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**THE ROLE OF ASSISTED REPRODUCTIVE TECHNOLOGIES IN  
PROMOTING SUSTAINABLE DEVELOPMENT GOALS**

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*Abstract*

In 2015, leaders of 193 nations including Malaysia, gathered to adopt Agenda 2030 and pledged commitment towards achieving 17 Sustainable Development Goals (SDGs). One the identified goals is aimed to “ensure good healthy lives and promote well-being for all at all ages” (SDG3). It is targeted that by the year 2030, preventable deaths of new-born babies may be ended and universal access to sexual and reproductive health-care services are made available. This study thus seeks to argue for the use of assisted reproductive technologies that may ensure the birth of children who are free from genetic diseases as one of the ways in which SDG3 may be achieved. To accomplish this objective, the notion of individual reproductive autonomy that provides the theoretical foundation for the use of assisted reproductive technologies is briefly presented. This is followed by a descriptive elaboration on the functions of each assisted reproductive technologies identified so as to argue for their utilisation in ensuring healthy lives and wellbeing according to SDG3. In the end, this study concludes that the use of these technologies should be promoted in Malaysia in order to safeguard the birth of healthy children and society in future as demanded by SDG3.

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**Keywords:** Sustainable development, SDG3, assisted reproductive technologies.



## **1. Introduction**

In September 2015, world leaders gathered at a special United Nations Summit in New York to adopt Agenda 2030 and declared adherence to the 17 Sustainable Development Goals (SDGs) formulated therein. Amongst the SDGs agreed upon is a pledge to “ensure healthy lives and promote well-being for all at all ages (SDG3).” (United Nations, n.d.). Generally, SDG3 aims to put a stop to preventable death of new-born babies and ensure access to sexual and reproductive health-care services together with the incorporation of reproductive health into national policies and agendas (United Nations, n.d.). Malaysia is one of the 193 nations that have agreed to and adopted the SDGs and have been committed ever since in achieving them as the then Minister in the Prime Minister’s Department, Datuk Seri Abdul Rahman Dahlan was reported as saying, “The SDG principles are entrenched in every facet of our development carried out under the 11th Malaysia Plan” (“Abdul Rahman: Malaysian on Track...”, 2017).

## **2. Problem Statement**

Promoting healthy lives and well-being of people of all ages is one of the essential components of SDGs. In realising this goal, tremendous efforts have been put in place so as to increase life expectancy and reduce deaths of new born babies ([www.un.org/sustainabledevelopment/health/](http://www.un.org/sustainabledevelopment/health/)). Assisted Reproductive Technologies (ART) are also connected with sustainable development where access to ART could be viewed as part of achieving sustainability (Marks, 2017; Inhorn, 2009). However, Richie (2015) believes that access to ART should be limited to those who are biologically infertile only so as to combat climate change concerns and maintain sustainable development. Nonetheless, the use of ART as a mechanism to achieve SDG3 has yet to be explored nor critically discussed. This study, therefore, undertakes the challenge to analyse the role that ART can play in promoting sustainable development goals, particularly SDG3

## **3. Research Questions**

This study is guided by the following questions:

- 3.1.** What are the ART methods that may achieve SDG3 to reduce preventable death among new-born babies?
- 3.2** How does the ART methods identified namely Three-Parent In Vitro Fertilisation, Preimplantation Genetic Diagnosis and Gene Therapy work in achieving the aims of SDG3?
- 3.3.** Why should access to these ART methods be promoted as part of the effort to realise SDG3?

## **4. Purpose of the Study**

This study is unique as it attempts to promote the use of several ART methods identified herein as one of the instruments in which early and preventable deaths of new-born babies may be eliminated consistent with SDG3. Thus, this study seeks to identify and explain the relevant ART methods and how they may secure the birth of healthy babies who are free from genetic diseases that may lead to premature death and in the end, help to achieve SDG3.

