

## Review article

# Prevalence, incidence and sex ratio of transsexualism

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Frequency figures for transsexualism, concerning incidence, prevalence and sex ratio calculated in the 1960s and 1970s, were compared with recent reports. The incidence figures remained constant over time, whereas the prevalence figures tended to increase during the review period. The incidence was found to be of the same magnitude in men and women, while the corresponding ratio for prevalence figures was 3:1. It is suggested that men seeking sex reassignment represent a more heterogeneous group than women, and that the reported male predominance to date is due to a lack of categorical studies of primary/genuine transsexualism. It would appear that genuine transsexualism is, on the whole, insensitive to societal changes. The fundamental disturbance underlying this psychosexual identity disorder is suggested to be neurobiological in origin.

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## Introduction

Transsexualism is a gender identity disorder in which patients feel that they are trapped in the body of the wrong sex, and strongly desire to correct this mistake of nature by having sex reassignment surgery.

The incidence of the disorder and the question of whether more men than women are transsexuals are two important issues to address. This is because of their impact on the discussion as to whether transsexualism is a disorder independent of culture and time or merely a phenomenon of our time and the societies in which we live. In order to analyse in more detail whether social pressures and variations over time may influence the incidence and sex ratio of transsexualism, it is important to compare recent data with previous reports.

The aim of this review is to compare the frequency figures for transsexualism reported in the 1960s and 1970s with recent reports, especially to determine whether the frequency increases or declines, and whether there is any change in the sex ratio.

## Definition

When calculating incidence, the criteria used for transsexualism are as follows (1):

- (a) a sense of belonging to the opposite sex, of having been born into the wrong sex, and of being one of nature's extant errors;
- (b) a sense of estrangement from one's own body, all indications of sex differentiation being regarded as afflictions and repugnant;
- (c) a strong desire to resemble the opposite sex physically as a result of therapy, including surgery;
- (d) a desire to be accepted by the community as belonging to the opposite sex.

These criteria adhere closely to those of the DSM-IV (2).

## Prevalence

The prevalence data for transsexualism have been calculated in various ways, and the discrepancies between the results are partly due to these differences in method. In the majority of the reviewed reports, the prevalence was estimated by counting all the patients who sought sex reassignment and were subsequently diagnosed as transsexuals. One should take into consideration, however, the fact that those estimations of prevalence which can be

made are minimal values, and there will always be a group of gender dysphorics who will escape diagnosis.

As is shown in Table 1, the data differ between studies. The prevalence in the USA in the 1960s was estimated to be 1:100 000 men and 1:400 000 women (3), while in Sweden prevalence figures of 1:37 000 men and 1:103 000 women were reported (1). These results were based on a population over 15 years of age, which set the standard for later studies. In England and Wales (4), and also in Australia (5), comparable figures were reported, although with different sex ratios.

Recent epidemiological studies from smaller countries with access to total population statistics show higher figures. Thus Tsoi reported in 1988 from Singapore a 100-fold higher prevalence than in earlier studies (6). The prevalence figures in The Netherlands are lower, but appear to be increasing (7, 8). Finally, DSM-IV (2) suggest that '... roughly one per 30 000 adult males and one per 100 000 adult females seek sex-reassignment surgery'. These are figures of the same magnitude as those presented by Wälinder in the 1960s (1).

### Incidence

Incidence is calculated by counting all new cases with a definitive diagnosis and relating them to the time period and total population over 15 years of age. In Sweden, where three consecutive incidence studies have been performed in an identical manner and can therefore be reliably compared, the annual incidence remains surprisingly constant, from the first report by Wälinder (9), of an incidence of 0.15 per 100 000 members of the population over 15 years of age, to a report from the same author in 1979, when the incidence had increased somewhat

to 0.17 per 100 000 (Wälinder et al., personal communication), to the most recent figures from Sweden (10), which show a constant incidence of 0.17 per 100 000 members of the population over 15 years of age. In England and Wales (4) the incidence figures correspond very closely to the Swedish data, whereas in Australia a threefold higher incidence was reported (5).

### Sex ratio

In the 1960s and 1970s transsexualism was considered to be more common among men, and the prevalence figures in Table 1 all show male predominance. On average, the male:female ratio in prevalence studies is estimated to be 3:1. However, as can be seen in Table 2, the incidence studies have shown a considerably lower male predominance. In Sweden and England and Wales a sex ratio of 1:1 has been reported. In the most recent incidence data from Sweden there is a slight male predominance among the group consisting of all applicants for sex reassignment, while in the group of primary transsexuals (11) there is no difference in incidence between men and women.

