The Incidence and Prevalence of SRS among US Residents

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Transgender at Work

ABSTRACT

This paper measures the incidence of Sex Reassignment Surgery (SRS) for US residents. It reports the number of US residents undergoing SRS in one calendar year (2001) using a survey of surgeons who offered SRS procedures. This run rate is used to calculate incidence of SRS, and to estimate prevalence. Estimates of incidence and inherent prevalence of Gender Identity Disorder (GID), mental health therapy, hormone treatments, and FTM bottom surgeries are derived.

The number of US residents undergoing primary SRS in the year 2001 (run rate) was 1170 (740 Male to Female or MTF and 430 Female to Male or FTM.) The incidence of SRS per year among US residents was 1: 240,000 (1:190,000 MTF and 330,000 FTM, a ratio of 1.75:1.) It follows that the inherent prevalence of those who have had or will have SRS in their lifetime was about 1:3,100 (1:2500 MTF and 1:4,200 FTM.) Not all have SRS: the inherent prevalence of diagnosed GID is estimated as 1:2000 (1:1500 MTF and 1:2800 FTM, a ratio of 1.9:1.) The inherent prevalence of transsexualism (including those who are not diagnosed) is estimated as 1:1000 (1:750 MTF and 1:1400 FTM.)

Keywords

Transsexual Prevalence. Sex Reassignment Surgery Prevalence

1. Introduction

This paper measures the annual incidence of Sex Reassignment Surgery (SRS) for US residents. It reports the number of US residents undergoing SRS in one calendar year (2001) using a survey of surgeons who offered SRS procedures to Americans. This incidence was extrapolated to estimate prevalence. The companion paper (Horton, 2008) builds on the incidence result to estimate the insurance cost to cover Transgender Health Benefits.

1.1 Previous Work

The prevalence ("the number of people in a given population affected with a particular disease or condition at a given time") of SRS has not been conclusively established. Many estimates have been made, few based on experimental data. These estimates focus on either the prevalence of transsexualism: "What fraction of the population has been diagnosed as transsexual?" or of SRS: "What fraction of the population has SRS at some point in their lifetime?"

The DSM-IV (DSM, 1994) states, "Data from smaller countries in Europe with access to total population statistics and referral suggest that roughly 1:30,000 adult males and 1:100,000 adult females seek sex-reassignment surgery

(Walinder, 1967) found a prevalence of 1:37,000 MTF and 1:103,000 FTM (ratio 2.8:1) in Sweden, based on a survey of therapists about patients currently being treated for GID over a 2 year period.

(Pauly, 1968) estimated a prevalence of transsexualism of 1:100,000 MTF and 1:400,000 FTM (ratio 4:1) in the US.

(Hoeniig, 1974) found a prevalence of 1:34,000 MTF and 1:108,000 FTM (ratio 3.2:1) in the UK, based on patients being treated currently for GID over an 11 year period.

(Tsoi, 1988) found a prevalence of 1:9,000 MTF and 1:27,000 FTM in Singapore, based on patients diagnosed with GID over a 5 year period.

The Janus Study (Janus, 1993) found that 6% of males and 3% of females have personally cross-dressed. The Janus question is asked in the context of variant sexual practices, and would appear to include the entire scale of transgendered people, from post-operative transsexuals to those who have only dressed as the opposite sex for Halloween.

(Weitze, 1993) found the prevalence of transsexualism in Germany to be 1:36,000-1:42,000 MTF and 1:94,000-1:104,000 FTM (ratio 2.3:1 or 2.2:1). This is based on the number of people requesting court orders for name changes or gender marker over a 10 year period.

(van Kesteren, 1996) found the prevalence of transsexualism in the Netherlands to be 1:11,900 MTF and 1:30,400 FTM (ratio 3:1.) This is based on the number of patients receiving HRT in the country over an 18 year period.

Richard Green (Green, 1999) gave the incidence of transsexualism at 1:10,000 MTF and 1:30,000 FTM.

