

On the Incidence and Sex Ratio of Transsexualism in Sweden, 1972–2002

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The purpose of this study was to investigate whether the incidence of transsexualism in Sweden has been stable over the period of the three decades sex reassignment has been permitted by law in Sweden and whether there has been a change over time in the sex ratio of those requesting sex reassignment surgery (SRS). The incidence and sex ratio of transsexualism were calculated on the basis of the total number of applications for sex reassignment submitted to the National Board of Health and Welfare between July 1972 and June 2002. The frequency data were then analyzed in relation to the number of SRSs performed, age at the time SRS was requested, and the proportion of applicants of foreign origin. The results showed that the incidence of transsexualism was not stable during the study period of three decades. The sex ratio changed from almost 1:1 in the late 1960s to almost 2:1 in favor of male-to-female (MF) transsexuals in the 1990s. The number of SRSs performed rose considerably after the mid-1980s. On average, MF transsexuals are now 6 years older than female-to-male (FM) transsexuals when they apply for SRS, and MF transsexuals are currently about 8 years older at the time of application than they were 20 years ago. The proportion of applications from applicants of foreign origin increased during the 1990s.

KEY WORDS: transsexualism; gender dysphoria; sex ratio; sexual orientation; Sweden.

INTRODUCTION

Wälinder (1971) published data on the incidence and sex ratio of transsexualism in Sweden based on all applications for sex reassignment between July 1967 and June 1970. One important finding from that study was that the sex ratio of male-to-female versus female-to-male (MF:FM) transsexuals was approaching 1:1 from having been 2.8:1 in 1963–1965 (Wälinder, 1967). During the period studied, the annual incidence of requests for sex reassignment was 0.15 per 100,000 inhabitants over 15 years of age (Wälinder, 1971). However, Wälinder (1971) reported a marked increase in requests for sex reassignment

between July 1967 and June 1970. He attributed this increase to the increased interest in “sex changes” in the media, which resulted in the spread of information on the possibility of sex reassignment surgery (SRS) to the public.

Reports on the incidence and sex ratio of transsexualism from some other European countries and elsewhere are shown in Table I. The higher incidence figures of transsexualism in both Australia and Singapore compared to Sweden and other European countries has been attributed to the stigmatization of homosexuals in societies less liberal than these European countries. However, Tsoi (1988) attached greater importance to the well established and easy access to SRS in Singapore as well as the high quality of the surgery. Concerning sex ratio, a male dominance has mainly been considered. In contrast to this, Godlewski (1988) found a reversed pattern in Poland.

The question of whether the incidence of transsexualism has fluctuated, and whether there has been a change over time in the sex ratio of those requesting SRS is

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Table 1. Incidence and Sex Ratio of Transsexualism in Different Countries

	Year	Authors	Incidence/100,000 and year ^a	Sex ratio MF:FM
England and Wales	1966–1968	Hoenig and Kenna (1974)	0.17–0.26	1:1
Sweden	1967–1970	Wälinder (1971)	0.15	1:1
Denmark	1970–1977	Sörensen and Hertoft (1980)	0.21	2.8:1
Australia	1976–1978	Ross et al. (1981)	0.58	5:1
Poland	1974–1980	Godlewski (1988)	—	1:5.5
Singapore	1971–1985	Tsoi (1988)	1.58	2.9:1
Germany	1981–1990	Weitze and Osburg (1996)	0.21–0.24	2.3:1
Germany	1970–1998	Garrels et al. (2000)	—	1.9:1

^aFor subjects over 15 years of age, except for the German figures.

relevant to the issue of whether transsexualism is a phenomenon influenced by social and cultural changes or not (Van Kesteren, Gooren, & Megens, 1996). In addition, changes in the characteristics of the treatment-seeking population, that is, whether they are younger/older at the time they request SRS, the proportion of applicants that go on to SRS, and the number of applicants of foreign origin, are also important to the interpretation of data on the incidence of the transsexual phenomenon.

The aim of this study was to report recent Swedish data concerning (1) the incidence and sex ratio of applications for SRS, and (2) to analyze the number of applications in relation to the number of SRSs performed, the age at which SRS is requested, and the proportion of applicants of foreign origin. The purpose is to determine whether the incidence and sex ratio are stable or not during the three decades (July 1972–June 2002) covered by the study.

