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# A cross-sectional survey of service delivery for infertility in Uganda: gaps, opportunities and a way forward

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## Abstract

**Background** Infertility affects approximately one in six adults globally and is associated with significant emotional and social burdens. In Uganda, where the prevalence is estimated at 6.4%, access to affordable and comprehensive infertility services remains limited. This study aimed to assess the availability and scope of infertility care across hospitals in Uganda.

**Methods** A cross-sectional national health facility assessment was conducted in 115 hospitals, comprising 53 public, 38 private not-for-profit (PNFP), and 24 private for-profit (PFP) hospitals. A structured questionnaire, adapted from Afferri et al. 2022, was administered through face-to-face or virtual interviews with facility administrators, obstetricians, and medical officers. Descriptive statistics were used to summarize the availability of infertility services and facility readiness across sectors.

**Results** Of the 115 hospitals surveyed, 112 reported offering infertility services (public: 51; PNFP: 37; PFP: 24); screening and diagnostic services were available in all 112 hospitals. Female Sexually Transmitted Infection testing was common; however, high vaginal swabs were reported less frequently in public hospitals (77%; 97% in private hospitals). Hormonal testing and hysterosalpingography were less available in public hospitals (31.4% and 15.7%, respectively) compared to PFP hospitals (91.7% and 62.5%). Semen analysis was available in 43.1% of public and 91.7% of PFP hospitals. While female infertility treatments were commonly provided, reproductive surgery and intrauterine insemination were primarily limited to PFP hospitals. Assisted reproductive technologies were reported in six (25%) PFP hospitals and one (2%) public hospital, mainly provided by obstetrician-gynecologists (88.4%), with limited involvement of endocrinologists and embryologists. Counseling services (79%) and ethical protocols were more frequently reported in PFP hospitals (67%; 26% public hospitals; 27% of PNFP hospitals). Across all sectors, male infertility care was less prioritized and data on infertility are neither collected nor reported in the HMIS. Overall, 52.7% of hospitals offered comprehensive care, with most advanced services concentrated in the Central region and PFP sector.

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**Conclusion** Infertility services in Uganda are predominantly basic, with limited availability of advanced treatments and male-focused care. Addressing these gaps will require targeted policy interventions and health system strengthening to improve equitable access.

**Keywords** Infertility, Screening services, Diagnostic services, Treatment services, Uganda

## Background

Infertility is a disease of the male or female reproductive system, characterized by the inability to achieve pregnancy after 12 months of regular unprotected sexual intercourse [1]. According to the World Health Organization (WHO), approximately one in six adults worldwide experienced infertility in 2023 [2]. In Africa, a systematic review reported a combined prevalence of primary and secondary infertility at 49.9% [3]. In Uganda, national survey data from 2006, 2011, and 2016 reported an overall prevalence of 6.4%. Primary infertility rates were relatively low, at 1.4% in 2006, 0.7% in 2011, and 0.8% in 2016. In contrast, secondary infertility remained consistently higher, with rates of 7.4%, 6.9%, and 7.1% in the respective survey years [4].

Infertility is classified into two types: primary infertility, where a couple has never conceived, and secondary infertility, where at least one prior conception has occurred [1]. In females, infertility may be caused by tubal or uterine abnormalities, ovarian dysfunction, and hormonal imbalances [5]. In men, the causes include blockages, hormonal disorders, testicular failure, and poor sperm quality [6]. Lifestyle factors such as smoking, excessive alcohol consumption, obesity, and exposure to environmental toxins can negatively affect fertility in both sexes [5, 6].

Infertility has far-reaching consequences that extend beyond reproductive health. Those affected often experience stigma, marital conflict, intimate partner violence, depression, anxiety, grief, and social isolation, particularly in low- and middle-income countries where childbearing is central to social identity and security [7–9]. Women are often blamed for infertility, even when male or combined factors are involved [10]. Furthermore, many couples face significant challenges in accessing clinical, psychosocial, and community-based support services related to fertility [11].

Since 2001, the WHO has recognized infertility as a disease of the reproductive system and as a key component of sexual and reproductive health and rights [1, 12]. However, diagnostic and treatment services remain limited in many low-resource settings and are rarely covered by public health financing, meaning couples must rely on out-of-pocket payments and private providers [1, 12–14]. In Uganda, reproductive health is a national priority, yet infertility care has received relatively little programmatic attention. Available evidence suggests fragmented services, limited diagnostic capacity, few treatment options in the public sector, and high reliance on private, fee-for-service care [15, 16]. Therefore, a systematic assessment of the availability and scope of infertility diagnostic and treatment services in Uganda is needed to identify gaps, inform policy, and guide the integration of infertility care into existing reproductive health platforms. This study was therefore undertaken to systematically assess the availability and scope of infertility diagnostic and treatment services in Uganda.

## Methods

### Study design

This was a nationwide cross-sectional, quantitative survey to assess the availability of infertility diagnosis and treatment services in public, private for-profit, and private not-for-profit health hospitals in Uganda. The structured survey questionnaire was adapted from a previously published cross-sectional facility survey conducted by Afferri et al. (2022) in the Gambia [17]. We undertook a structured adaptation process to ensure content relevance and comparability while aligning the instrument with the Ugandan health system context. First, the study team independently reviewed all items in the original tool and flagged items for modification based on the following predefined criteria: (i) conceptual equivalence to the Ugandan context, (ii) consistency with Uganda's facility nomenclature and service organization, (iii) feasibility of data collection in participating sites, and (iv) relevance to the study objectives. The proposed changes were then discussed at a consensus meeting with the study team, where disagreements were resolved through discussion until agreement was reached, resulting in the production of a final Ugandan version.

