth psychiatry agencies in Norway between 1992 and 2002. The authors of the 2004 study (Reigstad *et al.*) investigated all referrals that were prompted by a suspicion of hyperactivity/attention difficulties. Firstly, they found that there is a statistically high correlation between referral category (reason) and subsequent diagnosis. Furthermore, they found that the number of referrals prompted by hyperactivity/attention difficulties rose from 1.2% to 13.6% from 1992 to 2002. Similarly, they document that there occurred at the same time an equivalent reduction in the use of other referral categories. The study has also charted the number of media references and other public publications that focus on the theme of hyperactivity/attention difficulties and related topics, such as the positive effect of medicinal treatment.

This survey concludes that the marked increase in the number of referrals/diagnoses related to AD/HD may be partly explained by a greater focus on hyperactivity/attention difficulties both in the media and by the referring bodies. The most significant point in this connection, however, is that there actually was a significant increase in the number of referrals prompted by suspicion of AD/HD during the years 1992–2002. The proportion of referrals in this category, measured in relation to the total number of referrals to by child and youth psychiatry agencies, grew by as much as 12.4% between 1992 and 2002. A high correlation between referral category and diagnosis makes a more-or-less similar increase in the number of diagnoses seem likely. The survey describes a development that affected children and young people. The developmental trends amongst adults in the same period was probably affected by other factors.

Development characteristics in the period 2004–2011

There are no registers that show how many people have the diagnosis AD/HD in Norway. What is registered, however, is how many individuals are treated with AD/HD medications. This is recorded in the *Reseptregisteret* (the prescription-based medications register of the Norwegian national public-health institute, which we will refer to here as the “prescriptions register”).³ In this database, “AD/HD medications” include the psychostimulants methylphenidate (i.e. the products Ritalin and Concerta), dextroamphetamine and amphetamine, as well as atomoxetine (i.e. the product Strattera). The latter is the only one of these medications that cannot be regarded as a psychostimulant. Entries to the database begin in 2004. By comparing corresponding figures from year to year, data from the prescriptions register can give a certain impression of any pronounced developments during the period 2004–2011.

In the tables and figures presented in this sub-section, figures from the prescriptions register are used to calculate and illustrate some of the most pronounced trends. The register includes all users of AD/HD medications. Research suggests that about 77% of patients under the age of 18 (and probably a lower number of adults) have a positive response to, and are treated with, AD/HD medications (SINTEF, 2004:129)⁴. In other words, the number of *users* of AD/HD medications should not be confused with the number of persons with the diagnosis AD/HD.

³<http://www.reseptregisteret.no>

⁴The number of children and young people with the diagnosis can thus be estimated as “number of users” plus about “23% of the population” in the respective age categories.

Main trends in distribution between men and women 2004–2011

Table 1(below) shows the number of users of AD/HD medications for the whole country and the gender distribution during the years 2004–2011.

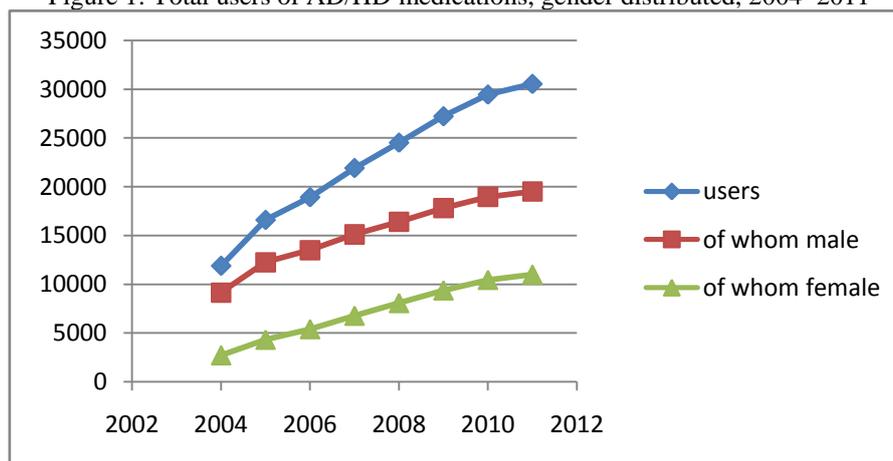
Table 1: Users of AD/HD medications, gender distributed, 2004–2011

year	users	of whom male	of whom female	Increase from previous year
2004	11 877	9 155 (77.1%)	2 722 (22.9%)	
2005	16 580	12 261 (73.9%)	4 319 (26.1%)	4 703 (39.6%)
2006	18 910	13 503 (71.4%)	5 407 (28.6%)	2 330 (14.1%)
2007	21 901	15 119 (69.0%)	6 782 (31.0%)	2 991 (15.8%)
2008	24 501	16 416 (67.0%)	8 085 (32.9%)	2 600 (11.9%)
2009	27 205	17 817 (65.5%)	9 388 (34.5%)	2 704 (11.0%)
2010	29 433	18 966 (64.4%)	10 467 (35.6%)	2 228 (8.2%)
2011	30 525	19 515 (63.9%)	11 010 (36.1%)	1 089 (3.7%)

