|  | **Table 1- Feature description for our dataset** |  |
| --- | --- | --- |
| **Variable** | **Variable levels** | **Variable Type** |
| Endoscopy-Hysteroscopy | 0, 1st Hysteroscopy, 1st Hysteroscopy | 2nd Hysteroscopy, 1st Hysteroscopy | 2nd Hysteroscopy | 3rd Hysteroscopy, , 3rd Hysteroscopy | 1st Hysteroscopy, 4th Hysteroscopy | 3rd Hysteroscopy | 1st Hysteroscopy | 2nd Hysteroscopy | Nominal |
| Endoscopy-Laparoscopy | 0, 1st laparoscopy, 1st laparoscopy | 2nd laparoscopy, 2nd laparoscopy | Nominal |
| Endocrine disorder-Pituitary | 0, acromegaly, Prolactinoma | Nominal |
| History-Habit | 0, Alcohol, Alcohol | smoking, smoking | Nominal |
| Medical HX-Neuro Psychological | 0, Anxiety, depression, depression | Epilepsy, Epilepsy, Psychotic disorder | Nominal |
| Medical HX-GI | 0, Appendicitis, IBD, IBS, IBS | Peptic ulcer, Peptic ulcer | Nominal |
| Medical HX-Immunologic disorder | 0, Arthritic rheumatoid, lupus | Nominal |
| Medical HX-respiratory disease | 0, Asthma, Bronchiectasis, bronchitis, bronchitis | Asthma | Nominal |
| Common surgery-Orchiopexy | 0, Bilat, Bilat | Left | Right, Left, Right, Right | Left | Nominal |
| Common surgery-Varicocelectomy | 0, Bilat, Left, Left | Bilat | Right, Left | Right, Right | Nominal |
| Common surgery-Hernia | 0, Bilat, Left, Left | Right, Left | Right | Bilat, Right | Nominal |
| Common surgery-HYdrocele | 0, Bilat, Left, Right | Nominal |
| History-Nipple discharge | 0, Bilateral, Bloody, Unilateral | Nominal |
| Current drug-Antihyperprolactinemia | 0, Bromocriptin, Bromocriptin | Dostinex, Dostinex | Nominal |
| Medical HX-Infection disorder | 0, Brucellosis, Hepatitis A, Hepatitis B, Hepatitis C, Herpes, TB | Nominal |
| Endocrine disorder-thyroid | 0, cancer, Hyper, Hyper | Hypo, Hypo, Nodule | Nominal |
| Medical HX cardiovascular disorder | 0, DVT, Heart failure, Hypertension, Hypertension | MVP, MVP | Nominal |
| Menstrual Criteria-With drug | 0, Estrogen, OCP, Progesterone, Progesterone | Estrogen, Progesterone | OCP | Nominal |
| History-Pelvic Infection HX | 0, Frequent discharge, History Of PID | Nominal |
| Current drug-Antidiabetic | 0, Glucophage, Metformin, Metformin | Glucophage, Metformin | Paraovarian cyst, Paraovarian cyst | Nominal |
| LT G | 0, II, II | III, II | Time of Injection, III, Time of Injection | Nominal |
| RT G\_\_1 | 0, II, II | Time of Injection, Time of Injection | Nominal |
| LT G\_\_1 | 0, III, Time of Injection | Nominal |
| Medical HX-Blood disorder | 0, Iron anemia, Major thalassemia, minor thalassemia | Nominal |
| Common surgery-Orchiectomy | 0, Left, Right | Nominal |
| Current drug-thyroid drugs | 0, Levothyroxin, Levothyroxin | metimazole, metimazole, PTO | Nominal |