The major modifications related to facility characterization. Specifically, the facility-type classifications used in The Gambia (primary/secondary/tertiary level and minor/major/teaching facility) were replaced with classifications used in Uganda—district hospital, general hospital, specialized hospital, and private fertility center. We also removed the geospatial (GIS) coordinate items intended to locate each facility, and we omitted the introductory table detailing the full range of sexual and reproductive health services offered at each facility because it was not essential to the Ugandan survey objectives and would have increased respondent burden. No additional substantive domains were introduced beyond these context-specific adaptations. (Supplementary file 1 and file 2).

The modified questionnaire comprised, 27 questions across three sections C. The first two sections had 25 closed-ended questions covering six domains: (i) respondent demographics, including professional qualifications and gender; (ii) facility characteristics, such as name, location, and level of care?; (iii) availability of reproductive health services, with an emphasis on infertility services and human resources; and (iv) components of the health management information system. The third section consisted of two questions rated on a 4-point Likert scale, designed to assess the perceived barriers to integrating infertility services in hospitals that are expected to provide such services, but currently lack them.

Finally, the adapted questionnaire was then pretested (piloting) in three hospitals selected to reflect diverse ownership and management models (one Public hospital, one Private hospital (PFP), and one Private Not-For-Profit hospital (PNFP)). Feedback from the pilot was used to refine the wording, improve clarity, and streamline administration before the study was rolled out.

### Study setting

With an average annual growth rate of 2.8%, Uganda's population is estimated to be about 50.6 million people, with 74% living in rural areas [18]. Life expectancy at birth was 62 years for men and 66 years for women in 2024 [18]. Around 31% of the population live on one dollar or less per day [18].

The Ugandan health system has a decentralized system of governance, with health care regionalized to districts and sub-districts [19]. The central government is responsible for policymaking, setting standards, and ensuring quality assurance [19]. Health services are provided by the public, private not for profit (PNFP), private for profit (PFP) health practitioners, and traditional and complementary medicine practitioners (TCMPs) [19]. Based on the information from the Ministry of Health's (MoH) Uganda Health facility Directory 2022/23, Uganda had a total of 6,930 health hospitals, both public and private [20]. Of these, 3,133 (45%) are government-owned, 2,795 (40.3%) are PFP, and 1,002 (14.4%) are PNFP hospitals [20]. Among the 171 hospitals in the country, 77 (43.5%) are government-owned, 30 (17%) are PFP, and 50 (39.5%) are PNFP [20].

### Study hospitals and participants

The study was conducted in public, PNFP, and PFP hospitals listed in the Uganda National Health Facility Master List, compiled by the Ministry of Health. From this registry, we identified all general hospitals, regional referral hospitals, and the national referral hospital as the sampling frame for the survey. Hospitals were eligible for inclusion if they: (i) were classified as general, regional referral, or national referral hospitals; (ii) provided reproductive health and/or obstetrics and gynaecology services; and (iii) had at least one clinician, nurse, or midwife knowledgeable about infertility services and who was able to respond to the questionnaire. Within each eligible hospital, we purposively approached the staff member most familiar with infertility care (e.g. an obstetrician-gynecologist, a fertility nurse, or unit in-charge) to complete the survey. We excluded lower-level health centers (HC II–IV), specialized hospitals without reproductive health services, and hospitals that reported not offering any infertility-related services or could not identify a knowledgeable respondent.

### Sampling and sample size calculation

Kish Leslie's formula with finite population correction was used to determine the sample size for assessing the availability of services for the diagnosis and treatment of infertility in Uganda [21]. The calculation was based on the following assumptions: a proportion (p) of 66% [17] representing hospitals offering infertility services, a 95% confidence interval (Z-score = 1.96), a 5% margin of error (e), and a total population (N) of 171 hospitals [20]. This generated a required sample size of 115 hospitals.

Hospitals were then listed based on information from the Ministry of Health's 2021 Comprehensive Service Standards Manual and the Uganda Health Facility Directory 2022/23, available on the Uganda National Health Facility Registry [22] hospitals. Using stratified random sampling, hospitals were selected with proportionate allocation based on ownership type. Within each stratum, random numbers were generated in Microsoft Excel. The hospitals were then sorted in ascending order of their assigned random values, and the required sample was drawn sequentially from the top of the list. During data collection, we identified seven hospitals that offered advanced care but did not offer gynaecology services (e.g., children's hospitals, internal medicine-only hospitals, mental hospitals, and cancer hospitals). These were replaced by the next nearest hospitals in the same region that had not initially been selected.

In total,115 hospitals were sampled, including 53 government hospitals, 38 PNFP hospitals, and 24 PFP hospitals.

### Study variables

The main study variables included infertility services provided, such as screening, diagnostic, and treatment services, as well as the availability of specific procedures such as ovulation induction, semen analysis, reproductive surgery, and assisted reproductive technologies (ART), including IVF. Other variables included the presence of trained personnel, such as gynaecologists and embryologists;, the integration of infertility services into general care; ethical practices; patient workload; and whether

data on infertility were reported in the Health Management Information System (HMIS). 'Availability' referred to whether a specific infertility service or resource was present and offered at the health facility at the time of the survey. This was assessed by determining whether services or components, such as high vaginal swabs, hormone testing, or intrauterine insemination were being provided and used in the care of patients with infertility.

### Data collection procedure

hospitalsData were collected through face-to-face or virtual interviews with purposively selected respondents at each facility. Eligible participants included health facility administrators, medical officers, and obstetricians who had relevant knowledge of institutional infertility care practices. Written informed consent was obtained prior to participation. Trained research assistants conducted the interviews and directly entered survey responses directly into Kobo Toolbox [23, 24], using electronic tablets to ensure data accuracy and consistency.

### Data management and analysis

Before exiting each facility, the research team checked the data for completeness and consistency. The data collected were then organized and reviewed for quality control by the principal investigator. Statistical analysis was conducted using STATA version 15 (StataCorp, College Station, TX, USA). Descriptive statistics were used to summarize the availability of diagnostic and treatment services, and the results were presented as frequencies and percentages using tables and graphs.