Source raw data: Prescriptions Register

From the second column from the left in Table 1 it emerges that in 2004 the total number of users of AD/HD medications in Norway was 11 877. In 2005 the number has increased to 16 580. In other words, the number of users has increased by 4 703 individuals, which represents an increase of 39.6% (as seen in the far-right column) from 2004 to 2005. From 2005 to 2006 the total number of users has increased by 2 330 individuals, which represents an increase of 14.1%. From 2006 to 2007 the total number of users has increased by 2 991 individuals, which represents an increase of 15.8%, whilst the following years show an equivalent increase of 11.9%, 11.0%, 8.2% and 3.7% respectively. The number of users shows a steady climb through the whole period. Even though the figures are not corrected for the general population growth, we can assume that they reflect a genuine growth in the proportion of individuals with the diagnosis over the period in question. The table also shows that the growth is significantly weaker in the years after 2005 than between 2004 and 2005. Despite a weak increase from 2006 to 2007, the growth in total users seems to fall off somewhat as the years pass. In 2010 and 2011, the figures show a growth in the number of users of 8.2% and 3.7% respectively. Even though the number is still growing, the trend nevertheless seems to indicate a significantly weaker growth in total users now than was the case previously; a point that is also illustrated in Figure 1 (below):

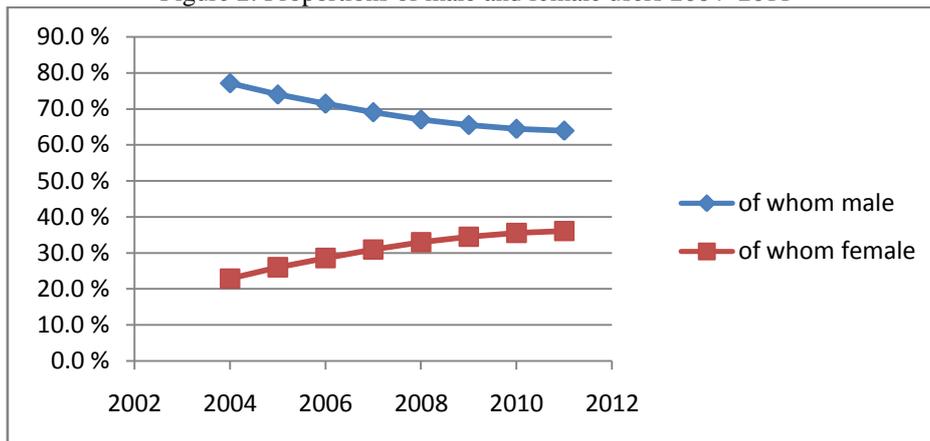
Figure 1: Total users of AD/HD medications, gender distributed, 2004–2011



Source raw data: Prescriptions Register

From the third and fourth columns in Table 1, which show total users distributed by gender, we see that males have been most heavily represented all the time. For each year that passes, however, females have been catching up on the males. Between 2004 and 2011, the proportion of female users of AD/HD medications has increased from just over a fifth to more than a third of the total number of users (see Figure 2 below):

Figure 2: Proportions of male and female users 2004–2011



Source raw data: Prescriptions Register

The national guide for the diagnosis and treatment of AD/HD points out that under-diagnosis of AD/HD can be greater amongst girls than amongst boys and that this gender difference is most apparent in children and youngsters, while it appears to even out as age increases. A possible explanation of this development is the contemporary perception that boys and girls traditionally display somewhat differing patterns of behaviour, so if the diagnostic criteria in the manuals appears to correspond most with deviant behaviour in boys there should be a greater openness to other types of symptoms when diagnosing girls and women (Sh-dir., 2006:8).

Main development trends in and across different age categories, 2004–2011

Table 2 (below) shows the number of users of AD/HD medications organised into different age categories during the period.

Table 2: Number of users of AD/HD medications in different age categories, 2004–2011