| Past-Irreg | 0, Oligomenorrhea, Poly menorrhea | Nominal |
| Medical HX-renal disease | 0,Recurrent infection, Renal anomaly, Renal stone | Nominal |
| Diabetes-1st degree relative | 0,Type I, Type I | Type II, Type II | Nominal |
| Endocrine disorder-D.M | 0, type1, type2 | Nominal |
| diagnosis-Uterine F | adenomyosis, Anomaly, Asherman, Myoma, Negative, Unexplained (thin endometrium) | Nominal |
| diagnosis-Ovulatory F | Age factor, Diminished ovarian reserve, Endocrine problem, Hypothalamic hypogonadism, Negative, PCOS | Nominal |
| Therapeutic-Agglutination | all, few, most, none, some | Nominal |
| Specimen Characteristics-Color | Amber-Yellow, gray | yellow, Grey, Light-Yellow, Milky, White, White-Grey | Nominal |
| Therapeutic-Type of sampling | Coitus, Coitus | Masturbation, Masturbation, Retrograde ejaculation, Retrograde ejaculation | Coitus | Nominal |
| Therapeutic Sperm preparation -technique | Discontinuous gradient, Pure sperm | Discontinuous gradient, Swim up, Swim up | Discontinuous gradient | Nominal |
| diagnosis-Recurrent abortion | Endocrine, Male, Negative, Thrombotic, unexplained | Nominal |
| Tuboperitoneal Type | Endometriosis, EP Hx, hydrosalipinx, Idiopathic, Negative, Post surgery | Nominal |
| diagnosis-Unexplained | Endometriosis, Idiopathic, Negative | Nominal |
| diagnosis-Other diagnosis | Genetic, Impotency, Incomplete data, Negative, other, poor obstetric outcome, sex selection, Vaginismus | Nominal |
| Menstrual Criteria-Amount | hypermenorrhea, Hypo menorrhea, Normal | Nominal |
| IUI clinic-IUI catheter | INDOVASIVE, Other, INDOVASIVE | Other, Catheter Impex, ORI | Nominal |
| Past-Type | more than 8 levels | Nominal |
| Surgical HX-Non gynecologic surgery | more than 8 levels | Nominal |
| DRUG HX-Past drug | more than 8 levels | Nominal |
| Male medical information-exposures | more than 8 levels | Nominal |
| Male medical information-Drug Hx esp | more than 8 levels | Nominal |
| coded After processing-Progression | more than 8 levels | Nominal |
| coded Before processing-Progression | more than 8 levels | Nominal |
| Therapeutic-Viscosity | Normal, Somewhat Thick, Thick, Thin, Very thick | Nominal |
| Specimen Characteristics-Viscosity  | Normal, Somewhat Thick, Thick, Very Thick | Nominal |
| Family history Endocrine disorder-Thyroid | NO, YES | binominal |
| Male medical information-Scrotum | Ab, NL | binominal |
| Specimen Characteristics-collect type | C, M | binominal |
| Therapeutic-Place of sampling | In, Out | binominal |
| Therapeutic-SPLIT Ejaculation | NO, YES | binominal |
| Menstrual Criteria-Interval | Normal (22-35 days), Abnormal (<21 , >36 days) | binominal |
| Infertility Type | primary, secondary | binominal |