Conway (Conway, 2001) estimated prevalence of MTF SRS in the US, by estimating the number of surgeries each year and summing over the past several decades. She estimated that 1 in 2500 Americans born male is currently a post-operative transsexual, and that at least 1 in 500 Americans born male has GID. She estimates the incidence of transsexualism (the number of people to transition from male to female each year) at 1:10,000 to 1:20,000, based on a 20 to 40 year career. Conway does "sanity checks" with other methods of calculation. Based on an estimated annual surgical count of 1500 to 2000 and an

annual male birth rate of 2,000,000, she estimates intrinsic (later termed as inherent) prevalence of SRS at 1:1333 to 1:1000, that is, as many as 1 in 1000 people will have SRS sometime during their lives.

(De Cuypere, 2006) found the prevalence of transsexualism in Belgium at 1:12,900 MTF and 1:33,800 FTM, based on a survey of surgeons performing SRS.

(Olyslager, 2007) calculates inherent prevalence from previous studies, introducing the concepts of Latent Transsexualism (people who will be treated) and Inherent Transsexualism (including people who will never be treated.)   Estimates of inherent transsexualism between 1:1000 and 1:2000 are reported.

Others have made estimates of transsexual or transgender people in other cultures, based upon personal experience. Conway (Conway, 2001) summarizes many of these estimates. These include:
- Number of Hijra (males living as women) in India: estimated at 1:375.
- Number of transsexuals "living as women" (without surgery) in Malaysia, estimated at 1:820.
- SRS in the U.K., estimated at 1:3750, and of transsexualism, 1:750.
- Katheoys (males living as women) in Thailand, estimated at 1:167.

3. Methodology

The goal of this study was to measure the incidence and create a realistic estimate of the inherent prevalence of SRS. The surgical *run rate* was measured by counting the total number of surgeries in one year, surveying the surgeons that most US residents go to, and the *incidence* calculated by dividing the run rate into the total population from the US census. *Inherent prevalence* is then estimated by extrapolating one year of data over the average life expectancy. This contrasts with *prevalence*, which only counts people currently known to be in treatment. Inherent prevalence will also include people who have previously been treated, will be treated in the future, or have the condition but will never receive treatment.

Persons desiring irreversible surgical procedures who value the quality of the result usually go to a surgeon who has performed the procedure many times previously. It is known within the American transgender community that the vast majority of transsexuals seeking surgery go to one of a relatively short list of surgeons for their final surgery.   By reputation, the vast majority of US transsexuals went to one of 15 surgeons. (Eight of these surgeons are in the US, and seven of them are not.) This study refers to these 15 surgeons as *major surgeons*. It is believed that the major surgeons account for nearly all the primary surgeries performed on US residents.

4.1 Survey

The author sent a survey in 2002 to all surgeons and clinics who were listed as members in HBIGDA. This survey inquired about all surgeries performed by the specific surgeon in the calendar year 2001. Questions asked included the total number of procedures performed annually, the total cost and average cost per patient, and the percentage of patients who are US residents.

SRS is a once-in-a-lifetime event for any given transsexual patient. Some patients, however, may undergo multiple surgical procedures. It is important to count each patient exactly once, in order to accurately measure the incidence. To this end, the concept of a *primary* surgery was defined. This is a surgery that can occur only once in the lifetime of any given patient, no matter how many follow-ups, corrections, reversals, or cosmetic surgeries are done. In addition, the primary surgery must be a procedure that is required, that generally must be performed for SRS to be considered complete.

For MTF patients, the primary surgery was defined to be the penectomy (removal of the penis.) This procedure is generally accompanied by a vaginaplasty, but in case of complications, a second vaginaplasty may be indicated. Only one penectomy is possible for any one patient

For FTM patients, the primary surgery was defined to be the bilateral mastectomy (top surgery.) The various *bottom surgeries* (hysterectomy, metoidioplasty, phalloplasty) are not always indicated, but most FTM patients will undergo a single top surgery.

