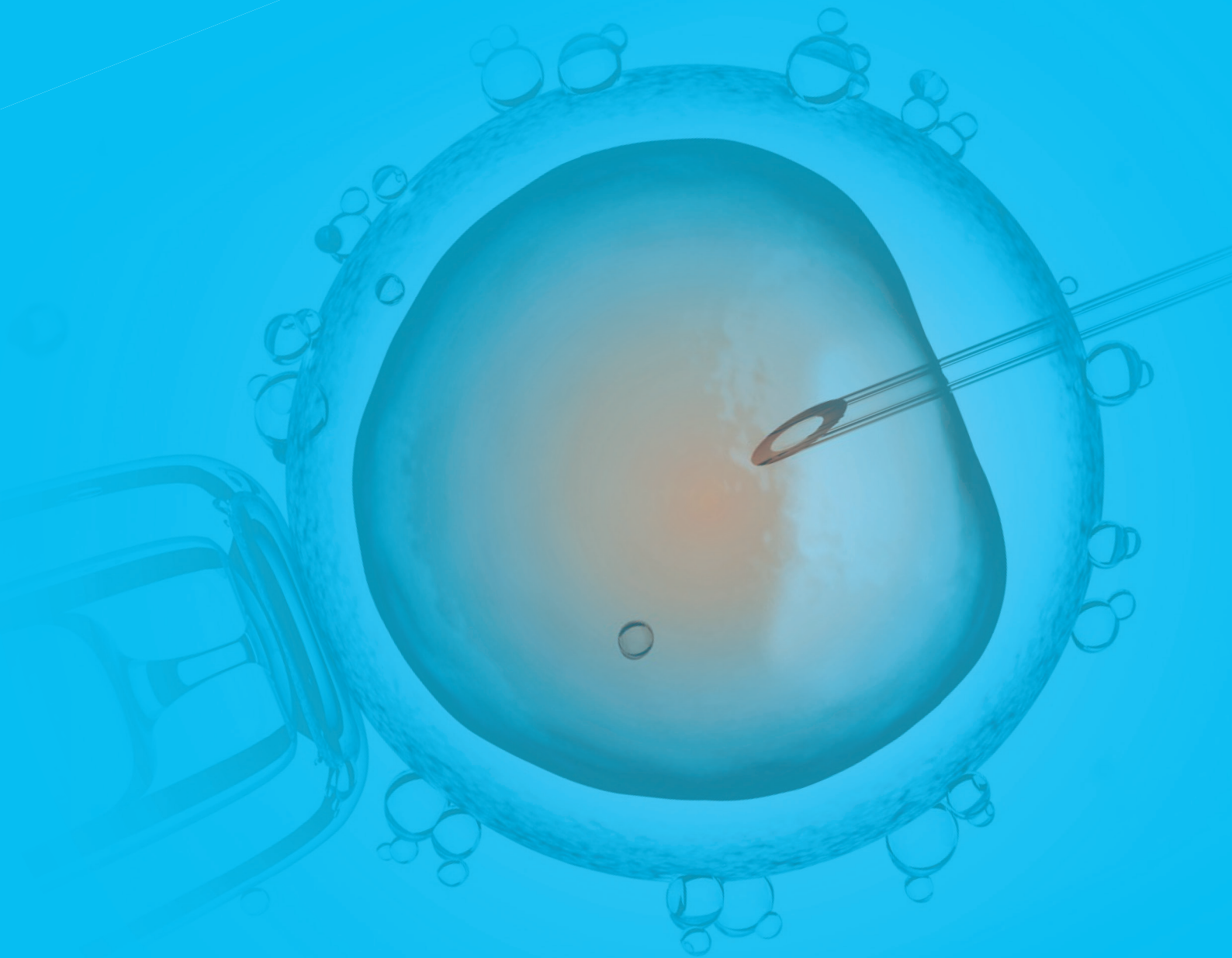
ANNUAL WORK REPORT

TRENDS AND FIGURES OF FERTILITY TREATMENTS IN MALTA FOR 2020



EMBRYO PROTECTION AUTHORITY

Putting Patients First

FEBRUARY 2021

ANNUAL WORK REPORT

TRENDS AND FIGURES
OF FERTILITY TREATMENTS
IN MALTA FOR 2020

EMBRYO PROTECTION AUTHORITY

Putting Patients First

Presented to Deputy Prime Minister and Minister for Health

Hon Christopher Fearne

As per Embryo Protection Act 2012, Chapter 524,

Embryo Protection (Amendment) Act, 2019

and

Embryo Protection Authority Regulations, LN32 of 2015 and LN343 of 2020

February 2021

EMBRYO PROTECTION AUTHORITY

PUTTING PATIENTS FIRST

ANNUAL WORK REPORT FOR 2020

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

FIGURES **Page No**

TABLES **Page No**

Chief Executive Officer's foreword

Welcome

2020, a year we will all remember for the onset of the pandemic that has led us to make difficult decisions, if I may say the most difficult decision we have had to take at the Authority since our inception in 2013. As I have stated in my open letter to the patients who had their ART treatment suspended or postponed, we at the Authority realise what distress this would cause whilst doing our best to ensure that any treatment offered in clinics could be safe. Our priority was always to keep patients and clinic staff safe, but we also had to consider guidance from the professional societies and government advice about the COVID-19 pandemic.

I know from personal experience what an emotional time undergoing fertility treatment can be, and that is why the Authority wanted to make sure that counselling was still available online from the clinics as well as from the Authority itself. As the Regulator, we requested clinics to provide the EPA, with a detailed assessment of how they will ensure safe services to ensure processes and procedures to keep patients and clinic staff safe once they reopened back.

In my open letter to the patients, I asked them to keep positive and take care of their health so that all can proceed with their procedures once they are called for by the clinics. As an Authority we also showed empathy by extending the maximum age of all women who were going to reach their maximum age of 43 years by the end of December 2020. Thus so no one would miss the chance of undergoing fertility treatment and thus miss the chance of becoming a parent, the Authority issued a six months extension to these women. With this measure a total of fourteen (14)

women were granted this extension to undergo procedures in both the private and public tissue establishments.

Through these struggles, 2020 was still another busy and successful year of daily miracles for the Embryo Protection Authority. We are proud that since our inception in 2013 to date **366 babies** have been born through ART Technologies, some of these babies were born as a result of the amendments to the Embryo Protection Act in 2018 which were then implemented by the licenced clinics in 2019 and 2020.

As with previous years, 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.

During 2020, we have worked tirelessly to have a new electronic exchange IT programme which since 2021 will be linking all clinics who perform all medically assisted procreation techniques including intrauterine 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 2021, which will see the introduction of third party donations of 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 the voice of our patients by introducing a new Strategy for 2021-2023, to mark our 10 year anniversary working in this sector, that will focus on what we want to achieve in this field and how we will work together with all stakeholders towards achieving it.

Ms Simone Attard

Chief Executive Officer

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 313/2019.

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 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.

The Embryo Protection Authority (Amendment) Regulations 2020, have been published by Legal Notice 343/2020 and came into force on the 21st August 2020 following the assent of the Minister responsible for Health with the concurrence of the Minister responsible for Justice.

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 2020 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 2020, to further strengthen its corporate structure, 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. In the last quarter of 2019 negotiations were held 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 necessary amendments came into force by the publication of Legal Notice 343/2020. The Authority structure has been amended to also include the position of Manager which although several interviews were held the post was still not filled up till the end of the year. New positions of Administrative Officer IT, and Administrative Officer Accounts were created and filled during 2020. The total number of employees directly fully employed with the Authority now stands at five (5) employees.

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 receive regular training throughout the year including

training for the wellbeing of the staff themselves. Staff also attend for sessions on Mental Health and Domestic Violence Awareness organised by the People Support and Well Being Directorate.

In February 2020, the Chief Executive Officer attended a Campus Symposium on 'Moving on from Individual connections to Networks, New Challenges in Donor Conception'. This Symposium was organised by the European Society for Human Reproduction and Embryology (ESHRE) and took place in Belgium Leuven.

In April 2020, EPA was represented by Mrs Attard who attended virtually the British Infertility Counselling Association (BICA) annual conference.

In May 2020, the Chief Executive Officer attended an interactive workshop online on 'Egg donation in Assisted Reproduction'. This online course was organised by the European Society for Human Reproduction and Embryology (ESHRE).

In May 2020, the CEO attended a meeting held virtually for the EU Competent Authorities on Substances of Human Origin Expert Group which was convened to discuss the COVID 19 situation. The meeting was attended by officials of Authorities in member States as well as the representatives of the European Centre for Disease Prevention and Control (ECDC), the World Health Organisation (WHO), the Council of Europe (EDQM) were present as observers and the Consumer, Health and Food Executive Agency (CHAFEA). The meeting focused on Covid-19 issues relevant for the tissues and cells field in particular, the impact of COVID-19 on donation programmes, testing protocols, inspection and authorisation issues.

The European Centre for Disease Prevention and Control (ECDC) updated the participants on the current situation regarding the SARS-CoV-2 pandemic in the EU and worldwide, showing the most recent distribution of COVID-19 cases and deaths. In response to the pandemic, ECDC published several risk assessments on the topic and two specific documents on the safety of SoHo and the risk mitigation measures recommended. No reports of COVID-19 transmissions through SoHo have been reported so far, although the risk should not be excluded.

According to ECDC, EU/EEA countries should continue precautionary actions to mitigate the potential risks to the viral safety of Substances of Human Origin (SoHO) and to manage the sufficiency of the national SoHO supply. Measures should be proportionate to the evolution of the pandemic and consistent with governmental and public health advice. Furthermore, it updated on how to contain the spread of the virus, so it is crucial that SoHO establishments remain vigilant and maintain precautionary measures.

The EU meeting also focused on the Commission activities on COVID 19 by DG Sante, discussions were also held on the impact of the pandemic on Tissue and Cells functions as well as how Authorities were managing inspections and Authorisations.

In July 2020, officials of the Authority virtually attended for the European Society for Human Reproduction and Embryology (ESHRE) 36th Annual General Meeting held online, including a Pre-Congress Course. The Pre-Congress course focused entirely on the Management of high risk pregnancies following In-Vitro Fertilisation. The following three day conference included a scientific programme on various topics ranging from genetics, psychosocial support, surgery, diet and lifestyle and the new technologies trends of oocyte and embryo freezing.

In November 2020, the Chief Executive Officer attended an interactive workshop online on 'An introduction to Errors in ART'. This online course was organised by the European Society for Human Reproduction and Embryology (ESHRE).

In December 2020, virtual attendance to a conference was made, the conference focused on the fertility preservation, 'From social to elective fertility preservation: the challenging interface between society and the clinic'. The conference was organised by the European Society for Human Reproduction and Embryology (ESHRE).

In December 2020, the Authority Head attended a regular meeting held virtually for the EU Competent Authorities on Substances of Human Origin Expert Group which was convened to discuss various issues. The meeting was attended by officials of Authorities in member States as well as the representatives of the European Centre for Disease Prevention and Control (ECDC), the World Health Organisation (WHO) and the Council of Europe (EDQM) were present as observers. One of the main topics discussed was the necessary preparations for and expected impact of BREXIT, including upcoming changes in the coding and rapid alert platforms (RATC), and the need to organize import from UK through EU-27 importing tissue establishments.

The issue of Surveillance and Vigilance was also discussed during this meeting with ECDC providing a short update on SoHO-relevant epidemiological diseases, beyond COVID. The participants expressed strong appreciation for this support by ECDC. SANTE presented an overview of Rapid Alerts launched over the RATC system since the last meeting.

EDQM presented the final summary report of the 2018 serious adverse events and reactions (SARE) reported by the Member States. EDQM also presented a state of play of the 2019 data (2020 collection exercise). Member States were reminded of the legal obligation to report these data timely.

The Authority CEO during 2020 also completed and achieved a certificate of achievement and a Masterclass certificate in Managing People Professionally Programme, providing non-technical skills training for Healthcare personnel. This training was held in conjunction with the Ministry for Health and the City of Glasgow College.

1.7. Authority Premises

The Ministry for Health had assigned 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 size of this office limits the Authority to invest in the recruiting of the much needed human resources. This one room office also posed a challenge to work in considering the measures taken re the COVID 19 pandemic.

In this regard a call for tenders was issued on the 30th June 2020 for the relocation of the Authority into a larger premises, this tender was not awarded. Several meetings were held by the Authority in conjunction with FMS and CPSU to draft a new tender document which has been published having a closing date of submission in February 2021.

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.

1.8. 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. Dr Patrick Sammut has offered his resignation in January 2020, however to date he has not been replaced.

Ms Moira Gialanze the Administrative Officer was appointed to also serve as the Authority Board's Secretary with effect from April 2019.

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 RRCouns., PGrad Cert, PGrad Dip Systemic Practice (Tavistock and Portman NHS Trust UK)., MBICA., GHZ., as Executive Director of the Embryo Protection Authority to serve for a second term of three years up to 31st January

2021. Following the publication of the Legal Notice 343/2020 Ms> Simone Attard was appointed as Chief Executive Officer on the 21st August 2020 to serve for a third term as Head of he Authority for three years up to 20th August 2023.

During 2020, ten Authority board meetings have been called and in all sittings quorum was achieved. One of the meetings was held virtually due to the COVID 19 measures in place. Attendance of the members and the Executive Director/CEO to these Board meetings were as stated hereunder:

Designation	**Name**	**Attended**	**Excused**
Chairperson	Judge Philip Sciberras	10	0
Vice Chairperson	Ms. Josephine Abdilla	10	0
Member	Dr. Patrick Sammut	0	0
Member	Profs. Victor Grech	6	4
Member	Ms. Mariella Meachen	10	0
Member	Ms. Sarah Camilleri	9	1
Executive Director / CEO	Ms. Simone Attard	10	0

During the ten meetings, two representatives 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.

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.

1.9. 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 2020 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 2020 paid to each member is as listed overleaf.

Designation	Name	Annual Remuneration (Euros)
Chairperson	Judge Philip Sciberras	11,620.80
Vice Chairperson	Ms. Josephine Abdilla	5,000
Member	Dr. Patrick Sammut	0
Member	Profs. Victor Grech	2,587.80
Member	Ms. Mariella Meachen	4,313
Member	Ms. Sarah Camilleri	3,881.70

1.10. 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. 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 to put in writing the different roles of the Authorities as well as when and to whom the clinics have to report to. Unfortunately although this meeting was very fruitful and to this effect a letter was circulated to clinics with the defined roles and responsibilities and reporting obligations of each Authority, during 2020, there still were instances when one of the clinics did not adhere to the established agreement

between both Authorities and totally ignored the EPA as an Authority from which authorisation prior to procedure is to be sought. To this effect we are hereby again listing the separate roles and responsibilities of each Authority.

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 and from abroad to a Malta Centre
- Request for ART Procedures (IUI, IVF, ICSI) as well as procedures making use of transfer of cryopreserved embryos 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.

As Regulator, the Authority took an active role in the COVID 19 pandemic, as all operations were halted in the month of April, the Authority considered issuing an extension to the women who were to undergo treatment and were nearing reaching their maximum age. Thus so no one would miss the chance of undergoing fertility treatment and thus miss the chance of becoming a parent, the Authority issued a six months extension who would be reaching the age of 43 by end of December 2020. With this measure a total of fourteen (14) women were granted this extension to undergo procedures in both the private and public tissue establishments.

The Authority was also very much in touch with the Maltese Licenced clinics and was providing them with the latest news and updates from ESHRE, ECDC and other institutions on the experience of maintaining safe and sufficient supply of substances of human origin (SoHO) gained in the course of the COVID-19 pandemic and through recent scientific developments in understanding the evolution of the disease. The documents provided reassess the risk posed by COVID-19 and revises management options for the safe and sustainable supply of SoHO. It also includes information relating to the safety of staff in SoHO

establishments and recipients of SoHO products. The aim of this active role by the Authority was to assist the tissue establishments in responding to the threat posed by the pandemic.

The Authority also published an open letter to the patients who were going through this very difficult time, who might have had their treatment cancelled or postponed due to the measures taken in these challenging times to ensure safety and quality of service. The Authority has proceeded with caution in its decisions to suspend or postpone treatments in order not to continue creating emotional suffering to those who had already started their treatment, infact the Authority was offering counselling services to the patients through a special dedicated telephone line.

Throughout 2020, 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.

The Authority has received three (3) requests from the licensed clinics to grant permission for oocyte retrieval and cryopreservation only, from three women aged between 27 and 41, who wanted to preserve their fertility. Two permissions were granted to two women aged 27 and 29 years of age on medical grounds who made this request prior to starting chemotherapy, The other woman requested to cryopreserve her oocytes at the private facility for social freezing reasons, to use her oocytes at a later stage in life, this was also granted permission by the Authority.

Out of the three permissions granted, two women had successful oocyte retrieval and cryopreservation.

The Authority also received a total of 96 requests from the licenced tissue establishments to grant permission for sperm cryopreservation, 88 at MDH ART Clinic and 8 at the private clinic. All 98 requests were granted permission to cryopreservation sperm. In a number of cases, sperm was obtained through testicular aspiration/extraction (TESA/TESE).

The 96 requests were made for 90 males as there were males who had repeated requests in the same year. Seventy two (72) males vitrified their sperm, whilst twenty four (24) males who requested sperm cryopreservation did not vitrify sperm.

Twenty three (23) requests were made by males requesting Fertility preservation following oncology diagnosis prior to starting chemotherapy. The other seventy three (73) requests were made by 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. 7 vials of sperm were distributed to Malta in August 2020.

During 2020, the Authority also received requests for transfer of gametes and embryos between the Maltese Licenced Tissue establishments. All four requests were for transfers from the MDH ART Clinic to the St James Conception Unit. The Authority approved one request for transfer of two vials of sperm, two requests for the transfer of oocytes of two women, transferring 13 oocytes in total and one request of a couple to transfer two embryos to the private tissue establishment.

In the process of introduction of Brexit, the Authority received a number of enquires from prospective parents who had gametes and / or embryos cryopreserved in United Kingdom. The Authority guided these prospective parents on the process that will need to be applied for the transfer of the gametes/ embryos to Malta, after the introduction of Brexit.

1.11. 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 Chief Executive Officer, 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.

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 313/2019.

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 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.

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. Both licenced tissue establishments are now providing the contracts to the Authority. The Authority has noted that whilst the private tissue establishment contracts are signed by the patients and representative of the Tissue Establishment, the Public MDH ART Clinic contracts are signed by the patients and by the Chief Medical Officer and not by the Tissue Establishment itself.

Pursuant to changes coming into force, donations of third party gametes were allowed by law for all prospective parents as defined by law as any person regardless of gender or sexual orientation, who has attained the age of majority and is a receiver or user of the medically assisted procreation techniques. Thus these services are provided to single women, heterosexual couples and lesbian couples.

After the introduction of the changes in law, St James Conception Unit has informed the Authority that they do not wish to perform any cycles using donated oocytes, sperm or embryos and that they will not seek to be licenced to provide such services or the distribution or importation of third party gametes from abroad to store in Malta.

On the other hand the Public MDH ART clinic has sought permission from the Authority to start offering third party donations as allowed by law, those being of Known Direct Donations and also donations through the distribution of sperm and oocytes from abroad.

After several meetings held between the Authority, legal representatives, the office of the Chief Medical Officer and the MDH ART Clinic personnel, the necessary documentation was drafted for the approval of the Authority to grant permission for Known Direct (local) Donation of non-partner gametes (sperm and oocytes).

The Embryo Protection Authority granted its approval for same services and in 2019 the Superintendent of Public Health issued a licence for Known Direct (local) donations for both sperm and oocytes to MDH ART Clinic. However to date no requests have been made by the MDH ART Clinic for direct donation neither through IUI nor IVF.

For the distribution of donor gametes from abroad to be brought to Malta a third party agreement had to be reached between the ART Clinic and the foreign tissue establishment. The Authority was involved in quite a number of meetings with the legal representatives, office of the Chief Medical Officer, the Licence Holders and representatives of the ART Clinic together with the foreign tissue establishment for the distribution of third party (non-partner) donor sperm to Malta. Following submission of the necessary documentation that was certified as being in line with Maltese Embryo Protection Act Legislation, the Authority issued its approval for the distribution of sperm from a sperm bank in a European Union Member State.

Subsequently the Superintendent of Public Health issued a Licence to the MDH ART Clinic in May 2020 for the non-partner sperm distribution from abroad, to be used in open donations. These procedures will be regulated with identity release of donor identifying information to the child on reaching age of majority if s/he only requests it. These third party sperm donations can be used in both IUI and IVF procedures.

Distribution of third party donor oocytes from abroad is still not approved by the Authority as no third party agreement has been reached by the MDH ART Clinic with a foreign tissue establishment as yet.

The Embryo Protection Authority was presented with a draft third party agreement by MDH ART Clinic with an EU tissue establishment. The Authority brought to the attention of the Clinic that this was not in line with Maltese Legislation Several meetings were held to this effect with the MDH ART Clinic personnel, the Chief Medical Officer, the Licence holders and legal representatives to explain why this draft agreement was not in line with Maltese Legislation and needed amendments.

The Authority's position was final and that it could not approve this agreement as the foreign tissue establishment could not provide all the required donor documentation to the Embryo Protection Authority as well as the term of donor record keeping was not in line with Maltese Legislation. Thus amendments need to be made for the Authority to approve and Superintendence of Public Health to issue licence for the distribution of donor oocytes from abroad.

Following the changes to the Embryo Protection Act, the Superintendence of Public Health received an application for the licencing of a new tissue establishment in Malta that will offer Assisted Reproduction Technology services. This application was forwarded to the Authority for its approval and currently is in the process of being assessed by both the SPH and EPA.

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.

Several meetings were held with the Social Care Standards Authority (SCSA) and the office of the State Advocate on this issue of embryo adoption, it was agreed that a bill is presented to Parliament that will amend the current Adoption Administration Act to provide the necessary legal framework to facilitate embryo adoption. The main change to the principal Act, Chapter 495 is that the Adoption Administration Board will make recommendations to the Embryo Protection Authority regarding the eligibility and suitability of prospective parent or parents relative to adoption of an embryo as provided in sub-article (3) of article 4 of the Embryo Protection Act.

This bill has been already reviewed by the Legislation Unit of the Ministry for Justice, Equality and Governance and will be presented by SCSA to the Minister for the Family, Children's Rights and Social Solidarity to table at the House of Representatives for discussion.

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 eleven 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.

1.12. 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 2020 the Authority was represented on this Committee by its Chief Executive Officer 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, with an unforeseen delay between meetings due to COVID 19, to decide which of these couples requires prioritization for treatment.

Three reports were consequently issued showing a total of 155 couples that had been reviewed by the ART Prioritisation Committee during 2020. One hundred and forty

nine couples were prioritised as they met the necessary criteria for prioritisation. Three 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. Two other couples were not prioritised as the Authority requested clarification on the files presented and another couple was not prioritised as the Committee requested legal guidance on the status of the couple prior to prioritising.

During 2020, the prioritisation Committee revised the criteria for prioritisation of prospective parents and also introduced new prioritisation criteria for prospective parent /parents making use of third party donated sperm.

1.13. 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 2020, due to COVID19 measures in place, no physical inspections together with the Superintendence of Public Health (SPH) were carried out at the tissue

establishments. These were in conformity with the legislative requirements for periodic re-inspection before renewing the licence as both tissue establishments have a valid licence in place, with that of the Public MDH ART Clinic valid up to 30th April 2022 and that of St James Conception Unit valid up to 19th November 2021.

Re the inspections due as new services were going to be introduced that of non-partner third party donations, at the MDH ART Clinic, the Authority held virtual online meetings with the stakeholders and in collaboration between both Entities that of SPH and EPA.

1.14 Incidents and actions taken

In the last quarter of 2020, the Authority brought to the attention of the MDH ART Clinic an incident that had occurred on a cryopreserved embryo that was thawed and had arrested without the prior approval of the Authority to transfer the embryo and without the necessary consent forms.

The Authority took this incident very seriously and wrote to the Chief Medical Officer under whose responsibility falls the MDH ART Clinic, copying in the Responsible Person of the MDH ART Clinic. In his reply after consultation with representatives of the Clinic, the CMO replied that this was an oversight due to the COVID 19 measures in place.

However the Authority Board did not take this incident lightly and informed the Chief Medical Officer that the Authority strongly feels that the clinic's admission of 'oversight' of an embryo that was thawed and arrested is grave, considering that here we are dealing with substances of human origin, with an embryo with the potential to become a human being. The Authority also stressed the fact that the clinic indicated that this was possibly aggravated by the COVID situation, and insisted that responsibility still remains to see that these events do not happen in any circumstance more and more now when more due diligence should be maintained in these prevailing times.

The Authority insisted that this is clearly not an indication of an oversight, but a clear case of negligence in not following Standards of Operating Procedures and policies, and taking the Authority instructions for granted. The Authority insisted that this was not an embryo transfer, effected after first pickup, but a new cycle making use of cryopreserved embryos that needed approval from the Authority However, this embryo thaw was carried out without a request for Approval to the Authority.

The Authority pointed out to the MDH ART Clinic that more seriously is the fact that in their letter of reply they indicate that Consent Forms by the couple will be signed in their next meeting at the clinic after the procedure was carried out. The Authority insisted that Consent Forms <u>should be signed prior to any procedure and Not after.</u>

In its final reply the Authority informed that it will be debating the imposition of a fine at its next Board meeting and reserved the right to take such further action in terms of the law and Protocol.

Regretfully the Board noted that during the week when the Authority was evaluating this process, another two similar cases occurred at the MDH ART Clinic without the prior approval of the Authority and without consent when both patients were undergoing their third cycle, to this effect the Authority further stressed that these were not merely an oversight as stated by the Clinic but it was intentionally done and thus taking the Authority Governance for granted.

The Board members unanimously agreed that as the above are in breach of the Authority's Protocol Regulatory Principle, the Authority imposed a fine on the MDH ART Clinic of the sum of ten thousand Euros (€10,000-) for this incident. The Authority in its final decision also brought to the attention that as per Protocol Guidance Notes, the Responsible Person is accountable for the overall performance of the Tissue Establishment and should ensure that there are clear responsibilities, roles and systems of Accountability in place to support good governance.

Two other incidents occurred at the private facility wherein two out of the four consultants who feed patients to the St James Conception Unit were in breach of the Protocol and the Embryo Protection Act in the cycles carried out in October 2020.

The first case concerns one of the Medical doctors who performs IVF's at the St James Conception Unit. The Authority received a call from the IVF Lab Manager requesting a reason why permission for IVF was not granted by the EPA Board, when patient was already scheduled for an IVF Pickup by the said consultant the following morning at 7am. The Authority informed the Lab Manager that documentation, results and patient consent to have additional fertilisation had not reach the Embryo Protection Authority from the Consultant. So how could the

Authority approve if it did not know what the patient was consenting to for fertilisation, whether it was two or five oocytes.

The Authority informed St James Conception Unit that, Authority Protocol is very clear on documentation to submit to the Authority and that Article 6 of the Embryo Protection Act clearly specifies that there should be permission from the Authority prior to any procedure. This case was referred to the Medical Council for their attention and necessary action.

The second case concerns another one of the Medical doctors who performs IVF's at the St James Conception Unit. In this case a representative of the consultant who bought the necessary documentation to the Authority office, informed the Board Secretary that a patient who had to undergo a cryopreserved embryo transfer only cycle would be undergoing a fresh cycle with fertilised oocytes as she had been stimulated by the Consultant to fertilise fresh oocytes.

The Board Secretary immediately informed the representative that this was not possible in term of the EPA Act. The CEO of the Authority informed the Consultant that in terms of Article 6B of the EPA Act which clearly specifies that no fresh fertilised oocytes can be created if there are embryos already cryopreserved. The Consultant insisted that the patient was already stimulated and had oocytes to be picked up for fertilisation. The Authority informed the consultant that the EPA could not approve this procedure as this was in breach of the Act. This case was also referred to the Medical Council for their attention and necessary action.

In another instance, the Authority brought to the attention of the MDH ART Clinic that a patient that was prioritised to undergo treatment at the MDH ART Clinic could not be approved by the Authority as the woman who was requesting treatment was legally married and living with her husband, but was requesting treatment with another man. The Authority notified the Clinic that as the women was still legally married to her husband than the child would be registered on the husband's name when the clinic was using the sperm of another man to create the embryo.

The Authority insisted that this is a clear case where the use of an 'unofficial donor' was to take place which is in breach of Article 9 of the EPA Act and this application will not be approved. The clinic informed the couple and a new proper application will be filed with the MDH ART Clinic wherein husband and wife will be the prospective parents and the other male will be registered as a Known donor.

In the last quarter of 2020, the Authority was notified through a telephone call, by a partner of a patient of a same sex couple, who wished to have access to treatment with a sperm donation, that they had already done two intra-uterine inseminations in Malta using donor sperm of a donor who was brought over to Malta in the previous months. The Authority informed this partner that this was illegal as no private clinic was licenced to undergo procedures using donor sperm, which according to the EPA Act need to be registered and donor identification information held. The partner informed the Authority that the medical practitioner informed them not to tell anyone about these procedures, however they anonymously wished to inform the Authority about this. As the partner did not want to release the name of the recipient in this procedure and neither the clinic or medical practitioner undergoing this procedure, the Authority could not take action in this case. It was however unanimously agreed during a board meeting that a letter is sent to all medical practitioners registered with EPA regarding this case.

In late 2020 the Authority was also notified that a complaint had been filed by a couple with the Ombudsman Officer against the MDH ART Clinic, in relation to the conduct, treatment received, action and/or inaction of the ART Clinic personnel in regards to the couples treatment procedure. The couple are requesting redress and the Ombudsman to conduct an investigation. The file is currently being processed by the Ombudsman's office.

1.15 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. The CEO was also in constant contact with the Chief Medical Officer's office to advice on other matters and especially on the amendments required to the NHS eligibility criteria, which came into effect in 2020 through DH68/2020.

Authority personnel have also attended several Conferences online 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. Online 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 online 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 was made available by first quarter of 2020 for user testing and any re-work necessary on the system. Final implementation of the system and issuing of software licences as well as data migration was ready by end of 2020.

This high-end software system for the Electronic Exchange and filing of Assisted Reproductive Technologies (EEART) that meets the current and also future requirements of the Embryo Protection Authority to link the said Regulatory Authority with all ART Registered Clinics both public and Private.

This project of €100K+ investment provided from local funds under the Ministry for Health, included the development of tailor made software according to the Maltese Legislation regulating the ART Sector and will be handling all applications for treatment, approvals for additional fertilisation, oocyte and sperm collection, fertilisations, embryo transfers, gamete and embryo storage, pregnancies and life births, and embryo adoption, all to be filed online.

It will also provide for the handling of Intra-Uterine insemination procedures, as well as the cryopreservation and storage of gametes and embryos for patients prior to receiving oncology treatment for preservation of fertility for future use. The system provides also for the movement of gametes and embryos between tissue establishments in Malta as well as the distribution of gametes and embryos to and from foreign clinics.

This system also features, as required by the EPA Act, the keeping of registers of all assisted reproductive procedures carried out in Malta. It also supports the encryption of donor identity data which will be held at the Authority and will only be released if the donor conceived child requests this information on attaining age of majority.

This project will also enable real time statistics on the events being held in the ART field in Malta. It is currently installed at two Tissue Establishments and two ART Storage banks as well as ten clinics registered with the Authority. It also supports the possibility of including other clinics who will opt to offer ART services in the future.

Prior to launching of this project all staff at the Embryo Protection Authority as well as the staff at all the clinics were provided with adequate training and a user manual of the EEART system.

On the launch of the EEART system, the CEO of the Authority Ms Simone Attard, thanked her staff, a very small team, who worked literally round the clock to make this project possible and inputted over 6000 transactions in the system, so that all the procedures which were manually documented since the Authority was established in 2013, are now also accessible through the EEART system. As of 2021 all procedures will be filed online.

The Embryo Protection Authority, through its Chief Executive Officer , during 2020 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. The changes came into force by Legal Notice 263/2020.

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 2020, the Authority was also requested to give its feedback regarding the launch of the 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. Online meeting was held with the transgender clinic on way forward.

The Chief Executive Officer attended 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 2019 - 2022 Annual Report for September 2019 to September 2020 wherein it was mentioned that the EPA Authority had revised its protocol in line with SOGIGESC. In 2020, several enquires were made to the Authority for cryopreservation of gametes prior to transitioning process and receiving of hormone therapy.

One of the functions of the EPA is to see that all prospective parents receive clinical counselling. During 2020, the Chief Executive Officer, who is also a warranted

Counsellor, 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 May 2020, 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 Chief Executive Officer to contribute to the Journal of Fertility Counselling. Previous articles were also 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 2020, 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 20th April 2020, laid on the Table of the House of Representatives EPA's Audited Accounts for 2019 and Financial Estimates for 2020, together with the Authority's Annual Report for 2019. A Parliamentary debate on the Authority's finances and work was held in one sitting on Wednesday 6th May 2020 and a vote taken in plenary on Wednesday 20th May 2020.

FERTILITY TREATMENTS IN MALTA FOR 2020 – 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 12th February 2021.

Article 22 of the Embryo Protection Act, which came into force on 1st October 2019 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 to date.

Throughout 2020, although with all the restrictions of the pandemic, the Authority has received and **approved** a total of **Four hundred and eighty applications (483**) just 30 applications less than the previous five hundred and thirteen (513) applications recorded for 2019. These approvals were issued for different procedures carried out by clinics in both the private and public sector. These were divided into **two (2)** approvals for **Oocyte cryopreservation cycle** where oocytes were retrieved and cryopreserved only on prior approval by the Authority due to medical reasons prior to receiving oncology treatment so no IVF procedure was carried out following the retrieval. Another **one (1)** approval was issued to the private tissue establishment for **Oocyte cryopreservation cycle** for social freezing reasons. These requests were made by **three single women**. Another **one hundred ninety (190) applications** were approved for **Fresh oocytes treatment cycles** by **187 heterosexual couples** as three couples had more than one approval. Here an increase of applications was registered over the previous year. Only **three (3) applications** were filed and approvals were granted for **Thaw oocyte treatment cycles** carried out by **three (3) heterosexual couples.** This has registered a 78.57% decrease in the applications for thaw cycles mainly as MDH ART Clinic did not undergo any oocyte thawing processes. **One hundred and seventeen (117)** approvals were issued for **Intra Uterine Inseminations** using partner sperm to **82 heterosexual couples.** A total of **sixty six (69) Cryopreserved / Thaw embryo treatment cycles** were approved for 64 patients in which a frozen embryo or embryos were transferred, here again an increase was registered over 2019. **Ninety six (96)** sperm cryopreservation were approved for **ninety (90) males.**

Finally a further **six (6)** approvals were granted to transfer gametes and embryos between tissue establishments. **Two (2)** approvals where granted to **two heterosexual couples** to transfer oocytes between Maltese Tissue establishments, **one (1)** further **heterosexual couple** was approved transfer of sperm between

Maltese Tissue establishments, whilst **one (1)** approval was issued to **one heterosexual couple** to transfer embryos from the public to the private tissue establishment. Another **one (1)** approval was granted to transfer sperm from abroad to Malta. This approval was issued to **one single male.**

Thus during 2020, the Embryo Protection Authority approved procedures for 340 heterosexual couples, 3 single women and 91 males. An increase in all sectors over 2019.