## Results

### Infertility service availability by the hospital type

The study included 115 hospitals, comprising 53 public, 38 PNFP, and 24 PFP. Of those, 112 (97.3%) reported providing infertility services – 51 (96.2%) of public, 37 (97.4%) of PNFP, and all 24 of PFP hospitals, as shown in Fig. 1.

### Distribution of infertility screening and diagnostic services across hospital types

All 112 hospitals offered infertility screening and diagnostic services. Screening services, including history taking, physical examination and STI screening for female partners, were commonly provided. However, physical examinations and STI screening for male partners were available to a lesser extent, particularly in PFP and PNFP hospitals (96% and 97%, respectively). STI screening tests for female partners such as HIV and syphilis screening (TPHA) were universally available, but high vaginal swabs were less common in public (39/51; 77%) when compared to PNFP (36/37; 97%) and PFP (23/24; 96%) hospitals, while screening for other STIs was lowest in public (23/51; 45%) and highest in PFP (19/24; 79%) hospitals. Male-partner STI screening services other than HIV, syphilis screening (TPHA), and hepatitis were lower in public (23/51; 45%) compared to PFP (18/24; 75%). Among the female diagnostic services, pelvic ultrasound

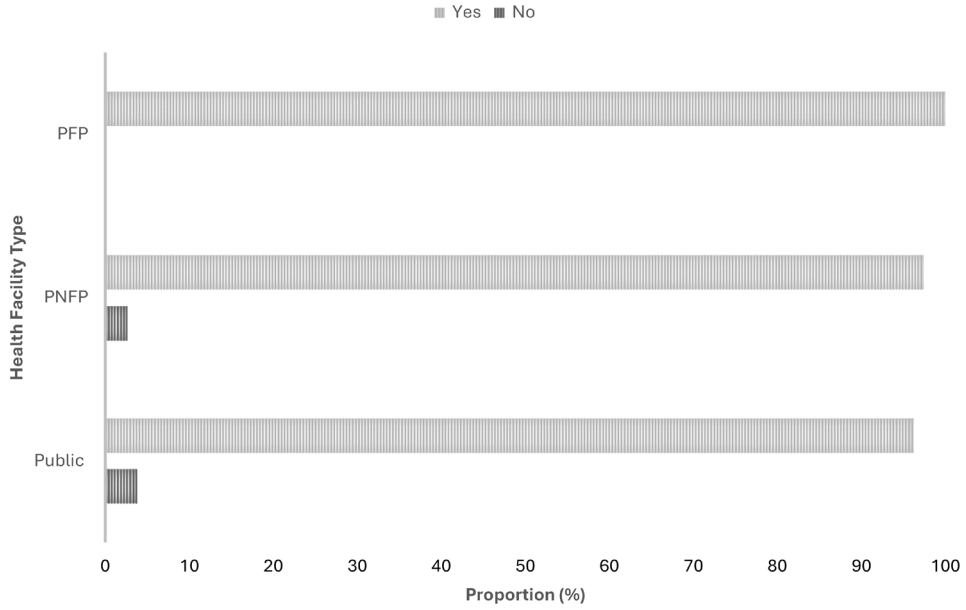



**Fig. 1** Availability of infertility services by health facility type in Uganda. This figure presents the proportion of hospitals offering infertility services, disaggregated by ownership type: public, private not-for-profit (PNFP), and private for-profit (PFP). Among public hospitals, 96.2% (51/53) reported providing infertility services, compared to 97.4% (37/38) of PNFP and 100% (24/24) of PFP facilities. A small proportion of public (3.8%) and PNFP (2.6%) facilities reported no infertility services. All PFP facilities surveyed offered such services. Percentages are displayed above each bar

was common across all hospitals, but reproductive hormone testing was notably lower in public (16/51; 31%) than PNFP (23/37; 62%) and PFP (22/24; 92%) hospitals. Similarly, advanced tests like hysterosalpingogram were less available in public (8/51; 16%) than PNFP (17/37; 46%) and PFP (15/24; 63%) hospitals. Male-partner diagnostic services showed a similar pattern, with semen analysis and reproductive hormone testing more common in PFP (22/24; 92%) hospitals than in public (22/51; 43% and 16/51; 31%, respectively). Scrotal, and transrectal ultrasound for males was available across hospitals, with ranges between 87.% in PFP and 92% in PNFP hospitals (Table 1).

### Availability of infertility treatment services across hospital types

Treatment services were slightly less available in public (49/51; 96%) and PNFP (35/37; 95%) hospitals compared to full coverage in PFP (24/24; 100%) hospitals. Female infertility treatment services were widely available in public (49/51; 96%), PNFP (35/37; 95%), and all PFP (24/24; 100%) hospitals. The most common treatment available was ovulation induction (public: 47/49; 96%, PNFP: 32/35; 91%, PFP: 24/24; 100%). Reproductive surgery was more frequent in PFP (22/24; 92%) and PNFP (27/35; 77%) than public (31/49; 63%) hospitals, while IUI was primarily provided by PFP hospitals (9/24; 38%). Among the 80 hospitals offering reproductive surgery, tuboplasty was the most common procedure (64/80; 80%). Treatment for male infertility was less widely available, but most prevalent in PFP hospitals (22/24; 92%), compared with public and PNFP hospitals (68.% and 78.4% respectively). Medications for male infertility were widely available across the hospitals (85/86; 99%), but advanced procedures such as reversal vasectomy, varicocele repair and surgical sperm retrieval were mostly available in PFP hospitals. ART services offering IVF, ICSI, and cryopreservation were limited across the surveyed hospitals, mainly being available in PFP hospitals (6/24; 25%). Only one public hospital (2%) reported the availability of ART. Most hospitals had obstetricians/gynecologists (99/112; 88%), as personnel providing infertility

