



Contaminantes de Preocupação Emergente: o que são e que riscos representam?



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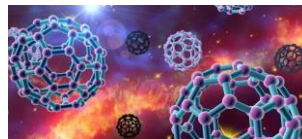
Contaminantes de Preocupação Emergente- CECs, o que são e quais as fontes?



PPCPs



MPs

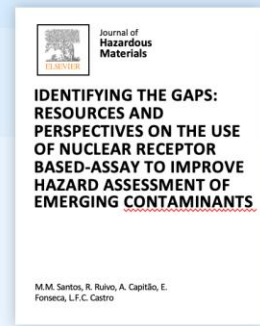
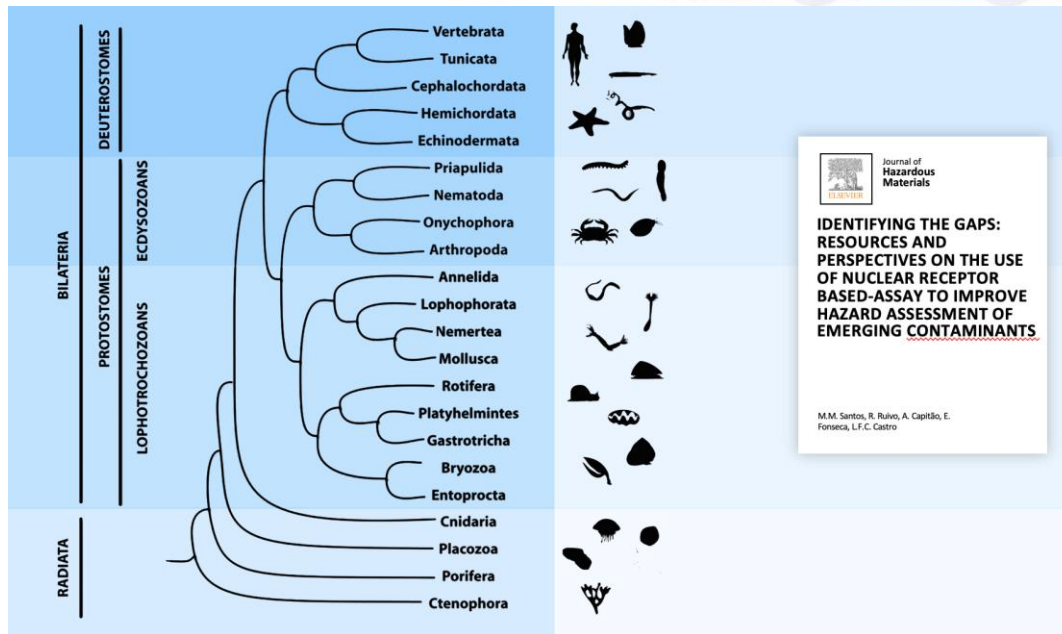
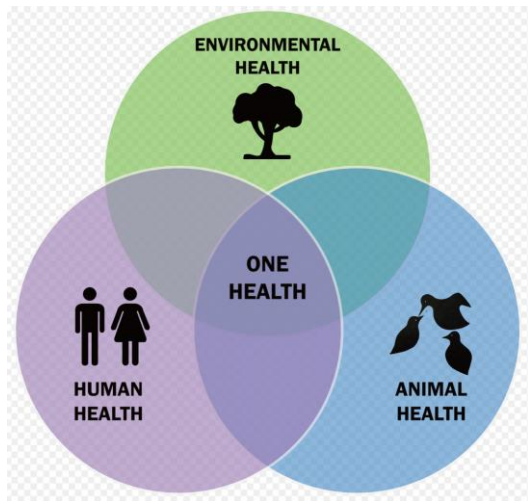


NP



Químicos industriais





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FEMINIZAÇÃO E MASCULINIZAÇÃO DE PEIXES EM RIOS E ESTUÁRIOS NOS ANOS 80.

