

The Cost of Transgender Health Benefits

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ABSTRACT

This paper measures the frequency and cost of Transgender Health Benefits (THBs) for US residents. It reports on a survey of surgeons who do Sex Reassignment Surgery (SRS) procedures, and reports the number of US residents undergoing SRS in the year 2001. The survey measured the average cost for MTF SRS and for FTM primary surgery (top surgery) in 2001. This cost is compared to the number of insured US residents in the 2000 US Census. Nonsurgical costs are calculated empirically, with margins of error. Total THB cost, and cost per insured, are estimated. Prevalence of SRS among US residents is calculated.

Keywords

Transgender Health Benefits Cost, Sex Reassignment Surgery Cost, Hormone Cost, Prevalence, Domestic Partner Benefits Cost, Transgender Insurance Cost, Transsexual Insurance Cost.

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1. Introduction

Many Health Care benefits policies contain an exclusion stating that any benefits related to sex change surgeryⁱ are excluded from the coverage. Initially, this ban was justified by considering the procedures "Experimental" or "Cosmetic." After over 20 years of routine health care for transsexual people, benefits are now routinely excluded as "Too expensive." Costs as high as US \$75,000 per person are cited as justification for exclusion. Transgender activists counter that so few people go through the process that the average cost per insured is very low.

What would it really cost to provide full or partial medical benefits to transsexual workers? How many people do go through this process each year? This study addresses these questions, by measuring the annual number of surgeries (*run rate*) on US residents, measuring the cost, estimating the nonsurgical cost, and then developing a mathematical model of total THB cost.

2. Background

A person who is Transgender is someone who transgresses gender norms. This can include crossdressers, drag queens, and transsexuals, among others. A very small minority of transgendered individuals feel so strongly about their self-identification with the opposite sex that they desire to permanently live in that gender role, often with medical intervention; these few individuals are called transsexuals. Transsexual people may transitionⁱⁱ in either direction: those who begin as males and become females are referred to as Male-to-Female (MTF,) and those who begin as females and become males are referred to as Female-to-Male (FTM.) It is the medical costs associated with these individuals that this study is concerned with.

A transsexual person usually begins by seeking the help of a mental health professional (therapist) who may confirm the finding with a diagnosis of Gender Identity Disorder (GID.) The GID diagnosis is a standard from the Diagnostic and Statistical Manual (DSM-IV,) and is generally the beginning of medical treatment as a transsexual.

Once a GID diagnosis is made, a very strict treatment process must be followed. This process is based on a document called the Harry Benjamin Standards of Care (SOC,) published by the Harry Benjamin International Gender Dysphoria Society (HBI-GIDA, 2001.) The SOC is widely accepted by the medical profession as the standard treatment for transsexualism, and is designed to ensure that only those who are truly transsexual undergo medical intervention.

Using the SOC process, the following steps are followed for treatment of GID:

1. A therapist skilled in the field diagnoses GID.
2. After determining readiness, the therapist writes a letter of recommendation to a qualified Medical Doctor for appropriate hormone therapy (HRT.)
3. The patient makes regular visits to the MD to prescribe and monitor progression of hormone therapy.
4. HRT will take about 2 years to be fully effective. After this period, a lifelong maintenance HRT (at a lower dosage for MTF patients) commences.
5. The patient works with the therapist to work on issues and plan the transition to living full time in the opposite gender role.
6. MTF transsexuals have electrolysis to remove the beard. Sometimes electrolysis is required for FTM transsexuals in the genital area or on a forearm donor site.

7. The patient works with the therapist to plan the transition, living full time in the new gender role. This will involve considerable planning and working with the family, the workplace, and all other aspects of the person's life.
8. The transition occurs, marking the beginning of a Real Life Experience (RLE) of at least one year after transitioning to the new gender.
9. FTM transsexuals have chest reconstruction surgery (mastectomy with chest contouring.)
10. After successful completion of at least 1 year of RLE, the patient qualifies for final evaluation.
11. If the therapist, following the SOC, believes the patient can be helped by genital surgery, s/he will write a letter of recommendation to the surgeon.
12. A second therapist or psychiatrist must also examine the patient and write a letter of recommendation. (One of the two letters must come from a person who holds a Doctorate degree, e.g. an MD in Psychiatry or a Ph.D. in Clinical Psychology.)
13. The two letters permit the patient to make an appointment with a surgeon. The patient must prepay a substantial deposit on the surgical fee to receive a surgery date.
14. The patient travels to the surgeon's location (often internationally) and undergoes surgery. (MTF patients usually have a single surgery; FTM patients often have 2 or 3 separate surgeries with different specialists.)
15. After completion of surgery, the surgeon writes a letter certifying the completion of genital surgery on the patient.
16. The patient can now use the surgery letter to update the gender marker on her/his legal documentation (drivers license, birth certificate, Social Security, etc, depending on state laws.)
17. With updated documentation, the patient can now live a normal life.

The process takes at least 1 year, depending on circumstances. During this process, the patient incurs many medical costs, often not covered by health insurance.

1. Office visits to the therapist. These may be covered by a Mental Health plan, or may be excluded from some plans.
2. Office visits to the MD for hormones and lab tests. These are usually billed as standard office visits, often quarterly. Blood work to monitor hormone levels occur at least once a year.
3. Pharmaceutical costs for hormones. These are the same US FDA approved drugs used for Hormone Replacement Therapy (HRT, estrogen and progesterone), blood pressure (spironolactone) or testosterone (hormone imbalance.)
4. Electrolysis costs (MTF only.) The electrolysis industry is never reimbursed by insurance, and is considered cosmetic by the US tax organization (IRS.) For this reason, we do not include electrolysis costs in this study. The patient must, nonetheless, pay for hundreds of hours of electrolysis, costing \$50-\$100/hour.
5. The surgery itself, which must be prepaid.

3. Surgical Procedures

3.1 Male-to-Female

Surgical procedures for the Male-to-Female transsexual patient include medically necessary procedures and, optionally, cosmetic procedures.

Male-to-Female medically necessary procedures usually include:

- Orchidectomy (removal of the testicles,)
- Penectomy (removal of the tissue inside the penis,)
- Vaginaplasty (creation of a vagina, using the skin of the penis as the lining of the vagina,)
- Labiaplasty (formation of the labia from the scrotal tissue.)

Surgical techniques vary, but these four procedures are usually performed at the same time, and are collectively known as Sex Reassignment Surgery (SRS.) These procedures are required to obtain a surgical letter, needed to authorize change of legal documents.

Cosmetic procedures for the Male-to-Female may include breast augmentation (implants,) tracheal shave (to remove the Adam's apple,) facial feminization surgery (to reshape the bones and hairline in the face.) There is currently no successful surgery available to change the voice. The patient may need to consult with a speech therapist to achieve a suitable female voice.

3.2 Female-to-Male

Female-to-Male medically necessary procedures may include:

- Mastectomy (Top Surgery, often performed by a specialist who will create a normal male chest,)
- Hysterectomy and Oophorectomy (removal of the uterus and ovaries,)
- Metoidioplasty (clitoral release, the severing of a ligament to reposition the clitoris as a small penis,)
- Phalloplasty (formation of a penis by skin grafting, often from the forearm or abdomen.)

Of these procedures, Mastectomy is required, Hysterectomy is sometimes indicated, and either the Metoidioplasty or Phalloplasty (almost never both) is occasionally performed. The results of the Metoidioplasty or Phalloplasty are, with current surgical techniques, sometimes unsatisfactory, and the vast majority of FTM patients choose, for medical or aesthetic reasons, not to undergo either procedure. The surgeries are usually performed by specialists in the respective procedures.

4. Cost Concerns

For an individual patient, these costs can be a hardship. If they are covered by health insurance, the monthly premium costs and co-pays are significant. Many patients pay premiums and must also pay the full cost of their medical needs, because their insurance plan excludes coverage for anything related to transsexualism.

Employers and Insurers face rapidly escalating medical costs. As employees pay an increasing share of these costs, they voice their concerns about high costs. As a result, there are increased efforts to keep costs down, and any proposal to add coverage is carefully scrutinized. Insurers have expressed concern that, if medical benefits are covered, transsexual workers will be attracted to companies offering the benefits, and the usage will skyrocket. (This is sometimes called "the magnet effect.")

When an insurance claim is submitted, the approval process usually includes verification that the treatment is eligible for coverage. Procedures usually must be considered "medically necessary." There are varying standards for what constitutes medical necessityⁱⁱⁱ but the insurance administrator, not the doctor, usually makes the decision. Even when a health plan does not contain a specific exclusion of transsexual benefits, the insurer often denies the claim, stating that it is not medically necessary. The HBGDA SOC states "Such a therapeutic regimen, when prescribed or recommended by qualified practitioners, is medically indicated and medically necessary."