**Table 1** Availability of infertility services by hospital type

| Variable | Public | PNFP | PFP |
|---|---|---|---|
| | *N* (%) | *N* (%) | *N* (%) |
| **Fertility services offered (*n* = 112)** | | | |
| Screening services | 51(100) | 37(100) | 24(100) |
| Diagnostic services | 51(100) | 37(100) | 24(100) |
| Treatment services | 49(96) | 35(94.6) | 24(100) |
| **Screening services offered (*n* = 112)** | | | |
| Fertility history taking | 51(100) | 37(100) | 24(100) |
| Physical examination for females | 51(100) | 37(100) | 24(100) |
| Physical examination for males | 51(100) | 37(100) | 23(95.8) |
| Female STI Screening | 51(100) | 37(100) | 24(100) |
| Male STI Screening | 51(100) | 36(97.3) | 24(100) |
| **Female STI screening services (*n* = 112)** | | | |
| Female Screening/HIV | 51(100) | 37(100) | 24(100) |
| Treponema Pallidum Hemagglutination Assay (TPHA) | 51(100) | 37(100) | 24(100) |
| High Vaginal Swab | 39(76.5) | 36(97.3) | 23(95.8) |
| Hepatitis B and C | 50(98) | 36(97.3) | 24(100) |
| Other STIs | 23(45.1) | 20(54.1) | 19(79.2) |
| **Male STI screening services (*n* = 111)** | | | |
| HIV | 50(98) | 36(100) | 24(100) |
| TPHA | 50(98) | 36(100) | 24(100) |
| Hepatitis B and C | 49(96.1) | 36(100) | 24(100) |
| Other STIs | 23(45.1) | 17(47.2) | 18(75) |
| Diagnostic services offered (*n* = 112) | | | |
| **Female** | | | |
| Ultrasound Pelvic Hormones | 50(98) | 37(100) | 24(100) |
| Hormones | 16(31.4) | 23(62.2) | 22(91.7) |
| Hysterosalpingogram | 8(15.7) | 17(45.9) | 15(62.5) |
| **Male** | | | |
| Semen Analysis | 22(43.1) | 26(70.3) | 22(91.7) |
| Hormone | 16(31.4) | 25(67.6) | 22(91.7) |
| Pelvic Ultrasound Scan | 45(88.2) | 34(91.9) | 21(87.5) |

services, but reproductive endocrinologists (10/112; 9%) and embryologists (9/112; 8%) were mostly deployed in PFP hospitals, which also had more counseling services (19/24; 79%) (Table 2).

### Infertility care across facility types: consultations, workload, ethical practices, and decision-making

Infertility treatment consultations were integrated into general services in 84% of public hospitals and 97% of PNFP hospitals, while PFP hospitals showed lower integration (58%) and with more stand-alone services (7/24; 29%). Weekly patient load was generally moderate, with

**Table 2** Availability of infertility treatment services across the different hospital types

| Variable | Public | PNFP | PFP |
|---|---|---|---|
| | *N* (%) | *N* (%) | *N* (%) |
| **Female infertility treatment services** | | | |
| No | 2(3.9) | 2(5.4) | 0(0) |
| Yes | 49(96.1) | 35(94.6) | 24(100) |
| **Female infertility treatment services offered (*n* = 108)** | | | |
| Intrauterine Insemination (IUI) | 1(2) | 2(5.7) | 9(37.5) |
| Ovulation induction | 47(95.9) | 32(91.4) | 24(100) |
| Reproductive surgery | 31(63.3) | 27(77.1) | 22(91.7) |
| Tubal flushing | 34(69.4) | 24(68.6) | 16(66.7) |
| **Reproductive surgery (*n* = 80)** | | | |
| Surgery/laparoscopy | 3(9.7) | 7(25.9) | 16(72.7) |
| Surgery/hysteroscopy | 1(3.2) | 4(14.8) | 13(59.1) |
| Surgery/tuboplasty | 23(74.2) | 24(88.9) | 17(77.3) |
| Surgery/reversal tubal sterilization | 1(3.2) | 2(7.4) | 7(31.8) |
| Surgery/myomectomy | 11(35.5) | 11(40.7) | 16(72.7) |
| **Male infertility treatment services** | | | |
| No | 16(31.4) | 8(21.6) | 2(8.3) |
| Yes | 35(68.6) | 29(78.4) | 22(91.7) |
| **Male infertility treatment services offered (*n* = 86)** | | | |
| Medication for male factor infertility | 35(100) | 28(96.6) | 22(100) |
| Reversal vasectomy | 0(0) | 0(0) | 3(13.6) |
| Surgical sperm retrieval | 1(2.9) | 0(0) | 5(22.7) |
| Varicocele Repair | 1(2.9) | 2(6.9) | 2(9.1) |
| **Provision of ART (*n* = 112)** | | | |
| No | 50(98) | 37(100) | 18(75) |
| Yes | 1(2) | 0(0) | 6(25) |
| **ART services offered (*n* = 7)** | | | |
| In-vitro fertilization | 1(02) | 0(0) | 6(25) |
| IVF with ICSI | 1(02) | 0(0) | 6(25) |
| Embryo cryopreservation | 1(02) | 00) | 6(25) |
| Oocyte cryopreservation | 1(02) | 00) | 6(25) |
| Sperm cryopreservation | 1(02) | 0(0) | 6(25) |
| Pre-implantation genetic diagnosis | 0(00) | 0(0) | 2(08) |
| Sex selection | 0(00) | 0(0) | 2(08) |
| **Personnel involved in providing services (*n* = 112)** | | | |
| Obstetrician/gynecologists | 45(88.2) | 31(83.8) | 23(95.8) |
| Reproductive endocrinologists | 2(3.9) | 2(5.4) | 6(25) |
| Anesthetists | 33(64.7) | 25(67.6) | 21(87.5) |
| Medical assistants | 14(27.5) | 13(35.1) | 2(8.3) |
| Pharmacists | 27(52.9) | 26(70.3) | 20(83.3) |
| Nurses | 25(49) | 23(62.2) | 18(75) |
| Midwives | 32(62.7) | 30(81.1) | 17(70.8) |
| Embryologists | 1(2) | 2(5.4) | 6(25) |
| Laboratory assistants | 35(68.6) | 33(89.2) | 24(100) |
| Psychologists/counsellors | 12(23.5) | 16(43.2) | 19(79.2) |