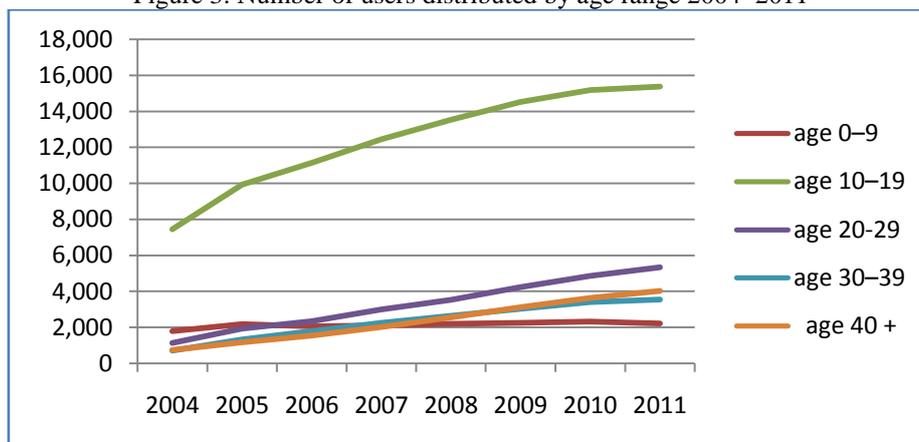
year	age 0–9	age 10–19	age 20–29	age 30–39	age 40 +	total
2004	1 806	7 455	1 149	720	747	11 877
2005	2 192	9 931	1 943	1 341	1 173	16 580
2006	2 065	11 139	2 353	1 803	1 550	18 910
2007	2 117	12 446	2 999	2 256	2 023	21 901
2008	2 220	13 531	3 530	2 656	2 564	24 501
2009	2 269	14 519	4 243	3 050	3 124	27 205
2010	2 337	15 180	4 864	3 407	3 645	29 433
2011	2 228	15 370	5 336	3 557	4 034	30 525
increase 2004-2011	422	7 915	4 187	2 837	3 287	18 648
% increase 04-11	23.37	106.17	364.40	383.38	440.03	157.01

Source raw data: Prescriptions Register

A comparison between the different age categories in the columns in Table 2 shows that throughout the whole period the great majority of users of AD/HD medications were in the 10–19 age group. The next-to-the-bottom row in the table (increase 2004–2011) shows that 10–19-year-olds, with a total growth of 7 915 users, is also the age category with by far the greatest number of new members during the period. Figure 3 (below) is a graphic representation of the number of users per year from 2004 to 2011, distributed according to the different age categories. The vertical axis gives the number of users, whilst the horizontal axis gives the corresponding year. The figure clearly indicates that there has constantly been a significantly larger group of users in the 10–19 age range than in the other age groups. Furthermore, the figure shows that the 0–9 age group has shown the weakest growth throughout the period. The increase has been from just under to just over 2 000 children. The

other three age categories (older than 19 years) all had fewer users in 2004 but more in 2011, than the age group 0–9 years.

Figure 3: Number of users distributed by age range 2004–2011



Source raw data: Prescriptions Register

The lowest row (% increase 04–11) in Table 2 (above) gives the relative increase in the proportion of users within each of the age groups in the same period. When the increase is calculated in relation to the total number of individuals in their respective age groups, we see that the proportionately-strongest growth during the period (440.03%) occurred in the age range 40+. The age ranges 20–29 and 30–39 have both seen a relative increase well in excess of 300%, whilst the group with the greatest number, 10–19-year-olds (who have also recruited the greatest number of new members), has “only” seen a relative growth of 106.17% during the period. The lowest growth, both in terms of the number of individuals (422) and as a percentage of own age group (23.37%), was found in the 0–9 age range.⁵

Table 3 (below) shows the percentage annual increase (from 2004) within each of the age groups.

Table 3: Annual percentage user growth per year and age group 2004–2011. Proportion in 2004= 100%

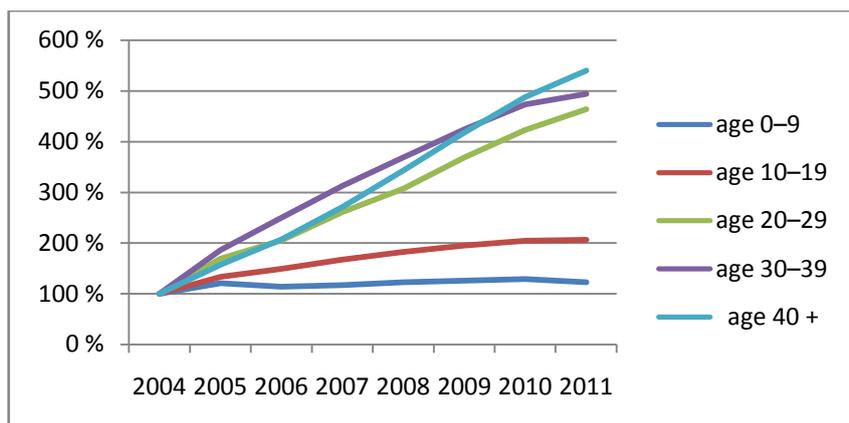
year	age 0–9	age 10–19	age 20–29	age 30–39	age 40 +
2004	100%	100%	100%	100%	100%
2005	121%	133%	169%	186%	157%
2006	114%	149%	205%	250%	207%
2007	117%	167%	261%	313%	271%
2008	123%	182%	307%	369%	343%
2009	126%	195%	369%	424%	418%
2010	129%	204%	423%	473%	488%
2011	123%	206%	464%	494%	540%
increase 2004-2011	23%	106%	364%	394%	440%

Source raw data: Prescriptions Register

The main trends based on the figures in Table 3 (above) become apparent in Figure 4 (below).

