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Rise of gender identity disorders among children and adolescents – data from 10 countries. Possible explanations, conclusions for parents

Wzrost zaburzeń tożsamości płci wśród dzieci i młodzieży – dane z 10 krajów. Możliwe wyjaśnienia, wnioski dla rodziców[1]

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Abstract: There are more and more publications in the world pointing to the global trend of a significant increase in people who identify themselves inconsistently with their biological sex. Children and adolescents are a particularly sensitive group here, as various dimensions of their identity are still taking shape. These trends are also reaching Poland. Parents and state services involved in the upbringing and education may be surprised and unprepared for such a state of affairs. There is a lack of analyses of these trends and attempts to explain them in the context of the already available knowledge on gender identity disorders, which would facilitate the elaboration of practical recommendations. The first part of the article presents epidemiological data illustrating the occurrence of gender identity disorders in the population. The methodological challenge was to define a reliable criterion illustrating the strength and scope of the observed changes in epidemiology among children and adolescents and at the same time enabling international comparisons of data from autonomous and clinics scattered all over the world. The challenge was all the greater given the problem of data availability. The article presents data on the explosion of gender identity disorders in children and adolescents based on the criterion of a number of referrals to specialized youth clinics from 10 countries: Sweden - an increase of 19,700%, Italy – 7,200%, Great Britain – 2,457%, Norway – 1,750%, the Netherlands - 904%, Finland - 634% and outside Europe: Australia – 12,650%, Canada - 538%, USA - 275%, and New Zealand - 187% (on average over 8 years). These data were also subjected to qualitative analysis (gender and age of referrals, number of referrals versus diagnoses). The explanations given in the scientific literature were also collected and analysed in relation to the available knowledge about the genesis of gender dysphoria, which, according to research, is acquired. Both the scale of the trend and additional qualitative analyses (change of the clinical picture and the inflow to clinics, especially of teenage girls), indicate that this trend cannot be explained only by an increase in social awareness, but also by the inducing influence of media and culture (additional studies have been cited to support these conclusions). The article provides an overview of the available knowledge in the field of the epidemiology of gender identity disorders, especially in children and adolescents, and helps to define practical steps, especially in the neglected area of prevention, which is crucial from the parents' perspective.
Keywords: epidemiology of gender dysphoria, gender dysphoria, gender identity disorders, parents, youth

Abstrakt: Na świecie pojawia się coraz więcej publikacji wskazujących na ogólnoświatowy trend znacznego przyrostu osób identyfikujących się niezgodnie z płcią biologiczną. Szczególnie newralgiczną grupą są tu dzieci i młodzież, gdy różne wymiary tożsamości wciąż jeszcze się kształtują. Trendy te docierają także do Polski. Rodzice i wszelkie służby państwowe zaangażowane w proces wychowania i edukacji, mogą być więc zaskakiwani i nieprzygotowani na taki stan rzeczy. Brakuje analiz tych trendów i podjęcia próby ich wyjaśnienia w kontekście już dostępnej wiedzy nt zaburzeń tożsamości płci, które ułatwiłyby wypracowanie praktycznych rekomendacji. W pierwszej części artykułu zebrano dane epidemiologiczne obrazujące występowanie zaburzeń tożsamości płci w populacji. Wyzwanie metodologiczne stanowiło określenie miarodajnego kryterium obrazującego siłę i zasięg zmian w epidemiologii wśród dzieci i młodzieży i zarazem umożliwiającego międzynarodowe porównania danych z autonomicznych i rozsianych po świecie klinik. Wyzwanie tym większe, że istnieje problem z dostępnością danych. W artykule przytoczono dane dotyczące eksplozji zaburzeń tożsamości płci u dzieci i młodzieży w oparciu o kryterium zgłoszeń do specjalistycznych klinik dla dzieci i młodzieży z 10 krajów: Szwecji - wzrost 19700%, Włoch - 7200%, Wielkiej Brytanii - 2457%, Norwegii 1750%, Holandii - 904%, Finlandii - 634% oraz poza Europą: Australii - 12650%, Kanady - 538%, USA - 275%, i Nowej Zelandii - 187% (średnio w ciągu 8 lat). Dane te następnie poddano analizie jakościowej (płeć i wiek zgłoszenia, zgłoszenia a postawione diagnozy). Zebrano także podawane w literaturze naukowej wyjaśnienia, które przeanalizowano w odniesieniu do dostępnej wiedzy na temat genezy transseksualizmu, który, jak wskazują badania, jest przeważająco nabyty. Zarówno skala trendu, jak i dodatkowe analizy jakościowe (zmiana obrazu klinicznego i napływ do klinik zwłaszcza nastoletnich dziewcząt), wskazują, że nie jest on wyłącznie efektem wzrostu świadomości społecznej, ale pozostaje także pod indukującym wpływem mediów i kultury (przytoczono dodatkowe badania, które popierają te konkluzje). Artykuł stanowi więc przegląd dostępnej wiedzy w zakresie epidemiologii zaburzeń tożsamości płci, zwłaszcza u dzieci i młodzieży oraz pomaga określić praktyczne kroki, zwłaszcza w zaniedbanej dziedzinie profilaktyki, kluczowej z punktu widzenia rodziców.
Słowa kluczowe: dysforia płciowa, epidemiologia dysforii płciowej, młodzież, rodzice, zaburzenia tożsamości płci

1 Artykuł w języku polskim: https://www.stowarzyszeniefidesetratio.pl/fer/2022-1Szczygiel.pdf

1. Introduction and justification of the choice of subject matter

Scientific reports on gender dysphoria have recently begun to include data on a significant increase in referrals of minor patients with suspected gender dysphoria and gender identity spectrum disorders to specialist clinics. These data, however, are known mainly in narrow circles of specialists in the world, and almost unknown in Poland, where there is lack of analyses on gender dysphoria, especially among children and adolescents, as noted for example by Dora, Grabski, Dobroczyński (2020, p. 1-2). These authors only mention in one sentence, the very fact of "a significant increase in the number of clinic-referred gender-dysphoric children and adolescents disclosing discomfort in relation to the sex assigned to them at birth"(ibidem, p. 2). These issues are also initially documented in the article "Gender identity disorders in children and adolescents - a psychological perspective. Genesis, risk factors, prognosis, prevention" (Marianowicz-Szczygieł, 2021). This phenomenon is also noted by Beisert, Witkoś (2018), or Robacha (2021, p. 289). Apart from a report by the "She and He" Institute Foundation on the increase in the number of people identifying as LGBT, including young people (Marianowicz-Szczygieł, 2020) – probably no international analysis on epidemiological trends in this area has ever been published in Poland. What is even more lacking is a review of scientific articles documenting more broadly the trend intensity among children and adolescents, its geographical range and possible explanations, not only in sociological categories, e.g. an analysis of demographic variables, but also with reference to already existing psychological knowledge on the causes of gender dysphoria, its clinical picture. On the other hand, media coverage of the topic of gender identity/identification, including the appearance of formal and informal content intended directly for children and adolescents, makes the topic already present in Polish homes and raises parents' dilemmas: how to answer the child's questions, is there a possibility of gender dysphoria specifically in my child, etc.

2. Methodology of the report and problems of terminology

This article compares data from 10 countries. Statistics on gender dysphoria or suspicion there of, especially among children and adolescents, are not readily available. Therefore, the choice was made to use data on referrals to specialist gender-identity-disorder clinics, which are most commonly cited and enabled international comparisons, rather than data on diagnosis of gender dysphoria (where statistics are published less frequently and the criteria for diagnosis vary - cf. Indremo, White, Frisell, Cnattingius, Skalkidou et al. 2021)[2], or self-identification and behaviour, which in turn occur more frequently (cf. Arnoldussen, Steensma, Popma, van der Miesen, Twiski et al. 2020, Research, 2017). Displayed behaviours specific to the opposite sex are the broadest category, as indicated in Figure1 below (cf. discussion and data from Zucker 2017, p. B). Gender dysphoria is a specific diagnostic category, so it was decided to replace it with the collective term gender identity disorder, also acceptable in the DSM. It will be important to inform parents that, for example, a one-off gender non-conforming behaviour - e.g. boys playing princesses, is not indicative of gender dysphoria - both the DSM and ICD in case of children speak of persistence of symptoms that last at least 6 months.