2.2. Intra Uterine Inseminations

Since the Authority was established in 2013, this is the second 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 2020, only IUI's with partner sperm were being performed, as although the public tissue establishment had a licence to process, distribute and make use of transfer of donor sperm no procedures were reported to the Authority. Local direct non-partner donation was also allowed at MDH however again 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, and during 2020 another three registered with the Authority bringing the total to eleven clinics that are registered to perform IUI's with partner sperm.

In May 2020 MDH ART Clinic was licenced to perform IUI's with donor sperm also.

Due to the pandemic, out of the eleven clinics registered with the Authority, six clinics informed the Authority that they had suspended treatment with IUI and thus had nothing to report for 2020, one other clinic did not submit data to the Authority. Thus IUI reporting is for four clinics registered with the Authority. A total of 117 Intra Uterine Inseminations have been reported to the Authority as carried out up to end of 2020.

Forty six (46) IUIs or 39.32% of total IUIs were carried out at the MDH ART Clinic, followed closely by forty four (44) IUIs or 37.61% of total IUIs were carried out at Veduta Clinic, fifteen (15) other IUIs were carried out at Tal-Virtu Clinic amounting to 12.82%, whilst the remaining twelve (12) IUIs were carried out St James Hospital. It is to be noted that whilst at MDH ART Clinic IUI procedures were suspended between the months of April and September, the private clinics continued offering their services to the patients. (Figures 1 and 2).

Figure 1 - IUI distribution per clinic

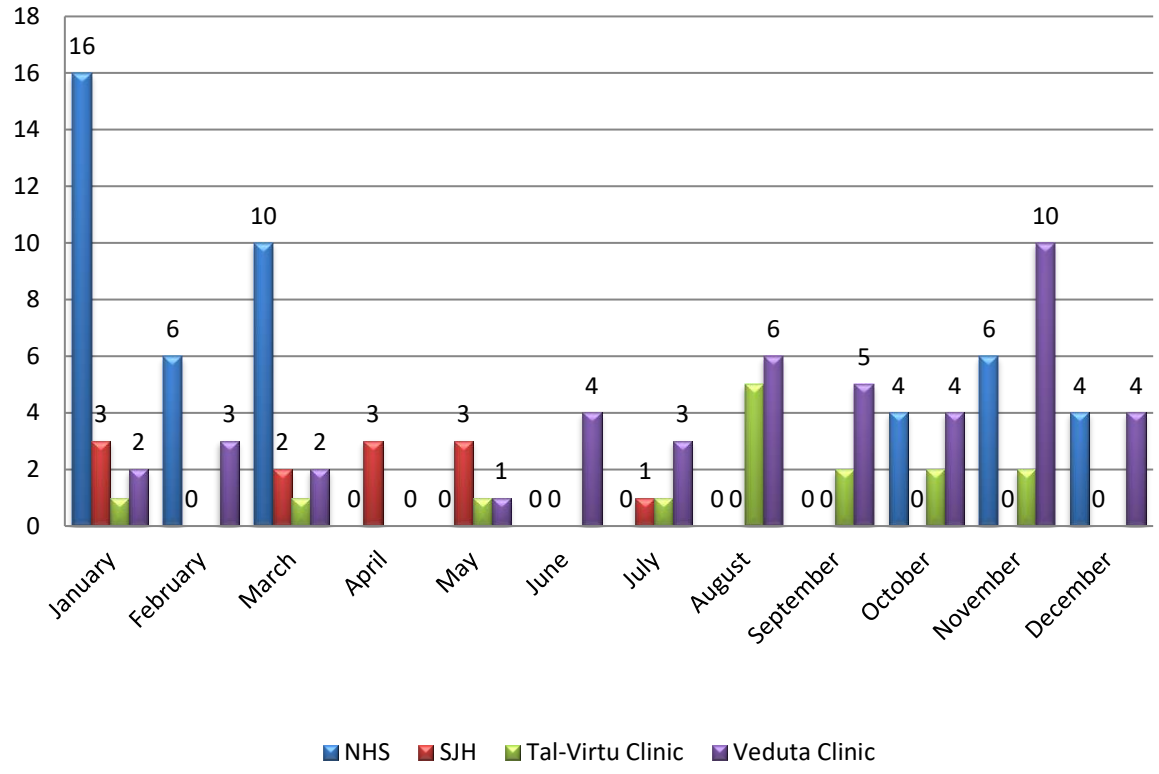
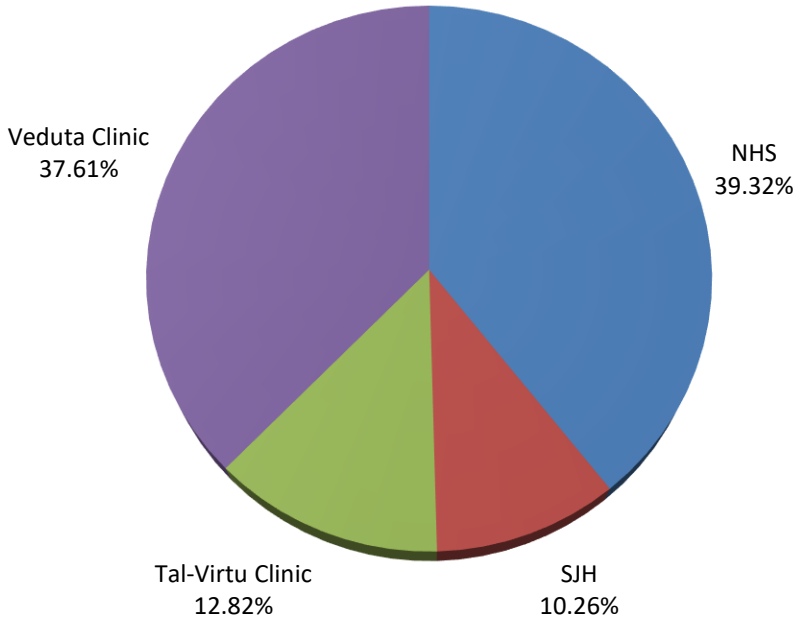


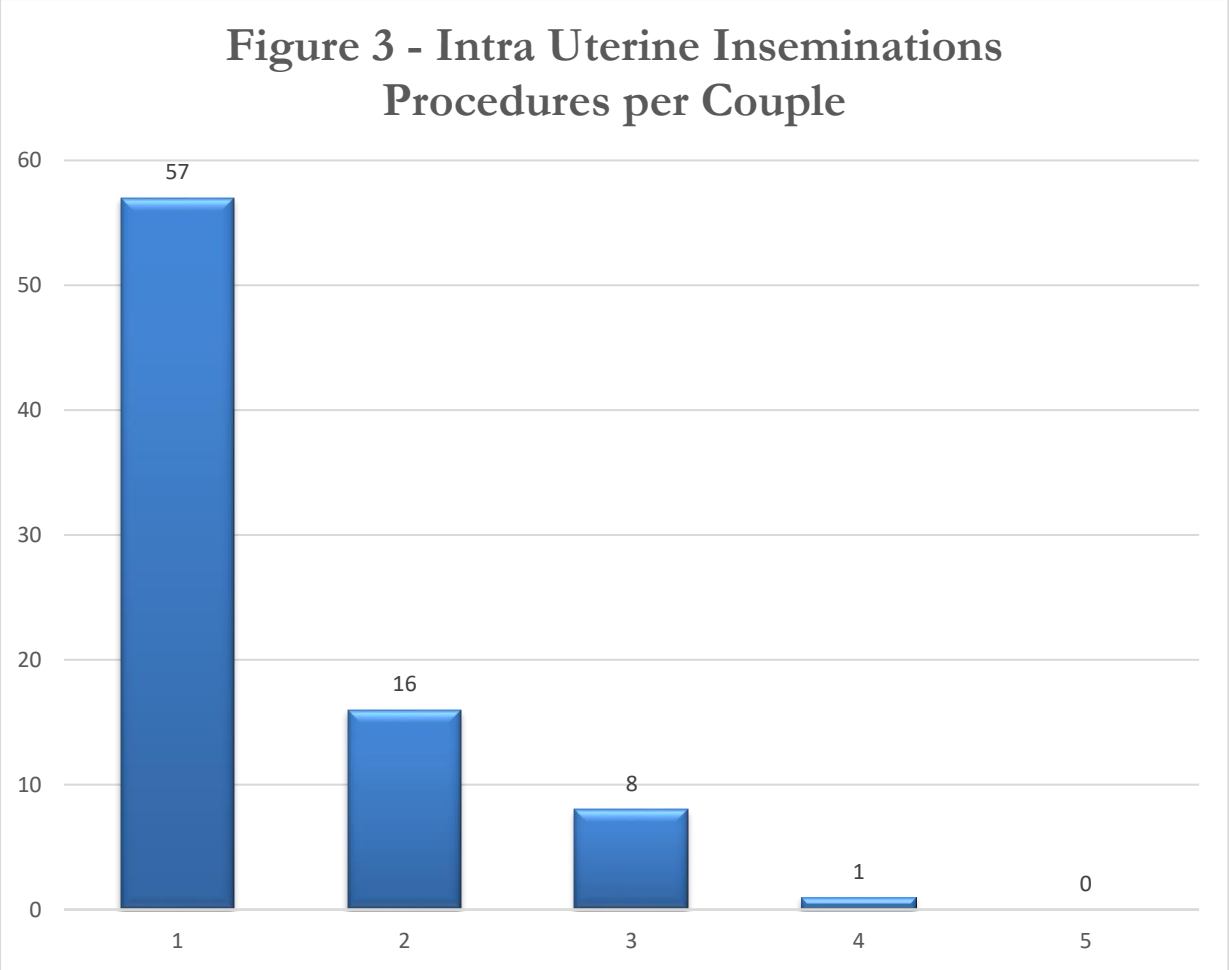
Figure 2 - Distribution of IUI by Clinic



The 117 IUI's were carried out by 82 heterosexual couples using partner sperm. The procedures were undertaken by women aged between 18 and 48 years, whilst the male partners were aged between 25 and 59 years.

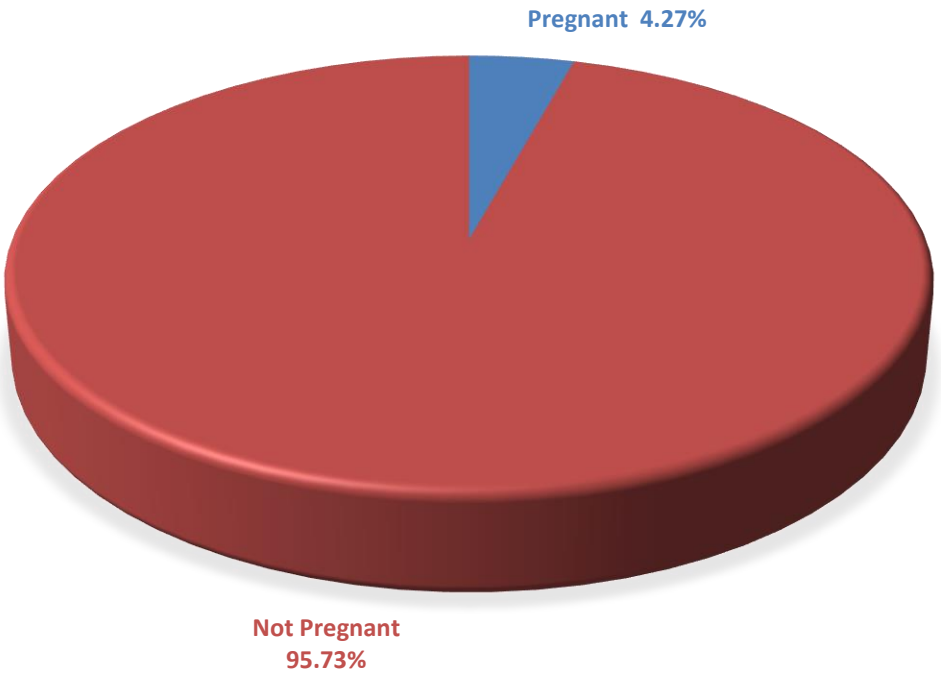
The majority of couples fifty seven (57) had undergone one session of IUI during 2020, followed by fifteen (15) couples who underwent two sessions in the same year at the same clinic. Seven (7) couples were reported as having 3 IUIs at the same clinic during 2020. One (1) couple was reported as undergoing one session of IUI at MDH and one at Veduta Clinic. Another one (1) couple had undergone two sessions of IUI at MDH and one IUI at Veduta Clinic. One (1) couple were reported as undergoing 4 sessions of IUIs in one calendar year, twice at MDH and twice at Veduta Clinic.

Contrary to what was reported in 2019, this year the majority of IUIs 60.68% were carried out in the private facilities whilst only 39.32% were carried out in the public facility. This contrasts with figures of 2019 wherein last year 68% of the IUIs were carried out on the NHS.



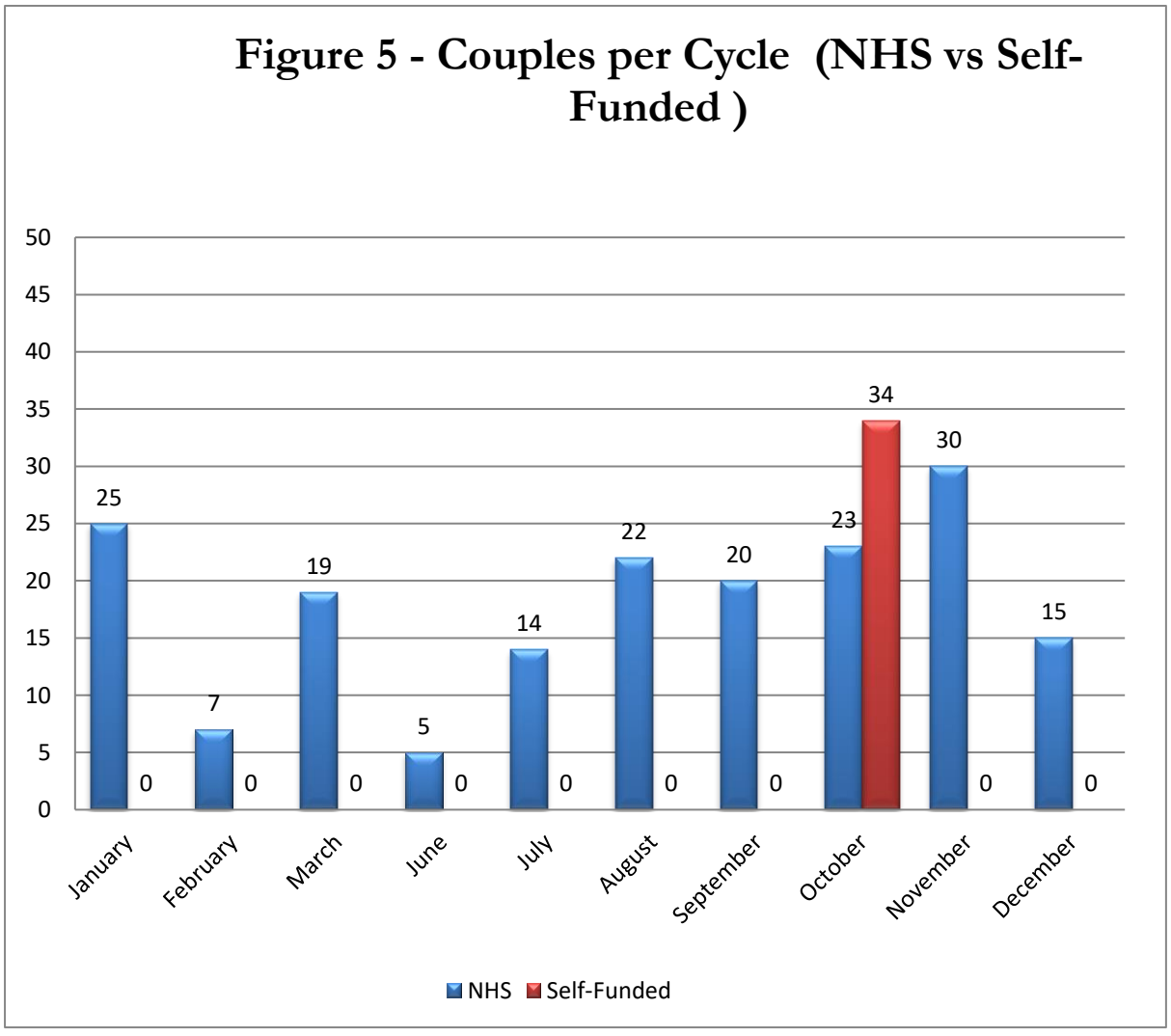
It is well known that Intra Uterine Insemination procedures are less successful than the more invasive IVF/ICSI procedures. Infact out of the 117 cycles carried out, only five (5) pregnancies were reported, four (4) at the MDH ART Clinic and one (1) at Tal-Virtu Clinic. Three woman have delivered four live births resulting in a set of twin and two singletons, whilst the two other women are still expecting to give birth. Thus from data submitted to the Authority up to end of 2020, success rate for IUI's using partner sperm is only of 4.27% a drop of 0.35% from the 4.62% reported in 2019. (Figure 4).

Figure 4 - Intra Uterine Inseminations Pregnancy Success Rate



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

One hundred and eighty (180) procedures (not treatment cycles) have been carried out at the ART clinic in Mater Dei Hospital (MDH), and thirty four (34) procedures were performed in the private sector at the Assisted Conception Unit in St James Hospital, thus a total of 214 procedures were carried out in Malta (Figure 5).



The number of ART procedures carried out in Malta in 2020 increased by 32.92% over the previous year, which is mainly attributed to the fact that in 2019 less procedures were carried out at the MDH clinic as the clinic had stopped activity for five months. The private clinic registered a decrease of 13 procedures over procedures carried out in the private clinic in the previous year. However, one is to note that while in 2019 the private facility had undergone 47 procedures spread over 3 batches of IVF's, in 2020 the 34 procedures were all carried out in one batch in October 2020.

One also has to point out that the 34 procedures carried out at the private facility are now being held by four feeder clinics an increase of two feeder clinics over 2019. As at 2019 at the St James Conception Unit procedures of patients of St James Hospital and patients of St Claire's Medical Services were being carried out. In 2020 the addition of procedures of patients of Veduta Clinic and Melody Clinic were added to the St James Conception Unit.

Out of the thirty four (34) procedures carried out in 2020 at the private clinic, one case was prior approved to be a 'freeze all oocytes cycle' for social reasons. Two other cases were reported as a risk of Ovarian Hyperstimulation (OHSS) after fertilisation of the oocytes were carried out thus all embryos had to be cryopreserved. One other couple had all their oocytes cryopreserved due to the fact that on the day the partner did not provide a sperm sample. Thus thirty (30) 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 eighty (180) procedures carried out, two were prior approved 'freeze all oocytes cycle' oncology cases, thus one hundred and seventy eight (178) could lead to a treatment cycle. However one other couple had all their oocytes cryopreserved due to the fact that on the day the partner did not provide a sperm sample. Due to COVID-19 measures eleven (11) couples had all their embryos cryopreserved for later use so these cycles could not result in a pregnancy.

In fifty one (51) 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 fifty one cycles had to be cryopreserved. This led to the fact that at MDH ART Clinic only one hundred and fifteen (115) cycles resulted in completed treatment cycle from which a pregnancy could result.

2.4. First Time/Repeated Cycles

Out of the 211 cycles carried out, patients reported a range of up to eight attempts of IVF. The majority, 47.4% of couples (100 couples) were undergoing the IVF/ICSI procedure for the first time. There were 28.4% of couples (60 couples) who were undergoing the cycle for the second time, 13.3% of couples (28 couples) for the third time, 5.7% of couples (12 couples) were undergoing their fourth attempt, 2.8% of couples (6 couples) were undergoing their fifth attempt, 0.9% of couples (2 couples) had undergone their sixth attempt, another couple had undergone their seventh attempt whilst another two couples had undergone their eight cycle.

These figures show an increase in the number of attempts, couples are ready to go through to achieve a pregnancy, as those reported for 2019 had shown couples going for a maximum of six attempts. One also notes the increase of 4.3% in couples undergoing their third attempt and in those undergoing their fifth attempt with an increase of 1.5% over last year's figures. Note worthy is also the fact that there was a considerable decrease of 7.7% of couples undergoing their first attempt at an IVF cycle. (Figures 6 and 7).

Figure 6 - ART Cycles per Couple - NHS vs Self-Funded

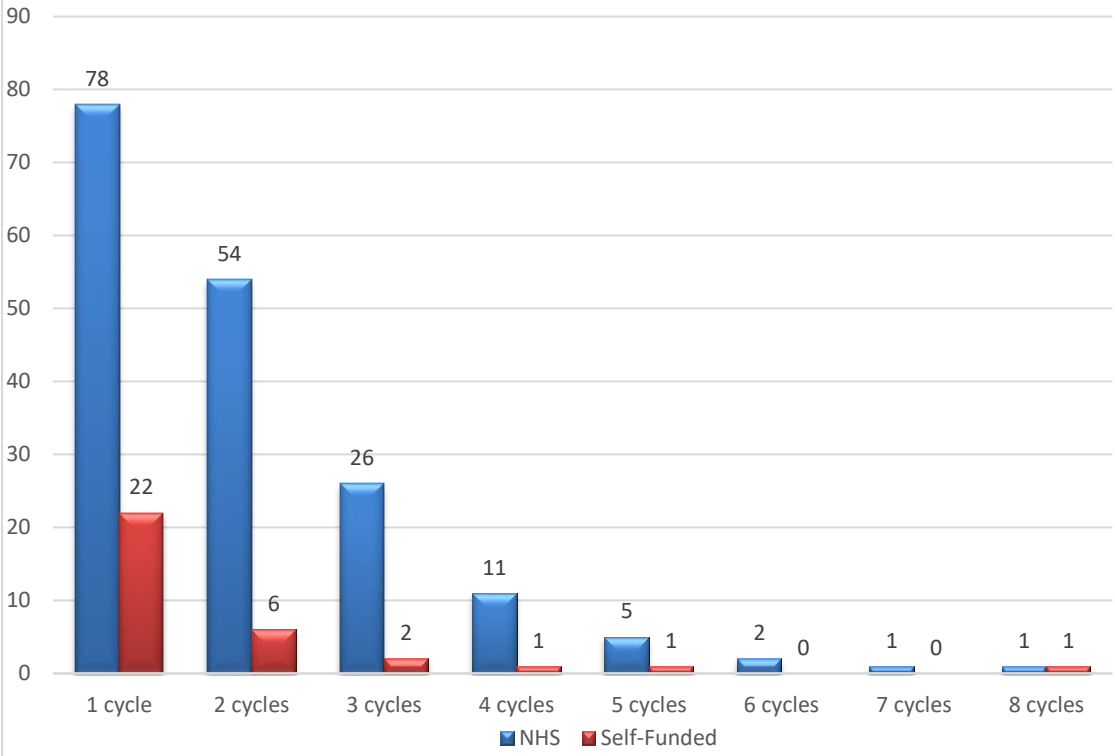
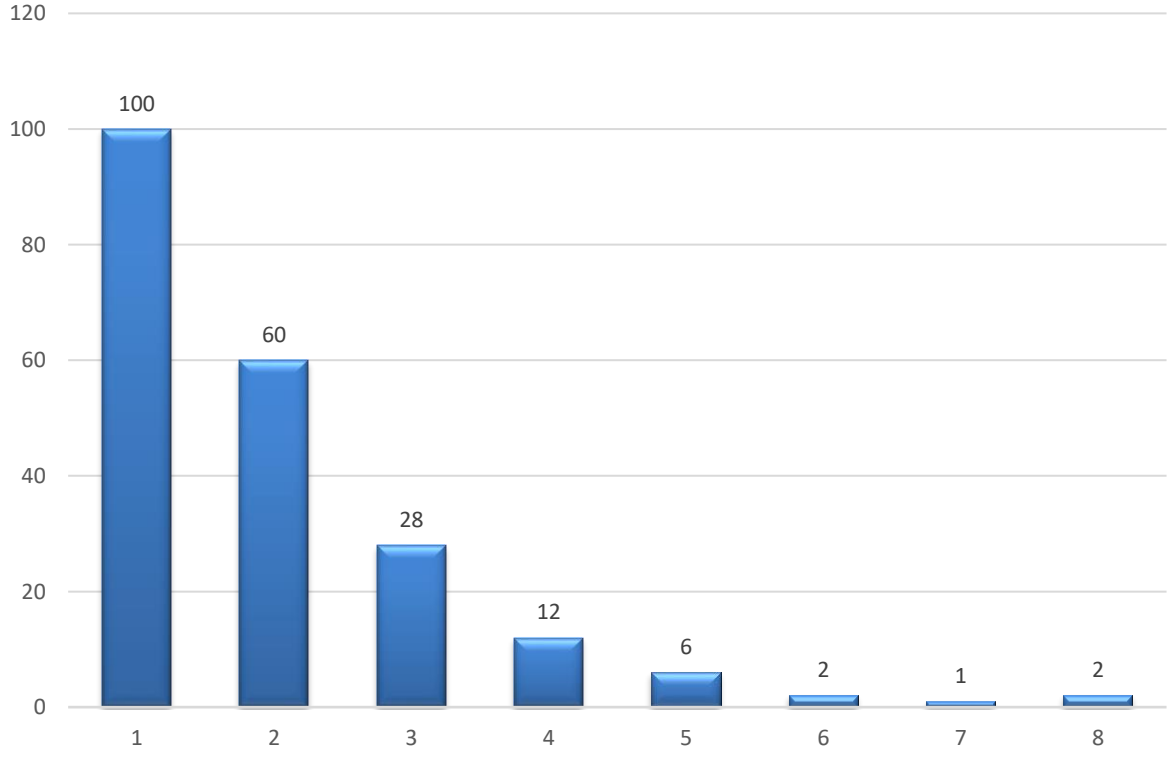
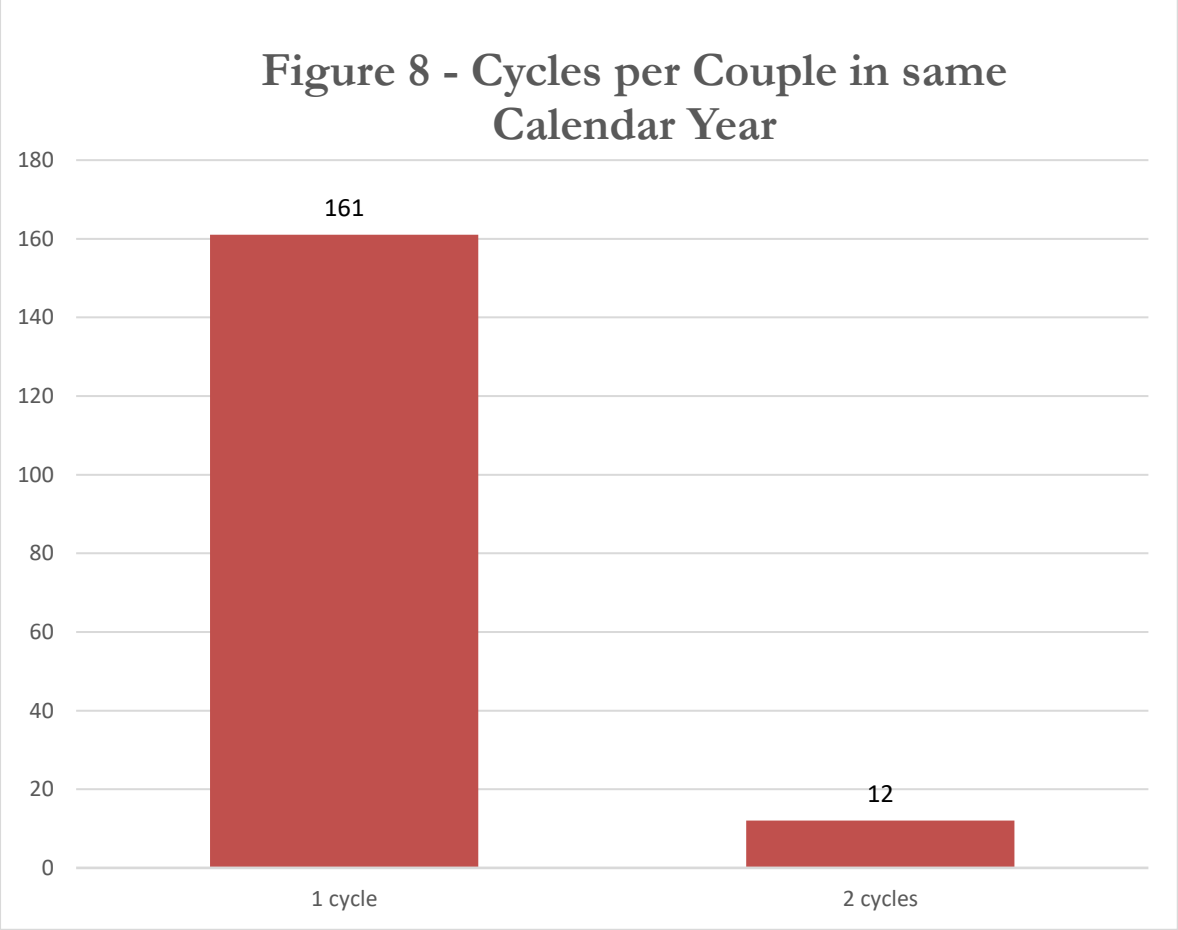


Figure 7 ART Cycles per Couple



During the same calendar year in 2020, there were 161 couples who had undergone a single cycle (26 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 at the same facility and two couples who did one procedure at one facility followed by another procedure at the other licenced clinic during the same calendar year. Thus, these 211 procedures were undertaken by 173 couples (Figure 8).

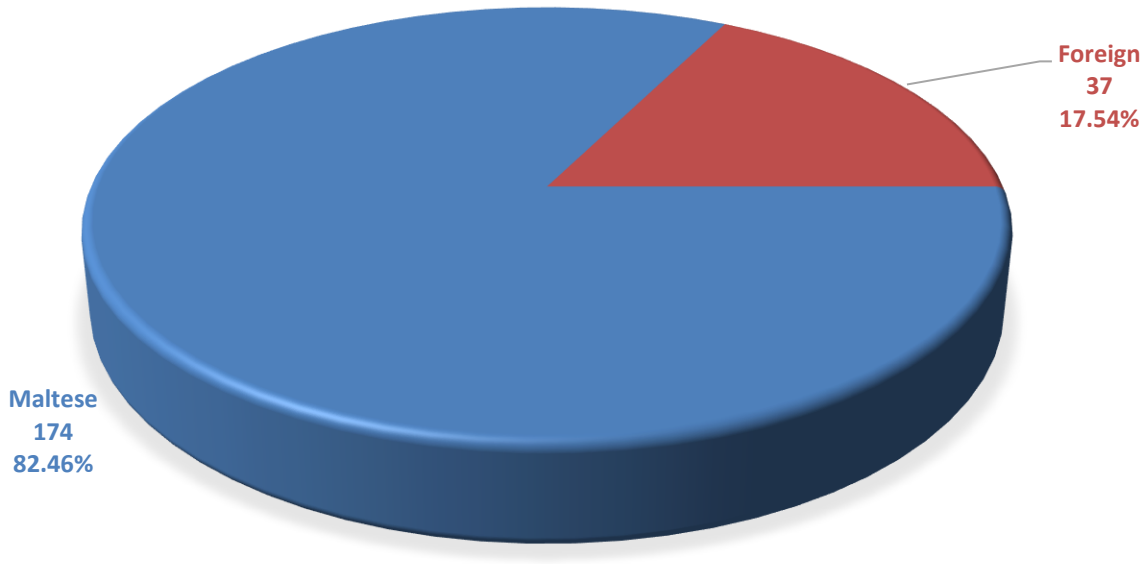


3. DEMOGRAPHICS

3.1. Nationality

Out of the 211 cycles performed this year, all were undertaken by Maltese Residents of different nationality. There was no foreign couples (non-Residents) who came to Malta specifically to perform the IVF/ICSI procedure in the private sector. This is in contrast with last year wherein the private sector had reported one Medical Tourism procedure 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 Philippines, China, Libya, Malaysia, Hungary, Ghana, Ivory Coast, Romania, England, Sweden, Scotland, Morocco, Italy, Ukraine, Germany, Serbia, India, Poland, Pakistan, Kuwait, Syria and Jamaica. These amounted to 37 out of the 211 cycles carried out, thus a 17.54% of cycles carried out, an increase over 2019, where 15.38% of cycles were reported. (Figure 9).

Figure 9 - Maltese and Foreign Residents



3.2. Regions

As reported in previous years, the overall majority of couples 42.06% (90 couples) who had undergone IVF/ICSI procedures in 2020 reside in Central Malta, followed by 36.92% (79 couples) who reside in Southern areas of Malta, 12.15% (26 couples) reside in the Northern part of the island, while the remaining 8.88% (19 couples) reside in Gozo. These figures show an increase in couples from Gozo and couples from the Southern part over last year's figures. This was reflected in decrease by the couples residing in the Central part of the island (Figures 10, 11 and 12).