A related health benefits issue is the provision of Domestic Partner Benefits (DPBs.) These benefits are similar to coverage of a spouse or dependent, and are generally seen as a Diversity benefit to show support of unmarried couples, especially gay and lesbian couples who are not legally able to marry. DPBs extend benefits to same sex couples that are similar to those extended to opposite-sex couples, under the principle that all employees performing equal work should receive equal compensation, including equal benefits. Domestic Partner Benefits carry a cost, estimated at an increase of 1%. Even with this additional cost, 42% of employers surveyed by the Human Rights Campaign offer DPBs. (HRC, 2004)

Similarly, denial of mental health, hormonal, and surgical benefits to transsexuals, when these same procedures are covered for other workers, represents a different level of coverage for transgendered workers. This paper will show that the overall cost of providing Transgender Health Benefits is considerably less than the cost of providing Domestic Partner Benefits.

5. Previous Work

“The question is often asked: how many transsexuals are there?” This is not an easy question to answer, because sex reassignment is usually quietly handled. Many estimates of prevalence have been made. Most are based on experience rather than data.

The costs charged by surgeons are well known. Prices of well known surgeons can be found on their web sites, or the web sites of transgender resources. They range from \$4,500 to \$26,000 for MTF surgeries, and from \$4,000 to \$60,000^{iv} for FTM surgeries.

The cost of THB coverage will depend on both the prevalence and the average cost per patient. Estimates of cost have primarily come from the insurance industry. With little actuarial data to base estimates on, estimates have been markedly conservative.

5.1 Prevalence of SRS

Prevalence is defined as “the number of people in a given population affected with a particular disease or condition at a given time”. The prevalence of SRS is less well known. Many estimates have been made, few based on experimental data. Estimates often focus on the prevalence of GID: “What fraction of the population is transsexual?” or of SRS: “What fraction of the population has SRS at some point in their lifetime?”

The DSM-IV (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." Conway (2002) stated that these figures were based on (Walinder, 1967) in Sweden.

The Janus Study (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.

Another study, (van Kesteren, 1996,) found the prevalence of transsexualism in the Netherlands to be 1:11,900 (MTF) and 1:30,400 (FTM.) This is based on the number of patients receiving treatment in the country.

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

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 1:2500 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 lifetime prevalence of SRS at 1:1333 to 1:1000, that is, as many as 1:1000 people will have SRS sometime during their lives.

Others have made estimates, based upon personal experience. Conway summarizes many of these estimates. These include:

- ❖ Number of Hijra 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.
- ❖ Katoeyos in Thailand, estimated at 1:167.

5.2. Experience with Employers

Some employers have decided to include full THB coverage for their employees, including surgery. We have a few years of experience to see what their costs were.

Lucent

Lucent provided coverage beginning in 2000. Originally with about 150,000 employees, Lucent has downsized and spun off most of its work force, and has about 33,000 employees as of 12/31/2003. There has been much publicity of Lucent's benefits in the transgender community. During this interval, Lucent paid for one MTF surgery in 2000 (Lucent's 80% share was "just over \$11,000") and one MTF surgery in 2003 (Lucent's share was \$8290.) A third Lucent employee had MTF SRS in 2002 and chose to fund the surgery herself rather than deal with insurance process.

Avaya

Avaya is a 2001 Lucent spin-off with about 40,000 employees. There have been no claims for surgery during the period through 2003.

San Francisco

The City of San Francisco published a paper (SF HRC, 1997) stating the case for THBs for City employees. They estimated costs for surgery from \$7,500 to \$36,000 for MTF transsexuals, and \$4,000 to \$75,000 for the combination of FTM surgeries, including surgeon, anesthesia, and hospitalization fees. Hormone therapy was estimated to average \$250/year for either sex. They stated that of 27,000 city employees, 12 were known to be transsexual.

In 2001, San Francisco added restricted THBs for city employees. At the time, they estimated that 17 of their 37,000 employees were transgender, and that 35 employees would use the benefit in its first year. (No explanation is given for this discrepancy.) (Dozetos, 2001.) Employees had to have 1 year of city employment to be eligible, and had a \$50,000 lifetime benefit cap. They set the additional cost at \$1.70/month/employee, or about \$750,000 per year total cost to the city. Because of the culture of acceptance in the San Francisco area, there is thought to be a higher density of transgendered residents in the city than in other large cities in the United States. If ever a claim could be made that an employer would be a magnet for transsexuals seeking surgery, San Francisco would be expected to see the effect.

In 2004, actual claim data was made available. In 3 years, there were 7 claims for surgery, totaling \$150,000, or \$50,000/year, not including costs for therapy or hormones. The city has lowered its charge to \$.85/month/employee, raised its lifetime cap to \$75,000 removed the 1 year employment requirement, and offered the benefit on every health plan offered to its 30,000 employees. One can calculate that \$.85 per month for 30,000 employees adds up to about \$300,000 per year to fund the benefits. The anticipated payout may increase from the initial experience, due to the reduced waiting period and increased cap. (Green, 2004.)

6. Methodology

The goal of this study was to create a credible estimate of the total cost of THBs per insured person. Surgical costs were measured by counting the total number of surgeries in one year and calculating the average cost per surgery. Nonsurgical costs were estimated by assuming standard treatments and standard costs for these treatments, then multiplying by the estimated number of patients undergoing each treatment. Total costs were summed, and then divided by the number of insured US residents.

Persons desiring irreversible surgical procedures who value the quality of the result will usually go to a surgeon who has performed the procedure many times previously. It is known within the transgender community that the vast majority of transsexuals seeking surgery go to one of a relatively short list of surgeons for their final surgery. Most surgeons who routinely practice this type of surgery belong to HBIGDA. In the fall of 2001, there were 43 individual surgeons and 12 clinics that belonged to HBIGDA. Of these, by reputation, the vast majority of US transsexuals went to one of 15 surgeons. (Some of these surgeons are in the US, and many of them are not.) This study refers to these 15 surgeons as *major surgeons*.^v

The author sent a survey in 2002 to all surgeons who were listed as members in HBIGDA. This survey inquired about all surgeries performed by the specific surgeon in the calendar year 2001. Questions were designed to support calculation of the *run rate* (total number of procedures performed annually), and the average cost per patient. The percentage of patients who are US residents was requested. The data was adjusted to apply only to US residents, and compared to available US census data. The percentage of the US population who undergo SRS each year (*prevalence of SRS*) was then calculated.

SRS is a once-in-a-lifetime event for any given transsexual patient. It was important to count each patient exactly once, in order to accurately estimate the run rate. To this end, we defined the concept of a *primary surgery*. This is a surgery that can occur only once in 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 must be performed for SRS to be considered complete.

For MTF patients, we defined the primary surgery to be the penectomy (removal of the penis.) This procedure is always accompanied by a vaginaplasty, but in case of complications, a second vaginaplasty may be indicated. Only one penectomy is possible for any one patient. The cost of the MTF primary surgery measured was the cost of penectomy, orchidectomy, vaginaplasty, and labiaplasty combined, and included surgical, hospital, and anesthesiologist fees.

For FTM patients, we defined the primary surgery to be the mastectomy. The various *bottom surgeries* (hysterectomy, metoidioplasty, phalloplasty) are not always indicated, but almost every FTM patient will undergo a single top surgery. The cost of the FTM primary surgery measured was the cost of the mastectomy and chest reconstruction, and included surgical, hospital, and anesthesiologist fees.

The specific questions are shown in Appendix A. They may be summarized as follows:

1. How many MTF primary surgeries did you do in 2001?
2. What was the total cost of the surgeries?
3. What fraction of the surgeries was done on US residents?
4. How many FTM primary surgeries did you do in 2001?
5. What was the total cost of the surgeries?
6. What fraction of the surgeries was done on US residents?

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.

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After tabulating the data, estimates for the major surgeons who did not respond were made, based on other available information. For example, many surgeons' prices are well known or on their web sites. Run rates were estimated by former patients who interacted with the staff for the 1-2 week period during their surgery.

Combining the surgical data with US Census data (Census, 2000,) it is possible to estimate the fraction of the US population who had SRS in the year 2001, and the average surgical cost for primary procedures.

Female-to-Male "bottom surgeries" (hysterectomy, metoidioplasty, phalloplasty) were estimated. The average prices for each procedure were calculated from public and survey data. By interviewing a subject matter expert, estimates were made of the fraction of FTMs who undergo each procedure. The average cost of each procedure was applied to the appropriate fraction of the total FTM population.

Additional (nonsurgical) costs can be estimated by applying standard rates. For example, the drug costs for hormone therapy, and the cost for office visits to therapists and physicians are easily estimated. Costs and prevalence for FTM bottom surgeries are more difficult to estimate, but ranges can be used to place bounds around the total costs.

Total costs can then be estimated by adding (separately for MTF and FTM populations)

1. Total primary surgical costs
2. Total additional surgical costs
3. Total mental health costs
4. Total hormone costs
5. Total doctor's office visit costs in support of hormones

These costs can be divided by the run rates for MTF and FTM primary surgeries, resulting in average cost per surgery.

