MILLIMAN REPORT

Comparing Progyny's fertility outcomes to national benchmarks

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I. Scope and purpose

Progyny, Inc. (Progyny) specializes in fertility and family building benefit solutions in the U.S. Progyny has developed a fertility benefit model intended to improve clinical outcomes while simultaneously benefiting employers, patients, and physicians. Progyny's fertility benefit model includes a network of fertility specialists, patient care advocates that provide clinical education and emotional support, and fertility coverage. Progyny offers fertility benefits including diagnostic testing, medical services and medications required for a member's full course of fertility treatment, care management, and patient care advocacy and support.

Progyny routinely measures how patient outcomes, managed through its fertility program, compare to national benchmarks. Milliman, Inc. (Milliman) was commissioned by Progyny to compare the clinical outcomes of Progyny's fertility benefit to national benchmarks.

This report comments on the following:

- Indicators used to measure the impact of Progyny's fertility management program
- Progyny's outcomes compared to national benchmarks
- Statistical significance of the results
- Discussions of data and methodological limitations when comparing Progyny's outcomes to national benchmarks
- Methodologies for calculating clinical outcomes and the consistency of these methodologies between those used to calculate the Progyny outcomes and the national benchmarks

Our analysis focuses exclusively on comparing clinical fertility outcomes of Progyny patients who visited in-network providers with external populations. Analyzing the drivers of Progyny's clinical outcomes with respect to its product offering was not within the scope of this analysis.

Fertility outcome measures

This report evaluates six primary clinical measures. The following methodology was used to calculate each Progyny measure:

- **In vitro fertilization (IVF) pregnancy rate** = IVF transfer with clinical pregnancy / IVF transfer with reported pregnancy outcomes
- **IVF miscarriage rate** = IVF miscarriage / IVF transfer with clinical pregnancy
- **IVF live birth rate** = (IVF transfer with clinical pregnancy − IVF miscarriage) / IVF transfer with reported pregnancy outcomes
- **IVF multiples rate** = IVF transfer with multiples / IVF transfer with reported fetal heartbeats
- **Single embryo transfer (SET) rate** = IVF transfer where one embryo was transferred / IVF transfer
- **Live birth rate per intended retrieval** = Intended retrieval resulting in live-birth deliveries / Intended retrieval

These are the most commonly reported measures to evaluate fertility outcomes.[1,2,3] These particular measures were chosen to assess pregnancy success, health of the pregnancy, and health of the baby. For example, SET is used to avoid multiple-fetus pregnancies, which are associated with increased risk of poor health outcomes for mothers and

[1] Pirtea, P. et al. (July 2020). Which key performance indicators are optimal to assess clinical management of assisted reproduction cycles?. *Fertility and Sterility, 114*(1), 24–30. https://www.fertstert.org/article/S0015-0282%2820%2930423-4/pdf

[2] Farquhar, C., & Marjoribanks, J. (2018). Assisted reproductive technology: an overview of Cochrane Reviews. *Cochrane Database of Systematic Reviews,* (8). https://pmc.ncbi.nlm.nih.gov/articles/PMC6953328/

[3] Gadalla, M. A. et al. (2018). How should we report outcomes in reproductive medicine?. *Ultrasound in Obstetrics & Gynecology, 51*(1), 7–9. https://obgyn.onlinelibrary.wiley.com/doi/full/10.1002/uog.18969

infants. These poor health outcomes among infants include preterm birth, low birth weight, birth defects, and miscarriage.[4]

This report does not provide opinions about Progyny's clinical model or its approach to managing patient cases. Analyzing the drivers of Progyny's clinical outcomes with respect to its product offering was not within the scope of this analysis.

II. Results

Overall, we find that Progyny patients undergoing assisted reproductive technology (ART) experience better clinical fertility outcomes compared to national benchmarks for the six measures studied. The improved clinical outcomes are statistically significant with p-values of less than 0.1%, indicating the results are highly unlikely to occur by chance. The Progyny results reflect the company's complete in-network member population, which included over 14,000 in-network transfers in 2022, supporting the reliability and credibility of the results. These findings indicate its efficacy and material impact on clinical fertility outcomes. The methodology follows an approach where clinical fertility outcomes for internal (Progyny) and external (non-Progyny) groups were normalized for birthmother age and compared to each other.

