ANNUAL WORK REPORT

TRENDS AND FIGURES OF FERTILITY TREATMENTS IN MALTA FOR 2019

EMBRYO PROTECTION AUTHORITY

Putting Patients First

FEBRUARY 2020

ANNUAL WORK REPORT

TRENDS AND FIGURES
OF FERTILITY TREATMENTS
IN MALTA FOR 2019

EMBRYO PROTECTION AUTHORITY

Putting Patients First

Presented to Deputy Prime Minister and Minister for Health

Hon Chris Fearne

As per Embryo Protection Act 2012, Chapter 524,

Embryo Protection (Amendment) Act, 2018

and

Embryo Protection Authority Regulations, LN32 of 2015

February 2020

EMBRYO PROTECTION AUTHORITY

PUTTING PATIENTS FIRST

ANNUAL WORK REPORT FOR 2019

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Executive Director's foreword

Welcome

2019 has been another busy and successful year of daily miracles for the Embryo Protection Authority. We are proud that since our inception in 2013 to date **328 babies** have been born through ART Technologies. After the introduction of amendments to the Embryo Protection Act in 2018, most of the changes started being implemented by the licenced clinics in 2019. The Authority was invited to raise awareness on the various media and take part in the public debates that arose on the subjects mainly on the implications of embryo freezing and embryo adoption as well as the introduction of direct and non-direct third party donation.

Many were surprised and publicly cited our regulation particularly that although we are a Health Care Sector Regulator we also engage in the moral and ethical concern issues in the well being not only of the child to be conceived but also of the prospective parent and her partner where applicable.

Our new Protocol which we published in 2018, but was laid on the Table of the House of Representatives in 2019 contains not only the changes to services as per the amendments to the law but also includes new features such as equality, gender and sexual orientation of the patients as well as the support that clinics should provide for patients both to those that are successful and more and more to those whose treatment was not successful.

During 2019 we have worked tirelessly to have a new electronic exchange IT programme which will eventually in 2020 be linking all clinics who perform all medically assisted procreation techniques including intra-uterine inseminations with

the Authority. This will facilitate recording of data, storage of data, approvals of the treatments to be performed and real time statistics to help us report on the state of the fertility sector both to the patients, the general public and Maltese Authorities.

I take this opportunity to thank my very limited but very supportive staff at the EPA for their continuous round the clock work in obtaining these achievements, delivered in a timely manner against very tight resources available to the Authority, all the statistical information can be found in this report in the Trends and Figures section.

Looking forward to 2020, which will see the introduction of third party donations of both sperm and oocytes from abroad thus opening up the services to a wider range of patients. We will continue to strive to see that the many strides we have made in this sector since the inception of the Authority in 2013 will continue to flourish.

We also promise that we will continue to be voice of our patients to receive the services from the clinics with the highest standards, and look forward to introduce new care pathways for the patients undergoing treatment to move on from single (treatment) to holistic (family) care path ways. Especially for the majority of our patients who unfortunately go through an unsuccessful process, care pathways for families making use of embryo donation and finally but not least care pathways for donor conceived families reaching up to day of disclosure.

Ms Simone Attard

Executive Director

1. BACKGROUND

1.1. The Embryo Protection Authority (EPA)

The Embryo Protection Authority is a body corporate having a distinct legal personality and is the sole Regulator of all Assisted Reproductive Technologies (ART) performed at both the public and private licensed clinics/hospitals in Malta. It has been established as per the Embryo Protection Act 2012, (Chapter 524) which covers the use and storage of sperm, oocytes (eggs), and embryos for human application. The Act has been amended through the Embryo Protection (Amendment), 2018. The new Amendment Act was enacted on the 21st June 2018 and came into force on the 1st October 2018 as per Legal Notice LN 313/2018.

The Protocol for Additional Fertilisation Requests (AFR) was established in writing by the Authority compiling all criteria and methodology for the application to grant more than two oocytes to be fertilised and consequently permission for embryo cryopreservation. The AFR Protocol was presented to the Parliamentary Health Committee on the 13th September 2018 and was unanimously approved on same day.

The Authority sets the standards and determines the policy framework (Protocol) while providing information to stakeholders, the general public, and to the prospective parent / parents seeking treatment.

1.2. Our Principles – PATIENTS FIRST

The Embryo Protection Authority treats all prospective parent / parents referred by the licensed Clinics with dignity and respect, and all information provided to the Authority in confidence remains highly confidential and disclosed only in the circumstances permitted by law, as per the Data Protection Act.

All decisions taken by the Embryo Protection Authority are taken in the best interest of the prospective parent/parents and of the child/children who may be conceived out of any assisted reproductive technology procedure undertaken.

1.3. Our Principles – Working closely with Stakeholders

The Authority ensures that the highest levels of standards are being kept as specified in the laws governing the fertility sector by working closely with all stakeholders in the Fertility field.

The Authority also performs its functions consistently and fairly with all clinics as per the established Laws and Regulations.

1.4. The Legal Framework

A number of laws and regulations make up the regulatory framework which covers the Assisted Reproductive Technology (ART) activities held in Malta.

1. *The 'Enabling' Act*:

The Embryo Protection Act 2012 – Chapter 524 of the Laws of Malta is the 'Parent' Act governing the Fertility Sector. The Bill was passed through Parliament and provides for the protection of human embryos through the establishment of the regulatory Authority (The Embryo Protection Authority).

2. *The 'Amended' Act:*

The Embryo Protection (Amendment) Act, 2018 of the laws of Malta is the amended 'parent' Act with the ultimate purpose to make all the regulated processes within the Fertility Sector, more accessible and equitable to all those who need them. This Amended Act amended the definition of prospective parent, allowed embryo cryopreservation and third party donation.

3. *The Regulations*:

The Embryo Protection Authority Regulations 2015 – (L.N.32 of 2015 – Chapter 524) have been published by Legal Notice 32/2015 following assent by the then Parliamentary Secretary responsible for Health. It grants the Authority its legal personality and representation, and outlines the executive administration and organisation of its affairs. This Legal Notice is in the process of being amended so that the Regulations put in place will bring the Authority in line with other recent established Authorities, changes are also necessary as some articles of the original Legal Notice needed updating.

4. *The 'Protocol' and 'Additional Fertilisation Request Protocol'*

The Protocol which was published by the Authority in 2013 is intended as a means of assisting licensed Clinics to comply with their legal obligations whilst also serving as a useful reference for patients and professionals working in the fertility sector. During 2018, work was performed to issue an amended Protocol to reflect the requirement changes stemming from the Embryo Protection (Amendment) Act, 2018. The Updated version of the Protocol was tabled in Parliament during 2019.

The Protocol for Additional Fertilisation Requests (AFR) was established in writing by the Authority compiling all criteria and methodology for the application to grant more than two oocytes to be fertilised with a set maximum of five oocytes and consequently permission for embryo cryopreservation. The AFR Protocol was presented to the Parliamentary Health Committee on the 13th September 2018 and was unanimously approved on same day. During 2019 tissue establishments making additional fertility requests had to strictly abide by this Protocol for their application to be approved by the Board.

Professionals working in the fertility sector are also bound to follow Directive 2004/23/EC which sets standards for donation, procurement, testing, processing, preservation, storage, and distribution of human tissues and cells.

1.5. Functions of the EPA

- To ensure that high standards of ethics are maintained by all medical practitioners, paramedics, and other personnel involved in procedures of medically assisted procreation;

- To request and obtain, in cases of reasonable suspicion that the provisions of the Embryo Protection Act are not being followed, information and copies, in any form, of documents required by the Commission Directive 2004/23/EC of the European Parliament and of the Council of 31 March, 2004 on setting standards of quality and safety for the donation, procurement, testing, processing, preservation, storage, and distribution of human tissues and cells to ensure traceability of human cells;

- To carry out inspections in order to ensure that the standards of best practice are being respected and implemented and that all information and documentation required under Article 18 of the Embryo Protection Act is being kept appropriately, and for this purpose to access clinics and any other places as necessary;

- To maintain a statement of the general principles which, in its opinion, should be followed in:

  a. Carrying out its activities under the Embryo Protection Act; and
  b. Carrying out its functions in relation to such activities under the Embryo Protection Act.

- To ensure, in relation to activities under the Embryo Protection Act, compliance with:

  a. The obligations and requirements imposed by or under the Embryo Protection Act;

b. The codes of practice established under paragraph (a) of the Embryo Protection Act.

- To perform such other functions as may, from time to time, be prescribed by regulations made under the Embryo Protection Act.

1.6. Human Resources

During 2019, to further strengthen its corporate structure, (the Authority currently employs only three employees), the Authority engaged in issuing calls to fill the vacated post of Assistant Director, although several interviews were held the post was still not filled up till the end of the year. The main struggle to this is that this position holds a definite contract. During the end of 2019 negotiations have started with the Industrial Relationship Unit, to amend the Authority's structure through a legal notice to enable other positions on an indefinite contract to be amended or adjusted.

The Authority strives to ensure that its employees have the skills and competences to match the organizational requirements in order to guarantee optimal executive performance. All the staff received regular training throughout the year including training of the wellbeing of the staff themselves. Staff also attended for sessions on Mental Health and Domestic Violence Awareness sessions organised by the People Support and Well Being Directorate.

In May 2019, the Executive Director attended an Interactive Workshop on 'Advances in Fertility and Donor Conceived Children'. This Workshop was organised by the British Infertility Counsellors Association (BICA), during their Annual Conference and took place in London, United Kingdom.

In June 2019, the Executive Director attended for the European Society for Human Reproduction and Embryology (ESHRE) 35th Annual General Meeting held in Vienna, including a Pre-Congress Course. The Pre-Congress course focused entirely on the hurdles and opportunities in Global Access to Assisted Reproduction Technologies. The following three day conference included various topics ranging from genetics, psychosocial support, surgery, diet and lifestyle and the new technologies trends of oocyte and embryo freezing.

In September 2019, the Executive Director successfully completed her studies and Practical Workshop in 'European Good Tissue and Cells Practices for demonstrating safety and Quality through recipient follow-up'. This project was co-funded under the EU Health Programme 2014-2020 and held in collaboration with Barcellona Tissue Bank. Through this Mrs Attard was awarded The European Good Tissue and Cell Practice Ambassador Certification 'EuroGTP II Ambassador'. This is an added asset to the Authority.

In October, the Executive Director attended a two day meeting held in Brussels for the EU Competent Authorities on Substances of Human Origin Expert Group which was convened to discuss the Transposition of Tissue and Cells Directives, and the Evaluation of the Tissue and Cell Legislation for better regulation. Update

on implementation of coding and import legislation as well as the Medical Device Regulation.

Discussions were also held as recommended by the European Centre for Disease Prevention and Control (ECDC) on infectious disease risks an Epidemiological - general update, Rapid alerts and update on the work of the Vigilance Expert Subgroup.

Update on the Presentation of Actions under the Public Health Programme were also presented including TRANSPOSE (TRANSfusion and transplantation: PrOtection and SElection of donors), and the use of registries for clinical follow up were also discussed.

International Updates from the Council of Europe on Tissue and Cell Activity Data Reporting and Updates on the Implementation of Coding and Import Legislation were also presented for discussion.

The Ministry for Health had assigned new premises to the Authority in 2016, and to date all staff including senior executive staff, are all still housed in this one-room office in St Luke's Hospital. The Authority looks forward to the re-location of its offices to another premises from where it would be able to perform its regulatory duties, and to be able to house the new staff which is crucial to employ due to the increase in the Authority work.

1.7. Board Members and Executive Administration

The legal representation of the Authority is vested in its Chairman, Hon. Judge Emeritus Philip Sciberras UOM. Vice-Chairperson Ms. Josephine Abdilla MBA *Henley,* DIP Mang. *Henley.* The other appointed members include Dr. Patrick Sammut MD MRCPCH MSc., Ms. Mariella Meachen B. Psych (Hons) MA (Psychotherapy) R.N., Profs. Victor Grech MD PhD. PhD FRCPCH FRCP, and Ms. Sarah Camilleri Dip Economic and Political Studies.

Ms Moira Gialanze the Administrative Officer was appointed to also serve as the Authority Board's Secretary with effect from April 2018.

In exercise of the powers conferred by Article 6 (2) of the Embryo Protection Authority Regulations, 2015 (L.N. 32 of 2015), the Hon Minister for Health, after consultation with the Embryo Protection Authority had appointed Ms. Simone Attard PGrad Cert, PGrad Dip Systemic Practice (Tavistock and Portman NHS Trust UK)., MBICA., as Executive Director of the Embryo Protection Authority to serve for a second term of three years up to 31st January 2021.

During 2019, twelve Authority board meetings have been called and in all sittings quorum was achieved. Attendance of the members and the Executive Director to these Board meetings were as stated overleaf:

Designation	Name	Attended	Excused
Chairperson	Judge Philip Sciberras	12	0
Vice Chairperson	Ms. Josephine Abdilla	12	0
Member	Dr. Patrick Sammut	10	2
Member	Profs. Victor Grech	12	0
Member	Ms. Mariella Meachen	12	0
Member	Ms. Sarah Camilleri	10	2
Executive Director	Ms. Simone Attard	12	0

During the twelve meetings, Representative from *the Obstetrics and Gynaecology Association* have been called in order to discuss requests for the additional fertilization of oocytes. These requests are made by the clinicians treating the parent / parents to the Embryo Protection Authority to approve the fertilization of a maximum of five oocytes instead of the two currently permitted by law. During 2019 the Association appointed another representative to attend also to these meetings and thus now have two representatives attending.

After the changes coming into effect on the 1st October 2018 and the approval of the Additional Fertilisation Request Protocol by the Parliamentary Health Committee the two members of the Paediatric Association of Malta offered their resignation from attending to the Authority meetings, to date although requests have been made by the Authority, the Association has not yet appointed other members to represent the Paediatrics on the Board.

1.8. Annual Remuneration to Board Members

The members of the Board are not fully employed by the Embryo Protection Authority but receive annual remuneration for their services, remuneration capping for 2019 in line with the new framework for the categorization, classification and remuneration of Boards and Committees stood as follows: Chairperson €13,954, Vice Chairperson €6,000 and members €5,176.

However, in line with good governance board members were only paid for sessions they attended to, and if sessions were held in the mornings a vacation leave form from their full time job had to be presented for payment to be effected. The remuneration for 2019 paid to each member is as listed hereunder.

Designation	Name	Annual Remuneration (Euros)
Chairperson	Judge Philip Sciberras	13,954
Vice Chairperson	Ms. Josephine Abdilla	6,000
Member	Dr. Patrick Sammut	3,882
Member	Profs. Victor Grech	5,176
Member	Ms. Mariella Meachen	5,176
Member	Ms. Sarah Camilleri	4,313

1.9. The Authority as a Regulator

As the sole regulator of all Assisted Reproductive Technologies (ART) performed at both public and private licensed clinics/hospitals in Malta, the Authority strives

to ensure compliance with the obligations and requirements imposed by or under the Embryo Protection Act and Protocol.

During 2019, the issue of having two competent Authorities that the clinics have to report to was raised by one of the clinics, this issue arose as EPA was not notified a priori of the alterations carried out in the clinics which involved movements of the Dewars where gametes and embryos, who are under the custodianship of the EPA, are held. This breach could be liable to a fine imposed on the clinic by EPA. To iron out these misunderstandings a meeting was held between the licencing Authority (SPH) and the Regulator (EPA) together with their legal representatives as well as the Chief Medical Officer so as to put in writing the different roles of the Authorities as well as when and to whom the clinics have to report to. To this effect a letter was circulated to clinics with the defined roles and responsibilities and reporting obligations as defined hereunder:

All reporting as regards to issuing of Licences and renewals of same, is to be made solely with the Licensing Authority, ie SPH. Same applies to quality and safety of general public health.

There are instances where the reporting is to be made by the Clinics to **both** Authorities simultaneously. Thus reporting of serious adverse events (SAE) and serious adverse reaction events (SARE), as well as all quality and safety issues relating to quality and safety of gametes and embryos during processes and storage are to be reported to both SPH and EPA.

Alterations to premises and equipment are to be reported to **both Authorities.** Henceforth, all requests for permissions are to be submitted before the actual activities are embarked upon.

Reporting of activities that need to reach solely EPA, supported by EPA forms and documentation including testing results, should include but are not limited to:

- Request for permission to cryopreserve gametes in oncology cases
- Request for permission to cryopreserve gametes in fertility preservation
- Request for permission to cryopreserve gametes by transgender persons prior to starting hormone therapy treatment
- Request for permission to discard gametes
- Request for permission to transfer gametes/embryos between licenced centres in Malta
- Request for permission to transfer gametes/embryos from a Malta Centre to abroad
- Request for ART Procedures (IUI, IVF, ICSI) and storage of gametes for patients undergoing an ART cycle
- Request for Additional Fertilisation of oocytes (up to a maximum of 5 oocytes) to be made in line with the EPA Protocol as approved by the Parliament Health Committee
- Request for Embryo Cryopreservation and potential Embryo Donation
- Request for Use of Third Party Donation and duly inform immediately every donation made with full identity details of the donor.
- Prior Authorisation by the Authority for the donation of cryopreserved Embryos

- Prior Authorisation by the Authority of the Agreement between the prospective parent or prospective parents and the licensee to regulate the cryopreservation of embryos
- Prior authorisation by the Authority to be granted to a prospective parent or prospective parents who prior to the coming into force of the Amendment Act, had cryopreserved embryos in tissue establishments abroad to bring two cryopreserved embryos to be transferred locally into the prospective parent or prospective parents for each cycle
- Outcomes of all procedures and storage carried out.
- To provide the Authority with all documentation and data in regards to reporting obligation of the Authority to the House of Representatives
- To pass on information to the Authority without delay of all confidential registers held by the licencee with full details of every medically assisted procreation procedure, germ line cell donation, cryopreservation of germ line cells and cryopreservation of embryos.
- Any other documentation that the Authority as Regulator may request in terms of the Embryo Protection Act
- Payment of all procedure and storage fees

Breaches in reporting duties with regards to the EPA may lead to prosecution by the Authority in accordance with the Embryo Protection Act.

Throughout 2019, several requests of applications for fertilisation of oocytes for couples undergoing cycles at the licensed clinics were reviewed. All the cases presented were discussed and decisions of approval or non-approval were unanimously taken accordingly. Also several requests for sperm and oocyte retrieval

and cryopreservation only where received by the Authority. These where approved or rejected subject to all virology tests being in order. Details of these approvals are given in detail in the second part of this Annual Report.

In March 2017, the Authority was informed by the Attorney General's Office that one couple had instituted a constitutional application at the Civil Court against the Attorney General and the Embryo Protection Authority. The Chairperson and Executive Director gave evidence in this case. On Friday 28, September 2018, the court decreed that no violation of the applicant's fundamental human rights had occurred. The couple have filed an appeal to this decision. On Friday 27, September 2019 The Constitutional Court did not accede to the appeal filed by the applicants, thus confirming the decision taken by the first Court, that the Embryo Protection Authority did not breach any Human Rights in setting a maximum age for treatment in the Authority's Protocol.

In September 2018, still under the provisions of the old Act, the Authority received a request for the freezing of two embryos which due to a *force majeur* not predictable at the time of fertilization, could not be transferred on the day of the planned embryo transfer as the mother had developed a medical condition after the oocytes retrieval and fertilisation of oocytes. The request was immediately approved by the Authority, and the two embryos were put in storage until the prospective mother was fit to undergo embryo transfer. As reported in the Annual Report of 2018 these were still in storage by end 2018. During 2019 these two embryos were transferred back into the prospective mother as she was fit to undergo embryo transfer.

The Authority has received six requests from the licensed clinics to grant permission for oocyte retrieval and cryopreservation only, from four women aged between 27 and 41, who wanted to preserve their fertility. Three permissions were granted on medical grounds, two patients made this request prior to starting chemotherapy, the other patient prior to undergoing a gynaecological intervention. The other woman requested on three separate occasions during 2019, to cryopreserve her oocytes at the private facility for social freezing reasons, to use her oocytes at a later stage in life, these were also granted permission by the Authority. Out of the six permissions granted, all four women had successful oocyte retrieval and cryopreservation.

The Authority also received a total of 88 requests from the licenced clinics to grant permission for sperm cryopreservation, 79 at MDH and 9 at the private clinic. In a number of cases, sperm was obtained through testicular aspiration/extraction (TESA/TESE). The 88 requests were made for 82 males as there were males who had repeated requests in the same year. Fifty six (56) males vitrified their sperm, whilst thirty two (32) males who requested sperm cryopreservation did not vitrify sperm.

Twenty three (23) requests were made for twenty two (22) males requested Fertility preservation following oncology diagnosis prior to starting chemotherapy. Six requests (6) were made for two (2) men who worked abroad thus could not provide a fresh ejaculate whilst their partner was undergoing treatment. Two (2) requests were made for one transgender person prior to hormone treatment. The other fifty eight (58) requests were made for fifty seven (57) males who had Urology referrals with the main reason for referral being decrease in male fertility parameters and azoospermia.

In the last quarter of 2019, the Authority received a request for transfer of cryopreserved gametes (sperm) from the United Kingdom to Malta. The Maltese patient had cryopreserved these gametes prior to undergoing treatment abroad some years ago. The Authority approved the transfer of the cryopreserved gametes to be cryopreserved in the public clinic in Malta.

In the Annual Report of 2018, we had reported that the private tissue establishment had requested approval from EPA for the transfer of oocytes stored in Malta to Cyprus. The Authority had requested further documentation from the Maltese facility to ascertain that these oocytes will be transferred to a licenced tissue establishment. The Authority issued approval for transfer in the first quarter of 2019 when all documentation was certified in order. Transfer was effected immediately on approval.

1.10. Changes to the Embryo Protection Act and introduction of the Embryo Protection Amendment Act

On the 11th April 2018, Deputy Prime Minister and Minister for Health Hon. Chris Fearne presented the Proposed Bill for amendments to the EPA Act for first reading in Parliament. This was the culmination of extensive fieldwork and input by the Authority's Executive Director, Ms. Simone Attard, as expert in the field. Her input was continuously throughout the Second reading in Parliament attending to all sessions held in Plenary. During the Committee Stage Mrs Attard answered to questions raised by members of Parliament sitting on the Committee as well as queries made by stakeholders and the general public that were allowed to intervene at this stage of Parliamentary discussion.

To this effect an Authority Board Meeting was conveyed so as to explain to members of the Authority Board, the main Changes to the EPA ACT and the Additional Fertilisation Permissions to be Granted by the Embryo Protection Authority, the changes included;

a. The definition of prospective parent / parents has been extended to not only include heterosexual couples, but this is now extended to all prospective parents who have reached aged of majority irrespective of gender or sexual orientation, thus from 1st October 2018 to also include same sex couples and single women.

b. The minimum age for the female prospective parent lowered to 18 from 25 while the maximum age was to remain the same i.e. 42 years if using own oocytes. If the female prospective parent was opting for donated oocytes, age threshold was to be increased to 48. Women who use their own oocytes and opt out of embryo cryopreservation and who had their oocytes retrieved after age 35 will have a maximum age of 42. However all women who opt to have resultant cryopreserved embryos, age was to be increased to 48 to have embryos transferred only.

c. Number of cycles – Women opting not to have embryos cryopreserved will be entitled to current number of cycles offered on the NHS. Women/couples who have embryos cryopreserved will be given enough cycles so they can make use of the cryopreserved embryos with two transferred in each cycle. This measure will also apply if the previous IVF was successful and have a child in the same relationship.

d. Prospective parents who up to the date of coming into force of the Amendment Act, had cryopreserved embryos abroad are entitled to transfer the embryos two at a time to Malta and be used in a cycle, not for storage only.

e. If prospective parent/s do not opt to cryopreserve embryos, only two oocytes can be fertilised and transferred in each cycle. No permission to be requested by the licensed clinics to the Authority to fertilise 3 oocytes as allowed in Parent Act.

f. Prospective parent/s who consent to embryo cryopreservation and potential embryo donation, will still be allowed to fertilise two eggs but a request to the EPA Authority can be made to fertilise up to a maximum of 5 oocytes in each cycle. If prospective parent/s have cryopreserved embryos from previous ART cycles no request to fertilise further eggs in subsequent cycle can be made until the cryopreserved embryos are utilised. A separate protocol/criteria for this clause to be prepared which will get prior approval from Parliamentary Health Committee prior to this article coming into force.

g. Donation of sperm, oocytes and embryos will be allowed. Donors of gametes both male and female have to be 18 up to 35 years of age. No post humous retrieval of oocytes or sperm can be made. However where gametes were donated prior to the donors death and s/he had consented to use after death these can still be donated. Donation of gametes to be a single donation providing offspring or siblings to one prospective parent/s only.

h. Anonymous donation as was proposed in Bill, has been removed instead the Finland model will be used where donor and recipient will never know identity of each other, however child born of donation (either gamete or embryo) can enquire with the EPA Authority once attaining majority (18) to have medical records and identity records of the donor. The Authority is obliged to give the medical records beforehand of the donor only in cases of medical emergencies. The Authority is also obliged to inform the recipients or the child on attaining majority if it comes to her knowledge of any serious ailments of the donor after the donation had been made. Records of donation have to be kept for 110 years.

i. Donations to be totally altruistic no compensation to be paid for sperm donation, oocytes donors will be reimbursed with the stimulation expenses.

j. EPA Authority to prepare information (booklets etc) for the children born from donated gametes/embryos and also other information for the persons who wish to donate gametes, prior to giving consent for donation.

k. All clinics to keep registers for each separate procedure (IUI, IVF, ICSI) and of all cryopreservation whether of gametes or embryos and of any embryo donation or adoption. All registers shall be confidential and sent to the EPA Authority immediately.

l. Government is proposing that all couples who were registered with the MDH ART Clinic and made use of all their cycles but had no live birth prior to this ACT coming into force will be given another chance within age parameters, if from this extra cycle cryopreserved embryos will result than additional cycles will be given until all embryos are transferred.

m. The EPA Authority will take for adoption purposes those cryopreserved embryos in the following situations:

- Death of the mother
- If the female prospective parent exceeds the maximum age of 48 and still has cryopreserved embryos.
- If prospective parent/s do not renew the cryopreservation contract with the licensed clinic (contract to be prior approved by EPA Authority to be for 5 years which can be renewed for further periods of 5 years each).
- The prospective parent refuses to have the embryo implanted in the womb.
- Prospective parents Jointly decide that their family is now complete and wish to give their embryos for adoption this can be done prior to age 48.

n. Process of adoption of embryos to be made through the Adoption Board under the Adoptions Administration Act and EPA Authority.

o. IVF special vacation leave to be extended also to oocytes donors.

p. Surrogacy has been removed completely from the proposed Bill, this is to be presented in a separate Bill to Parliament.

The new Amendment Act was enacted on the 21st June 2018 and came into force on the 1st October 2018 as per Legal Notice LN 313/2018.

The Protocol for Additional Fertilisation Requests (AFR) was established in writing by the Authority compiling all criteria and methodology for the application to grant more than two oocytes up to a maximum of five oocytes to be fertilised and consequently permission for embryo cryopreservation. The AFR Protocol was presented to the Parliamentary Health Committee on the 13th September 2018 and was unanimously approved on same day.

The MDH ART Clinic started offering additional fertilisations up to maximum five oocytes and embryo cryopreservation as from the October 2018 cycle.

St James Assisted Conception Unit informed the Authority that they will not be offering embryo cryopreservation in the October 2018 cycles, thus additional fertilisation were not approved by the Authority and all couples had permission to fertilise two oocytes only. However in the first quarter of 2019, the Responsible Person of the St James Assisted Conception Unit informed the Authority in writing that now the Clinic will start offering embryo cryopreservation to the couples who will be undergoing their cycles as of February 2019.

Pursuant to the Introduction of the new concept of Embryo adoption the Authority started discussions together with the Social Care Standards Authority (SCSA), to start working on the standards and protocols to regulate this procedure. However

during said meetings and also during the National Adoption Conference organised by SCSA to which the Authority was invited to attend, it was made very clear that the remit of the Adoptions Administration Act Board was solely on born children to be adopted and not embryos. Moreover there are divergencies in the laws of both Authorities, as while the adopted embryo will be automatically recognised as the child of the prospective parents, prospective adoptive parents of children adopted would have to make a court request. A meeting was also held with representatives of the Foundation for Social Welfare Services to explain to them the provisions of the law. A political direction is being sought on way forward on this procedure.

Following the introduction of the new amended law, clinics had to sign contracts with prospective parents who opted to cryopreserve their embryos as per required by the terms of the law. The private facility provided the contracts to the Authority, whist the Public MDH ART Clinic did not provide the contracts on time of cryopreservation. To this effect the Authority informed the Authority that cryopreservation of embryos without a contract as stipulated in the law was a breach to same law, thus requested the ART Clinic to regularise it's position on the 54 already cryopreserved embryos by a stipulated time frame given by the Authority.

As no further action was taken by the clinic to resolve this situation but kept on cryopreserving embryos, the Authority issued a warning letter informing the MDH ART Clinic that if the situation is not resolved within another extended timeframe than a fine of €1000- for each embryo cryopreserved would be imposd equivalent to €84,000-. It was only when action was taken by the Chief Medical Officer to sign the contracts himself on behalf of the clinic (as no clinic personnel wanted to sign these contracts) that the matter was resolved and the Authority waived the fine as a sign of goodwill.

A meeting was also held with the Malta College for Obstetric and Gynaecologists as in line with Article 22 of the Act every medical practitioner is to keep a register of all medically assisted procedures, including intra-uterine inseminations and forward these registers to the Authority without delay. Only eight clinics have to date registered with the Authority although we are of the knowledge that much more practitioners perform this procedure prior to referring patients for IVF.

1.11. ART Prioritization Committee

The Ministry for Health considers the fact that parent / parents requiring IVF cannot be waitlisted on a *first come-first served* basis. To this effect, the Ministry appointed an ART (Assisted Reproductive Technology) Prioritization Committee with the aim of objectively ranking in order of precedence the couples who are seeking assistance at the ART Clinic at Mater Dei Hospital (MDH). Each clinical case is considered individually and priority of treatment is given to couples where female age is an issue, since delays in providing an opportunity for treatment may make the couple ineligible for future treatment. Other factors, such as AMH levels, semen parameters, paternal age, duration of infertility, previous failed IVF/ICSI attempts, recurrent miscarriages, etc., are also taken into account. During 2019 the Authority was represented on this Committee by its Executive Director Ms. Simone Attard and by Profs. Victor Grech as member.

In view of the fact that new cases are registered at Mater Dei Hospital every week, this Committee met on a monthly basis to decide which of these couples requires prioritization for treatment. Five reports were consequently issued showing a total of 170 couples that had been reviewed by the ART Prioritisation Committee during 2019. One hundred and fifty six couples were prioritised as they met the necessary criteria for prioritisation. One couple's file had already been prioritised in the past

however the couple had not continued with the process, thus only revival of file was necessary as they were already on the list. Fourteen couples were deemed ineligible for the prioritisation process as the files presented by the MDH ART Clinic had missing documentation, thus the Committee requested that these files will be prioritised in following sessions when all documents are in order.

1.12. Inspections

The Authority, from time to time makes the necessary inspections so as to ensure that there are no infringements of the provisions of the Act or the Regulations, or of the Protocol which the Authority is entitled to enforce. These inspections are held in order to make certain that the standards of best practice are being respected and implemented, that the documented system which ensures the identification of all gametes and embryos from procurement to use is in place, and that the storage and consignment of gametes from one centre to another is verified against Standards of Practice (SOPs) and third party agreements, as required in the EU Directive.

In 2019, inspections together with the Superintendence of Public Health (SPH) were carried out at the MDH ART Clinic. These were in conformity with the legislative requirements for periodic re-inspection before renewing the licence and also as new services were going to be introduced that of non-partner third party donation. Present for this inspection representing EPA was the Authority's Infertility Inspector. During the inspection, various major deficiencies were noted and brought to the attention of the SPH inspectors to include in the report, one of which was as already explained earlier the lack of embryo cryopreservation contracts as required by law.

However contrary to previous years, when one joint report was issued on behalf of both Authorities, this year SPH opted without informing the Authority, to issue a report and omit the deficiencies as noted by the EPA Inspector. On 30th August 2019, the Chairman of the Authority on behalf of the Board wrote to the Superintendent of Public Health to inform about this situation and stressed about the importance of collaboration between both Entities. Subsequent to this episode the Authority issued a separate report to the MDH ART Clinic listing the major deficiencies noted by the EPA Inspector.

The Authority thus advised the Superintendent Public Health to refrain from issuing a full licence, but rather issue a temporary licence until all deficiencies where rectified. To this effect, the MDH ART Clinic was issued with a renewal licence valid only for six months up till 30th April 2020.

On August 6th the Authority brought to the attention of the SPH that the licence of the Assisted Conception Unit in St James Hospital Zabbar, was going to expire by end August, whilst clinic personnel had already submitted documentation for procedures to be carried out after this date. As the Assisted Conception Unit was to move to a new hospital in Zejtun, temporary extension of two months was granted to continue to operate from Zabbar, until a fully fledged inspection will be carried out at the new relocated premises.

In October 2019, SPH issued another temporary licence for one month only to the Assisted Conception Unit this time in Zejtun to store gametes and embryos and distribution of same from other clinics. However the Authority was not informed of this and immediately wrote to the Licence Holder that this was in breach of Article 23.3 of the Protocol, authority should have been sought from EPA to transfer the

dewars from Zabbar to Zejtun. The Authority also informed SPH that the sole responsibility of approval of transfer of gametes and embryos was of EPA and not SPH, so SPH had decided on something out of its remit without informing the Authority of this move.

In November 2019, an inspection was held together with the Superintendence of Public Health at the new facility of the Assisted Conception Unit in Zejtun to licence for full operation. Same procedures were going to continue at the new facility as the unit had decided not to offer direct or non-direct third party donation. Present for this inspection representing EPA was the Authority's Board Secretary as the Infertility Inspector was away on the time of the Inspection. Minor issues were noted such as missing documentation, which were rectified immediately and sent to EPA. Thus the new facility at Zejtun was issued with a full licence for two years, valid up to 19th November 2021.

1.13. Other work by the Authority

Apart from the normal processing of all applications for treatment, requests for additional fertilizations, and the storage of gametes (a detailed report is given in the second part of this report), the Authority was in continuous communication with the Ministry for Health in order to provide the relevant information in answer to the several Parliamentary Questions (PQs) repeatedly made on the ART procedures offered on the NHS, and the Eligibility Criteria as established in the Embryo Protection Authority's Protocol.

Authority personnel have also attended several Conferences to keep abreast with the changes being held in the various sectors. Such as the CPSU Conference, Social Determinants of Health Conference and the CRPD Conference. Attendance was also made to the Cancer Platform annual conference, wherein the Authority gave its contribution on the important role it plays in providing cryopreservation of gametes to patients prior to receiving chemotherapy treatment.

Together with the office of the Chief Medical Officer work was also ongoing on the changes needed to the Entitlement Criteria of patients applying for services on the NHS, these needed to be updated to now also include Intra-Uterine Insemination (IUI) and non-partner third party donation to be in line with the new Maltese Legislation. A lot of input was also made by the Authority on the changes and documentation needed to now cater for the introduction of direct and non-direct third party donation.

Work was also ongoing about the new IT solution that will link all licensed clinics to the Authority. The Authority sought and obtained permission from the Central Procurement and Supplies Unit to outsource the preparation process of the tender documents for the issuance of the second tender for the procurement and implementation of a new IT system based on the Technical Specifications Report prepared in 2017 that will link the Authority with all licensed clinics both private and public so all documentation can be filed on-line thus enabling the Authority to have real time data. The Authority followed closely developments and subsequently awaited publication of such document by the Contracts Department. Publication was made in the last quarter of 2018.

In February 2019, the contract was awarded to a software company that immediately started on the Software Development Procedure, the detailed analysis and design phase as well as the system customisation of the application that satisfy the functional, technical and business requirements have all been completed by end of year 2019.

A prototype will be made available by first quarter of 2020 for user testing and any re-work necessary on the system. Training will then be provided by the service provider to both the Authority staff as well as the clinics staff according to their roles and responsibilities. Final implementation of the system and issuing of software licences as well as data migration is to be ready by the second quarter of 2020 so that system will go live in the first weeks of the third quarter of 2020.

The Embryo Protection Authority, through its Executive Director, during 2018 was also in continuous discussion with the Ministry for the Family and Social Solidarity and the Ministry for Social Dialogue, Consumer Affairs and Civil Liberties, to update the Legal Notice that was issued on the 31st May 2017, granting Special Leave for Medically Assisted Procreation to now be in line with the New Amendment Act. Amendments were necessary to now include also single women and same-sex couples.

In addition to the monitoring of ART services given to patients by the licensed Clinics, the Authority also supervises the storage of gametes. A Gamete Storage Inventory (Dewar mapping) which stretches back to the date of first cryopreservations (July 2013), is kept by the Authority. This serves to ensure that storage of gametes is being properly documented so as to guarantee full traceability.

Together with the SPH, the EPA strives to make sure that each licensed Clinic adopts a Quality Management System that is in line with the EU Directives and Human Tissues and Cells Local Legislations related to the ART services.

During 2019, the Authority was also requested to give its feedback regarding the launch of the Consultation on Transgender Medical Services. This was being brought to the attention of the Authority as prior to transgender persons starting hormone therapy, a request will be made to EPA Authority to authorise cryopreservation of gametes to preserve fertility.

The Executive Director attended to several meetings and gave constructive input on the subject. This contribution was acknowledged by the 'Sexual Orientation, Gender Identity, Gender Expression and Sex Characteristics' (SOGIGESC) Unit within the Human Rights and Integration Directorate, during their Annual Conference. This was also highlighted in the LGBTIQ Equality Strategy and Action Plan 2018 - 2022 Annual Report for September 2018 to September 2019 wherein it was mentioned that the EPA Authority had revised its protocol in line with SOGIGESC. In 2019, two requests were made to the Authority for cryopreservation of gametes prior to transitioning process and receiving of hormone therapy. Both requests were approved and cryopreservation was done at the private ART facility.

One of the functions of the EPA is to see that all prospective parents receive clinical counselling. During 2019, the Executive Director was invited to give several sessions and information to Maltese Counsellors, family therapists and other professionals working in the family field about the changes in the Embryo Protection Act and the implications counselling that now needs to be offered to all accessing treatment.

In June 2019, the British Infertility Counsellors Association (BICA) Accredited by the Counselling and Psycho Therapy Central Awarding Body (CPCAB) which is the only Awarding Body to specialise in Counselling, invited the Executive Director to contribute to the Journal of Fertility Counselling. An Article was published in the Summer Edition of the Journal detailing the journey from the initial contribution by Mrs Attard to the Maltese Parliament way back in 2004 to the introduction of the Principal Embryo Protection Act and the latest Amendments to the Act were highlighted.

In view of the fact that the Authority processes personal data, in 2017 it took the necessary measures to be in conformity with the Data Protection Act, and duly registered its operations with the Commissioner for Data Protection and also appointed a Data Protection Officer to take care of Data Protection issues. To this effect with the introduction of the New Amendment Act, the Authority underwent the exercise of Data Protection Impact Assessment for all new processes that were being introduced.

The Authority's website was launched on the Ministry for Health's portal, though continuous collaboration with the Information Management Unit of the Ministry for Health in 2017. The website contains the Authority's Mission Statement, details about the Entity's Corporate Identity, Board Members and Executive Administration together with an Organisation Chart. All publications of the Authority have also been uploaded and these include: The Act and Legal Notices, EU Directives, Authority's Protocol and all Annual Reports issued to date. During 2019, the website was being continuously amended and uploaded with the new changes that came into effect. The website can be accessed on www.epa.gov.mt .

Pursuant to the EPA Regulations of 2015, the Authority is taking the necessary measures towards becoming fully autonomous.

The Deputy Prime Minister and Minister for Health, Hon. Chris Fearne on the 28th March 2019, laid on the Table of the House of Representatives EPA's Audited Accounts for 2018 and Financial Estimates for 2019, together with the Authority's Annual Report for 2018. A Parliamentary debate on the Authority's finances and work was held in one sitting on Monday 3rd of June 2019.

FERTILITY TREATMENTS IN MALTA FOR 2019 – TRENDS AND FIGURES

In line with LN32 of 2015 and the Embryo Protection Authority's Protocol which has been prepared in accordance with the Embryo Protection Act 2012, clinics in both the private and public sector are bound to provide the Authority with accurate data about their activities. This data is held on the Authority's Register of ART Procedures and the accuracy of this report is based on the information provided by the Clinics as at 31st January 2020.

Article 22 of the Embryo Protection Act, which came into force on 1st October 2018 also requires that all medical practitioners keep a register with full details of all medical assisted procreation procedures, including also Intra Uterine Inseminations and pass this information without delay to the Authority.