Figure 10 - Distribution by Region - NHS

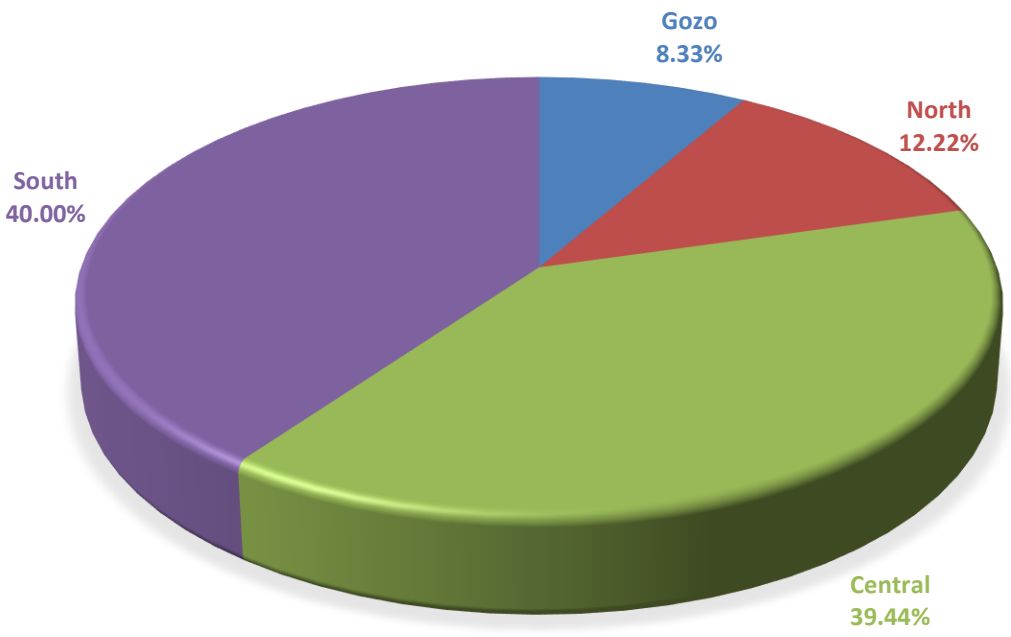


Figure 11 - Distribution by Region - Self-Funded

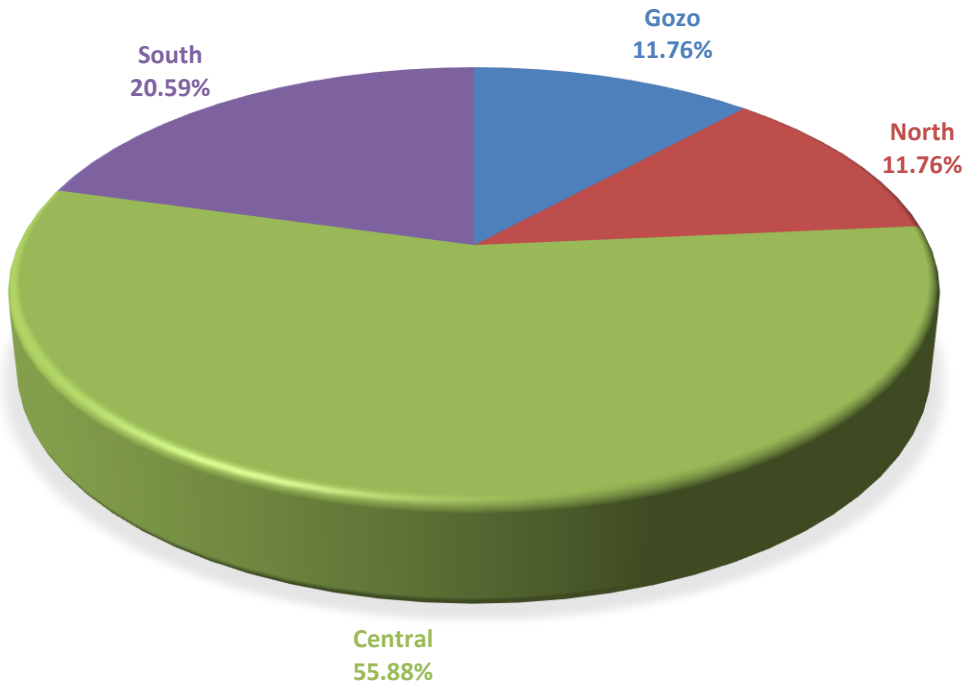
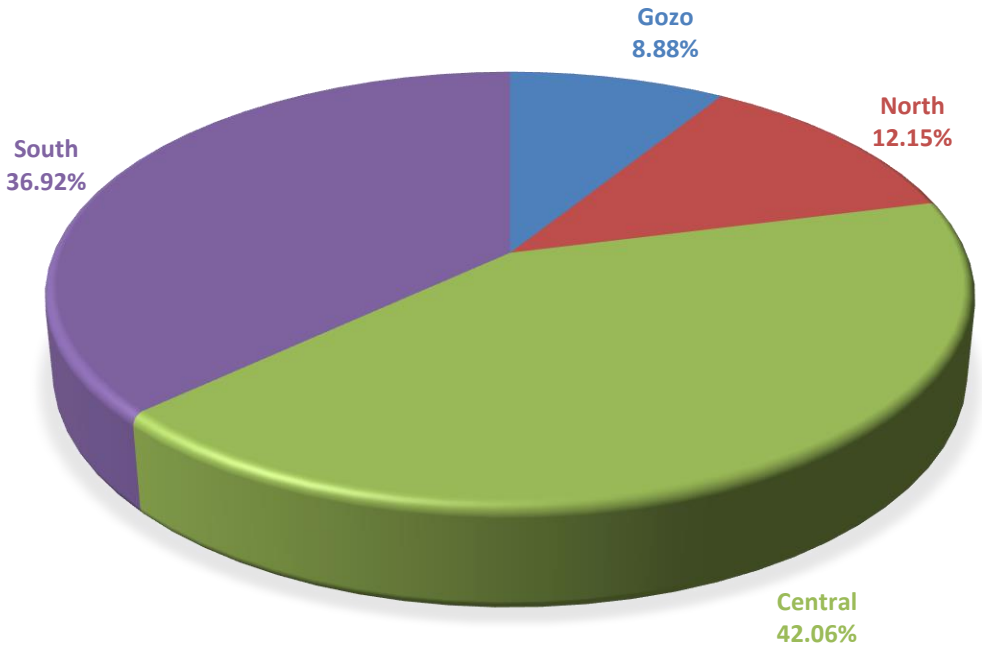


Figure 12 - Distribution By Region

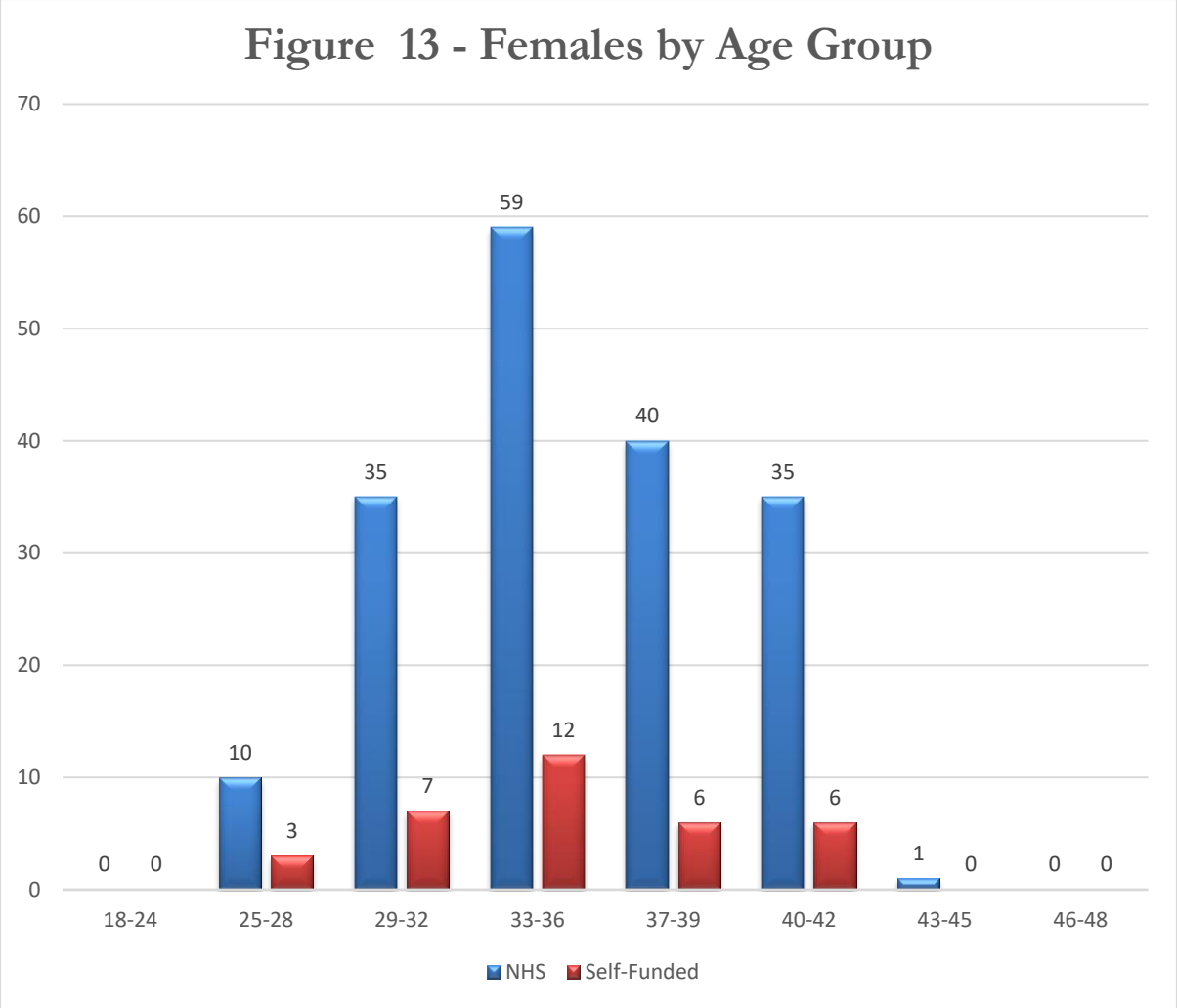


3.3. Maternal Age

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.

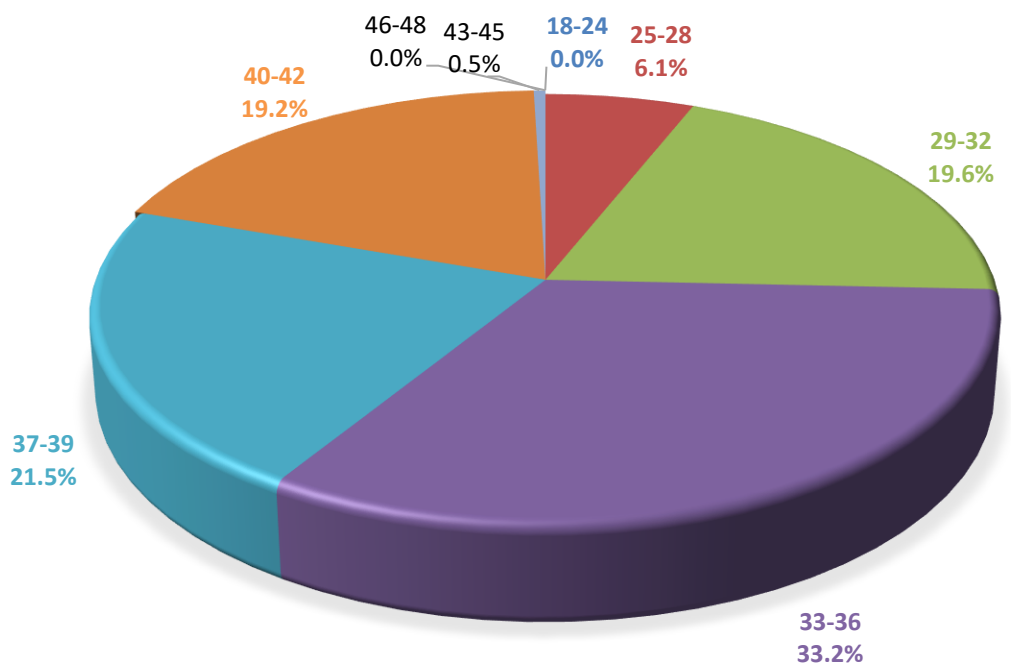
Throughout 2020, all procedures were carried out using own gametes and embryos, but women who had embryo cryopreservation cycles were still much younger than the maximum age of 48. No women aged between 18 and 24 made use of the services.

One woman who made use of the six months extension granted re the COVID-19 measures was aged 43 when undergoing her procedure. There has been a distribution of procedures across all age brackets, as can be noted from the chart hereunder (Figure 13).



As for the past six years, the largest number of female patients, 71 females (33.2%) undertaking procedures throughout 2020 were aged between 33 and 36. The second largest age group following closely was for female patients aged 37-39, 46 females (21.5%), while 42 females (19.6%) were in the 29-32 year old bracket. These were followed by 41 female patients (19.2%%) aged between 40-42, the remaining 13 female patients (6.1%) were aged between 25 and 28 years. One patient who benefited from the COVID-19 extension was 43 years. (Figure 14).

Figure 14 - Females by Age Group (%)

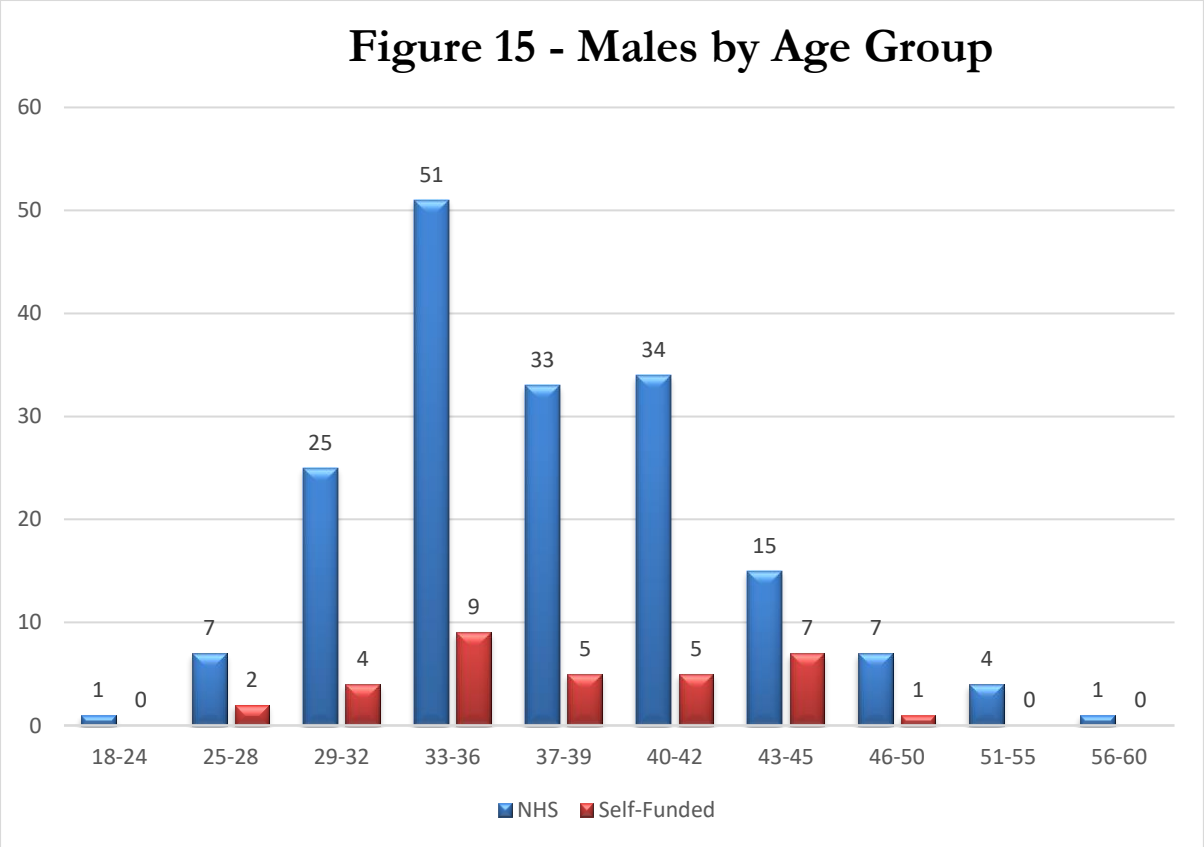


Noteworthy is the fact that in 2020 there has been a drop of 3.2% in the age group of females aged between 25 and 28 years, a drop of 0.9% in the age group of women aged between 29 and 32, a further drop of 2.1% in the age group of females ages between 37 and 39 and a 0.9% in women aged between 40 and 42 years.

Conversely, the age group of women aged between 33 and 36 years registered a large increase of 7.7%. over previous year.

3.4. Paternal Age

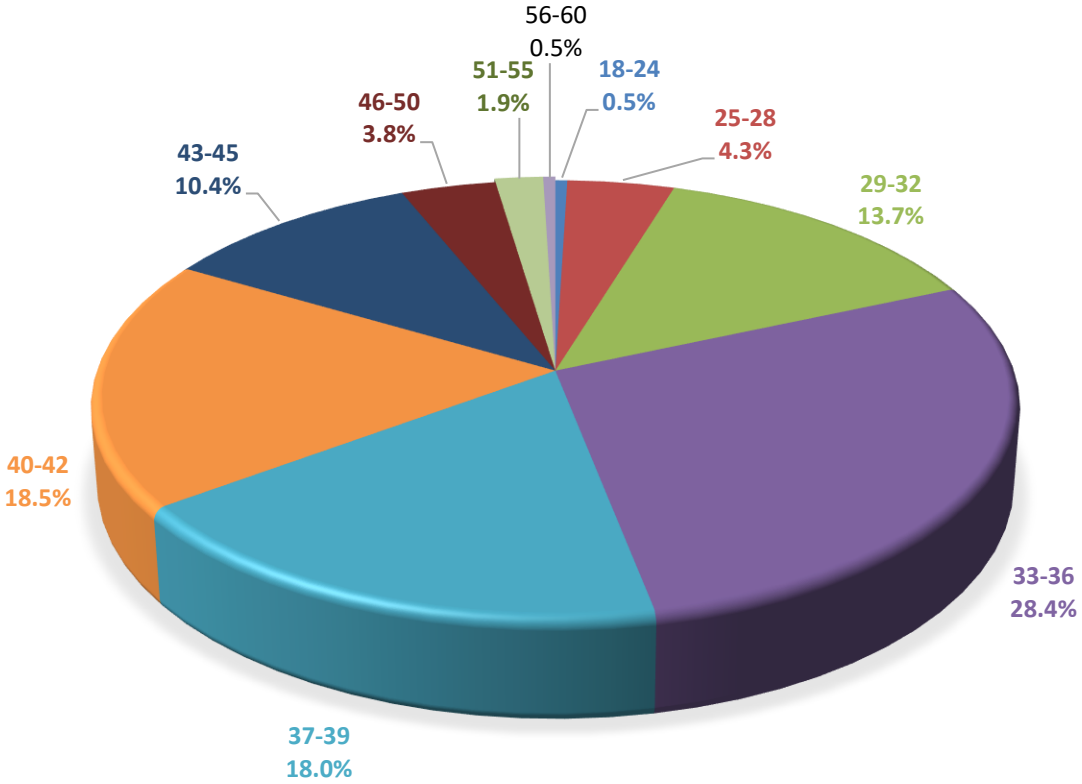
As with the female patients, the largest number of male patients, which amount to 60 males (28.4%) undergoing procedures was in the 33-36 year old bracket, while 39 males (18.5%) were aged between 40 and 43. The third largest age group (18%) consisted of 38 males in the 37 to 39 year old bracket. The age group of males aged between 29-32 years was the fourth largest age group with 29 males (13.7%), 22 other males were reported to be in the 43 to 45 age bracket, while 13 patients (6.2%) of male patients were aged 46 years and over. The remaining 10 males (4.8%) were under the age of 29. (Figures 15 and 16).



Noteworthy is the fact that while in 2017 the oldest male was in the 51-55 age bracket, in 2019 and 2020 the oldest male was in the 56-60 age bracket, with the oldest male being 58 years undergoing a cycle at the public facility. In 2020 there was a significant increase of 5% in the age groups of males aged between 40 and 42 and an increase of 2.1% in the age group between 43 and 45 years. All males over 50 years of age were registered in the public tissue establishment.

There was also a slight increase in the age group of males less than 29 years. Same as in 2019, this year the youngest male is reported to be 24 years old.

Figure 16 - Males by Age Group (%)

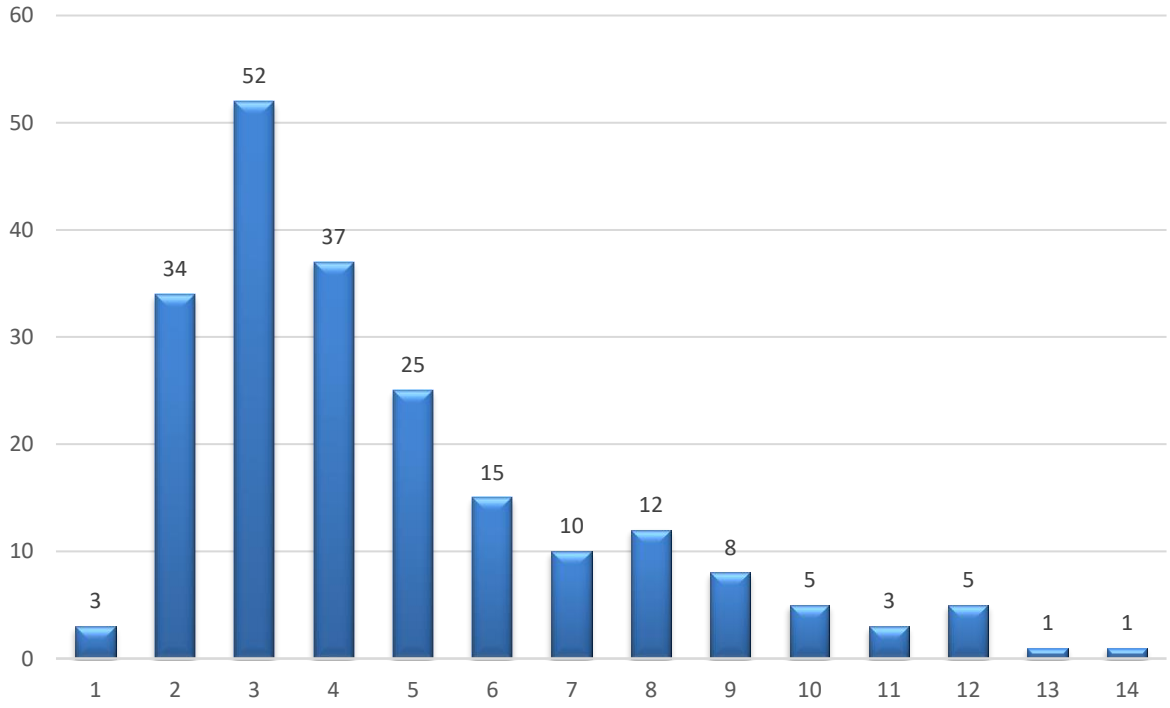


4. INFERTILITY

4.1. Duration of Infertility

There was a significant amount of variability in the reported duration of infertility amid couples undertaking procedures in 2020, with the minimum reported duration being that of one year up to a maximum of 14 years. Noteworthy to point out is that in 2018 and 2019, the maximum duration was reported to be 17 and 15 years respectively. Three (3) couples reported to be infertile for one year only, had undergone treatment at the private sector and self-funded their treatment. Thirty four (34) couples reported to be infertile for two years, fifty two (52) couples for 3 years, thirty seven (37) couples for 4 years, twenty five (25) couples for 5 years, while fifty (50) couples reported to be infertile between 6 and 10 years. Ten (10) couples, double the amount reported in 2019, all undergoing treatment at the MDH ART Clinic reported being infertile between 11 and 14 years. (Figure 17).

Figure 17 - Duration of Infertility (in years)

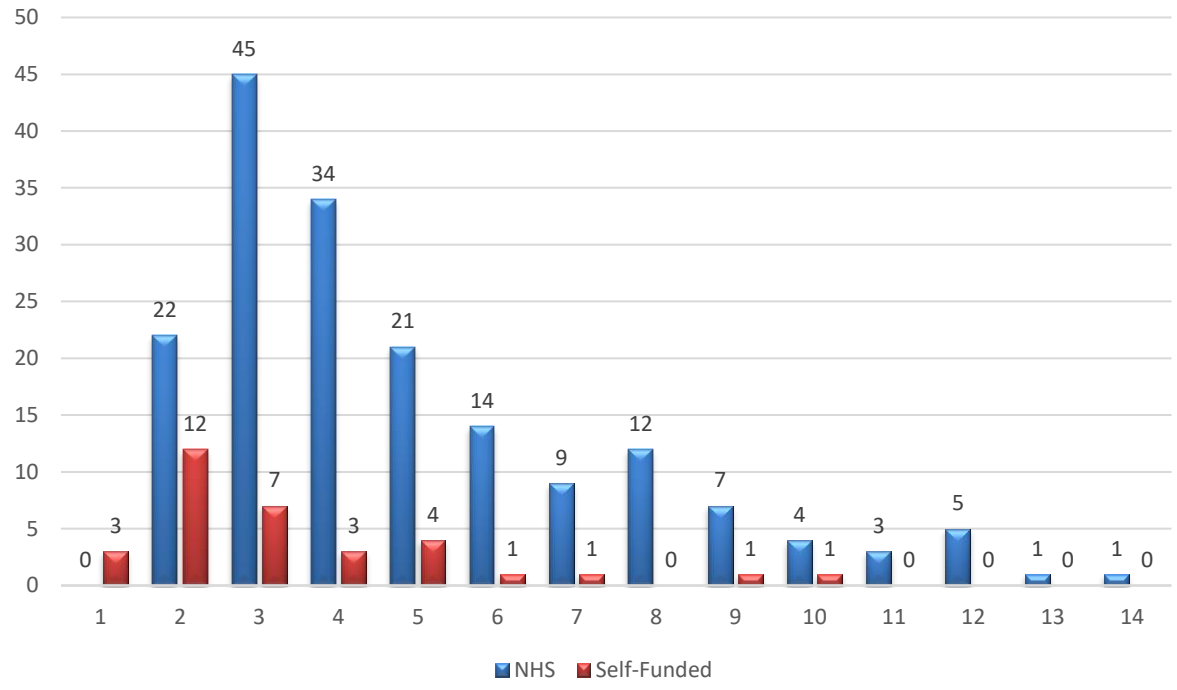


To be eligible for treatment on the NHS, a couple must declare being infertile for at least two years if there is no exceptional case to receive treatment before. In fact, 9.09% of couples who self-funded their treatment declared less than 2 years of infertility, same as in 2019. The majority of couples (66.67%) self-funding their treatment have reportedly been infertile for 2 to 4 years with an increase of 5.31% on the previous year. The remaining 24.24% of couples have been infertile for 5 years or more, in this duration bracket there has been a decrease of 5.31%, which is reflected in the increase in the two to four year bracket. In the figures quoted above the woman who underwent retrieval for social reasons is not included.

Similarly, the majority of couples (56.74%) who applied to undergo IVF/ICSI treatment on the NHS declared being infertile for 2-4 years, registering a 2.35% increase over the previous year. Thirty five (35) couples, or (19.66%), have declared being infertile for 5-6 years, a decrease of 4.04% over last year. Forty two (42) couples (23.60%), an increase of 4.3% over 2019, have been infertile between seven and fourteen years.

Noteworthy is the fact that 122 couples (68.54%) of total couples undergoing treatment on the NHS reported to have been infertile for up to 5 years. This shows a slight increase of 1% over the previous year, wherein 67.54% of the couples had been reported in 2019. In the figures quoted above the two women undergoing oocytes retrieval only, prior to receiving chemotherapy have not been included. (Figure 18).

Figure 18 - Duration of Infertility (in years) NHS vs Self Funded



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).

With the introduction of changes to the EPA Act, couples who had cryopreserved embryos were also added to the NHS entitlement criteria to undergo other treatment cycles that make use of their cryopreserved embryos, irrespective if they already have previous children from the same relationship.

In 2020, one couple who had a child from previous IVF cycles at MDH, and had subsequently undergone a treatment cycle at the St James Conception unit which resulted in cryopreserved embryos applied to have transfer of embryos. Following embryo transfer from one clinic to the other, the patient during 2020 has undergone a cycle at MDH ART Clinic using the cryopreserved embryos, thus this couple become the first couple who had already had children from the same relationship to undergo treatment on the NHS.

The majority of couples, 188 couples (89.10%) who have applied for IVF/ICSI treatment in both the NHS and private sector in 2020 suffered from Primary Infertility, an increase of 8.33% over 2019.

Noteworthy is the fact that 3 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 1.42% of couples undergoing treatment in 2020.

The total of couples who reported secondary infertility in 2020 has decreased to 23 couples or 10.83% of couples undergoing treatment, a decrease of 8.40% over 2019. (Table 1).

Table 1. Classification of Infertility

Classification of Infertility	NHS	Self-Funded	Total	%
Primary	160	28	188	89.10%
Secondary - Child from Same Relationship	1	3	4	1.90%
Secondary - Female has child from Previous Relationship	16	2	18	8.53%
Secondary - Male has child from Previous Relationship	1	0	1	0.47%
Secondary - Both Partners had children from Previous Relationship	0	0	0	0.00%
Total	178	33	211	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 19 and 20, the majority of couples (40.8%) undertaking IVF/ICSI procedures suffered from Female factor only infertility. These were followed by couples (32.2%) suffering from Male factor only and followed by the couples (17.1%) suffering from Female and Male factor while the remaining 10% suffered from idiopathic infertility.

Noteworthy to bring to attention is the fact that in 2020, there was a significant increase of 9.1% in the group of patients who reported Male factor only and an increase of 3.6% in the group of patients who reported Female factor only infertility over the figures reported in 2019.

There was also reported a significant 11.1% decrease in the group of couples who suffered from Female and Male infertility and a slight drop of 1.5% of couples with idiopathic infertility over figures reported in 2019.

Figure 19 - Indication for Infertility Factors NHS - Self funded

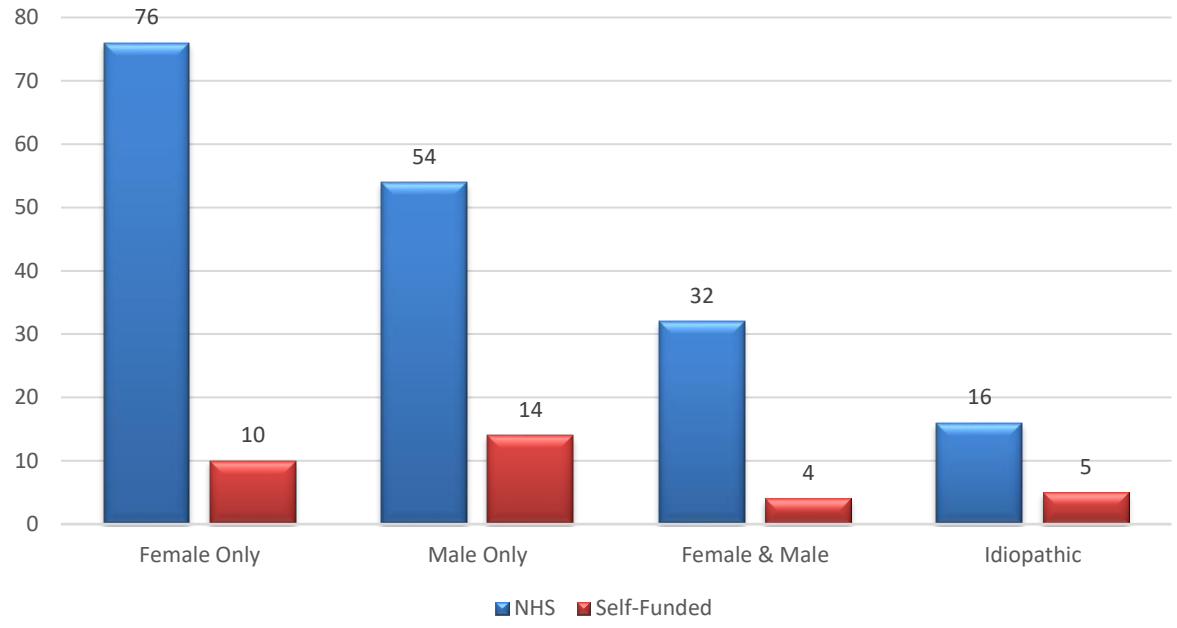
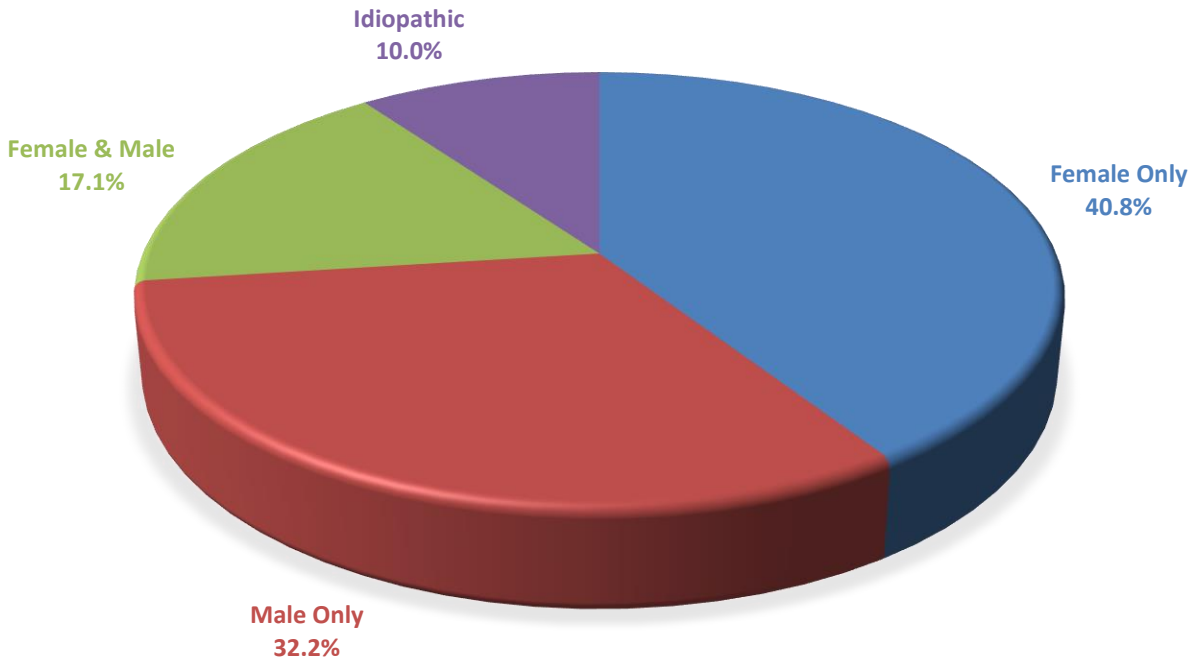


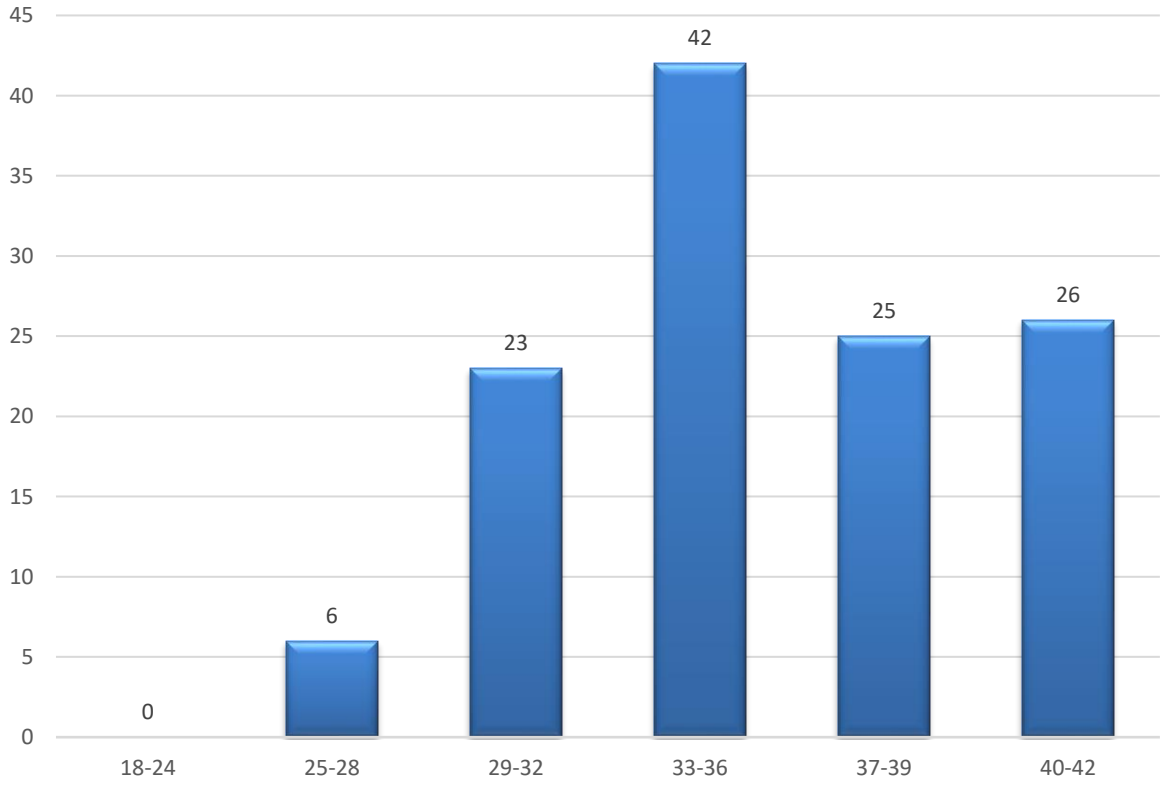
Figure 20 - Indication for Infertility Factors (%)

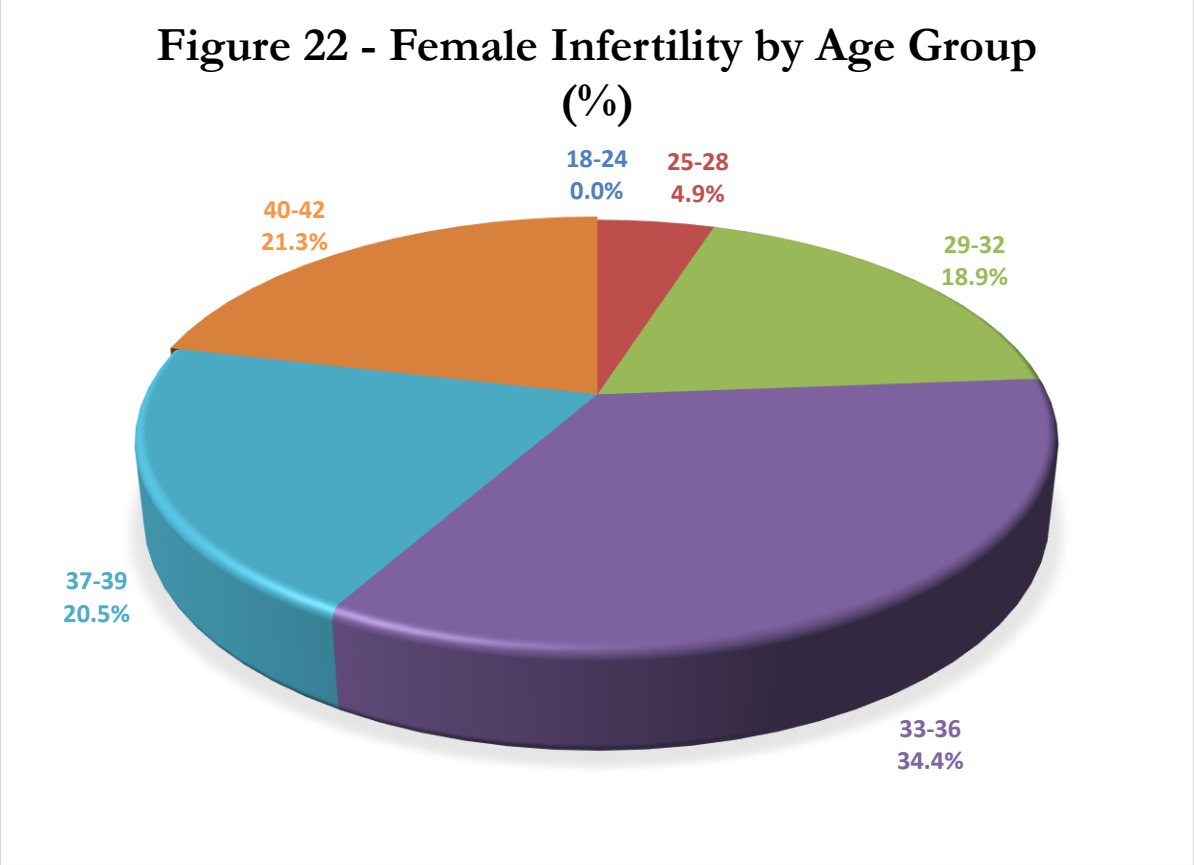


From those couples suffering from Female factor infertility, the largest group (34.4%) were in the 33-36 year old bracket, this age bracket has registered a significant increase of 10.9% over the figures of last year. This is followed by the age group of 37-39 year old females at 20.5%. This age group has suffered a 7% drop over figures reported for 2019.