The analysis relied on data from the Centers for Disease Control and Prevention (CDC), the Society for Assisted Reproductive Technology (SART), and Progyny in-network providers. The populations included in the analysis are:

- The Progyny population, which includes 100% of in-network transfers[5]
- The all-clinic national population excluding Progyny experience
- The out-of-network national population (a subset of the all-clinical national population based on Progyny network status) excluding Progyny experience
- The in-network national population (a subset of the all-clinical national population based on Progyny network status) excluding Progyny experience

These results indicate for the six studied measures:

- Progyny's pregnancy rate per transfer is 16% higher than the non-Progyny national rate
- Progyny's miscarriage rate per pregnancy is 13% lower than the non-Progyny national rate
- Progyny's live birth rate per transfer is 19% higher than the non-Progyny national rate for SART; similarly, Progyny's live birth rate per transfer is 25% higher than the non-Progyny national rate for CDC
- Progyny's SET rate per transfer is 19% higher than the non-Progyny national rate
- Progyny's multiples rate per live birth is 40% lower than the non-Progyny national rate
- Progyny's live birth rate per intended retrieval is 27% higher than the non-Progyny national rate

For each measure, Progyny's outcome rates exceed national non-Progyny rates, even within the same in-network clinics' population. The difference between Progyny's rate and the national out-of-network clinical rate is more pronounced than the national in-network clinical rate, supporting the indication that network selection strongly correlates with outcomes for all six of the fertility measures, but is not the only factor. When controlling for network selection, Progyny patients experienced improved clinical fertility outcomes compared to national benchmarks within the Progyny network.

The six outcome measures Progyny uses are commonly cited in the literature to measure pregnancy success, health of the pregnancy, and health of the baby.[6]

[4] Johns Hopkins Medicine (n.d.). *Complications of multiple pregnancy*. https://www.hopkinsmedicine.org/health/conditions-and-diseases/staying-healthy-during-pregnancy/complications-of-multiple-pregnancy

[5] 98% of Progyny transfers have reported pregnancy outcomes.

[6] Pirtea, P. et al. (July 2020). Which key performance indicators are optimal to assess clinical management of assisted reproduction cycles?. *Fertility and Sterility, 114*(1), 24–30. https://www.fertstert.org/article/S0015-0282%2820%2930423-4/pdf

As of the date of this report, Progyny collected fertility outcomes data from 2021 to 2023. We relied on 2022 Progyny data, which includes transfers that occurred in 2022, regardless of the retrieval date. The national data sets used in the analysis include the SART 2021 Final National Summary Report and the CDC 2022 National Summary and Clinic Data Sets, both including data from retrievals that occurred in 2021 and transfers that occurred within a year of those retrievals, which could have occurred in 2021 or 2022. Both data sets were made available in 2024 and were the most recent and complete national data sets available at the time of this study, limiting the time-aligned consideration of this study to Progyny's 2022 data. The data sources are outlined in Figure 1.

FIGURE 1: PROGYNY'S FERTILITY OUTCOMES STUDY: SUMMARY OF DATA SOURCES

Data Source	Description
2022 Progyny*	Transfers that occurred in 2022, regardless of retrieval date
SART 2021 final national summary report	Transfers that occurred no more than 12 months following a retrieval in 2021**
CDC 2022 national summary and clinic data sets	Transfers or thaw procedures that occurred no more than 12 months following a retrieval in 2021***

** Used to compare to national benchmarks.*
*** For informational purposes only.*
**** Includes transfers that occurred in 2021 or 2022.*

The non-Progyny populations have been normalized by age to match the 2022 Progyny population. Figure 2 summarizes fertility outcome rates across all clinics excluding Progyny volume, non-Progyny out-of-network clinics, and non-Progyny in-network clinics compared to 2022 Progyny rates.