Nonsurgical per-patient costs were then determined using known regimens and costs. Since many transsexuals have therapy or hormones without proceeding to surgery, the run rates for each procedure will be different. Nonsurgical run rates could be estimated in proportion to the surgical run rates. The run rates and per-patient costs for each type of treatment (mental health therapy, hormones, doctor's office visits in support of hormones, surgery) can be combined to estimate the total THB cost for US residents. The costs can be divided by the number of insured US residents to determine the cost per insured.

The range of error in this type of study is difficult to measure. The approach used here is to place boundaries around each estimate, using the most optimistic and most pessimistic possible assumptions. Ranges can then be calculated using these boundaries, to establish a range from the minimum cost scenario to the maximum cost scenario. The results of these calculations shows that the actual value for each cost lies somewhere between the two calculated extremes, and that the values calculated using the best estimates available are between these two extremes.

7. 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.

7.1 Raw 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 HBIQDA membership directory. Responses were received from 15 surgeons. Of the 15 major surgeons, usable responses were received from 12, including 3 surveys from major surgeons with correctable errors. One major surgeon did not respond, one responded with an unusable survey, and one declined to participate.

The correspondence with the surgeons whose surveys contained errors (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 surgeries performed by 10 surgeons, and 336 primary FTM surgeries (top surgery or mastectomy) 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 do MTF, 3 do FTM, and 6 do both.)

Partial data was also provided for FTM "bottom surgeries." One Ob/Gyn surgeon (the "Other FTM-only" surgeon) 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 are known to perform metoidioplasties, 3 providing data totaling 15 surgeries on US residents. 4 surgeons provided data about phalloplasties, and 5 others are believed to perform them. For purposes of this study, only those who perform significant numbers of primary surgeries were counted as major surgeons.

Dollar figures given were incomplete. Because some patient counts did not have costs attached, this data required reconstruction to be useful. Raw MTF dollar figures for primary surgeries averaged \$7,877, representing 471 patients. Raw FTM dollar figures averaged \$13,027, representing 112 patients. For bottom surgeries on US residents, 16 metoidioplasties cost an average of \$10,481, and 10 phalloplasties on US residents cost an average of \$23,743,

The surgeons estimated the percentage of their clients who were US residents. 624 of 866 MTF patients, or 72%, were US residents. 294 of 336 FTM patients, or 87%, were US residents.

| Number of Surveys | Specialties of Surgeons | | | Total | Resp Rate |
|----------------------------|-------------------------|-----|------|-------|-----------|
| | MTF | FTM | Both | | |
| Returned by Major Surgeons | 3 | 3 | 6 | 12 | 80% |
| Sent to Major Surgeons | 4 | 5 | 6 | 15 | |
| Returned by Other Surgeons | 0 | 1 | 1 | 2 | |
| Sent to Other Surgeons | | | | 40 | |
| Returned (Total) | 3 | 4 | 7 | 14 | |
| Sent (Total) | | | | 55 | 25% |

Table 1: Number of Surveys Sent and Returned

7.2 Reconstructed Surgical Data

In informal interviews of transgendered US residents considering surgery, and of subject matter experts, the same surgeons names come up repeatedly. We therefore believe that the major surgeons account for nearly all the surgeries performed on US residents. We estimate that 95% of MTF patients go to a major MTF surgeon, and 75% of FTM patients go to a major FTM surgeon. It is believed to be 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 possible for an FTM transsexual to get an ordinary mastectomy.

In some cases, surveys were returned but incorrect or incomplete. For major surgeons, we filled in the blanks with estimates believed to be accurate. Methods used to correct or complete surveys include:

1. Asking the surgeon or their office staff to clarify the data.
2. Calculating a total cost by multiplying the cost of the procedure and the number of patients.
3. Using published costs from the surgeon's web page.
4. Percentages of US Residents were filled in based on average percentage of other surgeons.
5. Major surgeons who did not provide data were estimated based on their published price and the estimates of volume by former patients.
6. Other surgeons who did not respond were considered part of the extrapolated percentage that are not included in the measured data.

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.

Multiplying by the percentage of US residents gives a good estimate of the total number and costs of primary surgeries for US residents. Dividing by the extrapolation percentage (95% and 75%) gives an estimate of the total volume and cost of primary surgeries.

Including costs for FTM bottom surgeries (hysterectomy, metoidioplasty, phalloplasty) is more difficult. The estimates made here are based on interviews with a subject matter expert in the FTM community, and should be considered less precise than measured data. We know how much the bottom surgeons charge, but we can only estimate how many FTM transsexuals choose the different bottom surgeries. Also, any qualified surgeon may do hysterectomies, so they are impractical to count directly. We do know, however, the actuarial costs for hysterectomies, and we can estimate the fraction of FTM patients undergoing chest surgery who also undergo the various bottom surgeries.

Subject matter experts estimate that 50% have a hysterectomy (at average cost of about \$15,000,) 5% have a Metoidioplasty (averaging about \$7,400) and 6% have a Phalloplasty (averaging about \$20,000.) This results in an estimate of 250 hysterectomies totaling \$3,750,000, 25 metoidioplasties totaling \$185,000, and 30 phalloplasties totaling \$600,000, for a total cost of \$4,535,000 or about \$9,100 per FTM transsexual.

The Table 2 summarizes the reconstructed totals based on the survey and the reconstruction techniques above. Totals are separated into Male-to-Female and Female-to-Male categories. (Note: numbers should only be considered significant to 2 digits.)

| Surgical Data | MTF | FTM | Total |
|--|------------|------------|--------------|
| Raw Number Primary Surgeries counted | 1015 | 375 | 1390 |
| Estimated Primary Surgeries not counted | 53 | 125 | 178 |
| Extrapolated Total Primary Surgeries | 1068 | 500 | 1568 |
| Total Cost of Primary Surgeries (millions) | \$11.43 | \$4.25 | \$15.69 |

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| | | | |
|--|-----------------|-----------------|-----------------|
| Cost of additional surgeries (FtM bottom surgeries, millions.) | \$0.00 | \$4.72 | \$4.72 |
| Total Cost of All Surgeries (millions) | \$11.43 | \$8.97 | \$20.41 |
| Average cost per Surgery | \$10,702 | \$17,944 | \$13,010 |
| Percent of counted surgeries on US residents | 76% | 86% | 78% |
| Number of Primary Surgeries on US residents | 807 | 430 | 1237 |

Table 2: 2001 Surgical Frequencies and Costs

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.)

| US 2000 Census Data | Males | Females | Total |
|--|-------------------|-------------------|--------------------|
| Number of US residents eligible for surgery (between 18 and 65.) | 86,584,740 | 87,556,000 | 174,140,740 |
| Percent of US residents with health insurance | 81.5% | 81.5% | 81.5% |
| Number of eligible US residents with insurance | 70,566,563 | 71,358,140 | 141,924,703 |
| Ratio of US Residents having Surgery in 2001: 1 in ... | 107,279 | 203,772 | 140,802 |
| Ratio having SRS in 47 year adulthood: 1 in ... | 2,283 | 4,336 | 2,996 |

Table 3: US 2000 Census Data

The data here shows that the run rate of SRS among US residents in 2001 was about 800 MTF and 430 FTM, for a total of 1,230. The average cost was about \$10,700 for MTF patients and \$17,900 for FTM patients, with a weighted average of about \$13,000 per patient. If all of these patients are covered by insurance, this places the prevalence of SRS per year at 1:142,000 (about 1:107,000 MTF and 1:204,000 FTM.) About 1 in 3,000 US residents will have SRS at some time during their adult lifetime.

8. Nonsurgical Costs

If we include nonsurgical treatment costs, we can create a more complete picture of total costs for THBs. These nonsurgical costs include mental health, hormones, and doctor office visits and lab tests in support of hormones. According to (SOC) these treatments are considered medically necessary by HBGDA.

We do not consider the costs of cosmetic treatments. Cosmetic treatments include electrolysis, breast augmentation surgery, tracheal shave, facial feminization surgery, and similar treatments.

The approach taken here is to build on the surgical data in the previous section and the known cost per patient of standard nonsurgical treatment. If we estimate the fraction of transsexuals who have SRS, and we know the SRS run rate, we can estimate the prevalence of GID. If we then estimate the fraction of those with GID who use each nonsurgical treatment, we can determine the run rate for these treatments. Combining the run rates with the cost of treatment of a typical patient, we can estimate the total cost.

8.1 Frequency of Nonsurgical Treatment

Estimates of costs of the nonsurgical treatments can be made based on well known costs of typical treatments. Since not all transsexuals need every treatment, we can estimate total volume based on assumptions about treatment rates.