Patient counting was based only on primary surgeries. Patient cost, however, was based on total cost of all surgeries, including follow-ups to treat complications. Questions 2 and 5, below, requested total cost of all surgeries.

The specific questions may be summarized as follows:
1. How many MTF primary surgeries did you do in 2001?
2. What was the total cost of all the MTF surgeries?
3. What fraction of the MTF surgeries was done on US residents?
4. How many FTM primary surgeries did you do in 2001?
5. What was the total cost of all the FTM surgeries?
6. What fraction of the FTM surgeries was done on US residents?

Respondents were assured that their individual survey responses would be kept confidential. For this reason, only summarized data is presented.

After a two-month interval, follow-up letters were sent to the major surgeons who had not yet responded. All major surgeons who had not responded were again contacted, until it was clear there would be no further responses.

4.2 Analysis

The data was analyzed, using the following approach.
1. The run rate of primary surgeries per year was established. The raw counts in the surveys were reconstructed by correcting errors, in cooperation with surgeons and their staffs. Missing information was extrapolated using other available information. For example, many surgeons' prices are well known or on their web sites. A former patient who interacted with the staff for the 1-2 week period during their surgery estimated run rates. In one case, missing data was discovered in a published book. Data was extrapolated to include other surgeons. Finally, the total patient count included non-US residents; the US resident percentages from the surveys were used to reduce the total run rate to represent US residents. (See Table 1.)
2. The bottom surgery run rates (for FTM patients) were reconstructed by correcting errors where possible. Missing surgeons were extrapolated using market share estimates from a subject matter expert (Green, 2003.) Finally, the US resident percentages were used to estimate the US run rates.
3. The annual primary surgery run rate was divided into the US resident population from the 2000 US Census, yielding the annual incidencce of SRS. This incidence was multiplied by the life expectancy from the census (separated by birth sex) yielding an estimate of the inherent prevalence of primary surgery (that is, the fraction of people alive today who have had or will have SRS or top surgery in their lifetime.) This inherent prevalence is divided by the fraction of transsexuals who have surgery (item 4 below) to estimate the inherent prevalence of transsexualism..
4. Incidence of nonsurgical procedures was calculated from percentage estimates. For example, it was estimated that 50% of transsexuals with intense TS feelings are diagnosed with GID, and that 60% of MTF transsexuals diagnosed with GID have primary surgery, therefore the inherent prevalence of MTF transsexualism is about 3.3 times that of SRS. It was estimated that 90% of MTF transsexuals diagnosed with GID undertake Hormone Replacement Therapy (HRT,) so the incidence of new HRT patients is 90% of the incidence of GID, or 150% of SRS.

For analysis of the medical cost (in dollars per US resident) see the companion paper The Cost of Transgender Health Benefits (Horton, 2008.)

4. Surgical Data

The data received from the surveys are summarized in this section. First, the raw data as received is summarized. This raw data contained a few errors and omissions that were correctable. The second section describes the reconstruction process and the data after reconstruction.

4.1 Primary Surgical Data

For reasons of confidentiality, specific surgeons are not listed in this paper. Rather, the aggregate totals only are given here.

55 Surveys were sent out in 2002 to all surgeons and clinics listed in the HBIGDA membership directory. Fifteen responses were received, 13 from major surgeons and 2 from others. Of the 13 responses received from the 15 major surgeons, one survey was unusable, and 3 had correctable errors.

For surveys that were not directly usable, correspondence with the surgeons (or their office staff) permitted the correction of some surveys. As a result, 12 of 15 major surgeons, or 80%, provided usable data for this project. Two surveys were returned by surgeons who were not on the list of major surgeons. One of these provided MTF data for the study; one provided both MTF and FTM data.