## 5. Research Methods

Overall, this study adopts a purely qualitative method where relevant literatures are explored in order to answer the research questions identified and achieve the purpose of the study. To explain the science of the ART methods identified, a descriptive method is employed where recent literatures on the field are referred to. Thus far, there is no literature that argues for the use of ART as one of the mechanisms to achieve SDG3 which is the central thesis of this study. Hence, this study is exploratory and descriptive as it paves the way for more critical discussions on the issue.

## 6. Findings

The improvement in ART has not only enables couples to produce any child but has extended to ensuring the birth of healthy babies who are free from genetic diseases. This is achievable through 3-Parent in Vitro Fertilisation (IVF), Preimplantation Genetic Diagnosis (PGD) and Gene Therapy. The advent of these technologies, arguably, may assist in achieving one of the sustainable development goals (SDGs), that is to promote healthy lives and well-being of people of all ages (SDG3). The use of ART as to assist human reproduction is founded upon the notion of individual reproductive autonomy. Harris (2000), for example, believes that upholding the notion of individual reproductive autonomy includes the freedom to, "...reproduce with the genes we chose and to which we have legitimate access or to reproduce in ways that express our reproductive choices and our vision on the sorts of people we think it right to create" (p.34). On this basis, the same freedom should be extended to the decision to produce a healthy child free from genetic diseases by using the ART methods identified herein. In what follows, the theoretical framework supporting the use of ART namely the notion of individual reproductive autonomy is briefly presented. This is followed by a description on the functions of each of the technology identified in order to illustrate their role in fulfilling SDG3, particularly goal 3.2. to put a stop to preventable deaths of new-borns and children under 5 years old by the year 2030 (World Health Organisation, n.d).

### 6.1. Individual Reproductive Autonomy

Autonomy literally means "self-governance or self-determination" (Stirrat & Gill, 2005). Harris (1985) defines autonomy as "self-government," whereby autonomous individuals are those who are able to control their lives by exercising their own judgment. The principle of autonomy urges that individuals should be free to decide for themselves on the courses of action that are crucial to their lives. Thus, respecting one's autonomy requires the acknowledgement of the individuals' right to make their own choices according to their own personal values without undue interference from others (Beauchamp & Childress, 2009). Respect for autonomy is crucial because it is through this recognition that individuals will be able to live their lives according to their own choices (Munson, 2000). Allowing individuals to shape their lives according to their own convictions enables them to assert their own "individuality" and to emphasise their own identity which is essential to give a "special and peculiar value" to their lives (Harris, 2003, p.11). According to Mill (as cited in Collin, 1989), the freedom to live one's life according to one's choices is crucial because it is through the "different experiments of living" that individuals learn the course of life that is suitable to them. He explained:

“As it is useful that while mankind is imperfect there should be different opinions, so is it that there should be different experiments of living; that free scope should be given to varieties of character, short of injury to others; and that the worth of different modes of life should be proved practically, when anyone thinks fit to try them. It is desirable, in short, that in things which do not primarily concern others, individuality should assert itself” (p. 57).

The argument that individuals should be free to exercise their autonomy without intervention from the State has been extended to the area of human reproduction. Jackson (2009), for instance, suggests that intervention in individuals’ reproductive decisions undermines their autonomy and privacy. As such, the freedom to decide on one’s own reproductive issues need to be respected. Expressed by the terms ‘reproductive autonomy’, ‘procreative autonomy’ or ‘procreative liberty’, it is this freedom or liberty that grants individuals the right to make their own reproductive decisions without intervention by others, provided such decisions do not cause harm to others (Zeiler, 2004). Founded upon this notion, the use of three ART methods identified below is promoted as a way to achieve SDG3.

