The Biological Reality of Sex and Intersex: A Response to the Executive Order, "Defending Women from Gender Ideology Extremism and Restoring Biological Truth to the Federal Government"

What is the reason for this Statement?

This Statement responds to the Executive Order, "*Defending Women from Gender Ideology Extremism and Restoring Biological Truth to the Federal Government*," signed by President Trump on January 20, 2025. As leading experts in Pediatric Endocrinology and the biological processes involved in the development of the reproductive tract, we present accurate and complete information on the definition of biological sex. The proposed definitions of biological sex within the Executive Order should not and cannot apply to people born with **biological conditions known as Differences of Sex Development (DSD). (Other words used for this group of conditions include: "disorders of sex development", "variations of sex characteristics", "variations of sex development", and "intersex conditions".**)

What are Differences of Sex Development or DSD?

DSD describes a collection of rare medical **conditions that occur *before birth* in which biological sex development does not follow the typical path**. Each year, about one in 4,500 people are born with a DSD. This totals over 60,000 people living with a DSD in the United States currently. Information regarding these conditions is seldom taught in schools. Most people are unaware of, and therefore cannot appreciate the implications of, these conditions. Herein, we briefly explain the biology of sex development as related to DSD.

What is biological sex?

Biological sex is *not* just about whether people can make sperm or eggs. It is much more complicated! A person's **biological sex is *typically* made up of three things**: their genetic sex, their gonadal sex, and their anatomic sex.

A person's **genetic sex** refers to the instructions in the chromosomes and genes that tell the body how to make its reproductive parts. Chromosomes are large groups of genes and genes are instruction codes. For example, when baking a cake, chromosomes are like the recipes and genes are like the different ingredients that go into the recipe. Most people have 46 chromosomes, and two of these chromosomes, the X and the Y, are the sex chromosomes. Most (*but not all*) of the time, people with a male biological sex have one X and one Y chromosome, whereas people with a female biological sex have two X chromosomes.

A person's **gonadal sex** refers to the glands (called gonads) inside the body that make sex hormones. These hormones tell the body how the reproductive parts should develop before birth (during pregnancy / fetal life), as well as later when puberty begins. Hormones are essential chemical messengers that tell the body how to grow and develop during fetal life and after birth. Most (*but not all*) of the time, people with a male biological sex have glands that become testes, which will produce sperm during adulthood. Most people with a female biological sex have glands that become ovaries, which will produce eggs during adulthood. *In the first part of pregnancy, all unborn babies develop gonads that are exactly the same in everyone (both males and females)*. A person's genetic instructions tell the gonads to become testes or ovaries during pregnancy. In addition to the sex chromosomes, several other genes influence the development of gonadal and anatomic sex.

A person's **anatomic sex** refers to their reproductive parts inside and outside their body. For example, most (*but not all*) of the time, people with a male biological sex have a penis and testes and do not have a uterus or vagina. Most people with a female biological sex have ovaries, a uterus, and a vagina and do not have a penis. Sex hormones (for example, testosterone) made during fetal life are important for the development of anatomic sex.

How does DSD happen?

Biological sex development is a complex process. **Changes in any of the factors needed for typical sex development**, such as genetic instructions or sex hormones, can result in differences in the development of the reproductive parts inside the body (for example, the uterus or male tubes) and/or outside the body (for example, the vagina or penis). People with these changes may not follow typical male or female developmental pathways, which **results in having a DSD**.

Some people who are born with a DSD may have a difference in their **genetic sex.** For example, some people have different numbers of sex chromosomes or a combination of both “male” and “female” chromosomes.

Some people who are born with a DSD have a difference in how their **gonads** formed. For example, some people may have gonads that did not develop fully or develop at all. Other people may have a testis on one side of their body and an ovary on the other. These differences in development affect whether they can make sex hormones and eggs or sperm.

Some people who are born with a DSD have **genitals** that do not look typical, making it hard to tell if the baby is male or female at birth. Some people may have genitals that look typical for a male – with a penis – but have XX (“female”) chromosomes and female body parts – a uterus and ovaries – due to medical conditions that affect the hormones. On the other hand, some people may have genitals that look typical for a female – with a vagina and no penis – but have XY (“male”) chromosomes and testes on the inside of their bodies.

Although DSD are present at birth, people who have a DSD can be identified at any age. Some people with DSD are identified shortly after birth due to their genital differences. Other people, who have typical male or female genitals, may find out they have a DSD during their teenage years or adulthood, for example, due to lack of puberty or infertility.

In what way are the definitions in the Executive Order not accurate for DSD?

The definitions provided in the Executive Order for “female” and “male” exclude those born with a biological condition that results in a DSD. The Executive Order Section 2 (d) states that ""Female" means a person belonging, at conception, to the sex that produces the large reproductive cell" and Section 2 (e) states that ""Male" means a person belonging, at conception, to the sex that produces the small reproductive cell". The gonads (or glands) that produce eggs or sperm (the “reproductive cells”) are the same in all unborn babies at the beginning of pregnancy (regardless of future sex and genital appearance). In most babies, as instructed by the chromosomes and hormones, the gonads develop during pregnancy into ovaries or testes that later should produce “large” or “small” reproductive cells.

Importantly, **people who are born with a DSD *do not* fit into these definitions**. They may have gonads that did not develop fully or develop at all. They may be unable to make either sperm or eggs. Some people with DSD have *both* types of gonads, a testis and an ovary in the

same body. Their reproductive cells do not "fit" with the rest of their biological sex development. People with DSD benefit from care by knowledgeable healthcare teams and providers for life-long treatment and support to achieve optimal physical and psychological health.

Why does it matter and why should we care?

People born with these rare conditions often experience feelings of shame and stigma. Erasure and redefinition of their biological sex differences will negatively impact their medical care and erode their health, dignity, safety, and well-being. In addition, the information provided by the Executive Order overlooks the reality of variations in biology and physiology by oversimplifying complex biological processes. The stated goal of this Executive Order is “basing federal policy on truth.” However, this Executive Order misrepresents the biological facts explained here. Furthermore, we welcome the opportunity **to explain and educate about the biology and physiology of sex development in our goal to protect and support people born with these conditions**.