Figure 4: % user growth per year within each age category 2004–2011. Proportion in 2004 is set as 100%

⁵It is only in the 0–9 age range that the entire growth can be explained by the recruitment of new users of AD/HD medications. In the other age categories, the growth is either due to “new” individuals being diagnosed or becoming users of AD/HD medications, or that former users have been transferred from a lower age range



Source raw data: Prescriptions Register

Figure 4 (above) shows the annual percentage growth of the proportion of users within the various age ranges. The proportion of users in 2004 is set at 100% for all age ranges. It clearly emerges that the relative growth has been far greater amongst the oldest users of AD/HD medications than amongst the youngest.

Table 4 (below) shows the proportion of users per 1000 of population for each year and age range. Any distortion as a result of changes in the overall population figures from year to year within the individual age ranges has been compensated for.

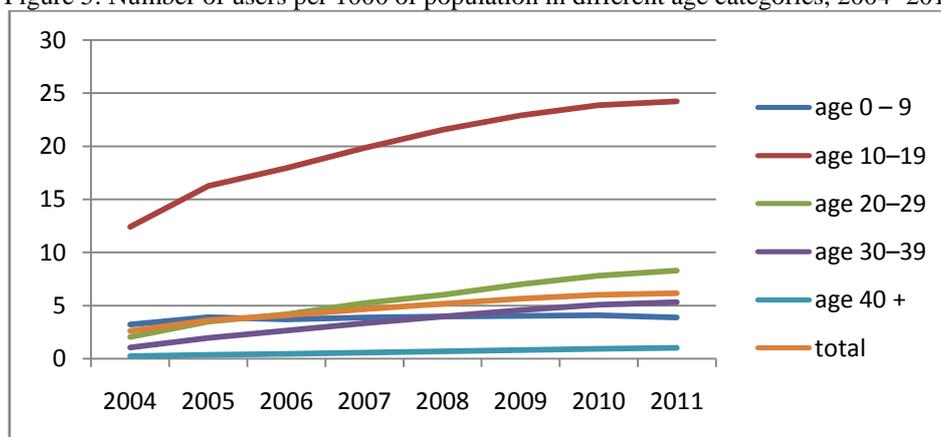
Table 4: Number of users per 1000 of population in various age ranges and years

year	age 0 – 9	age 10–19	age 20–29	age 30–39	age 40 +	total
2004	3.19	12.41	2.04	1.04	0.24	2.59
2005	3.89	16.25	3.47	1.94	0.35	3.59
2006	3.68	17.94	4.18	2.64	0.45	4.06
2007	3.88	19.82	5.23	3.32	0.56	4.65
2008	3.95	21.55	6.01	3.95	0.69	5.16
2009	4.01	22.90	7.01	4.54	0.82	5.64
2010	4.08	23.86	7.80	5.07	0.93	6.02
2011	3.85	24.22	8.29	5.30	1.02	6.16

Source raw data: Prescriptions Register

Figure 5 (below) is a graphic presentation of figures and trends from Table 4. Patterns and trends in the Figure correspond to the information given above.

Figure 5: Number of users per 1000 of population in different age categories, 2004–2011



Source raw data: Prescriptions Register

Summary of main trends in the period 1992–2011

Table 1 showed a clear growth trend in the total number of users of AD/HD medications throughout the period 2004 to 2011 inclusive. The total number of users has

increased from 11 877 persons per year in 2004 to 30 525 persons in 2011, a growth of almost 157% (Table 2). The largest user group all the time has been amongst children and youngsters in the 10–19 age range. Nevertheless, the relative growth is at its greatest amongst those over the age of 19. In these age categories, the percentage growth of the individual groups is well over 300%, whilst the corresponding growth in the age categories under the age of 20 lies respectively far under and slightly over 100%.⁶

In brief, we can say that the 10–19 age category appears both to have had the greatest number of users of AD/HD medications and probably the most people with the diagnosis. This seems to be the case for the whole of the period 1992–2011. In the period 2004–2011, over a half of the total users are in the 10–19 age range (see Table 2). In the same period, however, the relative growth is stronger in the over-19 age groups. However, the trend suggests that a slow levelling-out is taking place of the disparity between the number of children/youngsters and the number of adults being treated with AD/HD medications. It does not seem unreasonable to assume that this trend describes and reveals a development which has taken place at the same time between corresponding age groups in terms of “people with diagnosis”.

Taken as a whole, the survey confirms the general impression that during the period as a whole – from the beginning of the 90s and up until 2011 – there has been a great increase in the number of persons with the AD/HD diagnosis. The overall number of individuals being prescribed AD/HD medications has more than doubled over the seven years from 2004 to 2011.

Analysis also shows both that the actual growth (number of users) and the relative (proportionate) growth seems to have reached a peak in 2005 or perhaps earlier and to have fallen off somewhat during the years 2006–2009. In the period 2006–2009, the growth seems to have remained relatively stable at 2 300–3 000 new users of AD/HD medications per year, whilst the relative growth shows a slowly-sinking trend over the same period. In 2010 and 2011, the increase appears however to fall dramatically in comparison with the previous years (Table 1 and Figure 1).