This meta-analysis compiles available data from countries on three continents to examine trends on a global scale (North America, Europe, and Australia). However, these are data only from western culture. The growing trends in LGBT self-identification from the report of the "She and He" Institute (Marianowicz-Szczygieł, 2020), also include data from China (specifically on homosexuality), which would indicate their global scope, not just limitation to the western culture. The topic of interculturalism, however, should be the subject of further analysis.

2 These authors indicate that a single diagnosis of gender dysphoria can be challenged, while the positive predictive value of a diagnosis for surgical 'sex reassignment ' increases with the number of diagnoses and is 79% for four or more diagnoses (ibidem p. 1).

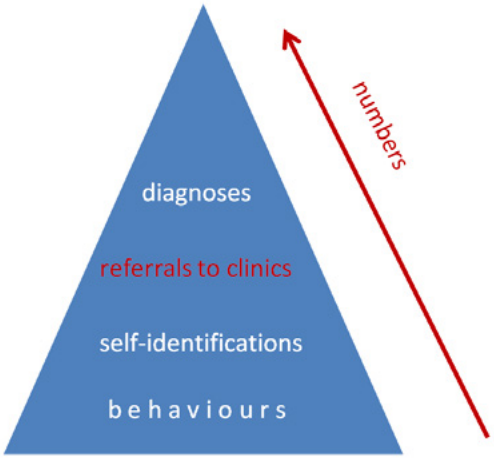

Figure 1. Decreasing number of measures of gender identity disorders.

3. Epidemiology - general data

From the work of Michael, Mormont, Legros (2001) we know that the percentage of people with transsexual tendencies in the population is about 0.002% (average for countries such as: Sweden, Great Britain, Australia, Ireland, Germany - Tab. no. 1 p. 368, average from the "Total" column), with the DSM IV giving an average of 1:30 000 for men and 1:100 000 for women (i.e. 0.003% for men and 0.001% for women). Thus, on average, men with transsexual tendencies seem to predominate worldwide. In Poland, as this article points out, for unknown reasons these proportions are reversed and it is women who much more often refer to specialist clinics. These proportions amount in our country to: M:K[3] - 1:5.5 (after Godlewski, 1988). More recent data, a meta-analysis from 2015 (Arcelus, Bouman, Van den Noortgate, Claes, Witcomb et al, 05-2015; 12 studies selected from 1473) gives different ratios: 4.6 per 100,000 people - 6.8 for 'transwomen' and 2.6 for 'transmen'. Next to Poland, Japan is mentioned as an exception here (p. 757). Possible explanations include different diagnostic criteria in our country or a different social position of women in post-communist countries than in the west.

Research indicates a gradual decline in the number of children and adolescents wanting to 'be the other sex' by the time they reach adulthood. Zucker (2017, p. B) reviewing research indicates that, depending on the subgroup, between 0% and 5% of children aged 4-11, according to their parents, would like to be the opposite sex (declarative data from The Child Behavior Checklist - CBCL), and as shown in the above percentages for adults, these figures reduce to the above mentioned 0.003% for males and 0, 001% for females in adulthood. With regard to children and adolescents, there are two age thresholds for the manifestation of gender dysphoria - early childhood and adolescence. The fact that the number of children with suspected gender dysphoria melts over time is also indicated by a review of studies by Marianowicz-Szczygiel (2021). Between the early childhood and early adulthood, as many as 81% of them decline (p. 107, based on 11 studies). Because of such a high degree of variability and fluidity in the developmental age, changing social identification and unequivocal resolutions (the wrongly used term "children and adolescents LGBT") should be avoided. As we do not currently have tools to accurately predict which children will have persistent gender dysphoria and in whom it will disappear (or appear sporadically) - there is a risk that explicit identifications may reinforce and perpetuate it. The research by Steensma, Boer, Cohen-Kettenis (2011) suggests that transition[4] before the age of 10 is particularly risky. The researchers (qualitative research on a small sample of individuals N=25) identified the following factors that may be important for changing identifications in children:

1. Change of school environment (in the Netherlands end of primary school),
2. Changes in the body connected with puberty,
3. First crush and sexual desire,
4. motivation - the group with permanent dysphoria tended to feel aversion to their body, the group in which gender dysphoria decreased tended wanting to enter roles typical of the desired gender.

3 M:K ratio – men: women.
4 Transition - or so-called gender reassignment, consisting of a number of stages.

4. Epidemiology - quantitative changes over time - analysis

Data from across the UK posted by one of the oldest (foundation year 1989) and considered one of the most prestigious specialist clinics for children with gender disorders - GIDS in London[5] , show that between 2010 and 2021 there was an increase in referrals from 138 to 2383 (patients' age: 3 years to 18+; data update 3 May 2021- GIDS 2021). If we extend the time frame to include one year earlier data that is no longer available on the clinic website, however was noted in a media publication (The Christian Institute 2018) and confirmed by a clinic report from 2009 - 2016 (Travistock and Portman NHS, n.d.), it appears that in 2009 the number of clinic referrals was 97. The Bayswater-support (n.d.) website shows even older data from 1989 (charts from the GIDS London website), so from the beginning of the clinic, when the first 4 patients referred there. However, it was until 2009 (97 cases) that the increase was slow, and accelerated greatly only after that date.

Data from the Netherlands are presented in Arnoldussen et al. (2020). They concern 1082 patients referring to the Center of Expertise on Gender Dysphoria in Amsterdam, age: 10.1- 18.1 years, in the period between 2000 and 2016. The article reports that the vast majority, 84.7%, of patients were diagnosed with gender dysphoria (Tab.1, ibidem). There has been a gradual increase in referrals since 2006 (the approximate figures read from the graph are 8 boys and 18 girls), while in the year taken as the last, i.e. 2016, there were 60 boys and about 175 girls.

Swedish data from the Astrid Lindgren Children's Hospital in Stockholm are for the years 2000 - 2016, there was an increase from a few cases up to 197 in 2016 (Friesen, Söder, Rydelius, 2017). This is also about clinic referrals, age category: children and adolescents. A sharp increase in the number of patients has occurred since 2006[6].

Cross-sectional studies for the four Scandinavian countries are given by Kaltiala et al. (2019), in addition to repeated data from Sweden, referrals to clinics in Norway, Denmark and Finland are included here. In the case of Denmark only the years 2016-2017 are covered, therefore only the data from Norway (for 2010-2017) and Finland (for 2011-2017) were qualified for the analyses, the increasing trends are very similar here. In 2011, Finland registered about 28 cases of clinic referrals, Norway about 18, while in 2017 respectively 180 and 175 referrals (data read from the graph, no exact numbers cited in the article). Age category: under 18 years.

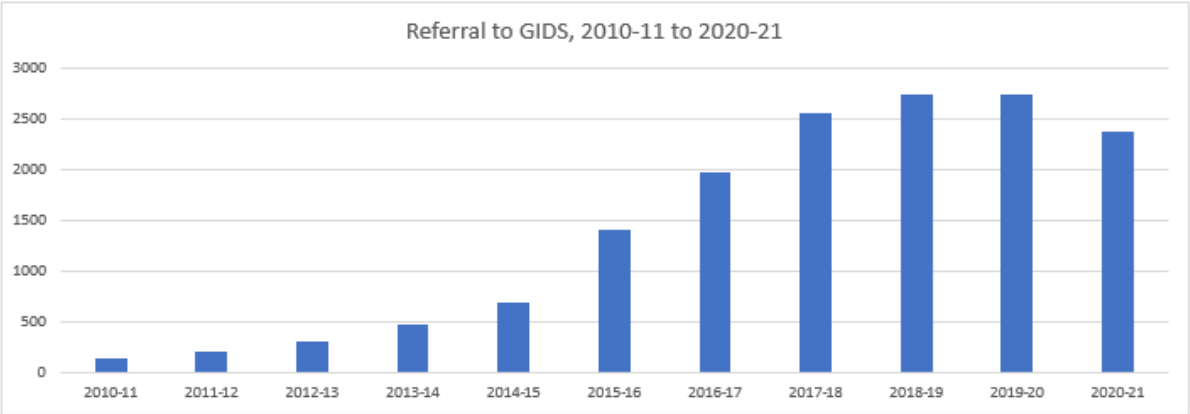

Chart 1. London GIDS clinic referral statistics 2010- 2021 from gids.nhs.uk.

