

Table 1: Key findings applicable to males and females from EDC-2: The Endocrine Society’s Second Scientific Statement on Endocrine-Disrupting Chemicals

Health impact	Obesity, diabetes mellitus, cardiovascular disease	Male reproduction	Prostate	Thyroid	Neuroendocrine and neurodevelopment
EDCs subject to intensive investigation	BPA, phthalates, tributyltin, arsenic, perfluorooctanoic acid, dioxin, PBDEs, PCBs, DDT	Antiandrogens, Xenoestrogens, Dioxins	Pesticides, insecticides, herbicides, Agent Orange chemicals, PCBs, BPA, alkylphenols, some heavy metals, inorganic arsenic	PBDEs, phthalates, perchlorate, PCBs	Brain receptive to wide range of hormones so any EDCs affecting hormones would be relevant
Principle health concerns	<ul style="list-style-type: none"> • Disrupt glucose and lipid homeostasis, increasing obesity and diabetes risk • Animal studies showed that they altered insulin production, increasing susceptibility to Type 2 Diabetes, significant CVD risk, and disrupted homeostatic control of adipogenesis • Clear link in studies with EDCs and obesity, diabetes and CVD • POPs associated with type 2 Diabetes • Link with EDCs and singular nucleotide polymorphisms increasing likelihood of the above. • Exposure to EDCs in perinatal stage triggered obesity later in life in animal studies • Studies on animals have shown that BPA triggered cardiomyocytes, arrhythmias and linked to hypertension 	<ul style="list-style-type: none"> • Increases in birth defects of male reproductive system including, Cryptorchidism and hypospadias, which has coincided with the increase of EDCs • Results variable but some show that semen quality has decreased, leading to longer conception times • Animal studies have shown a link with disrupting male hormones and cryptorchidism, hypospadias, poor semen quality and ultra structural testicular abnormalities • EDCs most relevant for male reproductive system are listed below, and act additively: <ul style="list-style-type: none"> ○ Antiandrogens ○ Xenoestrogens ○ Dioxins 	<ul style="list-style-type: none"> • Hormone-dependent structure, disruption for these pathways by EDCs can affect receptor sites and could increase prostate cancer risk • Some studies showed that pesticides in populations where they have single nucleotide polymorphisms, are at a higher risk of prostate cancer due to exposure • Those with prostatic effects include: <ul style="list-style-type: none"> ○ Pesticides ○ Insecticides ○ Herbicides ○ Agent orange chemicals ○ PCBs ○ Alkylphenols ○ BPA ○ Some heavy metals • Prostate cancer rates are increased with exposure to: <ul style="list-style-type: none"> ○ Pesticides ○ Agent orange chemicals ○ PCBs ○ Alkylphenols ○ Inorganic arsenic • BPA exposure, especially during early-life development, increases risk for prostate cancer 	<ul style="list-style-type: none"> • Large number of chemicals known to effect the thyroid, reducing circulating thyroid hormone, including: <ul style="list-style-type: none"> ○ PCBs ○ PBDEs ○ Phthalates ○ Perchlorate • Epidemiological data in humans support cognitive deficits in children and diminished IQ, exposed to certain thyroid disrupters. 	<ul style="list-style-type: none"> • Animal studies show that EDCs can alter the brain’s neuroendocrine system • Alteration in peripheral hormones and changes in behaviour • EDCs action in the brain can change gene expression and proteins involved in neuroendocrine behaviours including many cognitive functions. • Some evidence suggests that EDCs effects the brain differently depending on sex and this needs to be further investigated

Table 2: Key findings applicable to females only from EDC-2: The Endocrine Society’s Second Scientific Statement on Endocrine-Disrupting Chemicals

Health impact	Female reproduction	Hormone sensitive cancers in Females
EDCs subject to intensive investigation	BPA, Further studies are needed around the specific EDCs and linking them directly to reproductive outcomes	Industrial chemicals, pollutants, herbicides, pharmaceuticals, dioxins, pesticides including DDT and DDE, BPA, phthalates, perfluorooctanoic acid
Principle health concerns	<ul style="list-style-type: none"> • Studies show impairment of ovarian development. In animals this included germ cell nest breakdown and follicle formation • Some studies have looked at the link between EDCs and ‘abnormal puberty, irregular cyclicity, reduced fertility, infertility, polycystic ovarian syndrome, endometriosis, fibroids, pre-term birth and adverse birth outcomes’ • Sensitivity to EDCs increases in prenatal and postnatal life, along with puberty 	<ul style="list-style-type: none"> • Breast, endometrial and ovarian cancers are increasing and one of the suspected factors is EDCs • Dioxin, early life exposure leads to delayed pubertal breast tissue and effects later life lactation, breast and ovarian cancer risk