Another drop was registered in females aged between 25 and 28 years who only registered 4.9% compared to the 7.8% of 2019. The age group brackets of females between 29-32 years and the age group of females between 40-42 years were in line with figures reported in 2019 (Figures 21 and 22).

Figure 21 - Female Infertility by Age Group





From those couples suffering from Male factor infertility, the largest group (32.4%) were reported in the 33-36 year old bracket with an increase of 2% over previous year figures, this age group has been registering increase year over year. This is followed by males in the 29 to 32 age bracket at 18.1%. A significant increase of 4.4% was registered in the males aged between 40-42.

Noteworthy is the fact that we have seen an increase of Male Factor infertility where the male partner of the couple is over 40 years of age, this has increased by 5.4% from 24.1% reported last year to 29.5% for 2020. (Figures 23 and 24).

Figure 23 - Male Infertility by Age Group

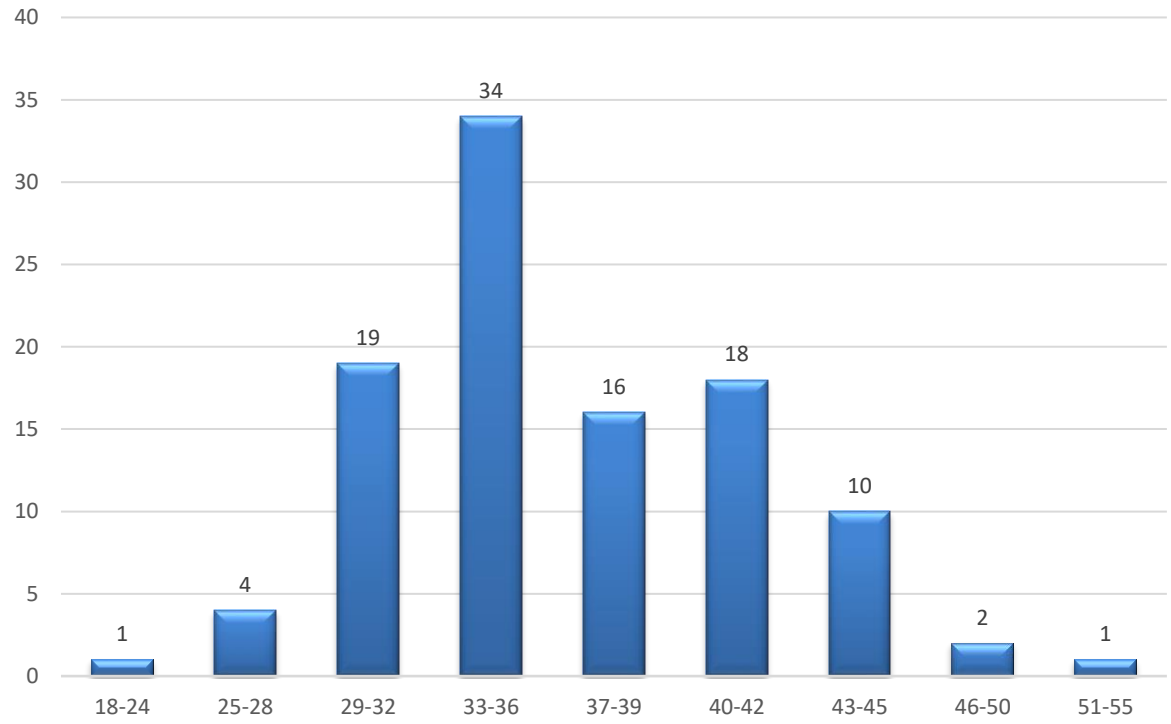
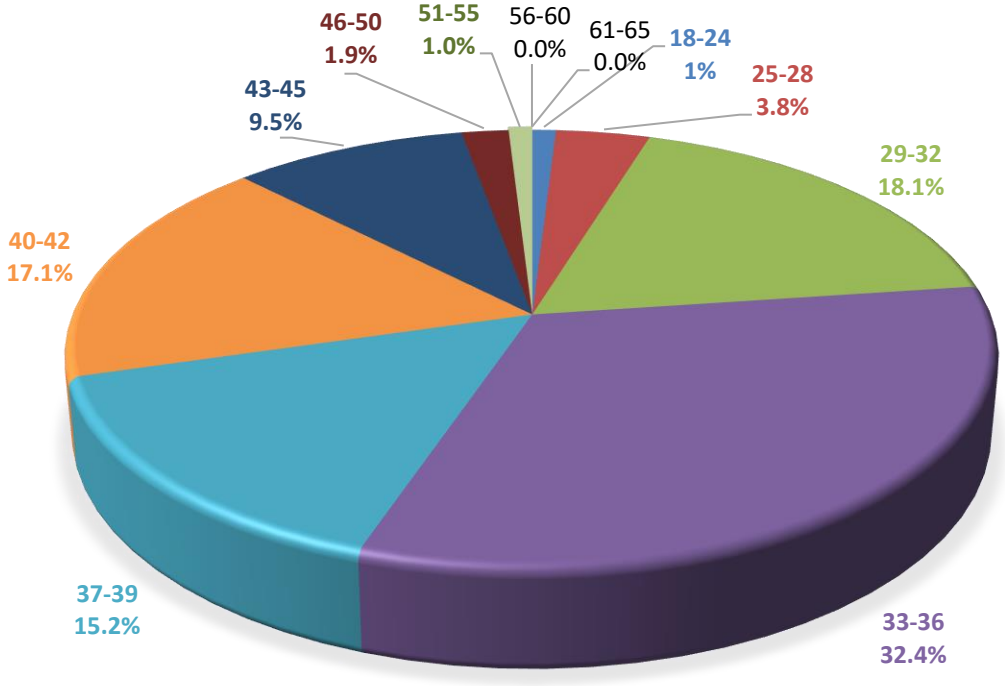


Figure 24 - Male Infertility by Age Group (%)



5. LIFESTYLE INDICATORS

5.1. Body Mass Index

For the third 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. It is the Authority's intention that in the coming months it will introduce a fertility education campaign aiming to raise awareness regarding the different factors effecting fertility with BMI being also in mind and to promote a healthy lifestyle that could help in achieving a pregnancy.

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.

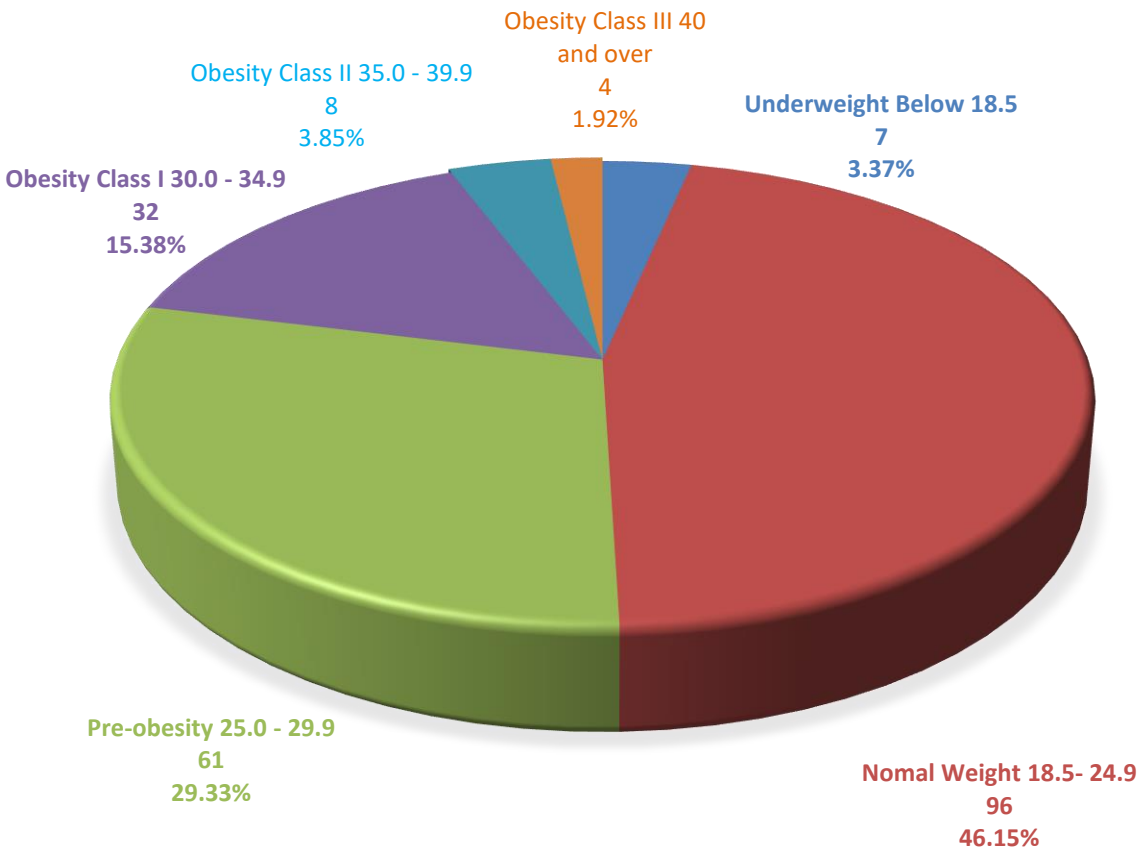
In 2020, the BMI's of females reported ranged from as low as 15.6 with the maximum BMI reported to be 44.5, average of BMI of women who resorted to IVF/ICSI was of 25.6 a slight increase of 0.42 over average of last year, thus being classified as in the range of pre-obesity (overweight) range.

7 females or (3.37%) of females undergoing ART treatment in Malta through IVF/ICSI were reported to be underweight this shows an increase of 1.45% over 2019, 96 females (46.15%%) were of normal weight, a drop of 6.41% over figures in 2019, while the remaining 105 females or 50.48% were classified in the overweight

and obese classifications. This shows an increase of 4.97% over the 45.51% reported last year. Noteworthy to bring to attention is the fact that 21.15% of all females resorting to ART treatments were classified as Obese. (Figure 25).

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 12.5% of the females who were pregnant in the Obesity Class I suffered a miscarriage.

Figures 25 - Body Mass Index of Females



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 214 procedures carried out, 149 (69.63%) were Fresh procedures with collection of oocytes; while another 3 (1.40%) were Thawed oocytes cycles all carried out at the St James Conception Unit. MDH ART Clinic did not perform any thawed oocytes procedures this calendar year. None of the couples in 2020, opted for a combined cycle whereby both fresh and thawed oocytes would have been utilized for the procedure.

During 2020, sixty two (62) couples (28.97%), had undergone embryo transfer only procedures in both licenced facilities, 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	118	28	146	68.23%
Thawed oocytes	0	3	3	1.40%
Prior approval for a freeze all oocytes cycle	2	1	3	1.40%
Thawed embryos	60	2	62	28.97%
Total	**180**	**34**	**214**	

Noteworthy is the fact that there has been a major drop in the option of undergoing a fresh collection of eggs cycle. During 2020, there was a 7.39% decrease in fresh oocytes collection cycles when compared to last year 2019. A drop of 7.3% was registered in the couples opting to undergo a thawed oocyte cycle in 2020 when compared to 2019. A considerable increase of 14.68% was registered in thawed embryo cycles which were now being carried out in both licenced facilities.

The majority of cycles (66.67%) carried out at the ART Clinic in Mater Dei Hospital were Fresh oocytes collection cycles, whilst 33.33% of cycles were thawed embryo cycles. No Thawed oocytes cycles were carried out on the NHS. In the self-funded cycles the majority of cycles (85.30%) were Fresh oocytes collection cycles, 8.82% were Thawed oocytes cycles, whilst the remaining 5.88% of cycles were thawed embryo transfer that were self-funded in 2020.

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, 2019, 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 2020, a total of 149 requests were received by the Authority. The majority of requests, 118 requests (79.20%) came from the ART Clinic at MDH, 109 of these requests were for the maximum injection of 5 oocytes under the Amendment Act, all of the 109 requests were approved. One couple specifically requested for permission to fertilise 4 oocytes only, and was granted approval. The remaining 8 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, 31 requests only (20.80%) of the AFR requests were made by private clinics, 21 of these requests were for the maximum injection of 5 oocytes under the Amendment Act, allof the 21 requests were approved. The remaining 10 requests made by the St James Conception Unit were for patients who opted to follow the principal Act and thus fertilise only two oocytes. (Figures 26 and 27).

The number of patients who chose to undergo a procedure following the Principal Act and thus fertilise only two oocytes and not opt for additional fertilisations thus not cryopreserving embryos, remained in line with the requests made in 2019. Thus 12.08% chose not to go for additional fertilisation whilst 87.92% requested the Authority for additional fertilisation approvals.

During 2020, all requests for additional fertilisations were approved by the Board.

Figure 26 - Total AFR Requests NHS vs Self-Funded

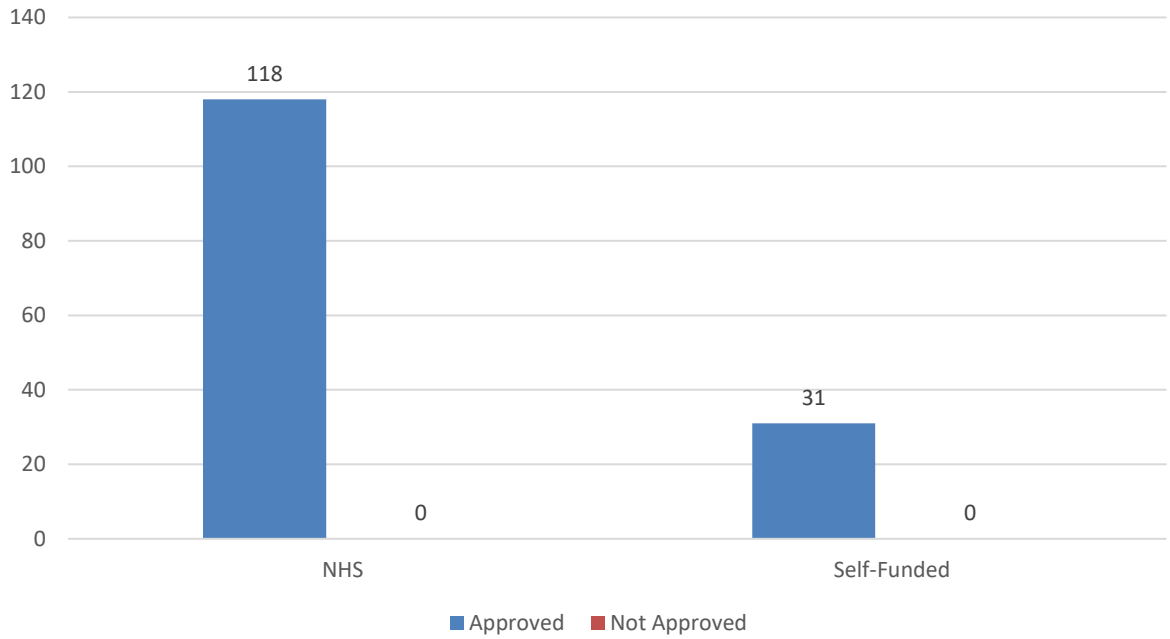
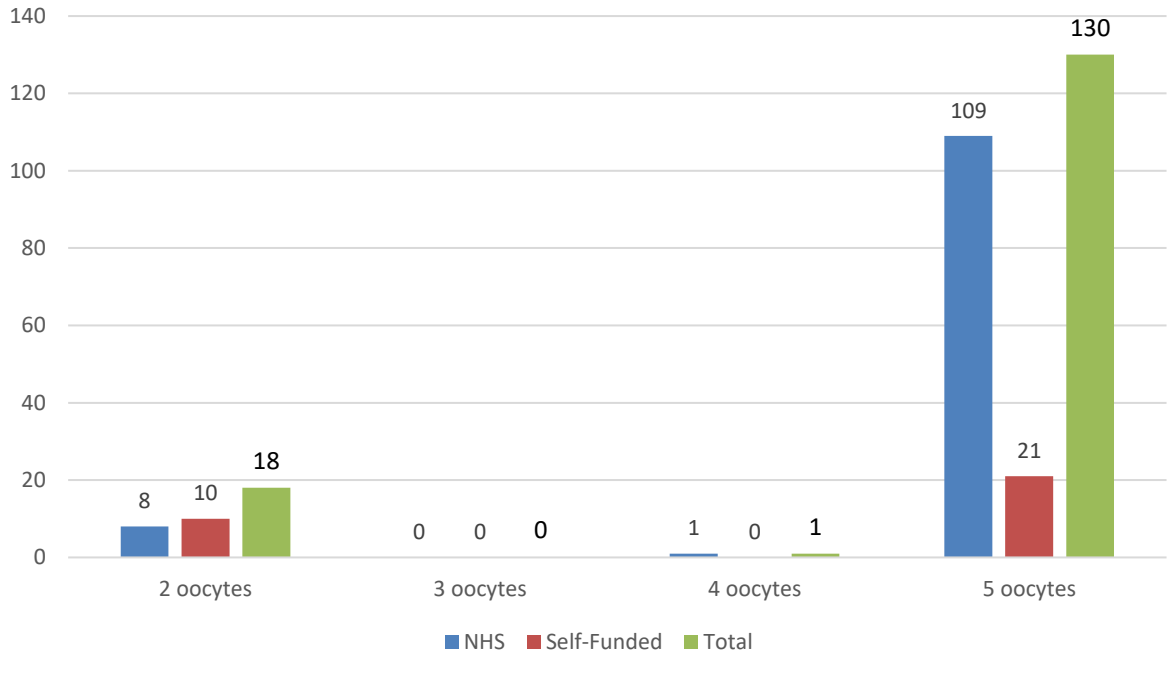


Figure 27 - AFR Requests NHS vs Self-Funded



7. GAMETES

7.1. Transfer of Gametes

Throughout 2020, there were 2 female patients who had their oocytes (13 oocytes) transferred from MDH to the licensed private Clinic. One male patient who had his sperm vials cryopreserved at MDH transferred the two sperm vials to the licenced private clinic. One couple also requested to transfer their two embryos cryopreserved at MDH to be transferred to the St James Conception Unit.

One other male patient requested transfer and effected distribution of 7 vials of sperm from the United Kingdom to the MDH ART Clinic.

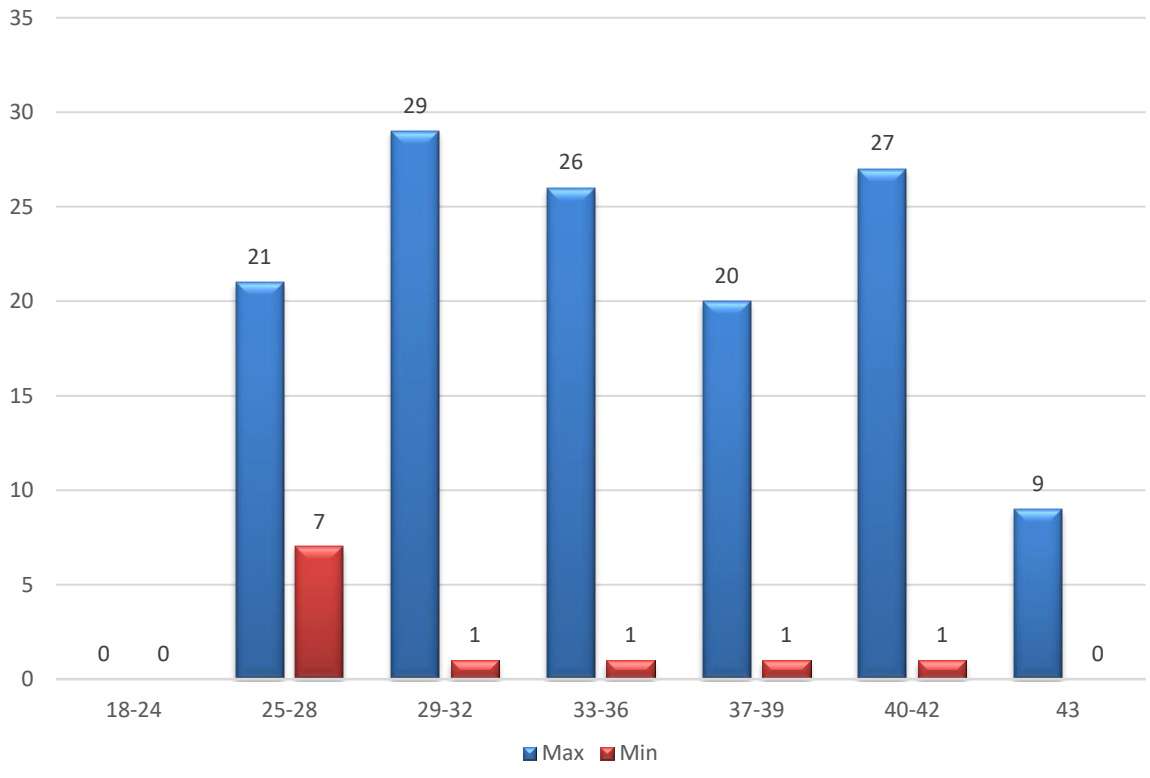
7.2. Collection of Oocytes

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 149 Fresh cycles carried out in 2020, a total of 1386 oocytes have been collected, at an average of 9.30 oocytes per patient. The maximum number of oocytes collected from a single patient was 29 oocytes from a female in the 29-32 years age bracket, this was followed by 27 oocytes collected from a female in the 40-42 years bracket and followed by 26 oocytes collected from a female in the 33-36 age bracket. All three patients had undergone treatment at MDH. The maximum number of oocytes collected in the St James Conception Unit was of 21 oocytes collected from a female in the 25-28 age bracket. (Figure 28).

Figure 28 - Max and Min Oocytes collected - Fresh Cycles by Age Group



In contrast to the previous year, in 2020 the largest number of average oocytes collected from one single patient, for an average of 14.13 oocyte per patient, was from females aged between 25 and 28, these were closely followed by 12.81 oocytes per patient, from females in the 29-32 year old bracket. An average of 8.70 oocytes was collected from patients aged 33-36. Not surprisingly, less oocytes were collected from women aged 37-39 and 40-42, for an average of 8.21 and 6.59 oocytes respectively. In all age groups there was an increase over the average oocytes collected per patient. In 2019 the largest number registered of average oocytes was of 10.52. (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	8	113	14.13	21	7
29-32	32	410	12.81	29	1
33-36	46	400	8.70	26	1
37-39	28	230	8.21	20	1
40-42	34	224	6.59	27	1
43	1	9	9.00	9	0
OVERALL	**149**	**1386**	**9.30**		

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 25-28 and 33-36 age bracket, when compared to self-funded patients. The average oocytes collected per patient at MDH is 9.42 compared to the 8.83 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	5	64	12.80	3	49	16.33
29-32	25	355	14.20	7	55	7.86
33-36	37	310	8.38	9	90	10.00
37-39	23	192	8.35	5	38	7.60
40-42	29	200	6.90	5	24	4.80
43	1	9	9.00	0	0	0
OVERALL	**120**	**1130**	**9.42**	**29**	**256**	**8.83**

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 left. 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 from 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 2020, there were 35 female patients with a serum AMH concentration of ≤1µg/l, who had undergone a Fresh cycle. The total amount of oocytes collected from these 35 patients was 148, with the maximum number of oocytes collected being 16 and the minimum 1 oocyte.

The average number of oocytes collected was 3.78 per patient and there were 11 females who had 5 or more oocytes collected. (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
35	1	16	148	4.22	11

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 700 oocytes have been discarded in 2020. Six hundred and ninety five (695) oocytes (99.29% of all discarded oocytes), or 50.14% from the total oocytes collected, were discarded following the egg retrieval process (Fresh cycle), for an average of 4.66 discarded oocytes per Fresh cycle. The remaining 5 oocytes (0.71% of all discarded oocytes) failed to survive the thawing process, for an average of 1.67 oocytes discarded per Thawed cycle (Table 6).

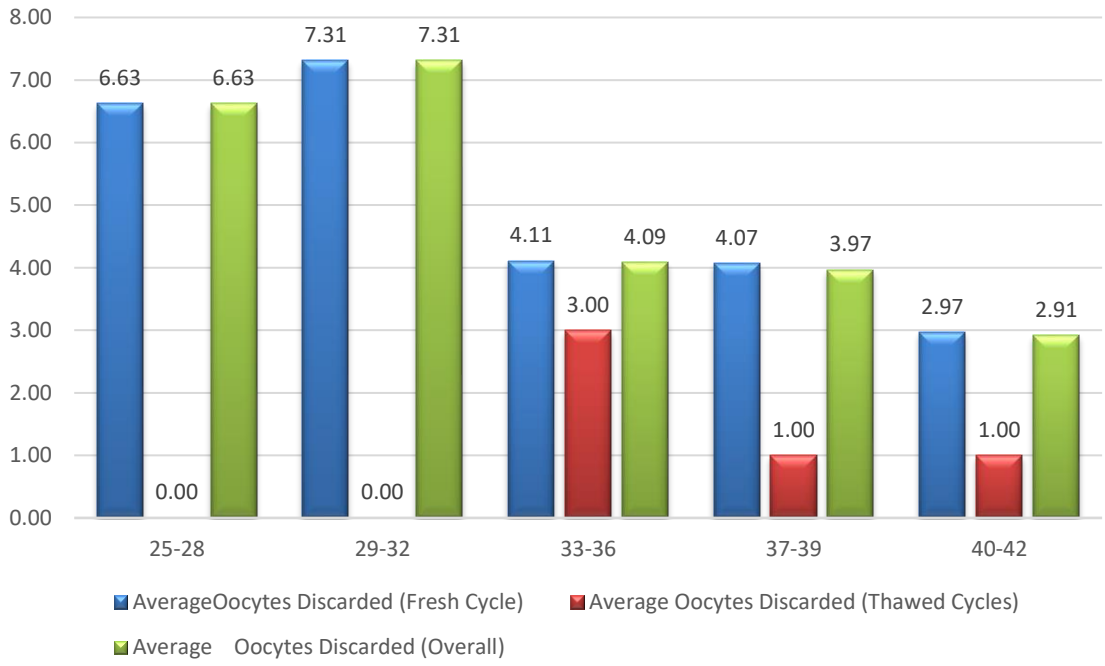
Table 6. Oocytes Discarded

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	8	53	6.63	0	0	0.00	8	53	6.63
29-32	32	234	7.31	0	0	0.00	32	234	7.31
33-36	46	189	4.11	1	3	3.00	47	192	4.09
37-39	28	114	4.07	1	1	1.00	29	115	3.97
40-42	34	101	2.97	1	1	1.00	35	102	2.91
43	1	4	4.00	0	0	0.00	1	4	4.00
OVERALL	**149**	**695**	**4.66**	**3**	**5**	**1.67**	**152**	**700**	**4.61**

In 2020, contrary to figures as reported in 2019 and 2018, the largest number of oocytes discarded is from women in the 29-32 year age bracket. In previous years the majority of oocytes were discarded from women in older age groups. Noteworthy is the fact that whilst in 2019 the discarding rate of oocytes stood at 42.91%, during 2020 there was an increase of 7.23% in oocytes that were discarded resulting in 50.14% of all collected oocytes / thawed oocytes being discarded.

The MDH ART Clinic reported a 52.74% discarding rate from oocytes collected at its centre, whilst the St James Conception Unit reported a discarding rate of 38.67% of total oocytes collected collectively from the four feeder clinics referring patients to its centre. (Figure 29).

Figure 29 - Average Oocytes Discarded by Age Group (Fresh vs Thawed vs Overall)



Whilst figures of 2019, show a constant average discarding of oocytes per patient for each age group which ranged from 2.88 to 4.80, this year's figures range from 2.91 to 7.31 oocytes discarded per patient, with the most oocytes discarded in the younger age group brackets.

7.4. Fresh vs Thawed Sperm

Out of the 149 cycles carried out in 2020 which required the provision of sperm, thawed sperm has been utilized in three (3) cycles only, or 2.01%, 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 149 females who had oocytes retrieved in 2020, only 32 (21.48%) had enough oocytes to store. This has registered a decrease of 9.17% from previous year. A total of 117 couples had no oocytes left to vitrify (Table 7). This is in line with figures registered in 2019 and 2018 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	5	4	80.0%	3	0	0.0%	8	4	50.0%
29-32	25	19	76.0%	7	4	57.1%	32	23	71.9%
33-36	37	33	89.2%	9	3	33.3%	46	36	78.3%
37-39	23	20	87.0%	5	4	80.0%	28	24	85.7%
40-42	29	26	89.7%	5	3	60.0%	34	29	85.3%
43	1	1	100.0%	0	0	0.0%	1	1	100.0%
OVERALL	120	103	85.8%	29	14	48.3%	149	117	78.5%

The total number of oocytes vitrified from Fresh cycles carried out in 2020 was only 160, figures are in line with the 172 vitrified in 2019 but this contrasts well with the 707 oocytes that were cryopreserved in 2018, for an average of 5.38 oocytes per couple. The maximum number of oocytes vitrified from a single cycle was 12 and the minimum was one oocyte which both were vitrified at the private facility.

It is noteworthy to point that while 15 out of the 29 patients who had oocyte collection vitrified oocytes at the St James Conception Unit equivalent to 51.72% of cycles, at the MDH ART clinic only 17 women out of the 120 who had oocyte

collection had oocytes to vitrify thus only 14.17% of cycles had resultant good quality eggs for collection. These figures show high contrast between both tissue establishments. This also highlights the fact that while in the private facilities 9.68% of cycles were thawed oocytes cycles, none were carried out at MDH ART Clinic.

The maximum number of oocytes thawed for one single female from thawed oocyte cycles was 8 while the minimum number of oocytes thawed was 2, both in a thawed oocyte cycles carried out at St James Conception Unit.

7.5.2. Storage of Sperm

Ninety six (96) sperm cryopreservation requests were approved for **ninety (90) males.** A total of seventy two (72) males vitrified their sperm, the remaining 24 who requested sperm cryopreservation did not vitrify sperm. In four cases, testicular aspiration/extraction (TESA/TESE) was performed to obtain sperm surgically.