FIGURE 2: PROGYNY'S FERTILITY OUTCOMES STUDY: COMPARISON OF RESULTS BY TIME PERIOD

Measure	All clinic national rate*	Non-Progyny all clinic national rate*	Non-Progyny out-of-network clinic national rate*	Non-Progyny in-network clinic national rate*	Progyny 2022
Pregnancy rate (per transfer)**	55.0%	54.2%	48.8%	55.5%	62.8%
Miscarriage rate (per pregnancy)**	18.0%	18.3%	19.7%	18.0%	15.8%
Live birth rate (per transfer)**	45.2%	44.4%	39.6%	45.6%	52.9%
Live birth rate (per transfer)***	43.5%	42.1%	39.5%	43.2%	52.9%
SET rate (per transfer)**	80.3%	78.8%	71.2%	80.7%	93.9%
Multiples rate (per live birth)***	5.2%	5.5%	7.0%	4.9%	3.3%
Live birth rate per intended retrieval***	35.7%	35.1%	32.1%	36.1%	44.4%

** Age-normalized to the 2022 Progyny population.*
*** Calculated based on the SART 2021 Final National Summary Report, published in 2024.*
**** Calculated based on CDC 2022 National Summary and Clinic Data Sets that reflect transfers occurring in 2021, published in 2024.*
Note: Progyny represents only Progyny member experience at Progyny in-network clinics.

Please note, births with multiples occurring from a SET occur naturally and cannot be influenced by the fertility clinics' protocol. When we remove multiples associated with a SET from the IVF multiples rate, Progyny's 2022 multiples rate decreases from 3.3% to 1.9%. While we are unable to calculate this measure using the national data sets for a comparison, given Progyny's large population size, it is possible the national results would decrease in a similar magnitude, and thus the comparison between Progyny and the national benchmark would be directionally consistent with Figure 2.

We calculated the statistical significance of the difference between Progyny 2022 outcomes and the non-Progyny in-network clinic national rate for each measure using a 0.1% significance level. We determined the observed differences to be statistically significant, meaning there is a low probability that the results between the two populations were achieved due to random variation/chance. We assumed a normal distribution and conducted a one-tailed two-proportion z-test to calculate statistical significance.

III. Methodology

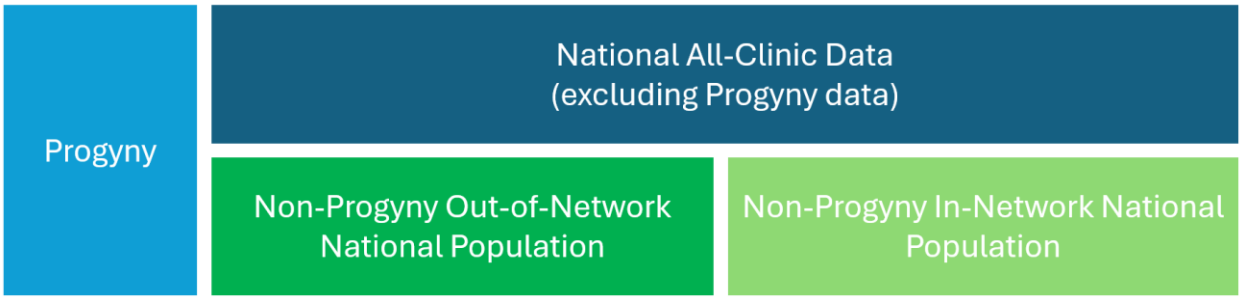
Based on information provided by Progyny and publicly available data from CDC and SART, we conducted an effectiveness study comparing the clinical outcomes of Progyny's fertility benefit to national benchmarks.

