Male reproductive development is intricately dependent on fetal androgen action. Consequently, disrupted androgen action during fetal life can interfere with the development of the reproductive system resulting in adverse effects on reproductive function later in life. One biomarker used to evaluate fetal androgen action is the anogenital distance (AGD), the distance between the anus and the external genitalia. A short male AGD is strongly associated with genital malformations at birth and reproductive disorders in adulthood. AGD is therefore used as an effect readout in rodent toxicity studies aimed at testing compounds for endocrine activity and anti-androgenic properties, and in human epidemiological studies to correlate fetal exposure to endocrine disrupting chemicals to feminization of new-born boys. In this review, we have synthesized current data related to intrauterine exposure to xenobiotics and AGD measurements. We discuss the utility of AGD as a retrospective marker of in utero anti-androgenicity and as a predictive marker for male reproductive disorders, both with respect to human health and rodent toxicity studies. Finally, we highlight four areas that need addressing to fully evaluate AGD as a biomarker in both a regulatory and clinical setting.