Twenty three (23) males requested Fertility preservation following oncology diagnosis prior to starting chemotherapy, out of which 17 had a successful cryopreservation.

Another fifty nine (59) males had Urology referrals with the main reason for referral being decrease in male fertility parameters. Forty two (42) of males successfully cryopreserved sperm. There has been a continuous request for sperm storage from the Urology Consultants throughout 2020.

Only fourteen (14) 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, thirteen of which successfully cryopreserved sperm. Only three males used thawed sperm for the procedures (Table 8).

Table 8 – Storage of Sperm

	Cryopreservation Requests	Cryopreserved Sperm	Not Cryopreserved
Oncology Referrals	**23**	**17**	**6**
Urology Referrals	**59**	**42**	**17**
Prior to IVF or IUI Procedures	**14**	**13**	**1**
Total	**96**	**72**	**24**

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 detailed in Section 1.9 above.

In 2020, three 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.

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 2020, the Authority received notification of 11 cycles carried out at the MDH ART Clinic that all the embryos created were cryopreserved due to the COVID 19

measures being taken. No such notification was received from the private facility, as all cycles were cancelled and not performed.

During 2020, the Authority also received notification from MDH ART Clinic that in 51 cases out of the 104 cycles that created embryos, all embryos created in those cycle had to be cryopreserved due to Risk of Ovarian Hyperstimulation (OHSS). Only two cases out of the 28 cycles that created embryos in the private facility reported cryopreservation of all embryos due to OHSS. Again figures here contrast immensely between the two tissue establishments, as while the Risk of OHSS rate at the private facility stands at 7.14%, the risk of OHSS rate requiring all embryos to be cryopreserved at MDH ART clinic is of 49.04%.

Since the introduction of the new law a total of 334 embryos have been cryopreserved for future use, thus bringing total to 341 cryopreserved embryos. A total of three hundred and twenty eight (328) embryos were cryopreserved at MDH ART Clinic whilst only thirteen (13) were cryopreserved at St James Conception Unit. (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
2020	184	7	191
Total Storage	328	13	341

Out of the total three hundred and forty one (341) embryos in storage, two embryos were transferred between the two licenced clinics whilst one hundred and two (102) embryos were thawed to be used in embryo transfer procedure. Only one embryo did not survive the thawing process. Thus the total of embryos cryopreserved as at end of 2020 stood at 197. (Table 10).

Table 10 – Storage of Embryos distribution 2020

Embryo Storage	NHS	Self-Funded	Total
Storage as at 01/01/2020	104	4	108
2020	184	7	191
Total	288	11	299
Transfer between Clinics	-2	2	0
Embryos Used 2020	-99	-3	-102
Storage as at 31/12/2020	187	10	197

7.6. End of Storage

During 2020, no requests for termination of cryopreservation of gametes were made from both the MDH ART Clinic and the St James Conception Unit.

7.7. Total Storage

As at 31st December 2020, the total amount of oocytes stored at the licensed clinics stood at a total of 1970 oocytes with the majority stored at MDH, whilst the total number of sperm vials was of 1775, again the majority stored at MDH. The one hundred and ninety seven (197) cryopreserved embryos of which the majority 187, are stored at the ART Clinic in Mater Dei Hospital whilst the remaining ten (10) embryos are stored at the St James Conception Unit (Table 11).

Table 11 – Total Storage

Type of Storage	NHS	Self-Funded	Total
Oocytes	1499	471	1970
Sperm	1699	76	1775
Embryos	187	10	197

The 197 embryos cryopreserved at both centres, belong to 84 couples., 77 of which received treatment at the MDH ART Facility and 7 at the St James Conception Unit.

The embryos stored at the MDH ART Clinic are of 24 couples who have one (1) cryopreserved embryo each, 22 couples who have two (2) cryopreserved embryo each, 18 couples who have three (3) cryopreserved embryos each, 10 couples who have four (4) cryopreserved embryos each, whilst 5 couples have five (5) cryopreserved embryos each.

The embryos stored at the St James Conception Unit are of 4 couples who have one (1) cryopreserved embryo each and 3 couples who have two (2) cryopreserved embryo each.

All couples have expressed their willingness to make use of their cryopreserved embryos including the thirteen couples that already gave birth through IVF and the five couples that are expecting to give birth from cycles carried out. Thus no embryos are currently available for embryo adoption.

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 6 cycles which were abandoned prior to oocyte retrieval. All six (6) couples who were going to self-fund their treatment abandoned their cycle. The majority of cycles, five (5) were abandoned due to poor response to the stimulation treatment the female patients received whilst another one (1) cycle was abandoned as the couple got pregnant naturally whilst waiting for their cycle.

8.2. Type of Procedure - IVF vs ICSI

In 2020, from a total of 214 cycles started, no IVF/ICSI procedure was carried out for 71 couples. This was due to the fact that there were eight (8) 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.

Another 3 patients that had to opt for a 'Freeze-all oocyte' cycle that were prior approved by the Authority, another two couples that had also a 'Freeze-all-oocyte' procedure as the partner did not provide a sperm sample on the day, and the sixty two couples that had an embryo transfer only (Table 12).

Table 12. Type of ART Procedure

Type of ART	NHS	Self-Funded	Total	Total %
IVF	0	0	0	0.00%
ICSI	109	30	139	64.95%
NIL	71	4	75	35.05%
Total	180	34	214	

Out of the 139 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, while 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 2020, a total of 539 oocytes were injected, the majority 531 oocytes or 98.52% of the total oocytes injected were from fresh cycles, the remaining 8 oocytes or 1.48% of the total injected oocytes where from thawed cycles. From the 539 oocytes injected a total of 441 were injected at the MDH ART Clinic and the remaining 98 oocytes at the St James Conception Unit (Table 13).

Table 13. Oocytes Injected

Type of Cycle	Oocytes Injected	%
Fresh	**531**	**98.52%**
Thawed	**8**	**1.48%**
Total	**539**	

Out of the total 539 injected oocytes, there were 439 oocytes that reached fertilisation stage while 100 oocytes did not fertilise (Figure 30). Thus fertilisation rate is of 81.45% of all oocytes injected, a decrease of 6.15% over figures reported in 2019 (Figure 31).

Figure 30 - Fertilised vs Non Fertilised of Injected Oocytes

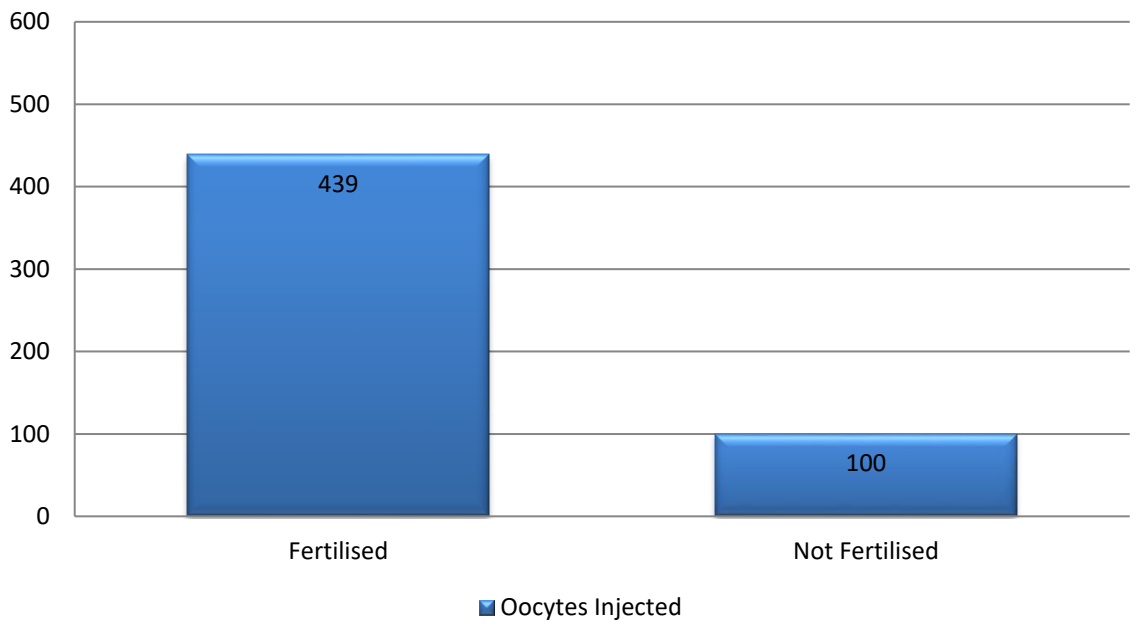
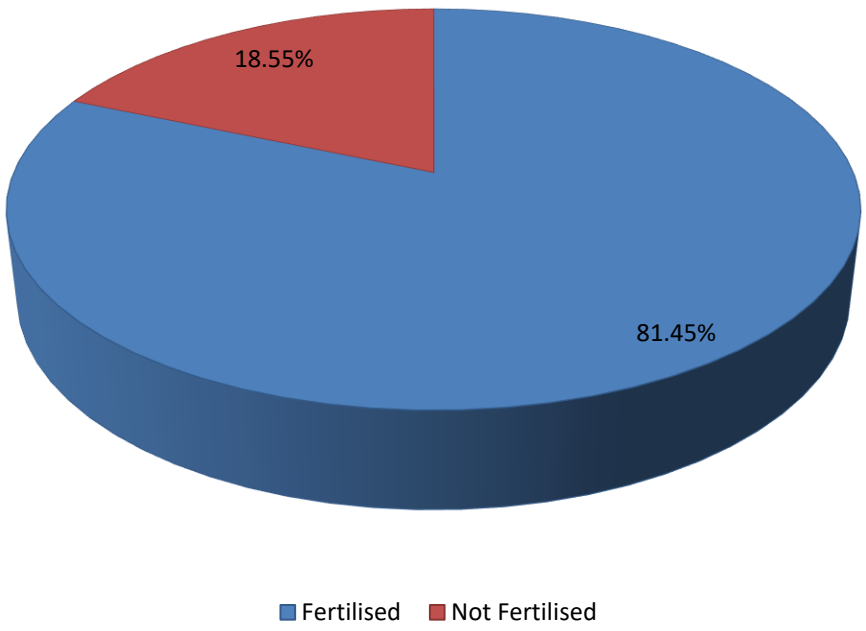


Figure 31 - Fertilised vs Non Fertilised Oocytes (%)

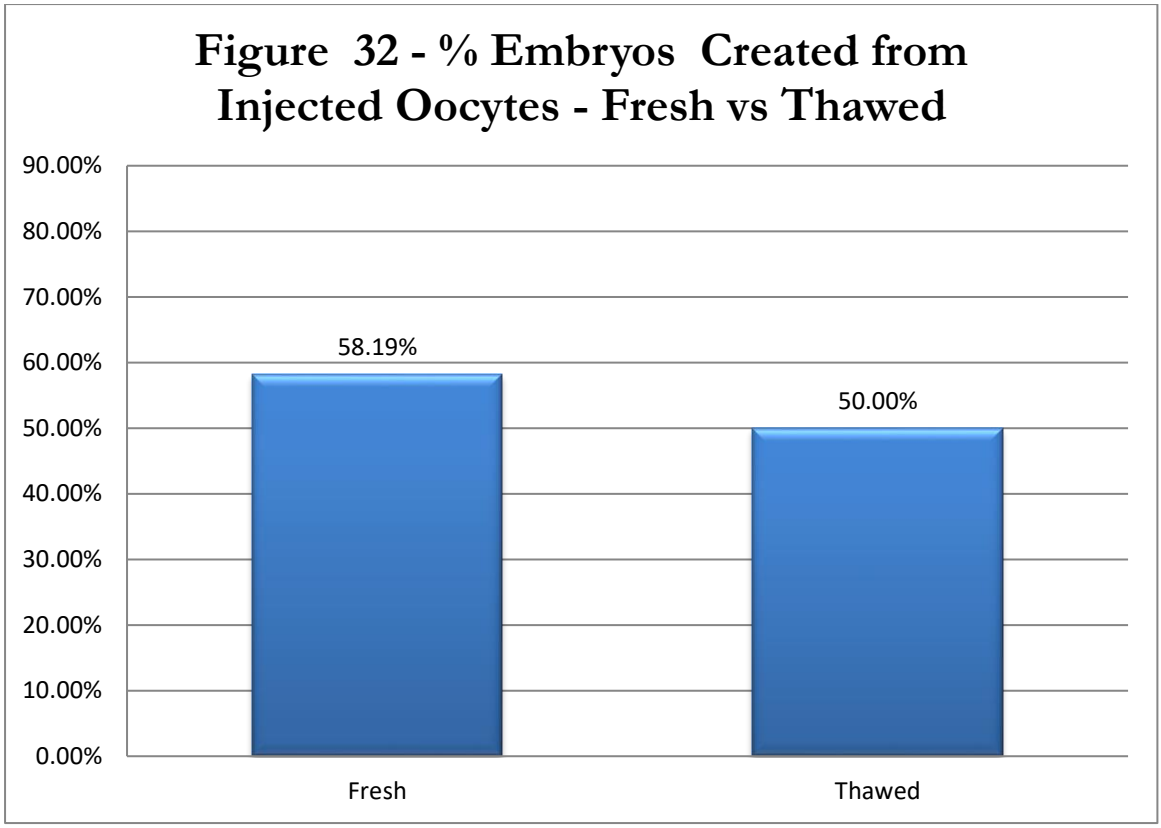


Out of the 439 fertilised oocytes, embryologists reported that a total of 128 embryos had arrested, 126 of these were from fresh oocyte cycles whilst 2 were from thawed oocyte cycles. The majority of these embryos 105 were from cycles at MDH ART Clinic and 23 embryos arrested at the private facility.

Further two (2) fertilised oocytes cleaved and resulted in four embryos. This resulted in the creation of a total of 313 embryos, 309 from fresh oocytes and 4 from thawed oocytes (Table 14 & Figure 32).

Table 14. Embryos Created

Type of Cycle	Oocytes Injected	Embryos Created	Created %
Fresh	531	309	**58.19%**
Thawed	8	4	**50.00%**
Total	**539**	**313**	



8.4. Embryo Transfers

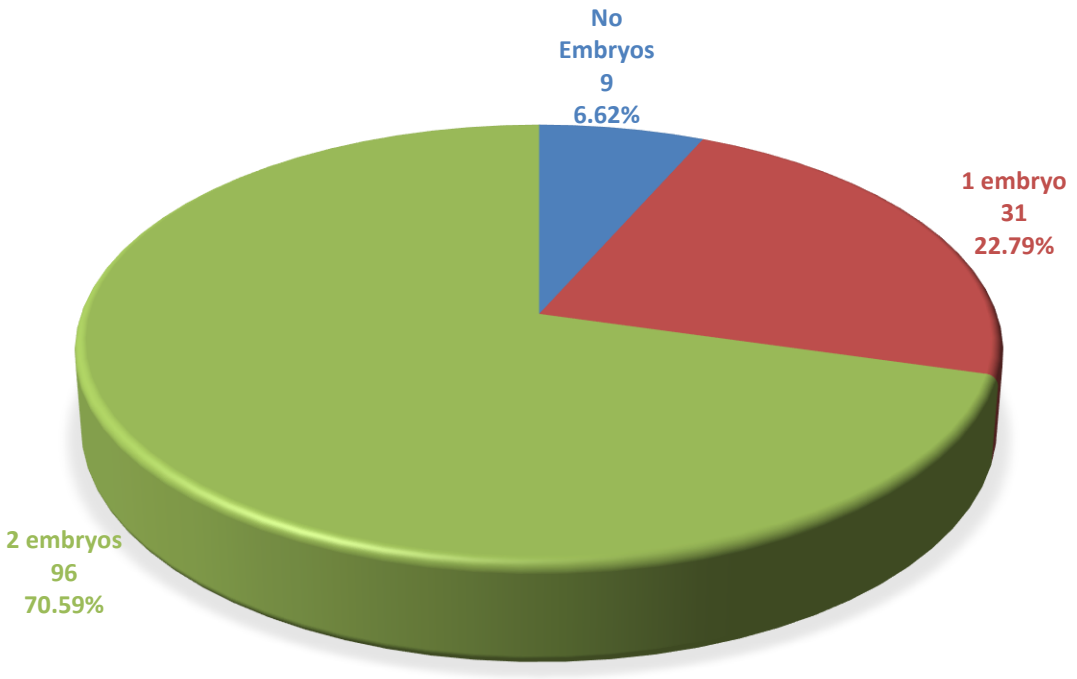
Out of the 313 fresh embryos created, one hundred and ninety one (191) embryos were cryopreserved, thus one hundred and twenty two embryos were transferred from fresh and thawed oocyte cycles. Another 102 embryos from those that were previously cryopreserved were removed from storage for transfer, only one thawed embryo arrested and the remaining one hundred and one (101) thawed embryos were transferred. Thus a total of two hundred and twenty three (223) embryos were eventually transferred that could lead to a pregnancy.

There were a total of 9 couples or 6.62% who had no Embryo Transfer affected, as the oocytes they had injected failed to fertilize or else the fertilised oocytes/embryos arrested.

The two hundred and twenty three (223) embryos were transferred in 127 treatment cycles that could result in a pregnancy. 100 of these treatment cycles were carried out at MDH ART Clinic whilst 27 treatment cycles were carried out at the private facility.

Out of the 127 couples who had viable embryos to transfer, 31 of them (22.79%) had a single embryo transferred. Whilst the remaining ninety six (70.59%) couples, had 2 embryos transferred, the maximum allowed by law (Figure 33).

Figure 33 - Embryos Transferred per Cycle



8.5. Embryo Transfers per Type of Cycle

Out of the 127 embryo transfer procedures carried out, 64 were fresh oocytes cycles, whilst 3 where thawed oocyte cycles. The remaining 60, where thawed embryos cycles, 58 carried out at the MDH ART Clinic and two thawed embryo transfers carried out at the St James Conception Unit.

The majority of the sixty four (64) fresh oocyte cycles were carried out at MDH ART clinic, 42 in number, whilst the remaining twenty two fresh oocyte cycles were carried out at the private facility. All of the three (3) thawed oocyte cycles, were carried out at the private facility. (Table 15 and Figure 34).

Table 15. Cycles with Embryo Transfer per Type of Cycle (%)

Type of Cycle	Cycles	Cycles with Embryo Transfer	Transferred %
Fresh Oocytes	72	64	**88.89%**
Thawed Oocytes	3	3	**100.00%**
Thawed Embryos	61	60	**98.36%**
Total	**136**	**127**	

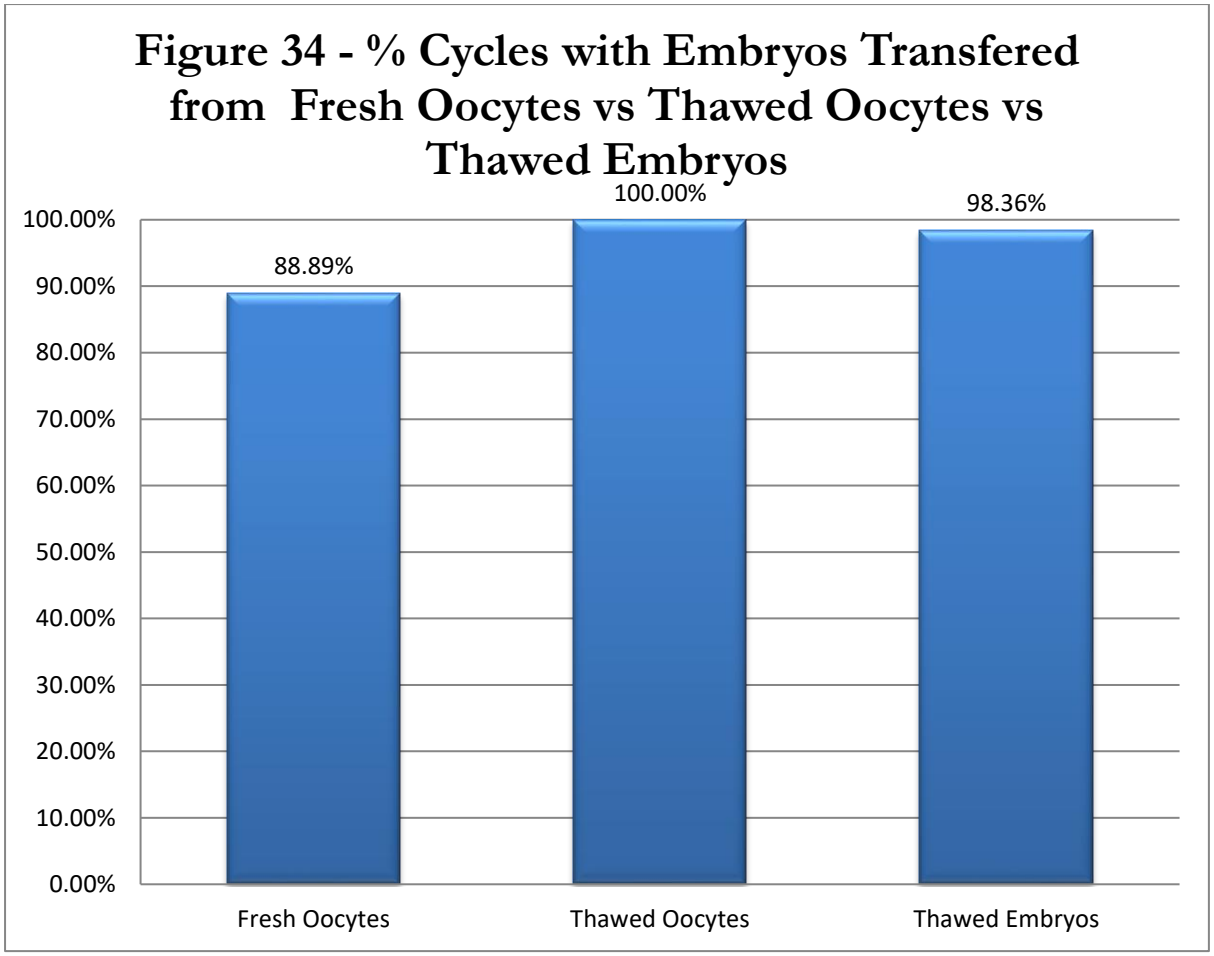
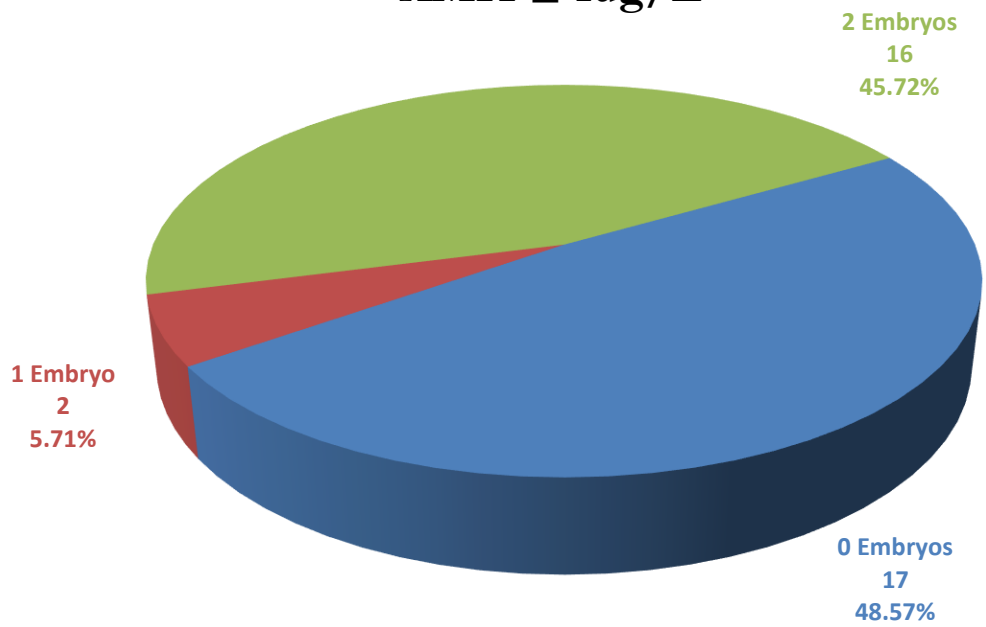


Figure 34 - % Cycles with Embryos Transfered from Fresh Oocytes vs Thawed Oocytes vs Thawed Embryos
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
88.89%
100.00%
98.36%
Fresh Oocytes
Thawed Oocytes
Thawed Embryos

8.6. Embryos transferred per AMH ≤1µg/L

As outlined already in Section 7.2, there was a total of 35 women with a serum AMH concentration of ≤1µg/l. Only 18 of these women had an embryo/s created and transferred as seventeen women (48.57%) did not have any embryos. Two women, 5.71%, had a single embryo created and transferred; 16 women, or 45.72%, had 2 embryos created and transferred. (Figure 35).

Figure 35 - Embryos Transferred for AMH ≤ 1ug/L



9. TREATMENT CYCLE OUTCOMES

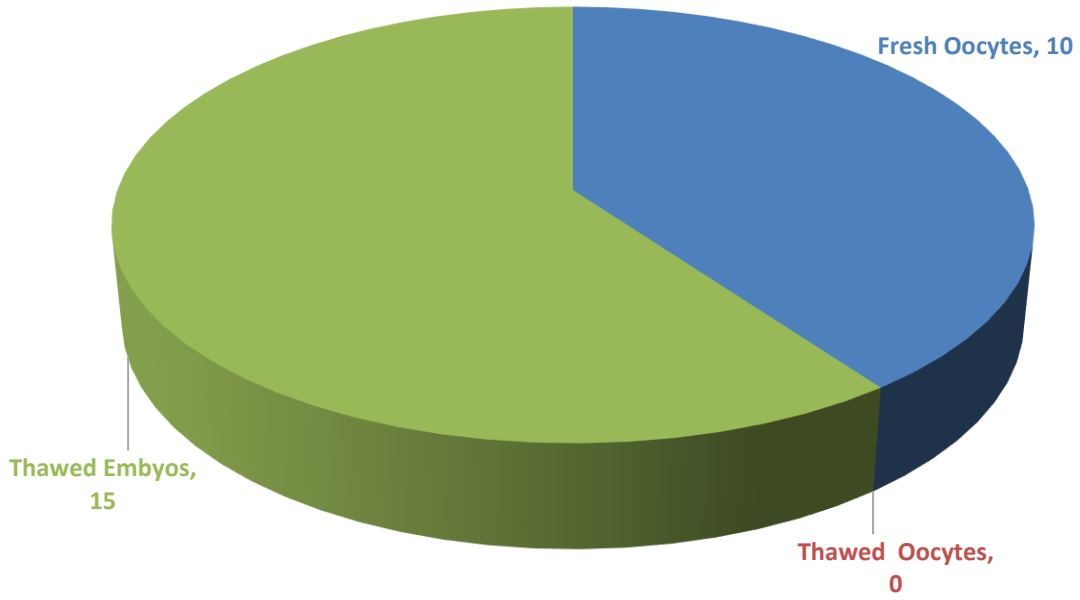
9.1. Pregnancies

Out of the 136 treatment cycles, carried out in 2020, there were 10 reported pregnancies from Fresh oocyte cycles, no pregnancies was reported from thawed oocyte cycle and 15 pregnancies from Thawed embryo cycles. **The resulting 25 pregnancies account for 18.38% of all treatment cycles started**, which is 4.20% lower than the pregnancy rate for 2019 (Table 16 and Figure 36).

Table 16. Cycle Outcome

Outcome	NHS	Self-Funded	Total	% Outcome by Type	% Outcome	% Outcome of Pregnancies
Not Pregnant	39	23	62	**86.1%**	**86.11%**	
Miscarriage	0	0	0	**0.0%**	**13.89%**	**0.0%**
Live Birth	4	0	4	**5.6%**		**40.0%**
Expected	4	2	6	**8.3%**		**60.0%**
Not Pregnant	0	3	3	**100.0%**	**100.00%**	
Miscarriage	0	0	0	**0.0%**	**0.00%**	**0.0%**
Live Birth	0	0	0	**0.0%**		**0.0%**
Expected	0	0	0	**0.0%**		**0.0%**
Not Pregnant	44	2	46	**75.4%**	**75.41%**	
Miscarriage	3	0	3	**4.9%**	**24.59%**	**20.0%**
Live Birth	4	0	4	**6.6%**		**26.7%**
Expected	8	0	8	**13.1%**		**53.3%**

Figure 36 - Outcome - Fresh Cycles vs Thawed Cycles (NHS + Self-Funded)



9.2. Cycle Outcomes – Fresh vs Thawed

Ten (10) couples, or 13.89% of those undergoing Fresh oocyte cycles managed to get pregnant, with a registered drop of 6.8% over figures of 2019. Out of these 10 pregnancies, 4 couples had a live birth, while the remaining 6 couples (60%) are still expecting (Figures 37 and 38). None of the couples undergoing a Thawed oocyte cycle got pregnant. (Figures 39). Fifteen (15) couples that underwent a thawed embryo cycle managed to get pregnant. Out of these 15 pregnancies, 3 couples miscarried, 4 couples had a live birth, whilst the remaining 8 couples (53.30%) are still expecting to give birth (Figures 40 and 41).

As a result, in 2020 the pregnancy rate for Thawed Embryo Cycles was 24.59%, which registered a large decrease of 14.54% than the figures which were registered for 2019. However this was still 10.70% higher than that for Fresh oocyte cycles. (Table 16).

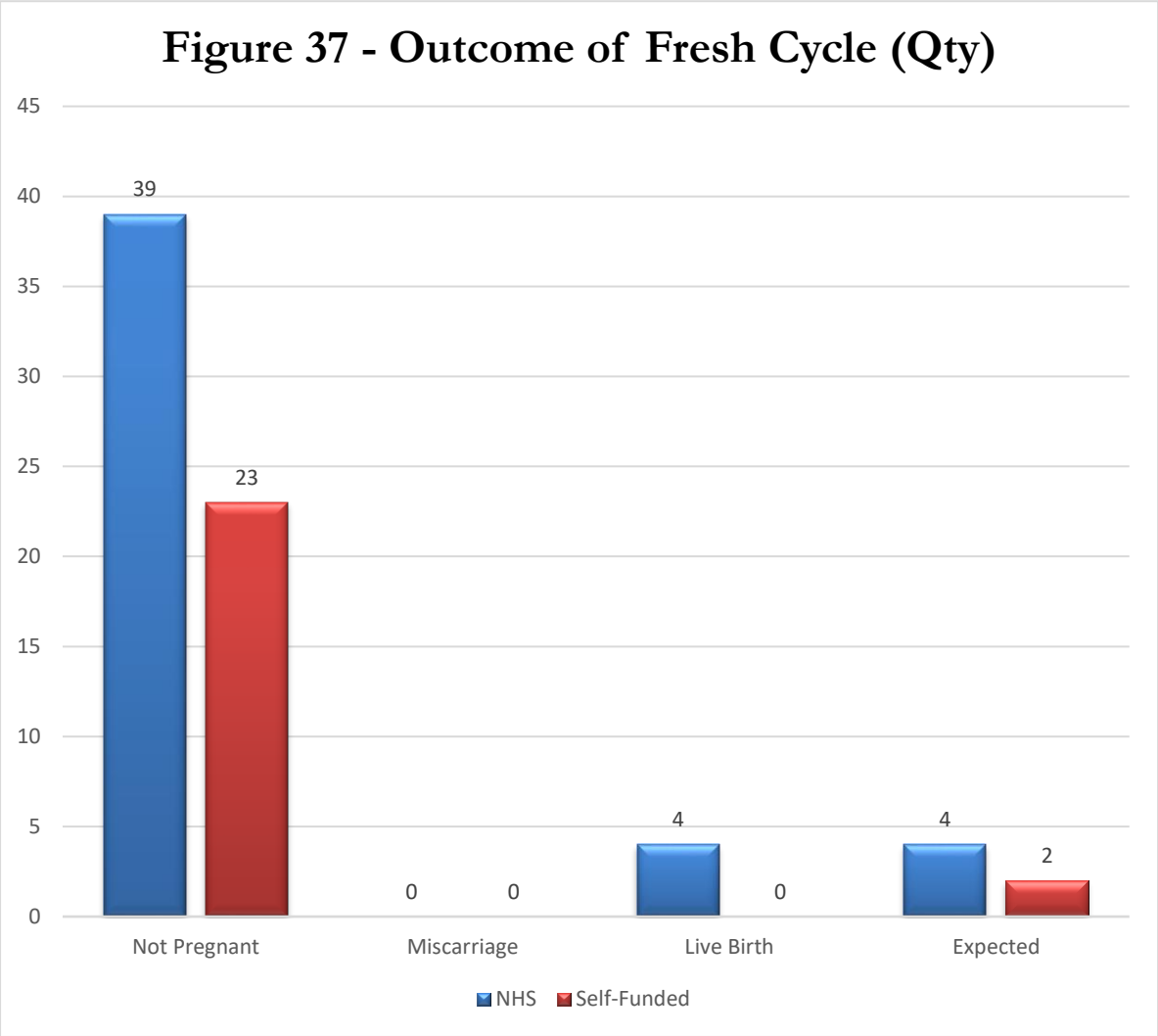


Figure 38 - % Outcome - Fresh Cycles (NHS + Self-Funded)