The analysis is a retrospective review of 2022 fertility outcomes of Progyny members compared to three benchmarks: the national average, the in-network average for all non-Progyny members, and the out-of-network average for all non-Progyny members. The measures include:

- Pregnancy rate per IVF transfer
- IVF miscarriage rate
- IVF live birth rate
- SET rate
- IVF multiples rate
- Live birth rate per intended retrieval

Further descriptions of the measures can be found in the **Fertility Outcome Measures** section of this report. The all-clinic national average includes all Progyny members from in-network and out-of-network providers. The second national benchmark includes patients who went to providers in Progyny's network but are not Progyny members. Comparing Progyny members to non-Progyny patients in the same provider network enables comparison between Progyny member outcomes and the outcomes associated with an identical provider network that excludes Progyny members. The third national benchmark includes patients who went to providers outside of Progyny's network and are not Progyny members. Comparing non-Progyny patient outcomes from in-network clinics to out-of-network clinics enables distinction between national outcomes based on network status. Figure 3 outlines the different populations included in this analysis.

FIGURE 3: SUMMARY OF POPULATIONS INCLUDED IN ANALYSIS (NOT TO SCALE)



Data collection

The Progyny member outcomes are collected directly from in-network clinics by Progyny's Provider Relations team. Following an IVF transfer, in-network providers are required by Progyny to report outcomes of the transfer within three months, reflecting the time needed to confirm outcomes clinically. This study includes the entire population of in-network Progyny transfers, eliminating the potential for sampling bias that arises in studies reliant on subsets or samples. Progyny achieved a 99% reporting rate for pregnancy outcomes following a transfer to in-network providers, enhancing the credibility of Progyny's reported data. Out-of-network providers are served primarily to facilitate transition of care and are not required to submit outcomes to Progyny and, therefore, are not included in this study. Out-of-network transfers represent less than 1% of Progyny's total transfers.

The national data sets used in the analysis include the SART 2021 Final National Summary Report and the CDC 2022 National Summary and Clinic Data Sets, both including data from retrievals that occurred in 2021 and transfers that occurred within a year of those retrievals, which could occur in 2021 or 2022. Both of these data sets were made available in 2024 and were the most recent and complete data sets available at the time of the study. CDC reports that it collected data from 457 clinics in the U.S. and separately reported that there are currently 500 clinics that provide ART services in the U.S.[7,8]

[7] CDC. (2024, December 10). *ART surveillance*. Retrieved February 14, 2025, from https://www.cdc.gov/art/php/surveillance/index.html?utm_
[8] CDC. (2024, December 10). *National ART surveillance system*. Retrieved February 14, 2025, from https://www.cdc.gov/art/php/nass/index.html?utm_

We also analyzed data from CDC and SART by Progyny network status (i.e., in-network clinics and out-of-network clinics) with Progyny experience removed.[9] These data were used to compare Progyny patient outcomes to non-Progyny patient outcomes across in-network clinics and out-of-network clinics. While clinic level SART data are available publicly, Progyny purchases an extract of the clinic level data in a single workbook. Using these data, we summarized the total volume in each measure for in-network clinics and then removed the Progyny volume to calculate the in-network non-Progyny volume.

Data periods

The data provided by Progyny includes transfers that occurred in 2022 and data runout through June 28, 2023. For the national average, non-Progyny in-network populations, and non-Progyny out-of-network populations, we calculated the pregnancy rate per IVF transfer, IVF miscarriage rate, IVF live birth rate, and SET rate comparisons using SART data, and calculated the IVF live birth rate and IVF multiples rate using CDC data, as outlined in Figure 4. These data sets are the most recent and complete data available from SART and CDC.[10]

FIGURE 4: PROGYNY'S FERTILITY OUTCOMES STUDY: SOURCES OF EXTERNAL DATA BY FERTILITY OUTCOME

Measure	Source*
Pregnancy rate (per transfer)	SART
Miscarriage rate (per pregnancy)	SART
Live birth rate (per transfer)	SART and CDC
SET rate (per transfer)	SART
Multiples rate (per live birth)	CDC
Live birth rate (per intended retrieval)	CDC

** Based on the CDC 2022 National Summary and Clinic Data Sets and SART 2021 Final National Summary Report that reflect retrievals occurring in 2021 and transfers occurring in 2021 or 2022.*

Population selection and normalization

The Progyny fertility outcomes reflect Progyny's complete in-network population of transfers. We compared fertility outcomes for Progyny patients who received care from in-network providers to both the national data sets, non-Progyny patients who received care from in-network providers, and non-Progyny patients who received care from out-of-network providers. Figure 5 outlines the number of IVF transfers included in each data set.