The 14 valid surveys (a 25% usable response rate) represented 866 MTF primary surgeries performed by 10 surgeons, and 336 primary FTM surgeries (top surgery) performed by 10 surgeons. 7 of the 14 surgeons performed both MTF and FTM surgeries, 3 MTF only, and 4 FTM only. (Of the 12 major surgeons with usable surveys, 3 did MTF, 3 did FTM, and 6 did both.) Missing data was reconstructed and extrapolated, as described above, to arrive at a total annual run rate of extrapolated total primary surgeries. (See Table 1.)

4.2 Bottom Surgery Data

Data was also provided for FTM "bottom surgeries." One Ob/Gyn reported performing 3 hysterectomies and no mastectomies. (Most FTM transsexuals go to a regular Ob/Gyn for a hysterectomy, not to a transgender specialist.) 6 surgeons were known to perform metoidioplasties, 3 of which provided data totaling 21 surgeries, of which 20 were on US residents. 4 surgeons provided data about phalloplasties, and 5 others were believed to perform them. 49 phalloplasties were reported, of which 21 were on US residents. For purposes of this study, only those surgeons who perform significant numbers of *primary surgeries* were counted as major surgeons.

4.3 Run Rate

It is estimated that 95% of MTF patients who have SRS go to a major MTF surgeon, and 75% of FTM patients who have top surgery go to a major FTM surgeon. This difference is based on belief that it is more likely that an MTF will go to a major surgeon, because the MTF procedure is highly specialized. While a specialized chest surgery is seen by many as important, it is also more realistic for an FTM transsexual to get an ordinary mastectomy.

Many of the major surgeons have practices outside the US, and their reported surgeries included both US resident and nonresident patients. The surgeons estimated the percentage of their clients who were US residents. These percentages were combined. 624 of 866 MTF patients, or 72%, were US residents. 294 of 336 FTM patients, or 87%, were US residents. These percentages were combined with reconstructed data and used in the extrapolation process, to arrive at run rates for US residents.

These methods made it possible to arrive at a total counted number of primary surgeries in 2001, and a good estimate of the total costs for the primary surgery. (See table 1.) Cost data and analysis is presented in (Horton, 2006.)

Table 1 summarizes the totals based on the survey and the reconstruction techniques above. Totals are separated into Male-to-Female and Female-to-Male categories.

Surgical Run Rates	MTF	FTM	Total
Raw Number of Primary Surgeries counted	866	336	1202
Estimated Additional Surgeries (reconstructed)	79	39	118
Reconstructed Number Primary Surgeries by major surgeons	945	375	1320
Estimated Primary Surgeries by other surgeons	*50*	*125*	175
Extrapolated Total Primary Surgeries	995	500	1495
Percent of counted surgeries on US residents	74%	86%	77%
Primary Surgeries on US residents	**736**	**430**	**1166**

 Table 1: 2001 Surgical Run Rates

5. Incidence and Prevalence Analysis

With the knowledge of the annual run rate and incidence, and the assumption that the run rate is flat, the inherent prevalence of primary surgery (SRS) can be estimated.

5.1 Incidence of Primary Surgery

If the US run rate is 1166 surgeries/year (MTF+FTM) and the population of adult US residents was 281,421,906 in 2000, the incidence of SRS *per year* among adult US residents is about 1:241,000 (about 1:187,000 MTF and 1:333,000 FTM.) That is, about .0004% of the population has SRS each year.

5.2 Prevalence of Primary Surgery

Generally, the term *prevalence* is understood to represent the fraction of the population at risk currently being treated for a condition, and can be calculated by dividing the size of the group measured by service providers into a subset of the wider population.   These prevalence results are often quoted in other contexts, and are misinterpreted to represent the fraction of the entire population who is transsexual. (Conway, 2001) coins the term *inherent prevalence* to mean the fraction of the population that is transsexual, including those who haven't yet sought treatment, post-ops, and those who avoid formal treatment. Inherent prevalence can be calculated from the incidence and life expectancy.