5 GIDS clinic, or Gender Identity Development Service.

6 Data for Sweden for children and adolescents are also reported by Indremo et al.(2021) - they refer to diagnoses, and Kaltiala, Bergman, Carmichael, de Graaf, Rischeli et al.(2019) - they refer to the number of clinic referrals, but cover a shorter time range: since 2010.

Table 1. Comparing the number of referrals of children and adolescents to specialist gender identity disorder clinics in 10 countries (sources cited in text)

No.	country/name of the clinic from which the data come	A. initial year/ number of referrals to clinics	B. year of the beginning of the surge	C. final year/ number of referrals to the clinic	age category of patients	% increase in number of patients from year B to C
1.	New Zealand (Wellington Region)	1990-2012	2012	2012-2016	under 20 years	
	N=	30	30	56		187%
2.	USA (Specialty Transgender Clinic of Northern California)	February-15	2015	June 2018	3 -17 years	
	N=	56	56	154		275%
3.	Canada (CYFS/CAMH Clinic in Toronto)*	1976	2003	2013		
	N=	6	8	43	adolescents	538%
4.	Finland (all clinics)*	2011	2011	2017	children and adolescents under 18 years	
	N=	28	28	180	5	643%
5.	Netherlands (Center of Expertise on Gender Dysphoria in Amsterdam)*	2000	2006	2016	10.1- 18.1 years	
	N=	11	26	235		904%
6.	Norway (all clinics)*	2010	2010	2017	children and adolescents under 18 years	
	N=	10	10	175		1750%
7.	United Kingdom (Gender Identity Development Service, London)	1989	2009	2021		
	N=	4	97	2383	3-18+	2457%
8.	Italy (8 clinics in Osservatorio Nazionale sull'Identità di Genere)	2005	2009	2018		
	N=	1	1	72	children and adolescents	7200%
9.	Sweden (Astrid Lindgren Children's Hospital, Stockholm)*.	2000	2006	2016		
	N=	1	1	197	children and adolescents	19700%
10.	Australia (Royal Children's Hospital Melbourne)	2003	2008	2017	„children", exact age unknown	
	N=	1	2	253		12650%

*Data,out of necessity, read from chart, inaccuracy may occur: +/-1 or 2 referrals; N- number of referrals

Italian data are also available (Fisher, 2019), collecting statistics from eight clinics affiliated to the ONIG network (Osservatorio Nazionales ull'Identità di Genere - National Observatory on Gender Identity[7] : in Turin, Florence, Rome, Naples, Torre del Lago, Bari, Bologna, and Trieste). Between 2005 and 2018, in terms of referrals of children and adolescents, there was an increase from 1 to 72 cases.

7 Website: http://www.onig.it

The CYFS/CAMH in Toronto, Canada is another clinic with a strong international reputation. Data available here concern referrals and diagnoses made for the adolescents'age category (Aitken, Steensma, Blanchard, Vanderlaan, Wood et al. 2015). The data from 1976 to 2003 oscillate between 0 and 5 cases, only after 2003 there was a sharp increase, i.e. from a level of 4 referrals in both girls and boys (8 cases in total) until the year 2013 when a total of 43 cases (9 boys plus 34 girls) were estimated, as shown in the graph (graph from p. 757).

Data from the USA are quoted in the article by Handler, Hojilla, Varghese, Wellenstein, Satre, Zaritsky (2019), covering a rather short period of time: February 2015 - June 2018. They concern a total of 417 patients aged 3-17 years referring to the Specialty Transgender Clinic in Northern California. Despite such a short time span compared to other analyses, here too an increase in clinic referrals was apparent (the entire time span given was considered) from 56 to 154 individuals. The paper also calculated a monthly increase from 5.1 patients per month to 25.7, which means 504%.

Data from New Zealand (Wellington region) are about referrals to endocrinology facilities and specialists from individuals who identify themselves as transgender. Between 1990 and 2016 there were a total of 290 referrals from biological males aged 11-66 years - Delahunt, Denison, Sim, Bullock, Krebsi (2018) and from 148 biological females (data from the same age range but for a different age category: 13-35 years). If only the youngest age category (under 20) is considered, there were 30 referral in the period from 1990 until 2012, and 56 referrals between 2012 and 2016. This division of the time scale was proposed by the authors themselves, and the way the data are given makes it impossible to capture the trend more precisely, although as the authors mention, the increase has occurred since 2010.

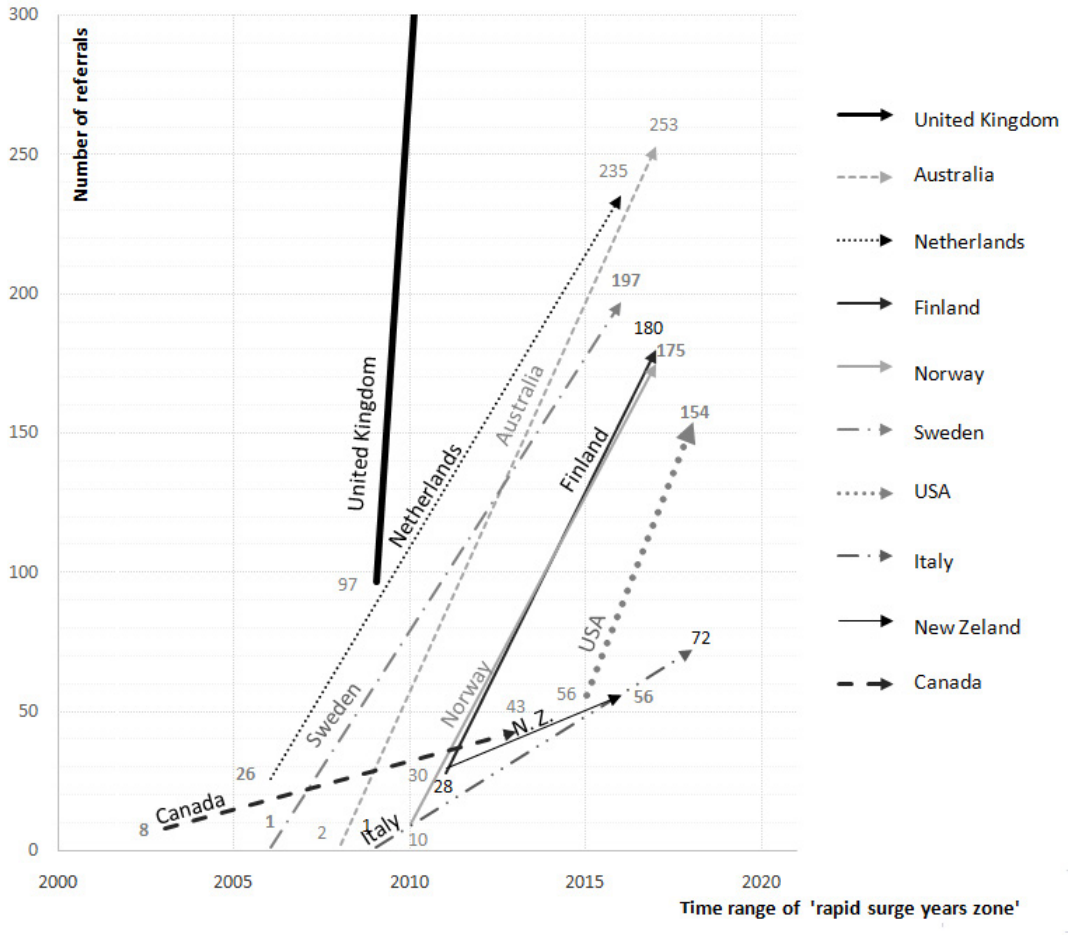

Chart 2. Increase of the number of referrals in clinics in 10 countries in 'rapid surge years zone'.