public and PNFP hospitals seeing 6–25 patients and PFP hospitals reporting slightly higher numbers. The time dedicated to infertility care was mostly low (0–25%) across public (31/51; 61%), PNFP (21/37; 57%), and PFP (13/24; 54%) hospitals. Female infertility was prioritized, with 76–99% of consultations addressing it in public (27/51; 53%), PNFP (21/37; 57%), and especially PFP (19/24; 79%) hospitals. Male infertility was often less addressed, with 0–25% coverage in public (38/51; 75%), PNFP (26/37; 70%), and PFP (19/24; 79%) hospitals. None of the hospitals collected and reported data on infertility in the HMIS, pointing to a systemic gap in data tracking and reporting. Only 26% public hospitals, 27% of PNFP hospitals, and 67% PFP hospitals followed ethical protocols. As there were no national ethical protocols, most hospitals followed international protocols. Decisions on ethically sensitive requests were most often made jointly (public: 19/51; 37%, PNFP: 11/37; 30%, PFP: 8/24; 33%), though PFP hospitals more frequently left final decisions to women (13/24; 54%) (See Table 3).

#### Levels of service as classified by the WHO

Over half of the health hospitals (59/112; 52.7%) provide comprehensive services, while 41.1% (47/112) offer basic services and a smaller proportion (7/112; 6.3%) provide advanced services. Regionally, the Central region had the highest share of hospitals providing comprehensive (33/112; 60%) and advanced (6/112; 10.9%) infertility services, while the Eastern region was dominated by hospitals providing basic services (17/112; 85%). Public hospitals mainly offered basic services (33/112; 64.7%), private not-for-profit (PNFP) hospitals focused more on comprehensive services (25/112; 67.6%), and private for-profit (PFP) hospitals had a notable share of advanced services (6/112; 25%). By facility level, district hospitals predominantly provided basic services (13/112; 68.4%), general hospitals mostly offered comprehensive care (39/112; 60%), and specialized hospitals had a balanced distribution between comprehensive (3/112; 42.9%) and advanced services (3/112; 42.9%)(Table 4).

## Discussion

In Uganda, This study reveals a comparable availability of infertility services across public and private hospitals in Uganda, indicating notable progress in the provision of such services by the public sector—contrary to earlier assumptions that such care was confined to private hospitals [13]. Although basic infertility screening is now almost universally available across all facility types, disparities remain in the availability of advanced diagnostic and treatment services.

These findings align with previous qualitative studies in Uganda which showed that, despite improved availability, financial, social, and knowledge-based barriers continue to impede the utilization of infertility service [25, 26]. One study found that women reported limited awareness of the causes of infertility and the available treatment options, with cost being a major deterrent [25]. Another study at Mulago reported the widespread use of herbal medicine to treat infertility (76%), as well as delayed medical care due to cost and non-disclosure to providers [26]. Although public hospitals now offer basic infertility services, access to advanced diagnostics and treatment such as tubal evaluations and IVF remains limited and unaffordable for many [27].

The improved fertility care coverage observed in our study can be attributed to the National Health Policy Guideline and Service Standards for Sexual and Reproductive Health and Rights. These guidelines stipulate that public hospitals must provide screening, diagnosis, and treatment for infertility [28]. Additionally, government funding for reproductive health commodities has increased from approximately $2.16 million in 2016/17 to $4.2 million in 2020/21, indicating a growing investment in reproductive health [29]. Furthermore, the growing number of private hospitals in Uganda, coupled with increased investment from civil society organizations through PNFP hospitals, has also significantly expanded the availability of infertility services.

Despite notable progress, the study reveals a gradient in the advancement of infertility services across facility types. Basic screening services—including taking fertility histories, physical examinations, and STI testing (HIV, syphilis, and hepatitis)—were universally available. However, public hospitals continue to lag behind PNFP and PFP hospitals in offering treatment and advanced diagnostic services. Although pelvic ultrasound is widely accessible, more specialized procedures, such as hormone assays, hysterosalpingography, and semen analysis, remain concentrated in private hospitals. These disparities suggest persistent resource constraints in the public sector. Similar findings have been reported in Gambia, where differences in the availability of fertility treatment and advanced diagnostics exist between private and public hospitals [17].

Conversely, the near-universal availability of ovulation induction for treatment services suggests that this relatively inexpensive intervention has been successfully integrated across all sectors [30]. However, more advanced reproductive surgeries, such as laparoscopic procedures and hysteroscopy, are more available in PFP hospitals than in public hospitals. These findings align with previous research documenting limited surgical capacity in public health hospitals across sub-Saharan Africa [13, 17]. Tuboplasty is the most commonly available reproductive surgery, likely reflecting the high prevalence of tubal factor infertility in low- and middle-income settings [31, 32].