Esturjão Rio Missouri

Exemplo de macho com intersex



Exemplos de efeitos negativos

**Compostos estrogénicos
Pilula Contraceptiva**



letters to nature

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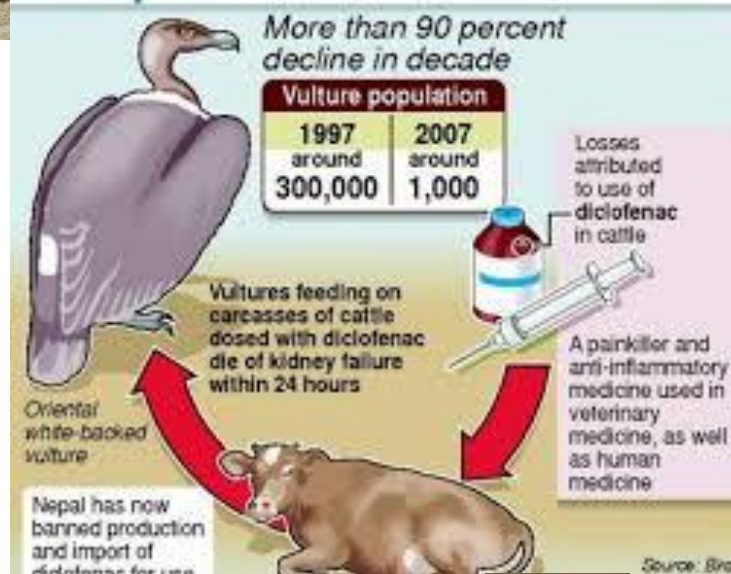
Competing interests statement The authors declare that they have no competing financial interests.

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Diclofenac residues as the cause of vulture population decline in Pakistan

J. Lindsay Oaks¹, Martin Gilbert², Munir Z. Virani², Richard T. Watson³, Carol U. Meteyer⁴, Bruce A. Rideout⁴, H. L. Shivaprasad⁵, Shakeel Ahmed⁶, Muhammad Jamshed Iqbal Chaudhry⁶, Muhammad Arshad⁶, Shahid Mahmood⁶, Ahmad Ali⁶ & Aleem Ahmed Khan⁶

Diclofenaco levou ao declínio de populações de abutres.
Falha dos Rins por vezes em 24h



Exemplos de efeitos negativos saúde Humana



Human Reproduction Update, pp. 1–14, 2017
doi:10.1093/humupd/dmz022

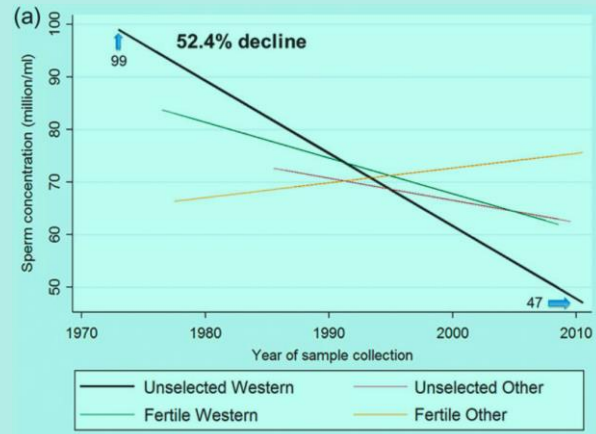
Temporal Trends in Sperm Count: A Systematic Review and Meta-Regression Analysis

Hagai Levine, Niels Jørgensen, Anderson Martino-Andrade, Jaime Mendiola, Dan Weksler-Derri, Irina Mindlis, Rachel Pinotti, Shanna H Swan

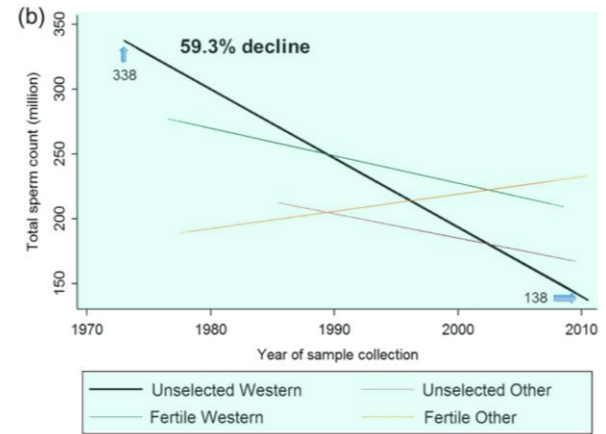
A total of 244 estimates of SC and TSC from 185 studies of **42 935 men who provided semen samples in 1973-2011** were extracted for **meta-regression analysis**, as well as information on years of sample collection and covariates [fertility group ('Unselected by fertility' versus 'Fertile'), geographic group ('Western', including North America, Europe Australia and New Zealand versus 'Other', including South America, Asia and Africa), age, ejaculation abstinence time, semen collection method, method of measuring SC and semen volume, exclusion criteria and indicators of completeness of covariate data].