Table 2. Average percentage annual increase in clinic referrals for each country within the given 'rapid surge years zone'

country	range of years of the ‚rapid surge years zone' patient numbers	number of referrals to clinics	average % annual growth
New Zealand	2012	30	16,9%
New Zealand	2016	56	
Canada	2003	8	18,3%
Canada	2013	43	
Finland	2011	28	36,4%
Finland	2017	180	
USA	2015	56	40,1%
USA	2018	154	
Netherlands	2006	26	24,6%
Netherlands	2016	235	
Norway	2010	10	50,5%
Norway	2017	175	
United Kingdom	2009	97	30,6%
United Kingdom	2021	2383	
Italy	2009	1	60,8%
Italy	2018	72	
Sweden	2006	1	69,6%
Sweden	2016	197	
Australia	2008	2	71,2%
Australia	2017	253	

The Royal Children's Hospital Melbourne, Australia (Hancock, 4-10-2018) published data on referrals of underage patients. The data from 2003 to 2017 are for "children" in general (children's hospital), the exact age range is not specified, however the number of patients increased from 1 in 2003, to 253 in 2017, with an increase starting in 2008 (2 patients).

Quantitative data from all 10 countries are summarised in Table 1 below. For each country, the range of calendar years for the available data and the names of the clinics are marked. Using the data for the year from which the beginning of the sharp increase in the number of referrals was observed (year B) compared with the data for the last available year (year C), the percentage increase in referrals between year B and year C was calculated (year B either read from the graphs or reported in the sources - the boundary is conventionalout of necessity). The countries were then ranked from lowest to highest in terms of these percentage increases.

Based on the data in Table 1 (the difference in data for years B and C, referred to as the "rapid surge years zone"), the Figure 2 was drawn. The line for the UK extends beyond the graph (this scale best represents the other data). The degree of slope of the line illustrates the strength of the upward trend.

The average annual percentage increments based on the same data are contained in Table 2,and the data from this table presented in graphical form is shown in Figure 3.

The data presented (Figure 2) illustrates the strong rising trend in all 10 countries, which averaged annually between 16.9% (New Zealand) and 71% (Australia). If the full percentage increase in the 'rapid surge zone' is considered, there was a 19700% increase in patients in Sweden (for 2006-2016), Italy - 7200% (2009- 2018), the UK - 2457% (2009-2021), the Netherlands - 904% (2006-2016), Norway - 1750% (2010-2017), Finland - 643% (2011-2017), and outside of Europe: Australia - 12650% (2008-2017), Canada - 538% (2003-2013), USA - 275% (2015-2018) and New Zealand - 187% (2012-2016). The average range of time for these changes is 8 years. Some differences between countries can be observed. In terms of the number of referrals the London clinic (the largest bubble size in Figure 3) is definitely ahead, but here the data is the most recent i.e. from 2021. These rapid changes were observed around the same time, i.e. the number of patients started to increase from 2003 (Canada), 2006 (Sweden, Netherlands), 2008 (Australia), 2009 (Italy, UK). The later dates, i.e. 2012 - in the case of New Zealand and 2015 –the USA, result from the data availability (in the USA the data start from 2015, in the case of New Zealand one had to adjust to the breakdown of the figures presented in the source article). In the case of the data for Finland and Norway, the whole time range was also included out of necessity (an apparent upward trend), perhaps earlier data would have captured the plateau.

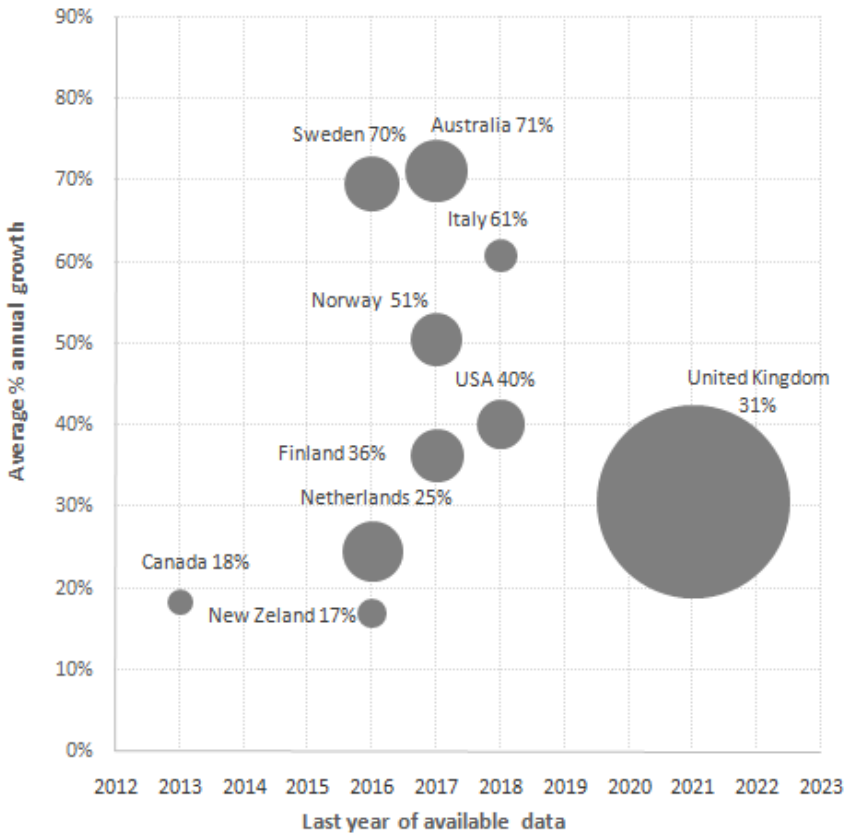

Chart 3. Average percentage annual increase in the number of patients per country in the 'rapid surge years zone'.

The above quantitative comparative analyses are of preliminary nature and need to be deepened as data becomes more available. The given percentage increases in each country - in the absence of complete data - are indicative values. It should also be noted that the data do not cover all clinics in each country - the exceptions being only Finland and Norway, and data from Italy (a consortium of eight clinics). Nevertheless they confirm the rapid trend in the influx of minor patients with suspected gender identity disorders into clinics for all 10 countries (albeit with varying strength).

5. Epidemiology - qualitative changes - change in clinical picture in terms of age and gender

To explain the above upward trends in epidemiology, it is also necessary to look at possible qualitative changes. In this area, several valuable comparative papers have been published, emphasising in particular the change in the sex ratio and age of patients. According to these analyses, instead of the previously predominant young boys, adolescent girls started to dominate the clinical picture. These data were cross-referenced with adult data to see how universal these trends are.