| Relationship-First cousin | 0,1 | binary |
| Relationship-distant relationship | 0,1 | binary |
| no Relationship | 0,1 | binary |
| diagnosis-Male factor | 0,1 | binary |
| Past-Reg (menstruation) | 0,1 | binary |
| Current-Reg (menstruation) | 0,1 | binary |
| Irreg-Oligomenorrhea | 0,1 | binary |
| Irreg-Poly menorrhea | 0,1 | binary |
| Cycle-Amenorrhea | 0,1 | binary |
| Amenorrhea-Primary | 0,1 | binary |
| Amenorrhea-Secondary | 0,1 | binary |
| Menstrual Criteria-IMB | 0,1 | binary |
| Coital HX-Lubricant | 0,1 | binary |
| Coital HX-PCB | 0,1 | binary |
| Coital HX-Vaginismus | 0,1 | binary |
| Coital HX-Impotency | 0,1 | binary |
| History-Cytotoxic Therapy | 0,1 | binary |
| Allergy-food | 0,1 | binary |
| Allergy-seasonal | 0,1 | binary |
| Allergy-Skin | 0,1 | binary |
| Allergy-Respiratory | 0,1 | binary |
| Family History-Infertility | 0,1 | binary |
| Family History-Recurrent abortion | 0,1 | binary |
| Family History-POF | 0,1 | binary |
| Family History-Hearing Disorder | 0,1 | binary |
| Family History-TB | 0,1 | binary |
| Family History-Mental retardation | 0,1 | binary |
| Cardio vascular-Myocardial Infarction | 0,1 | binary |
| Cardio vascular-HTN | 0,1 | binary |
| Respiratory disorder-Asthma | 0,1 | binary |
| Thalassemia-Minor | 0,1 | binary |
| Type of cancer-Breast cancer | 0,1 | binary |
| Type of cancer-Colon cancer | 0,1 | binary |
| Type of cancer-Leukemia | 0,1 | binary |
| Type of cancer-Uterus cancer | 0,1 | binary |
| Type of cancer-Lung cancer | 0,1 | binary |
| Family History-Epilepsy | 0,1 | binary |
| Antihyperprolactinemia-Bromocriptin | 0,1 | binary |
| Antihyperprolactinemia-Dostinex | 0,1 | binary |
| Current drug-Anti Depression | 0,1 | binary |
| Current drug-Anti hypertension | 0,1 | binary |
| Current drug-Anticoagulant | 0,1 | binary |
| Current drug-Folic acid | 0,1 | binary |
| Current drug-Estrogen | 0,1 | binary |
| Current drug-Progestron | 0,1 | binary |
| Current drug-Ferrous sulphate | 0,1 | binary |
| Current drug-Multi vitamin | 0,1 | binary |
| Physical Exam-hirsutism | 0,1 | binary |
| Type of pregnancy-Clinical pregnancy (class variable) | 0,1 | binary |
| Minimal stimulation-Gonadotropin | 0,1 | binary |
| Minimal stimulation-Letrosol | 0,1 | binary |
| Minimal stimulation-Clomiphen | 0,1 | binary |
| Type-Cetrorelix | 0,1 | binary |
| HCG.IU\_5000 | 0,1 | binary |
| HCG.IU\_10000 | 0,1 | binary |
| HCG.IU\_15000 | 0,1 | binary |
| Buserelin\_0.5cc | 0,1 | binary |
| Ovitrelle\_250 mgr | 0,1 | binary |
| Ovitrelle\_500 mgr | 0,1 | binary |
| Type-Fostimon | 0,1 | binary |
| Type-Gonal.F | 0,1 | binary |
| Type-Menopour | 0,1 | binary |
| Type-HMG | 0,1 | binary |