FIGURE 5: PROGYNY'S FERTILITY OUTCOMES STUDY: NUMBER OF IVF TRANSFERS BY POPULATION

Population	Number of IVF Transfers
Progyny 2022	14,724
CDC*	130,563
SART*	159,364**

** Based on the CDC 2022 National Summary and Clinic Data Sets and SART 2021 Final National Summary Report that reflect retrievals occurring in 2021 and transfers occurring in 2021 or 2022. These numbers include Progyny patients.*
*** SART reports the number of transfers for the first embryo transfer and then the number of thaws for secondary/subsequent transfers.*
Note: These IVF transfers are a subset of ART cycles as reported by SART, CDC, and Progyny. Total cycles reported also include retrievals and egg freezing that are not pregnancy attempts.

The national averages are reported by the following age categories: <35, 35 to 37, 38 to 40, >40 for CDC, and <35, 35 to 37, 38 to 40, 40 to 42, >42 for SART. As a result, we categorize treatment outcomes into these age categories depending on the age of the patient at their service date. We account for differences in age between the Progyny population and the national population. We re-weighted the benchmark data to match the age distribution of the Progyny population to enable age-normalized comparisons to Progyny's data. The age groups were aligned with those used in the CDC national data set, when applicable.

[9] Based on Progyny network status.

[10] Note: SART published preliminary 2022 data; however, the final 2021 data set includes an additional year to account for all remaining outcomes that should be included and linked to treatments that occurred in the previous year. The lag in SART and CDC data is due to the live-birth delivery data that requires data through October of the following year to account for the gestational period. Further data lags occur due to the time clinics need to report data to CDC, and additional time for CDC to validate and analyze the data.

IV. Discussion and limitations

Here, we describe our interpretation of each component included in the analysis. Additionally, we discuss other items that are currently not included in our analysis but may be appropriate to consider in the future.

Historical experience

We did not audit the historical experience provided to us by Progyny. We cannot comment on the accuracy of the data, including but not limited to underlying claims, completion factors, demographic/characteristic identification, or network status of clinics. Of the 14,724 reported IVF transfers for Progyny patients in 2022, 14,408 (98%) included reported pregnancy outcomes. Progyny does not collect data from patients who went to out-of-network providers for their fertility treatment, and we are not aware of any other exclusions to the Progyny data. Progyny patients who went to out-of-network providers for their fertility treatment were not included because, while these patients are allowed to continue treatment at out-of-network providers due to transition of care, out-of-network providers are not required to provide outcomes or statistical data to Progyny.

Based on our review of the size of each population included, we concluded that the internal and external populations are statistically credible. This study includes the entire population of Progyny transfers, eliminating the potential for sampling bias that may arise in studies reliant on subsets or samples.

Population selection and normalization

Our analysis normalizes for differences in age between the populations, which is critical for isolating differences in fertility outcomes between populations. Because fertility generally decreases with age, age is considered one of the strongest predictors in determining success rates with fertility treatments.[11] While the analysis could be improved if there were more factors accounted for in the analysis, such as infertility diagnosis, use of donor egg, preimplantation genetic testing (PGT), use of intracytoplasmic sperm injection (ICSI), and fertility insurance coverage, this is not currently possible due to the way the additional factors are reported by CDC and SART, as well as limitations in data collected by Progyny. While CDC collects data on the rationale for using ART, it does not report it by different age brackets, limiting the ability to compare outcomes data on these variables. Because we are not able to normalize for these factors and age at the same time, we chose to normalize for age as it is a critical factor to consider.[12] While Progyny's population is a significant percentage of the national population, it is possible that variations in Progyny's population relative to the non-Progyny national population in these areas also influence Progyny's outcomes.