The analysis also shows that the general development during the period 2004–2011 seems to show signs of an evening-out of two different kinds of disparity in connection with age and gender respectively. On the one hand, a gradual levelling-out has taken place between the number of users over and under the age of 19. At the same time, a gradual levelling has also taken place of the relationship between the numbers of male and female users of AD/HD medications. In 2011, 0.62% of the total population of Norway was registered as users of AD/HD medications. Despite the levelling-out in terms of age, 2.42% of all Norwegian 10–19-year-olds were registered as users of AD/HD medications in 2011. The over-40 age group had the lowest proportion of users (0.17%) in 2011 but the highest relative growth (440%) during the period 2004–2011 (440%). In 2011, 63.9% of all users of AD/HD medications are men/boys, whilst 36.1% are women/girls. Women report that they often encounter stereotypical descriptions of AD/HD. These associate AD/HD with active and aggressive boys or with introvert and dreamy girls – or quite simply with a diagnosis that *everyone* can have “if they just have some slight problems”. These women cannot identify themselves with such descriptions (Hannås, 2010). A gender-levelling can be interpreted as a sign that the general perceptions of AD/HD are in the process of change.

⁶We have chosen to put all the users of AD/HD medications who are older than 39 years old together in one age group. The purpose is to give a presentation which shows some of the main trends, without disturbing the image with unnecessary details.

Status 2011

In the first sub-section below, age-related variations as of 2011 are examined more closely, followed by a presentation of and commentary over figures showing the proportion of users by county in the same year.

Variation between age categories 2011

Table 5 (below) shows the number of users of AD/HD medications in relation to the population and in the various age categories in 2011.

Table 5: Distribution of the number of users of AD/HD medications in various age categories in 2011

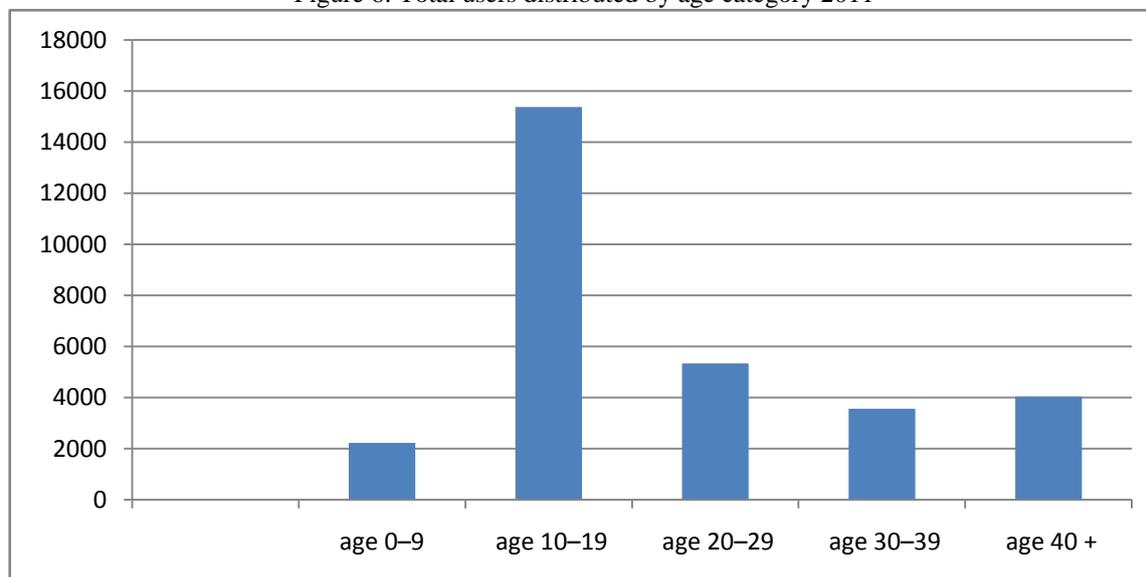
Age group	Number of users	Population basis	Users as % of population
age 0–9	2 228	579 307	0.38
age 10–19	15 370	634 630	2.42
age 20–29	5 336	643 775	0.83
age 30–39	3 557	671 437	0.53
age +	4 034	2 424 067	0.17
All ages	30 525	4 953 216	0.62

Source raw data: Prescriptions Register

The second column in the table shows the total number of users per age category, whilst the third column shows the population basis for each age category as it was in 2011. The final column shows a calculation of what percentage the user group comprises of the population basis in the respective age categories in 2011.

Figure 6 (below) is a graphic presentation of the information given in the second column of Table 5 (above).