| Type-Merional | 0,1 | binary |
| Type-Bravelle | 0,1 | binary |
| Before Stimulation-OCP | 0,1 | binary |
| Before Stimulation-Estradiol | 0,1 | binary |
| Cotreatment-Aspirin | 0,1 | binary |
| Adjuvant therapy-Acid folic | 0,1 | binary |
| Right-PCO | 0,1 | binary |
| Right-Cyst | 0,1 | binary |
| Left-PCO | 0,1 | binary |
| Left-Cyst | 0,1 | binary |
| Endometrial Texture-Three line | 0,1 | binary |
| have you married before-yes | 0,1 | binary |
| did you have any child-no | 0,1 | binary |
| Common surgery-T.BX | 0,1 | binary |
| Common surgery-Vasectomy | 0,1 | binary |
| Uncommon surgery-Urethral stricture | 0,1 | binary |
| Uncommon surgery-Brain surgey | 0,1 | binary |
| Medical history-Mumps | 0,1 | binary |
| Medical history-Hypertension | 0,1 | binary |
| Medical history-Veneral Dz | 0,1 | binary |
| Medical history-Allergy | 0,1 | binary |
| Medical history-D.M | 0,1 | binary |
| Medical history-M orchitis | 0,1 | binary |
| Medical history-Test Pain | 0,1 | binary |
| Medical history-TB | 0,1 | binary |
| Medical history-Epididimorchitis | 0,1 | binary |
| Medical history-UDT | 0,1 | binary |
| Medical history-UTI | 0,1 | binary |
| cigarette-occasionally | 0,1 | binary |
| cigarette-quarter pack per day | 0,1 | binary |
| cigarette-half pack per day | 0,1 | binary |
| cigarette-one pack per day | 0,1 | binary |
| cigarette-two packs per day | 0,1 | binary |
| cigarette-three packs per day | 0,1 | binary |
| Alcohol-occasionally | 0,1 | binary |
| Alcohol-one per week | 0,1 | binary |
| Opium-occasionally | 0,1 | binary |
| Opium-one per day | 0,1 | binary |
| Marital status of brothers-Married | 0,1 | binary |
| Marital status of brothers-New couples | 0,1 | binary |
| Family HX of infertility-Do your brothers have any children. | 0,1 | binary |
| Right testicle Size\_less than 1 | 0,1 | binary |
| Right testicle Size\_1-1.5 | 0,1 | binary |
| Right testicle Size\_1.5-2 | 0,1 | binary |
| Right testicle Size\_2-2.5 | 0,1 | binary |
| Right testicle Size\_2.5-3 | 0,1 | binary |
| Right testicle Size\_3-3.5 | 0,1 | binary |
| Right testicle Size\_3.5-4 | 0,1 | binary |
| Right testicle Size\_more than 4 | 0,1 | binary |
| Left testicle size\_less than 1 | 0,1 | binary |
| Left testicle size\_1-1.5 | 0,1 | binary |
| Left testicle size\_1.5-2 | 0,1 | binary |
| Left testicle size\_2-2.5 | 0,1 | binary |
| Left testicle size\_2.5-3 | 0,1 | binary |
| Left testicle \_3-3.5 | 0,1 | binary |
| Left testicle size\_3.5-4 | 0,1 | binary |
| Left testicle size\_more than 4 | 0,1 | binary |
| Vas-RT | 0,1 | binary |
| Vas-LT | 0,1 | binary |
| RT-NL | 0,1 | binary |
| RT-Ab | 0,1 | binary |
| LT-NL | 0,1 | binary |
| RT-G | 0,1 | binary |
| plan-med treatment | 0,1 | binary |