2. CYCLES PERFORMED

2.1. Cycles, Intra Uterine Inseminations and Cryopreservations Approved by the Embryo Protection Authority Board

With the introduction of the amendments to the law, embryo cryopreservation was now possible to be carried out as part of the cycle if the prospective parent/s opted for it together with embryo donation if necessary. Couples could still opt for the

request to fertilise two oocytes only and have them transferred without embryo cryopreservation. As new types of cycles where being introduced during 2019, we are hereby providing the definitions for the terminology being used in this year's Annual Report. A **Cycle** refers to all treatments that are conducted at a fertility clinic. **Oocyte cryopreservation cycle** is a treatment where prospective parent/s have all their oocytes collected and cryopreserved for future use due to medical reasons or for other social reasons. **Fresh oocytes treatment cycle** is a treatment cycle in which fresh oocytes are collected and are injected with sperm which may result in a fresh embryo which is transferred during IVF. IVF treatments in this report include ICSI. **Thaw oocyte treatment cycle** is a treatment cycle where prospective parents use their cryopreserved oocytes in an IVF treatment cycle. **Cryopreserved / Thaw embryo treatment cycle** is a treatment cycle in which a frozen embryo or embryos are transferred during IVF. Maltese Legislation allows only for the maximum of two embryos (irrespective if fresh or cryopreserved embryos) to be transferred in each treatment cycle. **Embryo 'freeze all' cycle** is a cycle in which all created embryos are cryopreserved due to the patient either having a risk of OHSS or else some other medical reason which at the time of the cycle the embryos cannot be transferred into the woman. **Sperm Cryopreservation** refers to cryopreserved sperm which can be produced through a fresh ejaculate or else surgically extracted. **Intra-Uterine Insemination (IUI)** is a treatment cycle where sperm is injected into the women's uterus. In this report only partner sperm are being reported as no IUIs where carried out using donor sperm.

Throughout 2019, the Authority has received and **approved** a total of **Five hundred and thirteen** (**513) applications** for different procedures from clinics in both the private and public sector. These were divided into **six (6)** approvals for **Oocyte cryopreservation cycle** where oocytes were retrieved and cryopreserved only on prior approval by the Authority due to medical reasons so no IVF procedure was carried out these requests were made by **two heterosexual couples and two single**

women. Another **one hundred eighty four (184) applications** were approved for **Fresh oocytes treatment cycles** by **179 heterosexual couples** as five couples had more than one approval. **Fourteen (14)** approvals were granted for **Thaw oocyte treatment cycles** carried out by **ten (10) new heterosexual couples** as four other couples were granted an approval following a fresh complete cycle. **One hundred and seventy three (173)** approvals were issued for **Intra Uterine Inseminations** using partner sperm to **99 heterosexual couples.** A total of **thirty eight (38) Cryopreserved / Thaw embryo treatment cycles** were approved in which a frozen embryo or embryos were transferred, **five** of which underwent embryo transfer only of embryos that were cryopreserved in 2018. One of these couples was the last couple that had been granted cryopreservation under force-majeure under the Principal Act. **Eighty eight (88)** sperm cryopreservation were approved for **eighty two (82) males, one of which was going through the process of transitioning from male to a female.**

Finally a further **ten (10)** approvals were granted to transfer gametes and embryos between tissue establishments. **Five (5)** approvals where granted to **five heterosexual couples** to transfer oocytes between Maltese Tissue establishments, **one (1)** further **heterosexual couple** was approved transfer of sperm between Maltese Tissue establishments, whilst **two (2)** approvals were issued to **two heterosexual couples** to transfer embryos from the private to the public tissue establishment. Another **two (2)** approvals were granted to transfer oocytes from Malta to abroad and transfer of sperm from abroad to Malta. These approvals were issued to **one heterosexual couple and one male.**

Thus during 2019, the Embryo Protection Authority approved procedures for 305 heterosexual couples, 2 single women, 82 males and one transgender person.

2.2. Intra Uterine Inseminations

Since the Authority was established in 2013, this is the first year in which the Authority is presenting statistics of Intra Uterine Inseminations carried out in Malta, as prior to the coming into force of the amendments to the Act, only IVF/ICSI procedures were required to be registered with the Embryo Protection Authority.

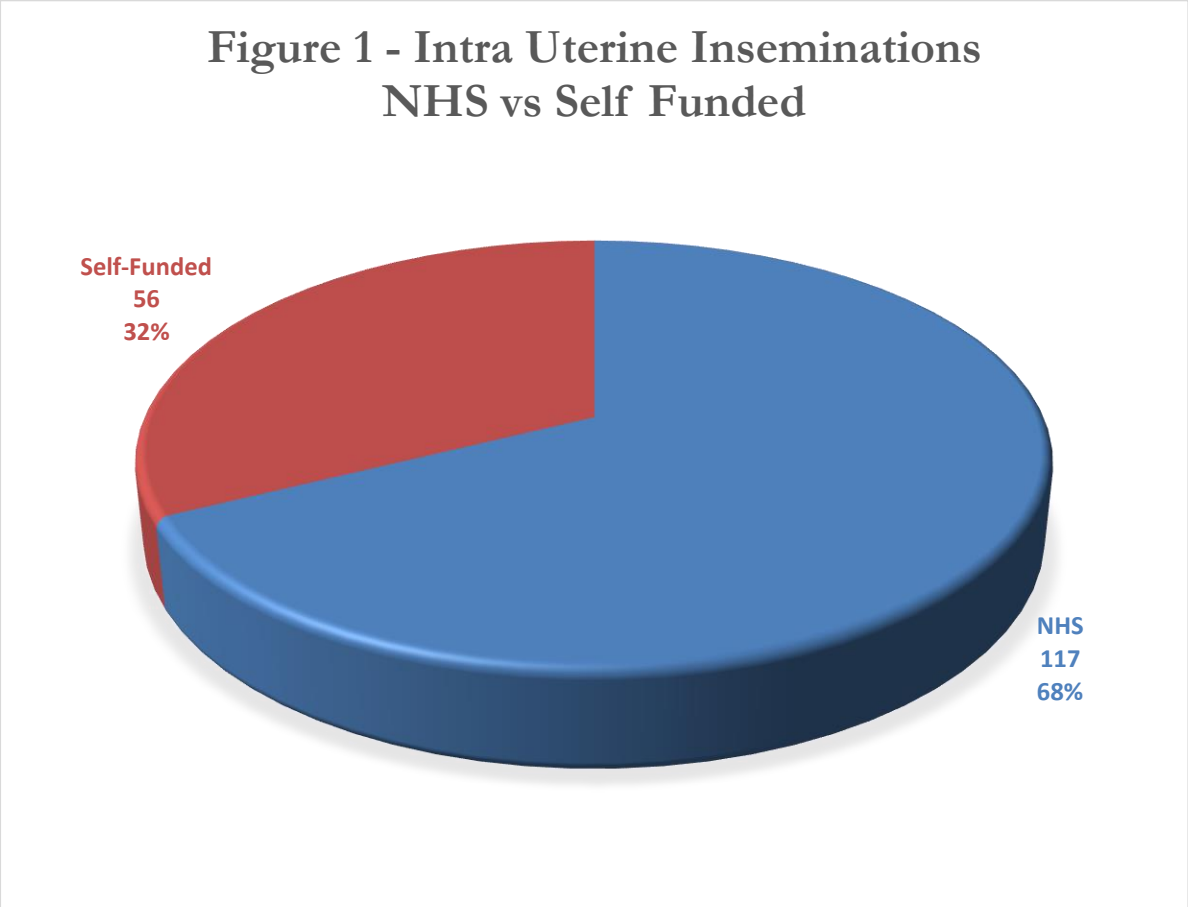
Intra Uterine Insemination (IUI) is a type of fertility treatment in which the better quality sperm are separated from sperm that are of lower quality, non motile or of abnormal morphology. These sperm are then injected directly into the uterus. This procedure may be performed using partner's sperm or donor sperm (known as donor insemination).

IUI may be used in the treatment of prospective parents who need donated sperm but have no female fertility problems, including single women and same sex couples. It may also be used by heterosexual couples who have a male factor infertility and thus need donated sperm. IUI may also be used by heterosexual couples who have unexplained infertility as a first step prior to moving on to IVF, however as it is less invasive and less successful normally several cycles are performed.

Up to 31st December 2019, only IUI's with partner sperm were being performed, as no Tissue Establishment had a licence to process, distribute and make use of transfers or importation of donor sperm. Local direct non-partner donation was allowed at MDH however no IUI's were reported using direct donated non-partner sperm.

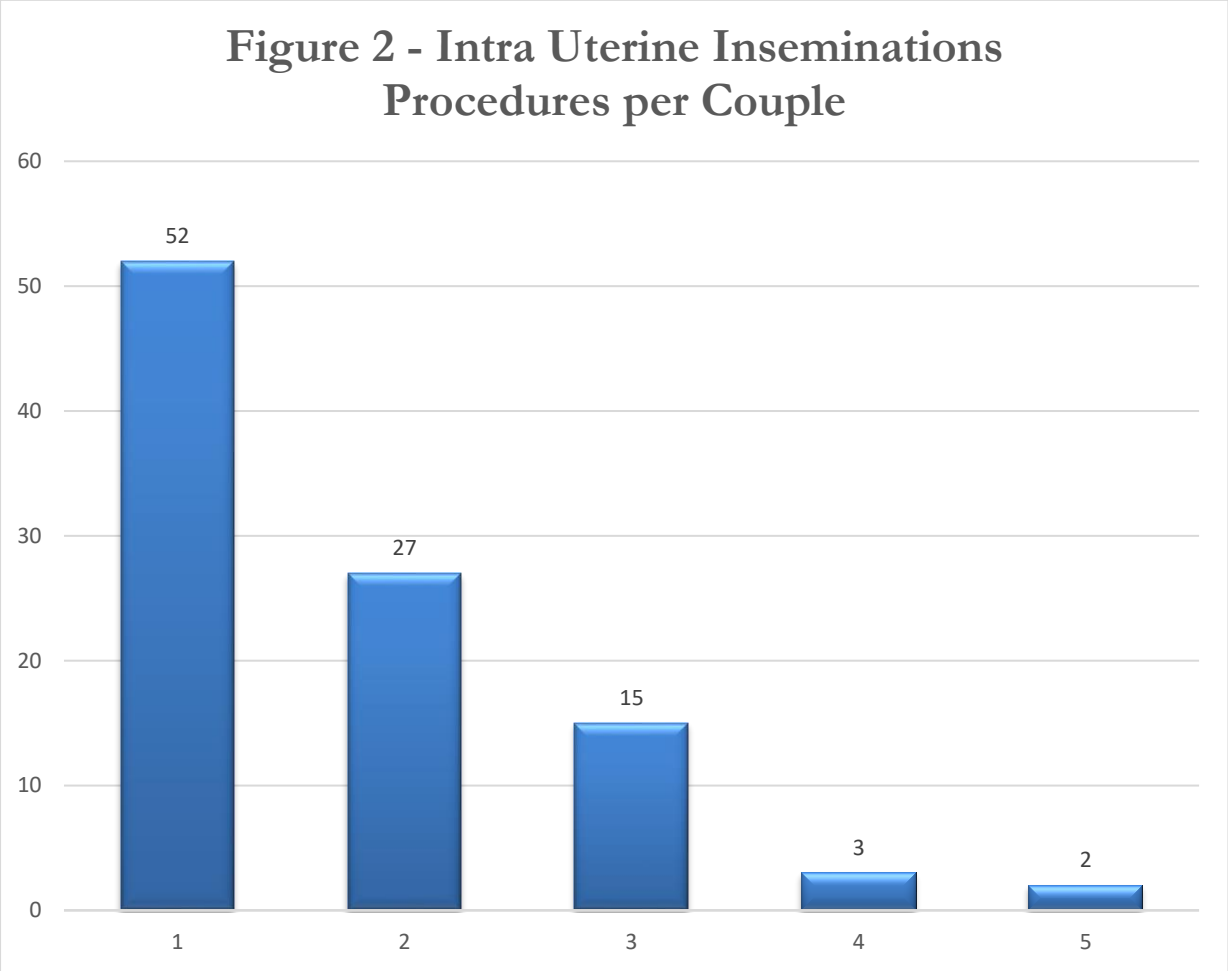
As the law came into force in 2018, one private clinic registered with the Authority to perform IUI's with partner sperm. During 2019, seven other clinics, six in the private sector and one in the public sector registered with the Authority to perform IUI's with partner sperm, bringing the total to eight clinics.

A total of 173 Intra Uterine Inseminations have been reported to the Authority as carried out up to end of 2019. The majority of these one hundred and seventeen (117) were carried out at the MDH ART Clinic, whilst a total of fifty six (56) IUI's were carried out between the seven private clinics (Figure 1).



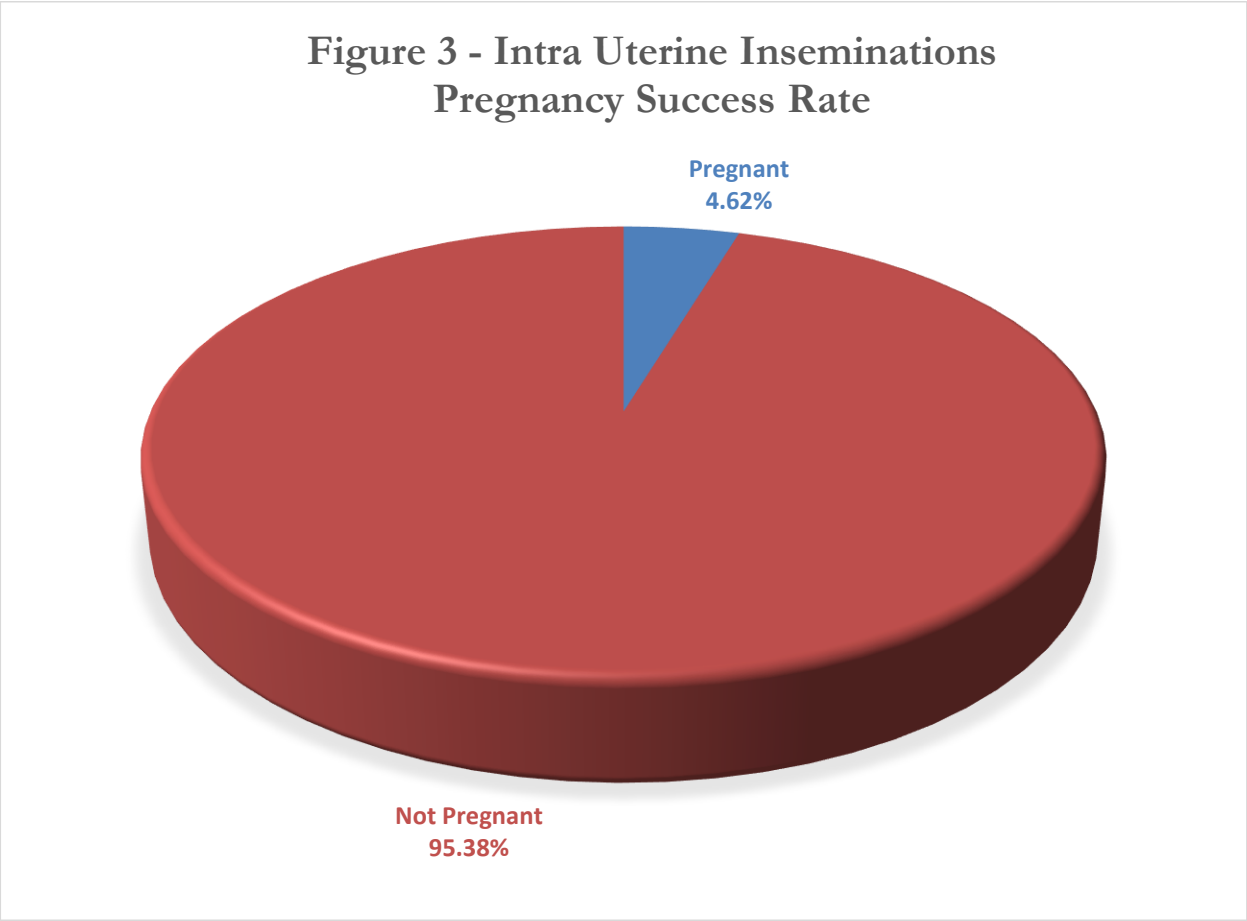
The 173 IUI's were carried out by 99 heterosexual couples using partner sperm. The majority of couples fifty two (52) had undergone one session of IUI during 2019, followed by twenty seven (27) couples who underwent two sessions in the same year.

Fifteen (15) couples were reported has having 3 IUI's whilst three (3) couples had undergone four IUI's. Two (2) couples were reported as undergoing 5 sessions of IUI's in one calendar year. From records received from all the clinics who reported IUI's, some couples underwent IUI's at both the private and public clinic in the same calendar year (Figure 2).



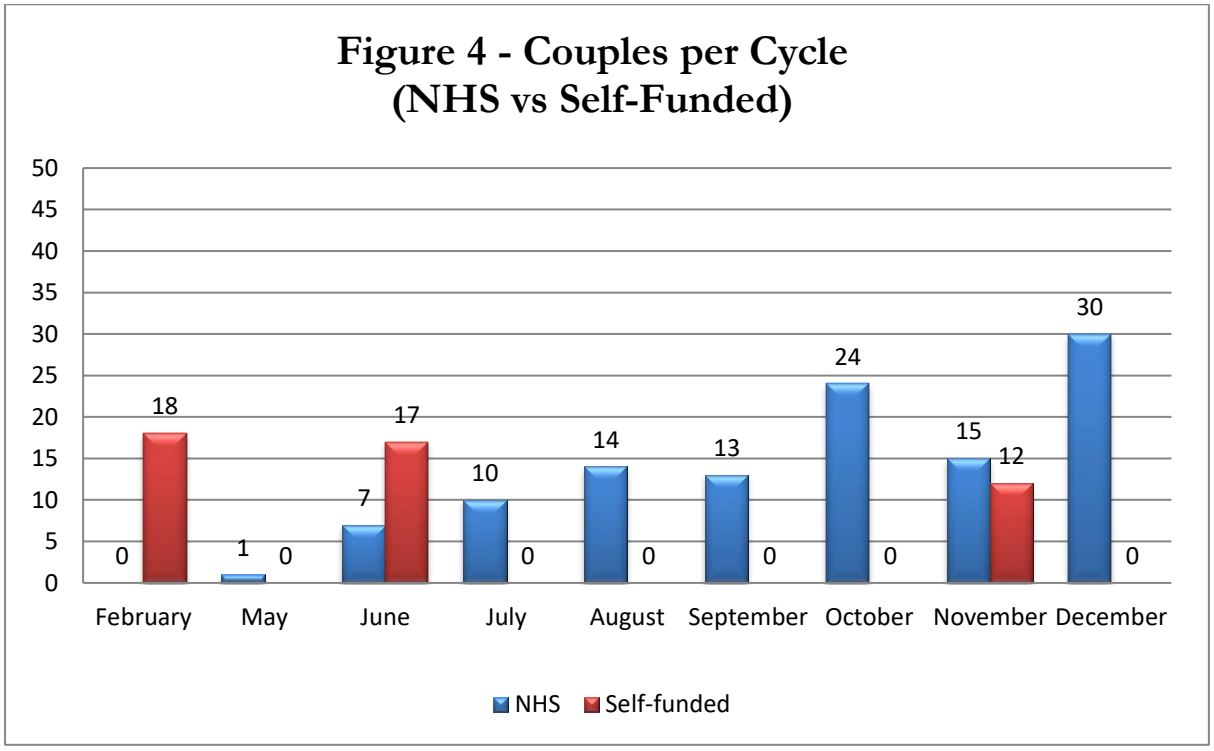
It is well known that Intra Uterine Insemination procedures are less successful than the more invasive IVF/ICSI procedures. Infact out of the 173 cycles carried out, only eight (8) pregnancies were reported, five (5) at the MDH ART Clinic and three from the private sector. Out of which three women miscarried, thus only five women were expected to give birth. One woman has delivered a live birth whilst the four other women are still expecting to give birth. Thus from data submitted to

the Authority up to end of 2019, success rate for IUI's using partner sperm is only of 4.62% (Figure 3).



2.3. Cycles and Treatment Cycles carried out by the Tissue Establishments. (IVF/ ICSI and Cryopreserved embryo Treatment Cycles)

One hundred and fourteen (114) procedures (not treatment cycles) have been carried out at the ART clinic in Mater Dei Hospital (MDH), and forty seven (47) procedures were performed in the private sector at the Assisted Conception Unit in St James Hospital, thus a total of 161 procedures were carried out in Malta (Figure 4).



The number of ART procedures carried out in Malta in 2019 decreased by 35.34% over the previous year, which is mainly attributed to the fact that less procedures were being carried out at the MDH clinic, with a major drop of 44.39% in procedures carried out in the public clinic. Whilst the private clinic registered an increase of 6.82% over procedures carried out in the private clinic in the previous year.

Out of the forty seven (47) procedures carried out in 2019 at the private clinic, three cases were prior approved to be a 'freeze all oocytes cycle' for social and medical grounds. Thus forty four (44) procedures could lead to a treatment cycle and all resulted in a completed treatment cycle from which a pregnancy could result.

On the other hand at the MDH ART Clinic from the one hundred and fourteen (114) procedures carried out, two were prior approved 'freeze all oocytes cycle' oncology cases, thus one hundred and twelve (112) could lead to a treatment cycle. However in thirty two (32) cases, MDH ART Clinic reported a risk of Ovarian Hyperstimulation (OHSS) after fertilisation of the oocytes were carried out, thus all embryos created from these thirty two cycles had to be cryopreserved. This led to the fact that at MDH ART Clinic only eighty (80) cycles resulted in completed treatment cycle from which a pregnancy could result.

2.4. First Time/Repeated Cycles

Out of the 156 cycles carried out, 55.1% of couples (86 couples) were undergoing the IVF/ICSI procedure for the first time. There were 27.6% of couples (43 couples) who were undergoing IVF/ICSI for the second time, 9% of couples (14 couples) for the third time, 5.8% of couples (9 couples) were undergoing their fourth attempt, 1.3% of couples (2 couples) were undergoing their fifth attempt, while the remaining 1.3% of couples (2 couples) had undergone their sixth attempt (Figures 5 and 6).

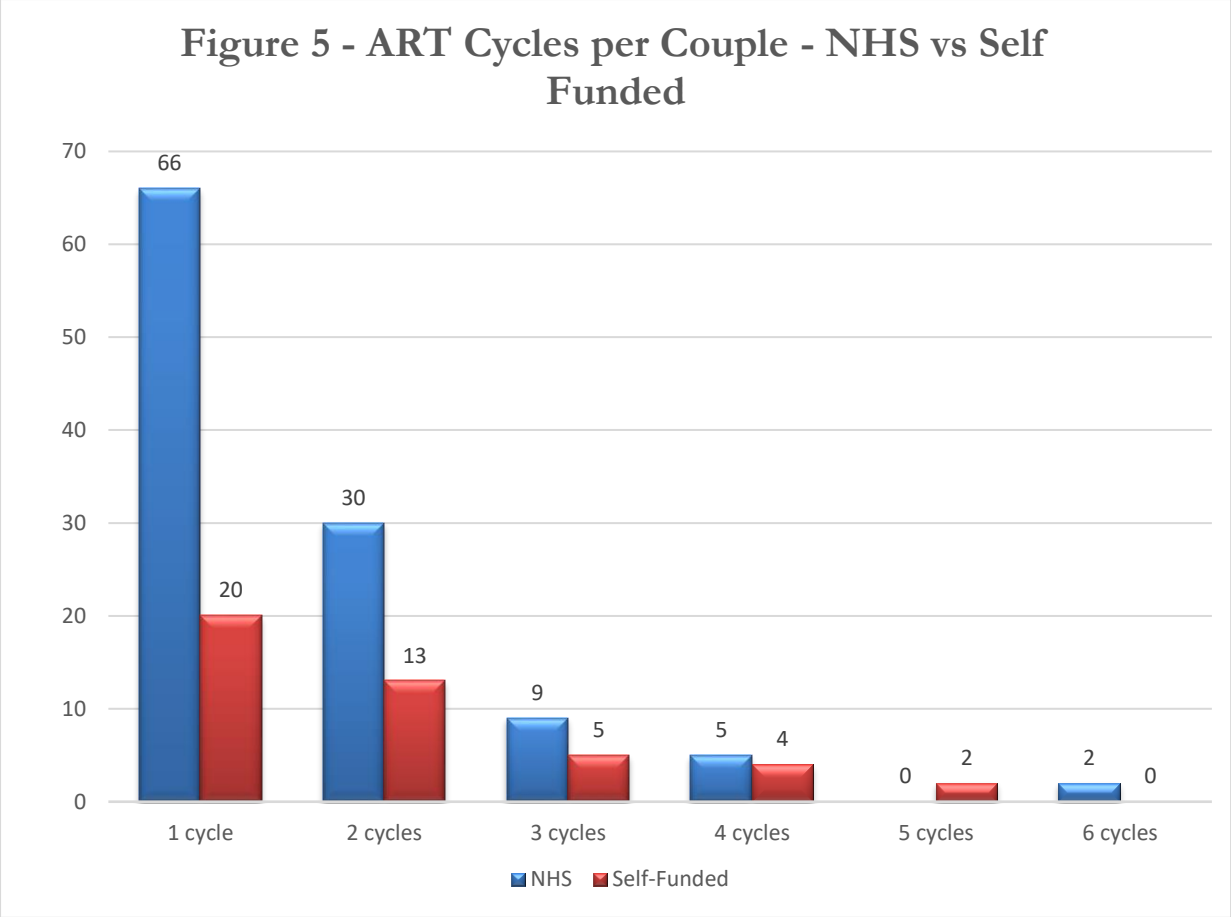


Figure 5 - ART Cycles per Couple - NHS vs Self Funded
70
60
50
40
30
20
10
0
66
20
30
13
9
5
5
4
0
2
2
0
1 cycle
2 cycles
3 cycles
4 cycles
5 cycles
6 cycles
NHS
Self-Funded

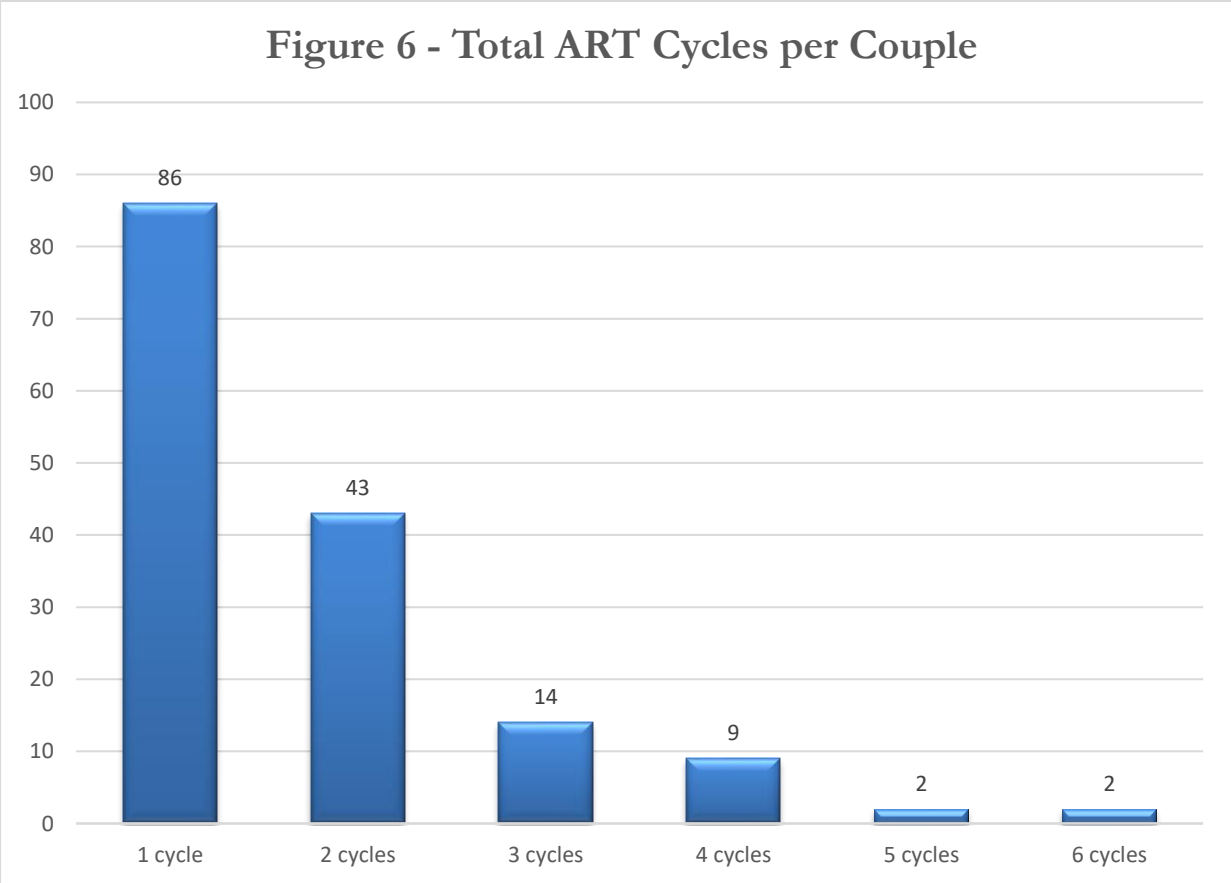
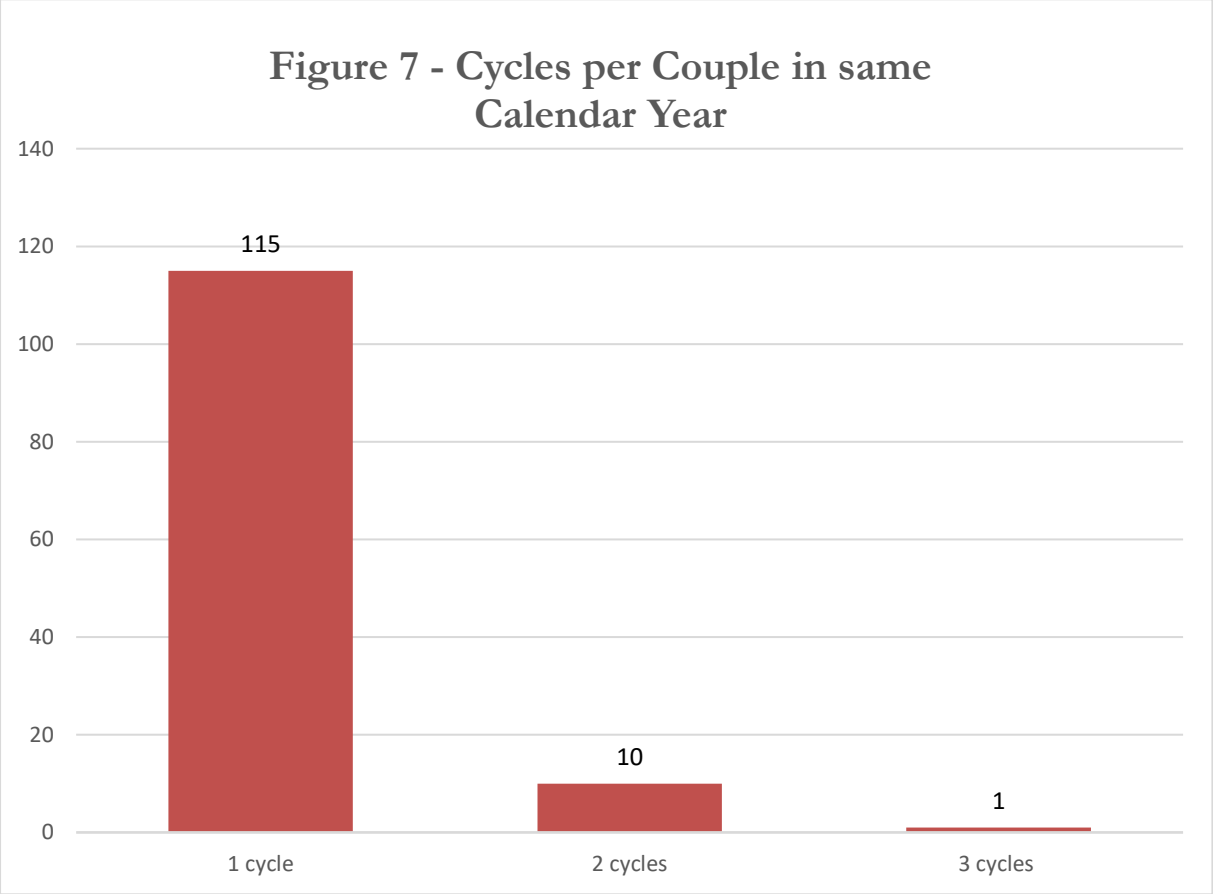


Figure 6 - Total ART Cycles per Couple
100
90
80
70
60
50
40
30
20
10
0
86
43
14
9
2
2
1 cycle
2 cycles
3 cycles
4 cycles
5 cycles
6 cycles

During the same calendar year in 2019, there were 115 couples who had undergone a single cycle (18 of which had undergone a freeze all embryos cycles and then later on in the year had an embryo transfer cycle to have a complete treatment cycle). Ten couples who had undergone 2 cycles and one couple who had undergone three cycles during the same calendar year. Thus, these 156 procedures were undertaken by 126 couples (Figure 7).

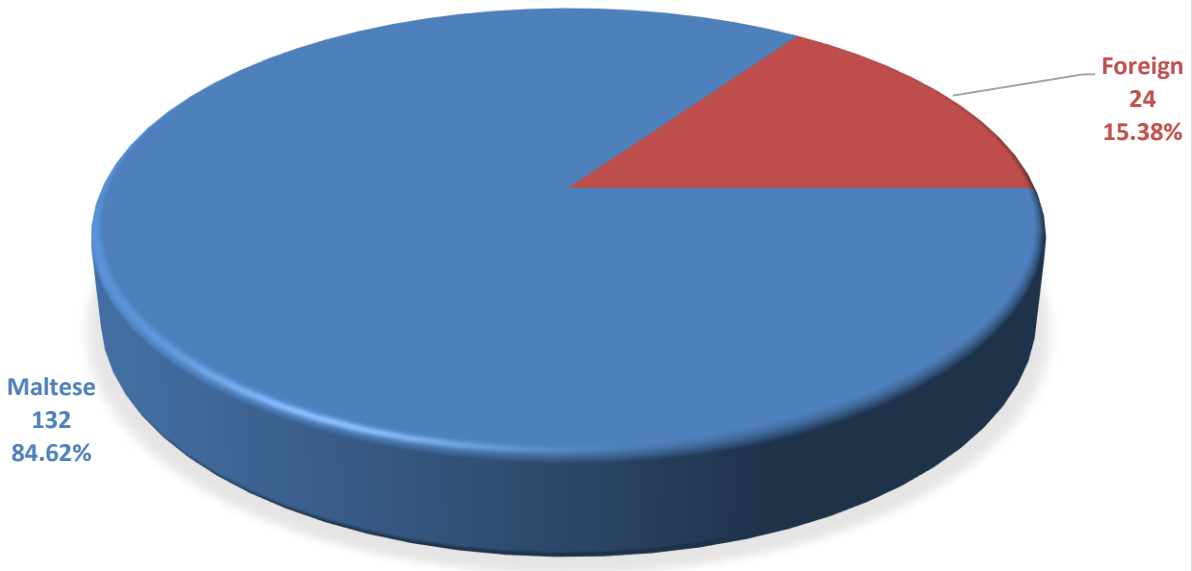


3. DEMOGRAPHICS

3.1. Nationality

Out of the 156 cycles performed this year, 155 were undertaken by Maltese Residents of different nationality. There was one foreign couples (non-Residents) who came to Malta specifically to perform the IVF/ICSI procedure in the private sector, in fact this couple's cycle was successful and the prospective mother gave birth to twins abroad. This is in contrast with last year wherein the private sector had reported no Medical Tourism in the Fertility sector. During this year the Maltese Residents seeking ART treatment registered an increase in foreign nationals living and working in Malta. Foreign Nationals ranged from countries such as England, Romania, Italy, Serbia, Uzbekistan, Hungary, Ethiopia, Armenia, Poland, Libya, Pakistan, Egypt, India, Moldova, and Ukraine. These amounted to 24 out of the 156 cycles carried out, thus a 15.38% of cycles carried out (Figure 8).

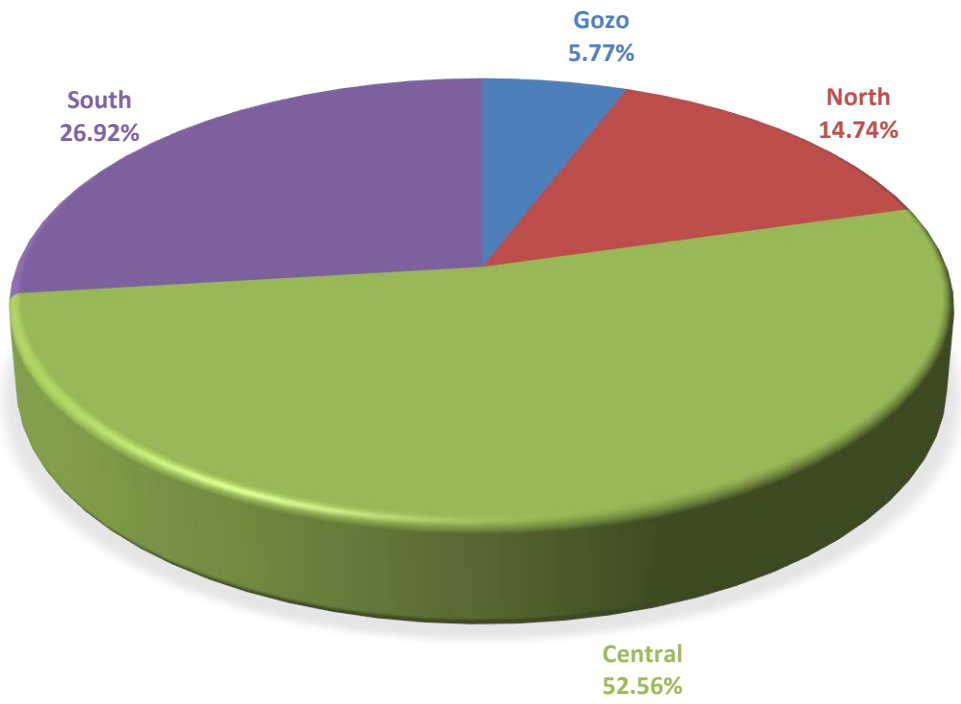
Figure 8 - Maltese and Foreign Residents



3.2. Regions

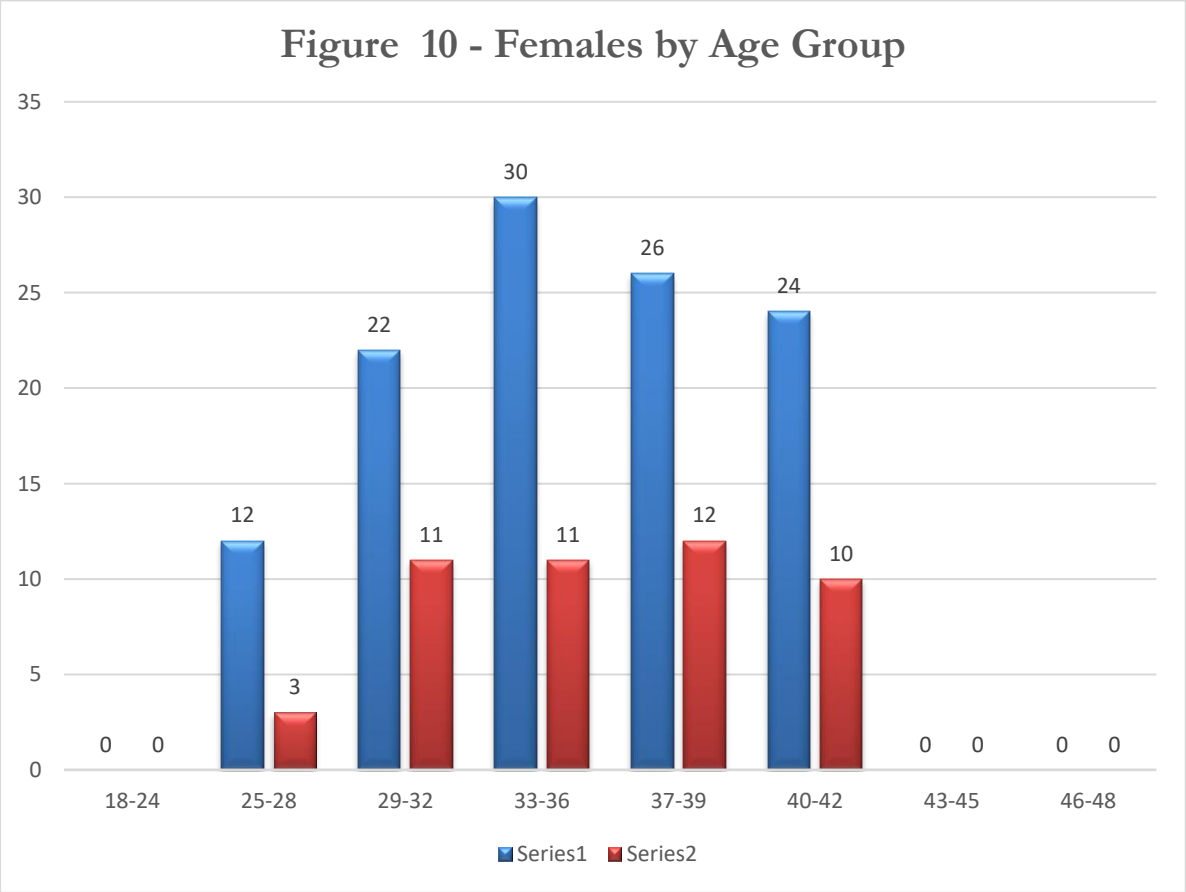
As reported in previous years, the overall majority of couples 52.56% (82 couples) who had undergone IVF/ICSI procedures in 2019 reside in Central Malta, followed by 26.92% (42 couples) who reside in Southern areas of Malta, 14.74% (23 couples) reside in the Northern part of the island, while the remaining 5.77% (9 couples) reside in Gozo. These figures show a major decrease in couples from Gozo and a slight decrease in couples from the Southern part over last year's figures. This was reflected in an increase by the couples residing in the Central and Northern part of the island (Figure 9).