We begin with the assumption that not every transsexual has surgery, but rather some who have Gender Identity Disorder will transition to living full time in the new gender role, may or may not have therapy,

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may or may not have HRT, and may or may not have surgery. Since those who do not transition cannot have surgery, we consider the THB needs of the population who do transition. We estimate the fraction of those who transition that have therapy, that have HRT, and that have surgery. By knowing the numbers who have surgery and the fractions of those who transition have therapy, HRT, and surgery, we can calculate the number who transition, and from that number we can calculate the number who have therapy and who have HRT.

We first estimate the fraction of transsexuals who transition that do have the surgery (we estimate 20% MTF and 80% FTM^{vi}.) Then we extrapolate from the number of surgeries (807 surgeries is 30% of 2690 transitions, for example.) Knowing the number of transsexuals, we can then estimate the rates of therapy and hormone usage. (Assuming 90% of MTFs who transition have therapy, 90% of 2690 is 2421 that have therapy.) These percentage estimates are based on empirical observations by subject matter experts, but not on scientifically collected data.

This is summarized in Table 4. If the percentage estimates are accurate, there are about 4,573 people who transition each year, and about 85% of them, or 3,887, will begin mental health therapy each year. Similarly, 89%, or 4,070, will begin HRT each year, requiring both hormones and doctor’s office visits to monitor their usage.

| | MTF | FTM | Total |
|--|------|-----|-------|
| Number of Surgeries each year | 807 | 430 | 1237 |
| Percentage of Transsexuals having Primary Surgery | 20% | 80% | 27% |
| Number of Transsexuals Transitioning each year | 4035 | 537 | 4573 |
| Percentage of Transsexuals having Therapy | 90% | 50% | 85% |
| Percentage of Transsexuals having HRT | 90% | 80% | 89% |

Table 4: Nonsurgical Cost Estimates

8.2 Mental Health Therapy

A typical patient will begin the process with therapy from a mental health provider. Today’s transsexual usually already understands the need to transition, permitting the therapist to focus on practical issues. Hormones are often prescribed in the first few visits, and the course of therapy typically lasts one year. We assume an average patient will undergo minimal therapy prior to transition and spend one year from transition to surgery (in accordance with the one year Real Life Experience described in the SOC.) Patients have a wide range of needs, ranging from 2 or 3 sessions (for someone who has already transitioned and is functioning well in their new gender role) to as many as 20 sessions over the course of a full year. We assume a rate of \$125/hour for 4 clinical sessions per year, plus group sessions or support groups totaling \$250. A second evaluation for the second letter required for SRS is estimated at a negotiated group rate of \$150. Many patients complete the program in a year, but we add an additional 3 months of therapy (a total of 15 months) to represent those who take longer. This results in a total treatment cost at \$1,088 per patient.

If 90% of the MTF patients and 50% of the FTM patients transitioning in the USA each year seek therapy, averaging 1.25 years of treatment, there will be about 3,900 patients in therapy, at a total cost of \$3.51 million, or \$.03 per insured.

| | MTF | FTM | Total |
|--|-------|-------|-------|
| Cost of Therapy per session (assume out of network) | \$125 | \$125 | \$125 |

| | | | |
|---|---------|---------|---------|
| Number of sessions per year per patient | 4 | 4 | 4 |
| Additional Therapy cost/year (group sessions) | \$250 | \$250 | \$250 |
| Second evaluation for SRS letter | \$150 | \$150 | \$150 |
| Therapy cost beyond first year | \$188 | \$188 | \$188 |
| Total cost of Therapy per patient | \$1,088 | \$1,088 | \$1,088 |
| Number of patients in year 1 of therapy | 3,632 | 269 | 3,900 |
| Total Therapy cost (millions) | \$3.95 | \$0.29 | \$4.24 |

Table 5: Mental Health Therapy Cost

As shown by Table 5, we can estimate that about 3,900 patients enter therapy for GID each year, costing an average of \$1,088 each. The total expense for US residents for GID therapy is therefore about \$4.24 million each year.

8.3 Hormones

A typical patient will begin hormones on a low dose, gradually increasing the dose to a maximum level in preparation for surgery. After surgery, the hormone dose is reduced to a low maintenance level, which may continue for life. We assume 2 years of hormones before surgery, with years 3 and on having the maintenance level. The regimens are different for MTF and FTM patients.

MTF patients will take estrogen in increasing doses, an anti-androgen in steady or increasing doses, and optionally may take a progesterone. We assume a typical path based on Premarin, Spironolactone, and Prometrium. In the first year, the Premarin dose gradually increases from .625 mg/day to 3.75 mg/day, the dosage of Spironolactone remains steady at 100 mg/day, for a total cost of \$882^{vii}. In the second year, we assume 5 mg/day of Premarin, 100 mg/day of Spironolactone, and 200 mg/day of Prometrium, costing a total of \$2,376 .

MTF patients who have completed surgery no longer require large doses of estrogen or anti-androgen. MTF patients who choose not to have surgery will usually reduce their dosage after 2 years, because the desirable changes from hormones occur during the first 2 years. In either case, a lower lifetime maintenance level of hormones is typical. In years 3 and on, we assume a maintenance dose of 1.25 mg of Premarin, costing \$382 .

FTM patients are assumed to have a simpler regimen of 1.0 to 2.0 cc of injectable Depo-Testosterone every 2 weeks, costing about \$229/year. We assume this is a constant cost and does not change over the lifetime of the patient.

Transsexuals usually transition as adults. If we assume the age of transition may range from 18 to 65, there are 47 possible years for the transition to occur, and maintenance costs will begin in year 3 of the transition (age 20 to 65) and continue to age 65. (After age 65, we assume Medicare is the primary insurer, so we do not consider patients over 65 here.) If we assume the 3,632 patients who begin HRT each year are evenly distributed from age 18 to 65, a 47 year span, about 1/47 will be age 18, 1/47 will be age 19, etc. After 2 years of transition HRT, those in maintenance will range from age 20 through age 65. Thus, there will be about 1/47, or 77 of the patients age 20 in maintenance, 154 age 21, 231 age 22, and so on up to 3,465 patients age 65. The total number on maintenance therapy in a given year can be calculated as the area of a triangle: $45 \times 46 / 2 = 1035$, times the 77 who transition annually at each age. This works out to about 79,980 patients who are in maintenance HRT at any time, assuming 47 years of transsexuals entering the system. (In practice, the current number is probably smaller because SRS has only become routine in the last 20 years.)

We consider the transitional (years 1 and 2) and maintenance (years 3 and up) costs separately. Insurance plans may or may not cover transitional HRT, but most currently cover maintenance HRT.

We can estimate as shown in Table 6.

| | MTF | FTM | Total |
|--|----------------|---------------|----------------|
| Number of patients in years 1-2 of HRT | 7,187 | 689 | 7,876 |
| Cost per patient: years 1-2 of HRT | \$1,621 | \$229 | \$1,499 |
| Total cost: Years 1-2 of HRT (millions) | \$11.65 | \$0.16 | \$11.81 |
| Number of patients in year 3+ of HRT | 79,980 | 5,914 | 85,894 |
| Cost per patient: year 3+ of HRT | \$382 | \$229 | \$372 |
| Total cost: Years 3+ of HRT (millions) | \$30.56 | \$1.35 | \$31.92 |
| Number of patients in HRT: combined | 87,167 | 6,603 | 93,769 |
| Cost per patient: HRT (combined) | \$484 | \$229 | \$466 |
| Total Cost: HRT (millions) | \$42.21 | \$1.51 | \$43.72 |
| Total HRT cost per insured (annual) | \$0.60 | \$0.02 | \$0.31 |

Table 6: HRT Cost

Transitional HRT costs (prior to surgery) are \$11.81 million/year or \$0.083 per insured. Maintenance HRT costs (after surgery or after 2 years) are \$31.92 million/year or \$0.225 per insured. Total HRT costs are about \$43.72 million/year or \$0.31 per insured. About ¾ of HRT costs are maintenance costs, currently covered on most insurance plans because the patient is considered to be in their new gender.

8.4 Doctor’s visits in Support of Hormones

A patient undergoing hormone treatment should see a doctor on a regular basis to monitor the hormones’ effects, and to have blood tests taken to monitor hormone levels. The SOC recommend lab tests at onset (as a baseline,) at 6 months, 12 months, and every 12 months thereafter for both MTF and FTM patients. Hormones are usually prescribed by an endocrinologist or by an internist or family practitioner that is experienced in the treatment of transsexuals. Quarterly office visits are the norm during the transition, changing to semiannual visits after the regimen levels off. These office visits and lab tests are referred to below as *HRT MD*.

Office visit charges are estimated at \$65 per visit (a typical negotiated insurance rate.) The lab tests for blood hormone levels are estimated at \$125 each. This will mean typical costs of \$510 in the first year (2 labs and 4 visits,) \$385 in year 2 (1 lab and 4 visits) and \$255 in subsequent years (1 lab and 2 visits.)