| Vitamin-Vitamin C | 0,1 | binary |
| Vitamin-Vitamin E | 0,1 | binary |
| plan-S.A | 0,1 | binary |
| plan-Imaging | 0,1 | binary |
| plan-H.A | 0,1 | binary |
| plan-CW | 0,1 | binary |
| plan-KARYO | 0,1 | binary |
| plan-AZF | 0,1 | binary |
| plan-TESE | 0,1 | binary |
| plan-Wives visit by Gyn required | 0,1 | binary |
| plan-Varicocelectomy | 0,1 | binary |
| plan-sperm Freezing | 0,1 | binary |
| plan-PC.U.A | 0,1 | binary |
| plan-Genetic Consult | 0,1 | binary |
| plan-Endocrine consult | 0,1 | binary |
| plan-DFI | 0,1 | binary |
| plan-Stop Smoking, Alcohol, Opium | 0,1 | binary |
| plan-Occupation hygiene | 0,1 | binary |
| plan-Low weight | 0,1 | binary |
| plan-Others | 0,1 | binary |
| Morphology-Amorph | 0,1 | binary |
| Morphology-Giant Head | 0,1 | binary |
| Morphology-Pin Head | 0,1 | binary |
| Morphology-Round Head | 0,1 | binary |
| Morphology-Cytoplasmic Droplet | 0,1 | binary |

| **Table 2- summary statistics for the features of our dataset** |
| --- |
| **Feature name** | **min** | **first Q** | **Median** | **third Q** | **Max** | **mean** | **sd** |
| Time Diff Between Cycles | 0 | 0 | 0 | 2 | 6.1 | 1.59 | 4.82 |
| 0 | 0 | 0 | 1 | 6.9 | 1.25 | 3.83 |
| Age\_x | 17 | 25 | 28 | 31 | 43 | 28.29 | 4.29 |
| 16 | 26 | 29 | 32 | 47 | 28.97 | 4.68 |
| Family Demographic Information (Education\_x) | 1 | 3 | 3 | 5 | 7 | 3.43 | 1.17 |
| 1 | 3 | 3 | 5 | 7 | 3.4 | 1.22 |
| Duration of Marriage (years) | 0.42 | 4 | 6 | 7 | 23 | 6 | 2.94 |
| 0.25 | 4 | 6 | 7.5 | 26 | 6.31 | 3.19 |
| Duration of infertility (Years) | 0.25 | 2.5 | 4 | 5 | 15 | 4.36 | 2.62 |
| 0.17 | 2.84 | 4.5 | 6 | 19 | 4.66 | 2.85 |
| Menstrual HX (Menarche old year) | 9 | 13 | 13 | 14 | 27 | 13.35 | 1.46 |
| 9 | 13 | 13 | 14 | 27 | 13.29 | 1.42 |
| Current Contraception Duration | 0 | 0 | 0 | 0 | 3 | 0.02 | 0.17 |
| 0 | 0 | 0 | 0 | 8 | 0.01 | 0.19 |
| Summary-Gravida | 0 | 0 | 0 | 0 | 6 | 0.29 | 0.66 |
| 0 | 0 | 0 | 0 | 6 | 0.26 | 0.61 |
| Summary-Para | 0 | 0 | 0 | 0 | 3 | 0.08 | 0.31 |
| 0 | 0 | 0 | 0 | 4 | 0.08 | 0.3 |
| Abortion-Early | 0 | 0 | 0 | 0 | 4 | 0.17 | 0.48 |
| 0 | 0 | 0 | 0 | 6 | 0.15 | 0.45 |
| Abortion-Late | 0 | 0 | 0 | 0 | 3 | 0.02 | 0.16 |
| 0 | 0 | 0 | 0 | 4 | 0.01 | 0.11 |
| Summary-IUFD | 0 | 0 | 0 | 0 | 2 | 0.01 | 0.11 |
| 0 | 0 | 0 | 0 | 2 | 0 | 0.07 |
| Summary-Mole | 0 | 0 | 0 | 0 | 1 | 0 | 0.06 |
| 0 | 0 | 0 | 0 | 2 | 0 | 0.04 |
| Summary-EP | 0 | 0 | 0 | 0 | 1 | 0.01 | 0.11 |
| 0 | 0 | 0 | 0 | 1 | 0.02 | 0.12 |
| Summary-Preterm | 0 | 0 | 0 | 0 | 3 | 0.03 | 0.2 |
| 0 | 0 | 0 | 0 | 5 | 0.02 | 0.16 |
| Summary-Term | 0 | 0 | 0 | 0 | 2 | 0.06 | 0.25 |
| 0 | 0 | 0 | 0 | 4 | 0.06 | 0.26 |
| Summary-Living child | 0 | 0 | 0 | 0 | 2 | 0.06 | 0.24 |