Figure 1 illustrates the distinction between measuring prevalence from actively treated individuals and inherent prevalence, and how previous prevalence calculations fail to consider people who will be treated, people who have previously been treated, and people who will never be treated.
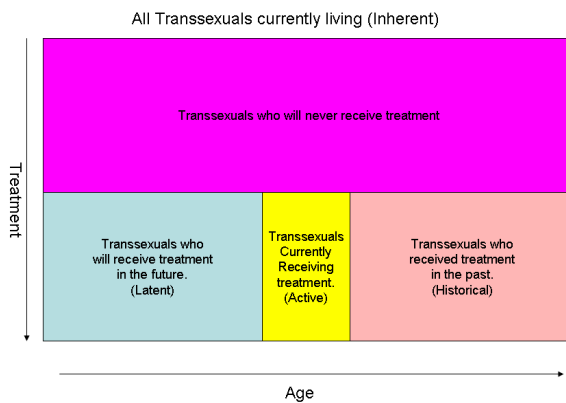

Figure 1: Prevalence vs Inherent Prevalence.

Previous studies have counted the "at risk population" to be those at least 15 years old. They have observed that most transsexuals seek treatment between 15 and about 35.   When using incidence to

calculate inherent prevalence, the age distribution of those being treated does not matter, as the result will be the same for any distribution. Because we are asking about the fraction of those *currently alive*, the key factor is life expectancy.

First, it is assumed the run rate will continue at the 2001 rate, and observe that a transsexual can have a primary SRS surgery only once in a lifetime, at any adult age. It is also assumed that life expectancies, as reported in the census based on sex, are accurate based on birth sex, and are not changed significantly by SRS. Using the previous incidence result that 1 in 187,000 people born male have SRS each year, this number can be multiplied by the male life expectancy (74.3 years.) This gives about 1 in 2500 as the number of birth males alive today who have had or will have SRS during some year in their lifetime. (See Table 2.)

Many more people have GID, or transsexualism, than wind up having primary surgery. For example, of 200 males with intense TS feelings, 120 may seek treatment, 100 may be diagnosed with GID and are counseled, 90 may receive hormones, 70 may transition, and only 60 may have SRS Each of these criteria would result in different prevalence results. For purposes of estimation, this study assumes the MTF ratios are as stated above, and also assumes that of 200 females with intense TS feelings, 120 seek treatment, 100 are diagnosed with GID and are counseled, 83 receive hormones, 83 transition, and 67 have primary surgery. These estimates are in line with previously published results and current empirical observations. The assumptions here are normalized at 100 GID diagnoses. The prevalence of intense TS feelings (transsexualism) may be twice as great as the prevalence of diagnosed GID.

Using the estimate that 60% of MTF transsexuals diagnosed with GID go on to have SRS, it follows that about 1 in 1500 birth males alive today has been or will be diagnosed as transsexual, and that 1 in 750 may actually be transsexual but not necessarily seek treatment. It is estimated that 67% of FTM transsexuals diagnosed with GID have primary surgery. The FTM and combined ratios can be calculated the same way, as shown in Table 2.

The inherent prevalence of SRS, for both genders combined, can be calculated as 1:3134; that is, about 1 in 3,100 US residents alive today have had or will have SRS at some time during their adult lifetime. US residential numbers are based on the 2000 US Census, eligibility is based on birth sex (e.g. those born male are the population eligible for MTF surgery.) Numbers should only be considered significant to 2 digits.

	MTF	FTM	Total
Primary Surgeries on US residents	736	430	1166
Number of US Residents	138,053,563	143,368,343	281,421,906
Incidence: Ratio of US Residents having Surgery in 2001: 1 in …	187,496	333,415	241,295
Years of Eligibility	74	80	77
Inherent Prevalence: Ratio having SRS in lifetime: 1 in …	2,524	4,183	3,134
Inherent Prevalence: Ratio of diagnosed GID: 1 in …	1,514	2,803	1,974
Inherent Prevalence: Ratio of transsexuals: 1 in …	757	1,401	987

Table 2: Inherent Prevalence of SRS and Transsexualism among US residents.