Figure 9 - Distribution By Region



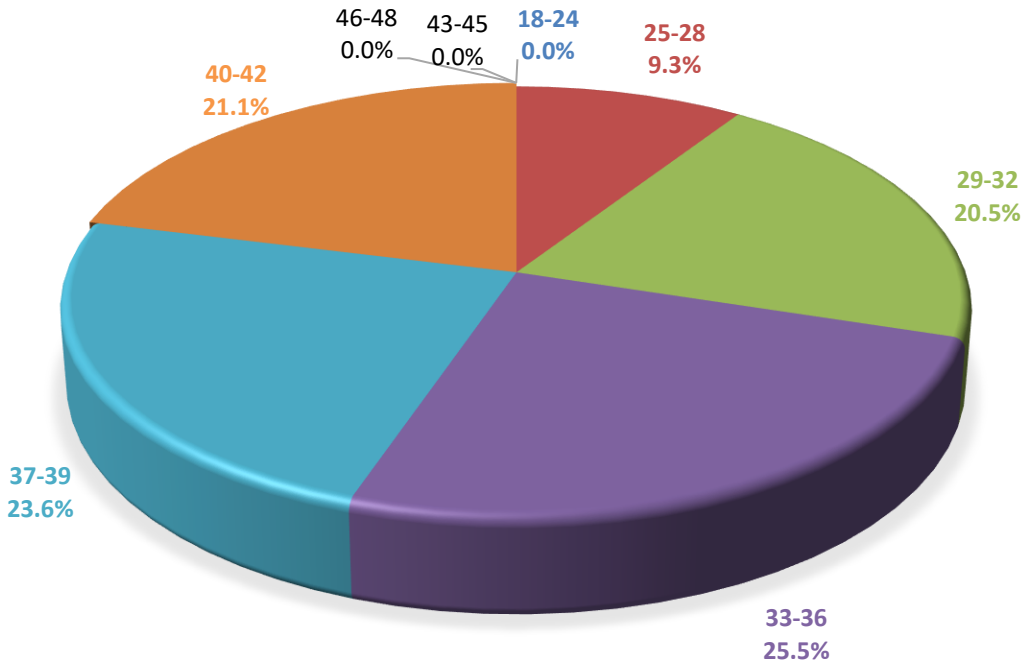
3.3. Maternal Age

In line with the Embryo Protection Authority's Protocol as amended in 2018, in Malta, women falling within the stipulated age bracket of 18 and 48 are eligible to undergo ART Treatment, the extension of maximum age from 42 to 48 years is applicable to women who make use of donated oocytes, women who have previously cryopreserved embryos and are undergoing an Embryo Cryopreservation / Thaw Cycle and woman who had previously cryopreserved their oocytes prior to reaching age 36 . Throughout 2019, all procedures were carried out using own gametes and embryos, but women who had embryo cryopreservation cycles were still much younger than the maximum age of 48. No women aged between 18 and 24 made use of the services. There has been a distribution of procedures across all age brackets, as can be noted from the chart hereunder (Figure 10).



As for the past five years, the largest number of female patients, 41 females (25.5%) undertaking procedures throughout 2019 were aged between 33 and 36. The second largest age group following closely was for female patients aged 37-39, 38 females (23.6%), while 34 females (21.1%) were in the 40-42 year old bracket. There were 33 female patients (20.5%) aged 29-32, while the remaining 15 female patients (9.3%) were aged between 25 and 28 years (Figure 11).

Figure 11 - Females by Age Group (%)

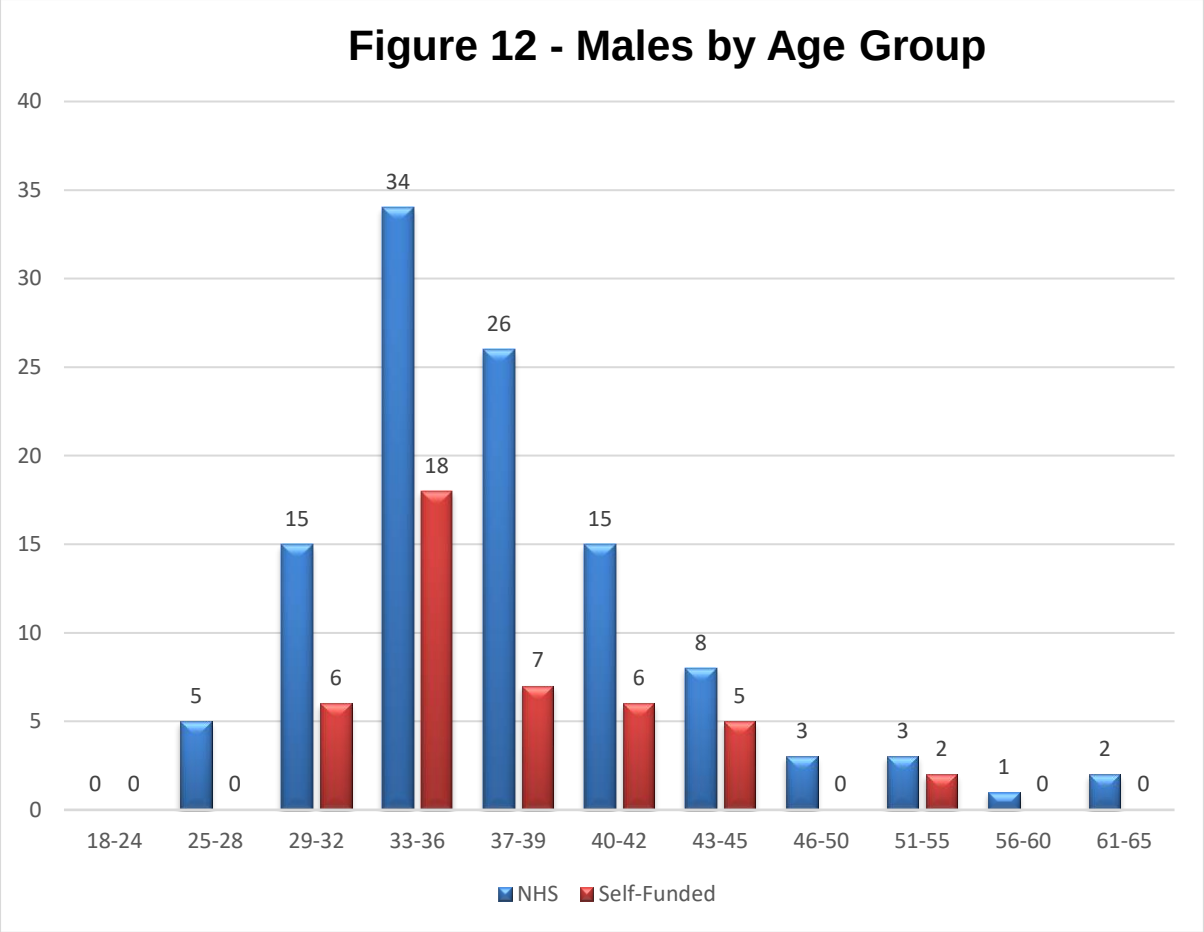


Noteworthy is the fact that in 2019 there has been a considerable drop of 8.6% in the age group of females aged between 33 and 36 years and a drop of 5.6% in the age group of women aged between 29 and 32.

Conversely the age group of women aged between 40 and 42 registered a large increase of 8.7%. over previous year. An increase of 4.1% was also registered in the age group of females aged between 25 and 28. The other age group of women aged between 37 and 39 registered a slight increase in females who had undergone a procedure.

3.4. Paternal Age

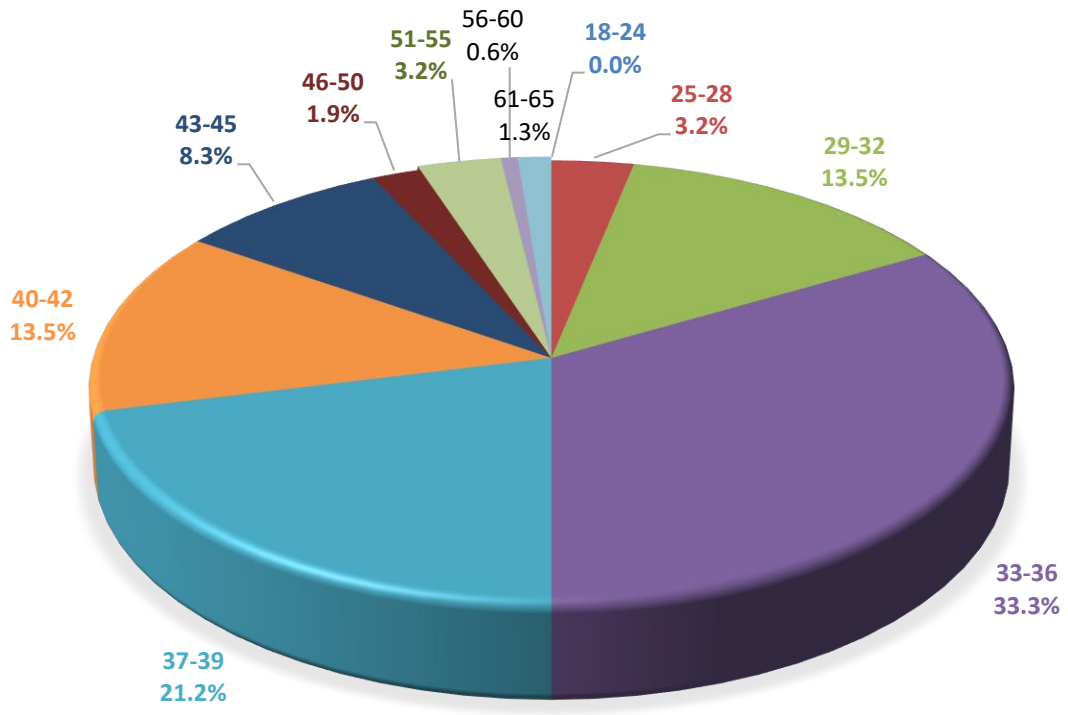
As with the female patients, the largest number of male patients, 52 males (33.3%) undergoing procedures was in the 33-36 year old bracket, while 33 males (21.2%) were aged between 37 and 39. The third largest age groups (13.5%) consisted of 42 males, 21 males aged 29-32 and another 21 males in the 40-42 year old bracket. The male age group of males aged between 43-45 years was the fourth largest age group with 13 males (8.3%) while 11 patients (7.1%) of male patients were aged 46 years and over. The remaining 5 males (3.2%) of males were under the age of 29. (Figures 12 and 13).



Noteworthy is the fact that while in 2017 the oldest male was in the 51-55 age bracket, in 2018 the oldest male was in the 56-60 age bracket and in 2019 the oldest male was in the 61-65 age bracket. In 2019 there was an increase in the age groups of males aged between 33 and 39 and in the age group more than 46 years. Increase in males over 56 years was registered in the public tissue establishment. There were no males over 56 years in the private facility.

There was also a slight increase in the age group of males less than 29 years. It is also good to note that whilst the youngest male undergoing IVF/ICSI procedure in 2017 was 25years old and in 2018 the youngest was 24 years, this year the youngest male is reported to be 27 years old.

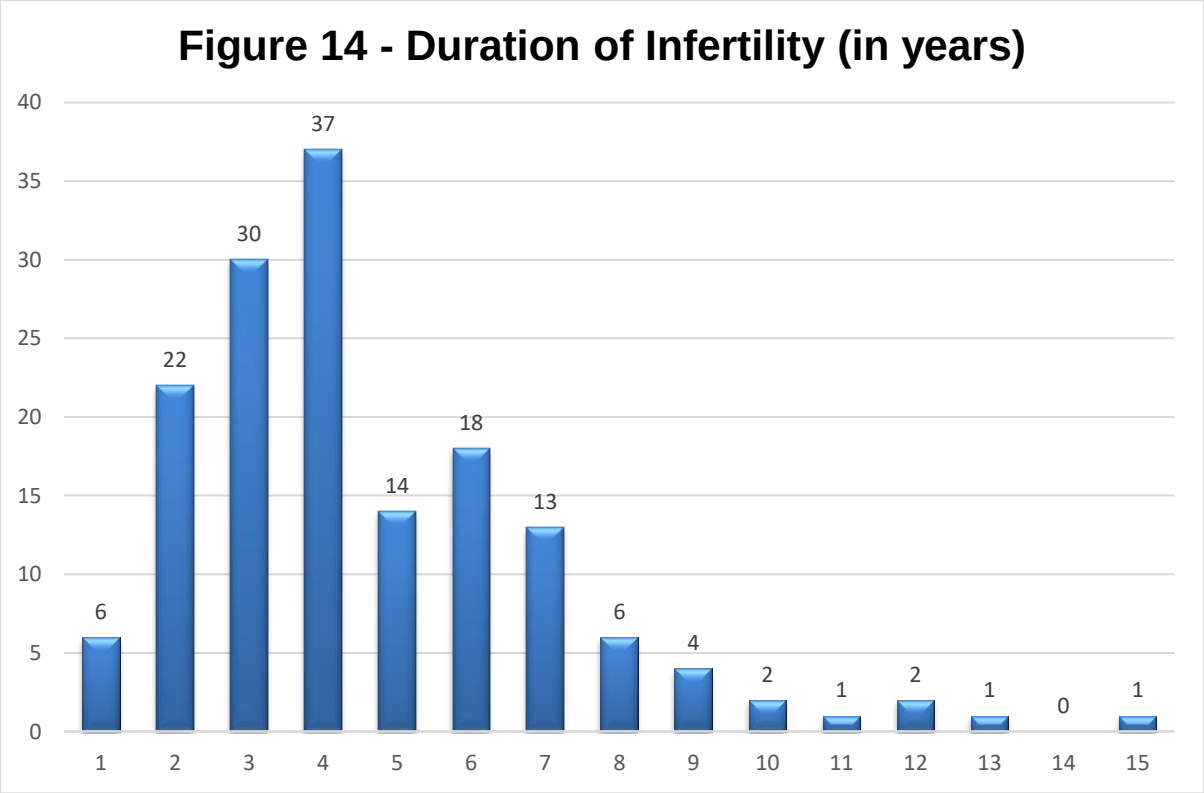
Figure 13 - Males by Age Group (%)



4. INFERTILITY

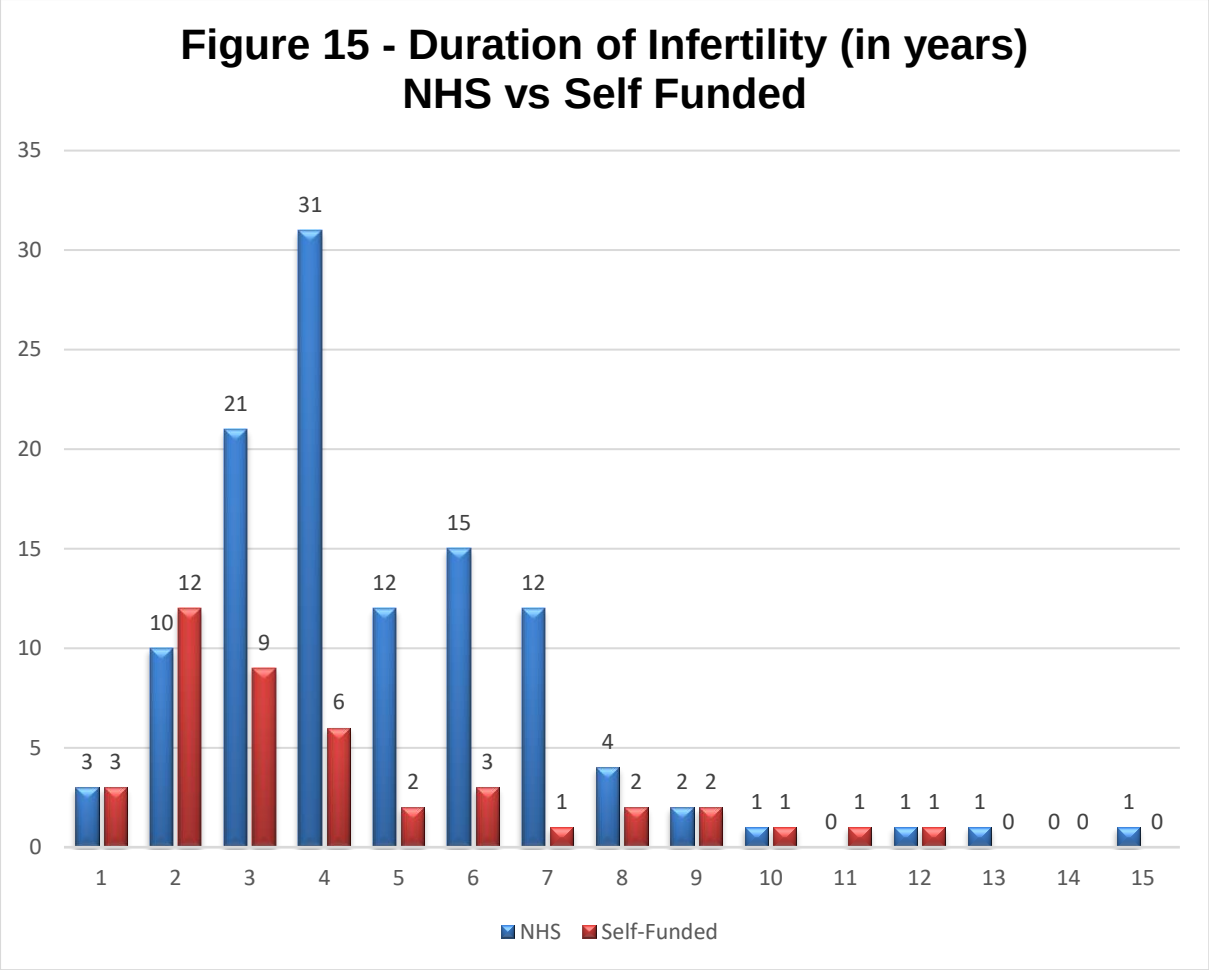
4.1. Duration of Infertility

There was a significant amount of variability in the reported duration of infertility amid couples undertaking procedures in 2019, with the minimum reported duration being that of three months, up to a maximum of 15 years. Noteworthy to note is that in 2018, the maximum duration was reported to be 17 years. One couple reported infertility for less than one year, while six (6) couples reported to be infertile for one year only, had undergone treatment at the private sector and self-funded their treatment. Twenty two (22) couples reported to be infertile for two years, thirty (30) couples for 3 years, thirty seven (37) couples for 4 years, fourteen (14) couples for 5 years, while forty three (43) couples reported to be infertile between 6 and 10 years. Only five (5) couples who had undergone treatment reported being infertile between 11 and 15 years. (Figure 14).



To be eligible for treatment on the NHS, a couple must declare being infertile for at least two years if there is no exceptional case to receive treatment before. In fact, 9.09% of couples who self-funded their treatment declared less than 2 years of infertility, thus a 4.51% decrease from 2018. The majority of couples (61.36%) self-funding their treatment have reportedly been infertile for 2 to 4 years with a slight increase of 2.26% on the previous year. The remaining 29.55% have been infertile for 5 years or more, even in this duration bracket there has been an increase of 2.25%.

Similarly, the majority of couples (54.39%) who applied to undergo IVF/ICSI treatment on the NHS declared being infertile for 2-4 years, registering a 4.71% decrease over the previous year. Twenty seven (27) couples, or 23.7%, have declared being infertile for 5-6 years, percentagewise same as last year. Twenty two (22) couples (19.3%) an increase of 2.1% over 2018 have been infertile between seven and fifteen years. Three couples underwent IVF/ICSI treatment on the NHS with a duration of less than 2 years due to medical conditions. (Figure 15).



Noteworthy is the fact that 77 couples (67.54%) of total couples undergoing treatment on the NHS reported to have been infertile for up to 5 years. This shows a slight decrease of 1.92% over the previous year, wherein 69.46% of the couples had been reported in 2018. In the figures quoted above the women undergoing oocytes retrieval only, prior to receiving chemotherapy have not been included.

4.2. Classification of Infertility

IVF/ICSI procedures are offered free of charge by the Government to couples who have no children (Primary Infertility), or to those who have children from a previous relationship (Secondary Infertility). The majority of couples, 126 couples (80.77%) who have applied for IVF/ICSI treatment in both the NHS and private sector in 2019 suffered from Primary Infertility, a decrease of 10.73% over 2018. Noteworthy is the fact that 11 couples who reported secondary infertility, as they already had a child from the same relationship, self-funded their treatment, as they were not eligible on the NHS, these represent 7.05% of couples undergoing treatment in 2019. The total of couples who reported secondary infertility in 2019 has increased to 30 couples 19.23% of couples undergoing treatment, an increase of 10.73% over 2018. (Table 1).

Table 1. Classification of Infertility

Classification of Infertility	NHS	Self-Funded	Total	%
Primary	101	25	126	80.77%
Secondary - Child from Same Relationship	0	11	11	7.05%
Secondary - Female has child from Previous Relationship	9	5	14	8.97%
Secondary - Male has child from Previous Relationship	2	1	3	1.92%
Secondary - Both Partners had children from Previous Relationship	0	2	2	1.28%
Total	112	44	156	100.00%

4.3. Indication for Infertility Factors

The Authority gathers data on what the contributing factor of infertility for each couple is. These consist of Female factor only, Male factor only, Female and Male factor, and Idiopathic (unexplained) infertility.

As shown in Figures 16 and 17, the majority of couples (37.2%) undertaking IVF/ICSI procedures suffered from Female factor only infertility. These were followed by couples (28.2%) suffering from Female and Male factor and followed by the couples (23.1%) suffering from Male factor only while the remaining 11.5% suffered from idiopathic infertility. These figures are in line with those reported in 2018.

Noteworthy to bring to attention is the fact that in 2019, there was a slight drop in the group of patients who reported, Male factor only and Female and Male factor infertility over the figures reported in 2018. There was also reported a 2.3% decrease in the group of couples who suffered from idiopathic infertility. On the other hand in 2019 the Female factor only group reported an increase of 4.4% over figures reported in 2018.

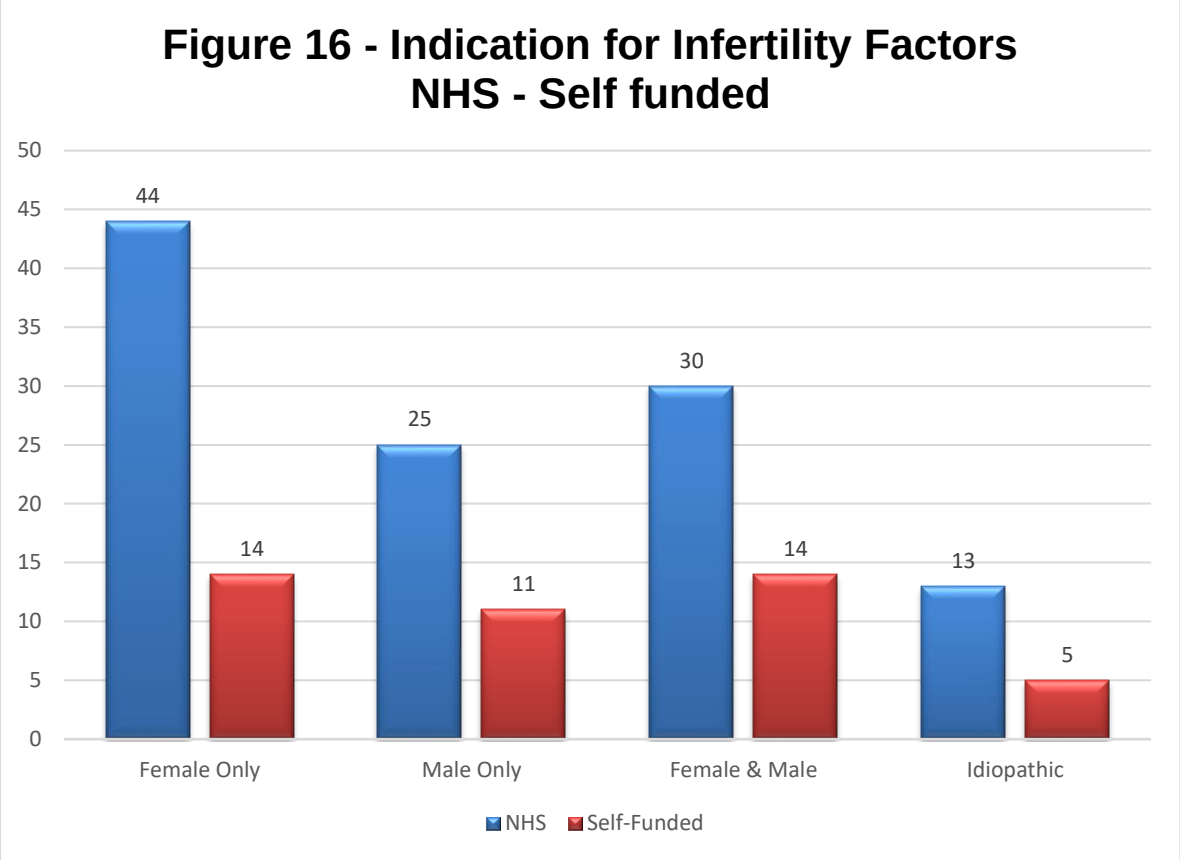


Figure 16 - Indication for Infertility Factors
NHS - Self funded
50
45
40
35
30
25
20
15
10
5
0
44
14
25
11
30
14
13
5
Female Only
Male Only
Female & Male
Idiopathic
NHS
Self-Funded

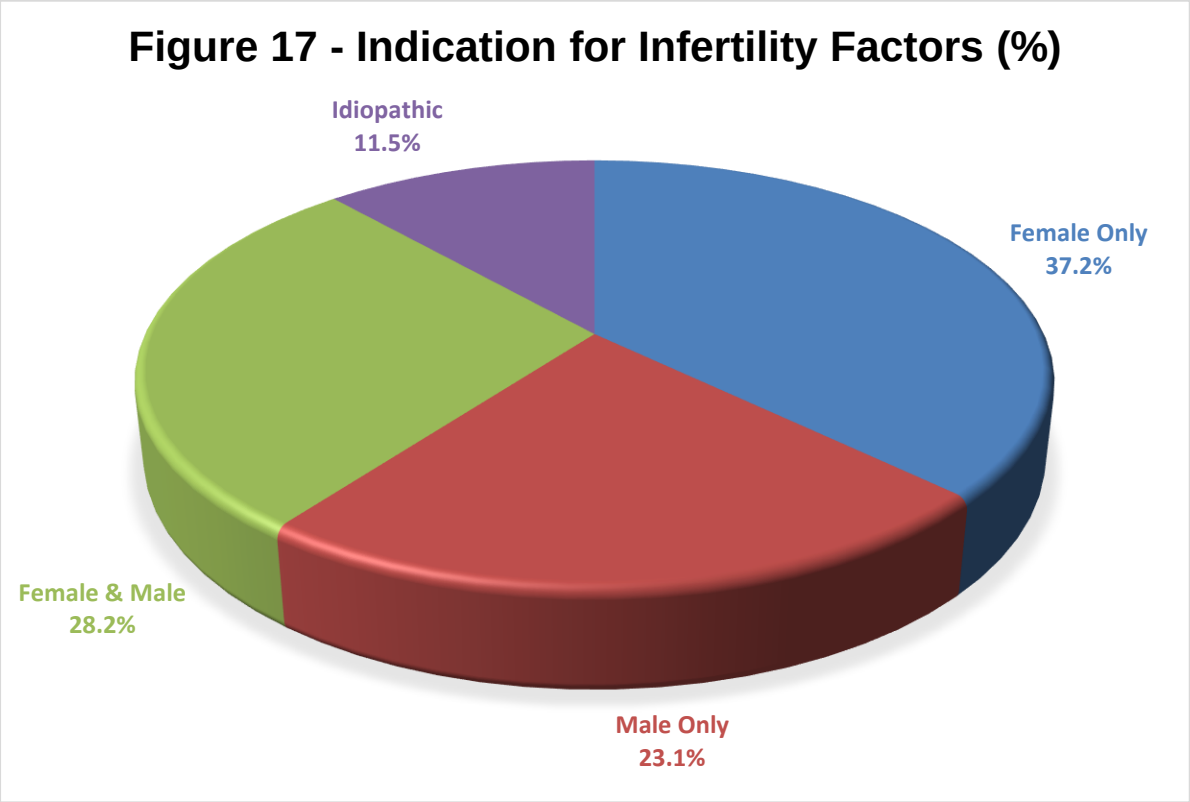
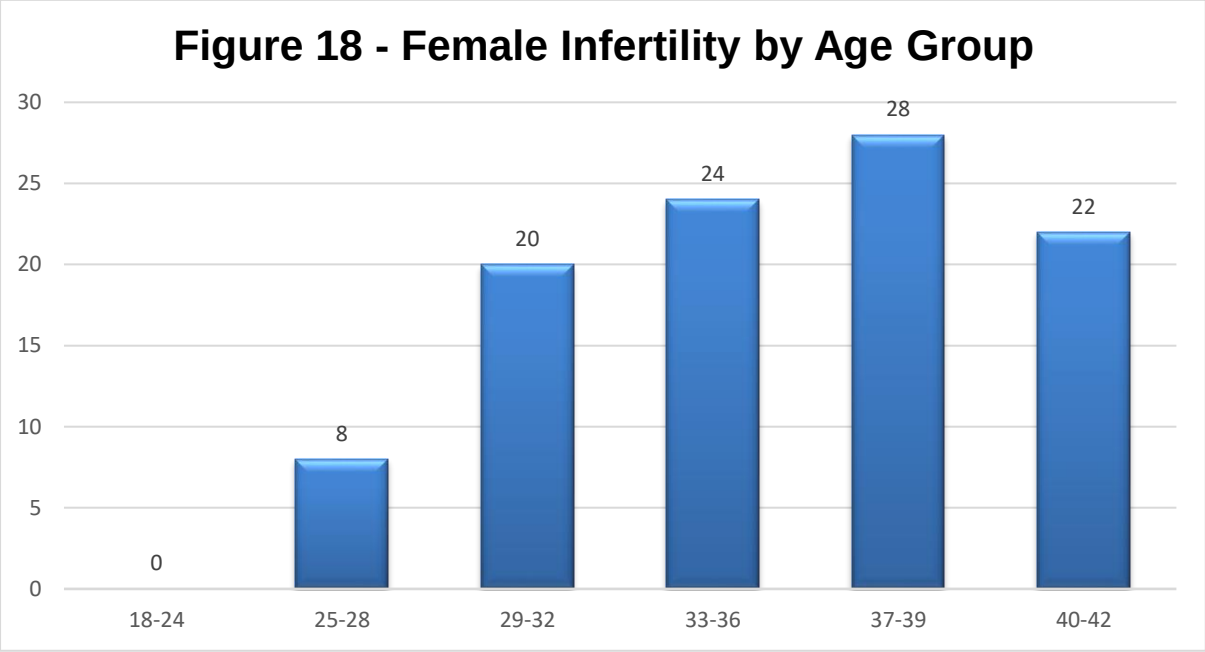
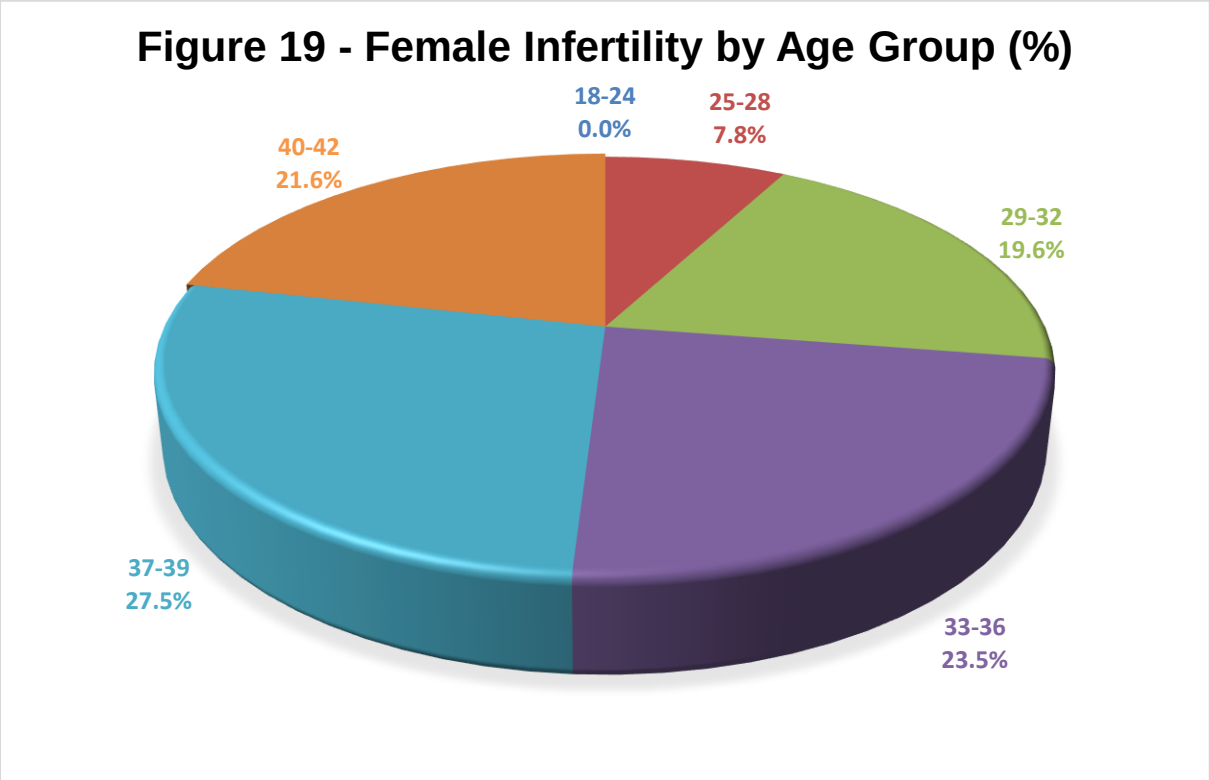


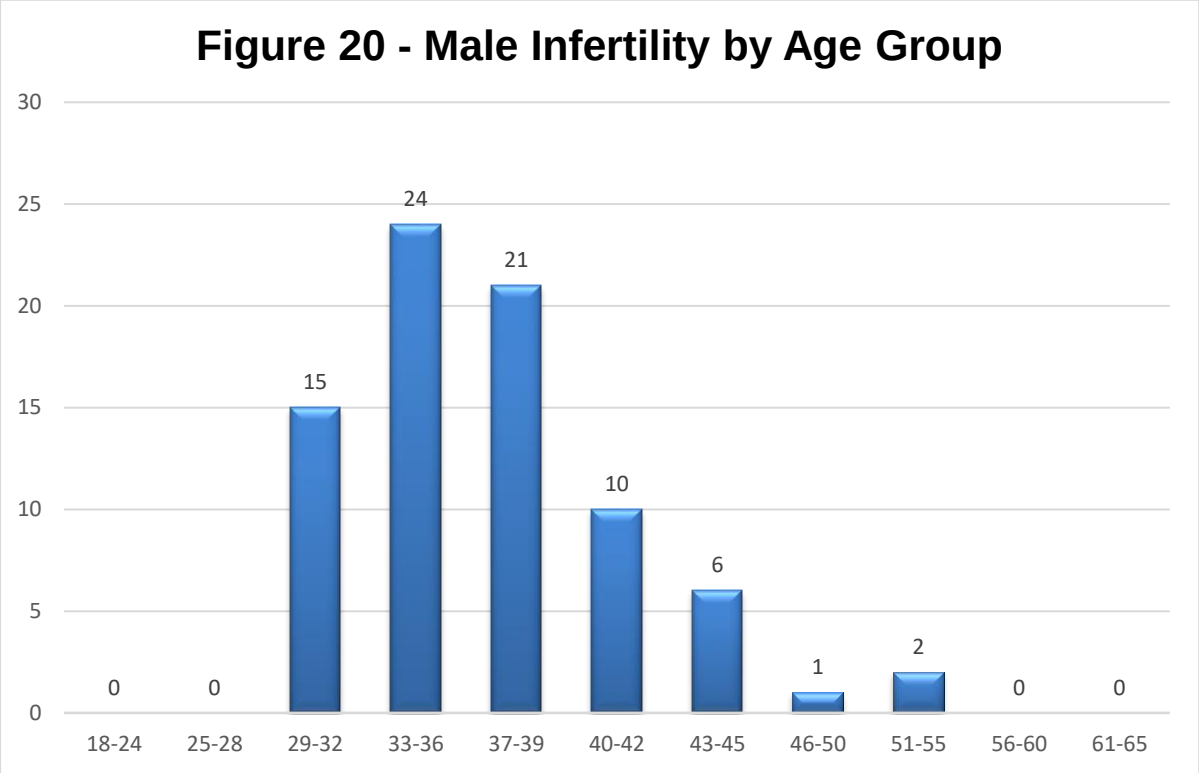
Figure 17 - Indication for Infertility Factors (%)
Idiopathic
11.5%
Female Only
37.2%
Female & Male
28.2%
Male Only
23.1%

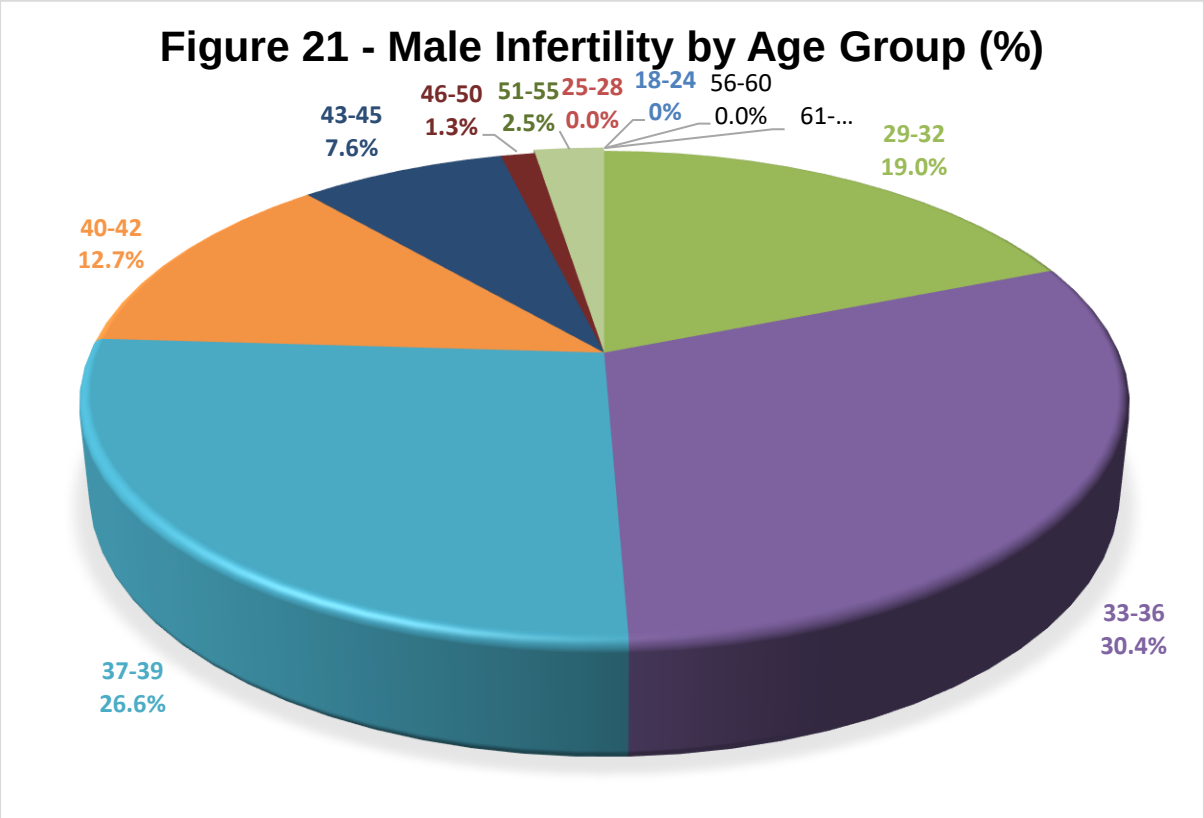
From those couples suffering from Female factor infertility, the largest group (27.5%) were in the 37-39 year old bracket, this age bracket has been registering increase over the years. The 2019 figures show an increase of 5.3% over figures reported in 2018. The age group bracket of females between 33-36 years registered a drastic drop of 15.1% over figures reported in 2018 (Figures 18 and 19).





From those couples suffering from Male factor infertility, the largest group (30.4%) were reported in the 33-36 year old bracket same as the previous year, followed by males in the 37-39 year old bracket (Figures 20 and 21).





5. LIFESTYLE INDICATORS

5.1. Body Mass Index

For the second time since issuing its Annual Report, the Authority is presenting a picture of the body Mass Index (BMI) of the Females resorting for Assisted Reproduction Treatments in Malta. Classifications reported are based on the World Health Organisation Classifications, thus women having a BMI below 18.5 are classified as underweight, women with a BMI between 18.5 and 24.9 as normal weight, women with a BMI of 25 to 29.9 as pre-obesity (overweight). Women are classified as Obesity Class I if reporting a BMI of 30 to 34.9, Obesity Class II with a BMI of 35 to 39.9. Women with a BMI above 40 are classified as Obesity Class III.