Figure 6: Total users distributed by age category 2011

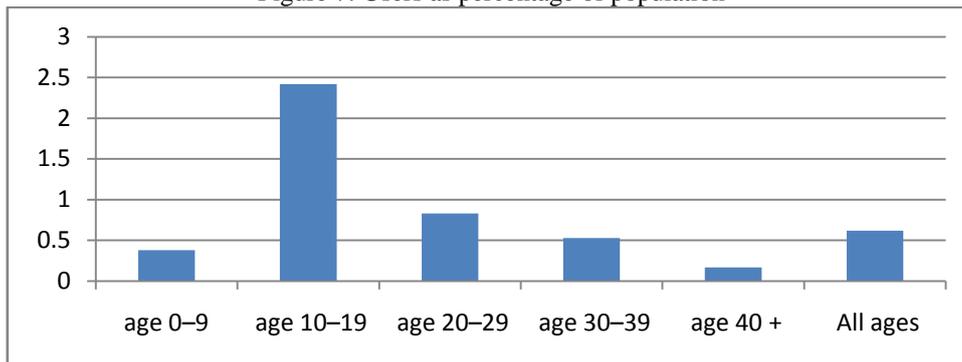


Source raw data: Prescriptions Register

The most striking aspect of Figure 6 (above) is that 10–19-year-olds stand out as having about twice as many users as the age range with the second-highest usage of AD/HD medications (i.e., the 20–29-year-olds).

Figure 7 (below) is a graphic representation of the information in the third column (users as percentage of population) in Table 5.

Figure 7: Users as percentage of population



Source raw data: Prescriptions Register

In Figure 7, the proportion of users is expressed as percentage of the total population within each individual age category. The figure shows that even when corrected for the population figures in the various age categories, 10–19-year-olds are still distinctive as the age group with by far the most users of AD/HD medications.

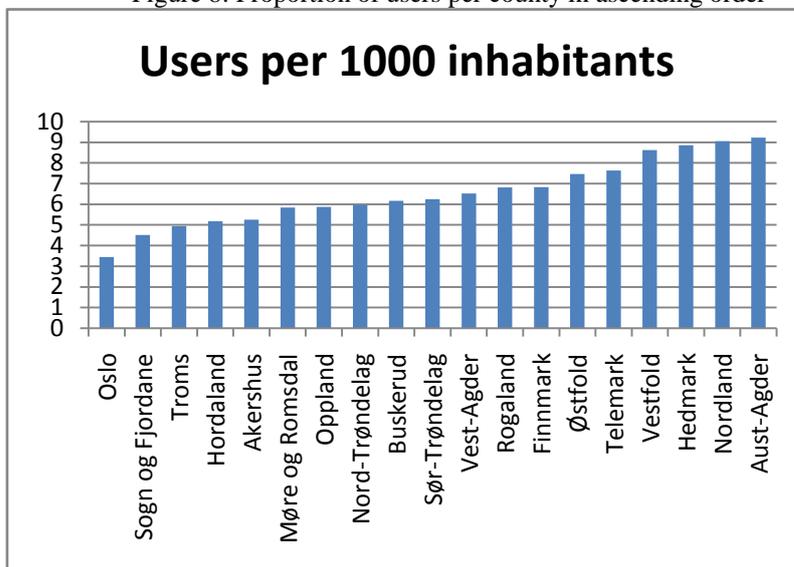
Geographical variation 2011

Recently, the media have focussed on the fact that the occurrence of AD/HD in the Norwegian population varies from one geographical area to another. The county-by-county figures below confirm that this is in fact the case. Table 6 (below left) provides an alphabetical list of the number of users of AD/HD medications per 1000 inhabitants in each county. In Figure 8 (below right) the same information is presented as a bar chart. The value of the vertical axis shows the number of users per 1000 inhabitants in each county. Along the horizontal axis, the counties are arranged according to the number of users, in ascending order from left to right

Table 6: Proportion of users per county

County	Users per 1000 inhabitants
Akershus	5.25
Aust-Agder	9.22
Buskerud	6.16
Finnmark	6.83
Hedmark	8.85
Hordaland	5.18
Møre og Romsdal	5.84
Nordland	9.06
Nord-Trøndelag	5.96
Oppland	5.87
Oslo	3.45
Rogaland	6.82
Sogn og Fjordane	4.52
Sør-Trøndelag	6.24
Telemark	7.63
Troms	4.94
Vest-Agder	6.53
Vestfold	8.63
Østfold	7.46

Figure 8: Proportion of users per county in ascending order



Source raw data: Prescriptions Register

Source: Prescriptions Register

Calculations based on the figures in the table show a national average of 6.55 users per 1000 inhabitants. The

proportion varies from 3.45 in Oslo, the lowest, to 9.22 in Aust-Agder, the highest proportion of users. Taking the population into consideration there is in other words almost three times the proportion of users of AD/HD medications in Aust-Agder as in Oslo.

Summary and reflections around the status in 2011

The preceding figures show that 10–19-year-olds are clearly distinct as the age range with by far the highest number of users of AD/HD medications. It can therefore be particularly interesting to look more closely at this age group in connection with the question of whether too many people are given the AD/HD diagnosis today. We will look at this more closely in the discussion in the next section.