5.2 Frequency of FTM Bottom Surgery

Estimating the frequency of FTM bottom surgeries (hysterectomy, metoidioplasty, phalloplasty) is more difficult than primary surgery. The *primary surgery* concept does not apply to bottom surgeries. The estimates made here are based on interviews with a subject matter expert in the FTM community (Green, 2003,) and should be considered less precise than measured data. Any qualified surgeon may do hysterectomies, so they were impractical to count directly.

It was estimated that 50% of transitioning FTM transsexuals have a hysterectomy, 5% have a Metoidioplasty, and 6% have a Phalloplasty. This results in an estimated run rate of 250 hysterectomies, 25 metoidioplasties, and 30 phalloplasties during the calendar year 2001.

Based on an 80 year life expectancy of birth females, it follows that the incidence of Metoidioplasty was 1 in 6,660,000 birth females, and the inherent prevalence was 1 in 83,000. Similar results were calculated for Hysterectomy-Oophorectomy and Phalloplasty, as shown in Table 3 below. Numbers are significant to 2 digits.

Procedure	Frequency	Patients	2001 Incidence	Inherent Prevalence
Hysterectomy-Oophorectomy	50%	215	1:666,000 (.00015%)	1:8,300 (.012%)
Metoidioplasty	5%	22	1:6,660,000 (.000015%)	1:83,000 (.0012%)
Phalloplasty	6%	26	1:5,550,000 (.000018%)	1:69,000 (.0014%)

Table 3: FTM Bottom Surgery Prevalence Estimates

5.3 Incidence of Nonsurgical Treatment

Not every transsexual has primary surgery. Rather some transsexuals will transition (living full time in the new gender role,) may or may not have therapy, may or may not have HRT, and may or may not have surgery. A baseline was set for the fraction of those with GID diagnoses who have surgery, allowing the run rate of GID diagnoses to be calculated. By definition, 100% of those with GID diagnoses receive therapy. Based on experience and the published literature, estimates were made of the fraction of GID diagnoses who have HRT, and the fraction of people in the general population with strong transsexual feelings who seek treatment and receive a GID diagnosis. From these estimated fractions, the incidence of GID can be calculated, and from that number the incidences of therapy, of HRT, and of transsexualism in the general population can be calculated.

There were 736 MTF surgeries each year. If 60% of transsexuals diagnosed with GID have surgery, the GID diagnosis run rate that year was about 736 / 60%, or 1227, MTFs. Similarly, about 430 / 67%, , or 642, FTMs received GID diagnoses. These are also the approximate run rates of mental health therapy.

The next step was to estimate the rates of hormone usage among those who transition. For example, with an estimate that 90% of MTF GID diagnoses, and 83% of FTMs, receive hormones, the HRT run rates are 1364 MTF and 773 FTM. These calculations are summarized in Table 4.

Nonsurgical Prevalence Estimates	MTF	FTM	Total
Primary Surgeries on US residents	736	430	1,166
Est. % of GID having Primary Surgery	60%	67%	63%
New GID diagnoses each year	1,227	642	1,869
Est. % of GID having Therapy	100%	100%	100%
Patients in year 1 of therapy	1,227	642	1,869
Est. % of GID having HRT	90%	83%	88%
Patients in year 1 of HRT	1,104	533	1,637
Est. % of GID having HRT	90%	83%	88%

Table 4: Nonsurgical Frequency Rates

6. Margin of Error Limit Analysis

In arriving at the above best estimates, it was necessary to estimate values that were not directly measured. To better understand the margin for error, each of these estimates was examined, to assess the practical range of values. Boundaries were set for each estimate, beyond which the estimated value could not reasonably reach. For example, major surgeons who did not respond to the survey could not have performed fewer than zero primary surgeries, and could not reasonably have performed more such surgeries than the busiest surgeons in their field. Lower and upper bounds were set, referred to here as *minimum cost* and *maximum cost*. This permitted lower and upper bounds to be calculated for the resulting frequencies. The resulting bounds on prevalence are summarized in Table 5.

