INTERNATIONAL SOCIETY OF DOCTORS FOR ENVIRONMENT
ISDE

Medici per l'ambiente

Congresso Nazionale ISDE Italia 2023

Inquinamento atmosferico e mutamenti climatici:
ruolo del medico imparziale ma non neutrale

20, 21 e 22 ottobre 2023
Auditorium Sede Direzionale Aboca – Loc. Aboca, 20 – 52037 Sansepolcro (AR)

Con il patrocinio di FNOMCeO e Ordine dei Medici Chirurghi e Odontoiatri di Arezzo

Inquinamento e Salute Riproduttiva

Il ruolo dei Biomarcatori Riproduttivi, «Sentinelle» della Salute Ambientale nel biomonitoraggio umano delle «Terre dei Fuochi» d'Italia

Luigi Montano

UroAndrologo – ASL Salerno
Coordinatore Progetto EcoFoodFertility
Past President Società Italiana di Riproduzione Umana
PhD program in Biologia Evoluzionistica ed Ecologia, Università Tor Vergata, Roma

EcoFoodFertility

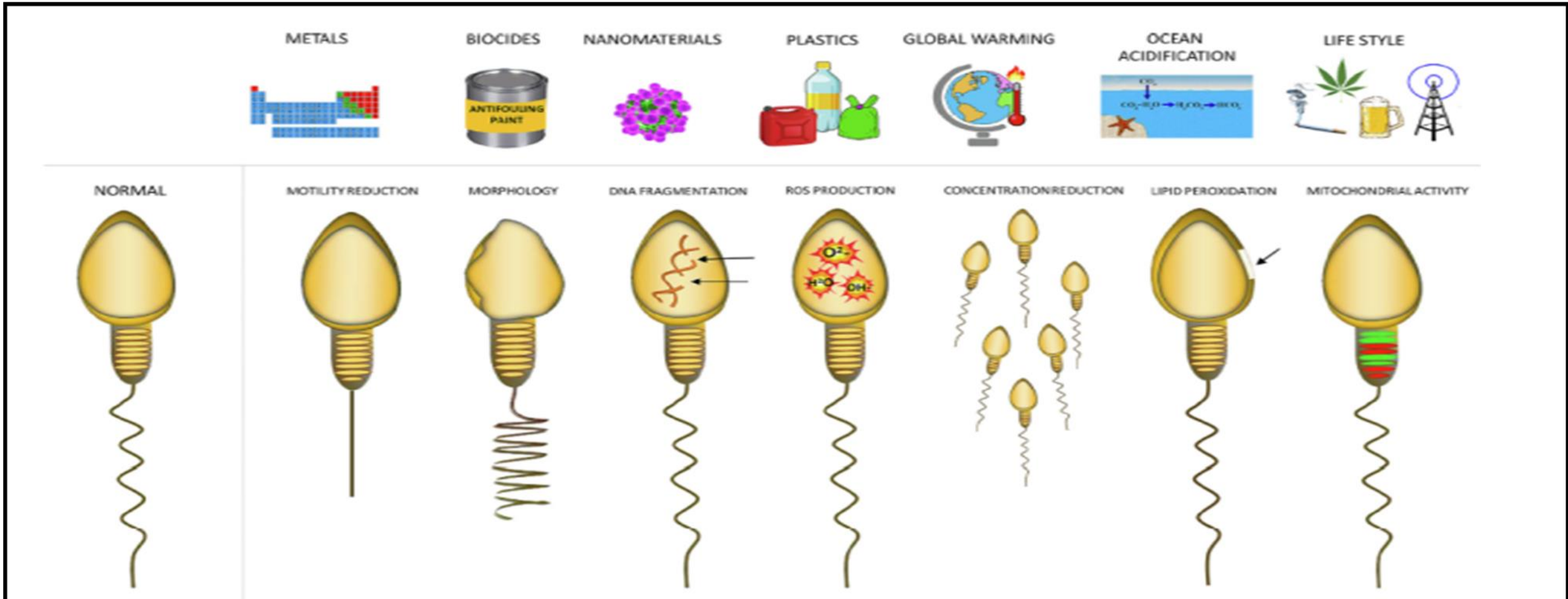
Interdisciplinary Network for Environmental and Reproductive Health

An alliance to safeguard Fertility

EcoFoodFertility

Gamete Quality in a Multistressor Environment

Review, 2020 May;138:105627.
doi: 10.1016/j.envint.2020.105627



EcoFoodFertility

Impact of environmental factors on human semen quality and male fertility: a narrative review.