An interesting question is whether the high number of users of AD/HD medications will be transplanted into new age categories as the current users in the 10–19 age range become older. Such a development will at least contribute to a levelling out of the age-related difference between user levels. This, however, is dependent on today's 10–19-year-old users neither discarding the diagnosis nor choosing to stop the medicinal treatment. A qualitative survey shows that in certain youth environments, especially at academic institutions, there seems to be a widespread perception amongst youngsters that they should stop using AD/HD medications as soon as they have completed their education (Loe & Cuttino, 2008). Another study shows that some young people for one reason or another had stopped or planned to stop taking the AD/HD medications, whilst others had discarded or planned to discard the diagnosis itself (Hannås, 2010). These, however, are matters that we cannot investigate further in this article.

In addition to the age-related and gender-related variations described above, the county-based presentation of the proportion of users of AD/HD medications suggests that some form of geographically-based variation is also apparent. In other words, the likelihood of being diagnosed with AD/HD seems to vary from county to county. There is no obvious explanation for this variation. Assuming that it does not reflect any genuine disparity in terms of the distribution of the AD/HD condition, there are several factors which could conceivably contribute to it in various ways. Several of these are connected to questions relating to the availability of relevant diagnostic skills. We will return to this matter in the next main section.

Discussion

We will now discuss alternative explanations of the most distinctive results from the study with regard to the main trends between 1992 and 2011 and the status in 2011, as presented in the two previous sections.

How many individuals have been diagnosed with AD/HD?

In considering such questions, we can find a reasonable norm or standard with which to compare relevant figures and proportions in the official *Veileder for behandling og diagnostikk av AD/HD* (Guide to Diagnostics and Treatment of AD/HD) published by the former Norwegian Directorate for Health and Social Affairs (Sh-dir.2006).⁷ This publication refers to surveys which conclude that the probable general occurrence of AD/HD is 1–3% based on the criteria for hyperkinesis (see ICD-10) and an occurrence of 4–8% based on the criteria for AD/HD (see DSM IV). One explanation of the discrepancy between the two manuals is that although the diagnostic symptoms are (more or less) identical, the criteria that are to be met are stricter in ICD-10 (the WHO manual) than in DSM IV (the American manual). Since it is ICD-10 that is the official manual in Norway, it is correct in this

⁷Following a reorganisation, the directorate in question has been renamed The Norwegian Directorate of Health.

connection to compare the different figures and proportions with an assumption of a general occurrence of 1–3%. It is also appropriate to note that the expression *general occurrence* includes both “users of AD/HD medications”, “individuals with a diagnosis who are not users of AD/HD medications” and “individuals with undiagnosed AD/HD”.

In relation to the health authorities’ estimate of a 1–3% occurrence of AD/HD in the population, it is probably not unreasonable to characterise a 2.42% proportion of *users* of AD/HD medications (in the case of 10–19-year-olds) as high. The average proportion of users for all the age categories that were investigated lies at under 1% and for the population as a whole the proportion of users is 0.62%. In terms of the question whether the condition may be under-diagnosed or over-diagnosed, we see that an assessment of this would vary according to which age group we are referring to. The variation that emerges between the different age groups can probably be largely explained with the help of public initiatives and structural changes.⁸ It is natural to envisage a continuation of the levelling-out of younger and older age groups of users of AD/HD medications, and the trends indicated in this survey support this idea. Nevertheless there may be reason to focus a little more on the possible (underlying) explanations as to why the 10–19 age category is not only clearly distinct from the others but that the proportion of users in this category seems in fact to be extremely high compared with the authorities’ estimate of the occurrence of AD/HD in the population. In the face of this issue, specialists in the diagnosis and treatment of AD/HD have in various connections pointed out that the teenage years may represent the most vulnerable period in a person’s life and that medicinal treatment may therefore be extra-important precisely during this phase.

In youth environments with relatively many and close relationships featuring a high degree of openness, youngsters with the diagnosis can function as good ambassadors and effective agents for AD/HD. They thus contribute to the spread of the diagnosis to others. In a qualitative survey, some young people tell that they were motivated to be assessed because it was “perfectly normal” since so many others already had the diagnosis and they thought that they had a great deal in common with friends who had already been diagnosed (Hannås, 2010). It is not unthinkable that a form of communal medical practice spreads through the same networks in an equivalent manner. One question that is still to be investigated more closely is what happens when the young people become older. Will they continue the medicinal treatment in order to tackle the challenges that will confront them in adult life, will they not need it any more, or will they find alternative ways to handle any difficulties?

How can the geographical variations be explained?

In Norway it is the case that the AD/HD diagnosis is conferred by the specialist health service. A county-based variation can therefore be due to a disparity in availability as a result of varied geographical distance to specialists. Similarly, the level of coverage, in other words the number of specialists in relation to the population, may vary from one region to another. These factors, however, do not appear to explain the geographical disparities between the counties in Figure 8. For instance, people living in Oslo, which has the lowest proportion of users, have a greater number of available specialists within a shorter distance than the inhabitants of Nordland and Hedemark counties – which nevertheless have up to three times as many users of AD/HD medications as Oslo.