	Best Estimate			Minimum Cost			Maximum Cost		
	MTF	FTM	Total	MTF	FTM	Total	MTF	FTM	Total
Primary Surgeries on US residents	736	430	1,166	662	293	959	1,418	1,199	2,617
Incidence: Ratio of US Residents having Surgery in 2001: 1 in ...	187,496	333,415	241,295	208,698	489,245	293,607	97,392	119,529	107,539
Intrinsic Prevalence: Ratio having SRS in lifetime: 1 in ...	2,524	4,183	3,134	2,809	6,139	3,813	2,072	2,543	2,288
Intrinsic Prevalence: Ratio of GID: 1 in ...	1,514	2,803	1,974	2,247	4,911	3,050	207	509	297

Table 5: Limits of Run Rate and Prevalence

7. Comparison to Previous Studies

Previous studies have reported widely varying values for the prevalence of transsexualism. Many authors have commented that they believe they are underreporting prevalence, and methodologies have varied widely. The prevalence values have been widely cited, interpreted, and criticized in public literature. However, some analysis yields insight into prevalence, and especially incidence, in the general population. (Olyslager, 2007) contains a related analysis of prevalence, taking into account transsexuals who will some day be treated or will never be treated.

Most prior studies used a methodology of counting known transsexuals being treated over some period of time, divided into the total census population (often of persons over age 15.) Such studies actually capture incidence, because they miss transsexuals who have completed treatment, who have not yet been treated, or who have found another way to address their transsexualism. It is sometimes possible to calculate annual incidence, based on the stated prevalence result and the length of the study period. For example, (van Kestern, 1993) found an MTF prevalence of 1:11,900 over an 18 year interval, equivalent to an annual incidence of 1:214,000.

Some studies measured prevalence of GID diagnosis, some measured Hormone Therapy (HRT,) and some measured primary surgery. Empirical evidence shows that not all transsexuals with the GID diagnosis begin HRT, and an even smaller group completes surgery. One would expect higher incidence for reports measuring GID than for HRT, and higher for HRT than for primary surgery (SRS,) and indeed that is the case. Table 6 shows these calculations for 12 previous studies.

			Stated Prevalence					MTF Incidence			FTM Incidence		
Source	Location	Date	MTF	FTM	Years	Criterea	Population	PS	HRT	GID	PS	HRT	GID
Cuypere	Belgium	2006	12900	33800	21	PS	Age 15+	270,900			709,800		
Horton	US	2002	2500	4200	74	PS	All	190,000			333,000		
Conway	US	2001	2500		40	PS	Age 18-60	100,000					
Weitze/Osburg	Germany	1993	48000	104000	10	PS (Court)	Adults	480,000			1,040,000		
van Kestern	Netherlands	1993	11900	30400	18	HRT	Age 15+	315,000	214,200		804,706	547,200	
van Kestern	Netherlands	1988	18000	54000	14	HRT	Age 15+		252,000			756,000	
Tsoi	Singapore	1988	2900	8300	16	GID	All			46,400			132,800
Tsoi	Singapore	1977	16000		6	GID	Age 15+			96,000			
Walinder	Sweden	1971	1500000	1500000	3	PS (Court)	Age 15+	500,000			500,000		
Hoeniig/Kenna	UK (part)	1968	34000	108000	11	GID	Age 15+			374,000			1,188,000
Pauly	US	1968	100000	400000	1	GID	All			100,000			400,000
Walinder	Sweden	1967	37000	103000	2	GID	Age 15+			74,000			206,000