| 0 | 0 | 0 | 0 | 4 | 0.06 | 0.25 |
| IUI Hx-Total | 2 | 2 | 2 | 3 | 10 | 2.73 | 1.47 |
| 2 | 2 | 2 | 3 | 11 | 2.7 | 1.4 |
| Result-Failed | 0 | 0 | 0 | 0.41 | 6 | 0.39 | 0.78 |
| 0 | 0 | 0 | 1 | 10 | 0.41 | 0.78 |
| Result-Pregnant | 0 | 0 | 0 | 0 | 2 | 0.04 | 0.2 |
| 0 | 0 | 0 | 0 | 2 | 0.02 | 0.14 |
| Summary of ART cycle-IVF | 0 | 0 | 0 | 0 | 2 | 0.01 | 0.13 |
| 0 | 0 | 0 | 0 | 6 | 0.03 | 0.24 |
| Summary of ART cycle-ZIFT | 0 | 0 | 0 | 0 | 1 | 0 | 0.02 |
| 0 | 0 | 0 | 0 | 3 | 0 | 0.06 |
| Summary of ART cycle-E.T freeze | 1 | 1 | 1 | 1 | 4 | 1.01 | 0.11 |
| 1 | 1 | 1 | 1 | 5 | 1.01 | 0.1 |
| Summary of ART cycle-Total | 0 | 0 | 0 | 0 | 4 | 0.02 | 0.2 |
| 0 | 0 | 0 | 0 | 9 | 0.04 | 0.31 |
| Physical Exam-height | 142 | 158 | 161.05 | 165 | 187 | 161.61 | 5.74 |
| 142 | 157 | 161.05 | 164 | 187 | 160.96 | 5.7 |
| Physical Exam-weight | 40 | 61 | 67.31 | 74 | 170 | 68.14 | 12.54 |
| 36 | 60 | 67 | 73 | 171 | 67.18 | 11.65 |
| Physical Exam-BMI | 15.02 | 23.53 | 25.93 | 28.04 | 52.11 | 26.01 | 4.23 |
| 14.19 | 23.34 | 25.93 | 28.01 | 57.09 | 25.92 | 4.22 |
| IUI clinic-Number of cycle | 1 | 1 | 1 | 2 | 5 | 1.35 | 0.63 |
| 1 | 1 | 1 | 2 | 7 | 1.31 | 0.59 |
| Infertility medical treatment-Starting day of Stimulation (menstrual day) | 1 | 3 | 3 | 3.42 | 8 | 3.39 | 0.73 |
| 1 | 3 | 3 | 3.42 | 14 | 3.42 | 0.82 |
| Letrosol Dose (mg/day) | 0 | 0 | 0 | 1.12 | 7.5 | 1.28 | 2.04 |
| 0 | 0 | 0 | 1.12 | 7.5 | 1.1 | 1.9 |
| Letrosol Duration | 0 | 0 | 0 | 1.19 | 12 | 1.34 | 2.17 |
| 0 | 0 | 0 | 1.19 | 15 | 1.16 | 2.05 |
| Letrosol Start day of stimulation | 0 | 0 | 0 | 0.77 | 5 | 0.86 | 1.41 |
| 0 | 0 | 0 | 0.77 | 17 | 0.76 | 1.38 |
| Clomiphen Dose (mg/day) | 0 | 0 | 59.87 | 100 | 150 | 57.97 | 45.82 |
| 0 | 0 | 100 | 100 | 150 | 60.19 | 45.54 |
| Clomiphen Duration | 0 | 0 | 3 | 5 | 12 | 2.94 | 2.33 |
| 0 | 0 | 5 | 5 | 15 | 3.07 | 2.36 |
| Clomiphen Start day of stimulation | 0 | 0 | 2.08 | 3 | 6 | 2 | 1.66 |
| 0 | 0 | 2.08 | 3 | 18 | 2.09 | 1.7 |
| Summary of foliculogenesis-Duration of stimulation | 1 | 9 | 10.23 | 11 | 25 | 10.41 | 2.59 |
| 1 | 9 | 10.23 | 11 | 31 | 10.2 | 2.63 |
| Fostimon Dose IU | 0 | 0 | 0 | 77.03 | 337.5 | 91.4 | 23.39 |
| 0 | 0 | 0 | 77.03 | 247.5 | 74.61 | 18.54 |
| Gonal.F Dose IU | 0 | 0 | 0 | 0 | 3750 | 60.96 | 26.71 |
| 0 | 0 | 0 | 0 | 6847 | 60.2 | 23.93 |
| Menopour Dose IU | 0 | 0 | 0 | 0 | 2700 | 10.65 | 125.74 |
| 0 | 0 | 0 | 0 | 3300 | 9.74 | 104.92 |
| HMG Dose IU | 0 | 0 | 0 | 150 | 2625 | 116.59 | 221.67 |
| 0 | 0 | 0 | 150 | 3300 | 125.45 | 230.94 |
| Merional Dose IU | 0 | 0 | 0 | 0 | 3900 | 66.25 | 295.78 |
| 0 | 0 | 0 | 0 | 9075 | 44.76 | 202.57 |
| Hemogon Dose IU | 0 | 0 | 0 | 0 | 1200 | 3.09 | 44.01 |
| 0 | 0 | 0 | 0 | 3000 | 4.95 | 55.65 |