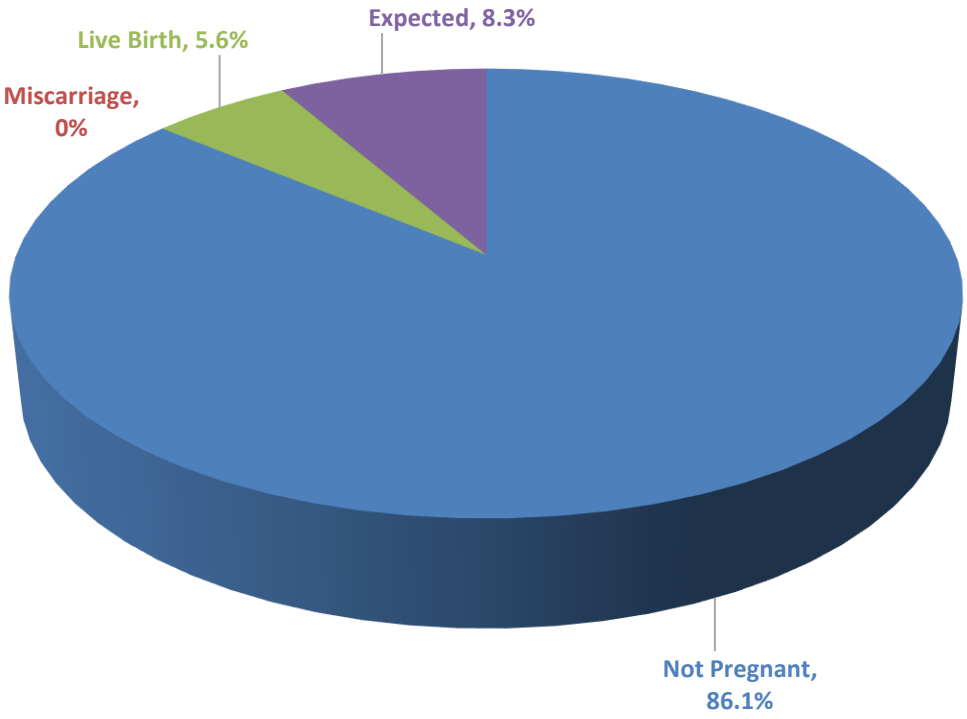


Figure 39 - Outcome of Thawed Oocytes Cycle

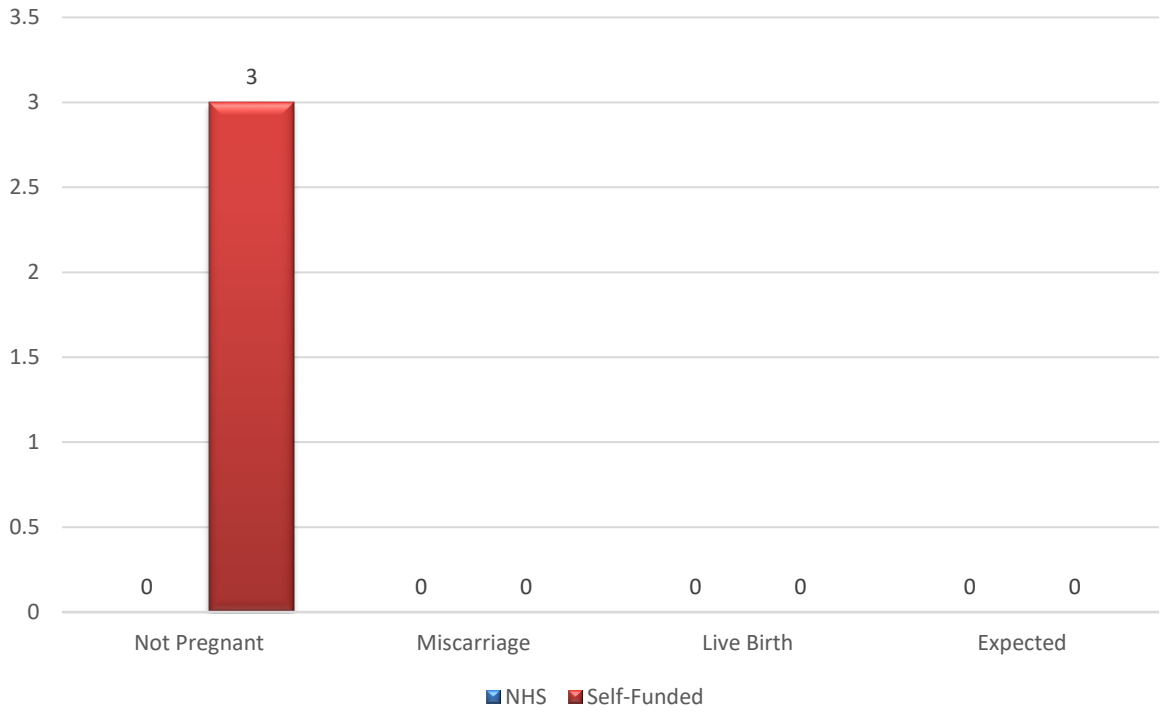


Figure 40 - Outcome of Thawed Embryos Cycle (Qty)

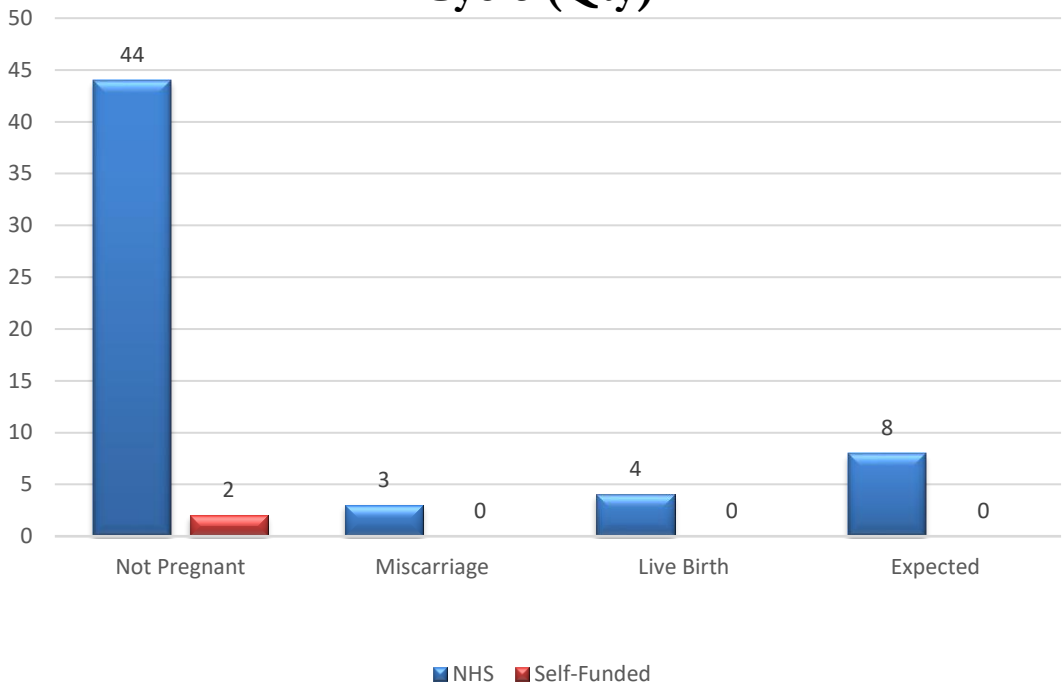
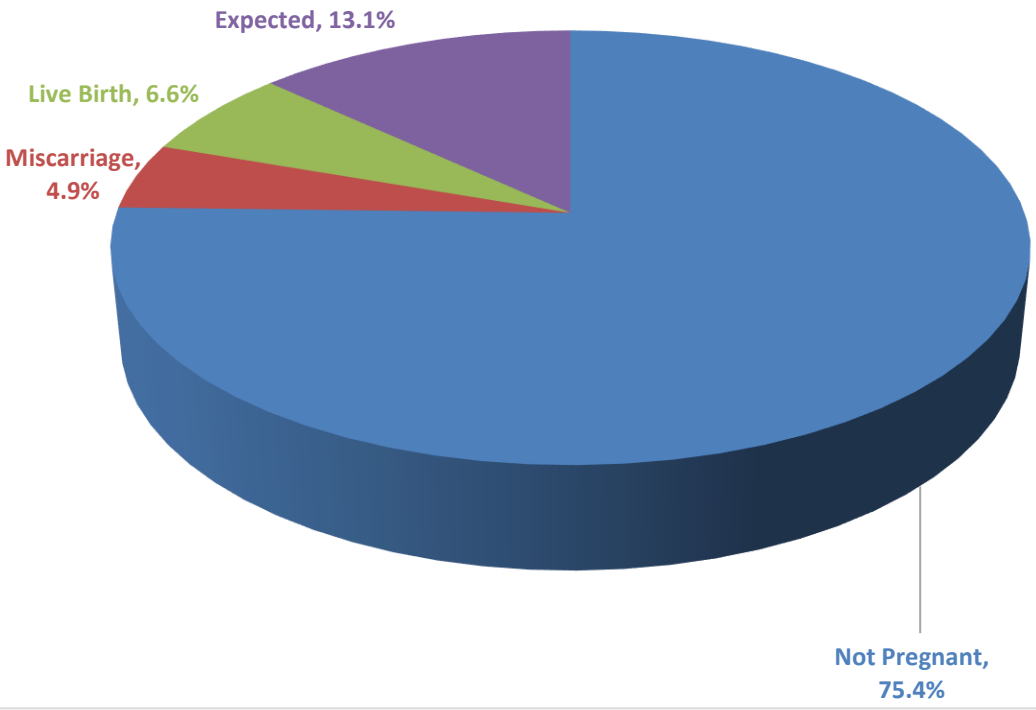


Figure 41 - % Outcome - Thawed Embryo Cycles (NHS + Self-Funded)



9.3. Cycle Outcomes – NHS vs Self-Funded

The pregnancy rate reported by the MDH ART Clinic, for fresh oocytes cycles was 9.02% higher than that reported by the St James Conception Unit. This is in line with figures reported in 2019.

The sum of live and expected births from Fresh cycles carried out at MDH was 17.02%, while that for private clinics was 8% (Figure 42). The sum of live and expected births from Thawed oocytes cycles carried out at St James Conception Unit was nil, as all three procedures carried out did not result in a pregnancy. (Figure 43).

The sum of live and expected birth rate from cycles carried out with thawed embryo transfers at the MDH ART Clinic was of 20.38%, this was due to the fact that MDH reported 3 miscarriages from the fifteen pregnancies registered for these cycles. No pregnancies for thawed embryo transfers were registered by the private facility (Figure 44).

The Overall pregnancy rate for MDH ART Clinic was of 21.69% whilst that of the St James Conception Unit incorporating patients from St James Hospital, St Claire's Medial Centre, Veduta Clinic and Melody Clinic stood at 6.67%. With the average pregnancy rate for Malta being 18.38% for the year 2020.

Figure 42 - Fresh Cycles - % Outcome (NHS vs Self-Funded)

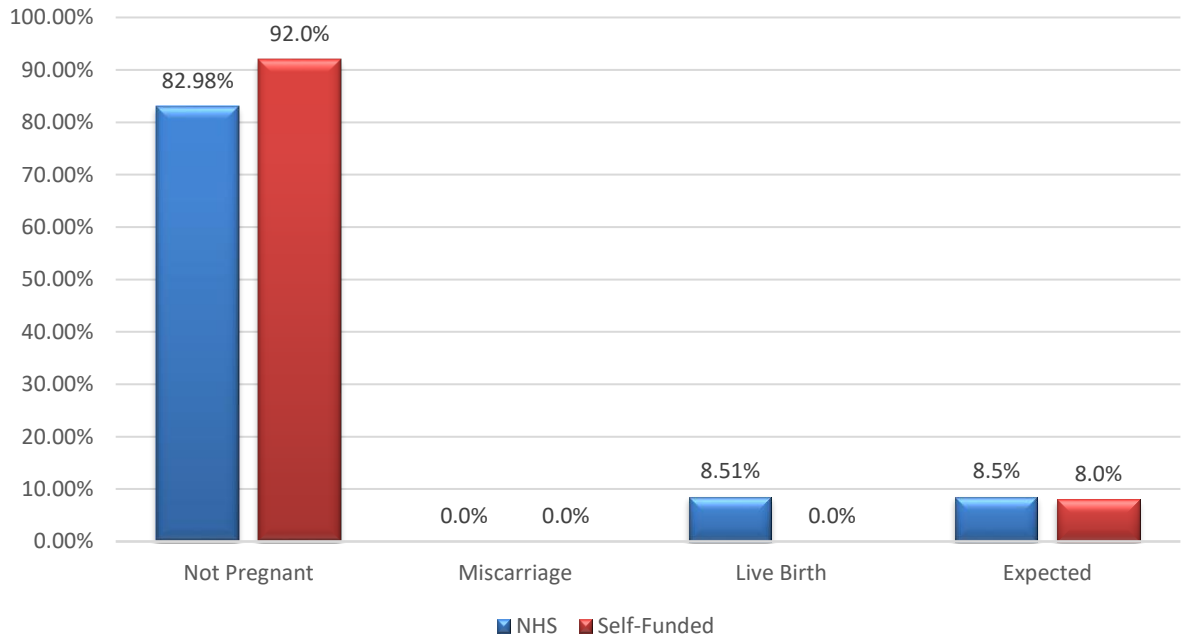


Figure 43 - Thawed Oocytes Cycles - % Outcome (NHS vs Self-Funded)

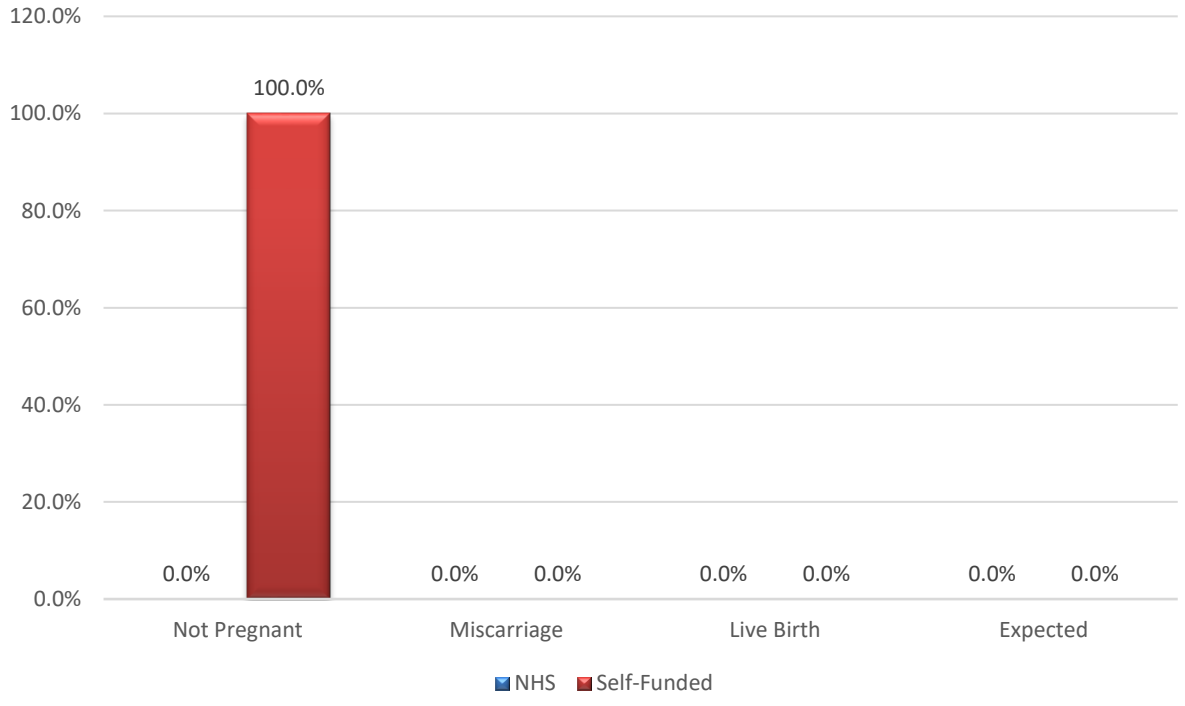
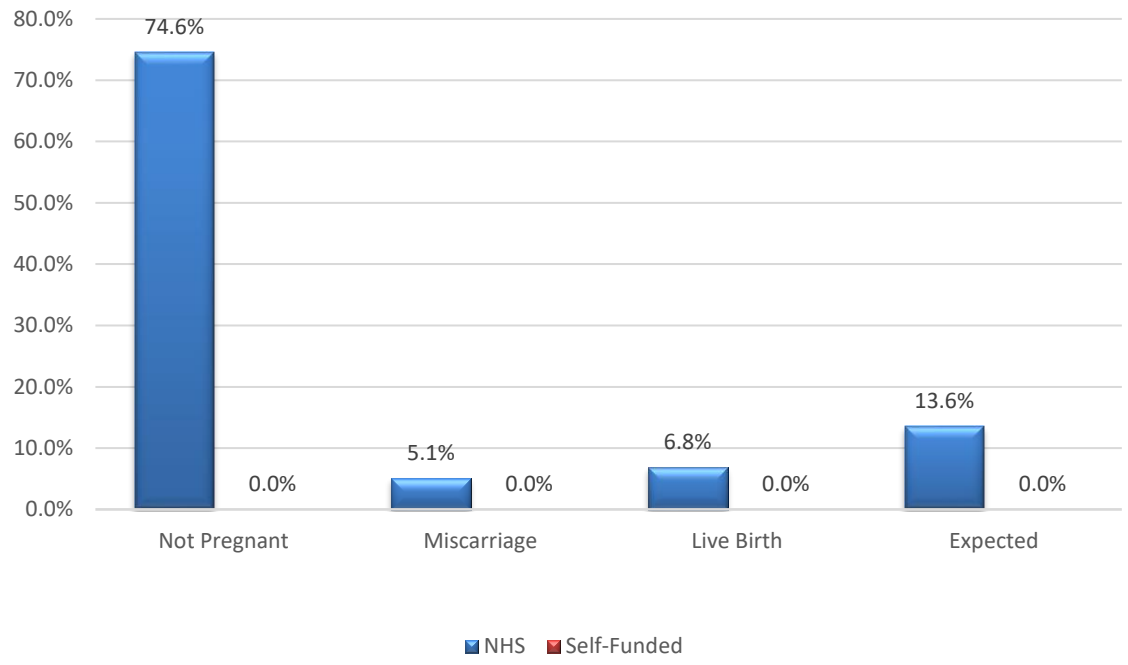


Figure 44 - Thawed Embryos Cycles - % Outcome (NHS vs Self-Funded)



9.4. Pregnancies by Age

In 2020, twenty five (25) 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 2019 and 2018 (Figure 45). This was however not reflected in the pregnancy rate, as percentage of cycles per age group was highest for women aged 25-28 at 25% (Figure 46).

This is in line with figures reported in 2019, where the highest pregnancy rate as percentage of cycle was reported in the 25-28 age group. It appears that in 2020 as in 2019, maternal age was one of the most important predictive factor for an IVF/ICSI procedure to result in a pregnancy.

Figure 45 - Pregnancy by Age Group

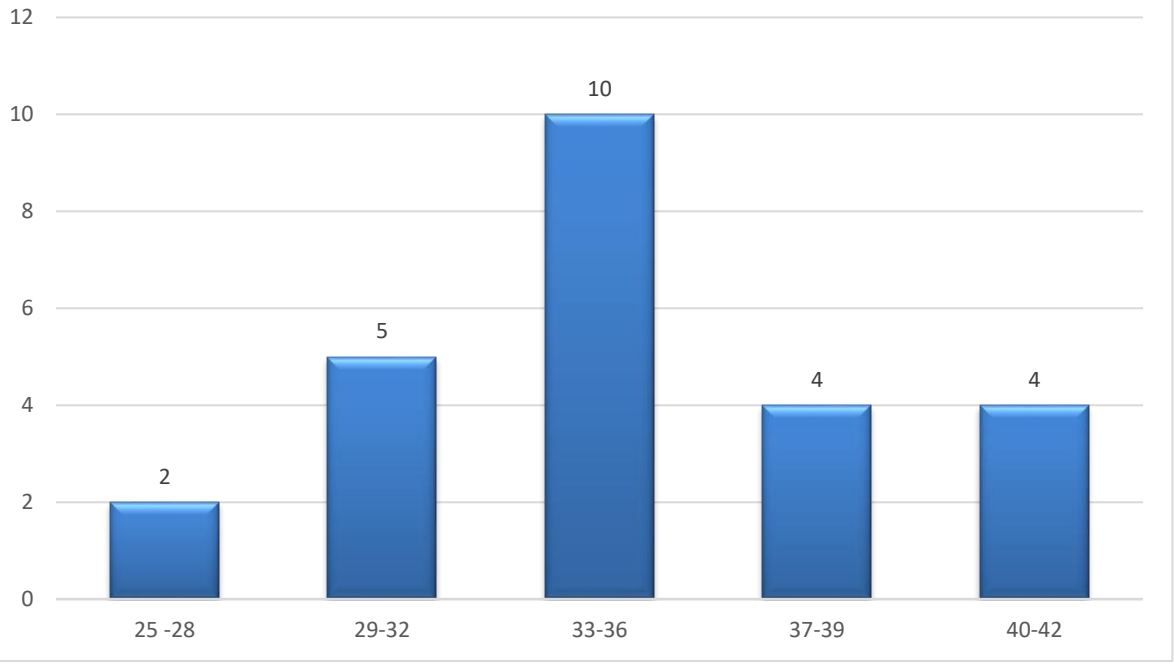
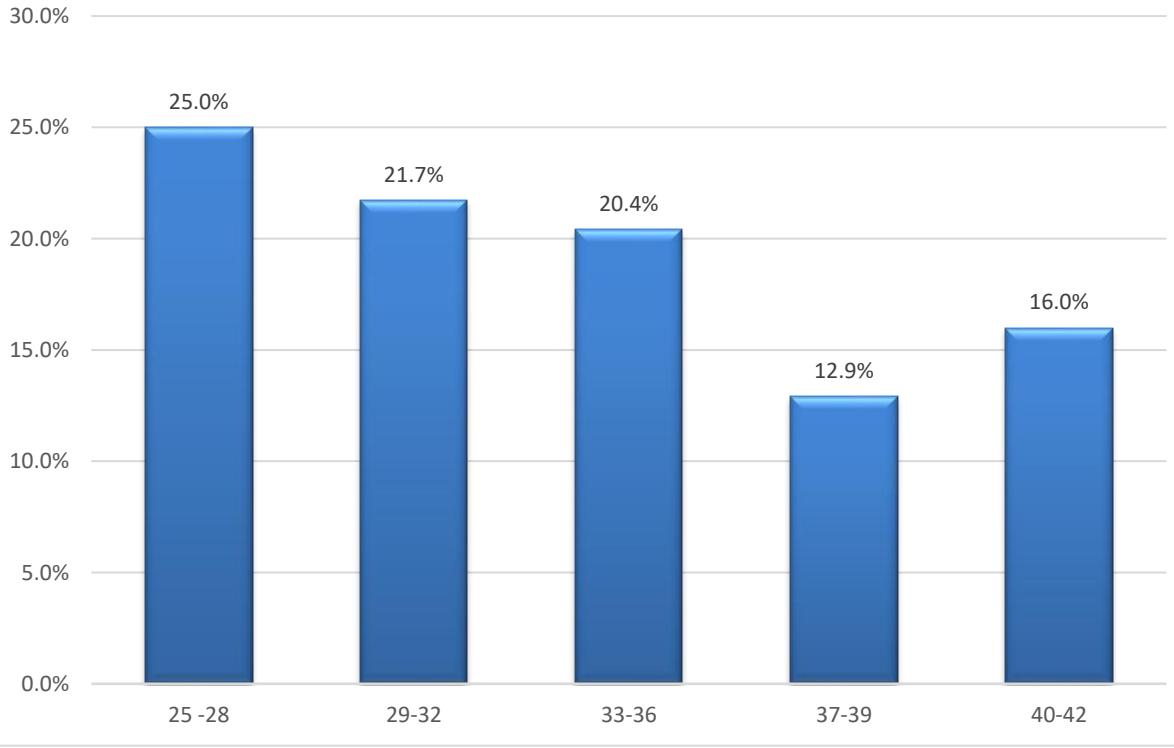


Figure 46 - Pregnancy Rate as % of Cycles per Age Group



9.5. Pregnancy Rate per Embryos Transferred

From a total of 136 couples who had a treatment cycle with the possibility of an embryo transfer effected, there were 25 resulting pregnancies, or 18.38%, a decrease of 4.20% when compared to the previous year.

The couples who were most successful at achieving a pregnancy in 2020, were those who had 2 embryos transferred (23.05%), the current calendar year registered a decrease of 8.09% from the 32.05% that was reported last year with 2 embryos transferred.

Noteworthy to point is that there was a slight drop of 2.37% in the pregnancies achieved by only one embryo transferred, from 8.82% reported in 2019 to 6.45% reported during 2020. (Table 17).

Table 17. Pregnancy Rate per Embryos Transferred

Transferred Embryos	Total IVF/ICSI Procedures	Total Pregnancies	% Pregnancies
0	9	0	0.00%
1	31	2	6.45%
2	96	23	23.96%
Total	136	25	18.38%
Total procedures with Embryo transfer	**136**	**25**	**18.38%**

9.6. Pregnancy Distribution per ART Cycle Attempts

Eight (8) couples (or 32%) out of the 25 couples who got pregnant from cycles carried out in 2020, achieved a pregnancy on their 1st IVF/ICSI attempt, these were achieved by 6 couples who had undergone their cycle at the ART Clinic at MDH and 2 couples who self-funded their treatment at the St James Conception Unit. Ten (10) couples (or 40%) achieved a pregnancy on their 2nd attempt, all the 10 couples had treatments at the MDH facility. Three couples (12%) on their 3rd attempt, achieved pregnancies from cycles on the NHS. Three couples achieved pregnancy on their 4th attempt and one couple achieved a pregnancy who had undergone their 5th attempt at the NHS facility. All couples undergoing their 6th, 7th or 8th attempt did not achieve a pregnancy. (Figures 47, 48 and 49).

Figure 47 - NHS Pregnant vs Non-Pregnant Totals per ART Cycle Attempts

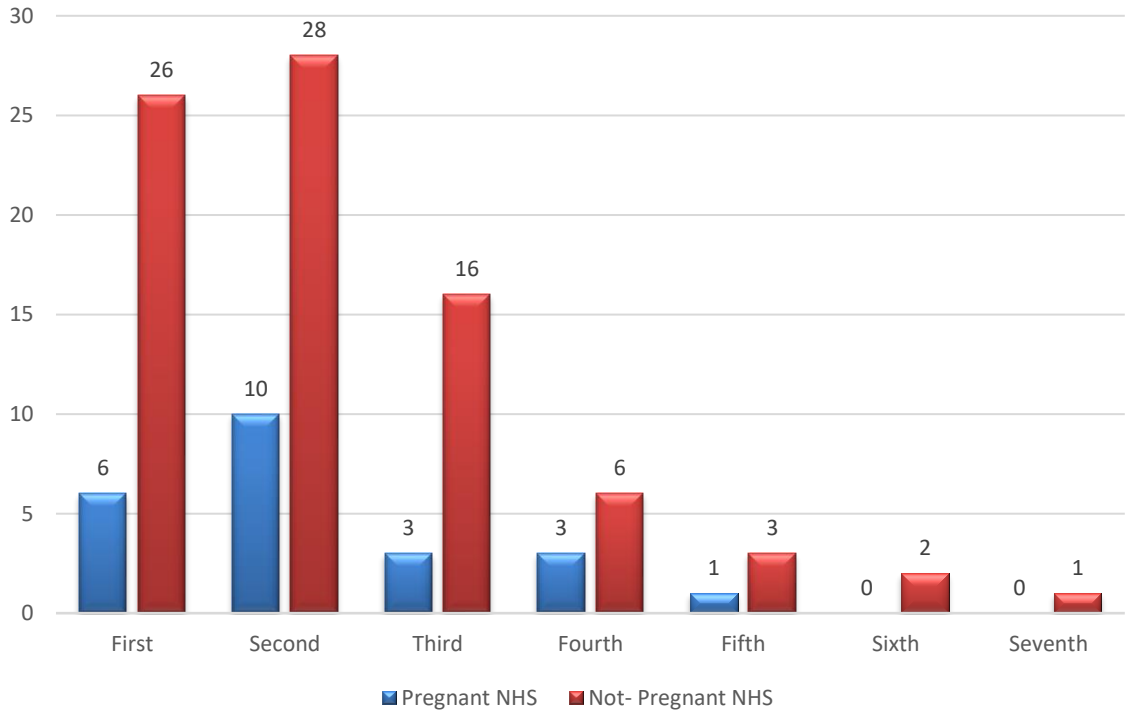


Figure 48 - Self-Funded Pregnant vs Non-Pregnant Totals per ART Cycle Attempts

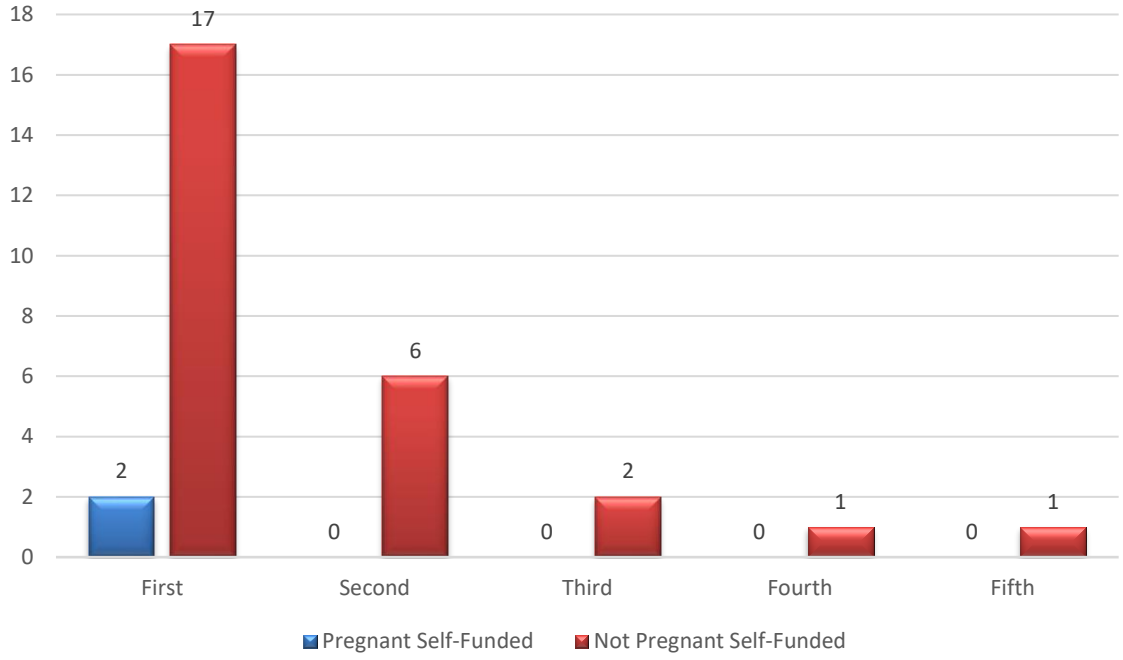
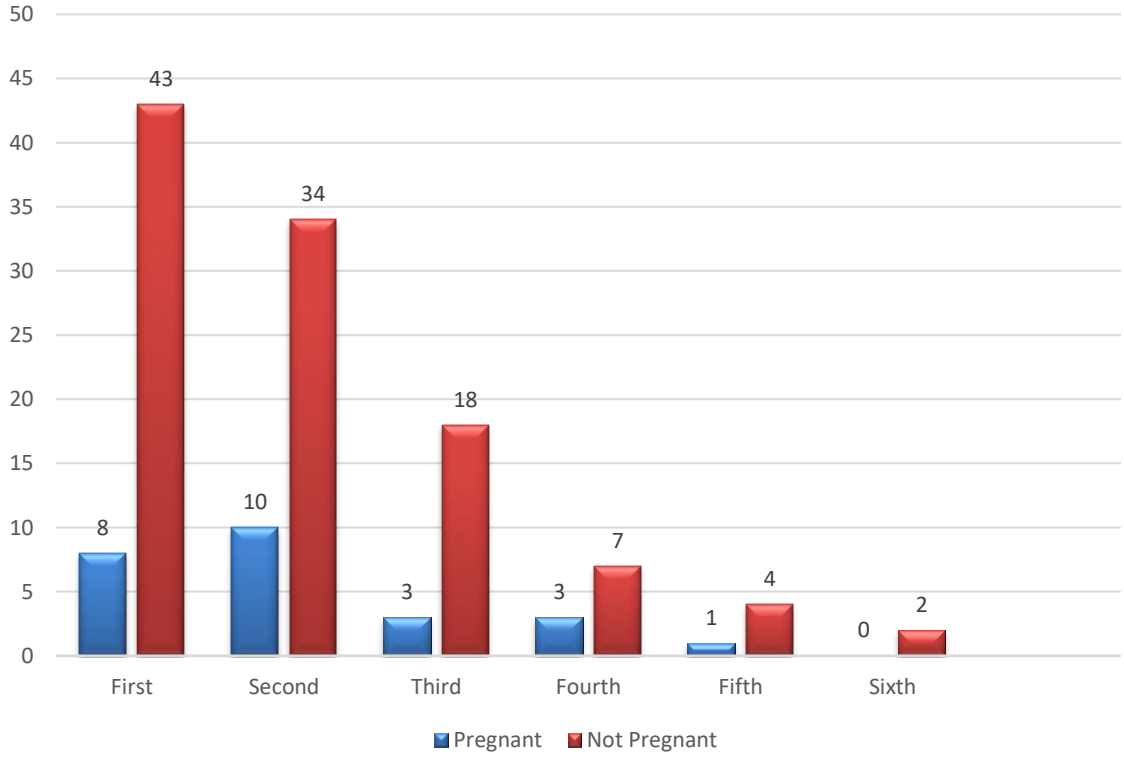


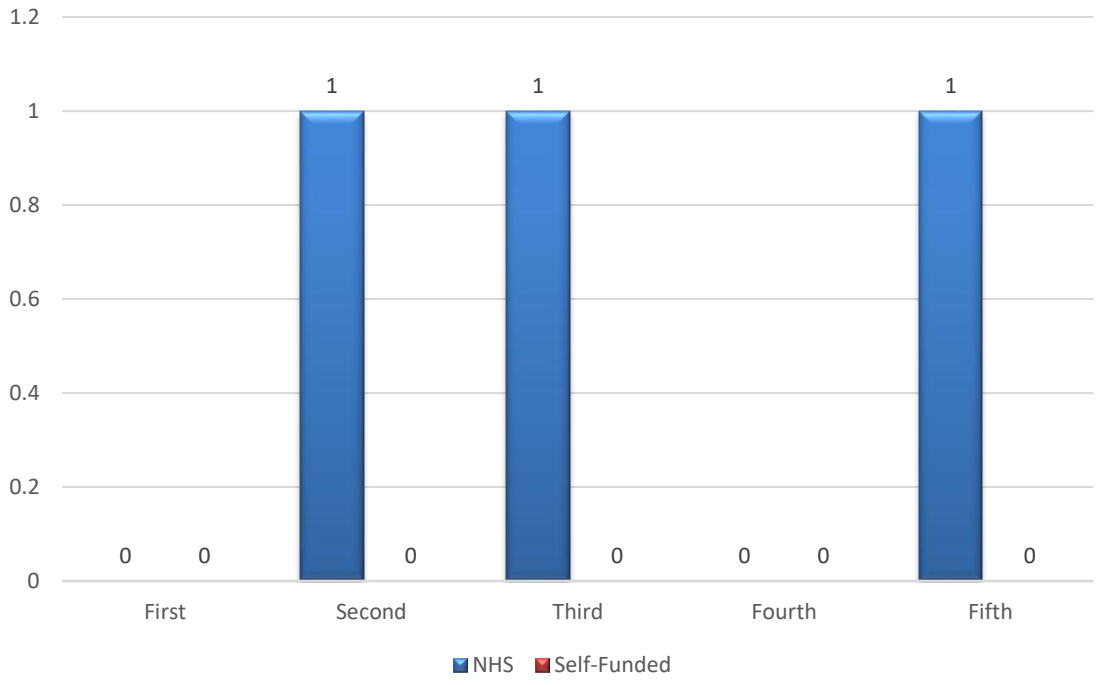
Figure 49 - Total Pregnant vs Non-Pregnant per ART Cycle Attempts



9.7. Miscarriages per ART Cycle

In 2020, a total of 3 miscarriages were reported, all from cycles carried out at MDH ART Clinic. One (1) of the couples who got pregnant on their second IVF/ICSI attempt miscarried. There was another couple who miscarried after a successful 3rd IVF/ICSI attempt. The other one (1) couple miscarried after getting pregnant from a 5th attempt. No miscarriages were reported for the couples who got pregnant on their 1st and 4th attempt (Figures 50).