**Table 3** Patterns of infertility care across hospital types

| Variable | Public | PNFP | PFP |
|---|---|---|---|
| | *N* (%) | *N* (%) | *N* (%) |
| **Infertility treatment consultations integrated** | | | |
| Stand Alone | 4(7.8) | 0(0) | 7(29.2) |
| Integrated | 47(84.3) | 37(97.3) | 17(58.3) |
| **Approximate number of patients per week** | | | |
| Fewer than 5 | 21(41.2) | 19(51.4) | 5(20.8) |
| Between 6 and 25 | 26(51) | 18(48.6) | 16(66.7) |
| Between 26 and 50 | 1(2) | 0(0) | 2(8.3) |
| Between 51 and 70 | 1(2) | 0(0) | 0(0) |
| More than 70 | 0(0) | 0(0) | 1(4.2) |
| Do not know | 2(3.9) | 0(0) | 0(0) |
| **Approximate percentage of time spent** | | | |
| 0 to 25 | 31(60.8) | 21(56.8) | 13(54.2) |
| 26 to 50 | 13(25.5) | 8(21.6) | 4(16.7) |
| 51 to 75 | 3(5.9) | 6(16.2) | 5(20.8) |
| 76 to 99 | 4(7.8) | 1(2.7) | 2(8.3) |
| Do not know | 0(0) | 1(2.7) | 0(0) |
| **Percentage of infertility consultations that address female fertility** | | | |
| 0 to 25 | 9(17.6) | 2(5.4) | 1(4.2) |
| 26 to 50 | 8(15.7) | 6(16.2) | 3(12.5) |
| 51 to 75 | 5(9.8) | 8(21.6) | 1(4.2) |
| 76 to 99 | 27(52.9) | 21(56.8) | 19(79.2) |
| 100 | 1(2) | 0(0) | 0(0) |
| Do not know | 1(2) | 0(0) | 0(0) |
| **Percentage of infertility consultations that address male infertility** | | | |
| 0 to 25 | 38(74.5) | 26(70.3) | 19(79.2) |
| 26 to 50 | 6(11.8) | 5(13.5) | 5(20.8) |
| 51 to 75 | 1(2) | 2(5.4) | 0(0) |
| 76 to 99 | 0(0) | 2(5.4) | 0(0) |
| Do not know | 6(11.8) | 2(5.4) | 0(0) |
| **Report about infertility in HMIS** | | | |
| No | 51(100) | 37(100) | 24(100) |
| Yes | 0(0) | 0(0) | 0(0) |
| **The facility follows ethical protocols** | | | |
| Yes | 13(25.5) | 10(27) | 16(66.7) |
| No | 37(70.6) | 24(64.9) | 7(29.2) |
| Don't Know | 1(2) | 3(8.1) | 1(4.2) |
| **Personnel responsible for a final decision on ethically sensitive requests** | | | |
| The woman wanting infertility treatment | 15(29.4) | 17(45.9) | 13(54.2) |
| The man wanting infertility treatment | 3(5.9) | 0(0) | 2(8.3) |
| Decision is always made together | 19(37.3) | 11(29.7) | 8(33.3) |
| The medical doctor providing the treatment | 10(19.6) | 8(21.6) | 0(0) |
| The ethical board of the health facility | 0(0) | 0(0) | 1(4.2) |
| Other | 4(7.8) | 1(2.7) | 0(0) |

The limited availability of advanced diagnostic and treatment services in public hospitals may largely be due to the associated costs. A systematic review of the costs of assisted reproduction treatments in Africa found that these can amount to up to 200% of the GDP per capita [14]. Although private clinics exclusively offering fertility care have begun to emerge in recent years, payment for these services is completely out-of-pocket. Therefore, despite policies and resources being geared towards increasing access to and availability of infertility services in Uganda, these measures are insufficient to address the current inequalities. More robust collaboration and partnerships with the private sector could help to fill gaps in public sector provision and increase affordability [28].

The disparities are even more pronounced with ART, with low availability reported across all health facility

**Table 4** Levels of service at the different types of hospitals as classified by WHO

| | Basic | Comprehensive | Advanced |
|---|---|---|---|
| | *N* (%) | *N* (%) | *N* (%) |
| Overall | 46(41.1) | 59(52.7) | 7(6.3) |
| **Region** | | | |
| Central | 16(29.1) | 33(60) | 6(10.9) |
| Eastern | 17(85.0) | 3(15) | - |
| Northern | 5(21.7) | 18(78.3) | - |
| Western | 8(57.1) | 5(35.7) | 1(7.1) |
| **Facility ownership** | | | |
| Public | 33(64.7) | 17(33.3) | 1(2) |
| PNFP | 12(32.4) | 25(67.6) | - |
| PFP | 1(4.2) | 17(70.8) | 6(25) |
| **Facility level** | | | |
| National referral hospital | 1(50) | - | 1(50) |
| Regional referral hospital | 8(42.1) | 11(57.9) | - |
| District hospital | 13(68.4) | 6(31.6) | - |
| General hospital | 23(35.4) | 39(60) | 3(4.6) |
| Specialized hospital | 1(14.3) | 3(42.9) | 3(42.9) |

types. This means that, despite the private sector's role in boosting the availability of infertility services, the exorbitant costs associated with ART still pose significant challenges. The situation is even worse in public hospitals, where only one facility reported providing ART, including IVF, ICSI, and cryopreservation of embryos and gametes, with only one clinic performing all these procedures. This finding mirrors patterns observed in other low-income countries, where ART remains largely inaccessible [33].

Male infertility services ware rarely available across all facility types, mirroring well-documented gender disparities in reproductive healthcare in sub-Saharan Africa [34]. Our findings revealed that medication was the most available treatment option for male infertility, while other options such as vasectomy reversal, surgical sperm retrieval, and varicocele repair were either less commonly provided or unavailable.

Additionally, the majority of hospitals reported that most infertility consultations were mostly attended by women rather than men. Previous research has shown that stigma surrounding male fertility problems can result in poor health-seeking behavior [35]. It is therefore imperative to understand the barriers impeding access to care from the male perspective, and to encourage greater male involvement in addressing infertility concerns and reproductive health issues in general.

In terms of human resources, although obstetricians and gynecologists were evenly distributed, specialized personnel such as reproductive endocrinologists and embryologists were less available in public hospitals. This creates a self-reinforcing cycle where advanced treatments are concentrate in areas with specialists, and specialists are concentrated in areas with advanced treatments. The greater availability of counseling services in PFP hospitals suggests more comprehensive, patient-centered, and holistic models of care in private settings, which is consistent with findings from other healthcare systems [36]. This suggests that patients in private settings may have greater access to supportive services, accentuating the differences in care models between the public and private sectors further [36].