From the late 1990s, a group of girls with gender dysphoria only manifesting in their teenage years began to appear in statistics - a trend that overlapped with the general trend of increasing cases of gender dysphoria among adolescents. Currently, although gender dysphoria cases in childhood are predomi-

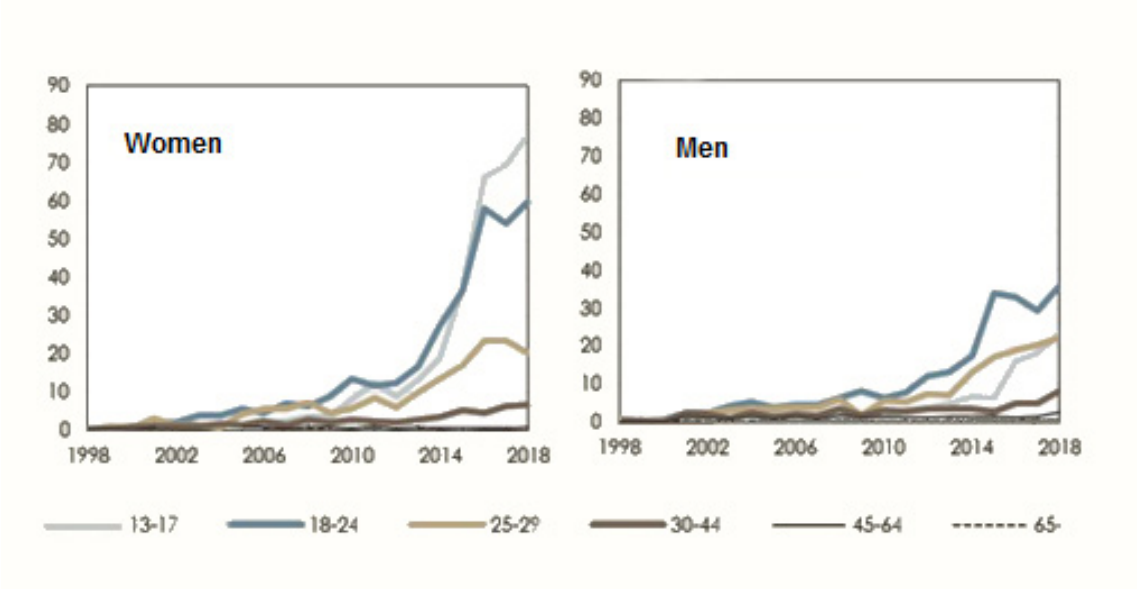

Chart 4. New cases of diagnosed gender dysphoria (F64) in Sweden per 100,000 population with age and biological sex at diagnosis based on data from the National Board of Health and Welfare, 2017 p. 7.

nantly boys, girls predominate in the teenage years (Aitken et al. 2015; Clarke, Spiliadis, 2019; de Graaf, Carmichael, Steensma, Zucker, 2018; Littman, 2018; Steensma, Cohen-Kettenis, Zucker et al, 2018; Zucker, 2017). The rapidity of this process is captured in particular by the study of Aitken et al. (2015), where the ratio of boys to girls was 2.11:1 between 1999 and 2005, only to decrease to 1:1.76 between 2006 and 2013. Clarke and Spiliadis (2019) also point out that from the age limit of 9-12 years onwards, girls begin to dominate the statistics. Steensma et al. (2018) report that prior to 2006 there was a predominance of boys to girls ratio at 2.11:1 (Toronto) and 1.41:1 (Amsterdam), but over time, as noted by de Graaf, Cohen-Kettenis, Carmichael, de Vries, Dhondt et al. (18-12- 2017 online, print 2018) this ratio decreased in favour of girls to: 1.27:1 and 1.25:1 in the second decade of the 21st century until the trend reversed to 1:1.59[8] between 2009 and 2013 (data from clinics in Switzerland, the Netherlands, Belgium and the UK).

The above analysed data from 8 countries reflect this increasing trend of quantitative dominance of adolescent girls over boys (i.e. Norway, Finland, Sweden, Netherlands, Italy, Canada, New Zeland, USA)[9]. Sweden can be pointed to as an example. According to Friesen, Söder, Rydelius, (2017), in 2010 in Sweden among adults after the so-called sex reassignment surgery there was a clear predominance of biological males 1: 7 750 and the proportion of biological females was like 1:13 120, while among minor patients at the Astrid Lindgren Hospital the sex ratio was the opposite, about 25% were boys and 75% girls (ibidem, p. 2). Linander (2018) reviewing the epidemiological data from Sweden (ibidem, p. 46) indicates that, irrespective of age category, the number of patients with gender identity disorder has been increasing, especially since 2015. However, aggregate data presented in this way do not capture all the qualitative changes that follow and more detailed analyses are needed. Other Swedish data from the National Board of Health and Welfare (2017, p. 7; cf. Figure 2), on the other hand, clearly shows that the most drastic increase in diagnoses is recorded mainly among girls and in the age categories from 13-17 and 18-24 years (the two highest lines). Among biological males, the upward trends are much weaker, and the 13-17 age category is only third in line after the 8-24 and 25-29 age categories.

8 Based on the data in Table 1 in the above studies.
9 For United Kingdom and Australia gender data are unavailable or incomplete.

6. Review of possible explanations for observed epidemiological trends.

As can be seen from the research review above, it is quite common in the scientific literature that the number of patients with gender identity disorders is increasing in all age categories. However, there is a clear change in the clinical picture: while biological males have predominated among adult patients in many countries so far, the number of female referrals in specialist clinics is now increasingly equal to that of males. This trend is much more pronounced among children and adolescents, where the previously statistically dominant group of young boys has been replaced by teenage girls. What is most relevant to psychology, however, is not simple statistical summaries, but the question of the cause of the growing trends and their consequences. What follows is a review of literature and a catalogue of possible explanations. Each of presented pathways involves specific practical implications for parents, which are discussed at the end.

6.1. Iclarifications concerning qualitative changes:

6.1.1. Sex ratio changes explained independent of the genesis of gender identity disorders:

1. The change in adolescent sex ratio is due to biological girls being more open about their transgender feelings due to less stigmatisation of such women than men.

This is how the sex ratio differences are explained by the team of Arnoldussen et al. (2020). Unfortunately, such a hypothesis would not explain why, taking into consideration gender-non-selective media coverage or public policies, such openness would suddenly appear in a selective way only for women and not for men, if it did not exist before.

2. The change in the sex ratio in adolescents would be due to an earlier onset of puberty in girls compared to boys.

This is also the hypothesis of the team of Arnoldussen et al. (2020), who himself openly admits (ibidem, p. 809 and 810), however, that if this hypothesis were true, girls would be referred to clinics earlier, and no such trend was observed here. Similar observations in adults who have, after all, already reached puberty, also speak against this hypothesis.

3. Other factors that may influence the change in sex ratio.

The fact that there has been an upward trend and reversal of gender trends among adults in Australia (biological females dominate instead of biological males as before) is explained by formal considerations and the high likelihood of the impact of the new 2015 medical regulations (Australian Pharmaceutical Benefits Scheme), which allow people to receive refunded hormone therapy subject to several medical certificates (Cheung, Ooi, Leemaqz, Cundill, Silberstein, 2018, p. 234).

6.1.2. Sex ratio inversion is linked to quantitative changes and the genesis of gender identity disorders:

Given the common psychological roots of both homosexuality and transsexualism (cf. Wieczorek, 2018, ch. 6.4), closer attention should be paid to issues of subjective gender perception and changing social gender patterns as a possible cause of the observed trends. In both cases, both positive and negative connotations about the gender in question need to be taken into account. Positive connotations: a gender that is subjectively on a social pedestal provides a greater sense of security and becomes more attractive. Negative connotations: an aversion to a given gender or a subjectively perceived lack of ability to identify and mentally "connect" with a given gender (lack of sufficient contacts, support, role models, own resources) "deters" from a given gender. This topic certainly requires further research, but in this model the aspirations of women raised by e.g. feminism, traditionally referred to as "masculine" and emphasizing male character traits as more desirable in women, could have contributed to the change of social patterns of femininity, and these

could lead to subjective changes. It is also much more common to talk about male dominance, and women's problems, than vice versa. Young girls may read this as a message: it is better to be a man than a woman. Overlapping these social patterns, changes in the body and the shock of puberty (growing breasts, the first menstruation and associated inconveniences) may further subjectively reinforce this message. Girls may also be more relational, expressive and use social media more frequently (cf. further quantitative explanations), although globally FB users are outnumbered by men: (800,026,950 men and 646,953,680 women - Garcia, Cuevas, Rahwan 2017, p. 13, Supplementary Table1). However there are large differences between countries here, e.g. in the US 75% of FB users are women (Affde 2021). It was also discovered that women are more active on FB in the context of networking (Garcia, Cuevas, Rahwan, 2017, p. 5).