We can apply the same age-related methodology as for Hormones, to the HRT MD cost. We consider the transitional (years 1 and 2) and maintenance (years 3 and up) costs separately. Insurance plans may or may not cover transitional HRT office visit and lab costs, but most currently cover maintenance HRT office visit and lab costs.

These costs are as shown in Table 7.

| | MTF | FTM | Total |
|--|--------|--------|--------|
| Number of patients in years 1-2 of HRT MD | 7,187 | 850 | 8,037 |
| Cost per patient: years 1-2 of HRT MD | \$448 | \$448 | \$448 |
| Total cost: Years 1-2 of HRT MD (millions) | \$3.22 | \$0.38 | \$3.60 |
| Number of patients in year 3+ of HRT MD | 79,980 | 9,462 | 89,442 |

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| | | | |
|---|---------------|---------------|---------------|
| Cost per patient: year 3+ of HRT MD | \$255 | \$255 | \$255 |
| Total cost: Years 3+ of HRT MD (millions) | \$20.39 | \$2.41 | \$22.81 |
| Number of patients in HRT MD: combined | 87,167 | 10,312 | 97,479 |
| Cost per patient: HRT MD (combined) | \$271 | \$271 | \$271 |
| Total Cost: HRT MD (millions) | \$23.62 | \$2.79 | \$26.41 |
| Total HRT MD cost per insured (annual) | \$0.33 | \$0.04 | \$0.19 |

Table 7: HRT Doctor’s Visit Cost

Transitional HRT MD costs (prior to surgery) are \$3.60 million/year or \$0.025 per insured. Maintenance HRT MD costs (after surgery or after 2 years) are \$22.81 million/year or \$0.161 per insured. Total HRT MD costs are \$26.41 million/year or \$0.19 per insured. About 86% of HRT MD costs are maintenance costs, currently covered on most insurance plans because the patient is considered in the new gender.

8.5 Total Nonsurgical Costs

Adding the therapy, HRT, and HRT MD costs, total nonsurgical costs can be summarized as shown in Table 8.

| | MTF | FTM | Total |
|--|----------------|---------------|----------------|
| Total therapy cost (combined) (millions) | \$3.95 | \$0.29 | \$4.24 |
| Total cost: HRT (combined) (millions) | \$42.21 | \$1.51 | \$43.72 |
| Total cost: HRT MD (combined) (millions) | \$23.62 | \$2.79 | \$26.41 |
| Total annual nonsurgical cost (millions) | \$69.78 | \$4.60 | \$74.37 |
| Total annual nonsurgical cost per insured (millions) | \$0.99 | \$0.06 | \$0.52 |

Table 8: Total Nonsurgical Costs

This table shows that the total cost for nonsurgical THBs is about \$74.37 million, or 52¢ per insured. Most of the cost is for hormones and their associated doctor’s office visits. About 74% is for maintenance HRT and HRT MD costs, and 26% is for therapy, HRT, and HRT MD for the transsexual currently engaged in the transition process.

9. Prevalence

There has been much speculation about the prevalence of transsexualism. With the knowledge of the annual run rate, we can calculate prevalence of SRS.

If the run rate is 1229 surgeries/year (MTF+FTM) and the population of adult US residents was 174 million in 2000, the frequency of SRS per year among adult US residents is about 1:142,000 (about 1:204,000 MTF and 1:141,000 FTM.) That is, about 0.0007% of the population has SRS each year.

Assuming the SRS rate has increased linearly from a few in 1960 to the current rate of 1229/year, there have been about 26,000 primary surgeries on US residents since 1960. Based on the US Census death rate of 8.5/1000 each year^{viii}, about 88.5% of these, or 23,000, are still alive. This means that roughly 1 in 7,600, or .013%, of adults alive in the US today (1 in 5,800 women and 1 in 11,000 men) is a post-operative transsexual.

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If we assume the run rate will continue at the 2001 rate^{ix}, and observe that a transsexual can have a primary SRS surgery only once in a lifetime, that SRS may occur any time from age 18 to 65. (We are not considering those who have SRS after age 65.) During this 47 year period, if 807 US males have MTF SRS each year, in 47 years 37,934 will have had surgery by their 65th birthday, or 1 in 2283. If 20% of those who are diagnosed with Gender Identity Disorder (e.g. who are transsexual) ever have SRS, it means 1 in 457 people born male have GID. FTM and combined ratios can be calculated in the same way, as shown in Table 9:

| | MTF | FTM | Total | Total (%) |
|-------------------------------------|----------------|----------------|----------------|----------------|
| US Residents | 86,584,740 | 87,556,000 | 174,140,740 | |
| No of SRS in 2001 | 807 | 430 | 1237 | |
| Frequency of SRS/year: 1:... | 107279 | 203772 | 140802 | 0.0007% |
| # Surgeries since 1960 | 16,949 | 9,023 | 25,972 | |
| Survival Rate since 1960 | 89% | 89% | 89% | |
| # Live Post-Ops | 15,008 | 7,990 | 22,998 | |
| Ratio Post-Ops/Person | 5769 | 10958 | 7572 | 0.0132% |
| | | | | |
| # years to choose SRS | 47 | 47 | 47 | |
| # alive today with SRS by 65 | 37,934 | 20,195 | 58,128 | |
| Prevalence of SRS 1:... | 2283 | 4336 | 2996 | 0.0334% |
| Estimated Ratio of SRS to GID | 20% | 80% | 27% | |
| Prevalence of GID 1:... | 457 | 3468 | 810 | 0.1234% |
| | | | | |
| Rounded Prevalence | 107,000 | 204,000 | 141,000 | |

Table 9: Prevalence of SRS in the year 2001 among US residents.

In other words, in a company with 100,000 employees, 50,000 men and 50,000 women, about one employee will have MTF surgery every 2 years, and one employee will have FTM surgery every 4 years. The female work force includes about 9 post-operative MTF transsexuals, and the male work force includes about 4 or 5 post-operative FTM transsexuals. The total work force in the company includes about 33 people, or .03%, who have had or will have SRS during their adult lifetime and another 90, or .12%, who may be transsexual but will not have SRS.

10. Limit Analysis of Costs

In arriving at the above best estimates, it was necessary to impute 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 surgeon in the field.

Lower and upper bounds were set, referred to here as *minimum cost* and *maximum cost*. This permits upper and lower bounds to be calculated for the resulting frequencies and costs. All numbers should only be considered significant to 2 digits.

10.1 Limit Analysis of Surgical Costs

The uncertainties involving surgical cost estimates can be summarized as follows:

1. Three surgeons did not provide their numbers of surgeries. These could have ranged from zero (or the provable minimum in one case) to a number equal to the busiest surgeon in their specialty.
2. The percentages of uncounted patients who are US residents, which could have ranged from 0% to 100% of all uncounted patients.
3. The percent of all primary surgeries performed by the major surgeons. The minimum cost case is that all surgeries were performed by responding surgeons (e.g.100%.) A very conservative upper bound can be established by supposing that as many MTF patients go to minor surgeons as major surgeons (50%) and, similarly, that there are as many FTM patients having mastectomies by nonspecialists as by specialists (50%.) These numbers are absurdly high, but serve to limit the worst case costs.
4. Limits on the cost of hysterectomies can range from 10% of patients having the least-cost hysterectomy (about \$2,000) to 100% of patients having the most-cost procedure (about \$17,000.)
5. Limits on the cost of metoidioplasties can be as few as 21 patients (the number of US residents counted) having the minimum cost metoidioplasty (cost ranging from \$6,677 to \$15,600). To establish an upper bound, we assume that all surgeons who do the metoidioplasty procedure, and did not respond, operate at maximum capacity (equal to the busiest surgeon who does this procedure.) There could be as many as 51 metoidioplasties done each year, and we assume they charge the maximum \$15,600.
6. Limits on the cost of phalloplasties can be as few as 21 patients (the number of US residents counted) having the minimum cost phalloplasty (cost ranging from \$15,500 to \$35,000). To establish an upper bound, we assume that all surgeons who do the phalloplasty procedure, and did not respond, operate at maximum (equal to the busiest surgeon who does this procedure.) There could be as many as 165 phalloplasties done each year, and we assume they charge the maximum \$35,000.

Using the above lower/upper bound reasoning, primary surgery rates on US residents can be limited from 674 to 1728 MTF surgeries, and from 294 to 1198 FTM surgeries.

Since patients can have a metoidioplasty, a phalloplasty, or neither, but not both, the FTM upper limit for bottom surgery cost is a full abdominal hysterectomy (\$17,000) combined with the most expensive phalloplasty (\$35,000.) The minimum cost case is to have no bottom surgery at all. (See also endnote ^{IV}.)

Total costs for MTF surgeries could be as low as \$7 million for 674 surgeries to as high as \$19 million for 1728 surgeries. Similarly, total costs for FTM top and bottom surgeries could be as low as \$3.4 million for 294 surgeries, to as high as \$47 million for 1728 total surgeries.