We were unable to normalize for other factors that may impact fertility outcomes, including certain patient characteristics (e.g., body mass index, smoking and alcohol use, and infertility diagnosis).[13] The national data sets did not report these metrics at the required level of granularity to normalize for these patient characteristics. Readers of this report should understand that the Progyny population could have a greater or smaller proportion of patients with characteristics that negatively impact IVF success compared to the national benchmarks; thus, Progyny's outcomes could be understated or overstated without normalizing for these patient characteristics.

Infertility diagnosis

While we normalized the data for differences in age, other patient/cycle characteristics may contribute to differences in fertility outcomes. Other factors that may contribute to differences in fertility outcomes include infertility diagnosis, which may include diminished ovarian reserve, endometriosis, male factor, uterine factor, tubal factor, ovulatory dysfunction, or unexplained infertility. For example, diminished ovarian reserve is associated with poor response to ovarian stimulation, resulting in decreased pregnancy rates during IVF.[14]

[11] George, K., & Kamath M. S. (2010). Fertility and age. *Journal of Human Reproductive Sciences, 3*(3), 121–123. https://journals.lww.com/jhrs/fulltext/2010/03030/fertility_and_age.3.aspx

[12] Understanding IVF success rate by age. (n.d.). *IVF Matters*. https://www.ivfmatters.co.uk/blogs/news/ivf-success-rates-by-age

[13] Society for Assisted Reproductive Technology. (2017, May 25). *Preparing for in vitro fertilization (IVF): Lifestyle factors* [Video]. YouTube. https://www.youtube.com/watch?v=1M31V1cANcU

[14] Yun, B. H. et al. (2017). In vitro fertilization outcome in women with diminished ovarian reserve. *Obstetrics & Gynecology Science, 60*(1), 46. https://ogscience.org/journal/view.php?doi=10.5468/ogs.2017.60.1.46

While CDC collects data on patients' rationale for using ART, it does not report it by different age brackets, limiting the ability to compare outcomes data on these variables. Figure 6 summarizes the percentage of patients and their reasons for using ART, as reported by CDC.[15]

FIGURE 6: PROGYNY'S FERTILITY OUTCOMES STUDY: CDC PATIENT RATIONALE FOR USING ART, 2022

Rationale	% of Patients*
Egg or embryo banking	42.6
Male factor	28.0
Diminished ovarian reserve	26.2
Other factor, infertility	25.6
PGT	18.3
Ovulatory dysfunction	13.9
Unexplained factor	10.6
Tubal factor	10.2
Other factor, non-infertility	7.0
Recurrent pregnancy loss	6.8
Endometriosis	6.3
Uterine factor	6.0
Gestational carrier	1.5

** These percentages do not add up to 100% as patients may have multiple reasons for using ART.*

Cycle characteristics

The SART 2021 Final National Summary Report was the first report that published data on outcomes associated with ICSI and PGT by age group. However, the value of these cycle characteristics has not been demonstrated for all IVF patients[16,17] and it is ultimately a decision of the provider as to whether these are appropriate for a patient. While Progyny's benefit structure covers PGT and ICSI, we did not assess this as a metric to evaluate Progyny's fertility outcomes.

Progyny data includes patients who used a donor egg, while donor egg cycles are excluded from CDC and SART data. There may be a difference between patients who used their own egg versus a donor egg, especially in the >40 age group as older patients using an egg from a younger donor may have different clinical outcomes. According to CDC, older patients are more likely to have a live birth when a donor egg is used compared to when they use their own egg; donors are typically in their 20s or early 30s and do not experience infertility.[18]

Fertility benefit coverage

The Progyny data set comprises patients who have fertility benefit coverage through their employer, while the external populations include a mixture of employer-funded and self-pay patients. Due to the large expense associated with IVF, self-pay patients may have financial considerations that Progyny members may not have. These financial considerations may influence patient decision making that could impact clinical fertility outcomes. Self-pay patients may be more likely to transfer multiple embryos and/or forego additional services provided during an IVF cycle (e.g., PGT, ICSI) that may or may not provide clinical benefit for certain patients. As fertility benefit coverage status was not included in the CDC or SART data sets, we were unable to control for this variable.