Naina Kumar & Amit Kant Singh

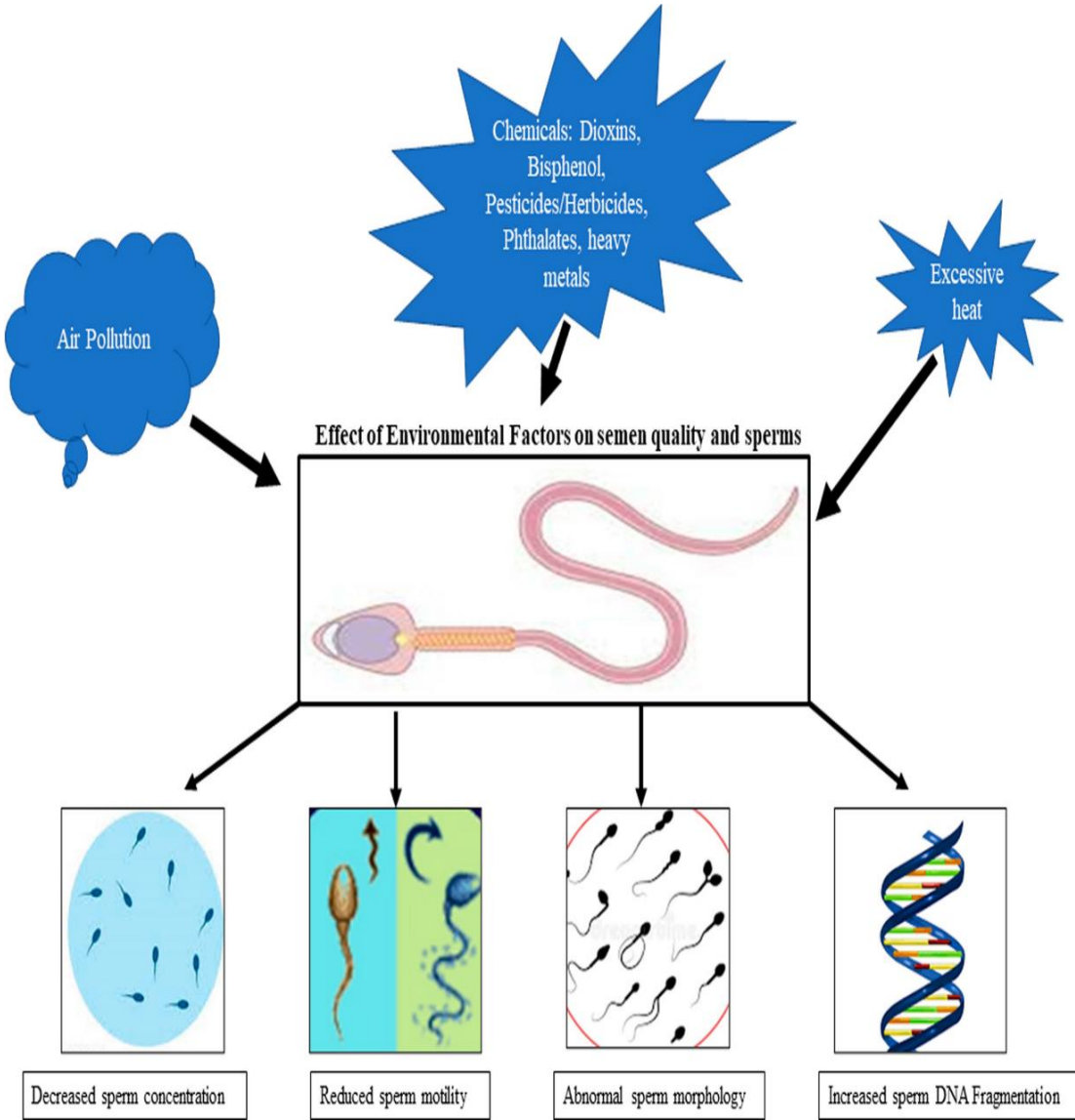
Environmental Sciences Europe volume 34, Article number: 6 (2022)

Background

Worldwide rising trend in infertility has been observed in the past few years with male infertility arising as a major problem.