Table 10 below summarizes the Best Estimate, Minimum Cost, and Maximum Cost cases for MTF, FTM, and Total Combined surgery costs.

| Surgical Data | Best Estimate | | | Minimum Cost | | | Maximum Cost | | |
|---|---------------|----------|----------|--------------|----------|----------|--------------|----------|----------|
| | MTF | FTM | Total | MTF | FTM | Total | MTF | FTM | Total |
| Number of Primary Surgeries on US residents | 807 | 430 | 1237 | 674 | 294 | 968 | 1728 | 1198 | 2926 |
| Average Cost per patient for SRS | \$10,702 | \$17,944 | \$13,010 | \$10,463 | \$10,332 | \$10,430 | \$11,076 | \$28,783 | \$17,558 |
| Total cost of all surgeries on US Residents | \$8.637 | \$7.710 | \$16.091 | \$7.055 | \$3.035 | \$10.096 | \$19.14 | \$34.47 | \$51.37 |
| Total annual cost of all surgeries, per insured | \$0.12 | \$0.11 | \$0.11 | \$0.10 | \$0.043 | \$0.071 | \$0.27 | \$0.48 | \$0.36 |

Table 10: Total Surgical Cost

The analysis determined that, while the expected cost of SRS is 11¢ per patient, it might be as low as 7¢, and it might be as high as 36¢. Each of these values is based on extreme and unlikely assumptions, and the true cost is certainly between the two figures.

10.2 Limit Analysis of Nonsurgical Costs

The nonsurgical costs are primarily based on interviews with subject matter experts. It is therefore more difficult to place upper and lower bounds around these numbers. This section shows conservative boundaries. Further research should narrow the range considerably.

Table 11 below uses the process of establishing boundaries around nonsurgical costs: therapy, hormones, and doctor’s office visits in support of hormones. We begin with the assumption that not every transsexual has surgery, but rather some who are diagnosed with Gender Identity Disorder will transition to 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. Since those who do not transition cannot have surgery, we consider the THB needs of the population who do transition. We estimate the fraction of those who transition that have therapy, that have HRT, and that have surgery.

By knowing the numbers who have surgery and the fractions of those who transition have therapy, HRT, and surgery, we can calculate the number who transition, and from that number we can calculate the number who have therapy and who have HRT. Since all of these values are not known quantities, but rather ranges, we can calculate the range values. This is shown in Table 11.

If the number of MTF surgeries in a year is 807 (range 674 to 1728) and 20% of those who transition have SRS (range 10% to 100%) we can calculate that the number who transition is about 4035 (range 674 to 17,285.) If 90% of those who transition have therapy (range 50% to 90%,) there are 3,632 (range 337 to 15,556) MTF transsexuals entering therapy each year. Similar reasoning applies to HRT and to FTM transsexuals. Doctor’s office visits are required for HRT so the HRT MD numbers will match HRT. Combined totals of MTF and FTM can be calculated by adding the two populations.

| No. of Transitioning Transsexuals | Best Estimate | Minimum Cost | Maximum Cost |
|-----------------------------------|---------------|--------------|--------------|
|-----------------------------------|---------------|--------------|--------------|

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| | MTF | FTM | Total | MTF | FTM | Total | MTF | FTM | Total |
|---|-------|-----|-------|------|------|-------|--------|-------|--------|
| Number of Surgeries/year | 807 | 430 | 1,237 | 674 | 294 | 968 | 1,728 | 1,198 | 2,926 |
| Percentage of Transsexuals having Primary Surgery | 20% | 80% | 27% | 100% | 100% | 100% | 10% | 20% | 13% |
| Number of Transsexuals Transitioning each year | 4035 | 537 | 4573 | 674 | 294 | 968 | 17285 | 5988 | 23272 |
| Percentage of Transsexuals having Therapy | 90% | 50% | 85% | 50% | 50% | 50% | 90% | 90% | 90% |
| Number of TS who have Therapy/year | 3,632 | 269 | 3,900 | 337 | 147 | 484 | 15,556 | 5,389 | 20,945 |
| Percentage of Transsexuals having HRT | 90% | 80% | 89% | 90% | 80% | 87% | 90% | 90% | 90% |
| Number of TS who begin HRT | 3,632 | 269 | 3,900 | 337 | 147 | 484 | 15,556 | 5,389 | 20,945 |

Table 11: Fractions of Transsexuals who have SRS, Therapy and HRT

10.3 Limit Analysis of Mental Health Therapy

A similar process can be used for the costs of each type of health care. Table 12 shows the cost range for therapy. If therapy costs \$125 per session (range \$60 to \$150) and there are 4 sessions per year for an average patient (range 3 to 20) then basic therapy costs for the first year are about \$500 (range \$180 to \$3,000.) Adding in possible costs for group sessions, evaluation by a second therapist, and a 3 month allowance for sessions beyond the first year, we can calculate a total cost per patient as \$1,088 (range \$180 to \$4,700.) The cost per patient is the same for MTF and FTM, but the percentages who have therapy are different. This may be because the therapist’s letter is essential for MTF SRS and is often required for HRT, but many FTMs have the option to live full time, and possibly even have top surgery, without a therapist’s letter.

The total therapy cost for the 90% (range 50% to 90%) of MTF patients who have therapy is therefore \$3.95 million (range \$61,000 to \$73.115 million) and, dividing this number by the number of insured US residents, the annual MTF cost per insured is \$0.056 . (range \$0.0009 to \$1.036 .) Similar analyses for the FTM population result in a cost per insured of \$0.004 (range \$0.0004 to \$1.036) and a combined total cost per insured of \$0.030 (range \$0.0006 to \$0.694 .)

| Therapy Cost Ranges | Best Estimate | | | Minimum Cost | | | Maximum Cost | | |
|---|---------------|-------|-------|--------------|------|-------|--------------|---------|---------|
| | MTF | FTM | Total | MTF | FTM | Total | MTF | FTM | Total |
| Cost of Therapy per session (assume out of network) | \$125 | \$125 | \$125 | \$60 | \$60 | \$60 | \$150 | \$150 | \$150 |
| Number of sessions per year per patient | 4 | 4 | 4 | 3 | 3 | 3 | 20 | 20 | 20 |
| Additional Therapy cost/year (group sessions) | \$250 | \$250 | \$250 | \$0 | \$0 | \$0 | \$1,200 | \$1,200 | \$1,200 |
| Second evaluation for SRS letter | \$150 | \$150 | \$150 | \$0 | \$0 | \$0 | \$500 | \$500 | \$500 |
| Therapy cost beyond first year | \$188 | \$188 | \$188 | \$0 | \$0 | \$0 | \$1,050 | \$1,050 | \$1,050 |

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| | | | | | | | | | |
|--|----------------|----------------|----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|
| Total cost of Therapy per patient | \$1,088 | \$1,088 | \$1,088 | \$180 | \$180 | \$180 | \$4,700 | \$4,700 | \$4,700 |
| Percent of TS in Therapy | 90% | 50% | 85% | 50% | 50% | 50% | 90% | 90% | 90% |
| Number of Patients in Therapy | 3,632 | 269 | 3,900 | 337 | 147 | 484 | 15,556 | 5,389 | 20,945 |
| Total Cost of Therapy (millions) | \$3.950 | \$0.292 | \$4.242 | \$0.061 | \$0.026 | \$0.087 | \$73.115 | \$25.327 | \$98.442 |
| Annual cost per insured | \$0.056 | \$0.004 | \$0.030 | \$0.0009 | \$0.0004 | \$0.0006 | \$1.036 | \$0.355 | \$0.694 |

Table 12: Cost Ranges for Therapy

10.4 Limit Analysis of HRT

HRT costs vary depending on the dosages prescribed by the doctor, and are different for MTF and FTM patients. The minimum cost MTF case is assumed to begin at .625 mg of Premarin, and .25 mg of Spironolactone daily, increasing to 5 g of Premarin and 100 mg Spironolactone in the 2nd year, costing an average of \$1,198 per year. The maximum cost MTF case is 4x1.25mg Premarin daily, 1x100mg Spironolactone daily, and 200 mg Prometrium daily, purchased in 30 day supplies at a retail pharmacy, costing \$2,376 per year. FTM HRT costs are assumed at \$229/year (range \$229 to \$600 .) Prices are based on one insurer's stated cost, and include both the employee + employer cost.