Figure 50 - Miscarriage per ART Cycle (NHS vs Self-Funded)



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 25-28 year old bracket, another miscarriage was reported in the 33-36 year old bracket. The other miscarriage was reported for women aged 37-39. No miscarriages were reported for women aged 29-32 years and women aged 40-42 years (Figures 51 and 52).

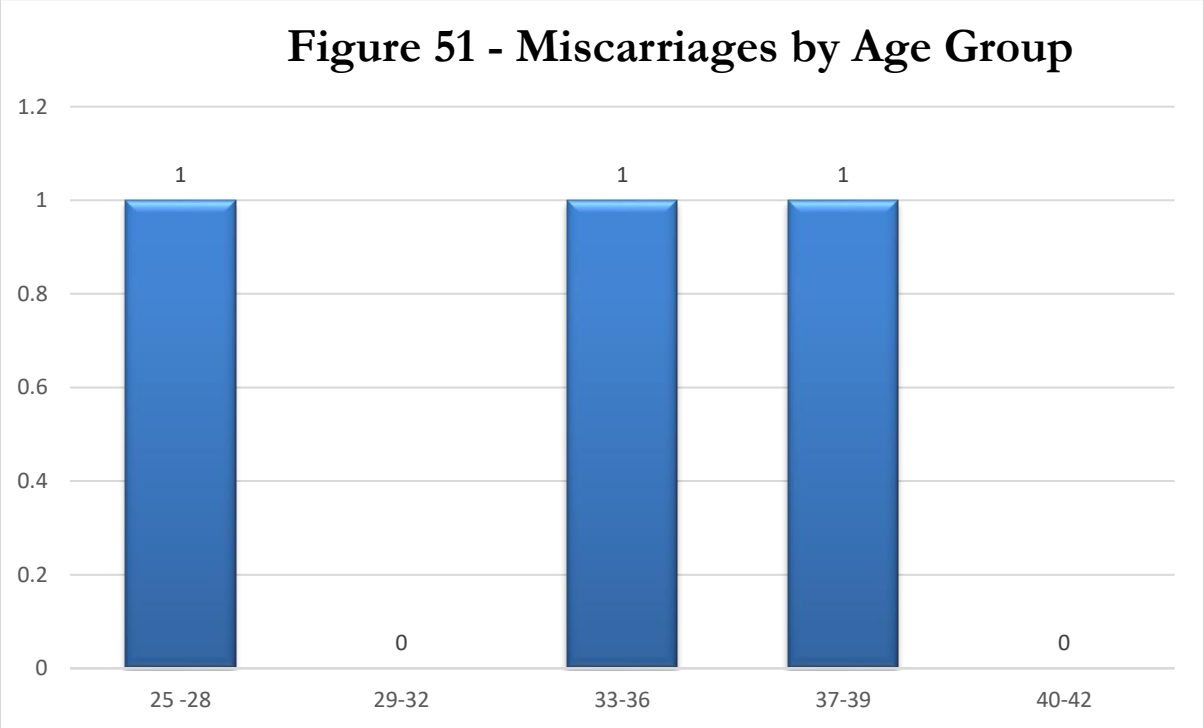
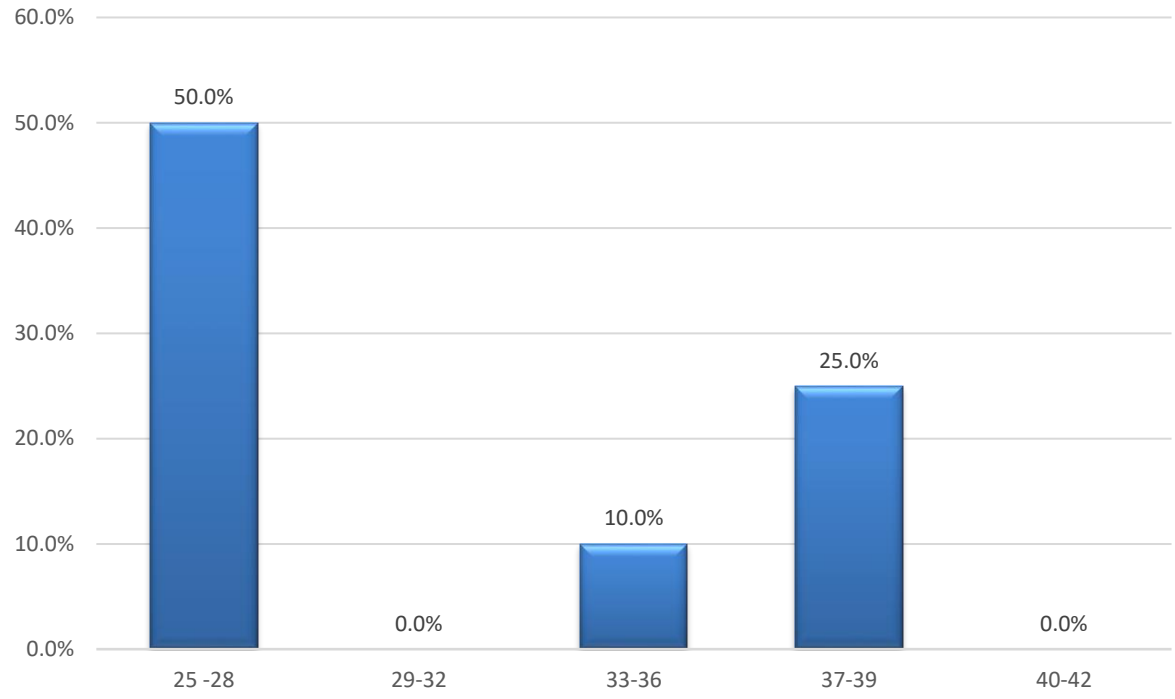
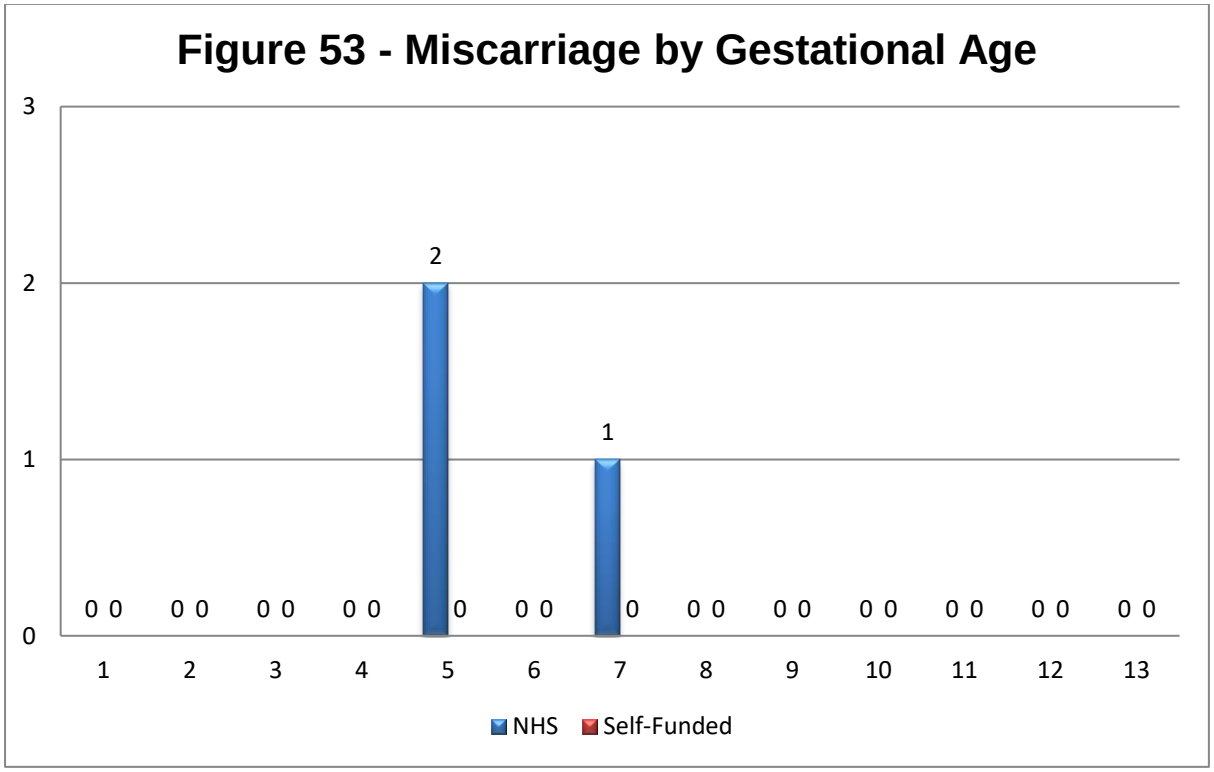


Figure 52 - Miscarriages as % of Pregnancies in Age Group



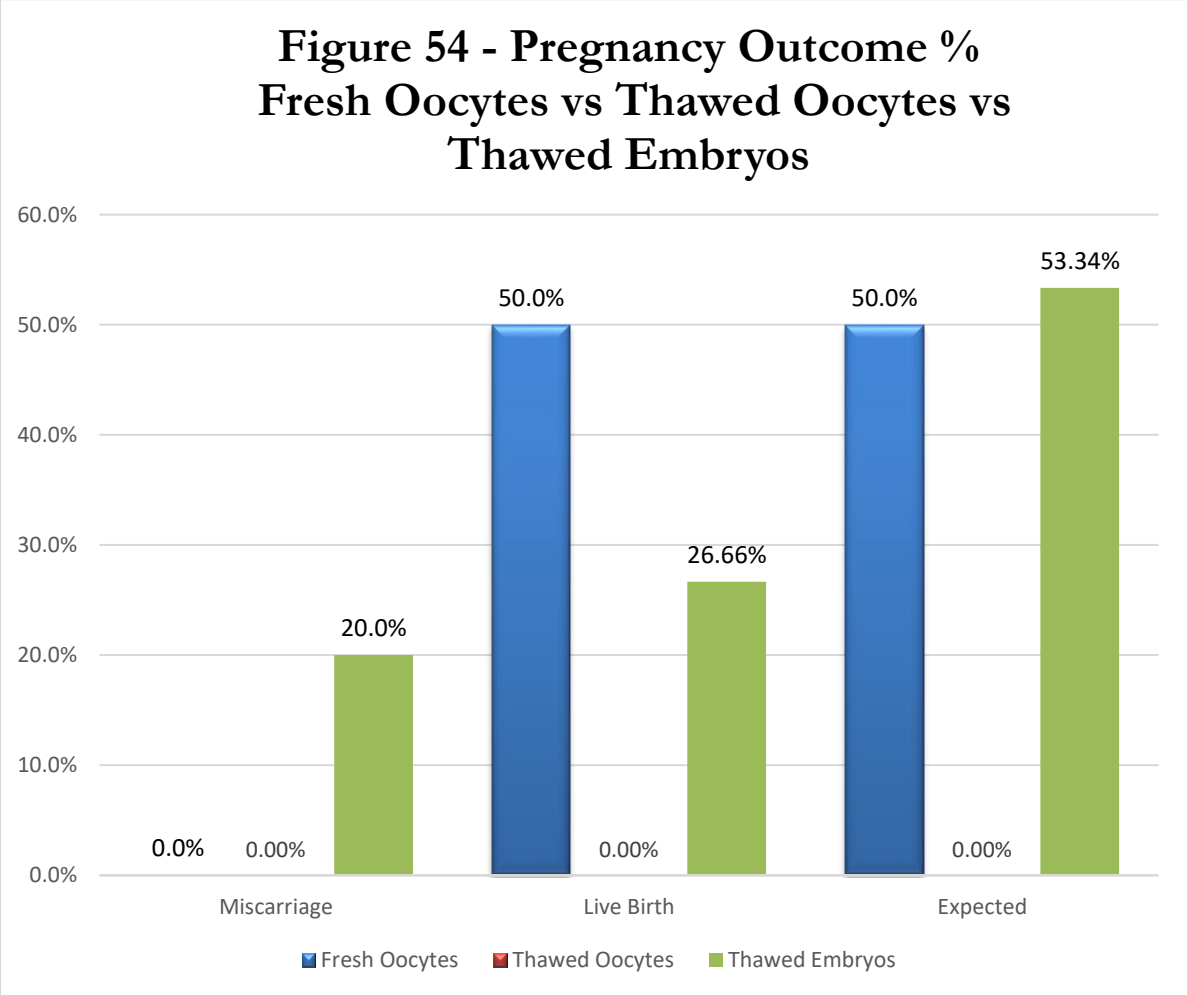
9.9. Miscarriages by Gestational Age

The 3 miscarriages reported were from two women who were in their 5th week of gestation. The other woman miscarried at 7 weeks gestation (Figure 53).



9.10. Miscarriages from Fresh vs Thawed Cycles

Three (3) couples, or 20%, miscarried after achieving a pregnancy from a thawed embryo cycle carried out at the MDH ART Clinic. No miscarriages were reported from Fresh cycles. (Figure 54, Table 16).



10. BIRTH EVENTS

10.1. Births from July - December 2019 Cycles

In 2020, eighteen (18) babies, 12 females and 6 males, were born as a result of cycles performed between July and December 2019 (Figure 55). Hence a total of 24 babies, 14 females and 10 males, were born out of the 28 pregnancies from procedures carried out throughout 2019 (Figure 56).

Figure 55 - Jul-Dec '19 Live Births
Males vs Females

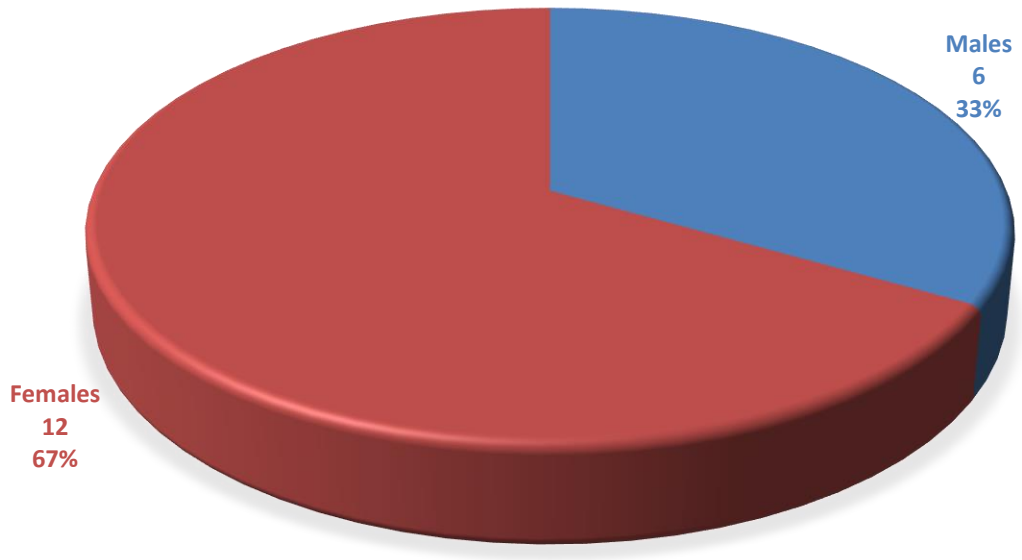
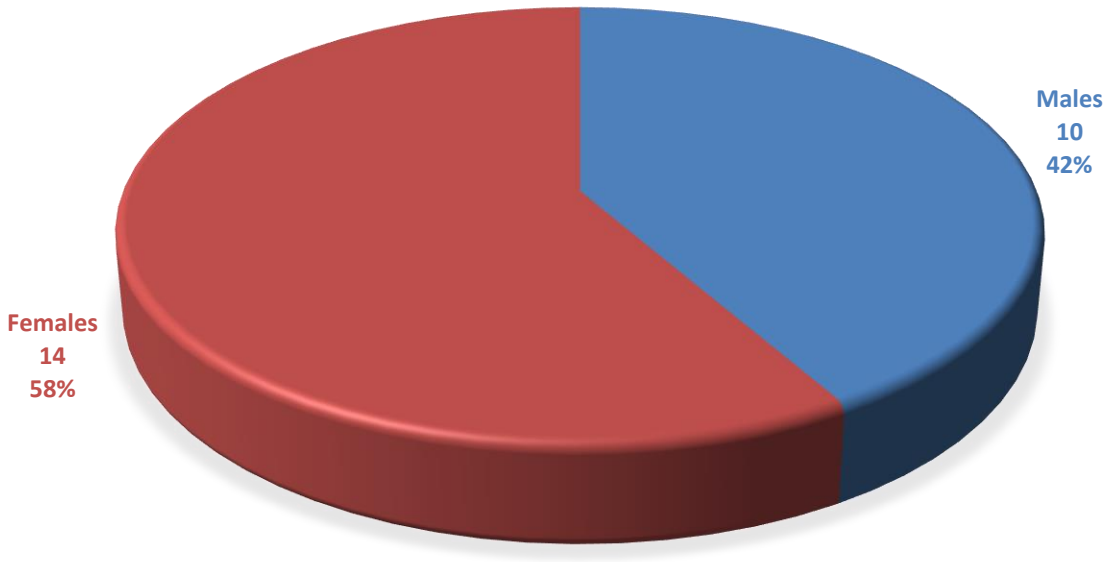


Figure 56 - 2019 Live Births
Males vs Females



Sixteen (16) babies, or 67%, were born out of Fresh oocyte cycles and one (1) baby was born out of Thawed oocytes cycles. Seven (7) other babies were born from the thawed embryo cycles (Figure 57).

Seventeen (17) babies or (71%) of the babies born out of procedures carried out in 2019 were from procedures carried out at MDH, while the remaining 29% were from procedures carried out at the private clinics (Figure 58).

Figure 57 - 2019 Live Births
Fresh Oocytes vs Thawed Oocytes vs Thawed Embryos

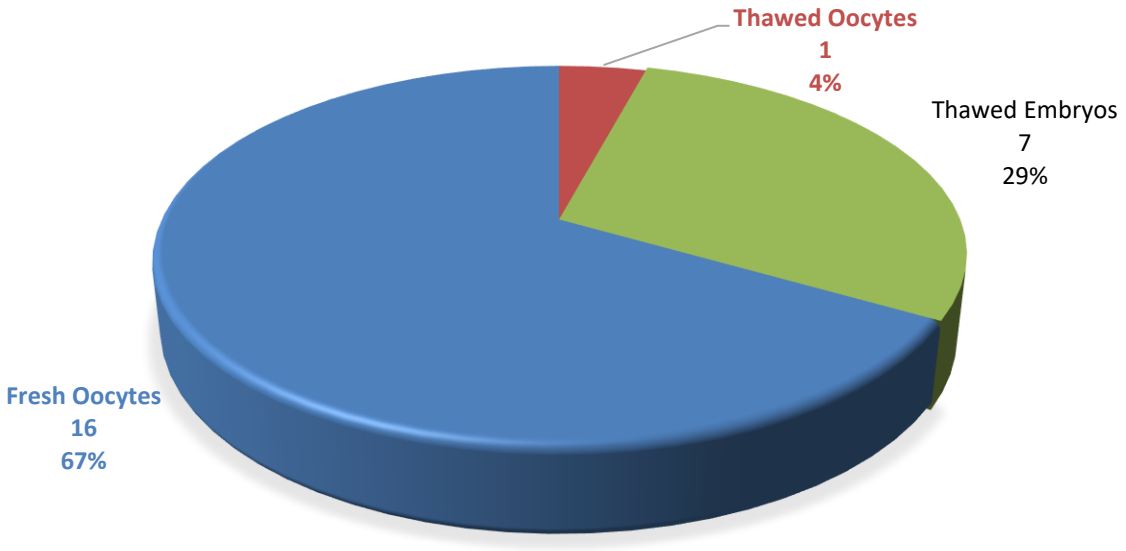
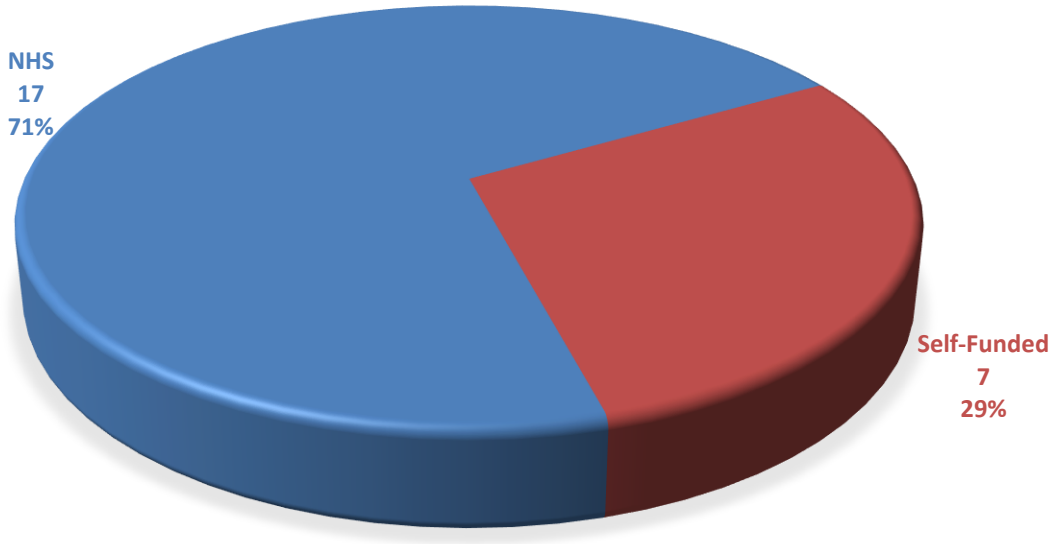


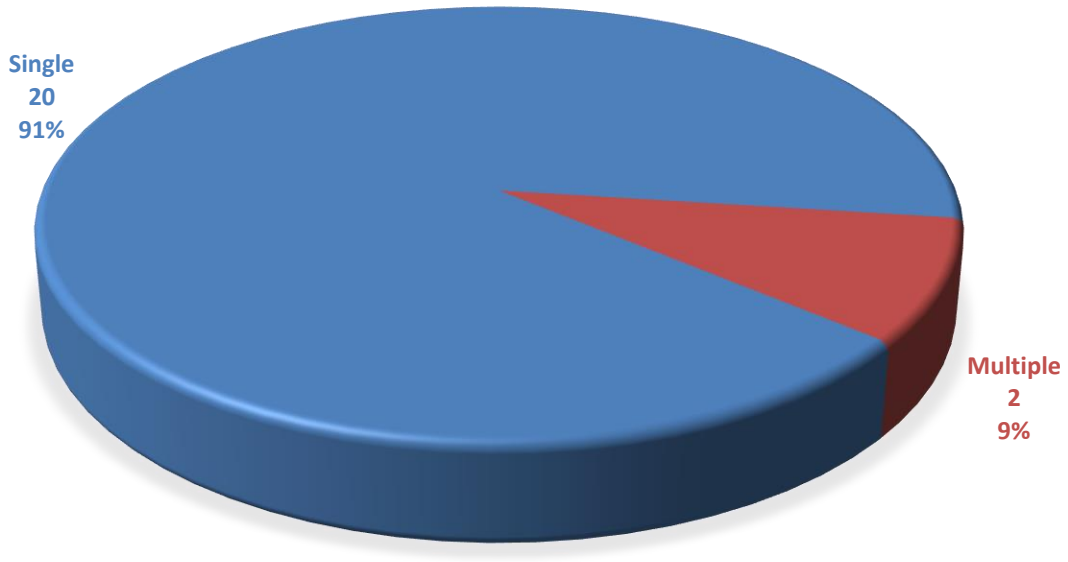
Figure 58 - 2019 Live Births
NHS vs Self-Funded



Out of a total of 28 pregnancies achieved in 2019, six women miscarried thus resulting in 22 live births. Out of the 22 live births recorded two resulted in still births both from cycles carried out at the MDH ART Facility , a further two couples had a birth of a child with down's syndrome, one from the MDH cycle and one from the private cycles.

Out of the 22 Live Birth Events in 2019, there were 20 single births and 2 multiple births. The multiple births consisted of two sets of twins. **The percentage of live births from multiple pregnancies in 2019 was of 1.61% of all cycles, a decrease of 2.85% over 2018.** (Figure 59).

Figure 59 - 2019 Live Birth Events - Singles vs Multiples



In summary, out of a total of 124 cycles carried out in 2019, 96 couples did not achieve a pregnancy, 6 miscarried, and 22 had a live birth, for a **final Take-Home Baby Rate of 17.74%** (Table 18), **which is a 0.96% decrease from that reported in 2018.**

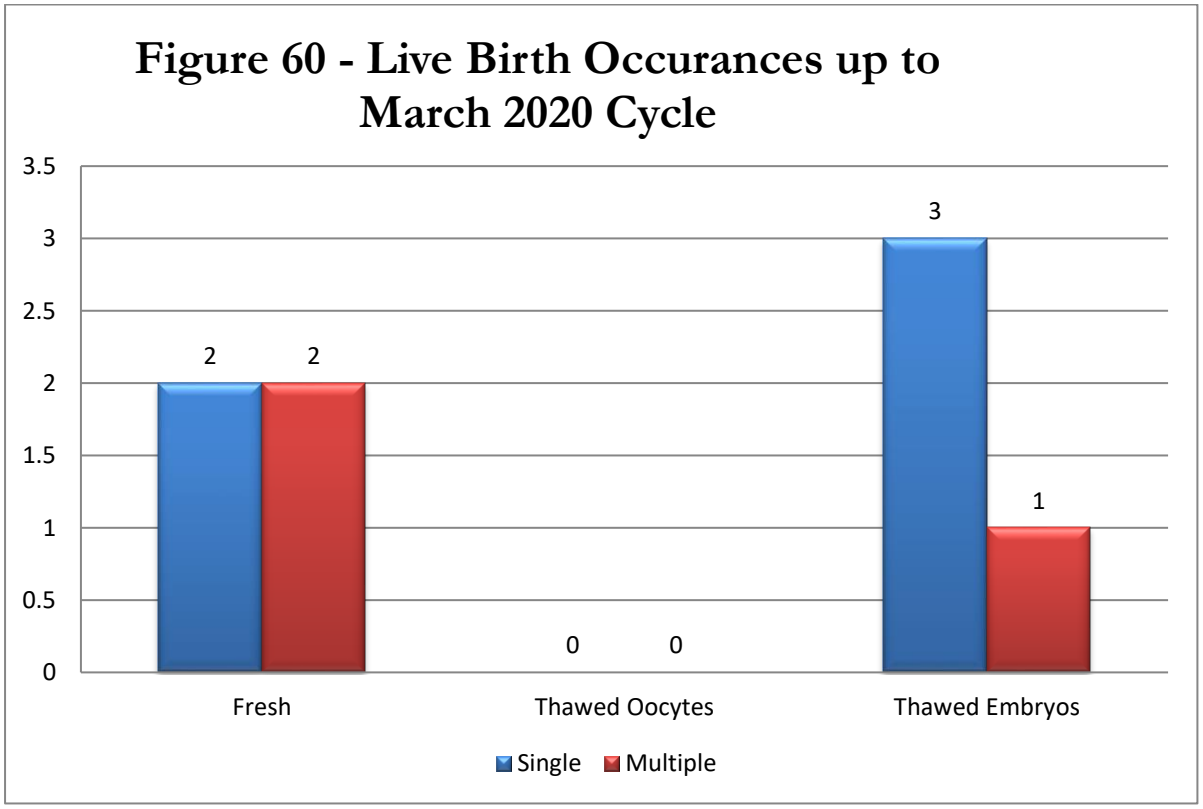
Table 18 - % Take-Home Baby Rate 2019

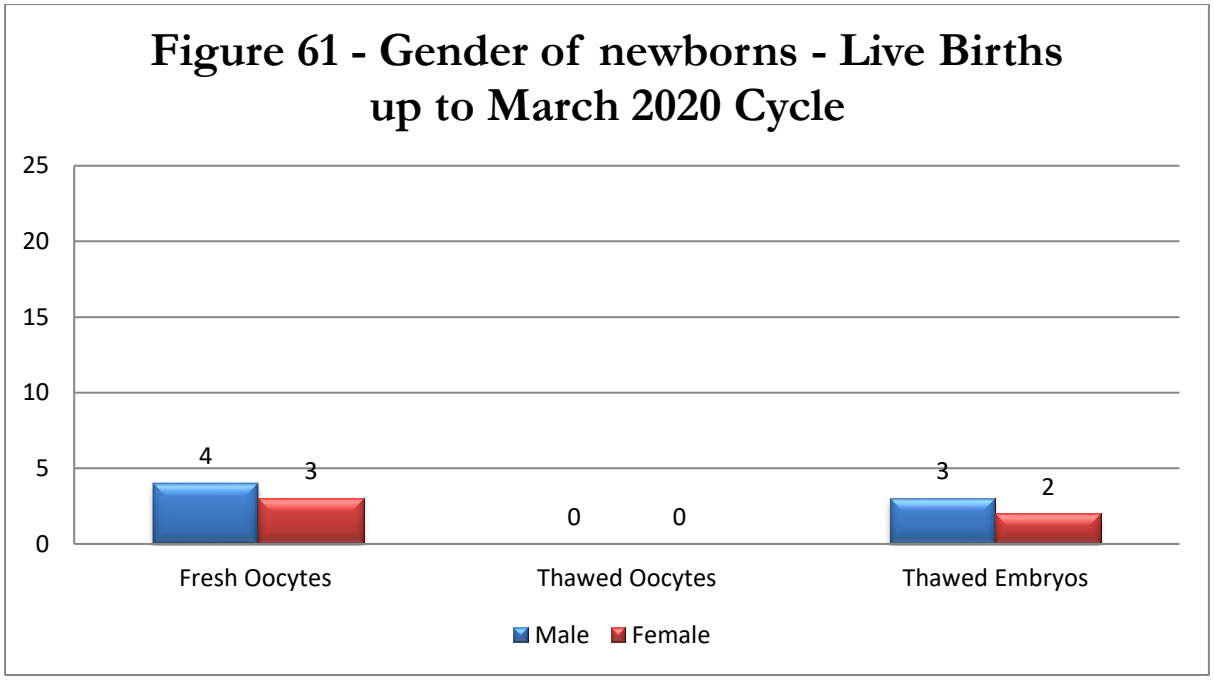
Cycle Outcome	Qty	% of pregnancies	% of total cycles
Live Birth	22	78.57%	**17.74%**
Miscarriage	6	21.43%	4.84%
Not Pregnant	96		77.42%
TOTAL CYCLES 2019	124		100.00%

10.2. Birth Events from 2020 Cycles – Fresh Oocytes vs Thawed Oocytes vs Thawed Embryos

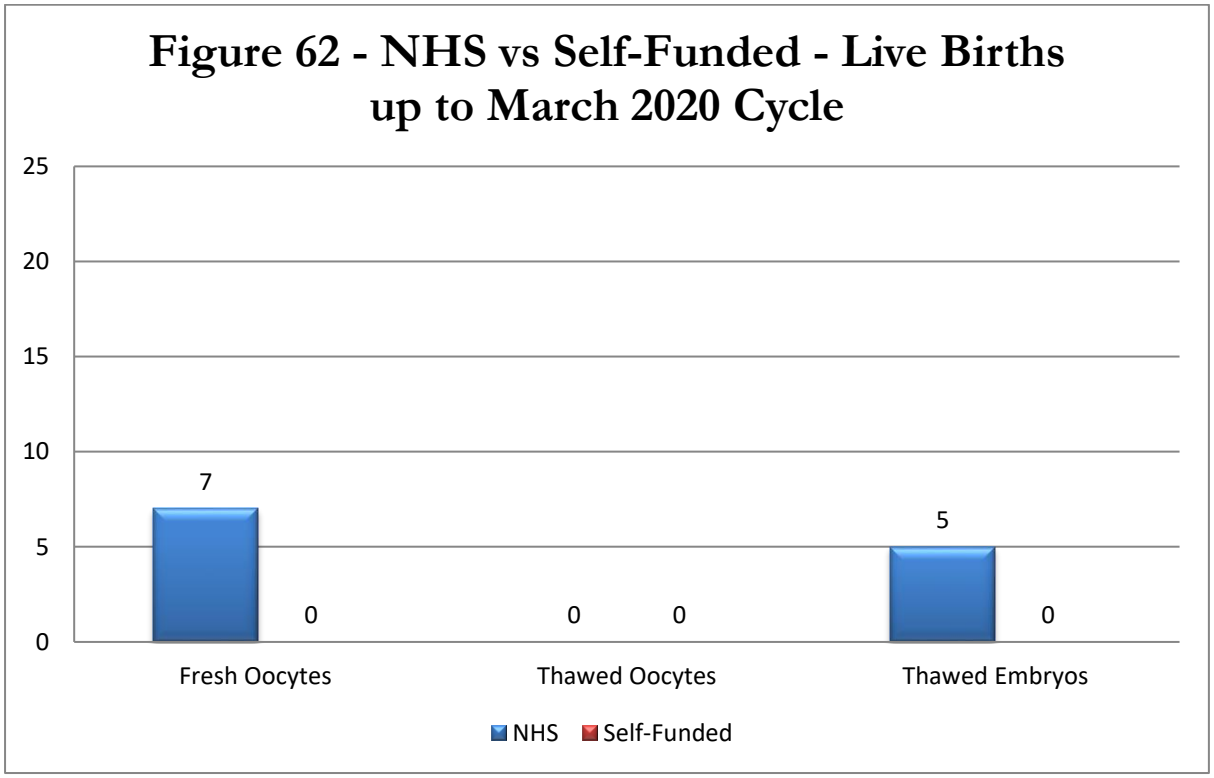
The number of babies born out of procedures carried out between January and March 2020 was of twelve (12) babies. Five (5) singletons and three multiples being two sets of twins and one set of triplets.

Out of the twelve (12) babies born, seven babies comprising of two singletons, a set of twins and the set of triplets were born from Fresh oocyte cycles carried out at the MDH ART Clinic. The other five (5) babies born, three singletons and a set of twins were born from thawed embryo cycles. No baby was born from thawed oocytes cycles. Babies born were 7 males and 5 females (Figures 60 and 61). No Anomalies were observed in the twelve infants born.





The eight (8) live births achieved up to March 2020 were all reported from procedures done at the MDH ART Clinic. From the fresh cycles two singleton females, a set of twins composed of a female and male and a set of male triplets were born. From the thawed embryo cycles, three singletons, 1 male and two females, as well as a set of twin males were born (Figure 62).



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

Fourteen (14) birth events are expected from cycles carried out between June and December 2020. These expected birth events are expected to give birth to seventeen (17) babies as 11 singleton and 3 sets of twins are expected. Fifteen (15) babies are expected from cycles carried out on the NHS whilst two other babies are expected from the self-funded cycles.