Table 6: Incidence of 12 Studies

Figures 2 and 3 show incidence for 12 studies, grouped by GID, HRT, and SRS criteria, and associated trend lines. Trend lines generally show an increase in incidence rates over time, probably reflecting increased awareness, acceptance, and availability of services. It seems that, for the most part, the incidence rates from the studies are reasonably consistent within the same criteria group.
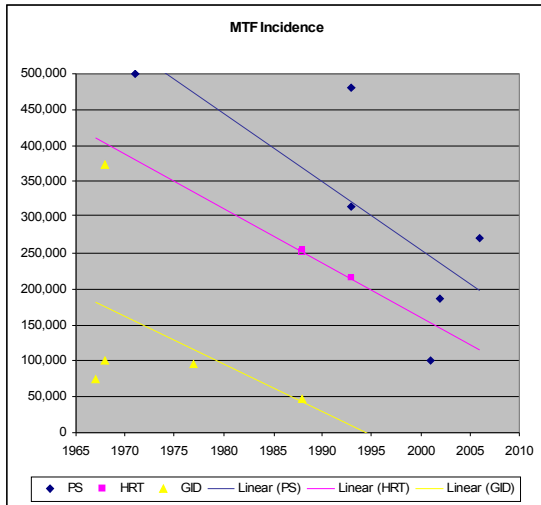

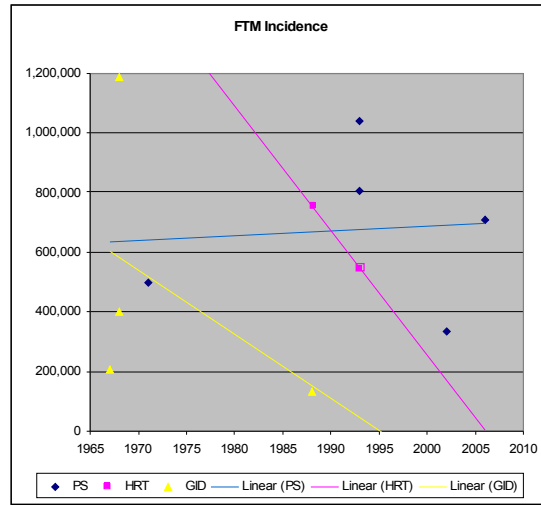**Figure 2: MTF Annual Incidence in 12 studies**

Figure 3: FTM Annual Incidence in 12 studies

Differences between reported prevalence rates can be partially explained by considering the criteria, the incidence, and the year of the study. The lowest reported MTF prevalence, 1:100,000 (Pauly, 1968) and the highest, 1:500 (Conway, 2001) represent an incidence of 1:100,000 for diagnosed GID in 1968, and of 1:20,000 for inherent prevalence of GID (diagnosed or not,) which are 33 years apart. Both of these extremes are based on estimates; the measured MTF results fall into an even closer range. More recent studies report higher incidences, presumably reflecting greater acceptance of the process and more available treatments. FTM incidence rates vary more widely, and do not trend as cleanly, but even so, all results are within an order of magnitude.

8. Conclusion

The number of US residents undergoing primary SRS in the year 2001 (run rate) was 1170 (740 Male to Female or MTF and 430 Female to Male or FTM.) The incidence of SRS per year among US residents was 1: 240,000 (1:190,000 MTF and 330,000 FTM, a ratio of 1.75:1.) It follows that the inherent prevalence of those who have had or will have SRS in their lifetime was about 1:3,100 (1:2500 MTF and 1:4,200 FTM.) Not all have SRS: the inherent prevalence of diagnosed GID is estimated as 1:2000 (1:1500 MTF and 1:2800 FTM, a ratio of 1.9:1.) The inherent prevalence of transsexualism (including those who are not diagnosed) is estimated as 1:1000 (1:750 MTF and 1:1400 FTM.)

It is possible to categorize many previous prevalence results by the event being studied (GID diagnosis, hormones, or surgery) and to calculate incidence of the event from stated prevalence results. Comparing the derived incidence results, most results fall into a reasonably consistent range, showing that incidence rates of treatments have increased over several decades as understanding of transsexualism and availability of treatment has improved.

9. Acknowledgements

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