Costs are separated into the transition phase (years 1-2) and maintenance phase (years 3+ to age 65.) Maintenance HRT costs for MTF patients are based on much lower dosages (1.25 mg Premarin/day) but are still higher, due to the need to continue maintenance HRT for the rest of the patient's life. The calculated values are shown in Table 13.

| HRT Cost Ranges | MTF | FTM | Total | MTF | FTM | Total | MTF | FTM | Total |
|--|------------|------------|--------------|------------|------------|--------------|------------|------------|--------------|
| Number of patients in years 1-2 of HRT | 7,187 | 689 | 7,876 | 931 | 377 | 1,308 | 30,782 | 10,663 | 41,445 |
| Cost per patient: years 1-2 of HRT | \$1,621 | \$229 | \$1,499 | \$1,198 | \$229 | \$919 | \$2,376 | \$600 | \$1,919 |
| Total cost Years 1-2 of HRT (millions) | \$11.65 | \$0.16 | \$11.81 | \$1.12 | \$0.09 | \$1.20 | \$73.13 | \$6.40 | \$79.53 |
| Number of patients in year 3+ of HRT | 79,980 | 5,914 | 85,894 | 7,424 | 3,234 | 10,658 | 342,571 | 118,669 | 461,240 |
| Cost per patient: year 3+ of HRT | \$382 | \$229 | \$372 | \$382 | \$229 | \$336 | \$1,000 | \$300 | \$820 |
| Total cost Years 3+ of HRT (millions) | \$30.56 | \$1.35 | \$31.92 | \$2.84 | \$0.74 | \$3.58 | \$342.67 | \$35.60 | \$378.28 |
| Number of patients in HRT: combined | 87,167 | 6,603 | 93,769 | 8,355 | 3,611 | 11,966 | 373,353 | 129,332 | 502,684 |
| Cost per patient: HRT (combined) | \$484 | \$229 | \$466 | \$473 | \$229 | \$399 | \$1,114 | \$325 | \$911 |
| Total cost HRT (combined, millions) | \$42.21 | \$1.51 | \$43.72 | \$3.95 | \$0.83 | \$4.78 | \$415.80 | \$42.00 | \$457.80 |
| Total HRT cost per insured (annual) | \$0.598 | \$0.021 | \$0.308 | \$0.056 | \$0.012 | \$0.034 | \$5.892 | \$0.589 | \$3.226 |
| Years 1-2 HRT cost per insured (annual) | \$0.165 | \$0.002 | \$0.083 | \$0.016 | \$0.001 | \$0.008 | \$1.036 | \$0.090 | \$0.560 |
| Years 3+ HRT cost per insured (annual) | \$0.433 | \$0.019 | \$0.225 | \$0.040 | \$0.010 | \$0.025 | \$4.856 | \$0.499 | \$2.665 |

Table 13: Cost Ranges for HRT

10.5 Limit Analysis of Doctor’s Office Visits in Support of HRT

A similar analysis is used for the cost of HRT doctor’s office visits in support of hormones. Costs include office visit charges and lab charges. Office visits are assumed at \$65 per visit (range \$50 to \$100.) Lab tests for blood hormone levels are assumed at \$125 (range \$100 to \$200.) In all cases, we assume quarterly doctor's office visits the first 2 years and semiannual visits thereafter, with lab tests twice in the first year and annually thereafter, as specified in the SOC. The results, separated into transition and maintenance costs, are shown in Table 14.

| HRT MD Cost Ranges | Best Estimate | | | Minimum Cost | | | Maximum Cost | | |
|--|---------------|---------|---------|--------------|---------|---------|--------------|----------|----------|
| | MTF | FTM | Total | MTF | FTM | Total | MTF | FTM | Total |
| Number of patients in years 1-2 of HRT MD | 7,187 | 850 | 8,037 | 1,201 | 465 | 1,666 | 30,782 | 10,663 | 41,445 |
| Cost per patient: years 1-2 of HRT MD | \$448 | \$448 | \$448 | \$351 | \$351 | \$351 | \$701 | \$701 | \$701 |
| Total cost: years 1-2 of HRT MD | \$3 | \$0 | \$4 | \$0 | \$0 | \$1 | \$22 | \$7 | \$29 |
| Number of patients in year 3+ of HRT MD | 79,980 | 9,462 | 89,442 | 13,363 | 5,175 | 18,538 | 342,571 | 118,669 | 461,240 |
| Cost per patient: year 3+ of HRT MD | \$255 | \$255 | \$255 | \$190 | \$190 | \$190 | \$255 | \$255 | \$255 |
| Total cost: year 3+ of HRT MD | \$20 | \$2 | \$23 | \$3 | \$1 | \$4 | \$87 | \$30 | \$118 |
| Number of patients in HRT MD: combined | 87,167 | 10,312 | 97,479 | 14,564 | 5,640 | 20,204 | 373,353 | 129,332 | 502,684 |
| Cost per patient: HRT MD (combined) | \$271 | \$271 | \$271 | \$203 | \$203 | \$203 | \$292 | \$292 | \$292 |
| Total cost: HRT MD (combined) | \$24 | \$3 | \$26 | \$3 | \$1 | \$4 | \$109 | \$38 | \$147 |
| Total HRT MD cost per insured (annual) | \$0.335 | \$0.039 | \$0.186 | \$0.042 | \$0.016 | \$0.029 | \$1.5437 | \$0.5288 | \$1.0334 |
| Years 1-2 HRT MD cost per insured (annual) | \$0.046 | \$0.005 | \$0.025 | \$0.006 | \$0.002 | \$0.004 | \$0.3058 | \$0.1048 | \$0.2047 |
| Years 3+ HRT MD cost per insured (annual) | \$0.289 | \$0.034 | \$0.161 | \$0.036 | \$0.014 | \$0.025 | \$1.2379 | \$0.4241 | \$0.8287 |

Table 14: Cost Ranges for Doctor’s Office Visits in Support of HRT

10.6 Total Cost, Cost Per Insured

All these costs can be combined into a single table, showing the best estimate of the cost per insured US resident, with range of minimum and maximum. The total nonsurgical costs, with ranges, are combined in Table 15.

| Total Cost | Best Estimate | | | Minimum Cost | | | Maximum Cost | | |
|--|---------------|--------|--------|--------------|--------|--------|--------------|-------|-------|
| | MtF | FtM | Total | MtF | FtM | Total | MtF | FtM | Total |
| Total therapy cost (combined) (millions) | \$3.95 | \$0.29 | \$4.24 | \$0.06 | \$0.03 | \$0.09 | \$73 | \$25 | \$98 |
| Total cost: HRT (combined) (millions) | \$42 | \$1.51 | \$44 | \$3.95 | \$0.83 | \$4.78 | \$416 | \$42 | \$458 |
| Total cost: HRT MD (combined) (millions) | \$24 | \$2.79 | \$26 | \$2.96 | \$1.15 | \$4.11 | \$109 | \$38 | \$147 |
| Total annual nonsurgical cost (millions) | \$70 | \$4.60 | \$74 | \$6.97 | \$2.00 | \$8.97 | \$598 | \$105 | \$703 |

| | | | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Total annual nonsurgical cost per insured (millions) | \$0.99 | \$0.06 | \$0.52 | \$0.10 | \$0.03 | \$0.06 | \$8.47 | \$1.47 | \$4.95 |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|

Table 15: Total Annual Nonsurgical Cost Ranges for US Residents

The total nonsurgical costs per patient, with ranges, are combined in Table 16.

| Total cost per insured | Best Estimate | | | Minimum Cost | | | Maximum Cost | | |
|-------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | MTF | FTM | Total | MtF | FtM | Total | MtF | FtM | Total |
| Cost per insured for therapy | \$0.056 | \$0.0041 | \$0.030 | \$0.0009 | \$0.0004 | \$0.0006 | \$1.04 | \$0.35 | \$0.69 |
| Cost per insured for HRT | \$0.60 | \$0.021 | \$0.31 | \$0.056 | \$0.012 | \$0.034 | \$5.89 | \$0.59 | \$3.23 |
| Cost per insured for HRT MD | \$0.33 | \$0.039 | \$0.19 | \$0.042 | \$0.016 | \$0.029 | \$1.54 | \$0.53 | \$1.03 |
| Cost per insured for Surgery | \$0.12 | \$0.11 | \$0.11 | \$0.10 | \$0.043 | \$0.071 | \$0.27 | \$0.48 | \$0.36 |
| Total cost per insured | \$1.11 | \$0.17 | \$0.64 | \$0.20 | \$0.07 | \$0.13 | \$8.74 | \$1.96 | \$5.31 |

Table 16: Total Annual THB Costs Per Insured US Resident

Based on this analysis, we can conclude that the best estimate of total health care costs for THBs in the US is about 64¢ per insured person. Of the 50¢ (rounded) for hormones and doctor’s office visits in support or hormones, about 39¢ is for years 3 and up, maintenance costs that are likely already covered. The cost for the surgery itself is about 11¢, or about 17% of the total THB cost.

The lower and upper bounds can be narrowed down to a minimum cost estimate of 13¢ and a maximum cost estimate of \$5.31. These are based on extremely optimistic and pessimistic assumptions for every patient, and the actual cost is likely to be in between the extremes.

11. Discussion

A typical health care plan costs about \$4,000 per year per insured. Thus, a total cost of 64¢ per insured would be .016% of the total health care costs. The upper bound of \$5.31/insured is about .13%, and the lower bound of 13¢ is about .003%. By comparison, Domestic Partner Benefits for same-sex partners usually cost about 1%, or up to 2% if same and opposite-sex partners are covered. THBs probably cost about 1.6% as much as DPBs, and in the highest-cost case cost no more than 13% as much as DPBs.