### **6.2. Three-Parent IVF**

Scientifically known as Mitochondrial Replacement IVF, this technique signifies a vast advancement in the traditional IVF method as it ensures the birth of babies who are free from inherited diseases caused by faulty mitochondria (Mullin & Harrison, 2018). The birth of a healthy baby is guaranteed by this procedure through the removal of the nuclear material from a woman’s egg with faulty mitochondria. This nuclear material is then placed in another woman’s egg that contains healthy mitochondria (Morley 2013). Unhealthy mitochondria in a woman’s egg is among the causes of early miscarriages and mitochondrial diseases such as muscular dystrophy, Leigh’s disease, amyotrophic lateral sclerosis (ALS) and even premature death (Whiteman, 2015). Three-Parent IVF has been hailed as a viable preventative method to avoid the birth of a child with mitochondrial diseases in which no cure is currently available (Human Fertilisation and Embryology Authority, 2013). Although 3-Parent IVF may be considered as a relatively new procedure with the United Kingdom being the first country in the world to legalise this technique in 2015 (Sample, 2018), access to this technique should be continuously promoted in safeguarding the birth of healthy children demanded by SDG3.

### **6.3. Preimplantation Genetic Diagnosis**

Another technique that may be utilised to prevent the birth of children with genetic diseases is Preimplantation Genetic Diagnosis (PGD). Pioneered in 1968, the functions of PGD has been constantly improvised and its use has been documented worldwide (Franasiak & Scott, 2012). PGD begins with typical IVF and the resulting embryos are then screened for the presence of sex-linked diseases such as haemophilia (Braude, Pickering, Flinter, & Ogilvie, 2002), single-gene disorders such as cystic fibrosis (Tasca & McClure, 1998) and chromosomal abnormalities that can cause birth defects and repeated miscarriages (Taylor, 2008). PGD offers a solution to couples who are at risk of producing children with genetic diseases and its use should therefore be encouraged as an alternative to prenatal diagnosis methods that may lead to abortion (Verlinsky & Kuliev, 1998). Currently, PGD is offered by many private healthcare providers in Malaysia and research on this technique in this country is constantly managed so as to improve its efficacy

(Olesen, 2013). Due to its main benefits in reducing the risk of producing children with genetic diseases, PGD should be made more readily available in Malaysia as part of the country's pledge to support SDG3.

#### **6.4. Gene Therapy**

A new technique on the horizon is known as Gene Therapy may now be made possible with the breakthrough of Crispr/C9 technology (Gallagher, 2015). Gene Therapy is another method that may in future help to avoid the birth of children with debilitating genetic conditions such as Huntington and Cystic Fibrosis (Zakri Abdul Hamid, 2018). This is achieved by modifying the genes causing the disease at the molecular stage (Sade & Khusef, 1998) which can be done in three ways. First, the mutated gene causing the disease is replaced with a healthy copy of the gene; secondly, the mutated gene that is malfunctioning is inactivated; or thirdly, a new healthy gene is inserted into the body to cure the disease (Genetics Home References, 31 July 2018). Though still regarded as an experimental procedure, Gene Therapy offers a promising cure to devastating genetic conditions that could be considered as an option in the quest of producing healthy children (Zakri Abdul Hamid, 2018). Malaysia should, therefore, closely monitor the development of Gene Therapy and invest in the research and development of this technology as one of the efforts to fulfil SDG3.

## **7. Conclusion**

Sustainable development is a concept that been entrenched as an international agenda by the United Nations with the introduction of Agenda 2030 containing 17 Sustainable Development Goals in 2015 (United Nations, 2015). The 17 goals include the promotion of healthy lives and well-being that consists of a specific target to inter alia, reduce preventable deaths of new-born babies (SDG3). To achieve SDG3, several mechanisms have been formulated such as access to clean water and sanitation, eradicating a wide range of diseases and many more ([www.un.org/sustainabledevelopment/health/](http://www.un.org/sustainabledevelopment/health/)). Additionally, as part of the possible efforts that may be adopted in realising SDG3, this study has argued for the application of ART namely 3-Parent IVF, PGD and Gene Therapy due to their functions in reducing the risks of producing children with genetic conditions that may lead to early death. To illustrate this argument, the function and benefits of each technology named has been briefly described in this study. The theoretical basis underlying the use of ART namely the notion of individual reproductive autonomy has also been presented. As one of the participating countries of Agenda 2030, it is hoped that Malaysia can improve access to these ART methods as one of its effort to achieve SDG3.

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