The present **review** focuses on some of these environmental factors that affect semen quality and hence, can cause male infertility. The literature from **2000 till June 2021** was searched from various English peer-reviewed journals Conclusion

Adverse environmental factors have a significant impact on semen quality, leading to decreased sperm concentration, total sperm count, motility, viability, and increased abnormal sperm morphology, sperm DNA fragmentation, ultimately causing male infertility. However, all these factors are modifiable and reversible, and hence, by mere changing of lifestyle, many of these risk factors can be avoided.



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Effects of lifestyle factors on fertility: practical recommendations for modification

Reproduction and Fertility (2021) **1** R13–R26
https://doi.org/10.1530/RAF-20-0046

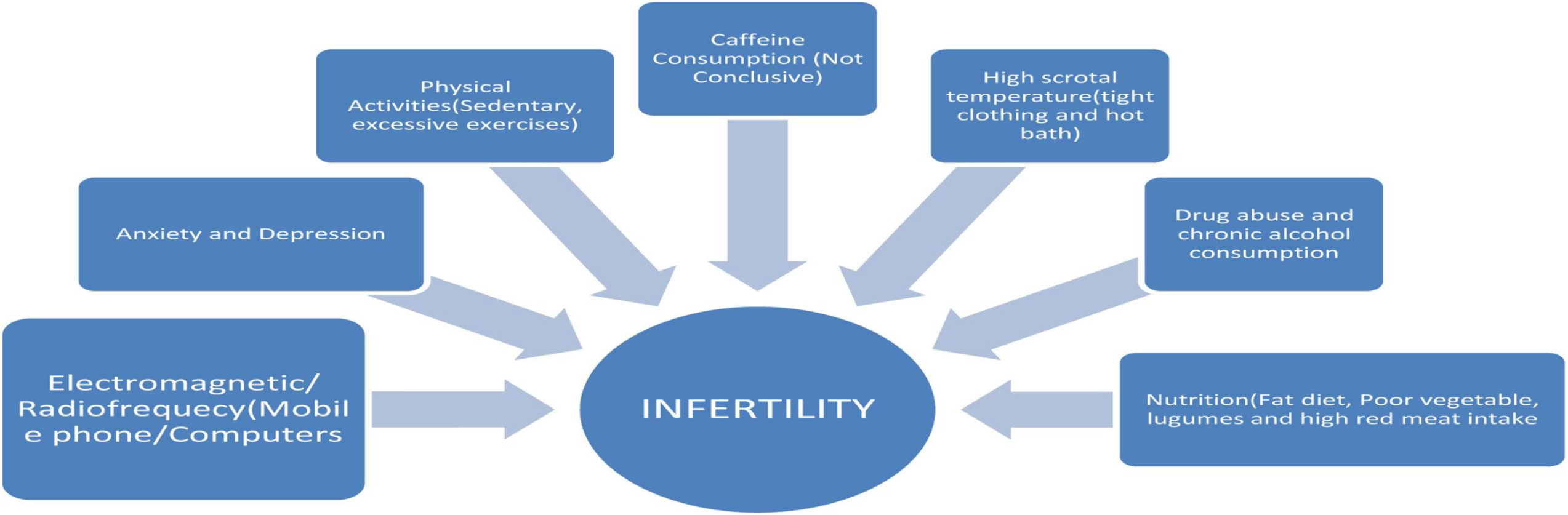

Figure 1 Schematic representation of lifestyle behaviors on infertility in both males and females.