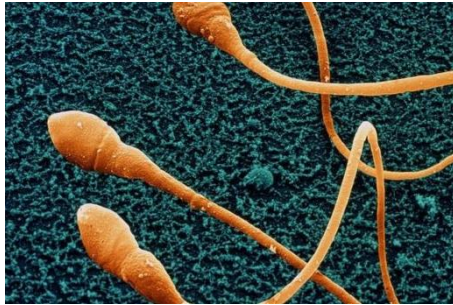
Wider implications: This comprehensive meta-regression analysis reports a significant decline in sperm counts (as measured by SC and TSC) between 1973 and 2011, driven by a **50-60% decline among men unselected by fertility from North America, Europe, Australia and New Zealand**. Because of the significant public health implications of these results, research on the causes of this continuing decline is urgently needed.

SPERM CONCENTRATION



TOTAL SPERM COUNT





Sperm count drop 'could make humans extinct'

Humans could become extinct if sperm counts in men continue to fall at current rates, a doctor has warned.

The assessment, one of the largest ever undertaken, brings together the results of 185 studies between 1973 and 2011.

Dr Levine, from the Hebrew University of Jerusalem, found a **52.4% decline in sperm concentration, and a 59.3% decline in total sperm count** in men from North America, Europe, Australia and New Zealand.

There is no clear evidence for the reason for this apparent decrease. But it has been linked with **exposure to chemicals used in pesticides and plastics, obesity, smoking, stress, diet**, and even watching too much TV.

Table 4. Evaluations of Exposure-Outcome Relationships

Exposure	Outcome	Strength of Human Evidence	Strength of Toxicological Evidence	Probability of Causation, %	Base Estimate, €	Low Estimate, €	High Estimate, €
PBDEs	IQ loss and intellectual disability	Moderate-to-high	Strong	70–100	9 587 571 420	1 577 449 522	22 356 864 892
Organophosphate pesticides	IQ loss and intellectual disability	Moderate-to-high	Strong	70–100	146 178 556 566	46 760 988 423	194 850 545 761
DDE	Childhood obesity	Moderate	Moderate	40–69	24 610 041	24 610 041	86 448 264
DDE	Adult diabetes	Low	Moderate	20–39	834 741 170	834 741 170	16 694 823 393
Di-2-ethylhexylphthalate	Adult diabetes	Low	Strong	40–69	15 610 612 091	15 610 612 091	15 610 612 091
Di-2-ethylhexylphthalate	Adult diabetes	Low	Strong	40–69	606 944 344	606 944 344	606 944 344
BPA	Childhood obesity	Low-to-low	Strong	20–69	1 537 177 463	1 537 177 463	1 537 177 463
PBDEs	Testicular cancer	Very low-to-low	Weak	0–19	1 695 951 864	626 359 671	1 695 951 864
PBDEs	Cryptorchidism	Low	Strong	40–69	259 614 654	233 683 168	233 683 168
Benzyl and butyl phthalates	Male infertility, resulting in increased assisted reproductive technology	Low	Strong	40–69	4 714 114 146	4 714 114 146	4 714 114 146
Phthalates	Low T, resulting in increased early mortality	Low	Strong	40–69	7 958 358 238	7 958 358 238	7 958 358 238
Multiple exposures	ADHD	Low-to-moderate	Strong	20–69	1 743 332 686	1 212 298 027	2 861 405 410
Multiple exposures	Autism	Low	Moderate	20–39	199 339 876	79 735 951	398 679 753

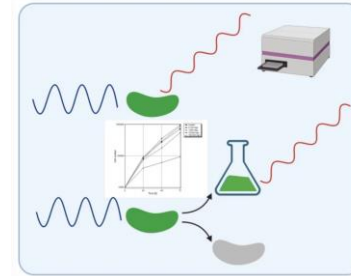
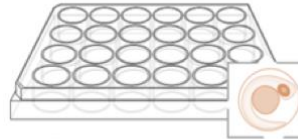
Abbreviation: ADHD, attention-deficit hyperactivity disorder.