Time periods

The national data sets used in the analysis include the SART 2021 Final National Summary Report and the CDC 2022 National Summary and Clinic Data Sets, both including data from retrievals that occurred in 2021 and transfers that occurred within a year of those retrievals, which could occur in 2021 or 2022. Progyny reports outcomes based on date of transfer as in some cases, patients may use retrievals performed prior to start of coverage. As such, we

[15] CDC. (2024, December 10). *National ART summary*. Retrieved February 14, 2025, from https://www.cdc.gov/art/php/national-summary/index.html?cove-tab=0

[16] American Society for Reproductive Medicine. (n.d.) *The use of preimplantation genetic testing for aneuploidy: A committee opinion (2024)*. https://www.asrm.org/practice-guidance/practice-committee-documents/the-use-of-preimplantation-genetic-testing-for-aneuploidy-a-committee-opinion-2024/

[17] American Society for Reproductive Medicine. (n.d.) *Intracytoplasmic sperm injection (ICSI) for non-male factor indications: A committee opinion (2020)*. https://www.asrm.org/practice-guidance/practice-committee-documents/intracytoplasmic-sperm-injection-icsi-for-nonmale-factor-indications-a-committee-opinion-2020/

[18] CDC. (2018, October). *Assisted reproductive technology 2018 national summary report.* https://archive.cdc.gov/www_cdc_gov/art/pdf/2018-report/ART-2018-national-summary-508.pdf

are not able to align the periods of the national data sets and the Progyny data completely. While the Progyny data used in this analysis was limited to transfers that occurred in 2022, we also compared Progyny data limited to transfers that occurred in 2021 to the national data sets and the results were statistically significant and directionally consistent.

Geographic variance

CDC provides data on the number of embryo transfers and the SET rate by state and age bracket, and meaningful variance can be observed in outcomes across geographic regions; for example, the SET rate for individuals <35 ranged from 62.3% in South Dakota to 95.9% in the District of Columbia. SART data, used to calculate most of the national rates in this study, does not include measures by geographic area and age. Normalizing for geographic variance across all measures is not possible due to how data are reported in the national benchmarks.

Population size

In larger populations, the average becomes more representative of the true mean of the data. Progyny accounts for approximately 10% of nationwide IVF transfers. Due to Progyny's IVF transfer volume relative to the nationwide volume, Progyny is less prone to extreme values, making it less likely to overestimate or underestimate the actual average. For example, results for smaller populations may be much higher or lower than the true average due to sample selection. A larger population study helps balance out these extremes.

Fertility outcome measures

The measures this study employed are commonly used in the literature to measure pregnancy success, health of the pregnancy, and health of the baby.[19] These measurements are particularly meaningful to patients who experience stress and anxiety throughout the IVF process, and may experience correspondingly acute emotional responses in conjunction with positive or negative outcomes.[20]

Progyny's current IVF live birth rate is calculated by subtracting the IVF miscarriage rate from the IVF pregnancy rate, while the national benchmarks are based on actual reported live birth rates. In addition to clinical documentation of a miscarriage, if a patient received a subsequent ART treatment, we assume the patient's prior IVF cycle did not result in a live birth. Progyny's live birth rate calculation may be impacted by miscarriage data and may be overstated if miscarriages are under-reported.

In the SART data, embryo transfers are split out into initial embryo transfer and subsequent embryo transfer. While the number of transfers is provided for the initial embryo transfer group, it is not available for the subsequent embryo transfer group. As a proxy, we utilized the number of thaw procedures to estimate the number of transfers in the subsequent embryo transfer group and removed cases where the thaw did not result in any embryos suitable for transfer. It is possible that some of these thaw procedures were intended for use in a gestational carrier, and thus would not be used in a Progyny patient. However, transfers of intended parent tissue into gestational carriers only account for less than 1% of all patient embryo transfers in the SART data, so it is unlikely to make a directional change in the results.