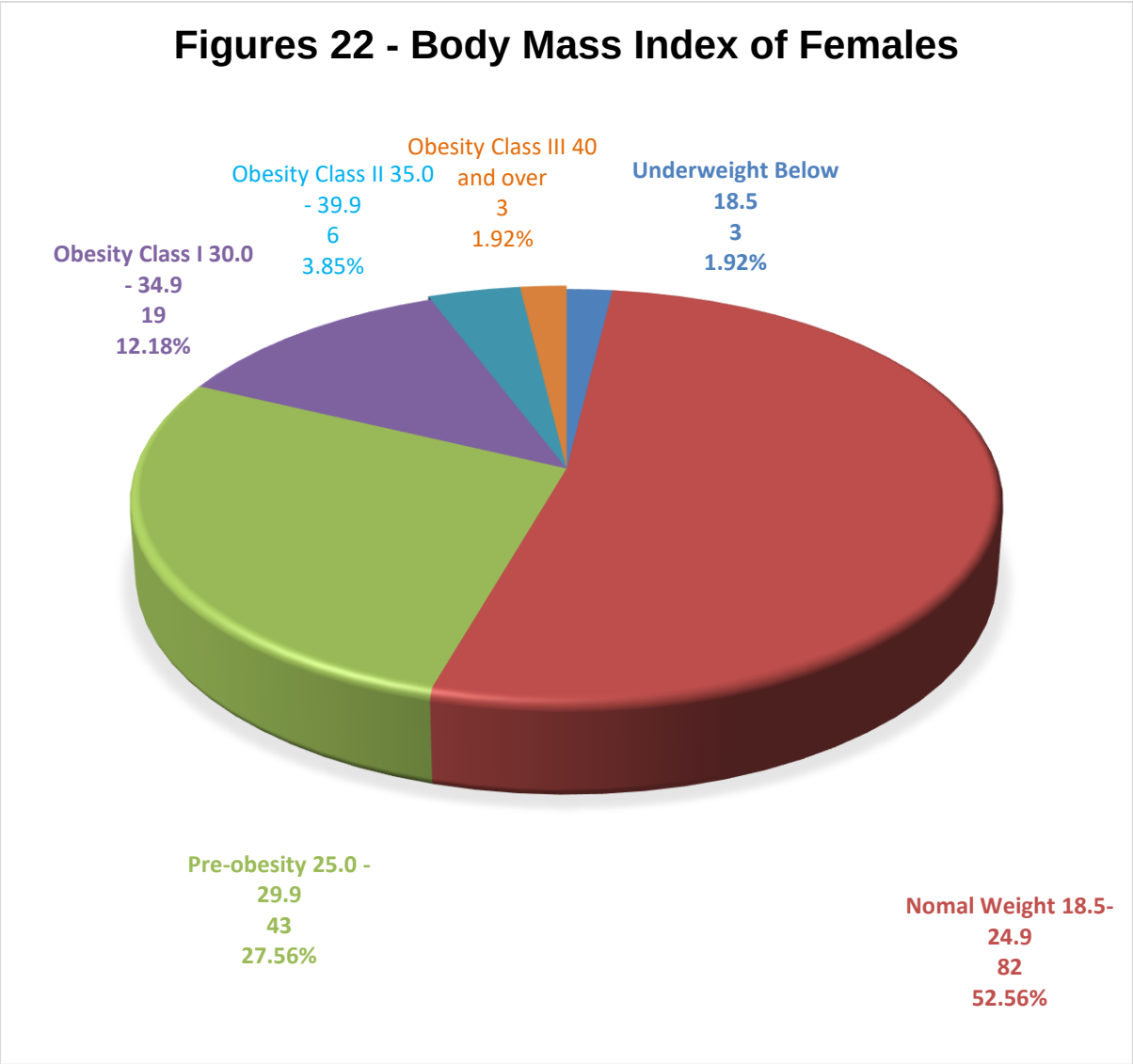
In 2019, the BMI's of females reported ranged from as low as 15.6 with the maximum BMI reported to be 43, average of BMI of women who resorted to IVF/ICSI was of 25.18, thus being classified as in the range of pre-obesity (overweight) range.

3 females or (1.92%) of females undergoing ART treatment in Malta through IVF/ICSI were reported to be underweight, 82 females (52.56%) were of normal weight while the remaining 71 females or 45.51% were classified in the overweight and obese classifications. Noteworthy to bring to attention is the fact that 17.95% of all females resorting to ART treatments were classified as Obese. (Figure 22).

The Authority felt that this study needed to be presented in this year's annual report to give a holistic picture of the females undergoing ART treatments. As will be reported later in the pregnancy and miscarriages sections no female who was

underweight became pregnant, same also applies to women in Obesity Class II and Obesity class III where no pregnancies were reported in these BMI classes.

Noteworthy is the fact that 27.27% of the females who were pregnant in the Pre-Obesity (overweight) class suffered a miscarriage, this miscarriage rate increased to 40% in women who were pregnant in Obesity class I.



6. TYPE OF CYCLE

6.1. Fresh vs Thawed

Couples may opt for Fresh collection of oocytes or Thawed cycles using vitrified oocytes, or a combination of Fresh and Thawed. Oocyte selection and vitrification are routine practice at the local ART clinics. Given that vitrification technology holds great promise in terms of gamete survival, pregnancy rates, and live births, data gathered on the outcomes from Thawed cycles is of high relevance. This is especially true in light of gamete vitrification techniques being employed for fertility preservation, as in the cases of oncology patients.

From a total of 161 procedures carried out, 124 (77.02%) were Fresh procedures with collection of oocytes; while another 14 (8.70%) were Thawed oocytes cycles. None of the couples, in 2019, opted for a combined cycle whereby both fresh and thawed oocytes would have been utilized for the procedure. During 2019, twenty three couples (14.29%), all at MDH, had undergone embryo transfer only of embryos that were cryopreserved previously through the permission granted by the Authority after they had requested additional fertilisation with the possibility of cryopreservation of embryos. (Table 2).

Table 2. Type of Procedure

Procedure	NHS	Self-Funded	Total	% of Total
Fresh oocytes	86	33	119	73.91%
Thawed oocytes	3	11	14	8.70%
Prior approval for a freeze all oocytes cycle	2	3	5	3.11%
Thawed embryos	23	0	23	14.29%
Total	**114**	**47**	**161**	

Noteworthy is the fact that there has been a major drop in the option of undergoing a fresh collection of eggs cycle. During 2019, there was an 10.53% decrease in fresh oocytes collection cycles when compared to last year 2018. A drop of 2.89% was registered in the couples opting to undergo a thawed cycle in 2019 when compared to 2018. A considerable increase of 14.21% was registered in thawed embryo cycles all carried out at the MDH facility.

The majority of cycles (77.19%) carried out at the ART Clinic in Mater Dei Hospital were Fresh oocytes collection cycles, 2.63% were Thawed oocytes cycles, whilst only 20.18% of cycles were thawed embryo cycles. In the self-funded cycles the majority of cycles (76.60%) were Fresh oocytes collection cycles, and the remaining 23.40%

were Thawed oocytes cycles. No embryo transfer only cycles were carried out that were self-funded in 2019.

6.2. Additional Fertilization Requests (AFRs)

Pursuant to the introduction of the Embryo Protection Act of 2012, the maximum number of oocytes which may be injected in any one cycle is two oocytes, or three oocytes in cases approved by the Authority under the Principal Act). All embryos created had to be transferred since vitrification (freezing) of embryos was forbidden by law under the Principal Act.

With the introduction of the Embryo Protection (Amendment) Act, 2018, all prospective parents will have two oocytes which may be injected in any one cycle however as approved in the AFR Protocol presented to the Parliamentary Health Committee, the Authority can now approve up to a maximum of five oocytes to be injected in any one cycle, provided that the couples have consented for embryo vitrification and potential embryo donation. Prospective parents who do not consent to embryo vitrification will only be allowed to inject two oocytes in any one cycle.

The Authority receives a significant number of requests from the licensed establishment clinicians to consider the fertilization of additional oocytes for specific couples, instead of the two permitted by law. These requests are analysed and discussed between the Members of the Authority together with Representatives from the Obstetrics and Gynaecology Association. Requests are considered on a case by case basis and matched against established criteria. These criteria include the

age of the female patient undergoing treatment, together with the number of failed IVF/ICSI cycles that the couple had already undergone as well as the indication of infertility.

Throughout 2019, a total of 198 requests were received by the Authority. The majority of requests, 150 requests (75.76%) came from the ART Clinic at MDH, 141 of these requests were for the maximum injection of 5 oocytes under the Amendment Act, all of the 141 requests were approved. The remaining 9 requests made by the ART Clinic at MDH were for patients who opted to follow the principal Act and thus fertilise only two oocytes.

The remaining of requests, 48 requests only (24.24%) of the AFR requests were made by private clinics, 32 of these requests were for the maximum injection of 5 oocytes under the Amendment Act, all of the 32 requests were approved. One couple specifically requested for permission to fertilise 3 oocytes only, and was granted approval. The remaining 15 requests made by the ART Clinic at MDH were for patients who opted to follow the principal Act and thus fertilise only two oocytes. (Figures 23 and 24).

Thus during 2019, all requests for additional fertilisations were approved by the Board.

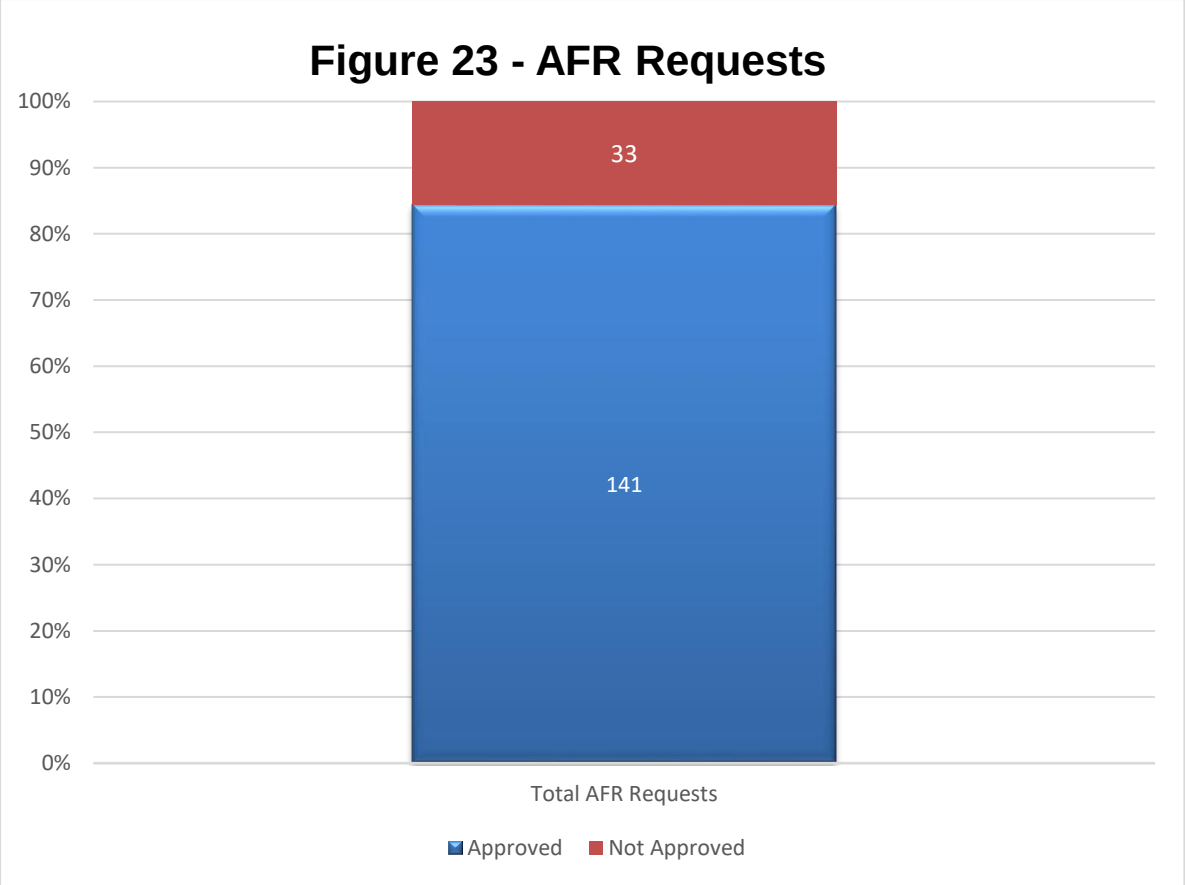


Figure 23 - AFR Requests
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
33
141
Total AFR Requests
Approved
Not Approved

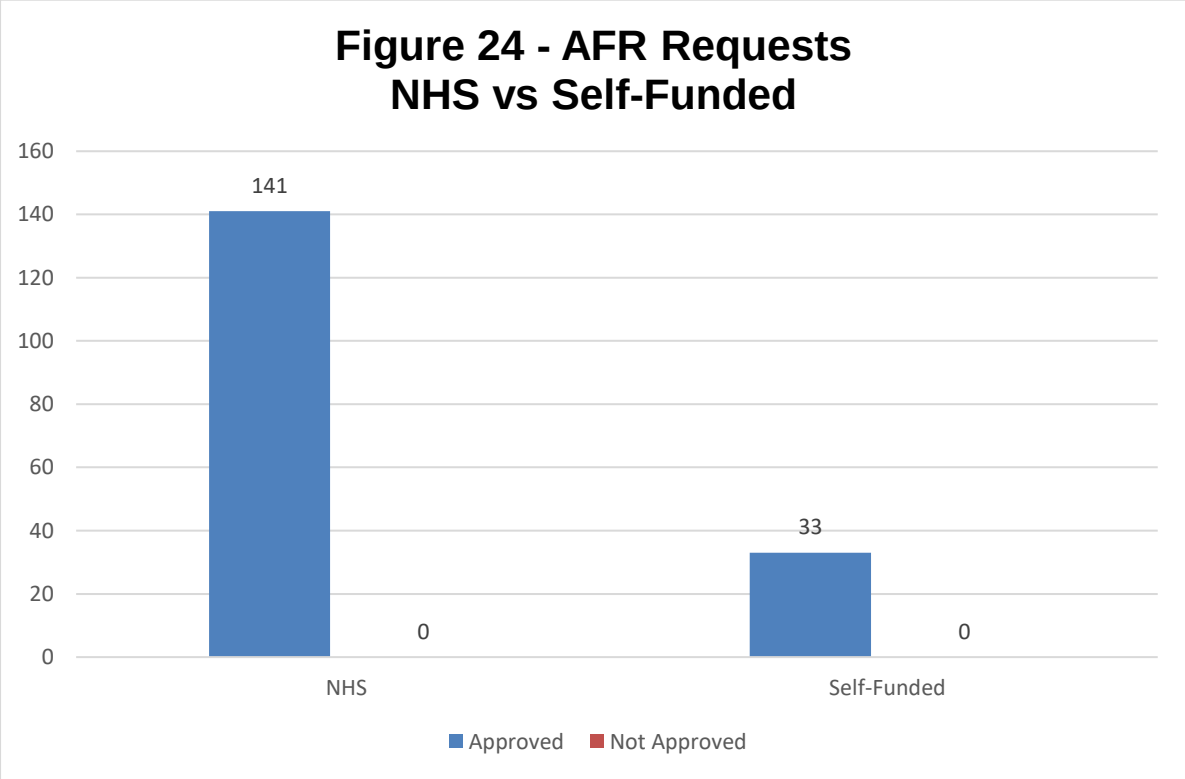


Figure 24 - AFR Requests
NHS vs Self-Funded
160
140
120
100
80
60
40
20
0
141
0
33
0
NHS
Self-Funded
Approved
Not Approved

7. GAMETES

7.1. Transfer of Gametes

Throughout 2019, there were 3 female patients who had their oocytes (32 oocytes) transferred from MDH to the licensed private Clinic. In turn, only one female transferred from the private clinic to MDH a total of 12 oocytes. Another female transferred her 6 oocytes from the licenced private Clinic to a licenced Clinic in Cyprus.

One male patient who had his sperm vials cryopreserved at MDH transferred the two sperm vials to the licenced private clinic.

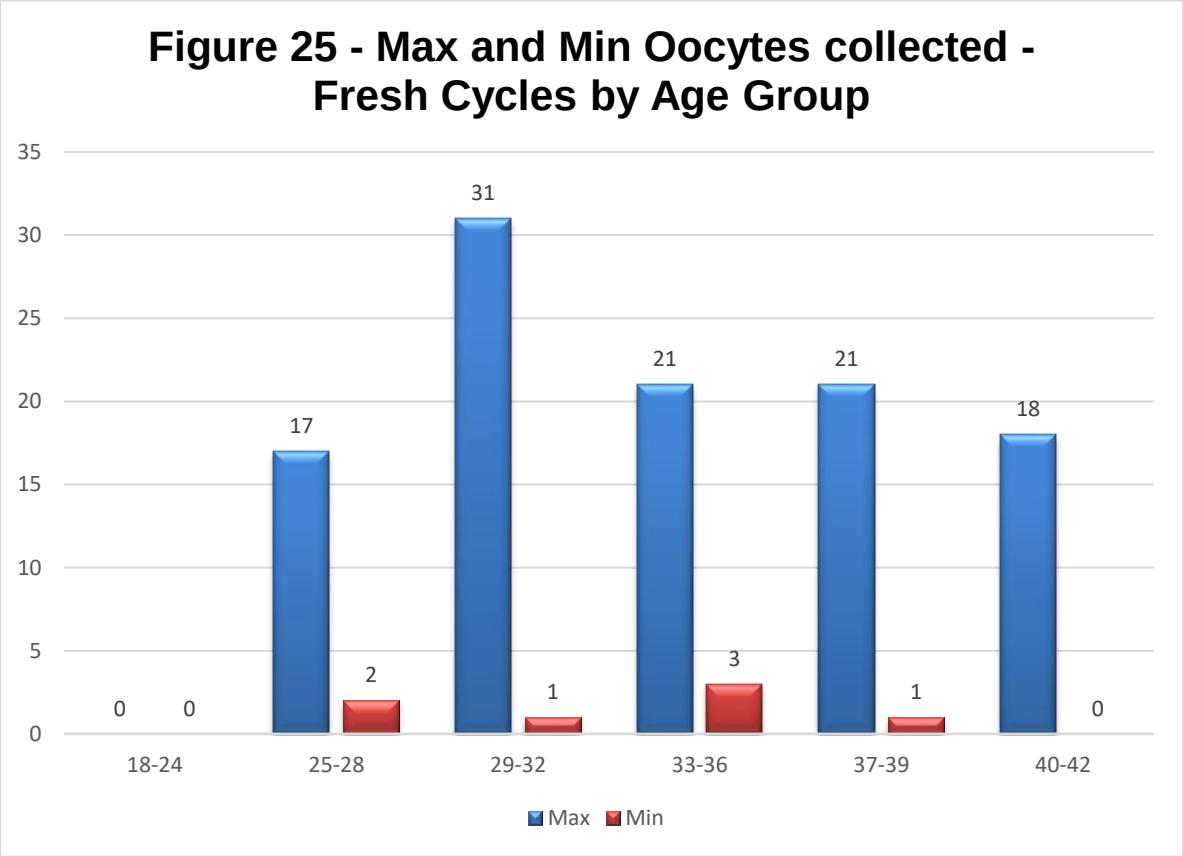
Throughout 2019, another two patients were granted permission to transfer their gametes, however these were not carried out until the end of the calendar year 2019.

7.2. Collection of Oocytes

The number of oocytes a female has remaining for the future, better known as 'ovarian reserve' is closely related to a woman's age but can vary considerably at any age. Oocyte quality is also associated with female age and the better the quality, the higher the probability for pregnancy since embryo quality is dependent on the quality of the oocytes. The number of oocytes attained through ART procedures such as IVF/ICSI strongly influences the chance for success.

During a Long Protocol IVF cycle, the female patient goes through down-regulation and ovarian stimulation phases that prepare her for treatment. The purpose of the Ovarian Stimulation phase is to stimulate the ovary into producing several follicles, inducing a controlled ovulation and maturation of oocytes so as to increase the chances of achieving a pregnancy during treatment.

From the 124 Fresh cycles carried out in 2019, a total of 1044 oocytes have been collected, for an average of 8.42 oocytes per patient. The maximum number of oocytes collected from a single patient was 31 oocytes from a female in the 29-32 years age bracket, this was followed by 21 oocytes each collected from two females, one in the 33-36 years bracket and the other in the 37-39 age bracket. All three patients had undergone treatment at MDH. Conversely, there was only one patients aged between 40 and 42 years, undergoing treatment who produced zero (0) oocytes. This patient had undergone treatment at MDH (Figure 25).



In contrast to the previous year, in 2019 the largest number of average oocytes collected from one single patient, for an average of 10.52 oocyte per patient, was from females aged between 29 and 32, these were closely followed by 10.16 oocytes per patient, from females in the 33-36 year old bracket. An average of 9.66 oocytes was collected from patients aged 25-28. Not surprisingly, less oocytes were collected from women aged 37-39 and 40-42, for an average of 7.20 and 5.50 oocytes respectively (Table 3).

Table 3. Oocytes Collected by Age Group

Age	No of Females	Total Oocytes Collected	Average	Max	Min
18-24	0	0	0	0	0
25-28	10	96	9.60	17	2
29-32	25	263	10.52	31	1
33-36	31	315	10.16	21	3
37-39	30	216	7.20	21	1
40-42	28	154	5.50	18	0
OVERALL	124	1044	8.42		

When taking into account the number of oocytes collected from the total number of female patients undergoing a Fresh cycle, it appears that the quantity of oocytes collected per cycle relative to the age of the female patient is higher at MDH in all age groups except in the 29-32 age bracket, when compared to self-funded patients. The average oocytes collected per patient at MDH is 9.22 compared to the 7.03 at the private establishment (Table 4).

Table 4. Oocytes Collected by Age Group – NHS vs Self-Funded

	NHS			Self-Funded		
Age	**No of Females**	**Total Oocytes Collected**	**Average**	**No of Females**	**Total Oocytes Collected**	**Average**
18-24	0	0	0	0	0	0
25-28	8	94	11.75	2	22	11.00
29-32	17	173	10.18	8	90	11.25
33-36	25	257	10.28	6	58	9.67
37-39	19	162	8.53	11	54	4.91
40-42	19	125	6.58	9	29	3.22
OVERALL	88	811	9.22	36	253	7.03

As pointed out already, women are born with a lifetime reserve of oocytes, and with age, the quantity and their quality gradually decrease. The cells in developing follicles secrete a chemical substance named Anti-Mullerian Hormone (AMH) and the levels of this particular hormone in a woman's blood, is normally a good indicator of her ovarian reserve. With increasing age, serum AMH levels decrease. Women suffering from polycystic ovaries tend to have high serum AMH concentrations while women close to menopause normally have low levels.

Clinicians generally refer to the AMH test results to get some insight into the remaining amount of oocytes their patient has got. This is especially important since

low AMH values could possibly suggest a poor response to IVF, while high values may denote an over-response to the IVF medication. Unfortunately, AMH levels do not tell us much about the quality of a woman's oocytes or her ability to get pregnant.

An analysis of the quantity of oocytes collected for women undergoing treatment and whose serum AMH values were ≤1μg/l, was performed. Due to the fact that a significant number of AMH test results were older than 6 months, on the day of oocyte retrieval the actual serum AMH values of the patient might have been less than the reported value. Hence the accuracy of all the AMH-related analysis in this report cannot be guaranteed. The data in the chart may however be of significance to clinicians dealing with patients with poor ovarian reserve, with respect to possibilities and expectations.

Throughout 2019, there were 41 female patients with a serum AMH concentration of ≤1μg/l, who had undergone a Fresh cycle. The total amount of oocytes collected from these 41 patients was 155, with the maximum number of oocytes collected being 14 and the minimum 0 (zero).

The average number of oocytes collected was 3.78 per patient and there were 12 females who had 5 or more oocytes collected. The one patient who had no oocytes to collect had an AMH of less than 1. (Table 5).

Table 5. Oocytes collected for AMH ≤1μg/l

AMH <= 1 Occurances	Min Oocytes Collected	Max Oocytes Collected	Total Oocytes Collected	Average Oocytes Collected	Occurances with 5 oocytes or more
41	0	14	155	3.78	12

7.3. Oocytes Discarded

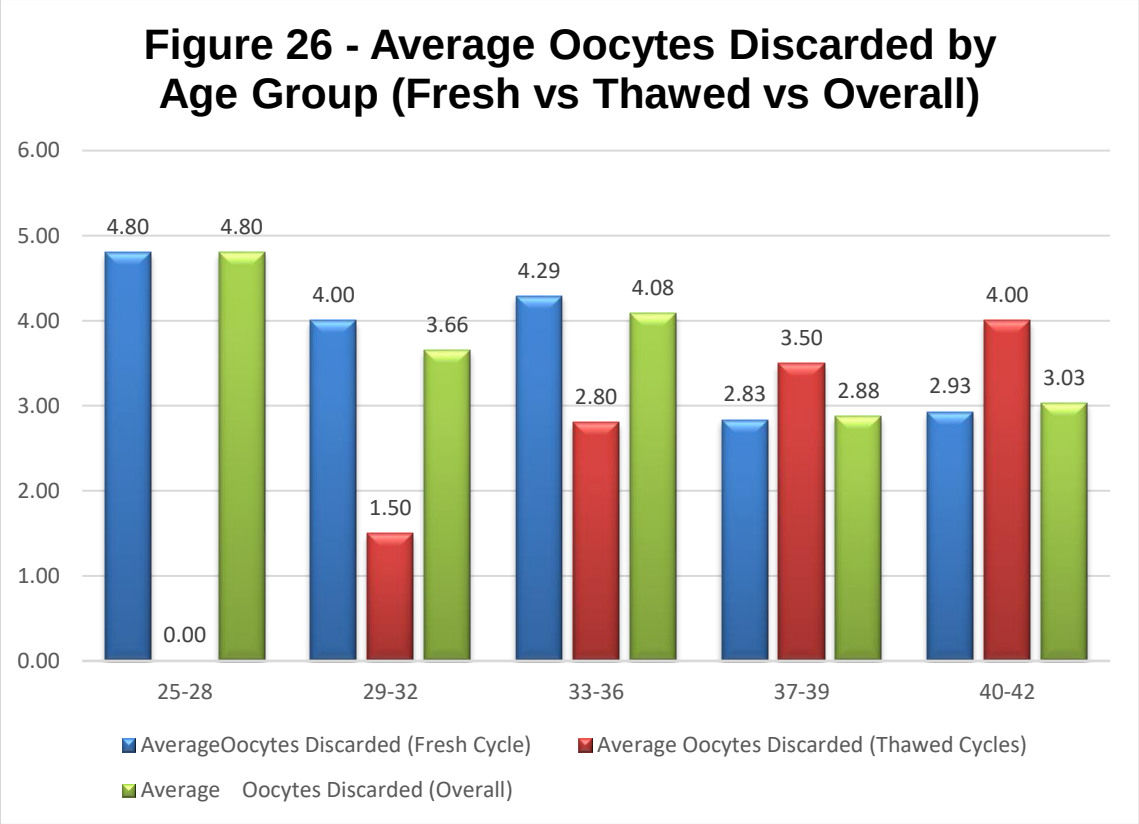
Oocytes obtained following ovarian stimulation should meet certain criteria in order to be considered suitable for IVF/ICSI. An appraisal is usually done by Embryologists to classify these oocytes, and those which are not deemed suitable for immediate fertilization or vitrification are discarded.

A total of 487 oocytes have been discarded in 2019. Four hundred and forty eight (448) oocytes (91.99% of all discarded oocytes), or 42.91% from the total oocytes collected, were discarded following the egg retrieval process (Fresh cycle), for an average of 3.61 discarded oocytes per Fresh cycle. The remaining 39 oocytes (8.01% of all discarded oocytes) failed to survive the thawing process, for an average of 2.79 oocytes discarded per Thawed cycle (Table 6).

Table 6. Oocytes Discarded

Age	No of Females (Fresh Cycle)	Total Oocytes Discarded (Fresh Cycle)	Average Oocytes Discarded (Fresh Cycle)	No of Females (Frozen Cycles)	Total Oocytes Discarded (Frozen Cycles)	Average Oocytes Discarded (Frozen Cycles)	No of Females (Overall)	Total Oocytes Discarded (Overall)	Average Oocytes Discarded (Overall)
18-24	0	0	0.00	0	0	0.00	0	0	0.00
25-28	10	48	4.80	0	0	0.00	10	48	4.80
29-32	25	100	4.00	4	6	1.50	29	106	3.66
33-36	31	133	4.29	5	14	2.80	36	147	4.08
37-39	30	85	2.83	2	7	3.50	32	92	2.88
40-42	28	82	2.93	3	12	4.00	31	94	3.03
OVERALL	124	448	3.61	14	39	2.79	138	487	3.53

In 2019, same as reported in 2018 and 2017, the largest number of oocytes discarded is from women in the 33-36 year old bracket which incidentally was the group from which the largest number of oocytes had been collected (Figure 26).



7.4. Fresh vs Thawed Sperm

Out of the 133 cycles carried out in 2019 which required the provision of sperm, thawed sperm has been utilized in 3 cycles only, or 2.26%, of the procedures undergone. Fresh sperm, ejaculated or in some instances obtained through testicular extraction/aspiration, has been used in the remaining procedures which have been carried out.

7.5. Storage of Gametes and Embryos

Pursuant to the introduction of the Embryo Protection Act of 2012, licensed clinics were allowed to store gametes (oocytes and sperm). Storage of gametes started as of July 2013 in the private licensed clinic, while storage from Government-funded cycles started in January 2014. Storage at the MDH facility started as of January 2015.

Up to 1st October 2018, embryo cryopreservation was only allowed in exceptional cases as approved by the Authority. With the introduction of the Embryo Protection Amendment Act of 2018, embryo cryopreservation was made available to all prospective parents with prior approval of additional fertilisations from the Authority.

7.5.1. Storage of Oocytes

Out of the 124 females who had oocytes retrieved in 2019, only 38 (30.65%) had enough oocytes to store. This has registered a decrease of 16.14% from previous year due to the fact that during 2019, patients had the option to cryopreserve embryos also. A total of 86 couples had no oocytes left to vitrify (Table 7). This is in line with figures registered in 2018 and 2017 where more couples had oocytes to discard than couples who had oocytes to store.

Table 7 – Fresh Cycles with NO Oocyte Vitrification

	NHS			Self-Funded			Total		
Age	No of Cycles	Total Cycles with NO Oocytes to Vitrify	% of cycles with no Oocytes to Vitrify	No of Cycles	Total Cycles with NO Oocytes to Vitrify	% of cycles with no Oocytes to Vitrify	No of Cycles	Total Cycles with NO Oocytes to Vitrify	% of cycles with no Oocytes to Vitrify
25-28	8	6	75.0%	2	0	0.0%	10	6	60.0%
29-32	17	15	88.2%	8	1	12.5%	25	16	64.0%
33-36	25	15	60.0%	6	3	50.0%	31	18	58.1%
37-39	19	13	68.4%	11	8	72.7%	30	21	70.0%
40-42	19	19	100%	9	6	66.7%	28	25	89.3%
OVERALL	88	68	77.3%	36	18	50.0%	124	86	69.4%

The total number of oocytes vitrified from Fresh cycles carried out in 2019 was only 172, this contrasts well with the 707 oocytes that were cryopreserved in 2018, for an average of 4.53 oocytes per couple. The maximum number of oocytes vitrified from a single cycle was 15 at MDH ART Clinic. The minimum was one oocyte which was vitrified at the private facility.

The maximum number of oocytes thawed for one single female from thawed oocyte cycles was 12 at MDH ART Clinic, 7 oocytes of which were discarded, while the minimum number of oocytes thawed was 2 in a thawed oocyte cycles carried out at St James Conception Unit.

7.5.2. Storage of Sperm

Eighty eight (88) sperm cryopreservation requests were approved for **eighty two (82) males,** one of which was going through the process of transitioning from male to a female. A total of fifty six (56) males vitrified their sperm, the remaining 32 who requested sperm cryopreservation did not vitrify sperm.

In eight cases, testicular aspiration/extraction (TESA/TESE) was performed to obtain sperm surgically, three of which cryopreserved sperm whilst the remaining five surgical procedures did not obtain sperm from the males.

Twenty three (23) males requested Fertility preservation following oncology diagnosis prior to starting chemotherapy, out of which 14 had a successful cryopreservation.

Another fifty three (53) males had Urology referrals with the main reason for referral being decrease in male fertility parameters. There has been a continuous request for sperm storage throughout 2019.

Only five (5) of the male patients who stored their sperm did this prior to proceeding with an IVF/ICSI or an IUI cycle in the same calendar year, but only 2 of them used thawed sperm for the procedures (Table 8).

Table 8 – Storage of Sperm

	Cryopreservation Requests	Cryopreserved Sperm	Not Cryopreserved
Oncology Referrals	23	14	9
Urology Referrals	53	36	17
Prior to IVF or IUI Procedures	10	5	5
Transgender prior to receiving Hormone Therapy	2	1	1
Total	88	56	32

7.5.3. 'Freeze-All' Oocytes Cycles

In exceptional circumstances, clinicians may decide to proceed with oocyte retrieval but freeze all the oocytes for later fertilization. This is usually the case when uterine pathologies or a risk of Ovarian Hyperstimulation (OHSS) has been identified. It may also be the case that while the oocytes were being retrieved, the male partner had no viable sperm in the sample provided; or else no sperm was found during a TESA procedure, and hence fertilization couldn't take place. During this calendar year there were also patients who were given prior approval by the Authority to proceed with a freeze-all cycle, as per detailed in Section 1.9 above.

In 2019, six prior approvals were granted by the Authority to proceed with a 'freeze-all oocyte cycle'.

7.5.4. Embryo Cryopreservation

In Malta, under the Principal Act up to 30th September 2018 permission for cryopreservation of embryos could only be granted by the Embryo Protection Authority as per Article 7 of the Law, in the event that transfer of the fertilized embryos in the womb was not possible owing to grave and certified *force majeur* not predicted at the moment of fertilization. The total of embryos cryopreserved under this exceptional cases clause between 2013 and 2018 amounted to 7 embryos. Only two embryos vitrified in 2018, at the ART Clinic in MDH under this exceptional case clause were still in storage.

With effect from 1st October 2018 and the introduction of the Embryo Protection Amendment Act, prospective parents undergoing ART treatment could opt to have additional fertilisation, two embryos transferred in one cycle and the resultant embryos cryopreserved for future use. During 2019, the Authority received 32 requests from MDH ART Clinic to cryopreserve all embryos created in that cycle due to Risk of Ovarian Hyperstimulation (OHSS), no such request was made by the private facility. Since the introduction of the new law a total of 143 embryos have been cryopreserved for future use, thus bringing total to 150 cryopreserved embryos. A total of one hundred and forty four (144) embryos were cryopreserved at MDH ART Clinic whilst only six (6) were cryopreserved at St James Conception Unit.

During 2019 at the MDH ART Clinic, apart from the 32 couples that made use of the 'freeze all embryos' cycle there were 7 others who had their embryos cryopreserved following a cycle wherein transfer of fresh embryos were made. At the St James Conception Unit five patients who had fresh embryos transferred also cryopreserved embryos (Table 9)

Table 9 – Storage of Embryos

Embryo Storage	NHS	Self-Funded	Total
Exceptional Cases	7	0	7
Oct-18	16	0	16
2019	121	6	127
Total Storage	**144**	**6**	**150**
Transfer between Clinics	2	-2	
Embryos Used up to 2019	-42	0	
Storage at end 2019	**104**	**4**	**108**

7.6. End of Storage

During 2019, 6 requests were received by the Authority from patients to have their cryopreserved gametes discarded, all gametes were stored at the Assisted Conception Unit at St James Hospital. 5 female patients have requested to have their oocytes (16 oocytes in total) discarded, all requests were approved. The other request was from a male patient requesting to discard four vials of sperm, approval for same was granted by the Authority. No requests for termination of cryopreservation were made from the MDH ART Clinic.

7.7. Total Storage

As at 31st December 2019, the total amount of oocytes stored at the licensed clinics stood at a total of 1821 oocytes with the majority stored at MDH, whilst the total number of sperm vials was of 1118, again the majority stored at MDH. The one hundred and eight (108) embryos cryopreserved are stored at the ART Clinic in Mater Dei Hospital 104 in number whilst the remaining four embryos are stored at the St James Conception Unit (Table 10).

Table 10 – Total Storage

Type of Storage	NHS	Self-Funded	Total
Oocytes	1419	402	1821
Sperm	1050	68	1118
Embryos	104	4	108

8. IVF/ICSI PROCEDURES

8.1. Cycles Started

In addition to the cycles which have been performed throughout the year, licensed clinics have also reported a total of 26 cycles which were abandoned prior to oocyte retrieval. Thirteen (13) couples abandoned their cycle at the ART Clinic in MDH, while another thirteen (13) couples who were going to self-fund their treatment abandoned their cycle. The majority of cycles, twelve (12) were abandoned due to poor response to the stimulation treatment the female patients received, four (4) cycles were abandoned due to financial reasons, whilst another four (4) cycles were abandoned for personal reasons.

Noteworthy is the fact that three (3) couples abandoned the treatment as they got pregnant naturally whilst waiting for their cycle. The other three (3) couples abandoned their cycle for the following reasons, one on medical ground, one as the couple decided to postpone to a later date and another couple decided to undergo IVF treatment abroad at the country of origin of the female.

8.2. Type of Procedure - IVF vs ICSI

In 2019, from a total of 161 cycles started, no IVF/ICSI procedure was carried out for 31 couples. This was due to the fact that there was one couples who had no oocytes retrieved, another two couples who had oocytes collected but which had to be all discarded as they were of poor quality, these couples performed their

procedures at the MDH ART Clinic. The 5 patients that had to opt for a 'Freeze-all oocyte' cycle and the twenty three couples that had an embryo transfer only (Table 11).

Table 11. Type of ART Procedure

Type of ART	NHS	Self-Funded	Total	Total %
IVF	0	0	0	0.00%
ICSI	86	44	130	80.75%
NIL	28	3	31	19.25%
Total	114	47	161	

Out of the 130 procedures carried out, all (100%) were *intra-cytoplasmic sperm injection* (ICSI). In contrast to conventional *in vitro* fertilization (IVF), where a single egg is incubated in the presence of a significant number of sperm, in ICSI, the embryologist selects a single sperm to be injected directly into an egg. This contrast with figures quoted for previous years in regards to procedures carried out at MDH ART Clinic wherein few procedures were reported as IVF's. The licensed private clinic always opted for an '*All-ICSI*' approach.

8.3. Oocytes Injected and Fertilisation

Throughout 2019, a total of 468 oocytes were injected, the majority 422 oocytes or 90.17% of the total oocytes injected were from fresh cycles, the remaining 46 oocytes or 9.83% of the total injected oocytes where from thawed cycles. From the 468 oocytes injected a total of 327 were injected at the MDH ART Clinic and the remaining 141 oocytes at the St James Conception Unit (Table 12).

Table 12. Oocytes Injected

Type of Cycle	Oocytes Injected	%
Fresh	422	90.17%
Thawed	46	9.83%
Total	468	

Out of the total 468 injected oocytes, there were 410 oocytes that reached fertilisation stage while 58 oocytes did not fertilise (Figure 27). Thus fertilisation rate is of 87.61% of all oocytes injected, a decrease of 0.76% over figures reported in 2018 (Figure 28).