Estudos do risco dos EDCs e CECs ao nível da saúde humana combinam estudos epidemiológicos com dados toxicológicos



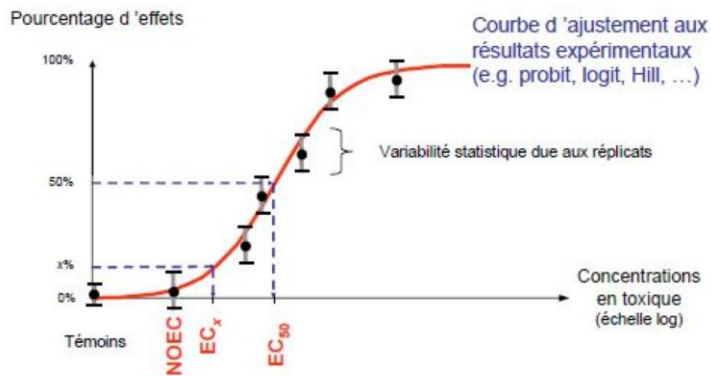
Como se testam os efeitos?

Testes Padronizados





Toxicological Dose Descriptors



NOEC → Caracterização do perigo

LOEC

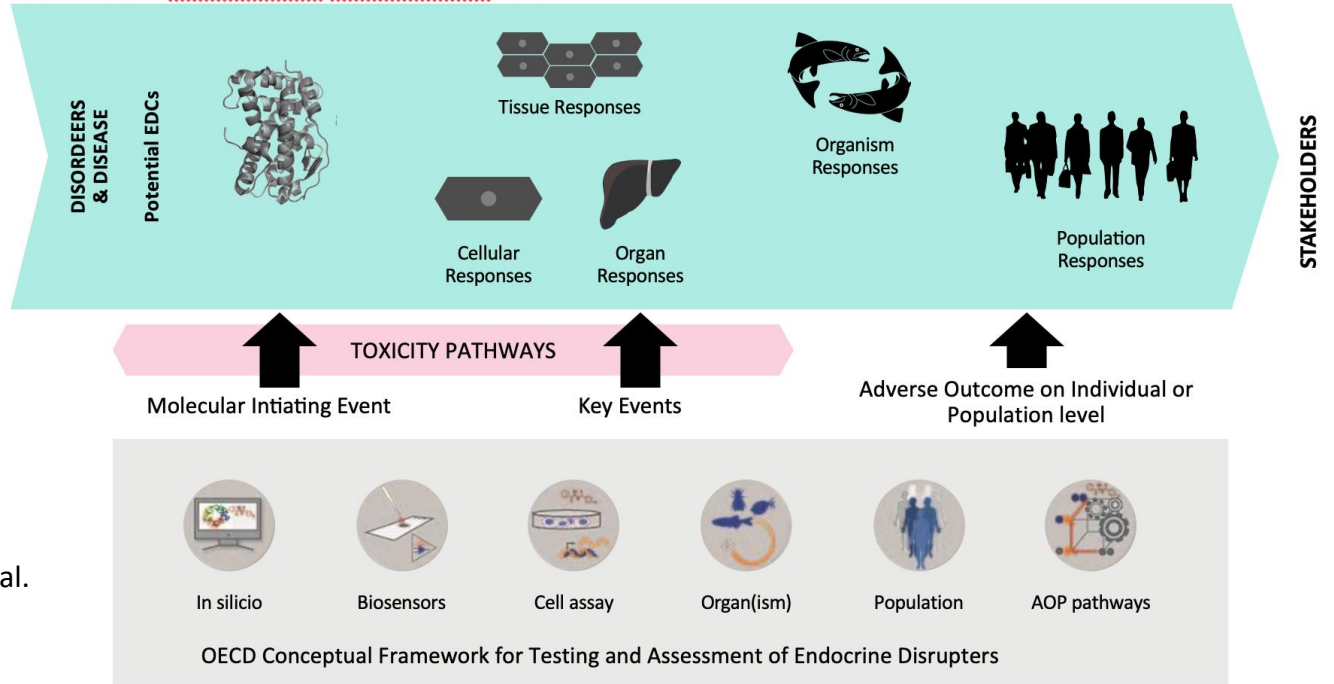
EC10

EC50

PNEC

Avaliação do risco

ADVERSE OUTCOME PATHWAYS - AOP



Santos et al.

OECD Conceptual Framework for Testing and Assessment of Endocrine Disrupters



Principais desafios associados com avaliação de risco:

- A necessidade de considerar a escala do ecossistema
- A importância de estudos crónicos, combinando múltiplas linhas de evidência
- Mistura de contaminantes num contexto de mudança global





Obrigado!

CIIMAR/FCUP_Group of Endocrine Disruptors
and Emerging Contaminants

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