6.2. Clarifications concerning quantitative changes:

6.2.1. The number of people with transgender tendencies is not increasing:

1. The number of people with transgender tendencies is not increasing, but the recognition of gender identity disorders is increasing, through greater public awareness and availability of specialist medical services, or decreasing social stigma; the media can facilitate communication - this narrative is most often.

Arnoldussen et al. (2020, p. 809 and 810) suggest that quite simple, gender dysphoria among adolescents is more common than previously thought, and that the increased social visibility of this topic helps young people to better recognise their symptoms and to referto specialists more courageously. The team of Kaltiala et al. (2019, abstract) provides the following explanation: "The reasons for the increase are not known but increased awareness of gender identity issues, service availability, destigmatization as well as social and media influences may play a role". Similarly, the team of Aitken et al. (2015, p. 760). "These trends may reflect changing social norms and broadly understood acceptance of gender diversity, as well as improved availability of specialist treatment for TGNC" - argues Handler, Hojilla, Varghese, Wellenstein, Satre et al. (2019, p. 4).

This type of hypothesis is also supported in Poland by Robacha (2021, p. 289): "Over the last years there has been an increase in referrals with this problem. This seems to be due to greater awareness, social openness and accessibility to treatment".

The same line of thinking is replicated by Beisert and Witkoś (2018): "The universality of this phenomenon is linked to the availability of psychological help, a greater degree of openness in the discussion of adolescent sexuality and an increasing understanding of adolescents. Another factor influencing the frequency of the phenomenon may be the development of the internet that gives transgender people a possibility to communicate internationally and seek help in this area". Indremo et al. (2021, p. 5) note that perhaps at the same time diagnostic thresholds in clinics have decreased.

Perhaps greater public recognition may account for a partial increase in the number of new referrals to clinics, but it would not explain such a high rate of increase, which is downright avalanche. Nor does it completely explain the qualitative changes (age and sex ratio of new referrals) - and thus the change in the clinical picture.

2. Other possible explanation (own): the number of people with transgender tendencies is not increasing, what's increasing is the number of referrals but not diagnoses.

The increasing amount of information on gender dysphoria has resulted in greater public awareness and greater willingness on the part of parents to look out for possible symptoms. The number of diagnoses is not changing, the increasing number of referrals is a result of "oversensitivity". This is only a hypothesis that needs to be verified. A comparison of the number of referrals to the number of diagnoses was made in

one study quoted here[10], i.e. in the Netherlands: the % of diagnoses of gender dysphoria remained fairly constant at an average of 84.6% - M. Arnoldussen et al. (2020, p. 808), implying a proportional increase in the number of diagnoses as patients flow in. This would speak against this hypothesis. Similarly, a cross-sectional analysis of gender dysphoria diagnoses for the years 2005- 2016 in Sweden (Indremo et al. 2021, Fig. 4, p. 6) confirms their increase in the group of 10-17 year olds, especially girls (see also Figure 4). This hypothesis is also adversely affected by the rapid increase in clinic referrals (and not "slight" or "moderate", as one would expect) and qualitative changes.

6.2.2. Referring to the genesis of transsexualism: the number of transsexual people is increasing because the intensity of factors that are (can be) linked to its mainly biological genesis is increasing:

1. Referring mainly to biological components in the genesis of gender identity disorders: other factors besides the psycho-social environment are responsible for quantitative changes, e.g. civilisation pollution, medication, links to autism.

Robacha (2021, p. 289) gives another explanation (unfortunately without anchoring it in the scientific literature), which refers to the biological determinants of transsexualism: "Perhaps the reason for gender identity disorders is the influence of drugs or civilization pollution, altering neurotransmitter metabolism in the brain during the prenatal period". Friesen et al. (2017; data for Sweden) show an increasing number of autism cases in Stockholm region (currently 2.5% of adolescents). As autism spectrum disorders are significantly overrepresented among those who reject their biological sex (up to 26%, according to the study), it is possible that common roots (biological, psychological or sociological) also influence the increase in cases of gender dysphoria.

6.2.3. Social transmission: the number of transsexual individuals is increasing as the psycho-social elements of the genesis of gender identity disorders are intensified:

1. Social transmission. Gender-neutral upbringing, sex education in an equality model or the "dogma of equality" in sexual and gender diversity induce an increase in cases of gender identity disorders.

MEP interpellation in the European Parliament (European Parliament, 2017, 21 March) question no. E-001877-17 asked by Marie-Christine Arnautu (ENF) - the French MEP suggests gender-neutral upbringing, "equality as dogma" and the general greater openness of Swedish society as possible reasons for the increase in the number of children "who want to change their sex".

The Swedish dilemma is also well illustrated by the larger quantitative figures for the increase in minor patients than elsewhere in the world - an increase of 19700% in 10 years.

Zucker (2008) indicated that incorrect reaction of parents and allowing sexually uncharacteristic behaviour may be the cause of gender dysphoria. Cysarz (2021, p. 302), citing Kohlberg's position (1966),emphasises that "gender identity in a child can be a permanent organising factor in his/her psychosexual attitudes only if he/she can be absolutely certain of its immutability". Thus, gender-neutral kindergartens in Sweden or gender-neutral toys would not create this immutable gender basis.

2. Social transmission. Fashion, media and social media influence, social networking induce or reinforce gender identity disorders in adolescents.

Littman (2018) described the *rapid-onset gender dysphoria* (ROGD) syndrome, suggesting that ROGD may arise under the influence of the internet and social media and through peer networks (cf. also the author's response to the methodological objections raised against her - Littman 2019). Zucker (2019)

10 i.e. one source article of quantitative data of 10 countries.

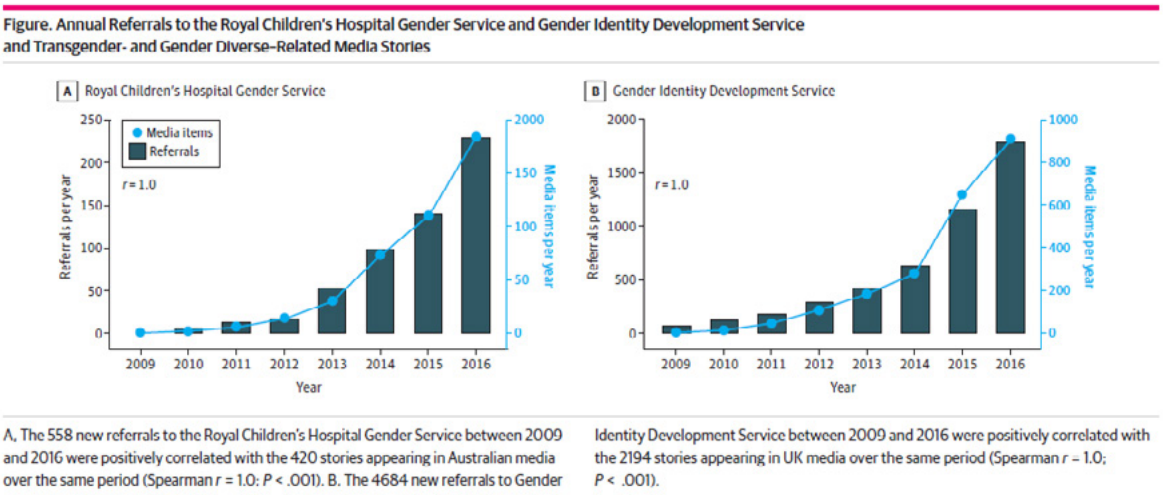

Chart 5. The correlation of increase of referrals to specialist gender identity disorder clinics with transgender- and gender-related media publications (left: Australia, right UK) after Pang et al. (2020, p. 4).

advises not too hastily reject this hypothesis. Similarly, this hypothesis is not dismissed lightly by Hutchinson, Midgen and Spiliadis (9-07-2019), who point out that it corresponds with their clinical experience and encourage further research. Furthermore, the Swedish psychiatrist Sven Roman points out that these are well-known facts that e.g. eating disorders or self-mutilations can be spread socially (e.g. through contact with peers) - Canadian Gender Report (2020, Update: 2021, 5 May). The same page shows data on Sweden, where after a fierce public discussion, media publications, statements by professionals and the film "Trans train", there was a 65% decrease in the trend of children and adolescents referrals to clinics in 2019. A similar process and, as a result, a social reflection as well asa downward trend occurred in the UK (cf. Figure 1).

