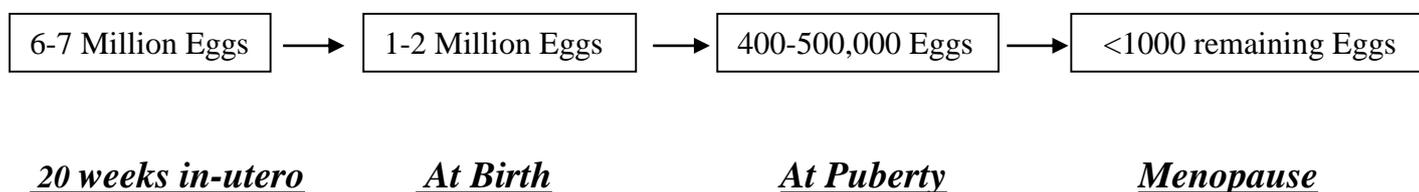


## **WHAT IS OVARIAN RESERVE?**

Ovarian reserve (OR) can be defined as the **quantity** of the follicles left in the ovary at any given time. A follicle is a fluid filled sac within which an egg (oocyte) develops. OR therefore determines the capacity of the ovary to provide eggs that are capable of fertilization resulting in a healthy and successful pregnancy both naturally and by assisted reproductive techniques (ART) such as IVF or ICSI.

A healthy woman has a finite number of follicles which is at its maximum (6-7 million) as a 20 week fetus and this number declines thereafter as they go through a continuous process of growth and degeneration to approximately 2 million at birth and 400,000 at puberty. These early stage eggs (primordial follicles) continue to decrease throughout reproductive life. The process accelerates approximately 10 years prior to the menopause, by which time the number of eggs fall to a few hundred.



## **WHY WOMEN ARE BORN WITH SO MANY EGGS?**

From puberty, a number of these follicles (3-30) are able to enter the last stage of growth every month in response to the cyclical hormone production that now occurs. One is selected as the “dominant follicle” which continues to grow and releases an egg at ovulation and the remainder degenerate. So if only 400-500 eggs are ever destined for ovulation and potential fertilisation (i.e. one egg per month for approximately 40 years), **“why so many eggs to start off with?”**

At all stages of the menstrual cycle there are a number of small resting follicles containing immature eggs (antral follicles) present. This number changes with age, being at its highest in younger women. As the level of follicle stimulating hormone (FSH) rises at the beginning of the menstrual cycle more follicles are recruited and some are then selected for further development. One follicle, however, will be at the right condition for development and this “chosen” follicle will continue to develop until mid-cycle when it ovulates. The quality of the released egg is related to both the age of the woman and the number of primordial follicles available in the ovary. Statistically speaking it is more likely for an egg to be of better quality if it is randomly “chosen”, for example, out of 100 competing primordial follicles than if it was randomly “chosen” out 10 competing primordial follicles.

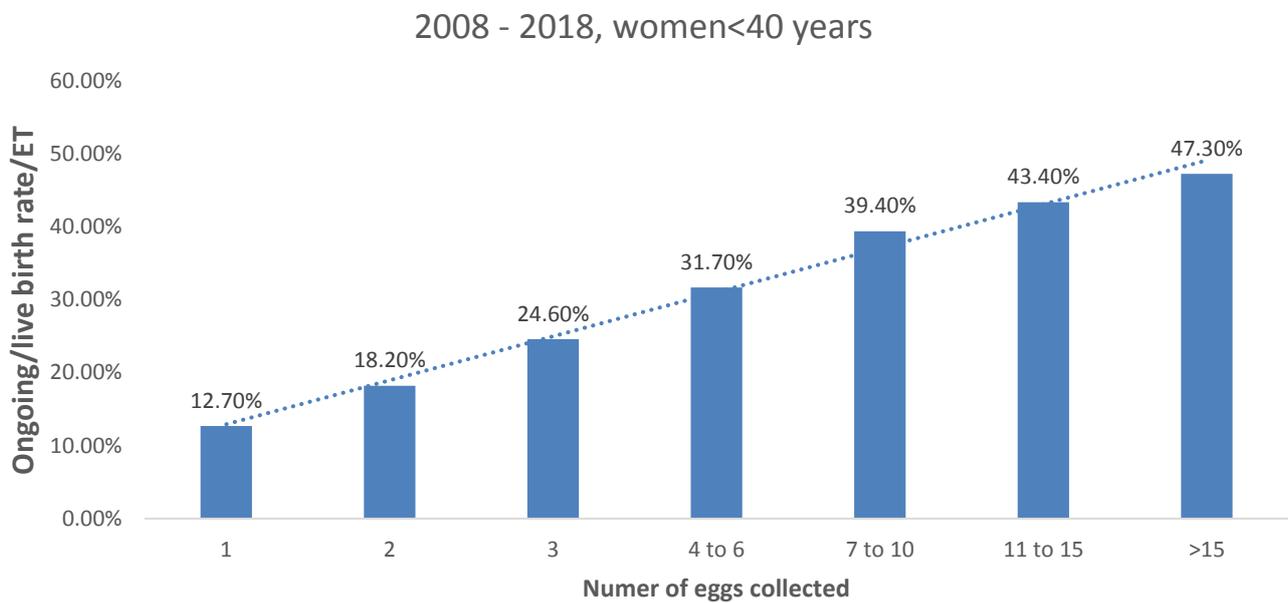
To use a sporting analogy, if you were picking an Olympic team and wanted to choose the best swimmer in the country you would have more chance of picking the best the larger the number competing in the heats. This is what we believe happens in the ovaries under the effect of follicle stimulating hormone (FSH), as it recruits the follicles in the early part of the cycle.

**WHY IS OVARIAN RESERVE IMPORTANT?**

An accurate assessment of ovarian reserve is vital as egg quantity impact on the chances of getting pregnant through ART and so can help a couple’s decision making process with regard to when and if they should proceed with a cycle of treatment. It also helps determine the correct dose of medication required as patients with reduced reserve will require higher stimulation doses.

**Egg quantity**

The effect of **egg quantity** can be demonstrated by looking at the outcome of ART (IVF/ICSI) by number of eggs collected. In those <40 undergoing treatment by IVF/ICSI at the Lister between 2008-2017, the live birth rate per embryo transfer are:



**Egg quality**

The egg quality is largely determined by the age of the woman. The following chart shows the live birth rate of those undergoing IVF/ICSI at the Lister between 2008-2017 by age overall and also by age in those collecting similar numbers of eggs (4-6 used as an example).

The overall success/cycle goes down with less number of eggs. However, the success goes back up again if the women gets embryo to transfer and even higher if blastocysts to transfer, meaning the embryos are good quality.

Per cycle success is lower with less number of eggs because the odds of getting an embryo for transfer is lower with less number of eggs. But if the eggs get fertilized and there is an embryo for transfer then the success is same as women of same age and with good number of eggs.

However there is age related decrease in the success meaning that age is the sole marker of quality of eggs.