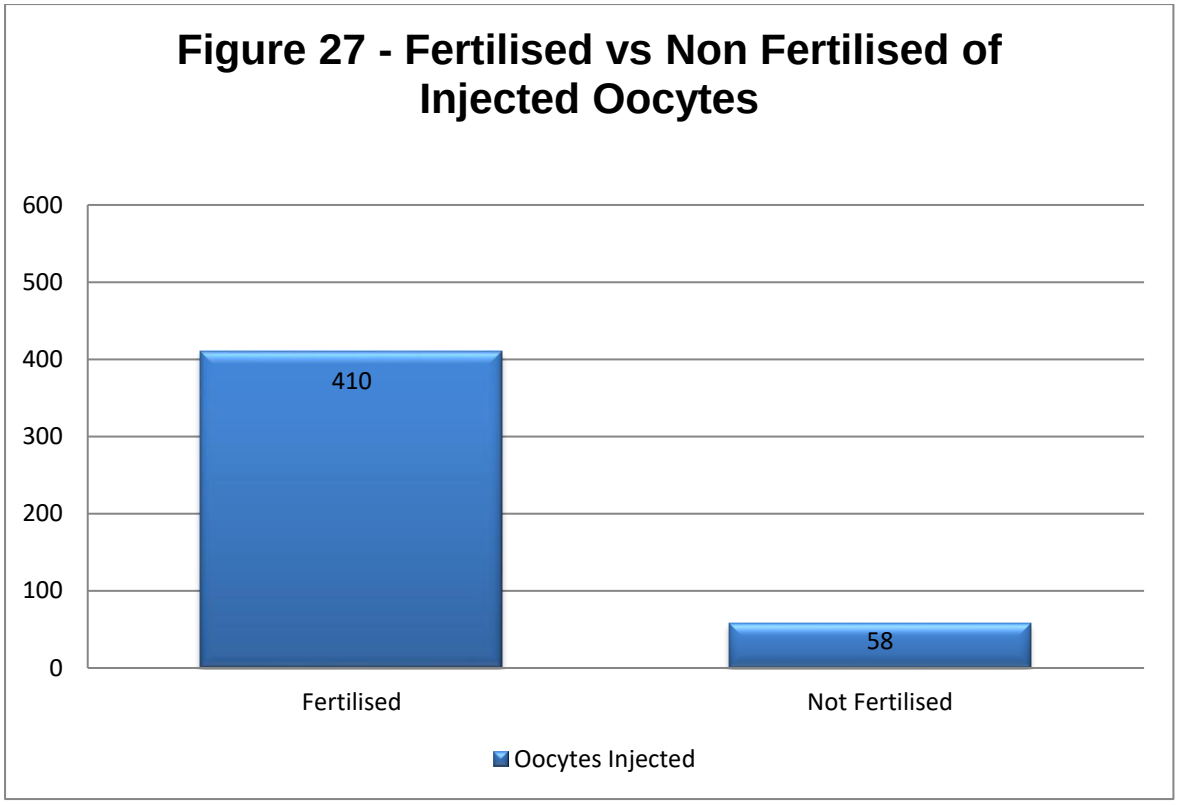


Figure 27 - Fertilised vs Non Fertilised of Injected Oocytes
600
500
400
300
200
100
0
410
58
Fertilised
Not Fertilised
Oocytes Injected

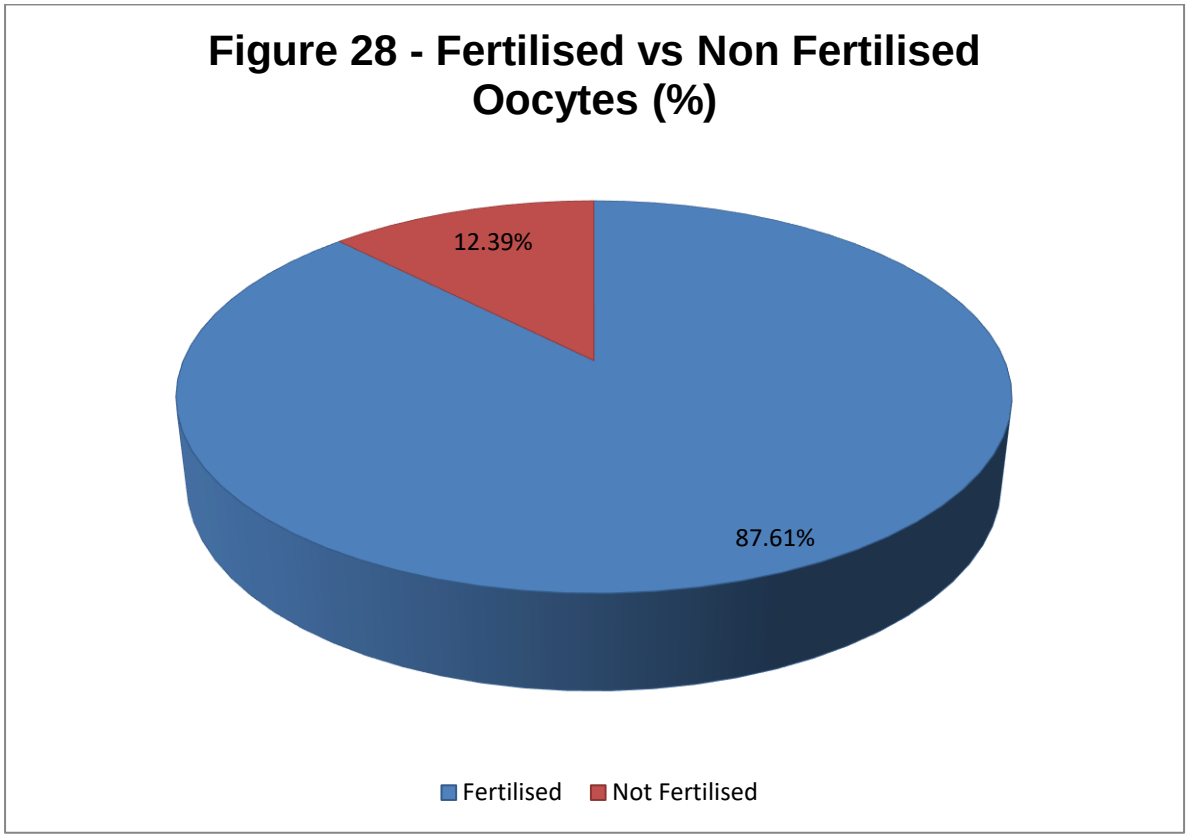


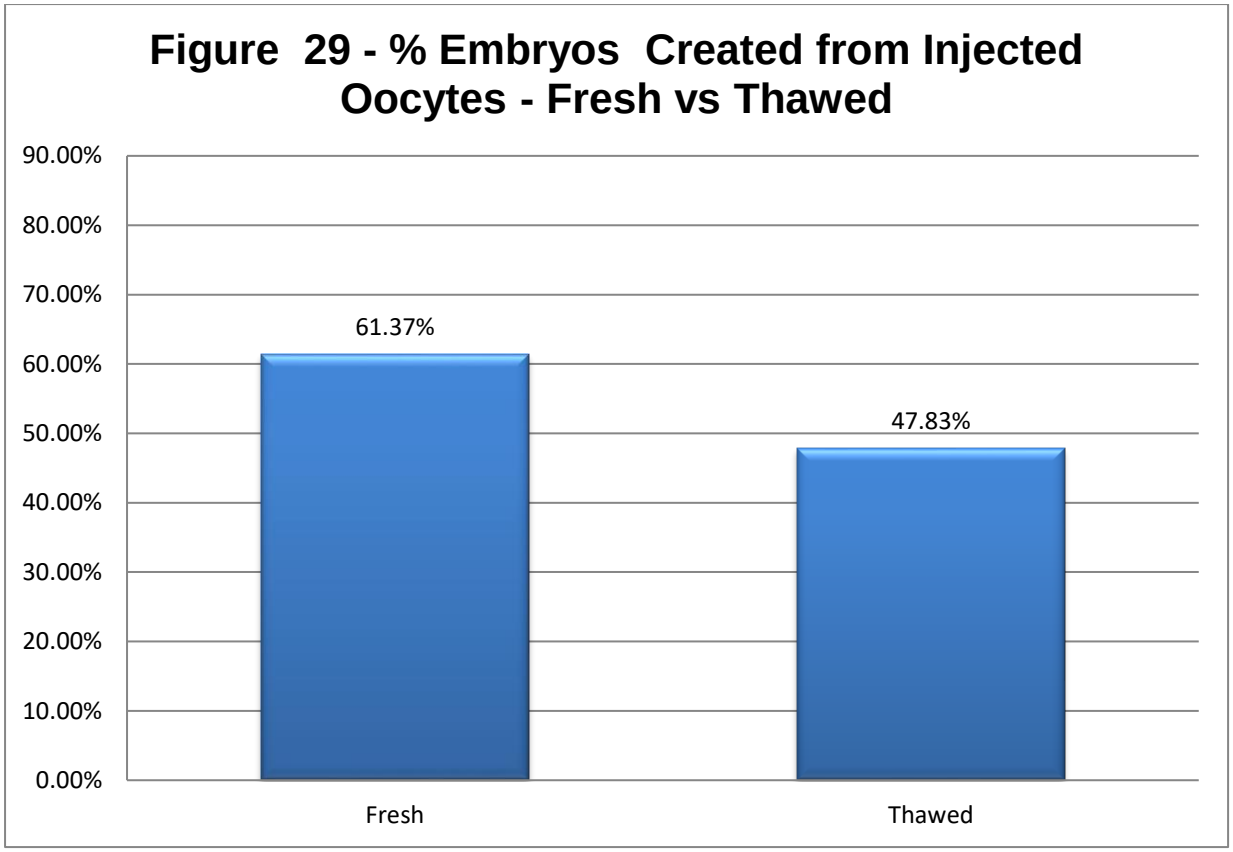
Figure 28 - Fertilised vs Non Fertilised Oocytes (%)
12.39%
87.61%
Fertilised
Not Fertilised

Out of the 410 fertilised oocytes, embryologists report that 7 oocytes had arrested during the incubation phase, 5 of these oocytes were from fresh cycles whilst 2 arrested oocytes were from thawed cycles. Further on in the incubation phase embryologists reported a total of 122 embryos that had arrested, 110 of these were from fresh cycles whilst 12 were from thawed cycles. The majority of these embryos 85 were from cycles at MDH ART Clinic and 37 embryos arrested at the private facility.

This resulted in the creation of 281 embryos, 259 from fresh oocytes and 22 from thawed oocytes (Table 13 & Figure 29).

Table 13. Embryos Created

Type of Cycle	Oocytes Injected	Embryos Created	Created %
Fresh	422	259	**61.37%**
Thawed	46	22	**47.83%**
Total	**468**	**281**	



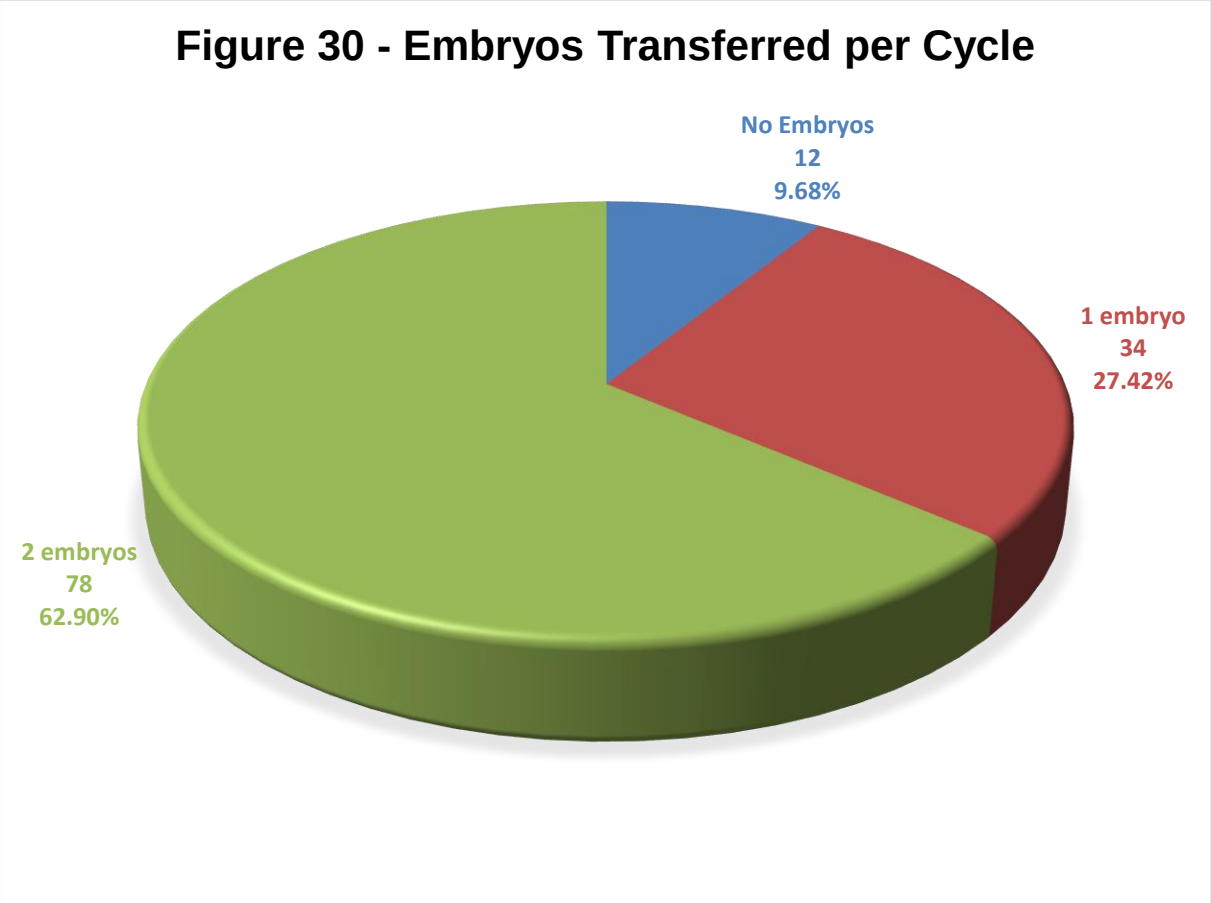
8.4. Embryo Transfers

Out of the 281 embryos created, one hundred and twenty seven embryos were cryopreserved, thus one hundred and fifty four embryos were transferred from fresh and thawed oocyte cycles. Another thirty seven embryos from those that were cryopreserved in 2018 and 2019 were removed from storage for transfer, only one thawed embryo arrested and the remaining thirty six thawed embryos were transferred. Thus a total of 190 embryos were eventually transferred that could lead to a pregnancy.

The one hundred and ninety embryos were transferred in 124 treatment cycles that could result in a pregnancy. 80 of these treatment cycles were carried out at MDH ART Clinic whilst 44 treatment cycles were carried out at the private facility.

There were a total of 12 couples or 9.68% who had no Embryo Transfer affected, as the oocytes they had injected failed to fertilize or else the fertilised oocytes/embryos arrested.

Out of the remaining 112 couples who had viable embryos to transfer, 34 of them (27.42%) had a single embryo transferred. Whilst the remaining seventy eight (62.90%) couples, had 2 embryos transferred, the maximum allowed by law (Figure 30).



8.5. Embryo Transfers per Type of Cycle

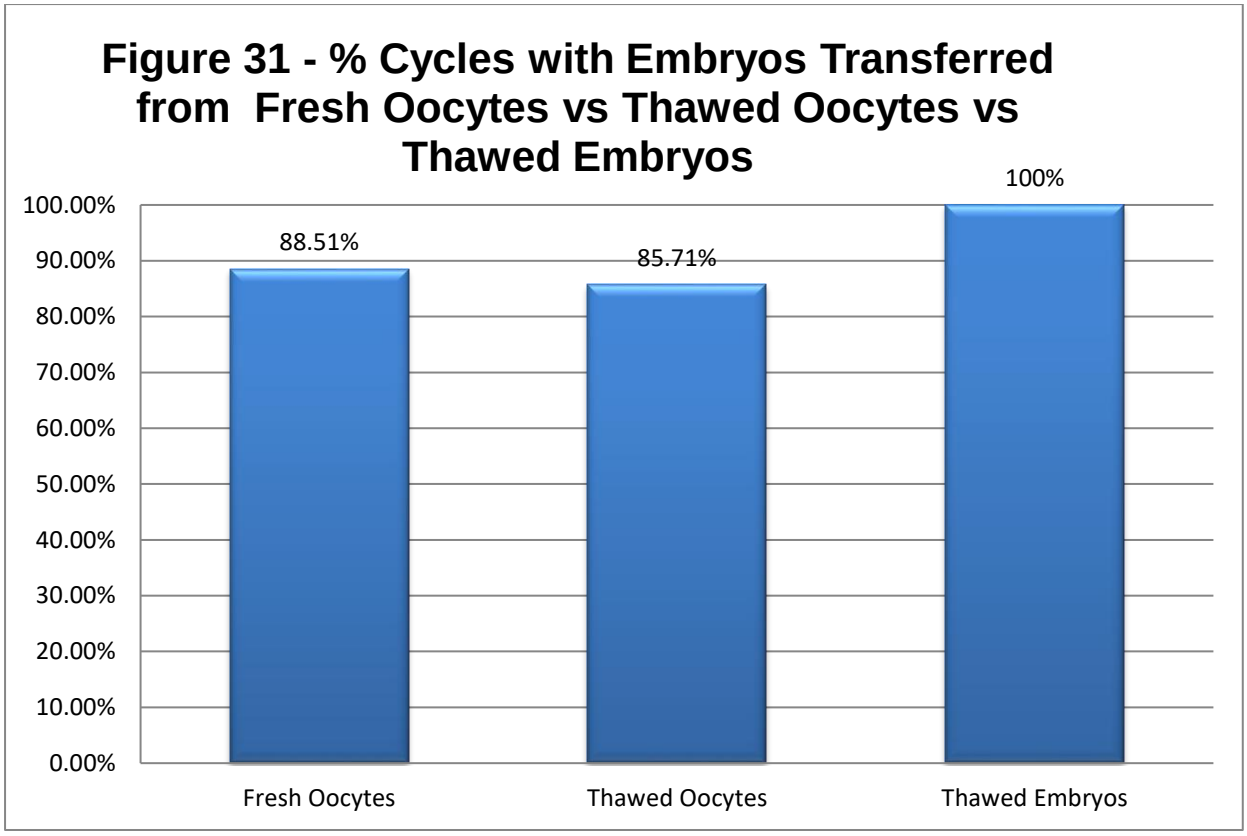
Out of the 124 procedures carried out, 87 were fresh oocytes cycles, whilst 14 where thawed oocyte cycles. The remaining 23, where thawed embryos cycles all carried out at the MDH ART Clinic.

The majority of the eighty seven (87) fresh oocyte cycles were carried out at MDH ART clinic, 54 in number, whilst the remaining thirty three fresh oocyte cycles were carried out at the private facility. On the contrary the majority of the fourteen (14) thawed oocyte cycles, 11 in number, were carried out at the private facility and only three where carried out at MDH ART facility.

The thawed embryo cycles, 23 in number all carried out at the MDH ART Clinic had all thawed successfully and all had an embryo transfer (Table 14 and Figure 31).

Table 14. Cycles with Embryo Transfer per Type of Cycle (%)

Type of Cycle	Cycles	Cycles with Embryo Transfer	Transferred %
Fresh Oocytes	87	77	**88.51%**
Thawed Oocytes	14	12	**85.71%**
Thawed Embryos	23	23	**100.00%**
Total	**124**	**112**	



8.6. Embryos transferred per AMH ≤1μg/l

As outlined already in Section 7.2, there was a total of 41 women with a serum AMH concentration of ≤1μg/l. Only 33 of these women had an embryo/s created as eight women (19.51%) did not have any embryos. Fourteen women, 34.15%, had a single embryo created and transferred; 15 women, or 36.59%, had 2 embryos created and transferred. One women had five embryos created, two of which were transferred and the remaining three embryos cryopreserved, another women had four embryos created two of which were transferred and the remaining two embryos cryopreserved. The remaining two women have cryopreserved all their created embryos, one women had one embryo whilst the other women had five embryos cryopreserved, while the remaining six couples had 3 embryos transferred (Figure 32).

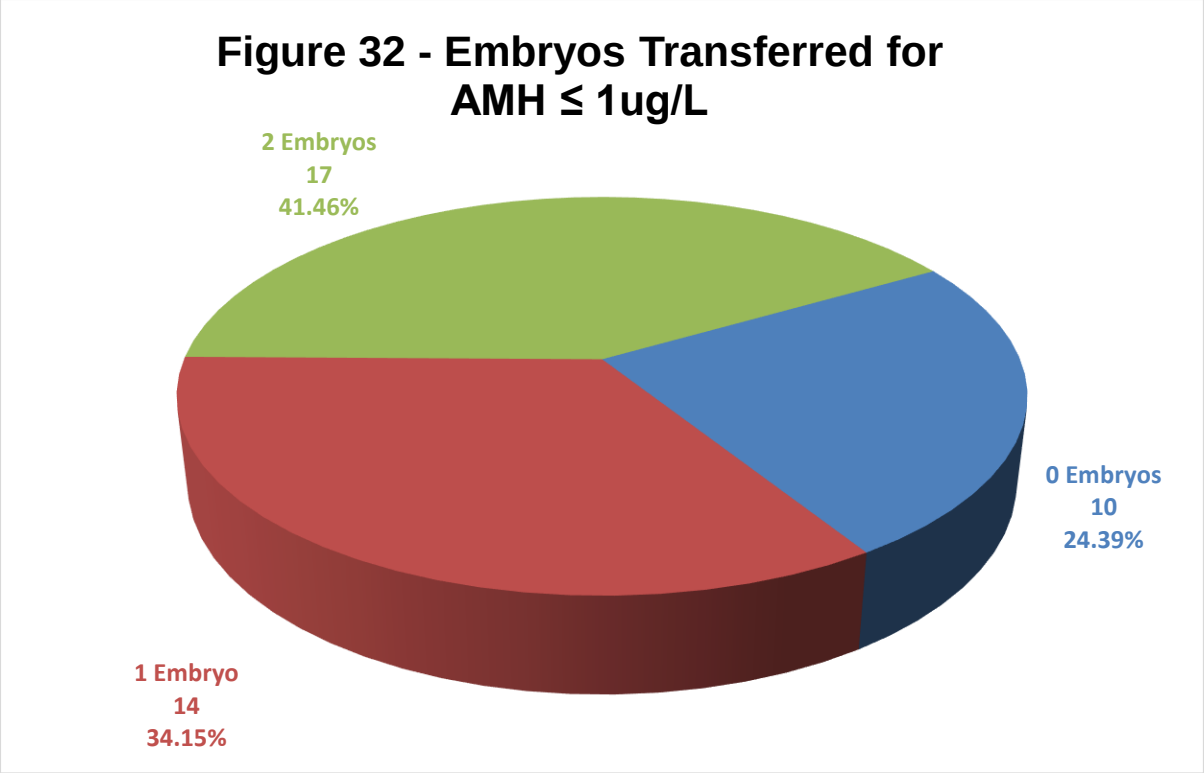


Figure 32 - Embryos Transferred for AMH ≤ 1ug/L
2 Embryos
17
41.46%
0 Embryos
10
24.39%
1 Embryo
14
34.15%

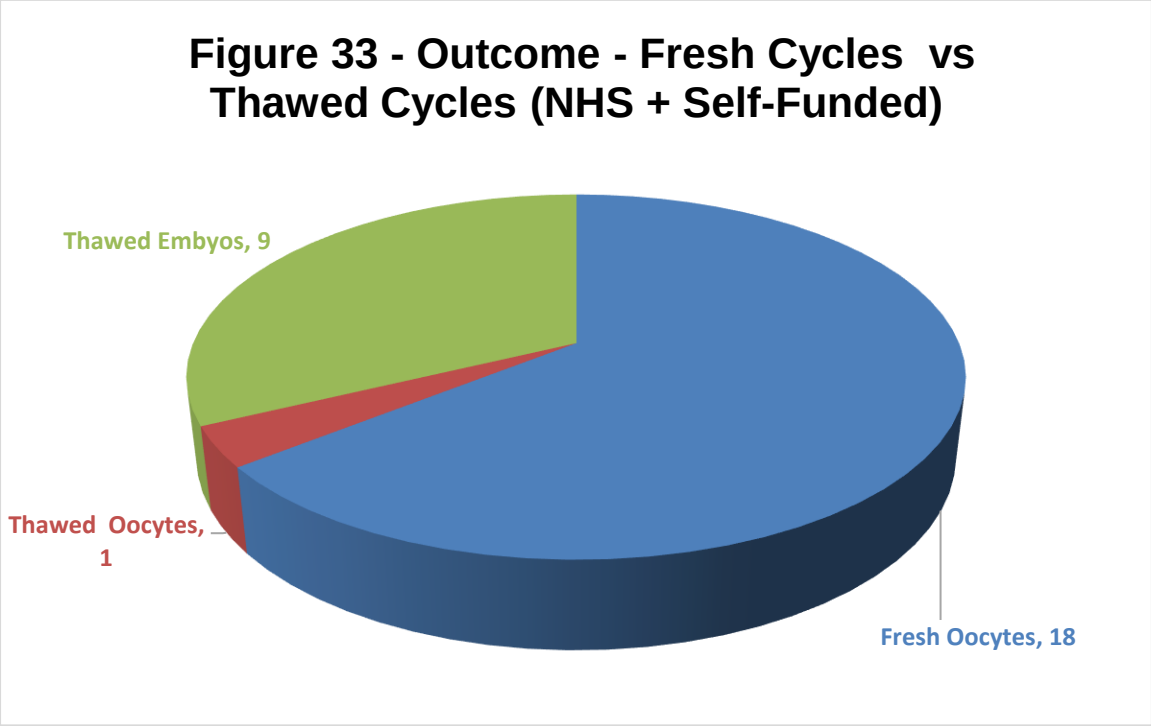
9. TREATMENT CYCLE OUTCOMES

9.1. Pregnancies

Out of the 124 treatment cycles, carried out in 2019, there were 18 reported pregnancies from Fresh oocyte cycles, 1 reported pregnancy from thawed oocyte cycle and 9 from Thawed embryo cycles. **The resulting 28 pregnancies account for 22.58% of all treatment cycles started**, which is 0.18% lower than the pregnancy rate for 2018 (Table 15 and Figure 33).

Table 15. Cycle Outcome

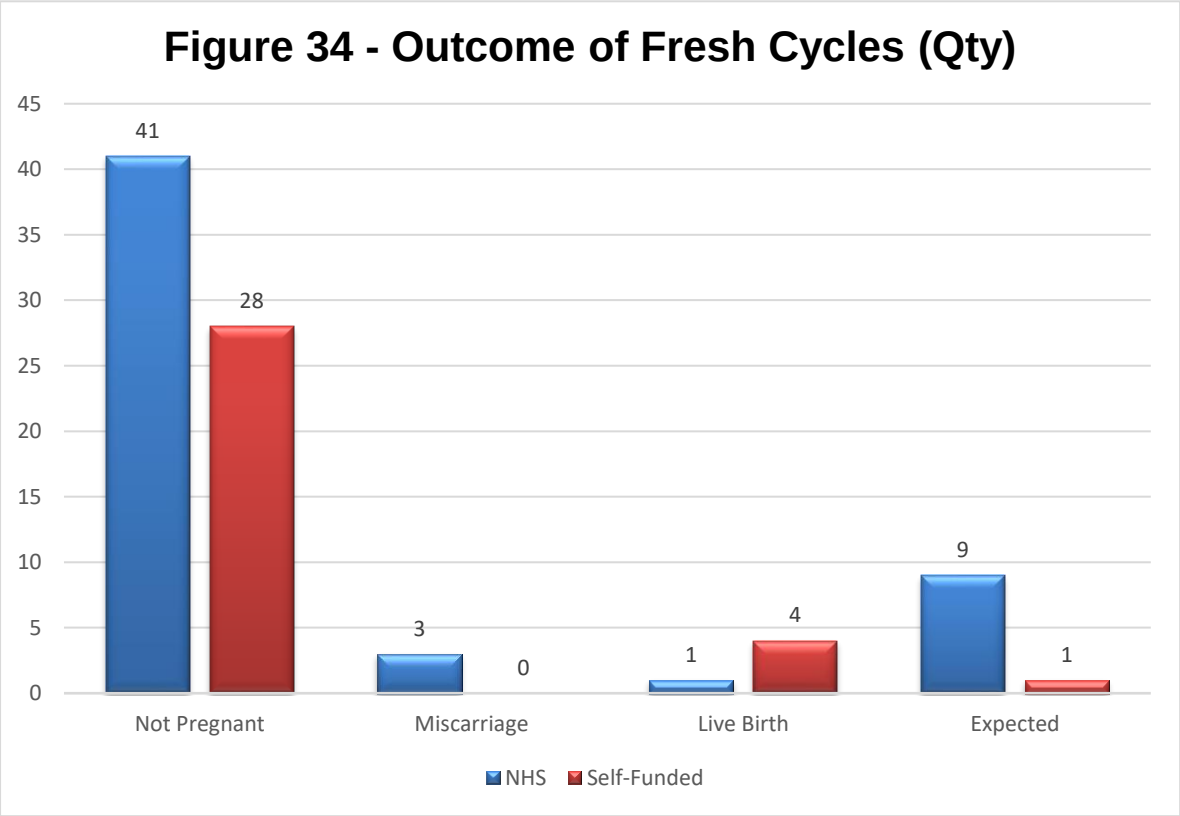
Type	Outcome	NHS	Self-Funded	Total	% Outcome by Type	% Outcome	% Outcome of Pregnancies
Fresh Oocytes	Not Pregnant	41	28	69	**79.3%**	**79.31%**	
Fresh Oocytes	Miscarriage	3	0	4	**3.4%**	**20.69%**	**16.6%**
Fresh Oocytes	Live Birth	1	4	5	**5.8%**		**27.8%**
Fresh Oocytes	Expected	9	1	9	**11.5%**		**55.6%**
Thawed Oocytes	Not Pregnant	3	10	13	**92.9%**	**92.86%**	
Thawed Oocytes	Miscarriage	0	0	0	**0.0%**	**7.14%**	**0.0%**
Thawed Oocytes	Live Birth	0	0	0	**0.0%**		**0.0%**
Thawed Oocytes	Expected	0	1	1	**7.1%**		**100.0%**
Thawed Embryos	Not Pregnant	14	0	14	**60.9%**	**60.87%**	
Thawed Embryos	Miscarriage	2	0	2	**8.7%**	**39.13%**	**22.2%**
Thawed Embryos	Live Birth	0	0	0	**0.0%**		**0.0%**
Thawed Embryos	Expected	7	0	7	**30.4%**		**77.8%**



9.2. Cycle Outcomes – Fresh vs Thawed

Eighteen (18) couples, or 20.69% of those undergoing Fresh oocyte cycles managed to get pregnant. Out of these 18 pregnancies, 3 couples miscarried, 5 had a live birth, while the remaining 10 couples (55.60%) are still expecting (Figures 34 and 35). One (1) couple, or 7.14% of those undergoing a Thawed oocyte cycle got pregnant. The couple are still expecting to give birth (Figures 36 and 37). Nine (9) couples that underwent thawed embryo cycle managed to get pregnant. Out of these 9 pregnancies, 2 couples miscarried whilst the remaining 7 couples (30.4%) are still expecting to give birth (Figures 38 and 39).

As a result, in 2019 the pregnancy rate for Thawed Embryo Cycles was 39.13%, which registered an 18.44% higher than that for Fresh oocyte cycles, and was 31.99% higher than that for Thawed Oocyte Cycles (Table 15)**.**



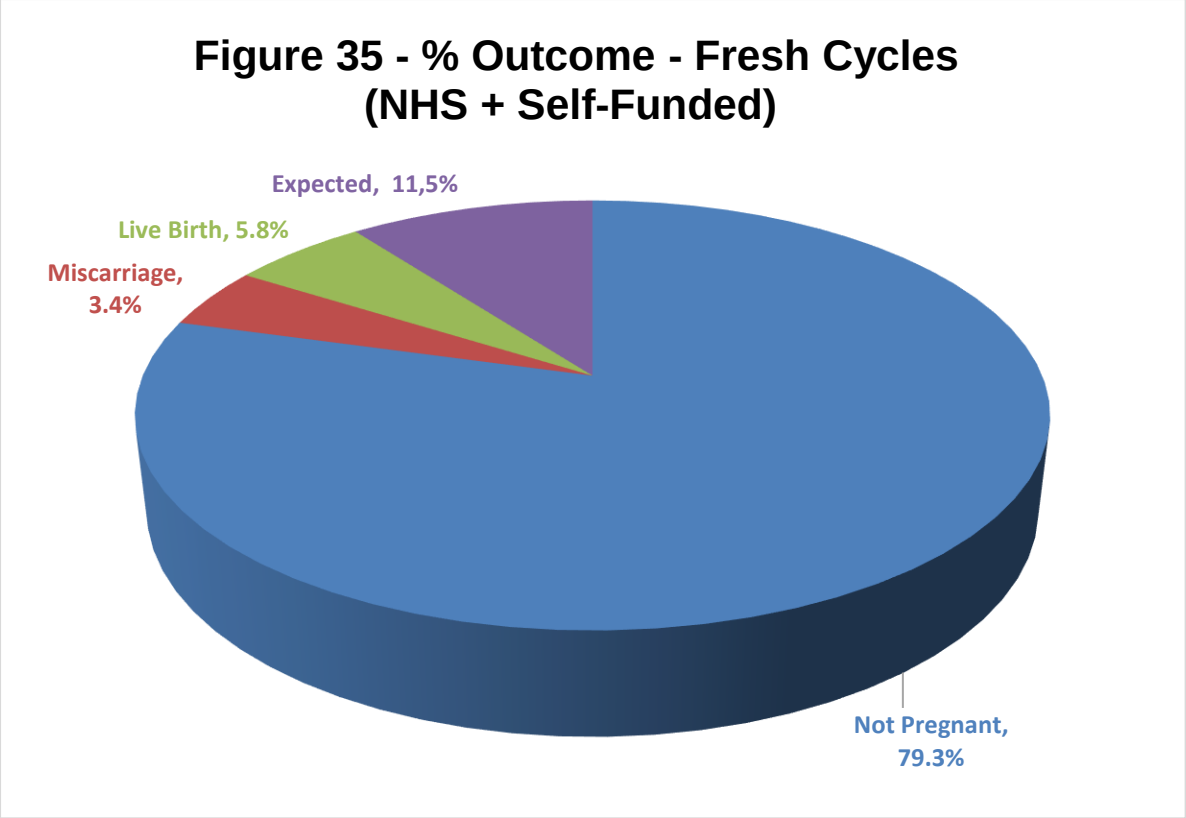


Figure 35 - % Outcome - Fresh Cycles (NHS + Self-Funded)
Expected, 11,5%
Live Birth, 5.8%
Miscarriage, 3.4%
Not Pregnant, 79.3%

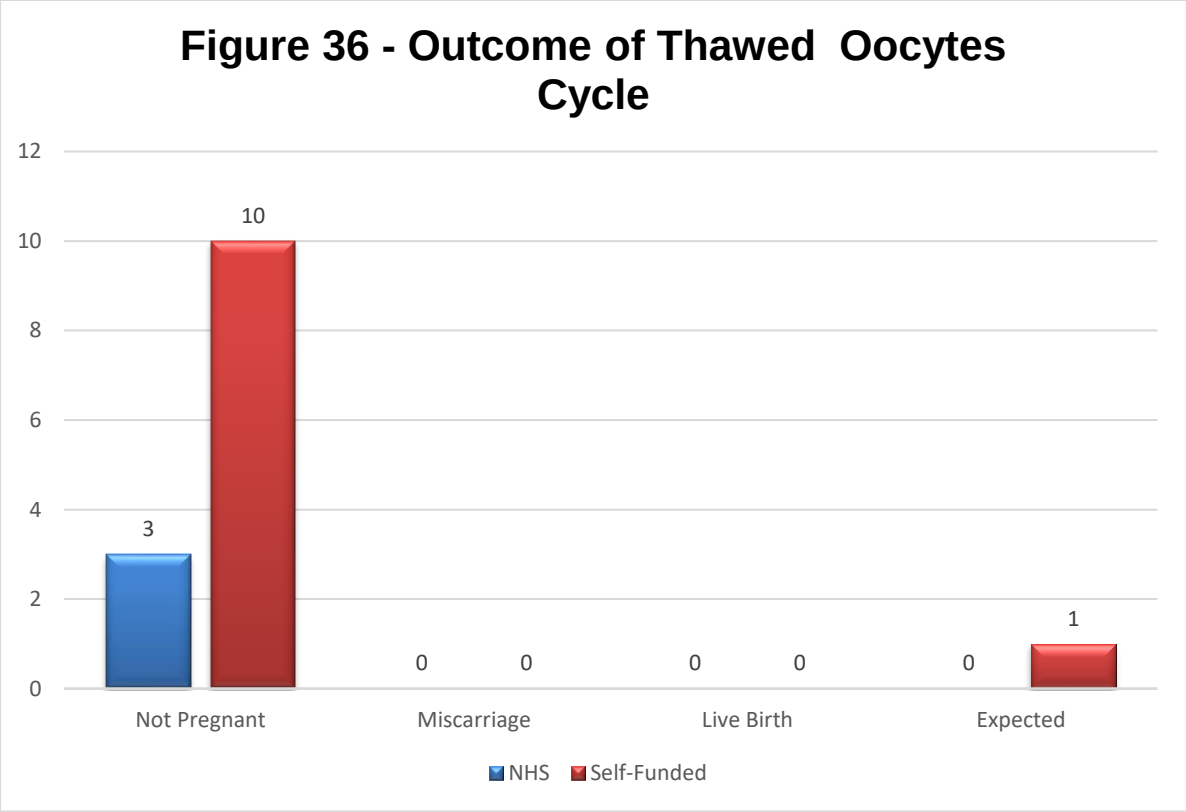


Figure 36 - Outcome of Thawed Oocytes Cycle
12
10
8
6
4
2
0
3
10
0
0
0
0
0
1
Not Pregnant
Miscarriage
Live Birth
Expected
NHS
Self-Funded

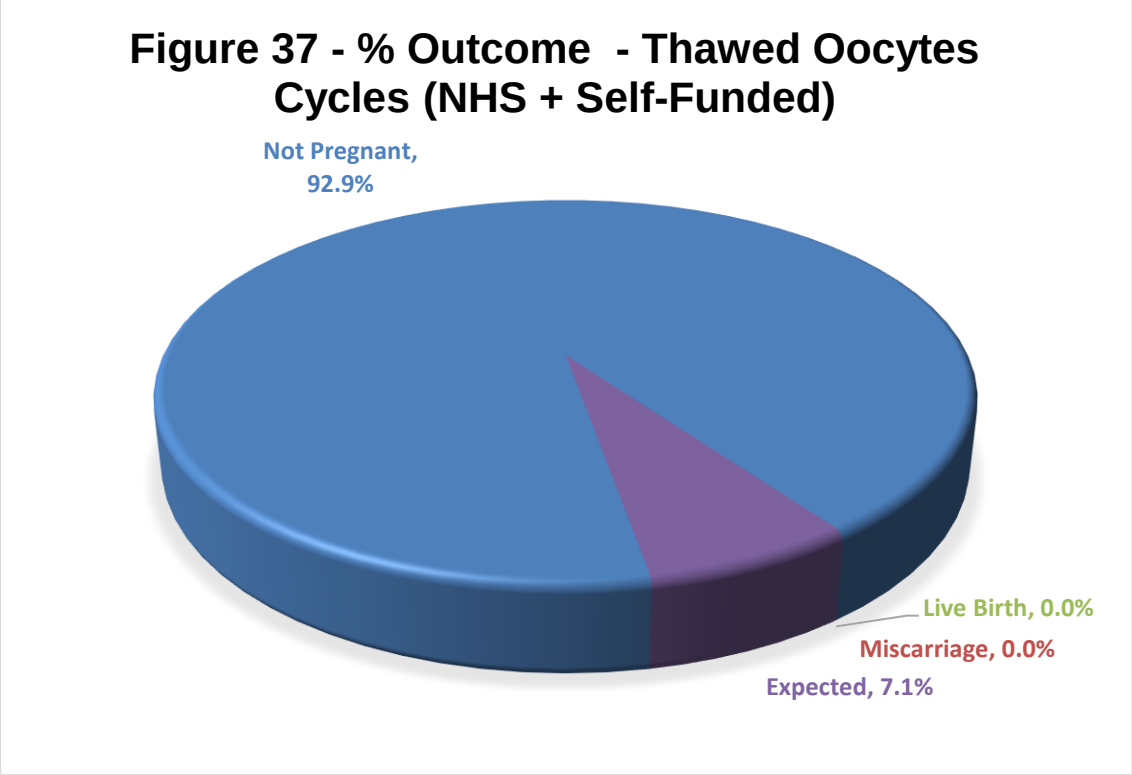


Figure 37 - % Outcome - Thawed Oocytes Cycles (NHS + Self-Funded)
Not Pregnant, 92.9%
Live Birth, 0.0%
Miscarriage, 0.0%
Expected, 7.1%