### Discussion

An important conclusion that can be drawn from this review is that the incidence of primary transsexualism is the same in women and in men. In Sweden and England and Wales the sex ratio based on incidence figures is 1:1. However, the sex ratio based on prevalence figures in The Netherlands, England and Wales, Sweden and Singapore remains constant at 3:1.

Various hypotheses have been suggested to explain the previously reported male dominance in gender dysphoria, and it has been proposed that transsexuals fall into two groups: primary and secondary (11, 12). These were defined as follows: 'The former are transsexuals throughout the course of their development; the latter are effeminate

Table 1. Prevalence and sex ratio of transsexualism

	Male prevalence	Female prevalence	Total prevalence	Sex ratio (male:female)
Sweden, 1967 (1)	1:37 000	1:103 000	1:54 000	2.8:1
USA, 1968 (3)	1:100 000	1:400 000		4:1
England and Wales, 1974 (4)	1:34 000	1:108 000	1:53 000	3.2:1
Australia, 1981 (5)	1:24 000	1:150 000	1:42 000	6.1:1
Singapore, 1988 (6)	1:2900	1:8300		2.9:1
The Netherlands, 1980 (7)	1:45 000	1:200 000		4.4:1
The Netherlands, 1986 (7)	1:18 000	1:54 000		3.1:1
The Netherlands, 1990 (8)	1:11 900	1:30 400		2.5:1

Table 2. Incidence and sex ratio of transsexualism

	Incidence/100 000 and year <sup>a</sup>	Sex ratio (male:female)
England and Wales, 1966-1968 (4)	0.17-0.26	1:1
Australia, 1976-1978 (5)	0.58	5:1
Sweden, 1967-1970 (9)	0.15	1:1
Sweden, 1968-1978 (10)	0.17	1:1
Sweden, 1972-1992, all applications (11)	0.17	1.4:1
Sweden, 1972-1992, primary transsexualism (11)	0.14	1:1

<sup>a</sup>For subjects over 15 years of age.

homosexuals and transvestites who become transsexuals under stress'. Subsequently, several authors have stated that a subgroup within DSM-IV criteria for transsexualism is recognizable. Synonyms such as 'core' transsexualism (13), 'true' transsexualism (14) or 'genuine' transsexualism (15) are used, and the prominent features (16) are an aversion to secondary sexual characteristics, an effeminate nature as a child, low sexual libido, lack of sexual arousal with cross-dressing, homosexual orientation, and no fluctuation in symptoms of gender dysphoria.

In accordance with this, Lundström (17) stated that 'Men seeking help to obtain sex reassignment represent a more heterogeneous diagnostic group than females with the same wish'. Lundström divided the total number of individuals who were referred for sex reassignment evaluation into two groups: those accepted for sex reassignment and those not accepted for such reassignment. In this way a genuine transsexual group and a more uncertain group were identified. The two groups differed markedly with regard to sex ratio, with values of 1:1 and 4:1, respectively. In the total sample referred for sex reassignment evaluation the sex ratio was 1.7:1.

A plausible explanation for the previously reported male predominance is therefore the lack of categorical studies of primary transsexualism. As suggested previously (17), the inclusion of transvestites, effeminate homosexuals and other gender identity disorders renders the groups studied to date heterogeneous.

It is also noteworthy that the incidence of transsexualism has remained astonishingly constant over time, whereas the prevalence appears to increase during the period reviewed. One interpretation of this trend is that the rise in prevalence is due to the development of a more sympathetic social climate for transsexuals, whereas the constant incidence data reflect the fact that the rate of growth is constant, and therefore a levelling off of prevalence is to be expected in the future.

During two decades of legally supported sex reassignment, the country of Sweden as well the rest of the world has undergone change. Although still a western society, the view of life has altered substantially compared to the 1960s and 1970s. If we consider the transsexual phenomenon to be sensitive to societal changes and the whims of fashion, we would expect rapid and unpredictable changes in sex ratio and incidence. By contrast, the reviewed findings suggest that the fundamental dis-

turbance underlying transsexualism is determined neurobiologically (18).

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