The organization and delivery of infertility care in Uganda reflect distinct structural and cultural patterns across facility types. Public and private-not-for-profit (PNFP) hospitals commonly integrate infertility services into general reproductive health care, which is a resource-efficient approach typical in low-income settings where specialized services and personnel are limited [37, 38]. In contrast, private-for-profit (PFP) hospitals are more likely to offer stand-alone infertility services, which aligns with the specialization model often seen in the private sector [39].

This study further demonstrates that infertility services in Uganda are largely limited to the basic (41.1%) and comprehensive (52.7%) levels, with advanced care available in only a small proportion (6.3%) of hospitals. Advanced services were mostly concentrated in urban referral centers, particularly in the Central region (10.9%), and are absent in the Eastern and Northern regions. This pattern is also evident across facility ownership and level, with most public hospitals (64.7%) offering only basic services and very limited advanced care, in contrast to private-for-profit hospitals (25%) and higher-tier hospitals such as national (50%) and specialized hospitals, which are more likely to provide advanced infertility treatments. These patterns may be largely explained by resource constraints. Advanced infertility treatments like

in vitro fertilization require specialized infrastructure, including well-equipped laboratories, reliable electricity, and highly trained professionals such as embryologists, all of which are often lacking outside major cities [17, 40]. Most public-sector hospitals are underfunded, lack insurance mechanisms to support fertility care, and do not have the technical staff required to offer ART [17, 40]. These findings are consistent with trends reported across sub-Saharan Africa, where infertility services, especially advanced care, are primarily available in the private sector and typically accessible only to wealthier individuals [13, 17].

Lastly, the complete absence of infertility reporting in HMIS systems across all hospitals represents a critical health system gap, and is similar to previous studies that indicated poor quality data and underutilization of the HMIS in health hospitals in Uganda [41]. This systemic invisibility of infertility in health information systems likely contributes to its continued marginalization in resource allocation and policy attention.

### Strengths and limitations

A key strength of this study lies in its comprehensive assessment of infertility services availability across all major hospitals in Uganda. This provides a nuanced picture of both progress and persisting disparities. Including public, PNFP, and PFP hospitals enables the study to offer valuable insights into structural differences in service provision and highlight areas where equity gaps are most pronounced.

However, the study also has limitations. The cross-sectional design only captures availability at a single point in time, limiting inferences about trends or changes over time. Additionally, while the study assesses service availability, it does not evaluate the quality of these services. Finally, the reliance on self-reported data from hospitals may introduce reporting bias, particularly regarding adherence to ethical protocols and service provision.

## Conclusion

This study reveals that Uganda has made notable progress in expanding the availability of basic infertility services across public, private-not-for-profit, and private-for-profit hospitals, reflecting policy commitments to integrate infertility care into the broader reproductive health framework. However, stark disparities remain, particularly in access to advanced diagnostics and treatment, particularly assisted reproductive technologies, which are largely concentrated in private-for-profit settings and remain financially inaccessible for many. Male infertility services are systematically neglected, reinforcing gender disparities in reproductive healthcare. Addressing these gaps will require comprehensive policy interventions, health system investments, and public-private partnerships aimed at ensuring that infertility care is equitable, affordable, and accessible to all Ugandans, regardless of socioeconomic status.

#### Abbreviations

| | |
|---|---|
| ART | Assisted Reproductive Technology |
| HMIS | Health Management Information System |
| HSG | Hysterosalpingogram |
| ICSI | Intracytoplasmic Sperm Injection |
| IUI | Intrauterine Insemination |
| IVF | In Vitro Fertilization |
| LMICs | Low- and Middle-Income Countries |
| MoH | Ministry of Health |
| OB/GYN | Obstetrician/Gynecologist |
| PFP | Private For-Profit |
| PNFP | Private Not-For-Profit |
| RMNCAH | Reproductive, Maternal, Newborn, Child, and Adolescent Health |
| SSA | Sub-Saharan Africa |
| STI | Sexually Transmitted Infection |
| TPHA | Treponema Pallidum Hemagglutination Assay |
| UBOS | Uganda Bureau of Statistics |
| WHO | World Health Organization |

## Supplementary Information

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Supplementary Material 1

Supplementary Material 2

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#### Author contributions

DZ conceived and designed the study, secured necessary approvals, and oversaw the study's execution. Additionally, DZ conducted the literature review, performed the data analysis, interpreted the results, prepared the tables and figures, and drafted and finalized the manuscript. DA, CKN, MN, AK, AA, and SNK contributed to the study design, data analysis, interpretation of the results, and provided substantial revisions to the manuscript. All co-authors participated in the redrafting and finalization of the article.

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#### Data availability

The dataset for this study is available upon request from the corresponding author.

## Declarations

#### Ethics approval and consent to participate

Ethical approval for this study was obtained from the Ministry of Health of Uganda to enable data collection across hospitals nationwide. Additional approvals were secured from the Uganda National Council for Science and Technology (UNCST) and the Makerere University School of Public Health Research and Ethics Committee (REC Protocol Number: SPH 2023 – 525). Administrative permission was also obtained from all participating hospitals. This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Written informed consent was obtained from all respondents prior to data collection. Participants were assured of the voluntary nature of their participation, their right to withdraw at any time without penalty, and the confidentiality of their responses. All data were anonymized at the point of collection and securely stored with access limited to authorized members of the research team.