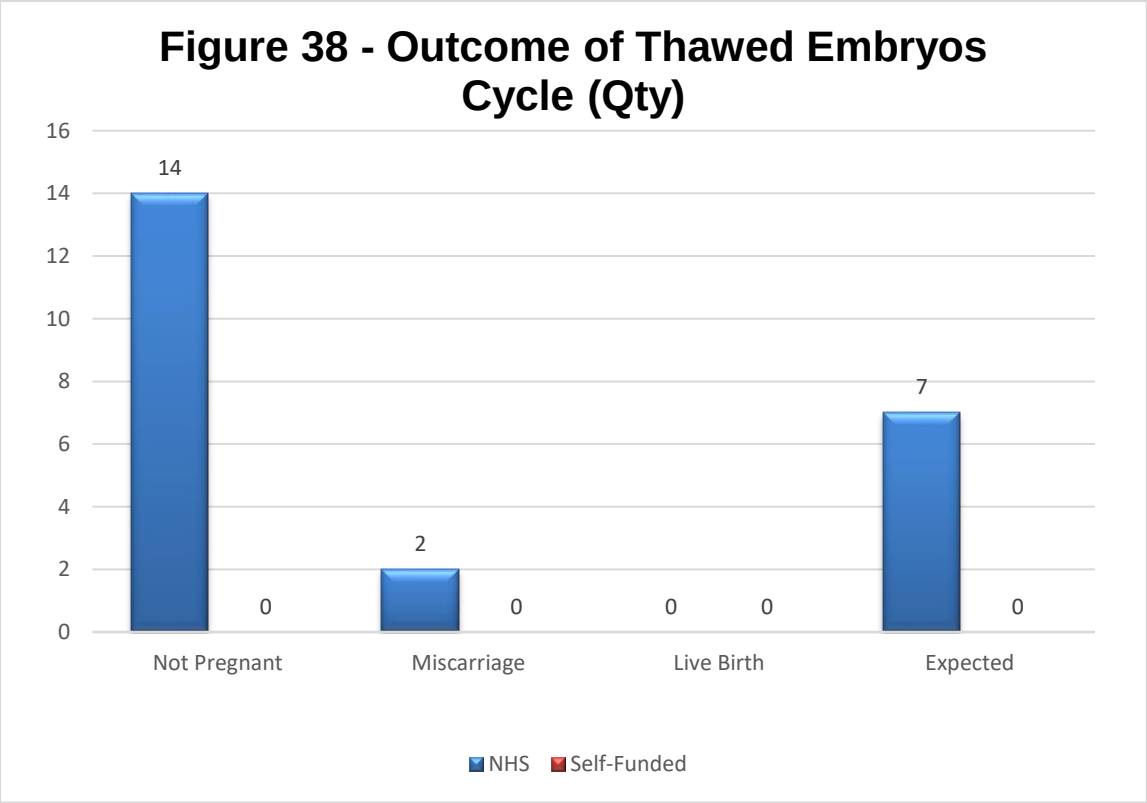
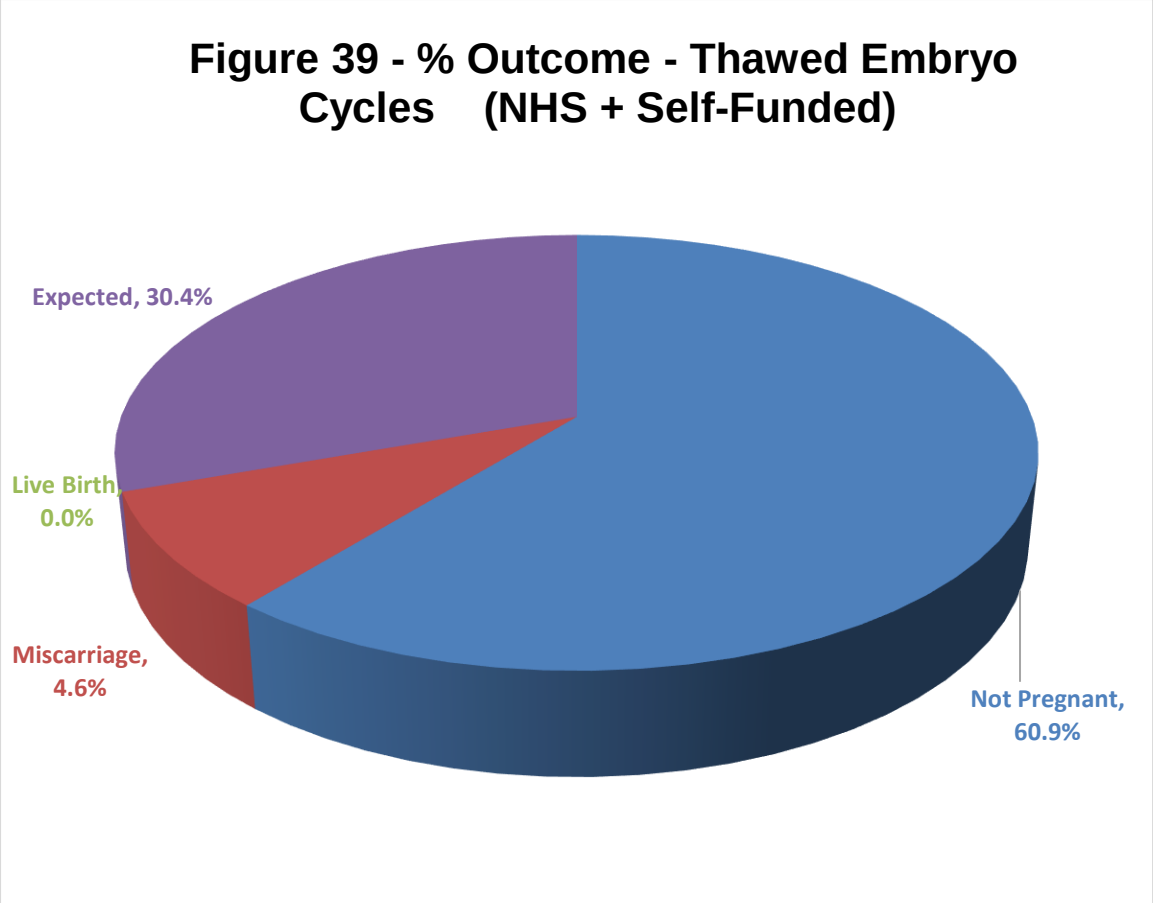


Figure 38 - Outcome of Thawed Embryos Cycle (Qty)
16
14
12
10
8
6
4
2
0
14
0
2
0
0
0
7
0
Not Pregnant
Miscarriage
Live Birth
Expected
NHS
Self-Funded



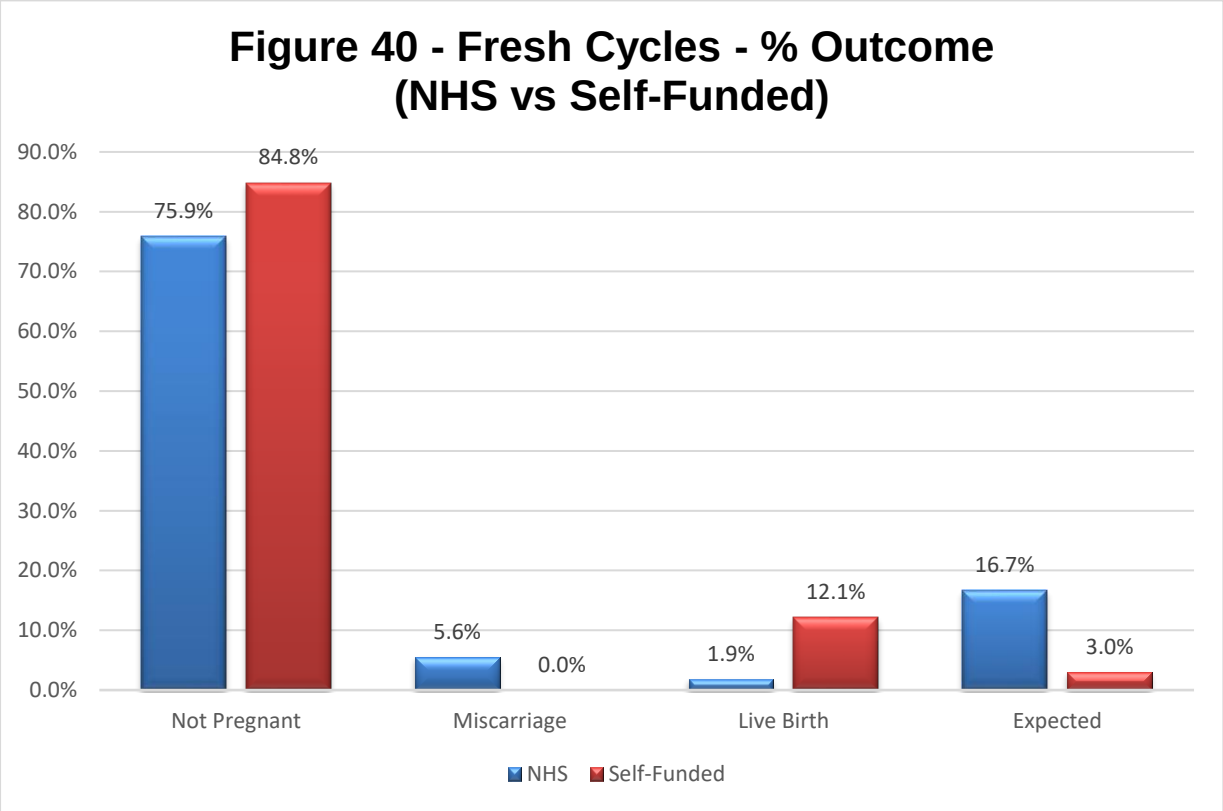
9.3. Cycle Outcomes – NHS vs Self-Funded

The pregnancy rate in 2019, reported by the private clinic for thawed oocytes cycles was 9.1% higher than that reported by the ART Clinic at MDH, same was reported in 2018 were the pregnancy rate for thawed oocytes cycles was 11% higher in the private facility.

In contrast the pregnancy rate reported by the MDH ART Clinic, for fresh oocytes cycles was 8.9% higher than that reported by the St James Conception Unit. This contrasts well with figures reported in 2018, were it was the private facility that reported an 8.9% higher rate than the MDH ART Clinic.

The sum of live and expected births from Fresh cycles carried out at MDH was 18.6%, while that for private clinics was 15.2% (Figure 40), this was also due to the fact that MDH reported 3 miscarriages whilst the private clinics reported no miscarriages. The sum of live and expected births from Thawed oocytes cycles carried out at MDH was nil, as all three procedures carried out did not result in a pregnancy while that for the private clinics was 9.1%, the private clinic reported no miscarriages from thawed cycles (Figure 41).

The expected birth rate from cycles carried out with thawed embryo transfers at the MDH ART Clinic was of 30.4%, this was due to the fact that MDH reported 2 miscarriages from the nine pregnancies registered for these cycles. No thawed embryo transfers were carried out by the private facility (Figure 42).



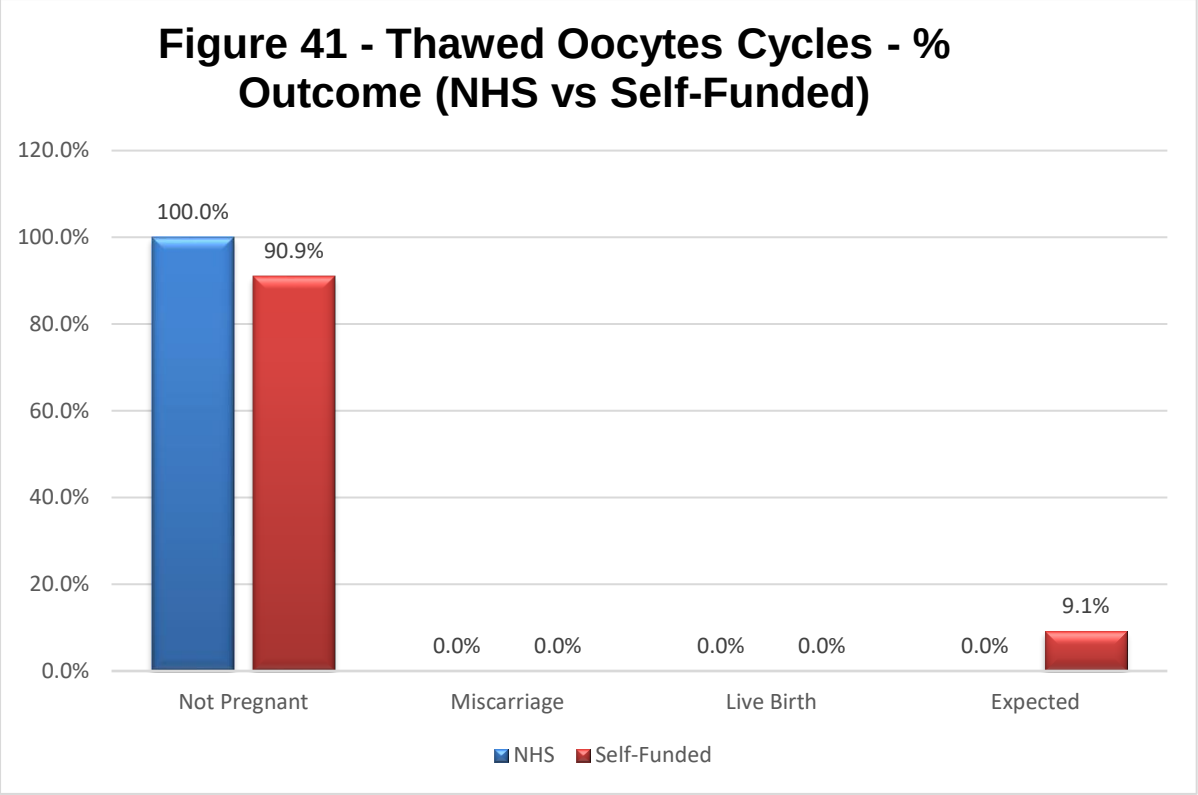


Figure 41 - Thawed Oocytes Cycles - % Outcome (NHS vs Self-Funded)
120.0%
100.0%
80.0%
60.0%
40.0%
20.0%
0.0%
100.0%
90.9%
0.0%
0.0%
0.0%
0.0%
0.0%
9.1%
Not Pregnant
Miscarriage
Live Birth
Expected
NHS
Self-Funded

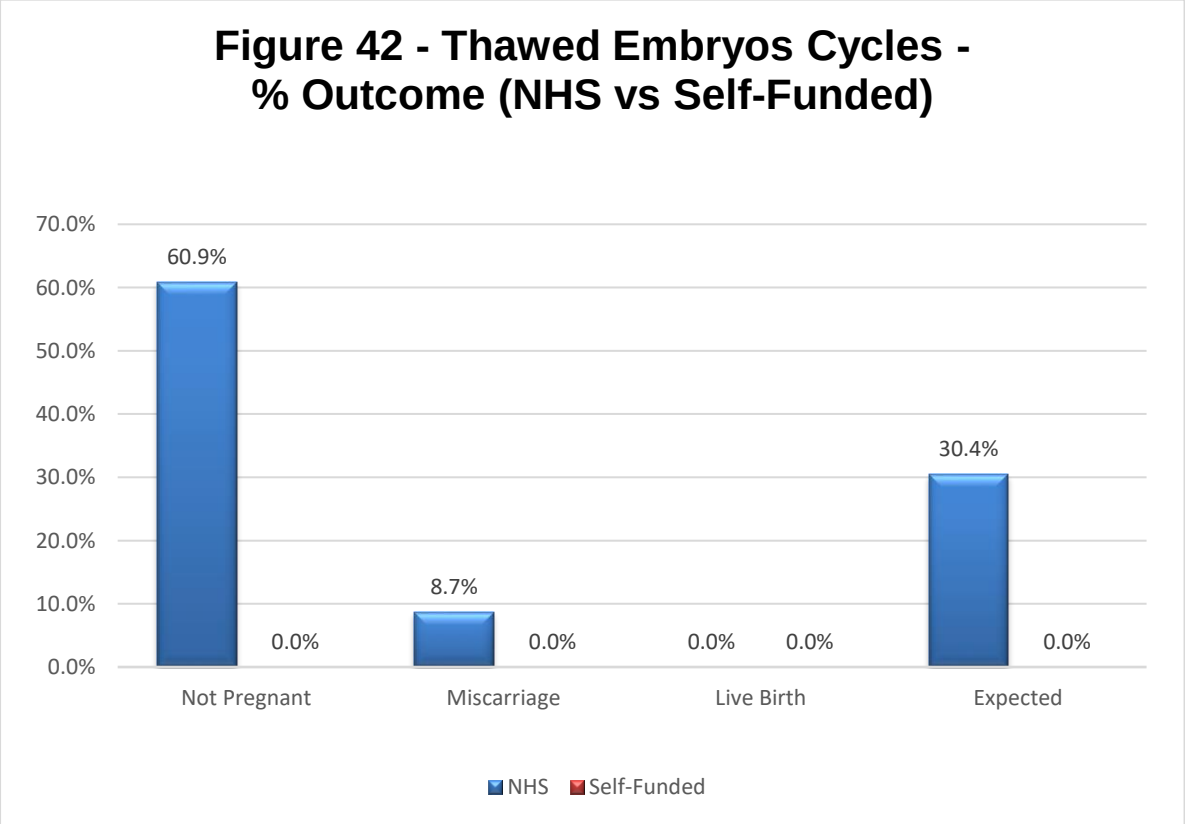
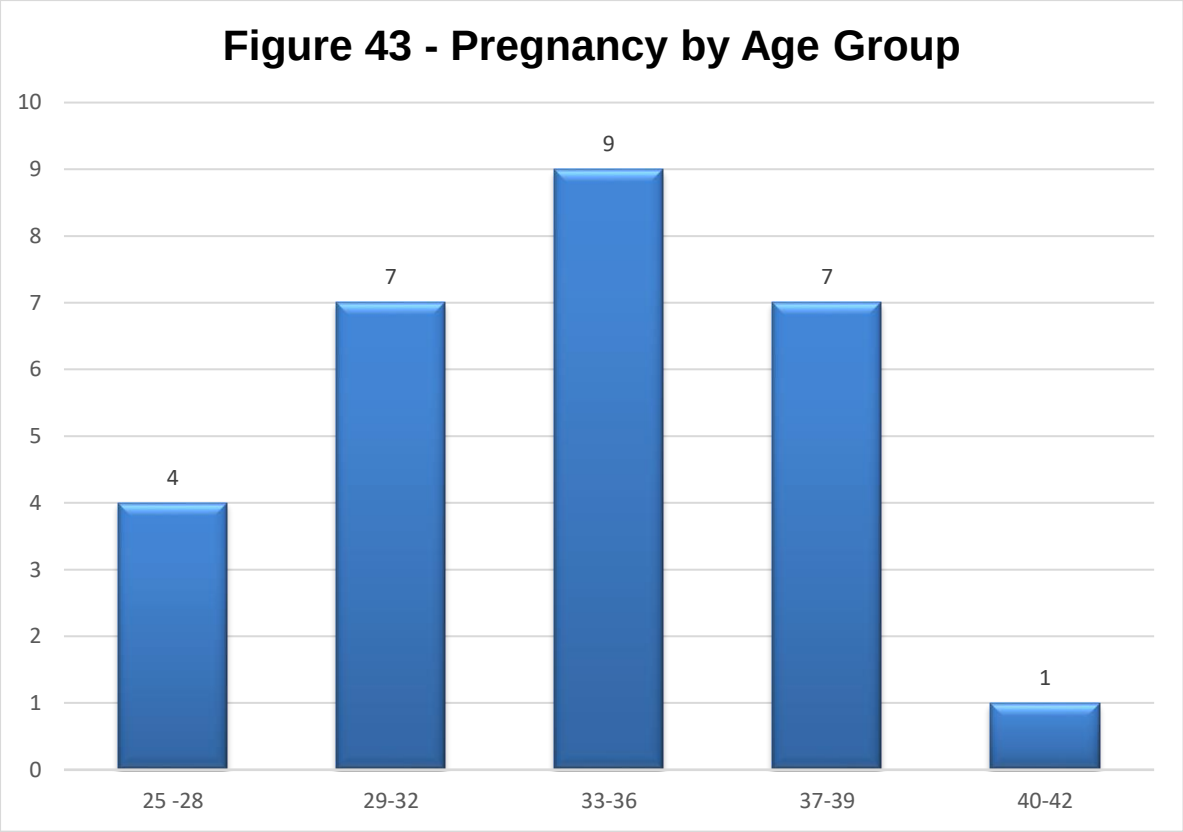


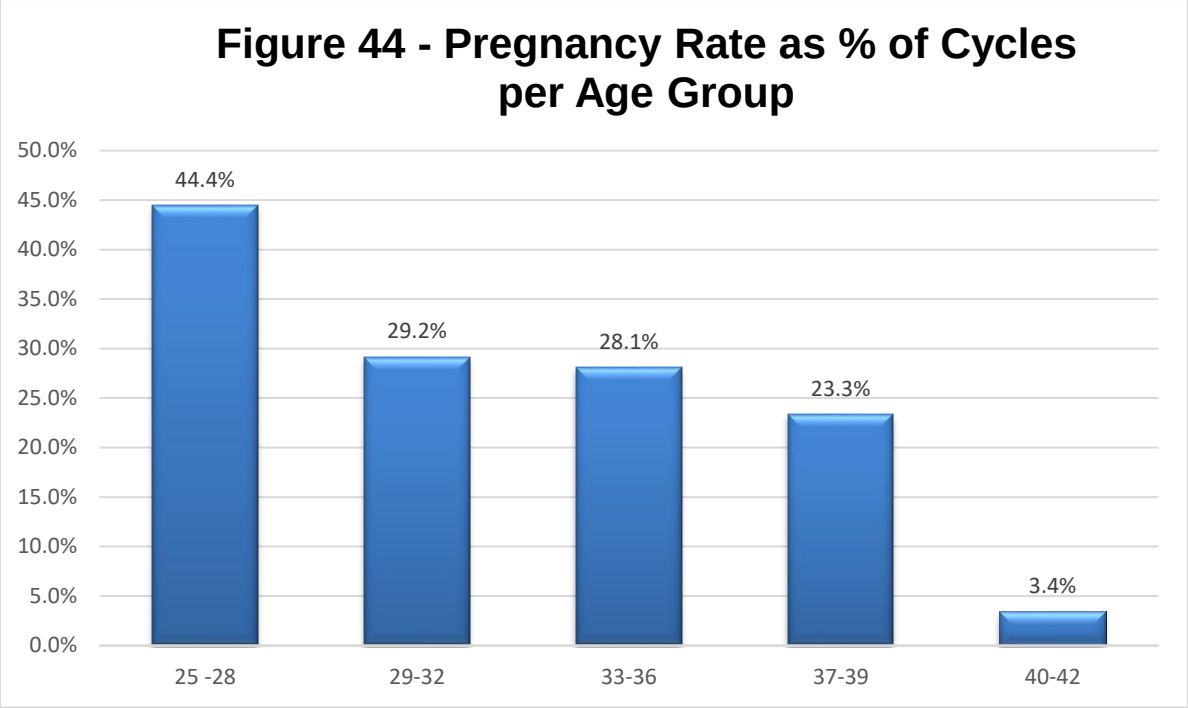
Figure 42 - Thawed Embryos Cycles - % Outcome (NHS vs Self-Funded)
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
60.9%
0.0%
8.7%
0.0%
0.0%
0.0%
30.4%
0.0%
Not Pregnant
Miscarriage
Live Birth
Expected
NHS
Self-Funded

9.4. Pregnancies by Age

In 2019, twenty eight (28) pregnancies were reported across all age groups. The highest number of pregnancies reported was for women in the 33-36 year old bracket, this is in line with figures reported in 2018 and 2017 (Figure 43). This was however not reflected in the pregnancy rate as percentage of cycles per age group which was highest for women aged 25-28, at 44.4% (Figure 44).

This is in line with figures reported in 2018, where a 46.2% was reported as pregnancy rate as percentage of cycles per age group. This contrasts well with the pregnancy rate as percentage cycles per age group reported in 2017 wherein the highest group was in couples where the female was between 33 to 36 years of age. It appear that in 2019 as in 2018, maternal age was one of the most important predictive factor for an IVF/ICSI procedure to result in a pregnancy.





9.5. Pregnancy Rate per Embryos Transferred

From a total of 124 couples who had a treatment cycle with the possibility of an embryo transfer effected, there were 28 resulting pregnancies, or 22.58%, a decrease of 3.84% when compared to the previous year.

The couples who were most successful at achieving a pregnancy in 2019, were those who had 2 embryos transferred (32.05%), this contrasts with figures reported in 2018, where the couples that were most successful were those who had 3 embryos transferred which was allowed under the principal Act up to 30th September 2018.

The current calendar year registered an increase of 6.88% over the 25.17% that was reported last year with 2 embryos transferred, this was expected with the exclusion of transfer of three embryos.

Noteworthy to note is that there was a significant drop of 13.06% in the pregnancies achieved by one embryo transferred (Table 16).

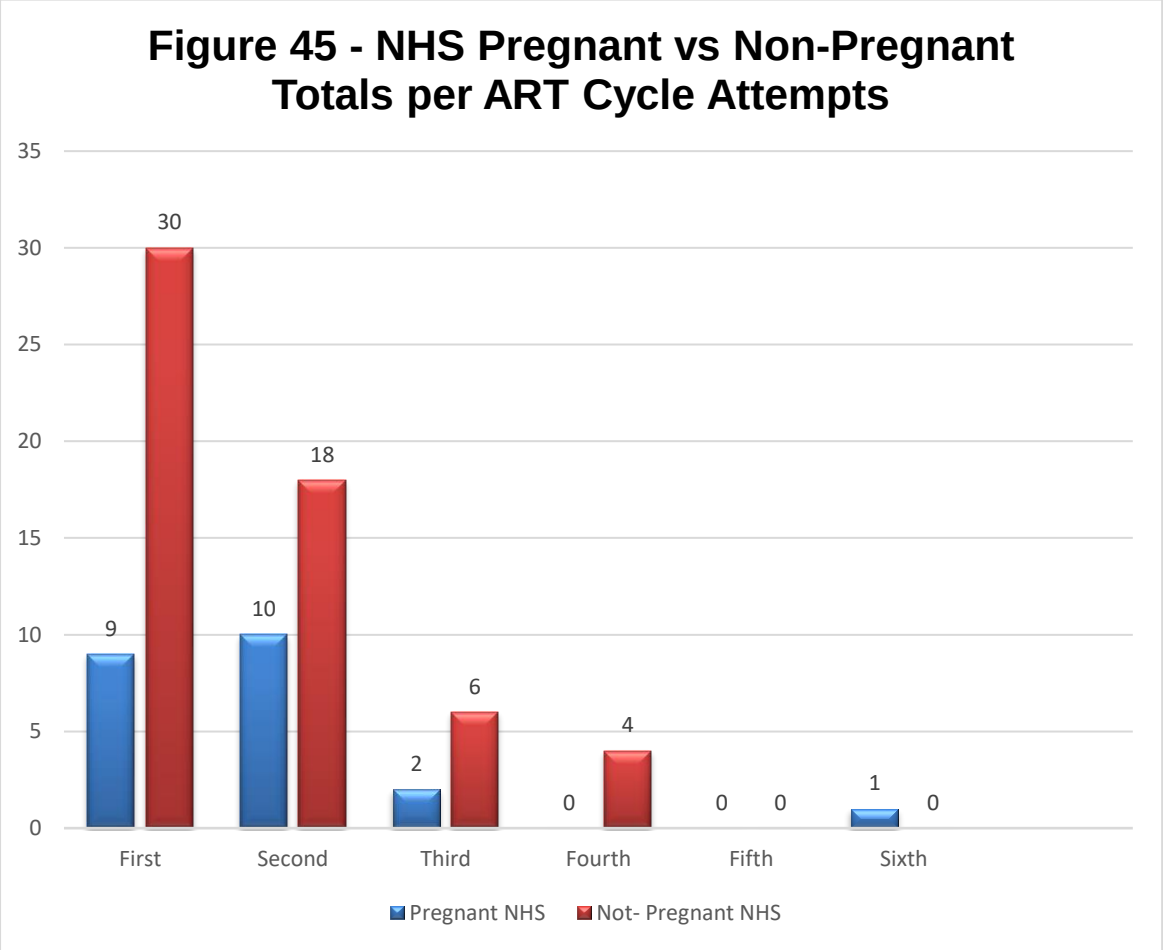
Table 16. Pregnancy Rate per Embryos Transferred

Transferred Embryos	Total IVF/ICSI Procedures	Total Pregnancies	% Pregnancies
0	12	0	0.00%
1	34	3	8.82%
2	78	25	32.05%
Total	**124**	**28**	**22.58%**
Total procedures with possibility of Embryo transfer	**124**	**28**	**22.58%**

9.6. Pregnancy Distribution per ART Cycle Attempts

Thirteen Couples (13) couples (or 21.66%) out of the 28 who got pregnant from cycles carried out in 2019, achieved a pregnancy on their 1st IVF/ICSI attempt, these were achieved by 9 couples who had undergone their cycle at the ART Clinic at MDH and 4 couples who self-funded their treatment. 11 couples (or 26.83%)

achieved a pregnancy on their 2nd attempt, 10 from MDH cycles and 1 from the private clinics cycles. 2 couples (15.38%) on their 3rd attempt, these pregnancies were both achieved from cycles on the NHS. One couple out of three achieved a pregnancy on their 4th attempt from a treatment cycle at the private facility. No pregnancies were reported for the two couples who had undergone their 5th attempt. On the contrary the only couple who had undergone their 6th attempt from a treatment cycle on the NHS became pregnant (Figures 45, 46 and 47).



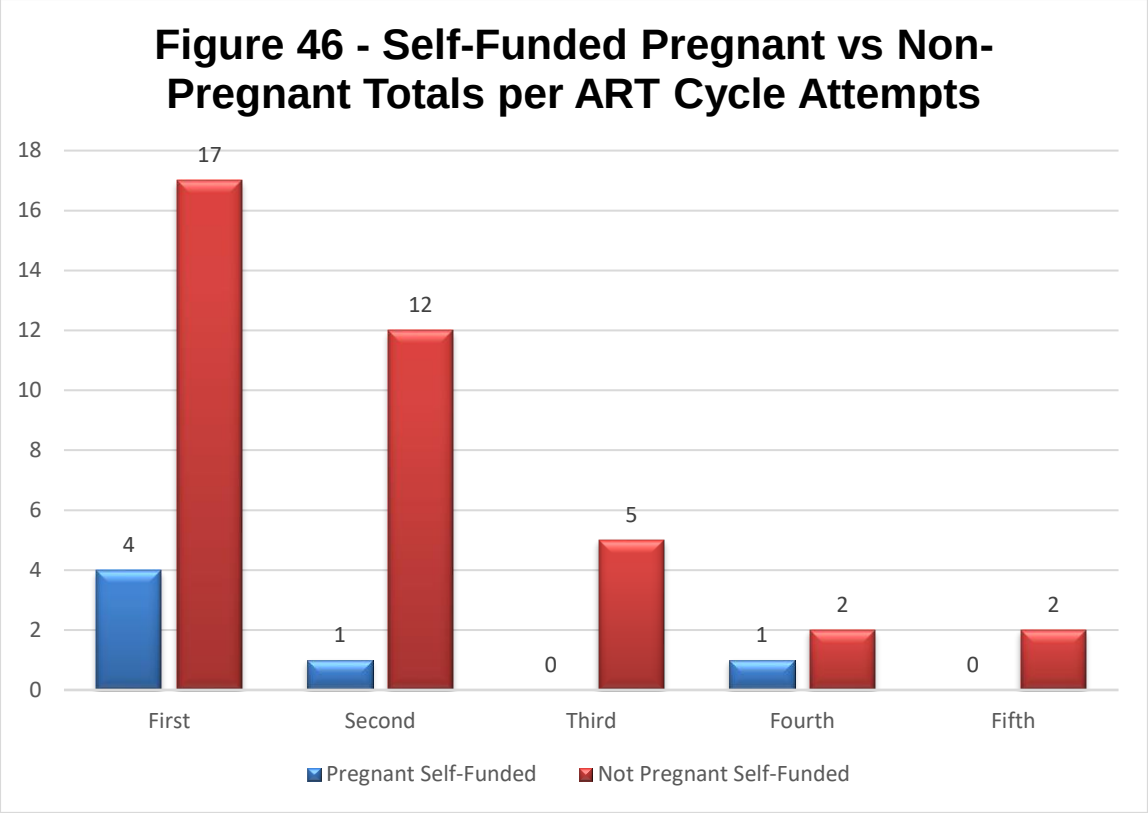


Figure 46 - Self-Funded Pregnant vs Non-Pregnant Totals per ART Cycle Attempts
18
16
14
12
10
8
6
4
2
0
17
12
5
4
1
0
1
2
0
2
First
Second
Third
Fourth
Fifth
Pregnant Self-Funded
Not Pregnant Self-Funded

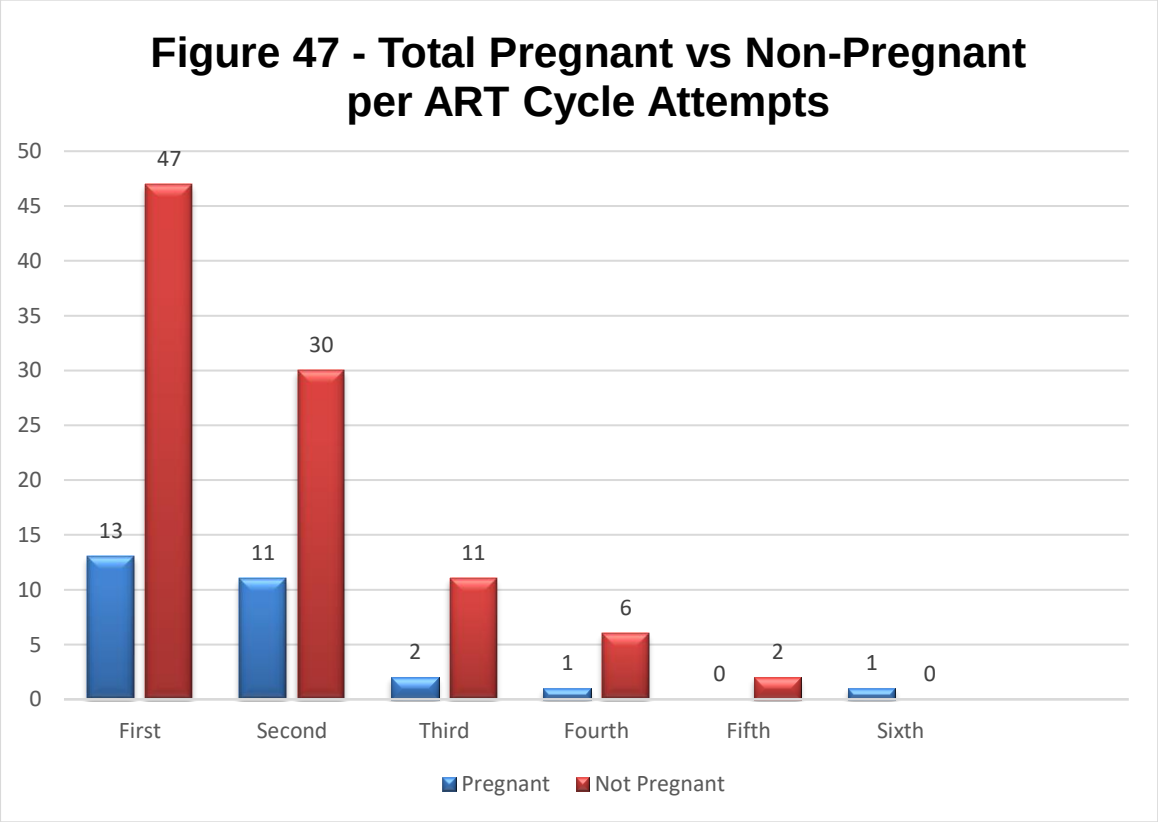
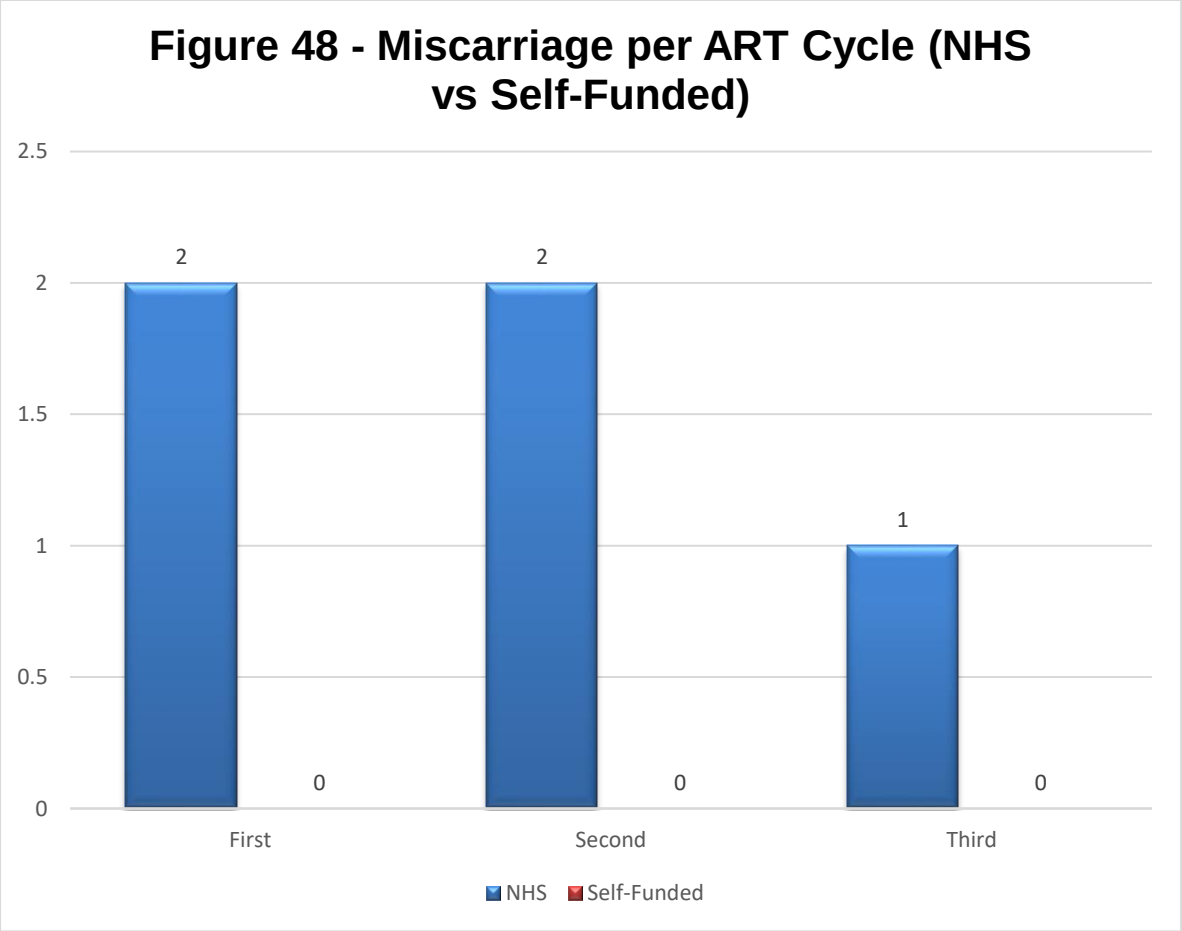
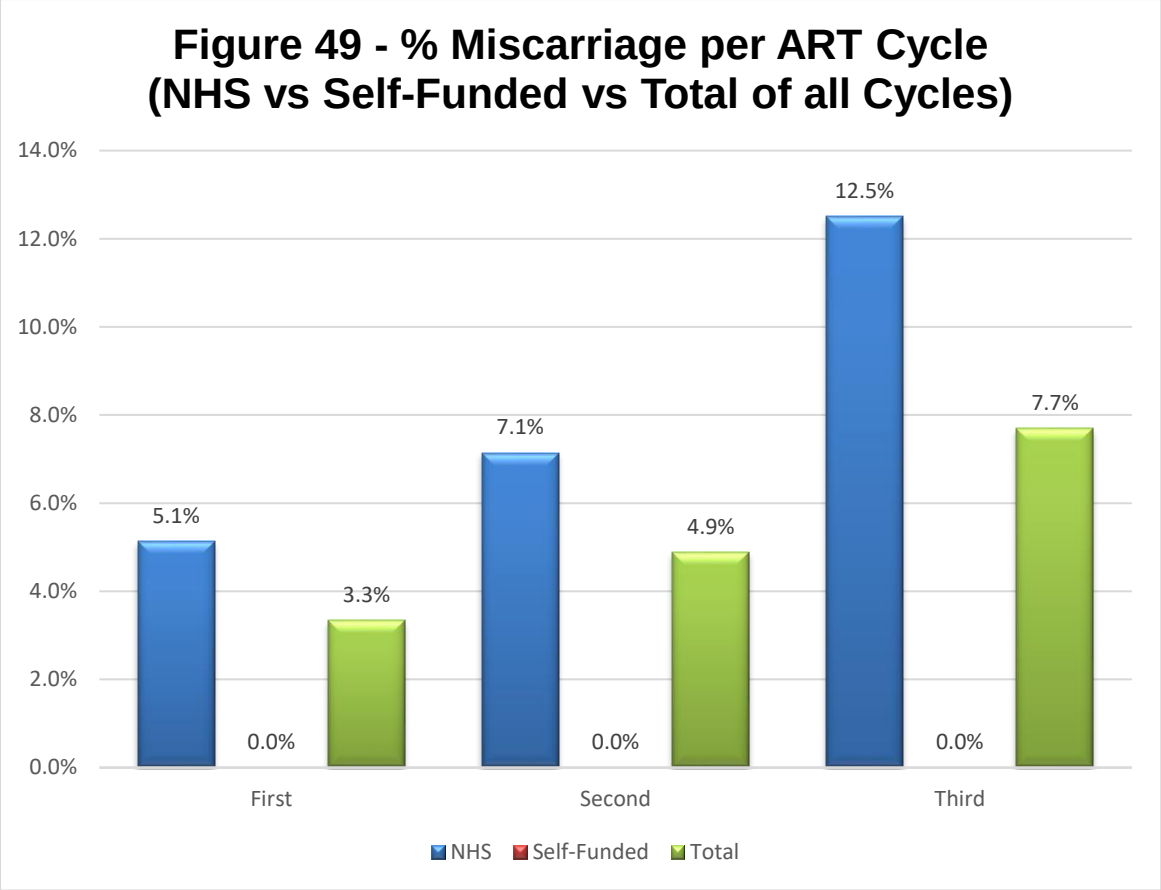


Figure 47 - Total Pregnant vs Non-Pregnant per ART Cycle Attempts
50
45
40
35
30
25
20
15
10
5
0
47
30
13
11
11
2
6
1
0
2
1
0
First
Second
Third
Fourth
Fifth
Sixth
Pregnant
Not Pregnant

9.7. Miscarriages per ART Cycle

In 2019, a total of 5 miscarriages were reported, all from cycles carried out at MDH ART Clinic. Two (2) of the couples who got pregnant on their first IVF/ICSI attempt miscarried. There were another two (2) couples who miscarried after a successful 2nd IVF/ICSI attempt. The other one (1) couple miscarried after getting pregnant from a 3rd attempt. No miscarriages were reported for the couples who got pregnant on their 4th and 6th attempt (Figures 48 and 49).





9.8. Miscarriages by Age

Miscarriages were reported for women aged up to age 39. There was one (1) reported miscarriage for women in the 29-32 year old bracket, another miscarriage was reported in the 33-36 year old bracket. The majority of miscarriages, 3 in number were reported for women aged 37-39. No miscarriages were reported for women aged 25-28 years and women aged 40-42 years (Figures 50 and 51).