| Menogan Dose IU | 0 | 0 | 0 | 0 | 3450 | 46.63 | 195.23 |
| 0 | 0 | 0 | 0 | 3600 | 44.2 | 163.25 |
| Bravelle Dose IU | 0 | 0 | 0 | 0 | 1050 | 7.93 | 57.94 |
| 0 | 0 | 0 | 0 | 2100 | 9.55 | 77.96 |
| Gonadotropin Total Dose | 0 | 225 | 375 | 450 | 4500 | 453.57 | 502.6 |
| 0 | 225 | 375 | 450 | 4424 | 411.52 | 410.99 |
| Esteradiol Dose | 0 | 0 | 0 | 0 | 6 | 0.33 | 0.99 |
| 0 | 0 | 0 | 0 | 8 | 0.42 | 1.16 |
| Esteradiol Duration | 0 | 0 | 0 | 0 | 15 | 0.25 | 0.95 |
| 0 | 0 | 0 | 0 | 14 | 0.3 | 0.96 |
| No of dominate follicle at HCG day\_17 | 0 | 1 | 1.65 | 2 | 10 | 1.81 | 1.46 |
| 0 | 1 | 1.65 | 2 | 11 | 1.61 | 1.38 |
| No of dominate follicle at HCG day\_18 | 0 | 0 | 0.95 | 1 | 7 | 0.97 | 0.95 |
| 0 | 0 | 0.94 | 1 | 9 | 0.92 | 0.87 |
| HCG day Endometrium (Endometrial thickness) | 4.3 | 8 | 8.51 | 9 | 19 | 8.67 | 1.47 |
| 1 | 8 | 8.52 | 9 | 18 | 8.48 | 1.51 |
| Age\_y | 20 | 30 | 33 | 35 | 72 | 32.82 | 4.7 |
| 20 | 30 | 33 | 36 | 80 | 33.35 | 4.88 |
| Family Demographic Information (Education\_y) | 1 | 2 | 3 | 4 | 7 | 3.38 | 1.23 |
| 1 | 2 | 3 | 4 | 7 | 3.31 | 1.25 |
| Specimen Characteristics-abstinence | 0.41 | 3 | 4 | 4.59 | 20 | 4.42 | 1.79 |
| 0.41 | 3 | 4 | 4.59 | 20 | 4.43 | 1.89 |
| Specimen Characteristics-volume (normal range 2.7 mL) | 0.1 | 2 | 3.2 | 4 | 9.5 | 3.29 | 1.56 |
| 0.1 | 2 | 3 | 4 | 10.5 | 3.23 | 1.54 |
| Specimen Characteristics-PH | 6 | 7.8 | 7.8 | 7.8 | 8.5 | 7.8 | 0.11 |
| 6 | 7.8 | 7.8 | 7.8 | 85 | 7.8 | 0.10 |
| Specimen Characteristics Liquefaction Time (normal range15-30 min) | 20 | 20 | 20 | 30 | 60 | 26.10 | 8.60 |
| 15 | 20 | 20 | 25.53 | 60 | 25.34 | 8.48 |
| Sperm Concentration- total sperm Count  | 10 | 104 | 170.1 | 202.72 | 399 | 165.46 | 84.57 |
| 10 | 92.5 | 168 | 204 | 400 | 163.60 | 88.18 |
| Sperm Motility-Total Motility (normal range 50) | 10 | 40 | 57.3 | 72.22 | 98.8 | 55.94 | 19.87 |
| 10 | 37.6 | 55.9 | 72.22 | 100 | 54.51 | 21.10 |
| Total motile sperm count | 1.14 | 41.06 | 86.70 | 132.90 | 354.88 | 95.29 | 64.21 |
| 1 | 35.52 | 81.55 | 132.90 | 370.11 | 93.71 | 69.08 |
| Sperm Motility-Shaking Grade | 0 | 0 | 0 | 0 | 5 | 0.03 | 0.36 |
| 0 | 0 | 0 | 0 | 15 | 0.03 | 0.48 |
| Sperm Motility-Grade I- | 0 | 0 | 0 | 0 | 19 | 0.12 | 1.14 |
| 0 | 0 | 0 | 0 | 34.3 | 0.12 | 1.16 |
| Sperm Motility-Grade I (grade d) | 0 | 0 | 3.6 | 8.2 | 37.3 | 5.3 | 5.92 |
| 0 | 0 | 3.6 | 8.2 | 46.4 | 5.40 | 6.18 |
| Sperm Motility Grade II- | 0 | 0 | 0 | 0 | 50.3 | 0.27 | 3.04 |
| 0 | 0 | 0 | 0 | 57.6 | 0.21 | 2.57 |
| Sperm Motility Grade II (grade c) | 0 | 10.27 | 26.7 | 36.8 | 64.7 | 24.11 | 16.26 |
| 0 | 11.9 | 26.4 | 36.7 | 70.0 | 24.25 | 15.97 |
| Sperm Motility Grade II+ | 0 | 0 | 0 | 0 | 23.2 | 0.01 | 0.58 |