**Consent for publication**
Not applicable.

**Competing interests**
The authors declare no competing interests.

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**References**

1. WHO. Infertility facts sheet. In.; 2024.
2. WHO. Infertility prevalence estimates, 1990–2021. World Health Organization; 2023.
3. Abebe MS, et al. Primary and secondary infertility in Africa: systematic review with meta-analysis. Fertility Res Pract. 2020;6(1):20.
4. Zaake D, et al. Prevalence, regional distribution, and determinants of infertility in Uganda between 2006 and 2016: analysis of three Demographic and Health Surveys. J Global Health Rep. 2024;8:e2024008.
5. ASRM. Fertility evaluation of infertile women: a committee opinion. Fertil Steril. 2021;116(5):1255–65.
6. Brannigan RE, et al. Updates to Male Infertility: AUA/ASRM Guideline (2024). J Urol. 2024;212(6):789–99.
7. Hasanpoor-Azghdy SB, et al. The emotional-psychological consequences of infertility among infertile women seeking treatment: Results of a qualitative study. Iran J Reprod Med. 2014;12(2):131–8.
8. Jain C, Khan W. Psychosocial Concomitants of Infertility. Narrative Rev Cureus. 2025;17(3):e80250.
9. Rouchou B. Consequences of infertility in developing countries. Perspect public health. 2013;133(3):174–9.
10. Ekpor E, et al. Experience of infertility-related stigma in Africa: a systematic review and mixed methods meta-synthesis. Int Health. 2025;17(6):903–13.
11. Adamson GD, et al. Policy solutions to improve access to fertility treatment and optimise patient care: consensus from an expert forum. Front Reprod Health. 2025;7.
12. Dierickx S, et al. The Nairobi Summit and Reproductive Justice: unmet needs for people with infertility. Am J Trop Med Hyg. 2021;104(3):812.
13. Whittaker A, et al. Access to assisted reproductive technologies in sub-Saharan Africa: fertility professionals' views. Sex Reprod Health Matters. 2024;32(1):2355790.
14. United Nations: United Nations. SDG indicators. United Nations Statistics Division. 2019. 2019.
15. MOH. The Uganda Rmncah Operational Research Program (2018–2021). 2018.
16. MOH. Reproductive, Maternal, Newborn, Child, Adolescent and Healthy Aging Sharpened Plan and Investment Case II 2022/23–2026/27. 2022.
17. Afferri A, et al. Availability of services for the diagnosis and treatment of infertility in The Gambia`s public and private health hospitals: a cross-sectional survey. BMC Health Serv Res. 2022;22(1):1127.
18. Uganda Bureau of Statistics. National Population and Housing Census 2024 Final Report. Kampala: UBOS; 2024.
19. Tashobya CK, et al. Decentralisation and the Uganda health system: what can we learn from past experiences to facilitate the achievement of Universal Health Coverage. Universal health coverage in Uganda: looking back and forward to speed up the progress. 2018.
20. Ministry of Health: National Health Facility Master List 2018: a complete list of all health hospitals in Uganda. Kampala: Ministry of Health; 2018.
21. Leslie Kish: Survey Sampling. By Leslie Kish. (New York: John Wiley &, Sons I. 1965. Pp. xvi, 643. $10.95). American Political Science Review. 1965;59(4):1025–1025.
22. Uganda National Health Facility Registry. Available form: https://nhfr.health.go.ug/hospitals.
23. Das AS. Chap. 4 - KoboToolbox. In: Open electronic data capture tools for medical and biomedical research and medical allied professionals. edn. Edited by Pundhir A, Mehto AK, Jaiswal A: Academic Press; 2024: 241–329.
24. Harvard Humanitarian. I: KoBoToolbox. 2019.
25. Jude C. Onwueme: lived experiences of seeking care for infertility among women at two selected fertility centers in Kampala district [master's thesis]. Kampala: Makerere University; 2023.
26. Kaadaaga HF, et al. Prevalence and factors associated with use of herbal medicine among women attending an infertility clinic in Uganda. BMC Complement Altern Med. 2014;14:27.
27. Asiimwe S, et al. Women's experiences of living with involuntary childlessness in Uganda: a qualitative phenomenological study. BMC Womens Health. 2022;22:532.
28. MOH. The national policy guidelines and service standards for sexual and reproductive health and rights. Reproductive Health Division; 2012.
29. MOH: Provision of family planning services in Uganda. The national Total Market Approach (TMA) strategy 2020–2025 for financial sustainability; 2020.
30. Inhorn MC, Patrizio P. Infertility around the globe: new thinking on gender, reproductive technologies and global movements in the 21st century. Hum Reprod Update. 2015;21(4):411–26.
31. Elhussein OG, et al. Epidemiology of infertility and characteristics of infertile couples requesting assisted reproduction in a low-resource setting in Africa, Sudan. Fertility Res Pract. 2019;5(1):7.
32. Dhont N. Clinical, epidemiological and socio-cultural aspects of -infertility in resource-poor settings. Evidence from Rwanda. Facts Views Vis Obgyn. 2011;3(2):77–88.
33. Njagi P, et al. Financial costs of assisted reproductive technology for patients in low- and middle-income countries: a systematic review. Hum Reprod Open. 2023;2023(2):hoad007.
34. Dhont N, et al. Gender differences and factors associated with treatment-seeking behaviour for infertility in Rwanda. Hum Reprod. 2010;25(8):2024–30.
35. Dierickx S, et al. Men and infertility in The Gambia: Limited biomedical knowledge and awareness discourage male involvement and exacerbate gender-based impacts of infertility. PLoS ONE. 2021;16(11):e0260084.
36. Scholle SH, et al. Characteristics of patients seen and services provided in primary care visits in obstetrics/gynecology: data from NAMCS and NHAMCS. Am J Obstet Gynecol. 2004;190(4):1119–27.
37. WHO. TECHNICAL SERIES ON PRIMARY HEALTHCARE. INTERGRATING HEALTH SERVICES. 2018.
38. Heyeres M, et al. The Complexity of Health Service Integration: A Review of Reviews. Front Public Health. 2016;4:223.
39. Basu S, et al. Comparative performance of private and public healthcare systems in low- and middle-income countries: a systematic review. PLoS Med. 2012;9(6):e1001244.
40. Ombelet W, et al. Infertility and the provision of infertility medical services in developing countries. Hum Reprod Update. 2008;14(6):605–21.
41. Kagoya HR, Kibuule D. Quality assurance of health management information system in Kayunga district, Uganda. Afr Evaluation J. 2018;6(2):1–11.

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