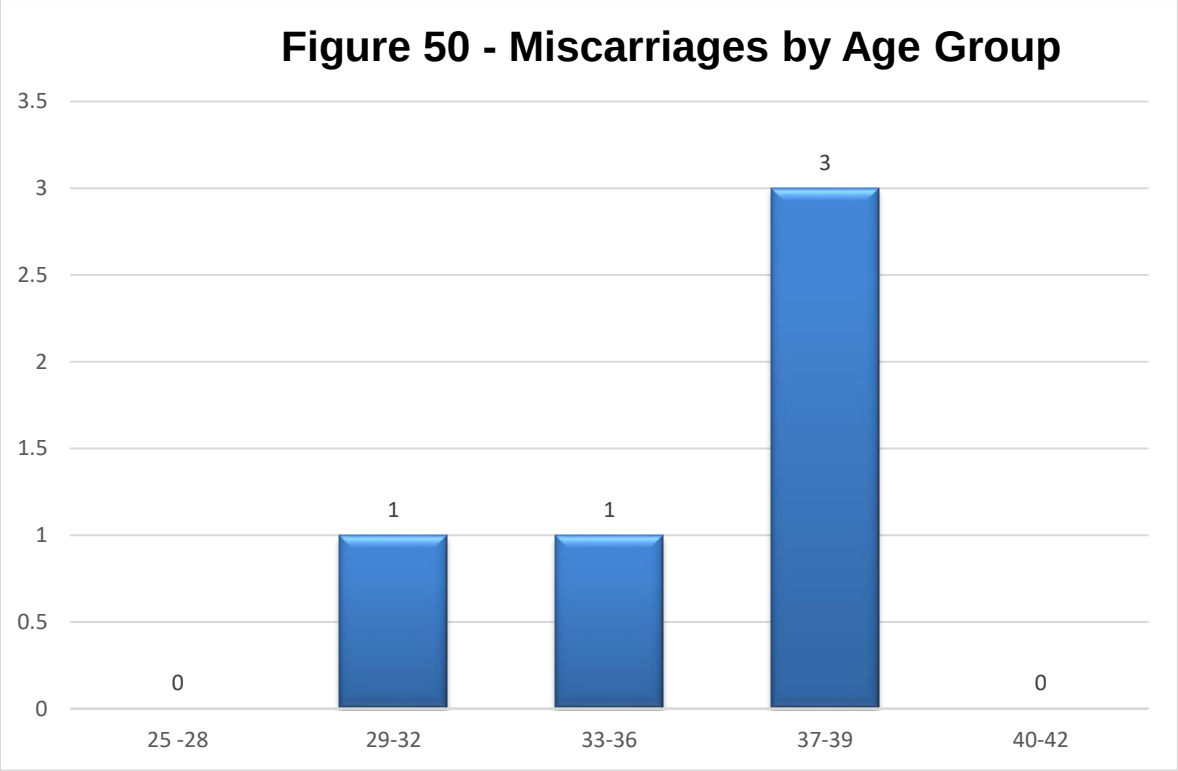


Figure 50 - Miscarriages by Age Group
3.5
3
2.5
2
1.5
1
0.5
0
0
1
1
3
0
25 -28
29-32
33-36
37-39
40-42

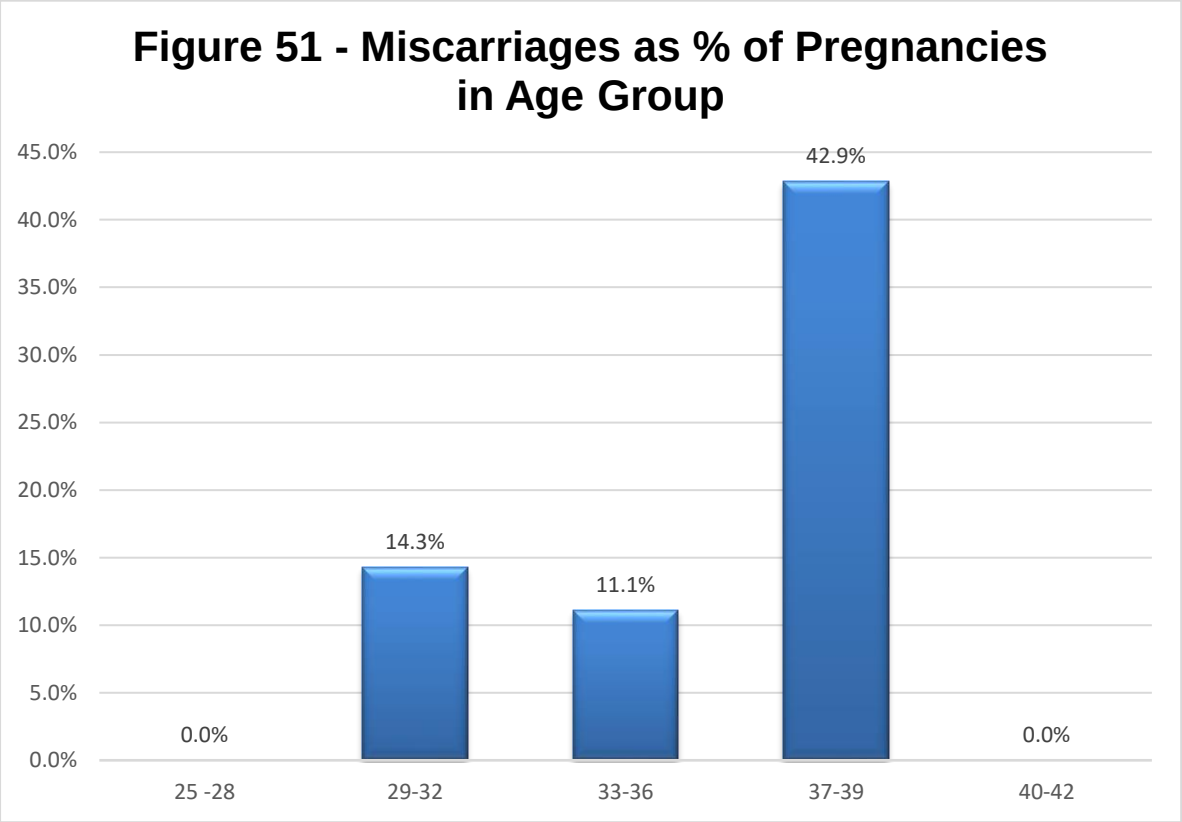
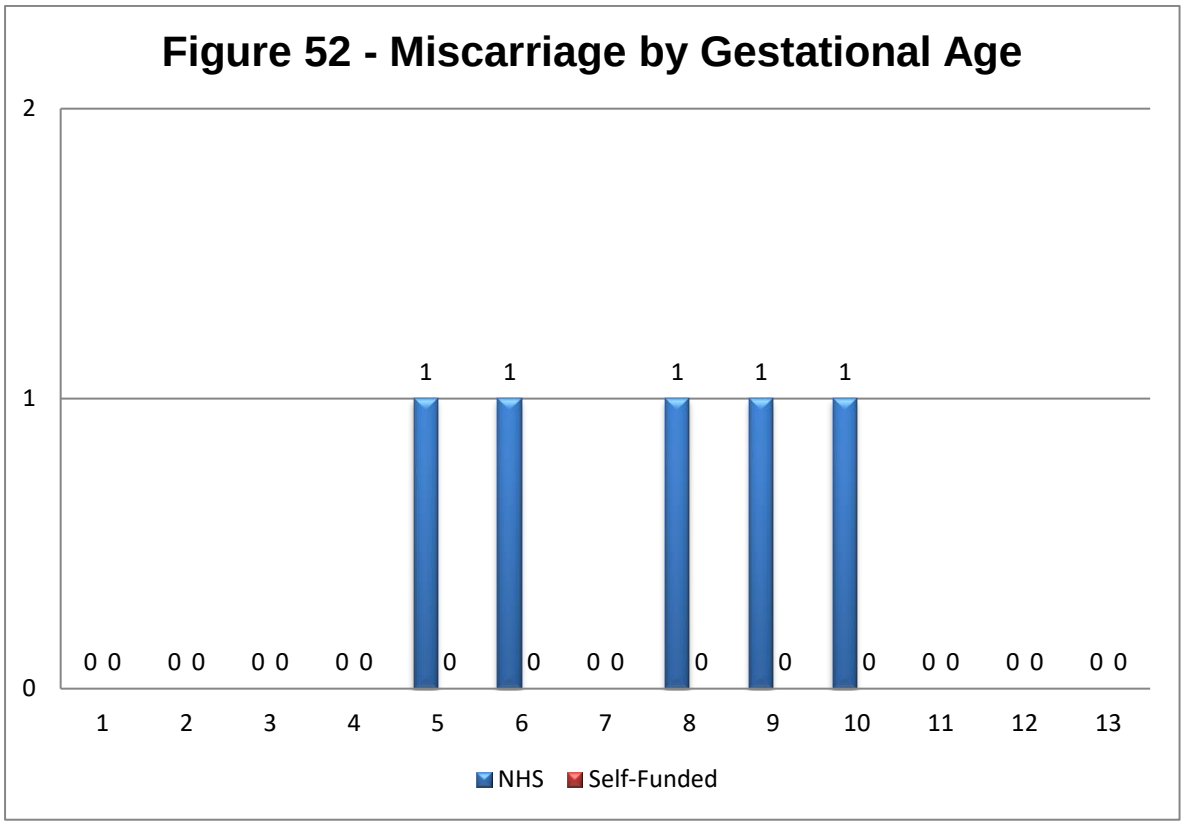


Figure 51 - Miscarriages as % of Pregnancies in Age Group
45.0%
40.0%
35.0%
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
0.0%
14.3%
11.1%
42.9%
0.0%
25 -28
29-32
33-36
37-39
40-42

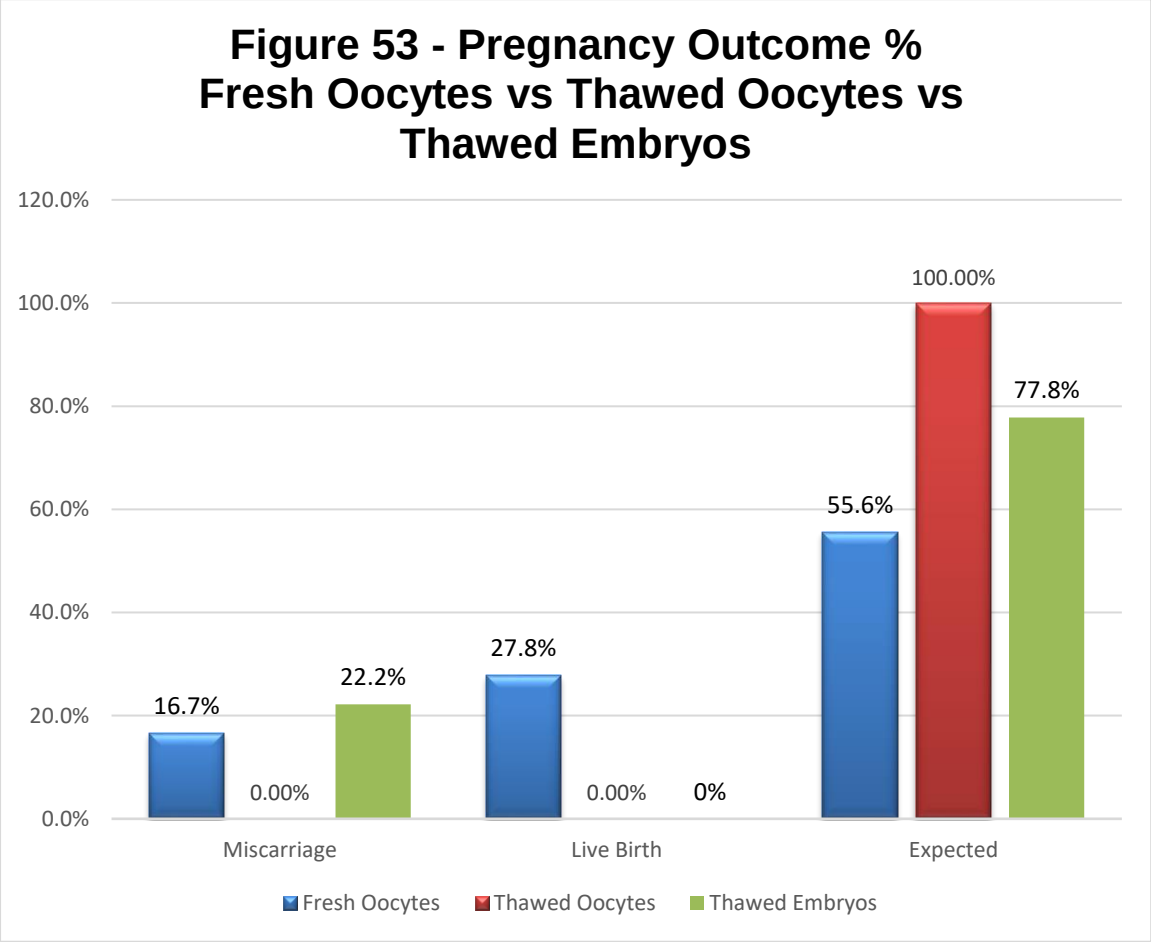
9.9. Miscarriages by Gestational Age

The 5 miscarriages reported were from one woman who was in her 5th week gestation, one (1) woman miscarried at 6 weeks; another one miscarried at 8 weeks; one miscarried at 9th week gestation. The remaining woman miscarried at 10 weeks gestation (Figure 52).



9.10. Miscarriages from Fresh vs Thawed Cycles

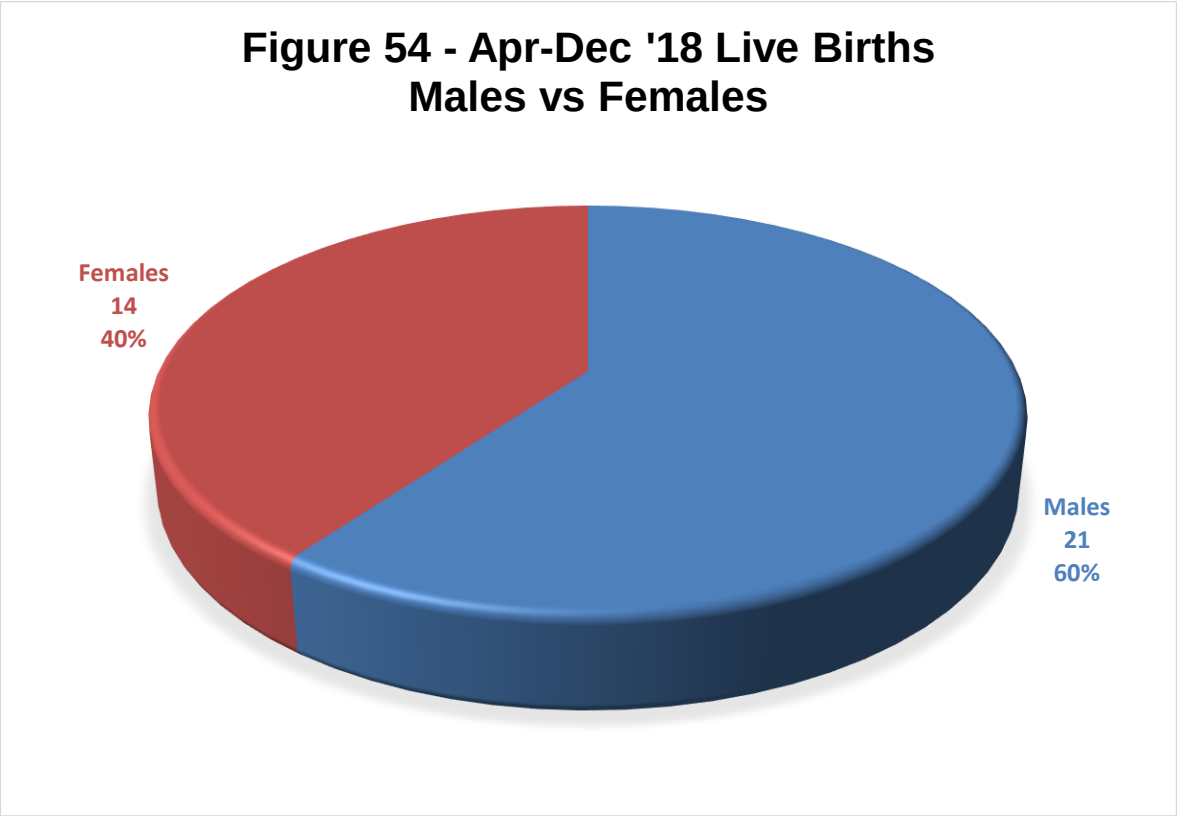
Three (3) couples, or 16.7%, miscarried after achieving a pregnancy from a Fresh cycle and 2 couples (22.20%), miscarried after a successful Thawed embryo cycle (Figure 53, Table 15).

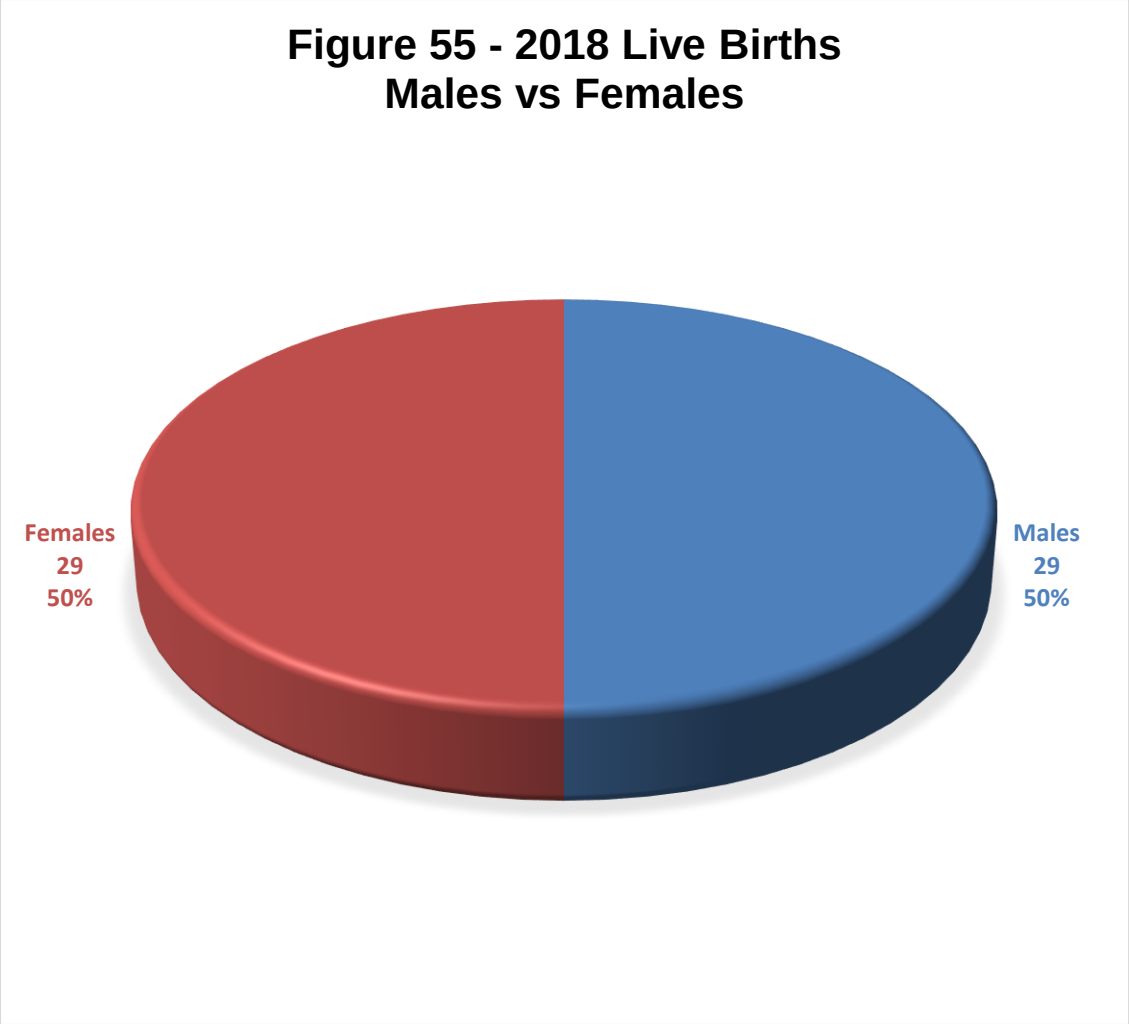


10. BIRTH EVENTS

10.1. Births from April - December 2018 Cycles

In 2019, thirty five (35) babies, 14 females and 21 males, were born as a result of cycles performed between April and December 2018 (Figure 54). Hence, a total of 58 babies, 29 females and 29 males, were born out of the 46 pregnancies from procedures carried out throughout 2018 (Figure 55).





Fifty four (54) babies, or 93.10%, were born out of Fresh cycles and four (4) babies were born out of Thawed oocytes cycles (Figure 56). Forty four babies or (75.86%) of the babies born out of procedures carried out in 2018 were from procedures carried out at MDH, while the remaining 24.14% were from procedures carried out at the private clinics (Figure 57).

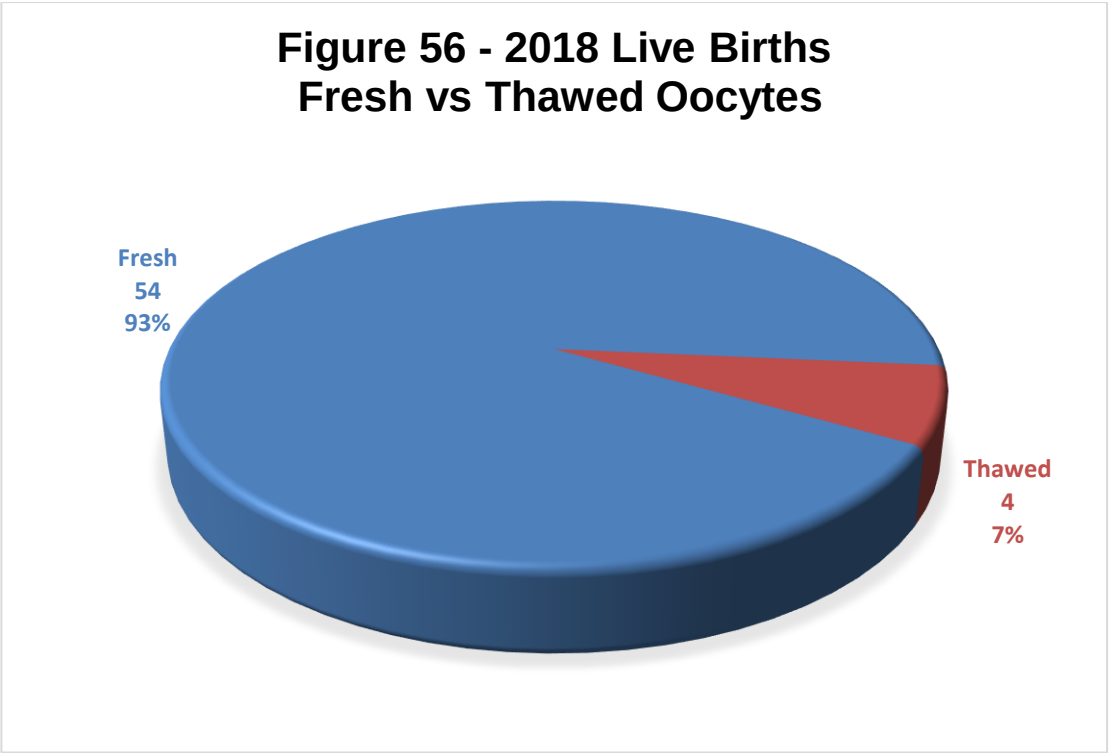


Figure 56 - 2018 Live Births
Fresh vs Thawed Oocytes
Fresh
54
93%
Thawed
4
7%

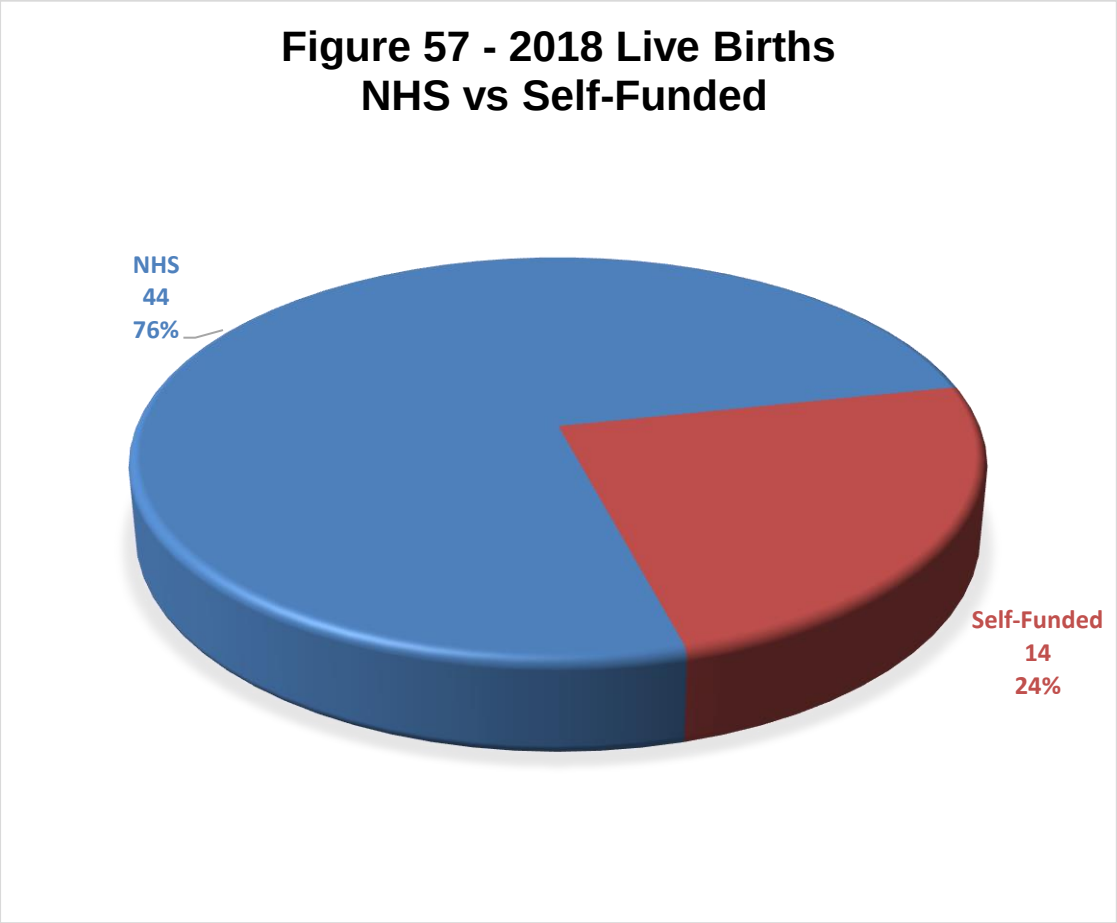
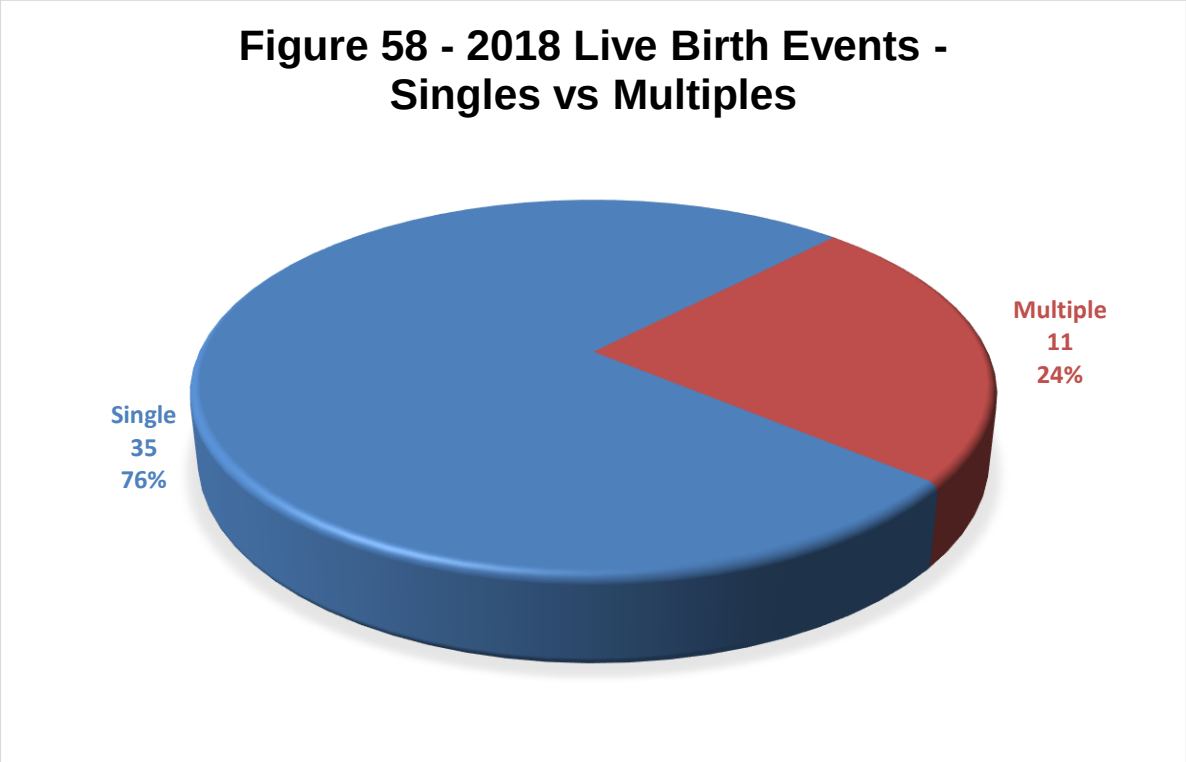


Figure 57 - 2018 Live Births
NHS vs Self-Funded
NHS
44
76%
Self-Funded
14
24%

Out of a total of 46 Live Birth Events in 2018, there were 35 single births and 11 multiple births. The multiple births consisted of ten sets of twins and one set of triplets. **The percentage of live births from multiple pregnancies in 2018 was of 4.47% of all cycles, an increase of 1.18% over 2017** (Figure 58).



In summary, out of a total of 246 cycles carried out in 2018, 190 couples did not achieve a pregnancy, 10 miscarried, and 46 had a live birth, for a **final Take-Home Baby Rate of 18.70%** (Table 17), **which is a 1.92% increase over that reported in 2017.**

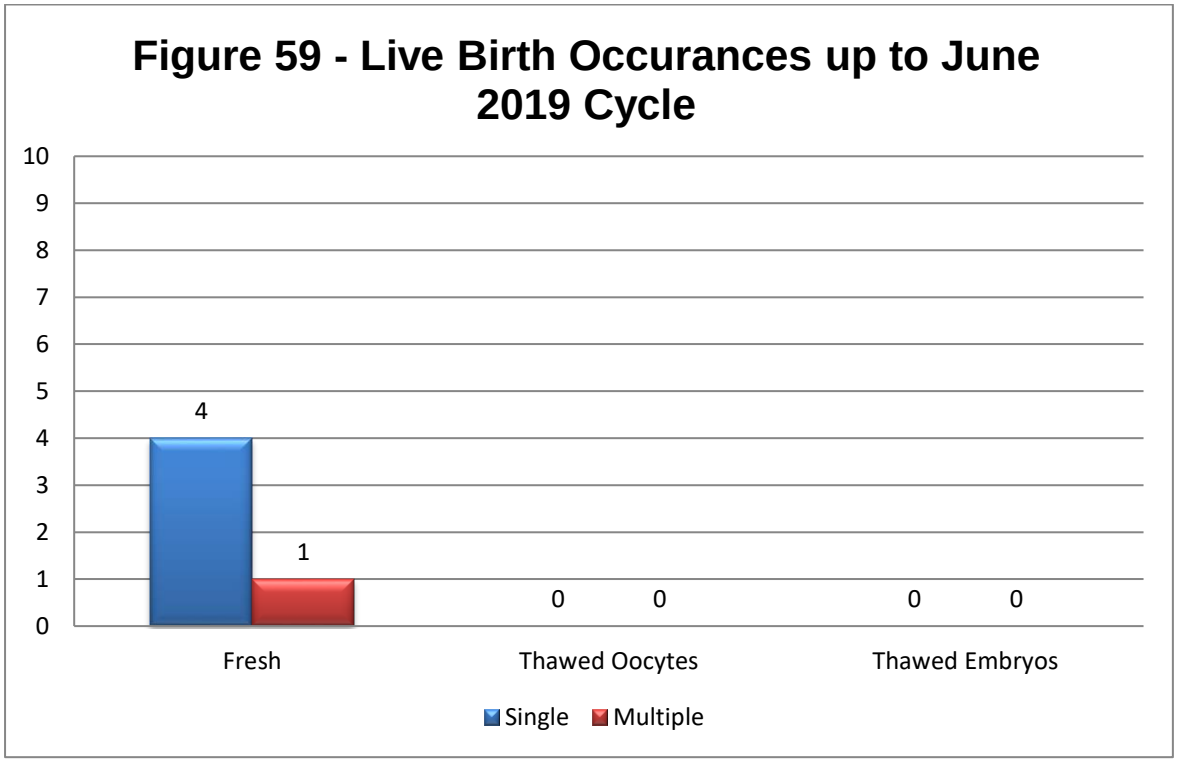
Table 17 - % Take-Home Baby Rate 2018

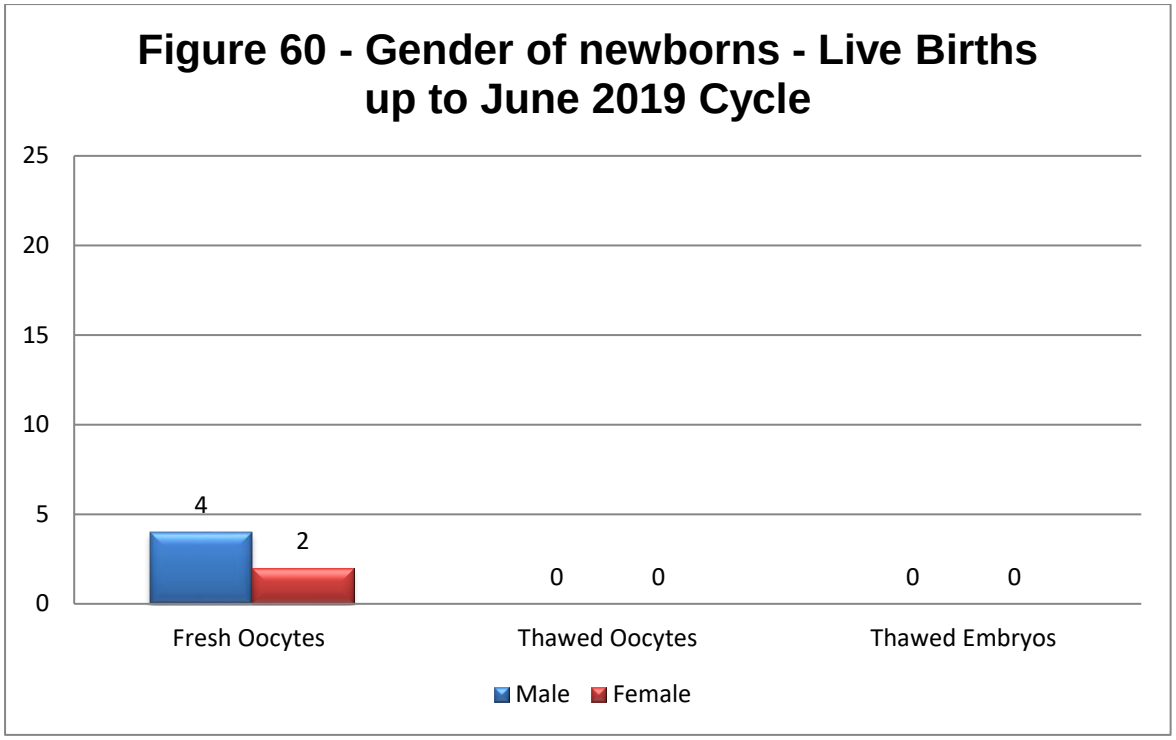
Cycle Outcome	Qty	% of pregnancies	% of total cycles
Live Birth	46	82.14%	**18.70%**
Miscarriage	10	17.86%	4.07%
Not Pregnant	190		77.23%
TOTAL CYCLES 2018	246		100.00%

10.2. Birth Events from 2019 Cycles – Fresh Oocytes vs Thawed Oocytes vs Thawed Embryos

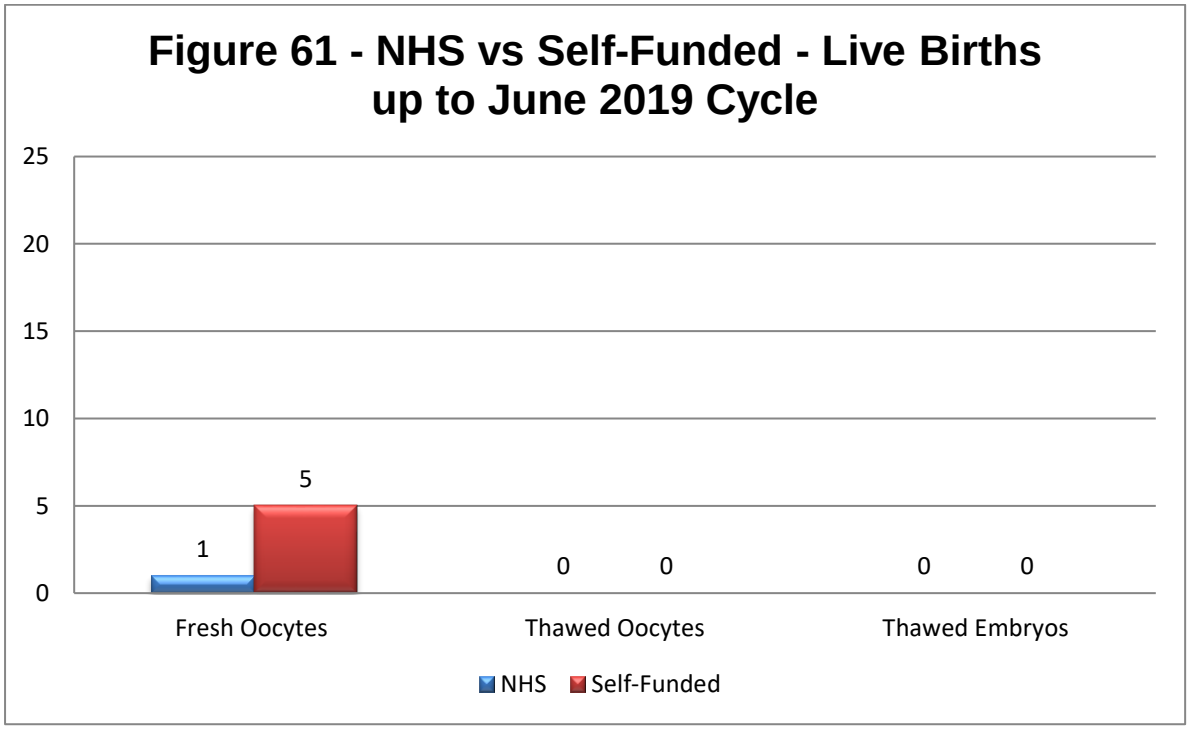
The number of babies born out of procedures carried out between January and June 2019 was of 6 babies. Four (4) singletons and one multiple, a set of twins was born from Fresh oocyte cycles.

No baby was born from thawed oocytes or thawed embryo cycles. One woman who was due to give birth from a thawed oocyte cycle carried out in the private facility in June 2019 had not yet given birth till going to print, thus this will be reported as an expected birth with the July to December 2019 cycles. Babies born were 4 males and 2 females (Figures 59 and 60). No Anomalies were observed in infants born.





The five (5) live births achieved up to June 2019 were all reported from fresh cycles, one was singleton, a male, was born from procedure done at the MDH ART Clinic whilst the other 4 live births were achieved from the private clinics. Three singletons, 1 male and two females, as well as a set of twin males were born from the self-funded cycles (Figure 61).



10.2.1. Expected Birth Events from Fresh Oocytes vs Thawed Oocytes vs Thawed Embryos

Eighteen (18) birth events are expected from cycles carried out between July and December 2019. These expected birth events are expected to give birth to twenty babies, 18 babies are expected from cycles carried out on the NHS whilst two other babies are expected from the self-funded cycles.

Ten (10) singletons are expected from Fresh oocytes cycles. Nine (9) of these are expected from treatment cycles carried out at MDH ART Clinic and one from the private licenced Clinic.

One (1) singleton is expected from Thawed oocytes cycles from the private facility out of the June 2019 cycle. There are no expected births from thawed oocytes cycles from the MDH ART Clinic as all treatment cycles were unsuccessful.

Seven (7) expected birth events are expected from Thawed embryo cycles carried out at the MDH ART Clinic. Five singletons and 2 multiple births are expected, to give birth to nine (9) babies (Figure 62 and Figure 63).

The percentage of live and expected births from multiple pregnancies in 2019 is of 2.42% of all treatment cycles carried out, a decrease of 2.05% from figures reported in 2018.