Another factor that could be regarded as contributing to this type of variation is that clinical discretion in practice is exercised differently in different areas within the specialist health services. Even though such factors may be thought to contribute in various ways to a

⁸ In 1994, the criteria were changed such that adults (over 18 years of age) could also receive the diagnosis. In 2005, adults received the same access to medicinal treatment with psychostimulants.

geographical variation in the proportion of users of AD/HD medications, it is not possible here to determine whether, or what, influence they have in reality on the variations that emerge in Table 6 and Figure 8 (above).

There is another interesting type of explanation also related to the question of accessibility. Unlike the above factors, which are concerned with access to diagnostic skills, this is concerned with the availability of what may be termed *referral skills*. Receiving an assessment for AD/HD requires a referral from a GP. The individual referral processes often involve representatives from different specialist areas and professions such as school, nursery, an educational psychologist or the primary health service. These representatives, on the basis of their own assessments, can advise or motivate individuals to request a referral from their own GP. Together with the GP, these representatives form what may be termed the formal or official referral system. The referral skills of the system will depend, amongst other things, on the individuals' knowledge of the AD/HD diagnosis. If this is inadequate it may result in fewer referrals.

Qualitative surveys suggest however that more informal systems often have a significant influence on the individual processes of youngsters and adults prior to an assessment for AD/HD (Hannås, 2010) (Andersen, 2009). In these cases, the accessibility of *significant others* with the diagnosis and their descriptions of the personal experiences with AD/HD seem to play a far more important role than the accessibility of the official referral system. Proximity to others and to their experiences of the diagnosis seems to represent both *someone* (a person) and *something* (an alternative description of AD/HD) with which many people find it easier to identify than the official definition of AD/HD. On the part of adult women, for instance, their own children with the diagnosis most often function as significant others, whilst for teenage boys, friends generally function in the role of significant others. In short, it is often family members or close acquaintances that play the role of the significant other in the informal referral systems.

However, both specialists in the official referral system and lay people in the informal referral system function as spokesmen and agents for the AD/HD diagnosis. As such they each contribute in their own ways to reinforcing and spreading the diagnosis of AD/HD. In other words, geographical variations in terms of the occurrence of the diagnosis and the proportion of users of AD/HD medications can be related to how well developed and effective the informal networks and agents for the diagnosis are in the different counties.

Summary comments to the discussion

The aforementioned changes to the formal criteria in respect of access to diagnosis (1994) and treatment for adults (2005) have probably contributed in their respective ways to the increase that was registered in the actual number of adults with the AD/HD diagnosis. In addition, the official guide for diagnosis and treatment (Sh-dir., 2006), which has been issued in several revised versions with a focus that includes both under-diagnosis and increased availability of diagnostic skills, has probably also contributed to a development in which we see that more and more individuals are being diagnosed with AD/HD.

Several possible explanations can also be envisaged for the different developmental trends indicated above. Reigstad *et al.* (2004) points out amongst other things a connection between the general focus on the AD/HD phenomenon and the number of registered cases of the diagnosis. Ian Hacking (2004), who has been concerned with the interactive function of the diagnosis within society, has shown that one explanation of the growth in the number of registered cases of the AD/HD diagnosis is as a consequence of a continuous dynamic and dialectic process between the categories and individuals in a society.

In addition, Bruno Latour (1987) has described how a category, AD/HD, is changed and extended as a result of new groups and individuals being included as members in it. This

dynamic can help explain the various historical and culturally-mediated changes both in the diagnosis and in public perceptions about it, as seen in narratives by young people and adults about their own lives. People who have received the diagnosis as adults describe how as children they were regarded as quite “normal” and that any digressions or problems were given explanations other than AD/HD (Hannås, 2010). According to the theory, another consequence of the process described above is that the boundaries for a category have gradually become so fluid that one diagnosis becomes split into several separate diagnoses.

Several of the explanations described above are related to a question of accessibility, although this has no relationship to the geographical distance to diagnostic assessment and treatment facilities. There is much to suggest that informal networks and relationships are at least as important as the official referral systems for attaining an effective recruitment and registration of new AD/HD cases.

Concluding reflections

As an extension of this study there are certain questions that it could be particularly interesting to follow up on over the coming years. Naturally enough, the survey had to round off with the last registrations in the Prescriptions Register from 2011. The analysis suggests, however, that a relatively stable growth in the number of users of AD/HD medications over the past years may just now be in the process of flattening off. The figures that are registered for the past two years, both for the population as a whole and for the age group with the most users (10–19-year-olds), can suggest that a marked change is under way. In this case, there are several different questions that it could be interesting to investigate more closely in the coming period. All of these are concerned with shedding light on different aspects of the development that is taking place. One of the questions is whether young users appear to stop the medicinal treatment after passing the “vulnerable phase”. Another is whether fewer *new* cases of AD/HD will be identified than previously and whether an equivalent growth will take place in new cases of other diagnoses. In addition it could be interesting to investigate any changes in the perceived significance of the label or in the official definition or criteria for the AD/HD diagnosis, as well as any changes in people’s subjective experiences of their own symptoms or of the public perception of AD/HD in society.

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