It is also worth noting that the analysed period overlaps with the emergence and spread of social media, with FB established in 2004, Twitter in 2006 and Instagram in 2010. However, chat rooms and internet forums were already popular before that.

Ground-breaking research was conducted by the team Pang, de Graaf, Chew, Hoq, Keithi et al. (2020), where it was shown that increased national media coverage of 'gender' and 'transgender' stories correlated positively with increased referrals to this type of clinics for children and adolescents in the UK and Australia between 2009 and 2016 (see Figure 3). During that time, there were 420 media publications in Australia and 2,194 in the UK. The lines presenting the appearance of these publications and the influx of referrals, almost overlap (ibidem, p. 4). From these data it can be calculated that for each single media release the numbers increased by 0.75 patients at the Melbourne Hospital in Australia and 0.46 patients at GIDS in London.

3. Social transmission. Own proposal: the impact of culture undermining and blurring biological sex.

Media pressure cannot, however, be the only factor responsible for quantitative changes and their sources must be sought in e.g. culture or social policy. An increasing number of easily accessible cultural messages in the public space proclaim "multiple genders", "gender choice", "easy sex change without side effects". In doing so, no distinction is made between subjective psychic identification - which is one layer of gender or social gender roles - and other layers anchored directly in biology (genetic, hormonal, gonadal, genital, phenotypic sex), proclaiming the primacy of psychic identification and its comprehensive capacity to create the reality: "you are who you think you are". Facebook, a medium with a very high impact force, in 2014 introduced a registration form in the US with as many as 50 gender and sexual identity terms (Sparkes, 2014), while in the UK the range of choices

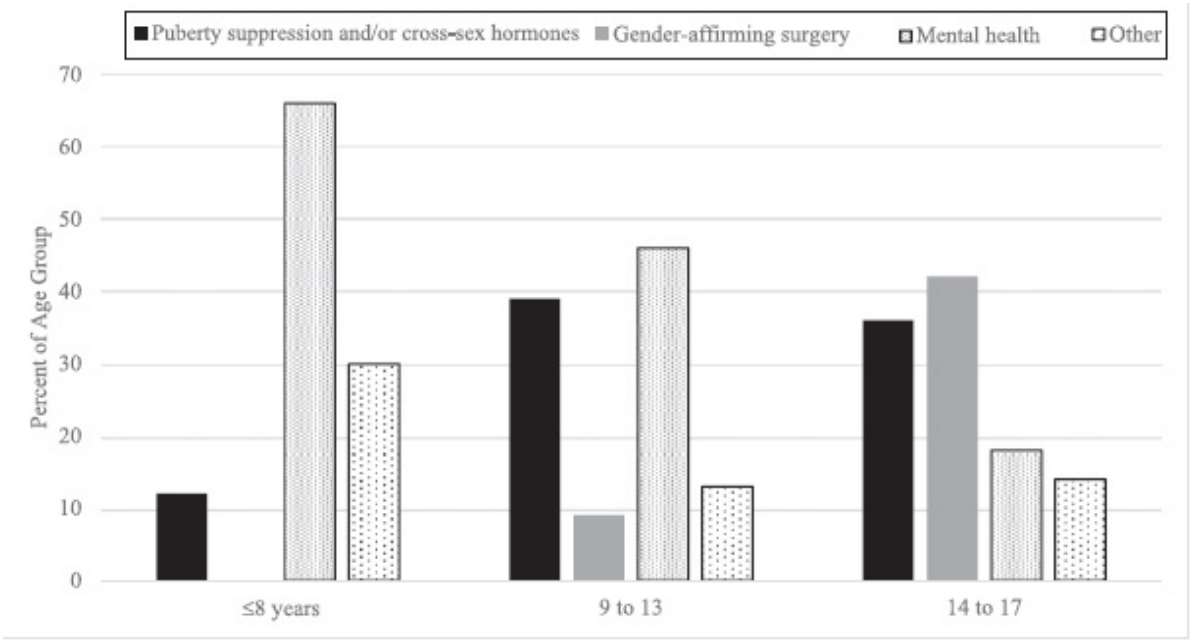

Chart 6. Types of specialist services provided at a clinic in North California, USA following Handler et al. (2019, p. 4). Colours in order: black - hormones, grey - surgery, shading - mental health support, dotting - other. Age groups indicated at the bottom.

was expanded with additional 21 options, giving a total of 71 identifications to choose from (Wiliams, 2014). One also encounters a whole host of non-specific terms such as: gender fluid, non-binary (i.e. rejecting the division into two biological sexes), third gender, etc. The highest number of terms for sexual and gender orientations is 235, as counted by the 'She and He' Institute (2020). The oldest university in Poland - the Jagiellonian University - introduced a questionnaire for students in which there are 5 options to choose from regarding sexuality, including a "non-binary" option (Solidarni2010, 2021). Vilnius University introduces gender-neutral language (Rachlevičius, 2021). Through anti-discrimination education and sex education in the CSE model supported by the UN (UNESCO 2018), which is compulsory in over a dozen countries[11], young people become accustomed to non-standard gender identifications as a positive alternative. The question arises whether this type of education preaching a message of tolerance can act as an encouragement to explore unknown areas (curiosity, desire to stand out, fashion)? Does it provoke e.g. escape reactions into the "other sex" especially in situations of crises and overload? Or can it sow uncertainty regarding one's own gender identity, which can be particularly risky during the developmental period? Let's add to this the crisis of masculinity, or the influence of fashion, which often mixes masculine and feminine elements[12], the art, which likes to shock, or the transgender rights movement.

The fact that this type of influence can at least sow uncertainty in children about their own gender is evidenced by a case from Canada, where a girl, after being presented with 'Queer Kids Stuff' materials in a kindergarten, began to claim that girls and boys do not exist and to question her girlhood (Johnston, 27-06- 2019). The earliest threshold for the beginning of upward trends was noticed in countries at the forefront of the social revolution (Canada, the Netherlands, and Sweden - cf. chapter 5).

4. Social transmission. Changes in public policy and pharmaceutical industry lobbying as enabling circumstances.

11 See the map onthe website of the sex education film "It's nothing": https://tonictakiego.pl/
12 E.g. Weppresent (n.d.).

The Royal Children's Hospital Melbourne, Australia (Hancock, 4-10-2018) reports that due to long queues, underage patients have to wait 14 months for their first appointment. The first clinic for children and adolescents with gender identity disorders was established in the US in Boston in 2007, in 2014 there were already 40 such clinics in the US (Human Rights Campaign, n.d.)[13] , and 80 in 2021 (Monostra, 2021). Add to this the fact that 'sex reassignment' means taking hormones for life. The so-called gender reassignment surgeries consist of many surgeries and treatments and are spread over several years. The annual maintenance of a sex-reassignment patient at the taxpayer's expense in Australia was calculated at $5,000 (Hancock, 4-10-2018), but the cost of a full transition at $100,000 (Lavoipierre, 1-03-2018). In the USA the costs are even higher than $100,000 - data after Jones 2019). In Poland 30-40 thousand zloty must be paid by a man who wants to resemble a woman, and 35 thousand zloty by a woman (data from Estheticon website, n.d.).