METHOD

Materials and Procedure

Sex reassignment in Sweden, including change of name, the sex of assignment, and genital surgery, cannot be obtained without the permission of the National Board of Health and Welfare (NBHW). On 1 July 1972, Sweden became the first country in the world to institutionalize sex reassignment and sex reassignment surgery by law as the treatment of choice for transsexualism (Wälinder & Thuwe, 1976). Following observation and hormonal treatment, the patient must apply to the NBHW for the desired sex change treatment. To be entitled to SRS, which is free of charge, the applicant must fulfil the following criteria: (1) The person must have felt that he/she belonged to the other biological sex from an early age (childhood or early adolescence) and have lived for a considerable time period (at least 2–4 years) in the cross-gender role.

The person should have no doubts about undergoing SRS and no fluctuations in symptoms; (2) the person must be over 18 years of age; (3) the person must be unmarried or legally divorced; (4) the person must be a Swedish citizen; (5) and the person must have undergone an operation for sterilization or for other reasons be incapable of reproduction.

The application must contain a medical certificate giving documentation for the diagnosis. All documents concerning the treatment are classified as “confidential” and are kept on file.

With the permission of the NBHW, we gained access to information from files on all applications made in the period between January 1992 and June 2002. The information in each application included (1) biological sex (MF or FM), (2) the origin of the applicant (native Swede or of foreign origin, that is, born in another country), (3) permission for change of name and possible sterilization, but not for genital surgery (other requests rejected), (4) permission for all requests, (5) all requests rejected, earlier applications/rejections, (6) applications for retransformation, (7) appeal of a decision, (8) applications recalled, and (9) age at application. To avoid conflicting results on incidence and sex ratio, this study employed the same method as was described in the studies by Wälinder (1971) and Landén, Wälinder, and Lundström (1996). The calculation was made on the mean number of persons in Sweden over 15 years of age during the period July 1992–June 2002 (7.2 million). The results obtained for the period 1992–2002 were then compared with the results of earlier studies by Wälinder (1971) and Landén (1999). The number of SRSs performed was obtained from Eldh, Berg, and Gustafsson (1997) and J. Rinder (personal communication, November 5, 2002). Eldh has been responsible for all SRSs done in Sweden since the late 1980s until recently when Rinder took over. Age at the time of applicants' first request in the initial years after the legal reform were obtained from a study by the NBHW (1978).

Table II. Incidence and Sex Ratio of Individuals Requesting Sex Reassignment During the Period July 1972 – June 2002

	July 1972–June 1982 (A)		July 1982–June 1992 (B)		July 1992–June 2002 (C)		<i>p</i> (A vs. B)	<i>p</i> (A vs. C)	<i>p</i> (B vs. C)
	<i>n</i>	Incidence 100,000/year	<i>n</i>	Incidence 100,000/year	<i>n</i>	Incidence 100,000/year			
Male–Female	78	0.23	56	0.16	111	0.32	.045	.038	<.0001
Female–Male	61	0.18	38	0.11	58	0.16	.021	.55 <i>ns</i>	.098 <i>ns</i>
Total	139	0.20	94	0.14	169	0.24	.009	.19 <i>ns</i>	<.0001
<i>p</i> values (Male–female) vs. (Female–male)	<i>ns</i>		0.092		0.001				
Sex Ratio	1.3:1		1.5:1		1.9:1				

Note. An optimal test based on the binominal distribution was used for comparison of Poisson distributions of the incidence of applications and sex ratio over the studied period of 30 years.

RESULTS

During the three decades covered by the study, 402 applications for sex reassignment were submitted to the NBHW. This group of applications constitutes the base for the calculated incidence figures. The mean annual frequency was 13.4 applications. During the period of time studied (1972–2002), the population in Sweden over the age of 15 years increased from 6.5 million to 7.3 million, resulting in a mean population of 6.9 million (Official Statistics of Sweden, 2001). This means that the annual incidence of applications for sex reassignment was 0.19 per 100,000 inhabitants over 15 years of age. The sex ratio was 1.6:1 for biological males versus biological females (*p* < .001, Sign test).

To clarify whether there were any changes in the number of SRS applications over this 30-year period, we divided the period into the three decades that it covers. As seen in Table II, the incidence figure was not stable but fluctuated over time. There was a lower incidence among both sexes during the 1980s as compared with the 1970s. Different patterns emerged during the 1990s, however, where the incidence of MF applications exceeded the

number in the 1970s but showed a smaller increase in the incidence of FM applications. In the 1990s, the sex ratio was almost 2 MF applications for every 1 FM application.

Until the mid-1980s, the number of SRSs performed was low in relation to the number of applications submitted for sex reassignment (see Table III). During the following decade, the number of SRSs performed increased considerably, especially in the FM direction. The number of SRSs in relation to applications increased significantly (*p* < .0001, Fisher's exact test) from the period January 1965–December 1985 (A) to the period January 1986–June 2002 (B).