| 0 | 0 | 0 | 0 | 37.3 | 0 | 0.38 |
| Sperm Motility Grade III (a+b) | 0 | 2.7 | 9.8 | 18.6 | 48.9 | 11.96 | 10.76 |
| 0 | 3.3 | 9.8 | 17.8 | 49.8 | 11.96 | 10.82 |
| Sperm Morphology-Normal Morphology (normal range 30) | 0 | 4 | 5.62 | 7 | 20 | 5.72 | 2.99 |
| 0 | 4 | 5.62 | 7 | 28 | 5.6 | 3.1 |
| Sperm Morphology-Abnormal Morphology (normal range 70) | 80 | 93 | 94.38 | 96 | 100 | 94.27 | 2.99 |
| 72 | 93 | 94.38 | 96 | 133 | 94.4 | 3.13 |
| Sperm Morphology-Amorph | 0 | 69 | 76 | 80 | 92 | 68.59 | 22.61 |
| 0 | 68.66 | 75 | 80 | 96 | 68.68 | 21.7 |
| Sperm Morphology-Double Head | 0 | 0 | 0 | 1.02 | 8 | 0.85 | 1.20 |
| 0 | 0 | 1 | 2 | 11 | 1.02 | 1.36 |
| Sperm Morphology-Giant Head | 0 | 1 | 2 | 4 | 20 | 2.40 | 2.51 |
| 0 | 1 | 2 | 4 | 25 | 2.53 | 2.61 |
| Sperm Morphology-Pin head | 0 | 1 | 2 | 4 | 30 | 2.95 | 3.47 |
| 0 | 1 | 2 | 4 | 30 | 3.14 | 3.37 |
| Sperm Morphology-round head | 0 | 1 | 2 | 4 | 20 | 2.85 | 2.92 |
| 0 | 1 | 2 | 4 | 20 | 2.66 | 2.69 |
| Sperm Morphology-Double Tail | 0 | 0 | 0 | 0 | 4 | 0.14 | 0.47 |
| 0 | 0 | 0 | 0 | 10 | 0.19 | 0.63 |
| Sperm Morphology-Coiled Tail | 0 | 1 | 3 | 5 | 25 | 3.79 | 3.48 |
| 0 | 2 | 3 | 6 | 28 | 4.17 | 3.84 |
| Sperm Morphology-Short Tail | 0 | 1 | 1 | 2.31 | 24 | 1.90 | 2.37 |
| 0 | 1 | 1 | 3 | 28 | 2.20 | 2.75 |
| Sperm Morphology-Cytoplasmic Droplet  | 1 | 4 | 7 | 14 | 20 | 8.08 | 4.94 |
| 1 | 4 | 7 | 12 | 30 | 8.12 | 4.85 |
| Other Tests-Germinal Cell | 0 | 1 | 2 | 3 | 15 | 2.14 | 1.87 |
| 0 | 1 | 2 | 3 | 21 | 2.20 | 1.79 |
| Therapeutic Duration of liquefaction (min) | 5 | 15 | 16.13 | 16.13 | 145 | 16.16 | 5.70 |
| 5 | 15 | 16.13 | 16.13 | 200 | 16.15 | 5.22 |
| Therapeutic volume | 0.5 | 2.5 | 3.59 | 4 | 13 | 3.6 | 1.64 |
| 0.01 | 2.5 | 3.5 | 4 | 13 | 3.54 | 1.66 |
| Therapeutic PH | 5 | 7.76 | 7.8 | 7.8 | 7.9 | 7.77 | 0.09 |
| 0.33 | 7.76 | 7.8 | 7.8 | 10 | 7.76 | 0.19 |
| Before processing motility | 0.04 | 0.3 | 0.37 | 0.45 | 0.92 | 0.38 | 0.14 |
| 0.01 | 0.28 | 0.37 | 0.45 | 0.98 | 0.37 | 0.14 |
| Before processing sperm concentration | 4 | 45 | 54.62 | 68 | 110 | 55.57 | 18.7 |
| 1 | 42 | 54.62 | 68 | 110 | 54.15 | 20.23 |
| After processing motility | 0.2 | 0.96 | 0.98 | 1 | 1 | 0.97 | 0.06 |
| 0.02 | 0.96 | 0.98 | 1 | 1 | 0.96 | 0.09 |
| Post wash total motile sperm count | 1 | 127.4 | 209.88 | 264.87 | 460 | 213.81 | 27.49 |
| 0.16 | 102.9 | 195 | 252 | 450 | 198.81 | 35.09 |
| After processing sperm concentration | 2 | 50 | 60.7 | 72 | 120 | 60.82 | 21.94 |
| 1 | 42 | 60.7 | 72 | 120 | 57.23 | 24.87 |

\* Statistical description of numeric variables: Each row is divided into two parts in which the top row is related to the positive class and the bottom row represents the negative class