The following shocking data (after Handler et al., 2019) shows that 'sex reassignment' surgery is performed, albeit in a minority (grey bar), as early as on 9 -13 year olds, andit's the dominant way of 'specialist assistance' for 14-17 year olds. An answer to the question appeared on the Polish Estheticon forum, which stated that 16-year-olds with gender dysphoria, by all means, with the consent of both parents, can have their breasts amputated (Estheticon, n.d.).

The growth of this medical business sectoris also evidenced in the article by Chen, Jin, Yang, Qu, Weng et al. (2019), which compiles the increasing frequency of clinical trial announcements (and therefore investments in this medical sector) on the US government website: ClincialTrials.gov. These trends are almost identical, in terms of rate and time scale of change, to the increase od referrals in specialist clinics (the year when the marked increase in announcements began was 2009). This is also facilitated by changes in the law and changes in public policies (e.g. transition refund). Although the inverse relationship is also possible.

7. Practical tips for parents

As can be seen from the above review of 10 possible explanations for the exponential increase in the number of referrals to clinics, among the factors that can be influenced by parents, they should pay primary attention to positive messages about their child's own gender and respect for the opposite sex. They should also monitor the child's development for early recognition of manifestation of gender dysphoria. Children's networks, including on social media and any exposure to undermining biological sex, especially gender-neutral parenting, are important. When gender dysphoria occurs, alternative help paths should be explored and assessedin each case by: health, psychological and social risks as well as financial costs. The psychological immaturity of a child as well as the high intrinsic variability and disappearance of gender dysphoria especially at puberty should also be taken into account. The help path proposed by a professional institution should be verified by providing reliable information (specific references to research and meta-analyses, clinical reports, and not just general statements or e.g. statements of professional industry associations). Careful attention should also be paid to the high financial profitability of transitions for medical institutions and, on the other hand, to inadequate promises of each therapy's effectiveness. There is a risk of bias in both. One should also be aware of the time variable - the earlier the therapy is undertaken, the more effective it is; but on the other hand, earlier application of an affirmative approach produces better aesthetic results in the case of so-called gender reassignment. The above risk analysis, however, is not sufficient and the predominantly acquired genesis of gender identity disorders must be borne in mind. The impact of biological factors in the case of transsexualism based on 11 studies was estimated at only 36% (median; Marianowicz-Szczygiel, 2021, p. 99, based on data from the meta-analysis of Polderman et al., 2018). K.J. Zucker (2008) discusses psycho-social factors

13 This Boston clinic established in 2007 is Gender Multispeciality Service (GeMS), it does not publish its data - https://www.childrenshospital.org/gems

in the genesis of gender dysphoria in children; Marianowicz-Szczygieł (2021, p. 98-106) also provides a helpful review of studies.

The following reviews of studies have shown low or no effectiveness of the so-called gender reassignment process for the actual improvement of the life quality of people with transgender tendencies: ARIF, 2004 based on 100 studies; Rowniak, Bolt, Sharifi, 2019 - 7 studies, 552 test persons, review of 70 studies Georgas, Beckman, Bryman, Elander, Jivegård et al. (2018), a report by the Swedish government agency SBU (12-2019), where the lack of long-term evidence was particularly marked. The team of Haupt, Henke, Kutschmar, Hauser, Baldinger et al. (2020) showed that the evidence for the efficacy and safety of estrogen administration in M/F individuals is insufficient - a "gap between current clinical practice and clinical research" was found. Both the American College of Paediatricians (2017) and the SEGM association[14] note the risk of advere effects of applying hormones to children and adolescents: cardiovascular disease, skeletal disease, blood pressure problems, blood clots, strokes, post-surgery complications, diabetes, in addition to the obvious infertility and removing healthy organs. It is also worth pointing out that the so-called gender reassignment surgery, if only for medical reasons, is not available to everyone who wants it. The team of Lane, Ives, Sluiter, Waljee, Yao et al. (04-2018) estimated that medical complications after the so-called sex reassignment surgery occur in 5.8% of patients (data from 1047 patients). See the SEGM website[15] for an overview of research on psychotherapy.

Limitations of the article and final conclusions

The level of knowledge about gender identity disorders in children, including epidemiology, will certainly increase. As far as the avalanche inflow of referrals of minor patients to gender identity disorder clinics is concerned, this is a fairly recent phenomenon, but one that is well established in the western culture. The advantage of this article is a bigger number of countries analysed in this respect to ten on three continents, which shows the scale of this phenomenon. Creating a matrix of possible explanations can also be a step forward. This stage is often overlooked or presented rather one-sidedly as the result of increased public awareness. A qualitative analysis was enormously helpful here. A limitation of the presented study review, on the other hand, is the lack of complete data for a given time period year by year for all clinics from a given country. Their availability would mean more complete comparisons and more sophisticated statistical tools. For example, in Sweden, in addition to the Stockholm clinic discussed here, there are other centres for adolescents aged 16 and over in Alingsås, Linköping, Lund, Umeå and Uppsala (Friesen, Söder, Rydelius, 2017, p. 3), however Sweden created a national registry andstarted to publish its aggregate data systematically only in 2018[16]. A gender identity disorder clinic was established in Denmark only in 2016, in Finland in 2011 (Kaltiala et al. 2019, p. 3). Although it seems that the increase in social awareness may be partly responsible for the increase in gender identity disorders among children and adolescents, the change in the clinical picture (influx of adolescent girls into clinics) indicates that multiple arguments for social transmission of these disorders seem to prevail, especially with the rather commonly ignored fact of a predominant environmental genesis (studies on twins). Of course, one should not forget to examine biological factors, which, however, play a rather supplementary role. Aitken et al. (2015, p. 760) also realise that the inversion of the sex ratio makes it impossible to explain changes solely by the factor of increased social awareness and availability of services. It's worth emphasizing that the hypothesis of a dominant psychosocial transmission of gender dysphoria (including epidemiology analysis carried out here) is consistent with models of developing and implementing sexuality from the perspective of various psychological schools. Cognitive-developmental

14 https://segm.org/
15 https://segm.org/studies
16 https://konsdysforiregistret.se/om-registret/arsrapporter/

models are based on universal stageality, where the basis of gender identity (the child's categorisation of himself/herself as belonging to a given sex) is overlaid with gender continuity (boys develop into males, girls into females), gender invariability and thus a gender stability in a given person is formed (Vasta, Haith, Miller, 1995, p. 551-552). Learning theories emphasise learnt gender patterns, which can also be modified, including rejection under the influence of changes in the environment (ibidem p. 553). Existential psychology, on the other hand, views carnality (including sexuality) as a way of self-realization that extends into relations with the outside world (Hall, Lindzey 1990, p. 305). Psychoanalysis strongly emphasises the relationship with the body and the discovery of one's carnality especially in early childhood, as well as frustrations, conflicts in social relations, and the process of identification. In Freud's stadium theory of psychosexual development, sexuality emerges in the third phallic stage, between the ages three and five, when children become aware of sexual differences due to anatomical structure (ibidem, p. 60-61). Sexuality based on sex awakens in adolescence. The neopsychoanalytic concept of E. Erickson emphasises the psychosocial and gradual development of identity with particular emphasize on a period of adolescence, when identity confusion may occur. Then the ego's task is to select and integrate its own talents and skills and to adapt (or not) to the environment (ibidem, p. 96). The reader will find an overview of biological, psychological and social theories of gender dysphoria formation in the work of Le Roux (2013). A description of the emergence of gender identity in relation to stages of psychosexual and gender development and family dynamics is given by Szymczyk (2013).

Publication of complete data on clinic referrals year after year as well as the numbers of diagnoses by age and gender,would significantly facilitate the verification of the above hypotheses and international comparisons. Taking into account the age threshold for the manifestation of gender identity disorders and distinguishing it from the age of referrals to the clinic, would be helpful in tracing links to puberty and changes in the body- as advised by DeVries (2020). Further research is certainly needed on the influence of the media, the gender-neutral upbringing, the social paradigm of equality and the social perception of agiven gender.

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