The age of the MF subjects at the time of the request for sex reassignment (Table IV) increased from a mean age of 27.8 years among applicants in the mid-1970s to 36.5 years 20 years later. This trend was not noticeable among the FM applicants, where the age variable was almost stable.

The proportion of applications from individuals of foreign origin increased during 1990s and currently constitutes almost one third of the total group, while they constitute approximately one eighth of the total population (Table V).

Table III. Number, Incidence, and Sex Ratio of Individuals Applying for Sex Reassignment: All Applications Compared With the Number of Individuals Who Received SRS

Period	Number				Incidence per 100,000 and year				Sex ratio (Male–female: Female–male)	
	Male–female		Female–male		Male–female		Female–male		Female–male)	
	Applications	Received SRS	Applications	Received SRS	Applications	Received SRS	Applications	Received SRS	Applications	Received SRS
Jan 1965–Dec 1985 (20 years)	107	47 (44%)	87	25 (29%)	0.19	0.08	0.16	0.05	1.2:1	1.9:1
Jan 1986–Jun 2002 (16 years)	151	114 (76%)	84	90 (107%) ^a	0.26	0.20	0.15	0.16	1.8:1	1.3:1

^aIncluded in this figure are patients who applied for SRS in the former period (1965–1985).

Table IV. Mean Age at Request for SRS

Period	Male-female			Female-male			<i>p</i> value (MF vs. FM)
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	
A. July 1972-Dec 1975	43	27.8	8.5	38	29.4	6.6	<i>ns</i>
B. Jan 1976-June 1992	91	32.2	9.5	61	29.3	7.4	.046
C. July 1992-June 2002	111	36.5	11.0	58	30.0	9.4	<.0001
A vs. C	<.0001			<i>ns</i>			
B vs. C	=.004			<i>ns</i>			

Note. *t*-tests were used for comparisons of ages between groups.

DISCUSSION

The sex ratio changed from almost 1:1 in the late 1960s to almost 2:1 in favor of MF transsexuals in the 1990s and the MF transsexuals are currently about 8 years older at the time of application than they were 20 years ago. The incidence of applications for SRS was not stable during the three decades of the study. The most obvious findings may be the low incidence during the 1980s for both categories and the increased age among MF applicants during the studied period.

During the 1970s, a growing gay movement influenced social attitudes toward homosexual behavior, which was reflected in the 1979 removal of homosexuality from the classification of diseases in Sweden (KOM UT, 1999). For some stigmatized homosexuals with gender dysphoria, this may have signified doing away with the guilt involved in participating in homosexual relationships, and may have lessened the need for SRS for some individuals.

Sex reassignment surgery has been performed in Sweden since the 1950s but up to the mid 1980s the results of SRS were often poor and the surgery was hampered by numerous complications (Eldh et al., 1997; Lindemalm, Körlin, & Uddenberg, 1986). This situation became known not only within transsexual circles but also came to the attention of the public when, at the beginning of the 1980s, a MF transsexual who later committed suicide re-

vealed details of her situation in the media. She attributed her suffering to surgical complications and the failure of her SRS (Anna, 1981).

Tsoi (1988) attributed the high incidence of transsexualism in Singapore to both the fact that SRS is well established there as well as to the high quality of the procedure. Further, in Singapore, homosexuality is not accepted by society (Tsoi, 1990), and is actually forbidden by law. Since the mid-1980s, SRS for both MF and FM transsexuals in Sweden has been centralized and surgical techniques have been improved (Eldh et al., 1997). This was reflected in the media during the 1990s, where the results of SRS for MF transsexuals have been said to resemble "a real woman so that not even a gynecologist could see the difference" (von Proschwitz, 1994).

From 1986 on, there was a marked increase in the number of individuals who received SRS (Eldh et al., 1997; Rinder, personal communication, November 5, 2002), in contrast to the situation in the Netherlands where the number of individuals who were actually receiving somatic (hormonal and surgical) treatment began to decline in 1989 and thereafter (Van Kesteren et al., 1996). In Germany, this change came in 1995, when fewer MF transsexuals requested treatment (Garrels et al., 2000). The German authors attributed the decline in the number of MF transsexuals requesting SRS to the fact that more psychotherapists were currently offering these patients help

Table V. Numbers of Applications From Individuals of Foreign Origin Requesting Sex Reassignment Compared With Native Swedes