Four (4) singletons and two sets of twins are expected from Fresh oocytes cycles. Two singletons and two sets of twins are expected from treatment cycles carried out at MDH ART Clinic and two singletons from the private licenced Clinic.

There are no expected births from thawed oocytes cycles as all treatment cycles were unsuccessful.

Eight (8) expected birth events are expected from Thawed embryo cycles carried out at the MDH ART Clinic. Seven singletons and one multiple birth of twins are expected, to give birth to nine (9) babies (Figure 63 and Figure 64).

The percentage of live and expected births from multiple pregnancies (5 sets of twins and one set of triplets, all from MDH ART Clinic) in 2020 is of 4.41% of all treatment cycles carried out, an increase of 2.80% from figures reported in 2019.

Figure 63 - Expected Birth Events (June to December 2020 Cycles)

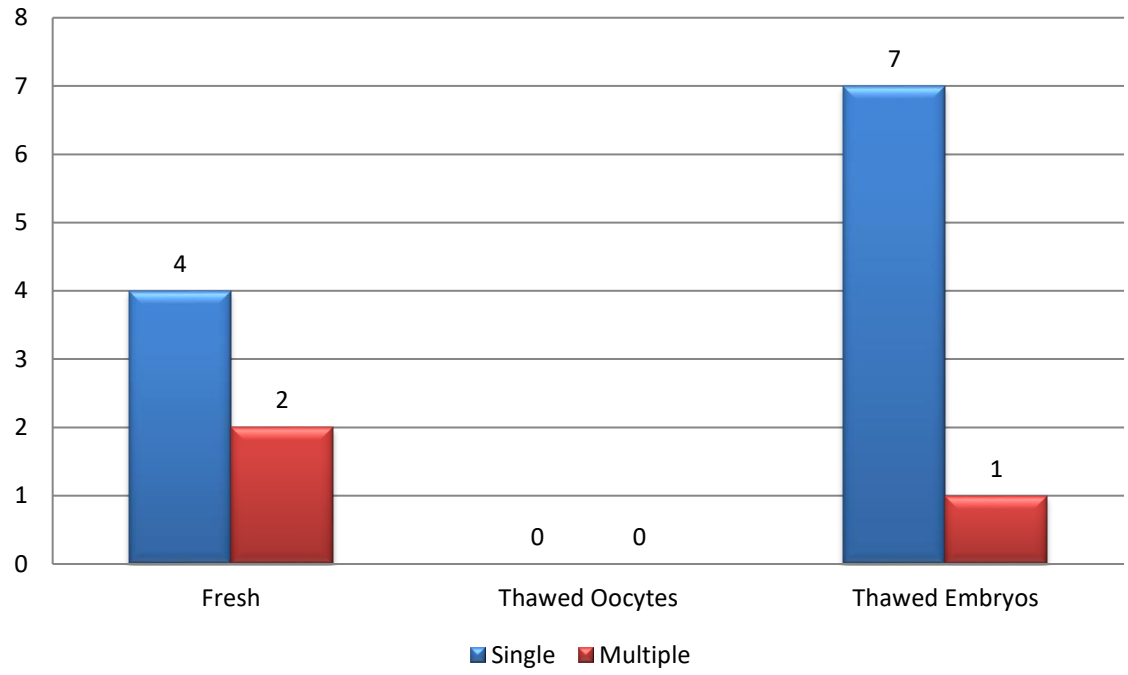
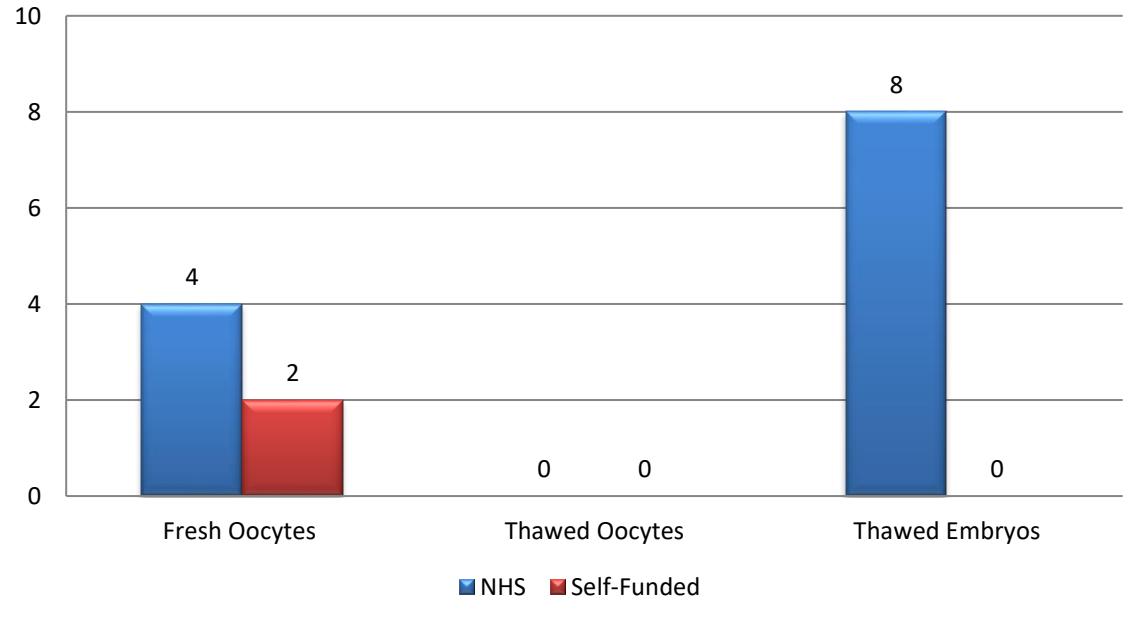


Figure 64 - NHS vs Self-Funded - Expected Birth Events (June to December 2020 Cycles)



Hence, out of the twenty two (22) live and expected births from procedures carried out in 2020 **a total of twenty nine (29) babies are to be born**, fifteen (15) babies are from pregnancies achieved through Fresh oocytes cycles and the remaining fourteen (14) babies are from Thawed embryos cycles.

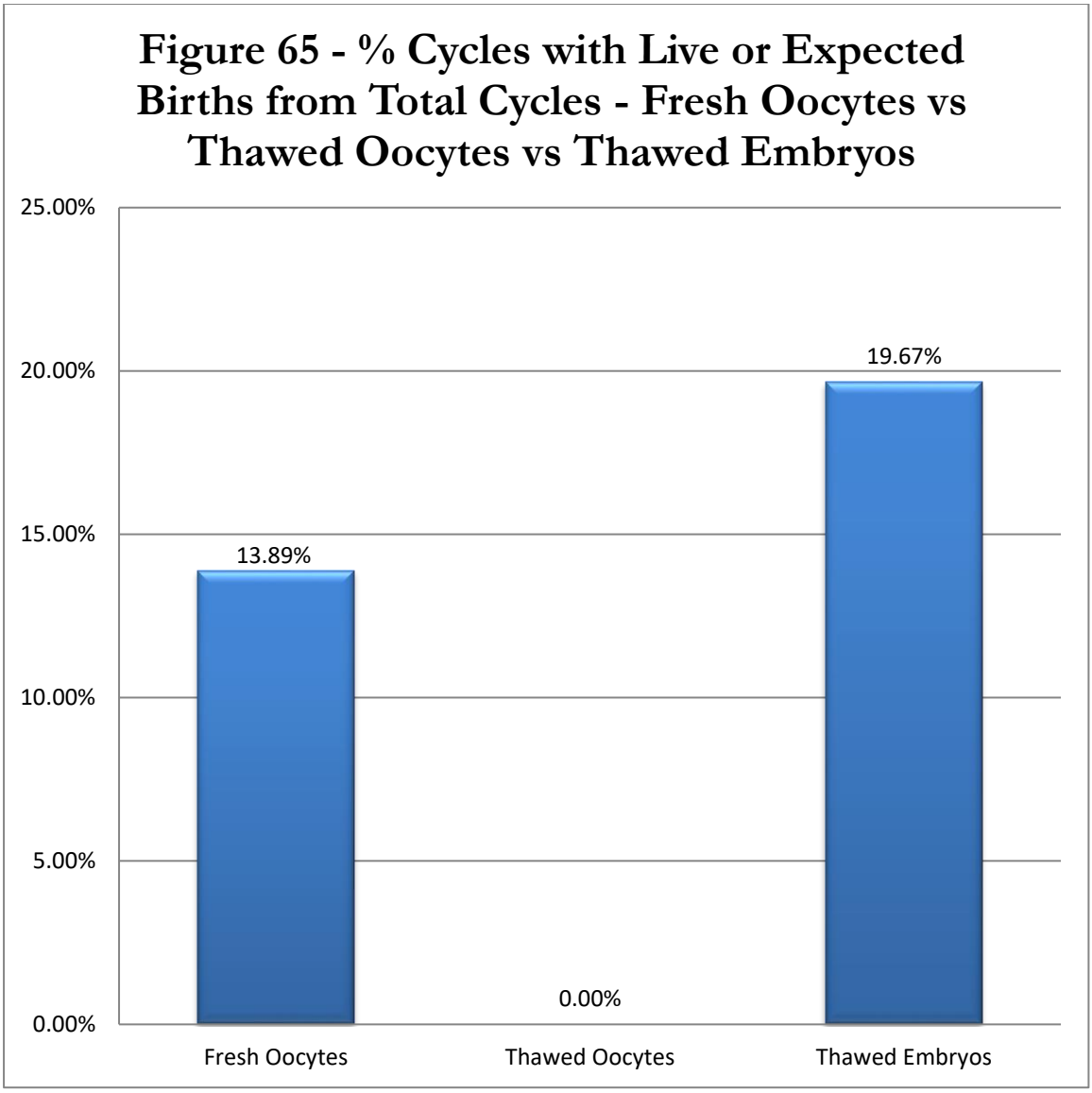
10.3. Maximum Success Rate – Fresh vs Thawed

From the **72 Fresh Oocytes** cycles carried out, there were **10** reported birth events (live + expected), for a maximum success rate of **13.89%,** which is 3.35% lower than last year's 17.24% maximum success rate from fresh cycles**.**

No birth events (live + expected) were reported from the **3 Thawed Oocytes** cycles performed.

Twelve (12) birth events (live + expected) resulted from the **61 Thawed Embryo** Cycles carried out in 2020, for a maximum success rate of **19.67%**, which is 10.76% lower than last year's 30.43% (Figure 65).

Figure 65 - % Cycles with Live or Expected Births from Total Cycles - Fresh Oocytes vs Thawed Oocytes vs Thawed Embryos

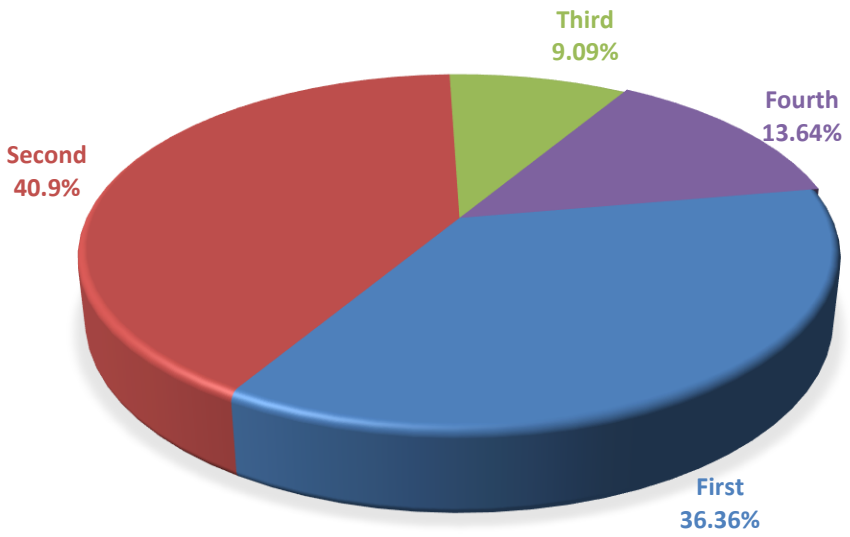


10.4. Birth Events per ART Cycle

Out of a total of 22 reported birth events (live + expected) from procedures carried out in 2020, there were 8 birth events (36.36%) from couples undergoing their first IVF/ICSI attempt, 9 birth events (40.90%) from a 2nd attempt. Two birth events (9.09%) from couples undergoing their 3rd attempt. Three other birth events were from couples undergoing their 4th attempt.

Noteworthy is the fact that whilst there was an increase in the 2nd and 3rd time attempts, there was a decrease in the first time attempts with a decrease of 11.47%. Contrary to last year 2019, this year no birth events were registered for couples undergoing more than 4 attempts. (Figure 66).

Figure 66 - Live & Expected Birth Events Distribution by ART Cycle



The majority of these birth events (live and expected) 20 couples or 90.91% of couples experiencing a birth event, are from cycles undergone at MDH, the remaining 2 couples had self-funded their treatment (Figure 67 and Figure 68).

Figure 67 - NHS Live Birth & Expected per ART Cycle

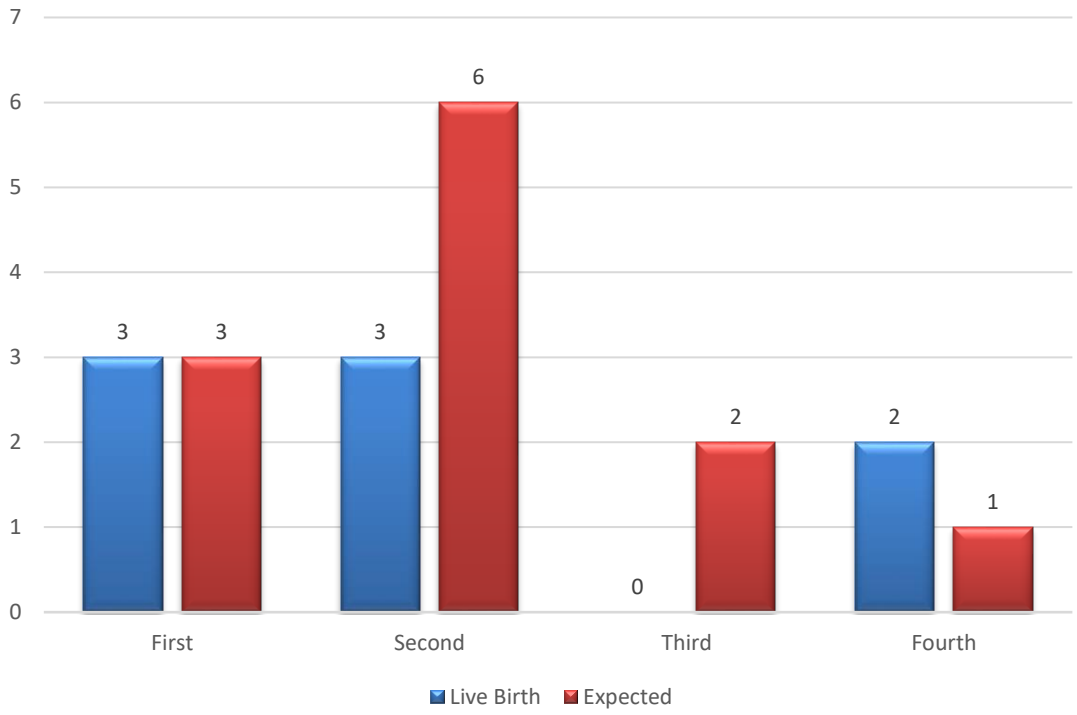
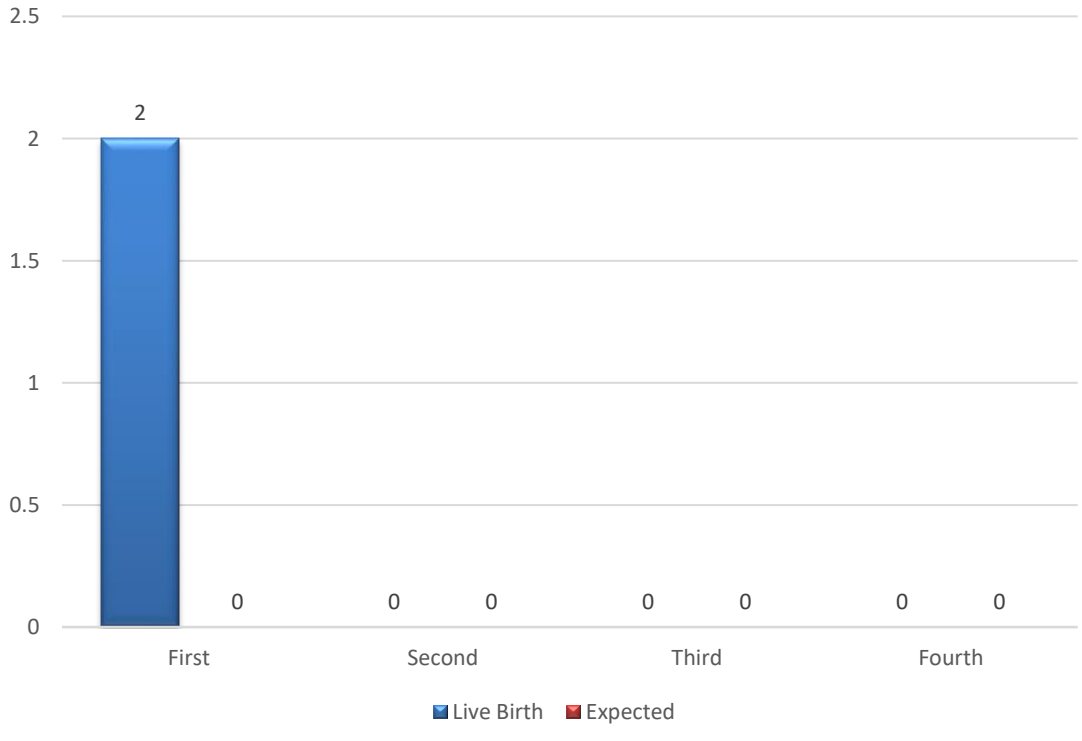


Figure 68 - Self-Funded Live Birth & Expected per ART Cycle



Overall outcome of birth events (live + expected) from all 136 procedures carried out in 2020, show that 15.7% of all couples undergoing their first IVF/ICSI attempt will experience a birth event an increase of 2.6% from figures reported in 2019. Total of couples undergoing a 2nd attempt have also registered a decrease of 1.6% from previous year from 22% to 20.4%. A total of 9.5% of all couples undergoing their third attempt will experience a birth event, this has registered an increase of 1.8% over previous year that had registered a 7.7% in third attempts. During 2020 a record of 30% of all couples undergoing their 4th attempt achieved a birth event, an increase of 15.7% over previous year, which is very encouraging for couples undergoing more than one attempt (Figures 69, 70, 71 and 72).

Figure 69 - NHS - % Live Birth & Expected of Cycles per ART Cycle

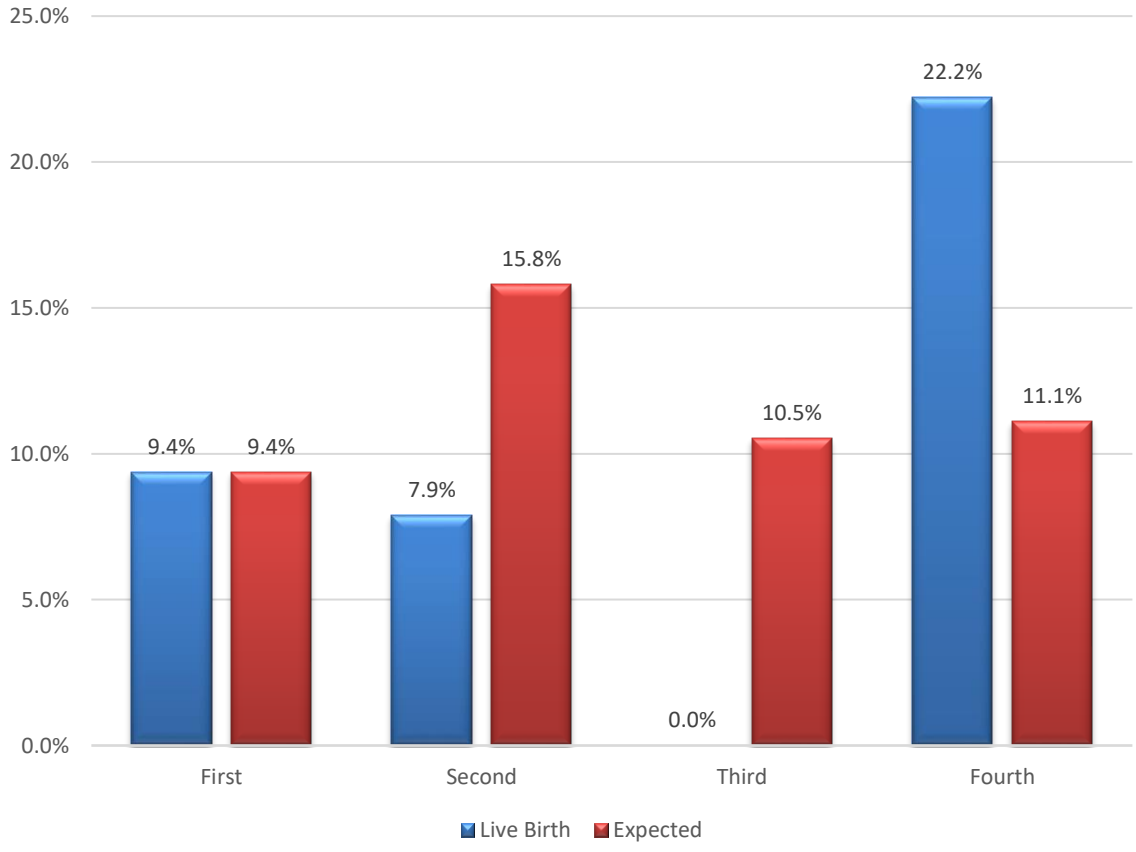


Figure 70 - Self-Funded - % Live Birth & Expected of Cycles per ART Cycle

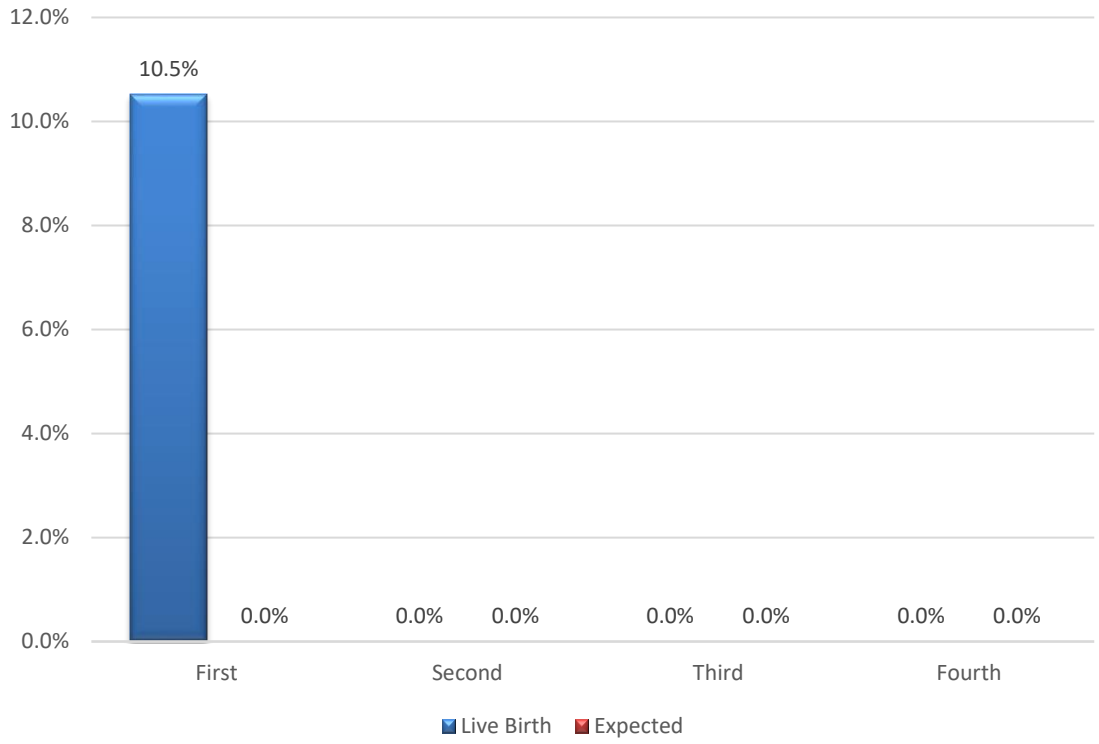


Figure 71 - Overall % Live Birth & Expected of Cycles per ART Cycle

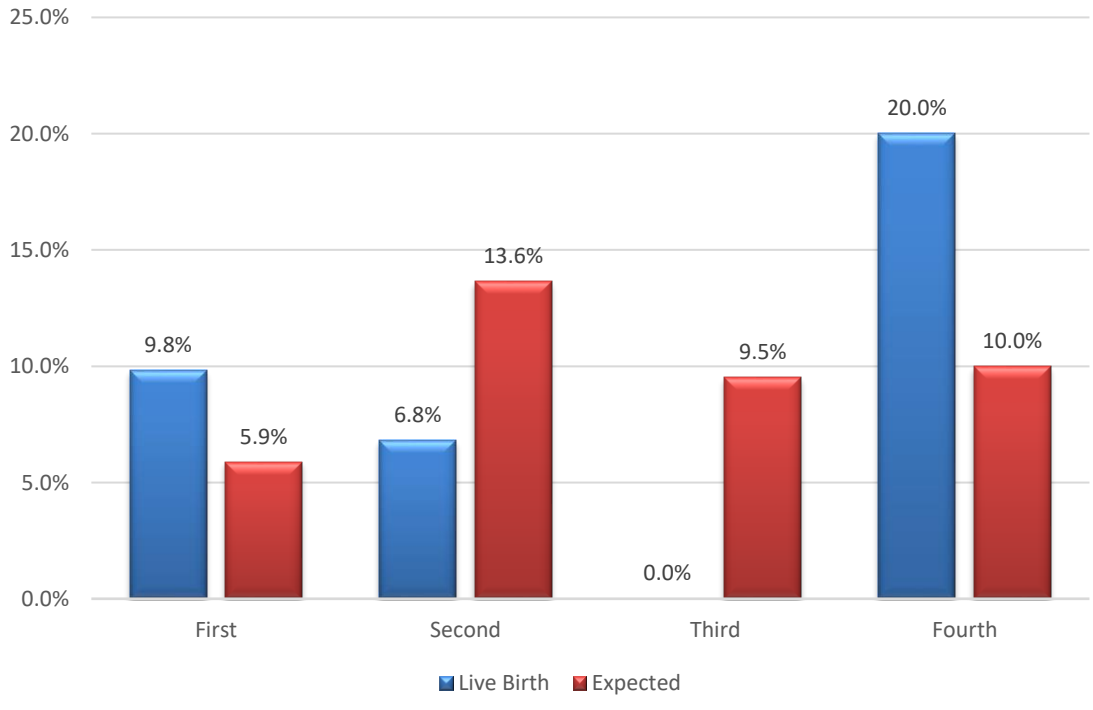
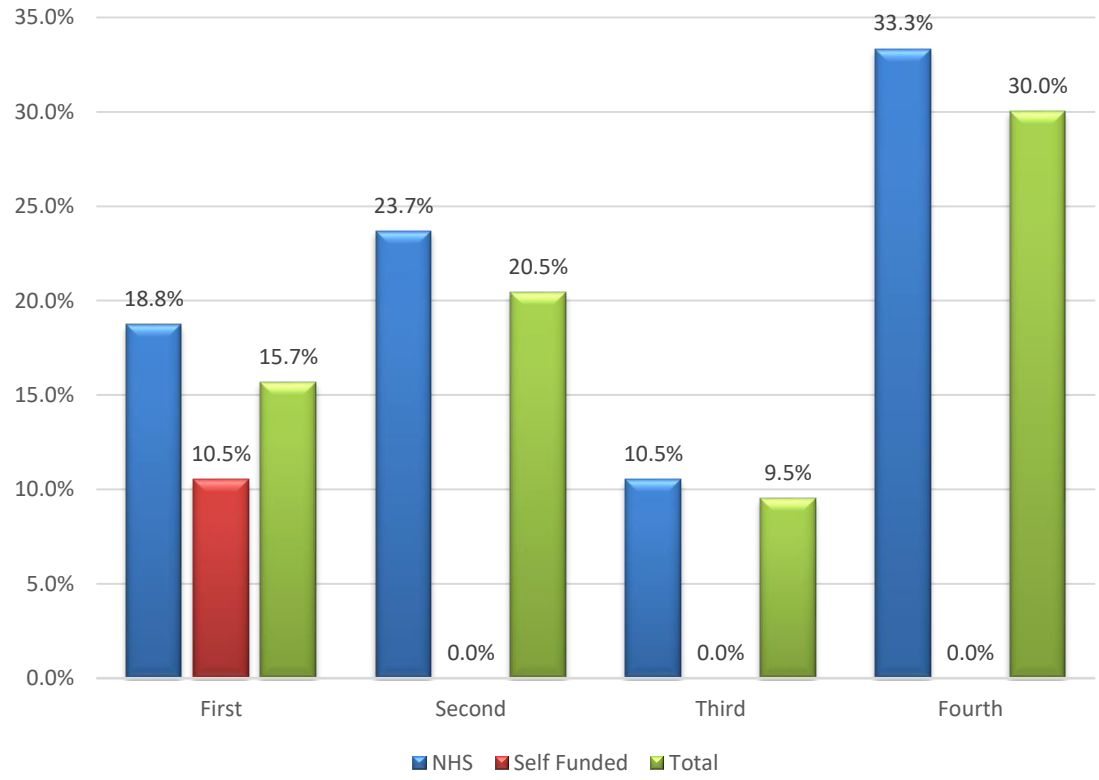


Figure 72 - Max 'Take-Home Baby' Rate - % of Cycles per ART Cycle - NHS vs Self-Funded

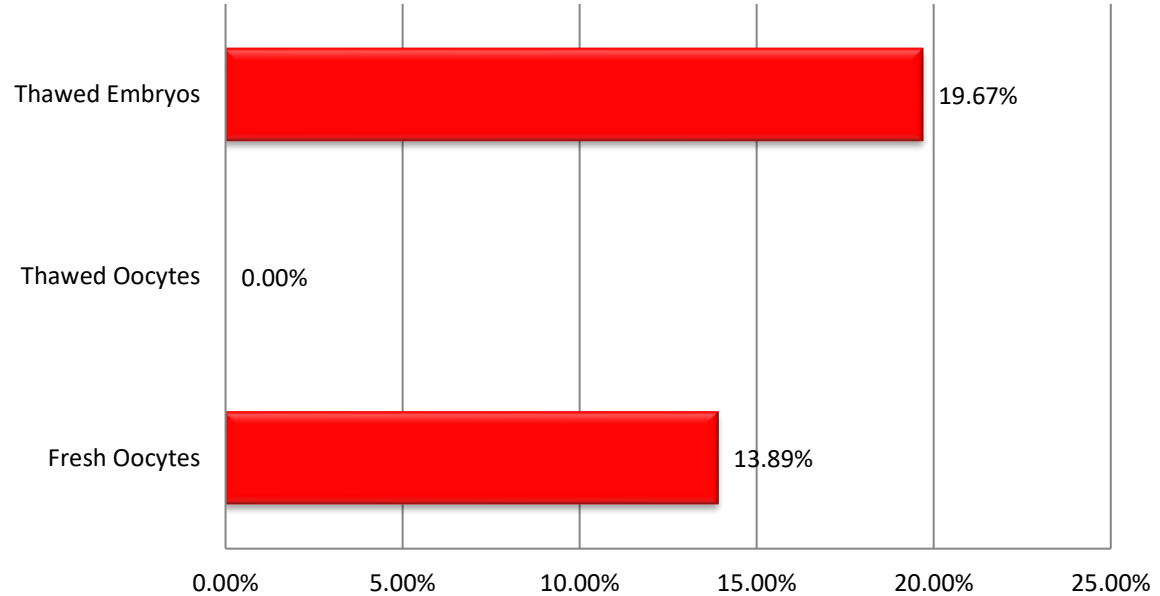


10.5. Percentage Maximum Success Rate – 'Take Home Baby' Rate

In conclusion, from the 25 couples who achieved a pregnancy in 2020, 8 (32%) had a live birth, 14 (56%) are still expecting, and 3 couples (12%) miscarried.

These were achieved mainly from Thawed Embryo cycles (19.67%), followed by Fresh Oocytes cycles (13.89%). No successes were registered from Thawed Oocytes Cycles (Figure 73).

Figure 73 - % Cycles with Live or Expected Births from Total Cycles - Fresh Oocytes vs Thawed Oocytes vs Thawed Embryos



Out of a total of 136 cycles carried out, **5.88%** of couples had a live birth, **10.29%** are still expecting, while **2.22%** miscarried.

Consequently, the maximum percentage success rate, or 'Take Home Baby' rate for calendar year 2020 is 16.18%, resulting in a decrease of 1.56% over 2019 (Table 19).

Table 19. % Maximum Success Rate – 'Take Home Baby' Rate 2020

Pregnancy Outcome	Qty	% of pregnancies	% of total cycles	% Max Success - 'Take Home Baby' Rate
Live Birth	8	32.00%	5.88%	16.18%
Expected	14	56.00%	10.29%	
Miscarriage	3	12.00%	2.22%	

11. Conclusion

The number of ART procedures carried out in Malta in 2020 increased by 32.92% over the previous year, which is mainly attributed to the fact that in 2019 less procedures were carried out at the MDH clinic as the clinic had stopped activity for five months in 2019. The private facility registered a decrease of 13 procedures over the previous year with the 34 procedures all carried out in one batch in October 2020. This increase in activity was still registered notwithstanding the COVID 19 measures in place.

ICSI was the preferred procedure of choice in all procedures carried out by the licensed clinics. There were **25 (18.38%)** reported pregnancies out of the 136 treatment cycles started which is **4.20% lower** than the pregnancy rate for 2019. As with last year, Thawed oocytes cycles were less effective than Fresh oocytes treatments.

The birth events were achieved mainly from Thawed Embryo cycles (19.67%), followed by Fresh Oocytes cycles (13.89%) no pregnancies were reported from 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 **16.18%**, which is **1.56% lower** than previous year. Considering all the restrictions and measures taken due to the COVID 19 pandemic the decrease of 1.56% is not that significant and as an Authority we shall strive together with all stakeholders to increase the success rate in the coming years.

The Embryo Protection Authority shall keep providing guidance and support to all the licensed ART clinics, as well as to all IUI registered 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, 2019.

To this effect a national Strategy 2021 - 2023 will be launched so the Authority will continue to be the voice of the patients, that will focus on what we want to achieve in this field and how we will work together with all stakeholders towards achieving it.

Hon Judge Philip Sciberras UOM
Chairperson

Ms. Simone Attard
Chief Executive Officer