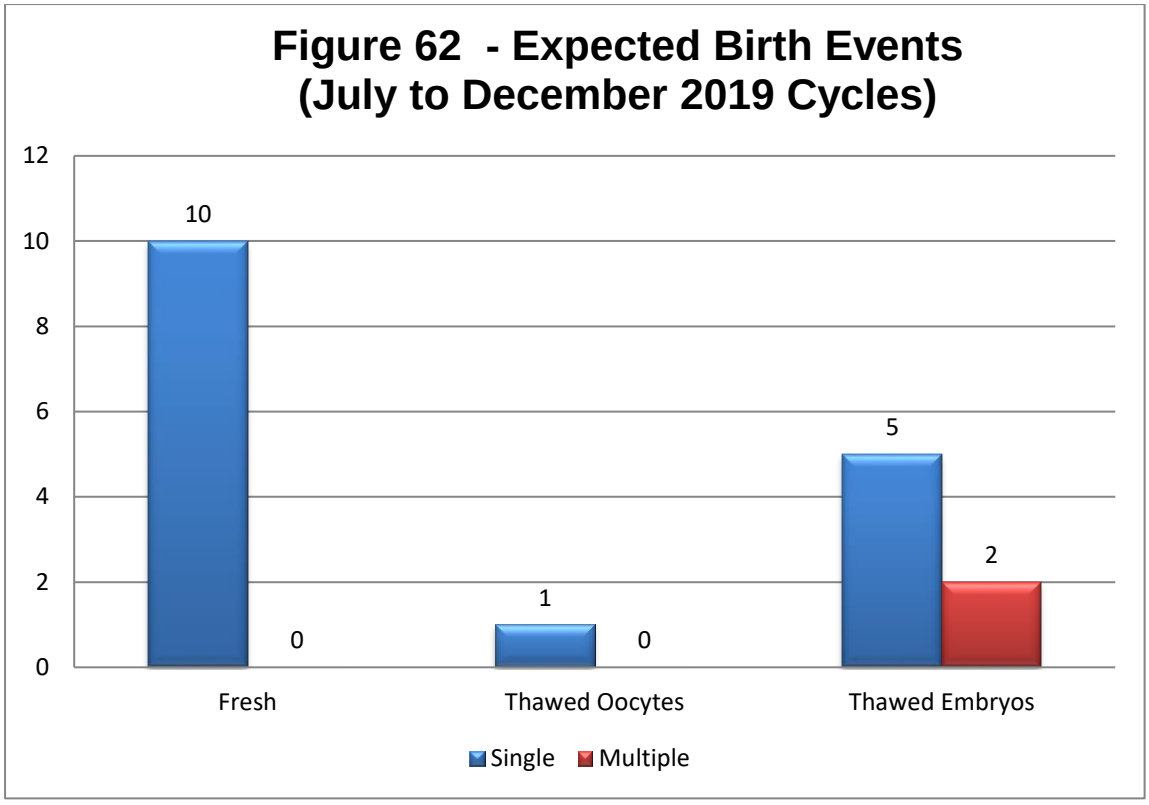


Figure 62 - Expected Birth Events (July to December 2019 Cycles)
12
10
8
6
4
2
0
10
0
1
0
5
2
Fresh
Thawed Oocytes
Thawed Embryos
Single
Multiple

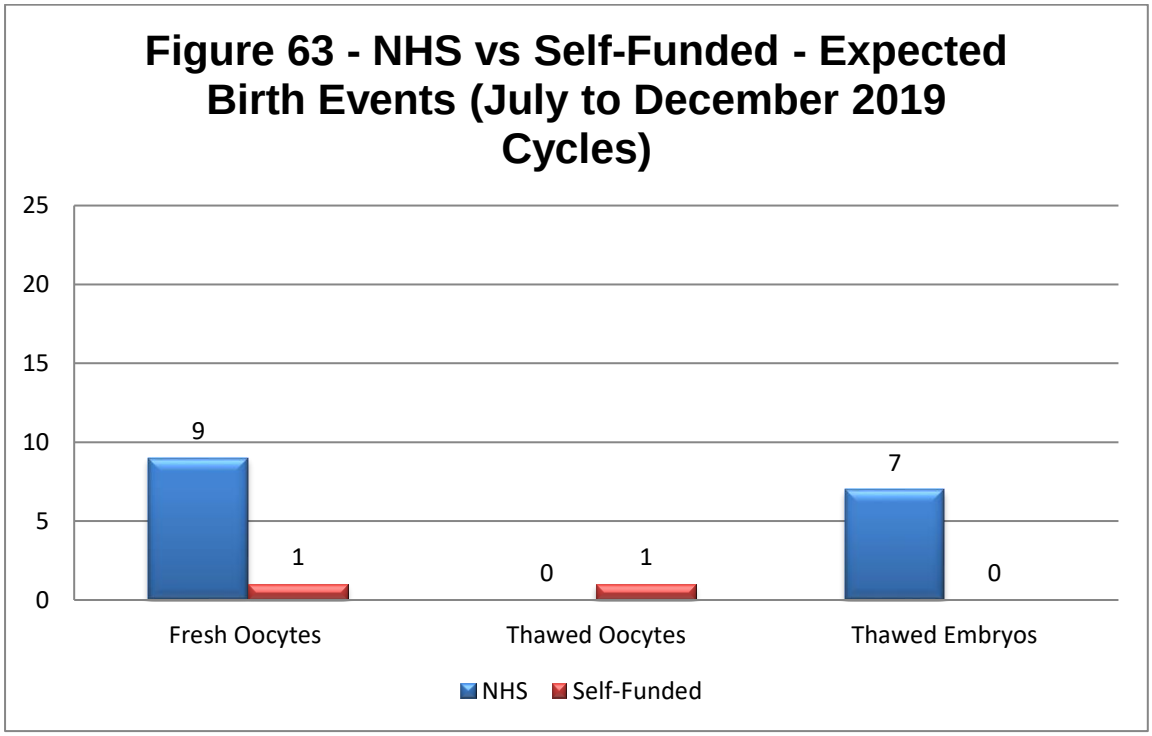


Figure 63 - NHS vs Self-Funded - Expected Birth Events (July to December 2019 Cycles)
25
20
15
10
5
0
9
1
0
1
7
0
Fresh Oocytes
Thawed Oocytes
Thawed Embryos
NHS
Self-Funded

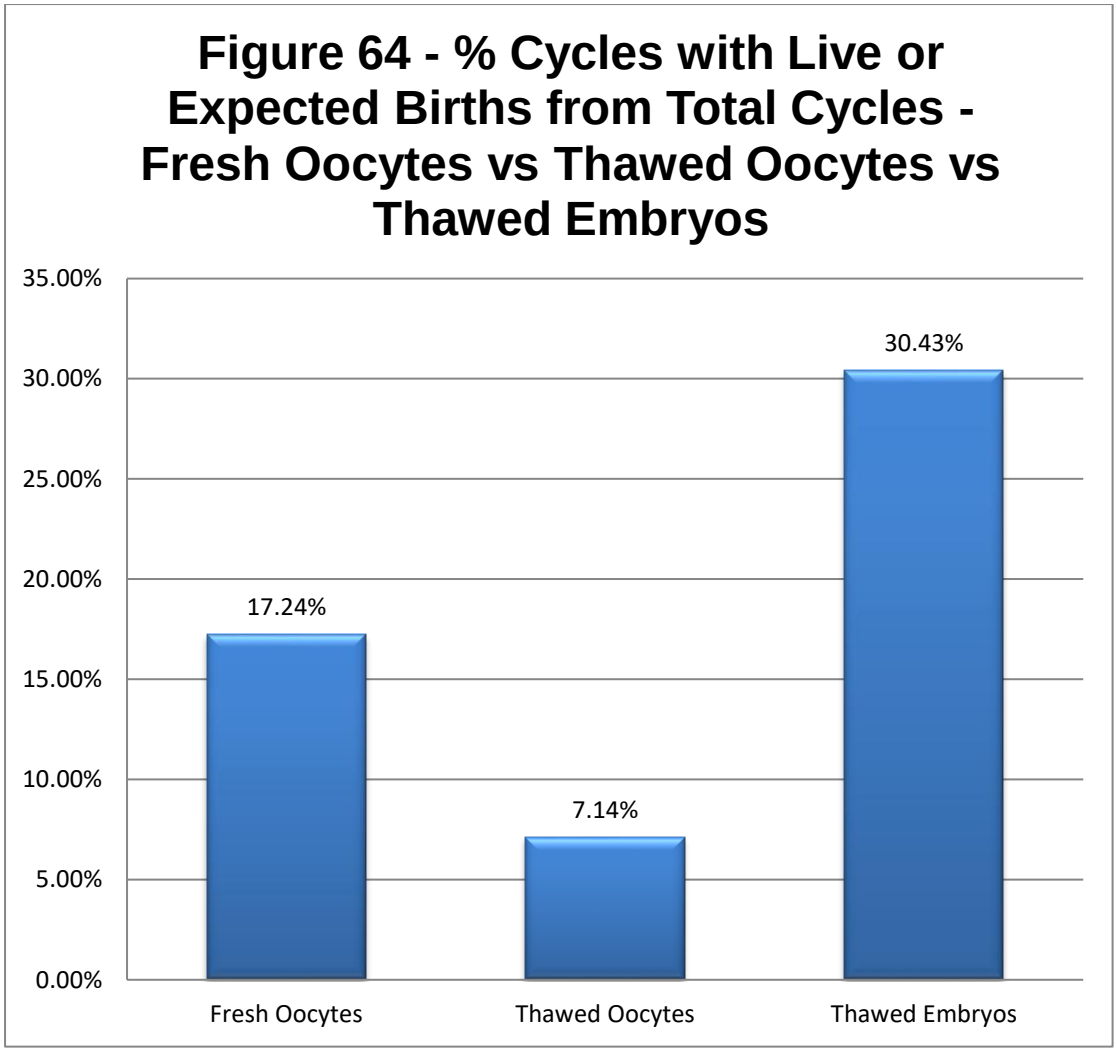
Hence, out of the twenty three (23) live and expected births from procedures carried out in 2019 a total of twenty six (26) babies are to be born, 16 babies are from pregnancies achieved through Fresh oocytes cycles, one (1) baby is from a pregnancy achieved through Thawed oocytes cycles and the remaining nine (9) babies are from Thawed embryos cycles.

10.3. Maximum Success Rate – Fresh vs Thawed

From the **87 Fresh Oocytes** cycles carried out, there are **15** reported birth events (live + expected), for a maximum success rate of **17.24%,** which is 2.58% lower than last year's 19.82% maximum success rate from fresh cycles**.**

Only one birth event (live + expected) is reported from the **14 Thawed Oocytes** cycles performed, for a maximum success rate of **7.14%,** which is 3.97% lower than that of 2018.

Seven (7) birth events (live + expected) resulted from the **23 Thawed Embryo** Cycles carried out in 2019, for a maximum success rate of **30.43%**. These figures are very encouraging, as the two cycles carried out in 2018 with thawed embryos were not successful. **This is also a result of the positive impact brought about by the amendments to the Embryo Protection Act which came into force on 1st October 2018** (Figure 64).

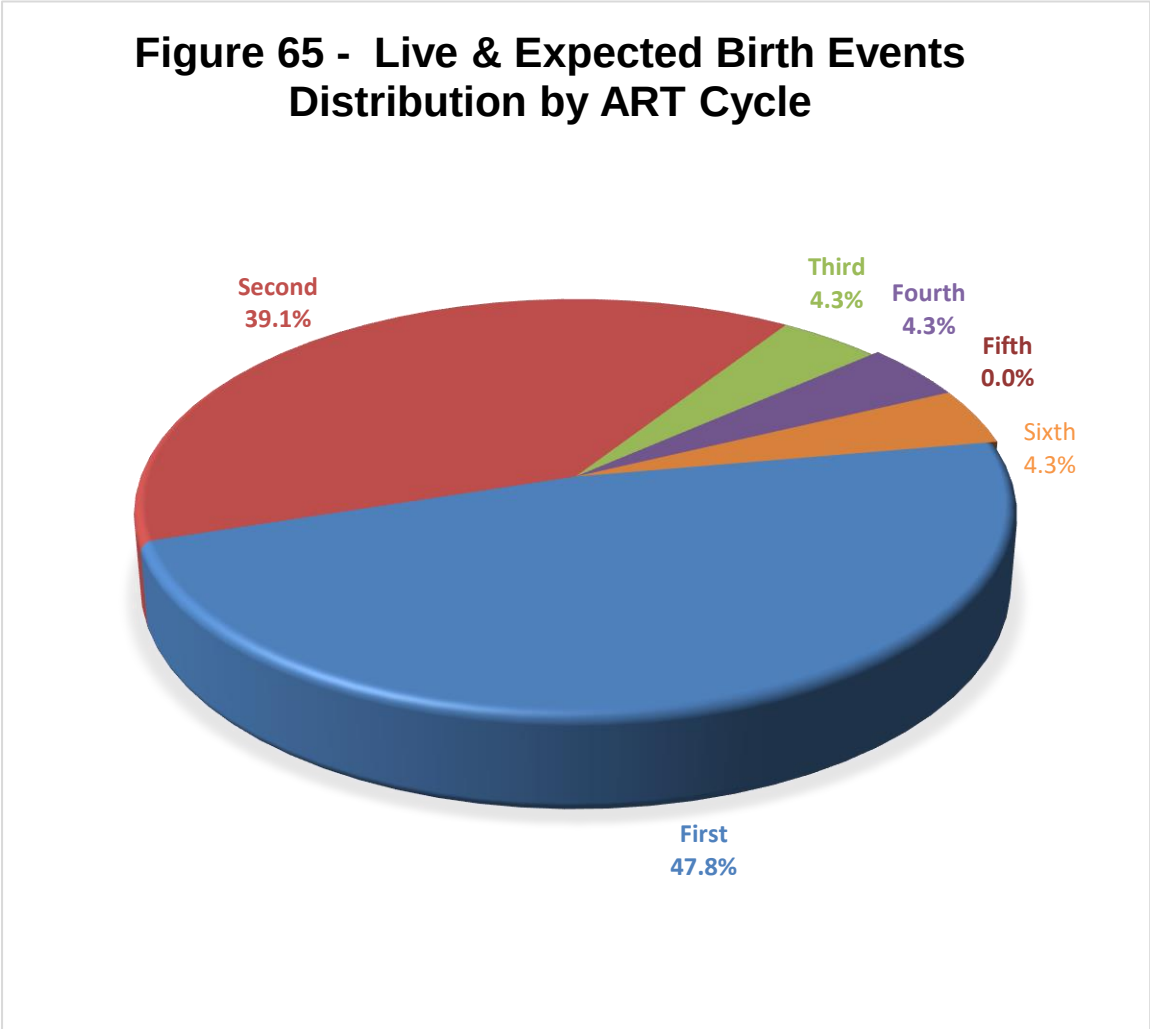


10.4. Birth Events per ART Cycle

Out of a total of 23 reported birth events (live + expected) from procedures carried out in 2019, there were 11 birth events (47.83%) from couples undergoing their first IVF/ICSI attempt, 9 birth events (39.13%) from a 2nd attempt and 1 birth event (4.35%) from a 3rd attempt. Two other birth events were from couples undergoing their 4th and 6th attempt respectively.

Noteworthy is the fact that whilst there was an increase in first and 2nd time attempts, there was a decrease in 3rd time attempts with a decrease of 19.56%. Contrary to

last year 2018, this year birth events were also registered for couples undergoing their 4th and 6th attempt respectively (Figure 65).



The majority of these birth events (live and expected) 17 couples or 73.91% of couples experiencing a birth event, are from cycles undergone at MDH, the remaining 6 couples had self-funded their treatment (Figure 66 and Figure 67).

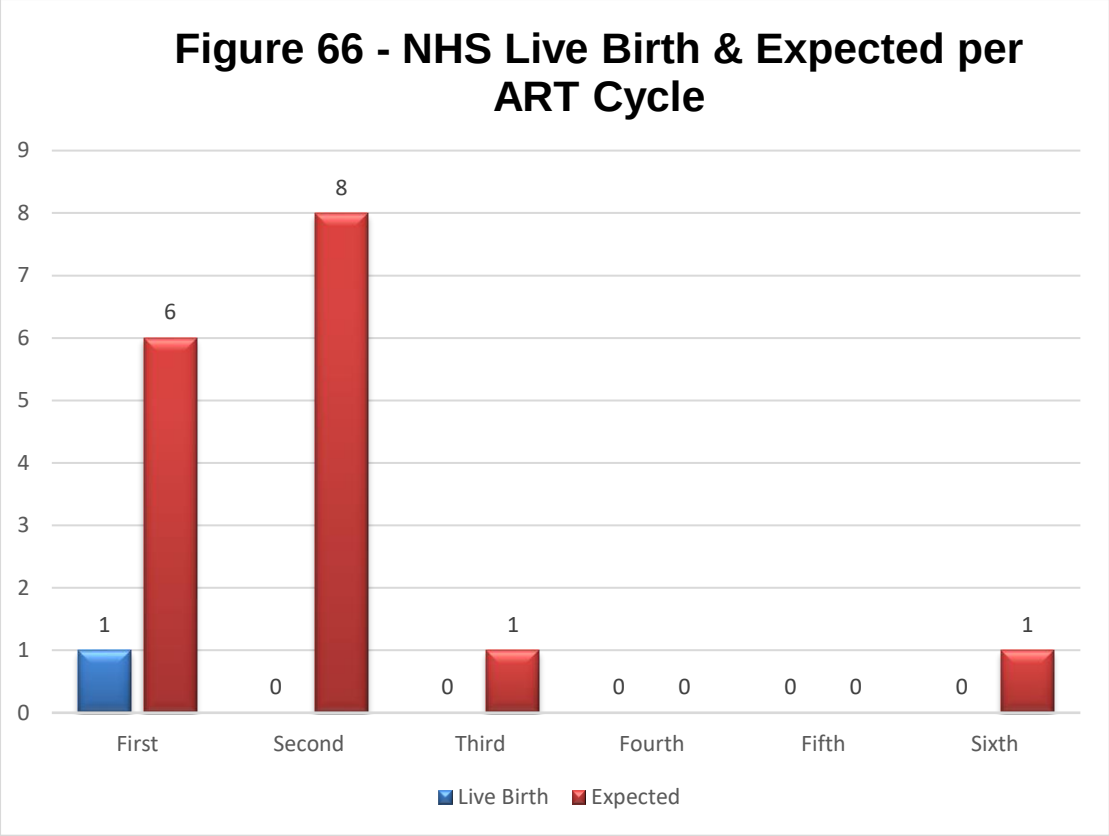


Figure 66 - NHS Live Birth & Expected per ART Cycle
9
8
7
6
5
4
3
2
1
0
1
6
0
8
0
1
0
0
0
0
0
1
First
Second
Third
Fourth
Fifth
Sixth
Live Birth
Expected

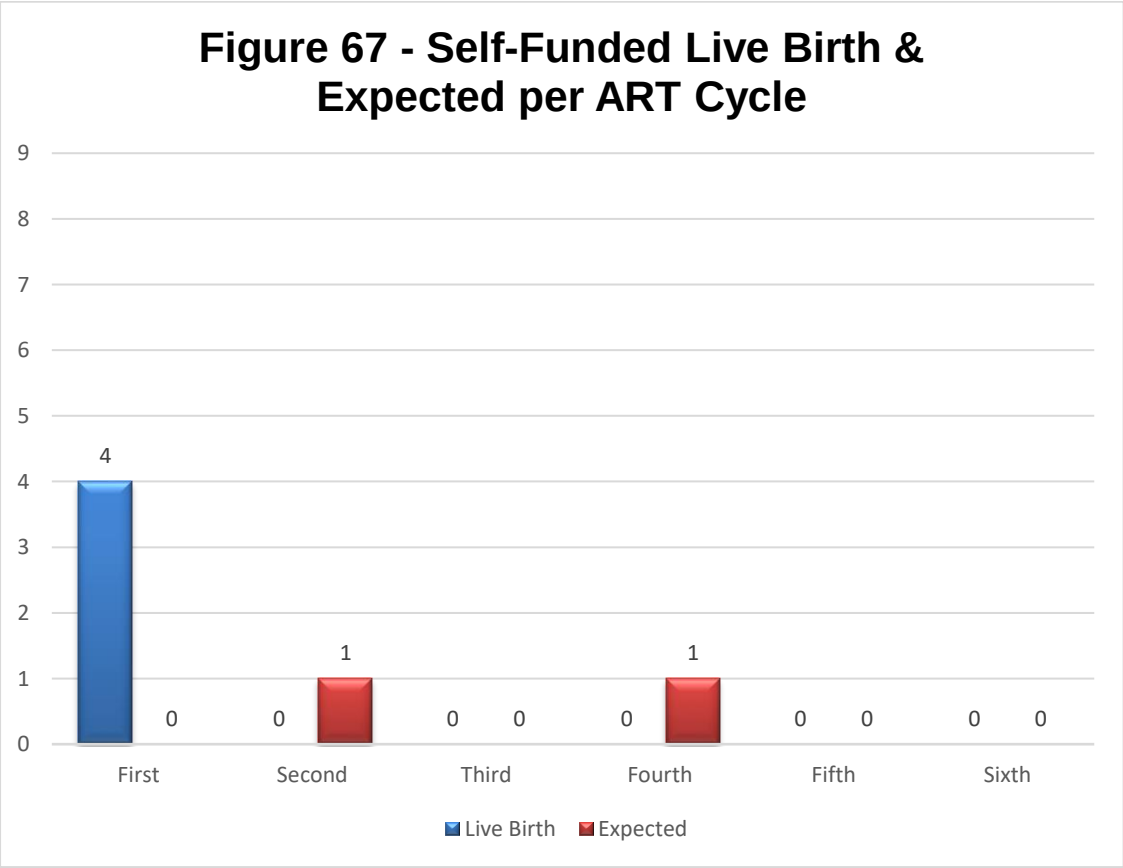
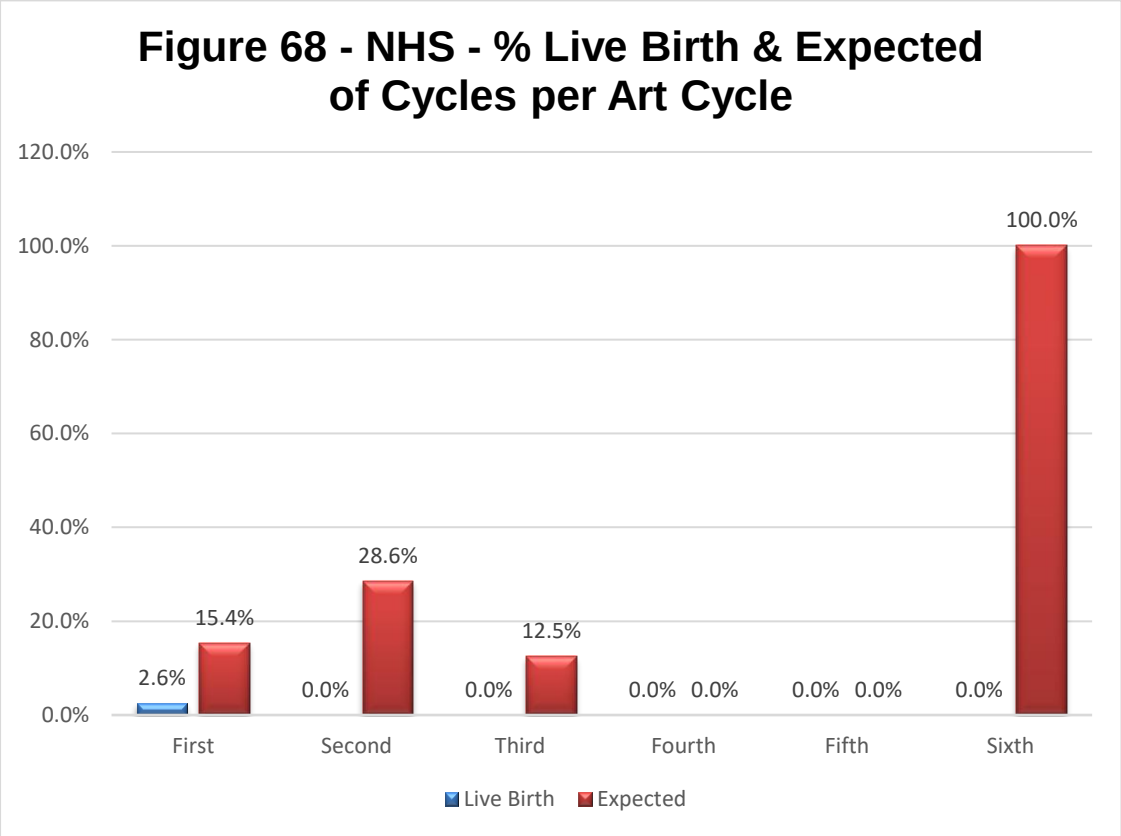


Figure 67 - Self-Funded Live Birth & Expected per ART Cycle
9
8
7
6
5
4
3
2
1
0
4
0
0
1
0
0
0
1
0
0
0
0
First
Second
Third
Fourth
Fifth
Sixth
Live Birth
Expected

Overall outcome of birth events (live + expected) from all 124 procedures carried out in 2019, show that 18.3% of all couples undergoing their first IVF/ICSI attempt will experience a birth event an increase of 1.4% from figures reported in 2018. Total of couples undergoing a 2nd attempt have also registered an increase of 2.8% over previous year from 19.2% to 22%. A total of only 7.7% of all couples undergoing their third attempt will experience a birth event, this has registered a drop of 27.8% over previous year that had registered a 35.5% in third attempts. During 2019 a new 14.3% of couples undergoing their 4th attempt achieved a birth event and the only couple undergoing their 6th attempt managed to achieved a birth event, thus having a 100% birth event in this attempt bracket. These figures are encouraging as they show a major increase over the figures reported in 2018 (Figures 68, 69, 70 and 71).



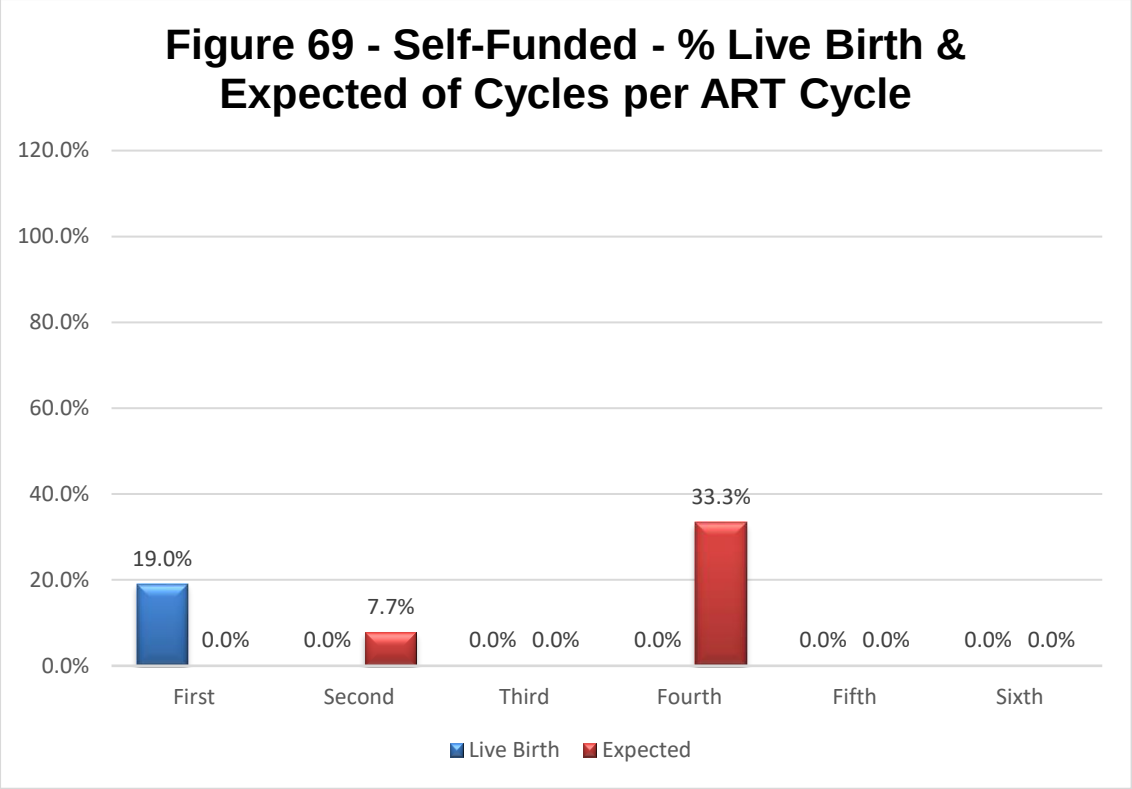


Figure 69 - Self-Funded - % Live Birth & Expected of Cycles per ART Cycle
120.0%
100.0%
80.0%
60.0%
40.0%
20.0%
0.0%
19.0%
0.0%
0.0%
7.7%
0.0%
0.0%
0.0%
33.3%
0.0%
0.0%
0.0%
0.0%
0.0%
First
Second
Third
Fourth
Fifth
Sixth
Live Birth
Expected

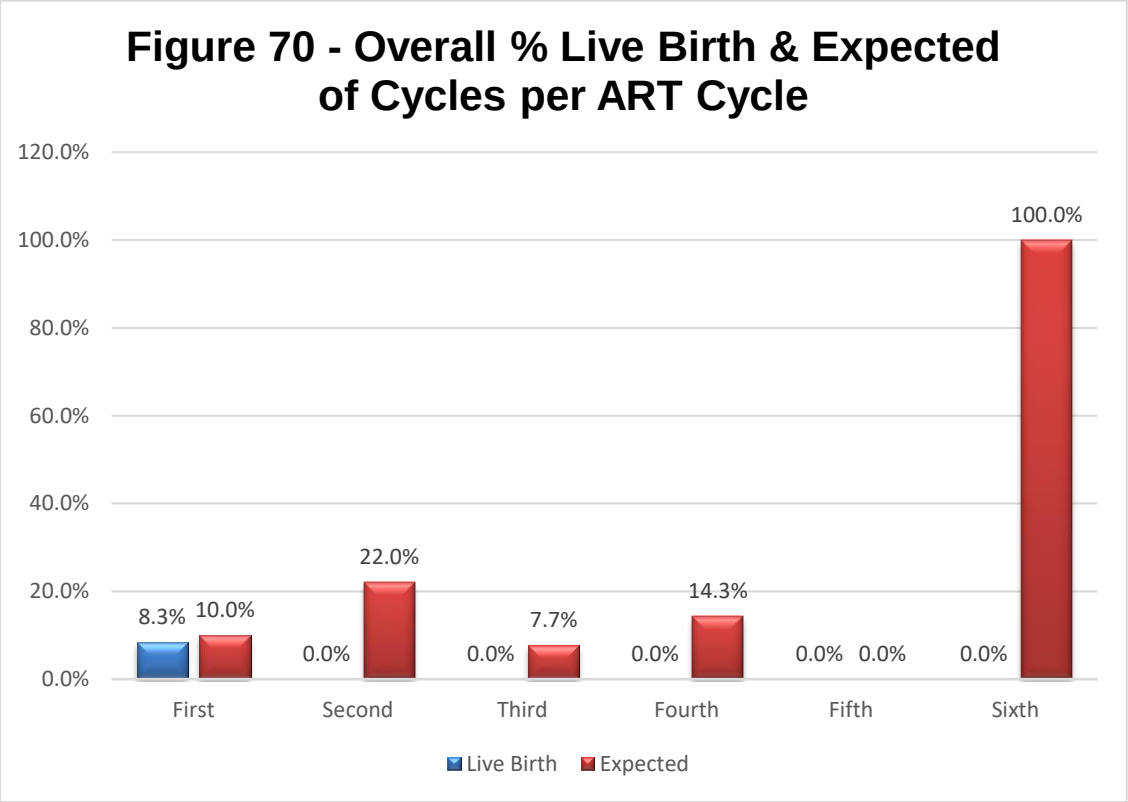
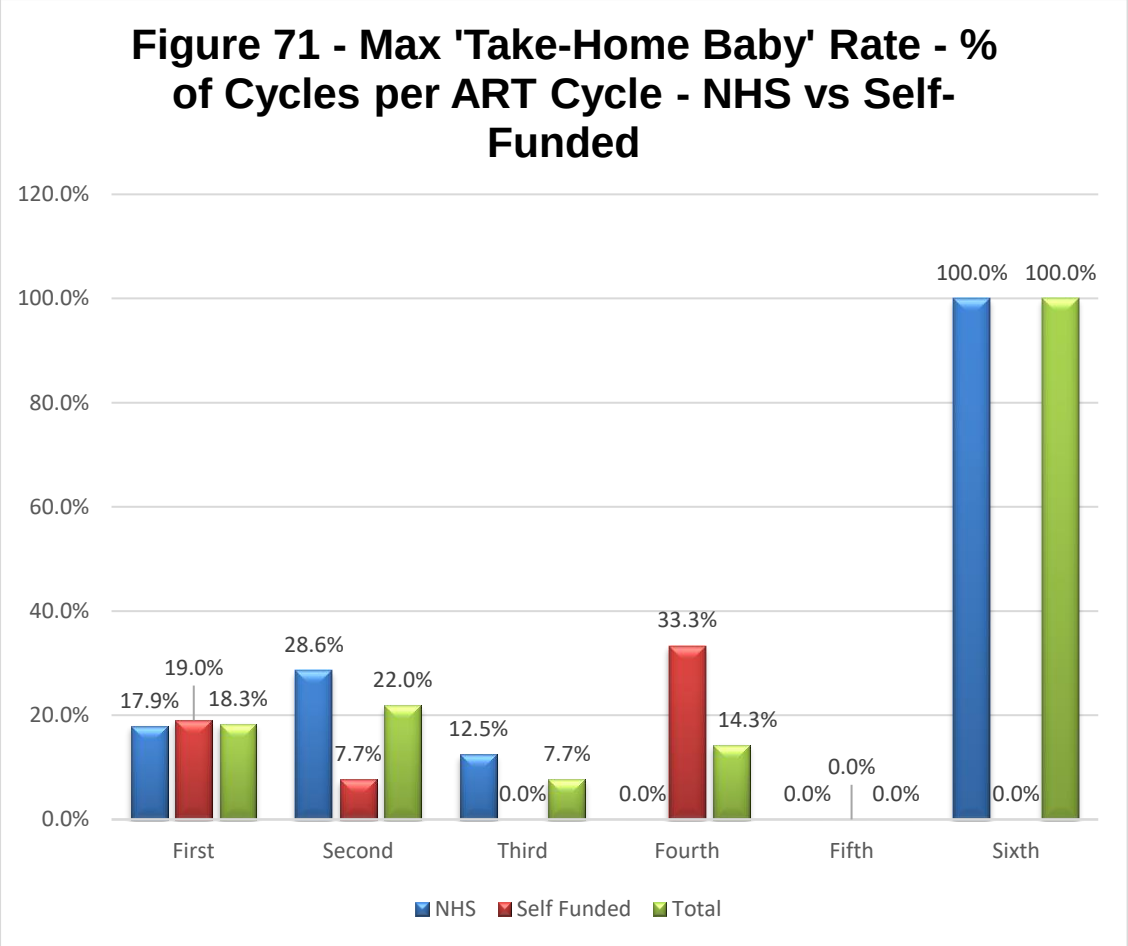


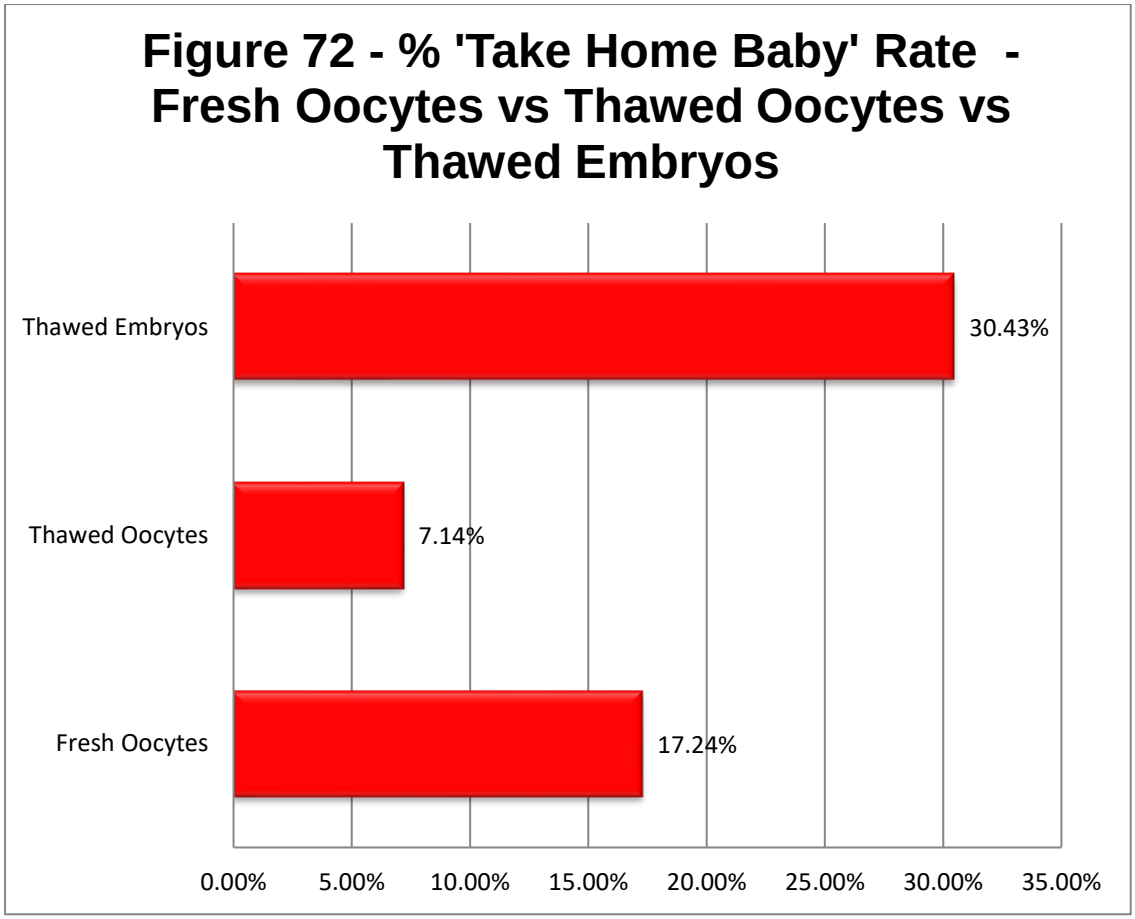
Figure 70 - Overall % Live Birth & Expected of Cycles per ART Cycle
120.0%
100.0%
80.0%
60.0%
40.0%
20.0%
0.0%
8.3%
10.0%
0.0%
22.0%
0.0%
7.7%
0.0%
14.3%
0.0%
0.0%
0.0%
0.0%
100.0%
First
Second
Third
Fourth
Fifth
Sixth
Live Birth
Expected



10.5. Percentage Maximum Success Rate – 'Take Home Baby' Rate

In conclusion, from the 28 couples who achieved a pregnancy in 2019, 5 (17.86%) had a live birth, 18 (64.28%) are still expecting, and 5 couples (17.86%) miscarried.

These were achieved mainly from Thawed Embryo cycles (30.43%), followed by Fresh Oocytes cycles (17.24%) and then by 7.14% of Thawed Oocytes Cycles (Figure 72).



Out of a total of 124 cycles carried out, **4.03%** of couples had a live birth, **14.52%** are still expecting, while **4.03%** miscarried.

Consequently, the maximum percentage success rate, or 'Take Home Baby' rate for calendar year 2018 is 18.55%, resulting in a decrease of 0.15% over 2018. (Table 18).

Table 18. % Maximum Success Rate – 'Take Home Baby' Rate 2019

Pregnancy Outcome	Qty	% of pregnancies	% of total cycles	% Max Success - 'Take Home Baby' Rate
Live Birth	5	17.86%	4.03%	**18.55%**
Expected	18	64.29%	14.52%	
Miscarriage	5	17.86%	4.03%	

11. Conclusion

The number of ART procedures carried out in Malta in calendar year 2019, has decreased by 35.34% when compared to 2018, which is mainly attributed to the fact that less procedures were being carried out at the MDH clinic, with a major drop of 44.39% in procedures carried out in the public clinic. Whilst the private clinic registered an increase of 6.82% over procedures carried out in the private clinic in the previous year.

ICSI was the preferred procedure of choice in all procedures carried out by the licensed clinics. There were **28 (22.58%)** reported pregnancies out of the 124 treatment cycles started which is **0.18% lower** than the pregnancy rate for 2018. As with last year, Thawed oocytes cycles were less effective than Fresh oocytes treatments.

The birth events were achieved mainly from Thawed Embryo cycles (30.43%), followed by Fresh Oocytes cycles (17.24%) and then by 7.14% of Thawed Oocytes Cycles *The* ***maximum percentage success rate****, or* ***'Take Home Baby' rate*** *which implies a birth event and is the most meaningful measure of treatment success*, stands at **18.55%**, which is **0.15% lower** than previous year.

The Embryo Protection Authority shall keep providing guidance and support to all the licensed ART clinics in Malta so as to ensure that they are operating under the highest standards.

Moreover, as the Regulator, the Authority will keep on striving to ensure that all local Clinics offering ART services comply with the obligations and requirements imposed by or under the Embryo Protection Act 2012, and the Embryo Protection (Amendment) Act, 2018.

Hon Judge Philip Sciberras UOM

Chairperson

Ms. Simone Attard

Executive Director