Period	Male-Female			Female-Male			Male-Female and Female-Male			<i>p</i> value (MF:FM)
	Native Swedes	Foreign origin	Total (<i>n</i>)	Native Swedes	Foreign origin	Total (<i>n</i>)	Native Swedes	Foreign origin	Total (<i>n</i>)	
July 1972-June 1992 (20 years)	101	33 (25%)	134	77	22(22%)	99	178	55 (24%)	233	0.11
July 1992-June 2002	84	27 (24%)	111	39	19(33%)	58	123	46 (27%)	169	0.07
<i>p</i> values (1972-1992 vs. 1992-2002)	<i>ns</i>			.05			.066			

Note. Fishers' Exact Test was used.

and that a critical discussion was underway among the transsexuals themselves concerning surgical treatment. Transsexuals have recently organized themselves in the Swedish Federation for Gay/Lesbian Rights and began to claim their right to self-identify as transsexuals and to be free to choose the treatment they find most suitable (Akerblom, 2000). Despite this, and contrary to the situation in Germany, the applications for SRS increased during the second half of the 1990s in Sweden.

The age of the applicants at the time of the request for SRS is one variable of importance when diagnosing the heterogeneous MF transsexual population. Blanchard (1994) found that early feminine identity was associated with low sexual interest in women and younger age at presentation. Blanchard confirms that the stronger a patient's early cross-gender feelings are, the sooner he is likely to seek consultation. Concerning sexual orientation and age at presentation, both Bentler (1976) and Blanchard (1988) reported that homosexual applicants requested SRS at an earlier age than the heterosexual group. In a comparison between three groups of non-homosexual transsexuals (analloerotic, bisexual, and heterosexuals) on the one hand, and homosexual transsexuals on the other, two differences emerged. The three groups of non-homosexual transsexuals reported less childhood femininity and applied for clinical assessment at a later age than the homosexual group (Blanchard, 1988). Tsoi (1990) found that, compared to Caucasian transsexuals, Singapore transsexuals were more exclusively homosexual in their sexual practice and partner preference, and they also requested sex reassignment at a younger age.

In Yugoslavia, Rakic, Starcevic, Jovan, and Kelin (1996) accepted only homosexual transsexuals for SRS. The mean age of those transsexuals who underwent MF surgery was 26.4 years ($SD = 7.8$). At almost the same age, Tsoi's male transsexuals (Tsoi, 1990) underwent MF surgery (mean age, 26.7 years; $SD = 5.3$). The corresponding figure for Tsoi's patients (Tsoi, 1990), who underwent FM surgery, was a mean age of 26.8 years ($SD = 3.8$); for the FM transsexuals reported in Rakic et al. (1996), the mean age at surgery was 27.8 years ($SD = 5.2$). According to Tsoi (1990) and Rakic et al. (1996), homosexual MF transsexuals in Singapore and Yugoslavia received their SRS at about the same age as FM transsexuals.

At the beginning of the 1970s, MF transsexuals in Sweden were younger when they applied for sex reassignment than MF applicants in the 1990s. MF transsexuals were also younger than FM transsexuals, which was in agreement with experience from the early 1970s in Sweden (NBHW, 1978). The change in sex ratio over the studied period of three decades in Sweden in favor of MF

transsexuals could be explained by a greater proportion of male non-homosexual transsexuals requesting SRS over time. A smaller number of male homosexual transsexuals requesting SRS over time could also be responsible for the observed increased age at which SRS was requested. However, we have no data on the sexual orientation of the patients to verify this.

Most authors have found FM transsexuals as a group to be more homogeneous (Landén, 1999) and better socially integrated (Rakic et al., 1996; Tsoi, 1992), to more frequently have a history of cross-gender behavior (Landén, 1999), to be homosexually orientated in sexual practice and partner preference, and to more frequently (at a younger age) go on to SRS compared to MF transsexuals (Futterweit, 1998; Van Kesteren et al., 1996).

The proportion of applicants of foreign origin during the period of time studied was higher in Sweden than in the Netherlands (Van Kesteren et al., 1996), and this trend became more pronounced in the 1990s. In Sweden, FM transsexuals of foreign origin increased most in number during the 1990s, which was unexpected as men with gender dysphoria have been thought to be more inclined to seek SRS abroad. Another group of individuals of foreign origin who apply for sex reassignment are adoptees from abroad. Early adoption has been identified as a possible small risk factor for boys to develop gender dysphoria (Zucker & Bradley, 1998). The number of applicants who are adoptees and their sex ratio within the Swedish transsexual group are thus far not known.

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