[19] Pirtea, P. et al. (July 2020). Which key performance indicators are optimal to assess clinical management of assisted reproduction cycles?. *Fertility and Sterility, 114*(1), 24–30. https://www.fertstert.org/article/S0015-0282%2820%2930423-4/pdf

[20] Society for Assisted Reproductive Technology. (n.d.). *Preparing for IVF: Emotional considerations.* https://www.sart.org/patients/a-patients-guide-to-assisted-reproductive-technology/general-information/preparing-for-ivf-emotional-considerations/

V. Conclusion

These results indicate that Progyny patients undergoing ART in 2022 at in-network clinics experienced statistically significant (p = 0.1%) better clinical fertility outcomes than national benchmarks across all six of the metrics calculated. For the six studied measures:

- Progyny's pregnancy rate per transfer is 16% higher than the non-Progyny national rate
- Progyny's miscarriage rate per pregnancy is 13% lower than the non-Progyny national rate
- Progyny's live birth rate per transfer is 19% higher than the non-Progyny national rate for SART; similarly, Progyny's live birth rate per transfer is 25% higher than the non-Progyny national rate for CDC
- Progyny's SET rate per transfer is 19% higher than the non-Progyny national rate
- Progyny's multiples rate per live birth 40% lower than the non-Progyny national rate
- Progyny's live birth rate per intended retrieval is 27% higher than the non-Progyny national rate

For each measure, the national in-network performance is better than the national out-of-network performance, indicating that network selection strongly correlates with the six fertility outcome measures. Furthermore, comparing Progyny's rate and the national in-network clinic rate indicates that Progyny patients experienced improved clinical fertility outcomes compared to national benchmarks, even within the same provider grouping.

We identified some factors that may account for differences between the Progyny and external populations, such as differences in infertility diagnosis and IVF cycle characteristics. While CDC, SART, and Progyny collect some information on infertility diagnosis and/or IVF cycle characteristics, these data are not always provided by different age brackets or for all measures, limiting the ability to compare outcomes data on these variables. The results from this analysis may not be representative of an individual patient's specific experience. Analyzing the drivers of Progyny's clinical outcomes with respect to its product offering was not within the scope of this analysis.

VI. Data reliance and important caveats

Briana Botros and Hiram Satterwhite are consulting actuaries with Milliman, Inc. They are members of the American Academy of Actuaries and meet the Qualification Standards of the Academy to render the actuarial opinions contained herein. To the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices.

Milliman was commissioned by Progyny to compare Progyny's outcomes to benchmarks for six common measures to evaluate fertility management related services. This report is intended to document the methodology and findings of the effectiveness study and should be reviewed in its entirety.

This study may not be appropriate for and should not be used for other purposes. This work has been prepared for Progyny to share with third-party stakeholders. We do not intend this information to benefit or create a legal liability to any third party, even if we permit the distribution of our work product to such third party. The information in this report is technical in nature and no party should rely on this information without conducting a thorough review, having expert understanding of the assumptions and methodology of the effectiveness study, and having extensive knowledge of fertility clinical outcomes.

Milliman does not endorse Progyny's fertility benefit. This analysis is intended for informational purposes only, and Milliman assumes no duty or liability to a recipient of this analysis. Users of this report are urged to ask their own questions of Progyny and be advised by their own experts.

Milliman has developed certain models to estimate the values included in this report. The intent of the models was to compare the clinical outcomes of Progyny's fertility benefit to national benchmarks. We have reviewed the models, including the inputs, calculations, and outputs, for consistency, reasonableness, and appropriateness for the intended purpose and in compliance with generally accepted actuarial practice and relevant actuarial standards of practice (ASOP).

The models rely on data and information as input to the models. We have relied on data provided by Progyny and publicly available information for this purpose and accepted it without audit, though we reviewed it for reasonability. To the extent that the data and information provided are not accurate or are not complete, the contents of this report, along with many of our conclusions, may likewise be inaccurate or incomplete. If there are material defects in the data and information, it is possible they would be uncovered by a detailed systematic review and comparison of the data to search for questionable data values or for relationships that are materially inconsistent. Such a review is beyond the scope of this assignment. The models, including all input, calculations, and output, may not be appropriate for any other purpose to document the methodology and findings of the effectiveness study. The results from the analysis will not be representative of an individual patient's specific experience.

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