Employers rarely cover 100% of health care costs. Employees are expected to contribute co-pays, premiums, and deductibles. THBs, if covered, are subject to these same rules. The Kaiser Family Foundation (Dispatch, 2003) found that, in 2002, single employees paid 15% of their health care costs, and families paid 26% of their costs, with employers paying the remainder. Each year the employee share increases as employers try to hold the line on the employer share. It seems likely that, of the 64¢ increase, the employee would pay some of the cost, and the employer would pay less than the full amount. With significant portions of the expense being for mental health and for drugs, both of which are often covered at lesser amounts than major medical benefits, the employee share will be substantial. Each employer should break out the expenses into the different types to arrive at the fraction that is their share.

Many companies already have health plans that offer partial coverage of THBs. A company that currently offers partial coverage and is considering increasing the level, or a company considering partial coverage, would incur a smaller increase as a result.

Some benefits are probably already being covered, even with plans that intend to exclude all coverage. In particular, the drug cost (and supporting office visits) of maintenance for post-operative transsexuals, who

are legally documented in their new gender, is usually covered because they are legally no different than any other hormone prescription. This maintenance amount, 39¢, represents over half of the total THB cost.

It is also common for patients diagnosed with Gender Identity Disorder to also have other mental health diagnoses (such as Depression) and for plans to cover the treatment under that diagnosis. Similarly, a prescription for hormones does not have an attached diagnosis, so some transsexuals are currently receiving coverage of their HRT and HRT MD health care because the insurance administrator cannot tell the reason for the treatment, and because these same treatments are fully covered for other patients who are not transsexual.

Some patients choose to self-fund parts of their health care even when covered by insurance. For example, many therapists are off-network and will not work with insurance companies, instead requiring the patient to do the paperwork. Some patients choose to pay their therapist directly rather than deal with the insurance bureaucracy. (Stories of insurance administrators repeatedly losing the paperwork or incorrectly rejecting a claim are commonplace.) Of three transsexual employees at Lucent who had their surgery during the covered period from 2000 to 2003, one chose to pay directly rather than submit the claim to insurance. In a field where lack of insurance coverage is so commonplace, many patients find the bureaucracy so foreboding that they will not face it.

The "magnet effect" is a concern that, if a small number of employers offer a THB benefit, transsexual workers may find such employers so attractive that they change jobs, thereby increasing total cost by locating a disproportionate number of workers in the one company. In theory, this should be mostly a concern when there are only a few such employers, and would tend to even out as THB coverage becomes more widespread. However, the experience of employers such as Lucent and San Francisco has not found any increase in claims due to disproportionate hiring of transsexuals. Employee resource groups point out that good benefit packages, including benefits such as Domestic Partner Benefits, are often used as recruiting tools to attract qualified employees from different minority populations, and that THBs would be no different. An employee still has to be qualified for the job if they are to be hired.

Another concern is that, as insurance coverage becomes more widespread, the total amount of affordable transgender health care may increase, and the total being spent may increase. This may indeed be a long term result of universal health coverage of THBs. There are many transsexuals who use hormones, but do not make regular use of therapy, and cannot afford electrolysis or surgery. In theory, if only 20% of transsexuals who want surgery are able to afford it today, the costs could grow by a factor of 5. However, most therapists and surgeons have full calendars, and the waiting lists for surgery dates are quite long. The system cannot quickly absorb a fivefold increase in demand, as an entire generation of new specialists would need to train and enter the field. Such an increase in capacity would increase competition and bring down prices. (For example, surgery in Thailand has become competitive, and Thai prices have come down by over 50% compared with North American prices.

11.1 Employer Cost Model

Combining these concerns, a model can be constructed to estimate costs for a specific employer. The figures in the table below can be adjusted to reflect a specific situation.

The figures given in the E column below represent the 15% share of a single employee. The CP column represents maintenance costs of post-operative transsexuals, who are likely to be currently covered by typical health plans. Based on the experience of employers like Lucent and San Francisco, it is reasonable to estimate zero for the increased care (IC) in the table below. The employer can estimate the other figures based on its own data and experience.

| Type of Cost | Total Cost / year / Insured | Employee Share (15%) | Employer Share | Employer Currently Paying | Increased Care (magnet & long term) | Increased cost to Employer |
|-----------------|-----------------------------|----------------------|----------------|---------------------------|-------------------------------------|----------------------------|
| Symbol for Cost | C | E | Er = C - E | CP | IC | I = Er - CP + IC |
| Therapy | \$0.03 | \$0.004 | \$0.025 | varies | 0 | ≤ \$0.022 |
| HRT | \$0.31 | \$0.046 | \$0.26 | \$0.22 | 0 | \$0.04 |
| HRT MD | \$0.19 | \$0.028 | \$0.16 | \$0.16 | 0 | \$0.00 |
| Surgery | \$0.11 | \$0.017 | \$0.10 | varies | 0 | ≤ 0.10 |
| Total | \$0.64 | \$0.096 | \$0.54 | ≥ \$0.38 | 0 | ≤ \$0.16 |

Table 17: Employer Cost Model

12. Conclusion

This paper measures the frequency and cost of Transgender Health Benefits (THBs) for US residents. It reports on a survey of surgeons who do SRS procedures, and reports the number of US residents undergoing SRS in the year 2001 to be MTF and FTM, with the confidence range setting lower and upper bounds of to MTF, and to FTM. The prevalence of SRS per year among US residents is about 1: (about 1:204,000 MTF and 1:141,000 FTM.)

The survey found that the average cost for MTF SRS in 2001 was (with a range of to) and for FTM primary surgery (top surgery) was (with a range of to .) This cost, compared to the number of insured US residents in the 2000 US Census, for MTF is 12¢ (per insured per year,) for FTM is 11¢, and in total is 11¢/insured/year.

Adding typical THB nonsurgical costs for mental health (3¢,) HRT (31¢,) and physician visits for HRT (19¢,) the total estimated annual cost per insured would be 64¢. The total cost per insured might be as low as ¢ or as high as . These costs represent the total cost, including employer and employee shares, and include any costs already being covered by the employer. Increased costs to employers would be less, probably no more than 16¢.

Employers considering the addition of some or all Transgender Health Benefits to their plans can reasonably expect the total cost to increase no more than 64¢ per year per insured, and because of existing partial coverage, and employees sharing the cost, the actual increase will probably be much less.

13. Future Work

This survey measures prevalence and cost information for primary surgeries for US residents.

Additional studies could more accurately measure the run rate and cost of FTM bottom surgeries. Better measurement of Therapy, HRT, and HRT MD costs are also possible.

Studies on populations other than US residents would be of interest.

Studies to chart data in different years would make it possible to measure trends in the run rate and prices being charged.

A study could determine the share of cost currently being paid by insurers, and the share being paid by employees.

Appendix A:

(Questions sent to surgeons.)

Acknowledgements

(to be written.)

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ⁱ A typical policy reads “**Transsexual Surgery**. Expenses related or leading to surgery to change an individual’s gender are not covered.”

ⁱⁱ The transition is the first day the transsexual begins to permanently live full time in the new gender role. Some of those who transition go on to have surgery.

ⁱⁱⁱ Lucent’s definition reads:

“**Medically necessary**: (medical necessity). The determination of medical necessity is made by the applicable **health care company**. Care is considered medically necessary if:

- It is accepted by the health care profession in the U.S. as appropriate and effective for the condition being treated,
- It is based upon recognized standards of the health care specialty involved,
- It represents the most appropriate level of care: the frequency of services, the duration of services, and the site of services, depending on the seriousness of the condition being treated (such as in the **hospital** or in the **physician's office**), and
- It is not experimental or investigational.”

^{iv} The theoretically least expensive FTM surgery is the least expensive chest surgery at \$4,000. The theoretically most expensive FTM surgery would be a combination of the most expensive chest surgery at \$7,500, a total abdominal hysterectomy at about \$17,000, and the most expensive phalloplasty at about \$35,000, totaling \$59,500.

^v Because the author's contacts and concept of "reputation" of a surgeon is US-centric, the results presented here will not necessarily apply to other countries or cultures.

^{vi} Chest surgery is seen as more essential and more attainable by the FTM population, whereas MTF transsexuals often cannot afford it, and live without the surgery.

^{vii} These prices are from one US insurance company in 2004 for a company health plan, using mail order delivery of a 90 day supply. Prices will vary.

^{viii} It has been speculated that the death rate among transsexuals is actually much higher than the general population. If true, there are fewer transsexuals among today’s living population.

^{ix} This is based on an assumption that the primary barriers to SRS today are social, family, and medical. It is also possible the rate will continue to rise, although this will require more surgeons to enter the field.