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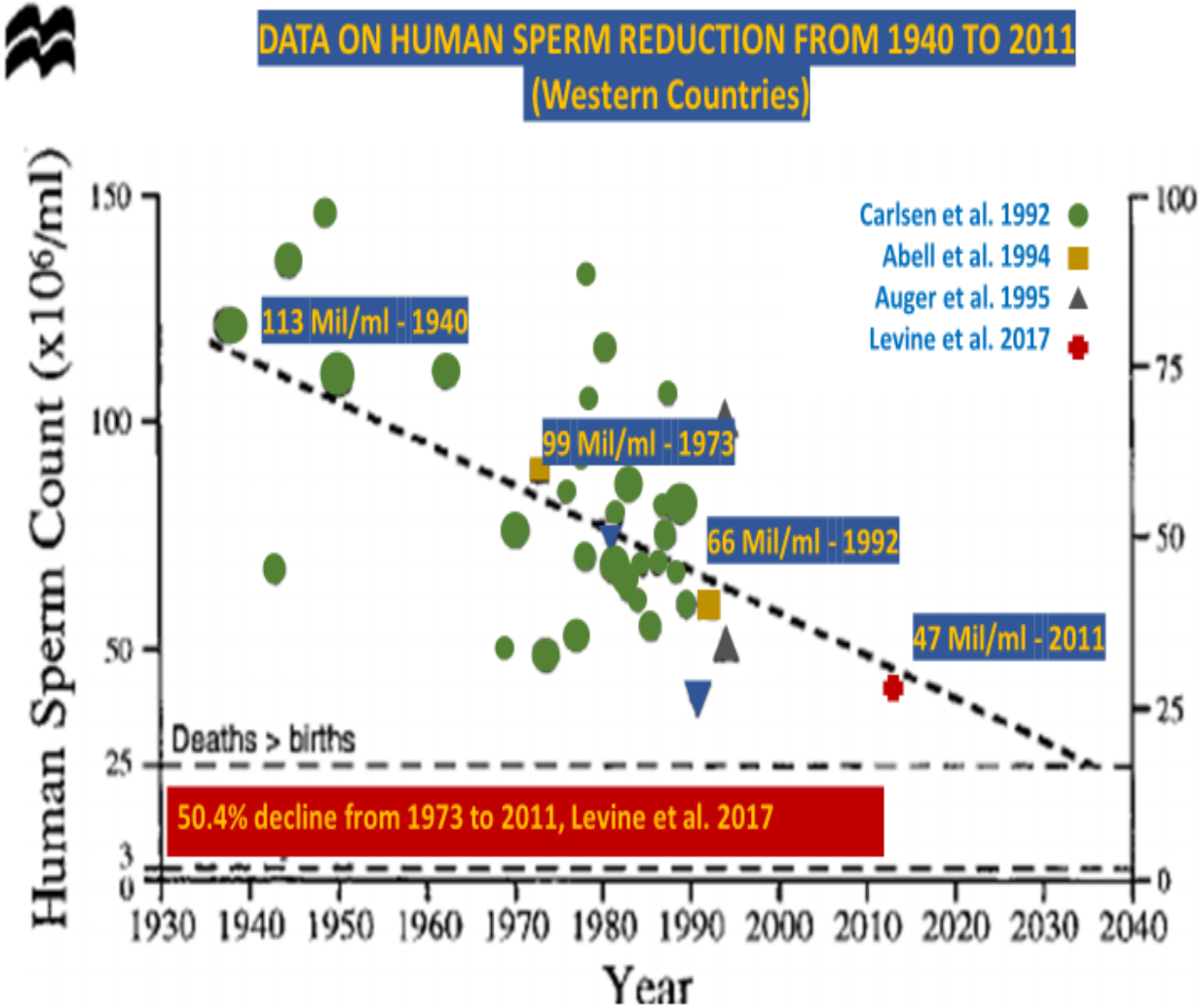
This decline leads us to consider human semen as the most faithful mirror of lifestyle and environmental changes in the last 70 years in western countries



Fonte: Human Reproduction Update

Sperm decline across various countries in the world

Evidence for decreasing sperm count in African population from 1965 to 2015

Pallav Sengupta[1,2], Uchenna Nwagha[2], Sulagna Dutta[1], Elzbieta Krajewska-Kulak[3], Emmanuel Izuka[4]

RESEARCH Open Access

Decline in seminal quality in Indian men over the last 37 years

Priyanka Mishra[1], Mahendra Pal Singh Negi[2], Mukesh Srivastava[2], Kiran Singh[2] and Singh Rajender[1*]

human reproduction update

Temporal trends in sperm count: a systematic review and meta-regression analysis of samples collected globally in the 20th and 21st centuries

Hagai Levine[1,*], Niels Jørgensen[2,3], Anderson Martino-Andrade[4], Jaime Mendiola[5], Dan Weksler-Derri[6,7], Maya Jolles[1], Rachel Pinotti[8], and Shanna H. Swan[9]

Nel mondo

SCIENTIFIC REPORTS
nature research

OPEN Changes in seminal parameters among Brazilian men between 1995 and 2018

Brasile

scientific reports

OPEN Trends in semen parameters of infertile men in South Africa and Nigeria

Nigeria e Sud Africa

Research Article

Iranian temporal changes in semen quality during the past 22 years: A report from an infertility center

Serajeddin Vahidi[1] M.D., Mohammad Reza Moein[1] M.D., Fatemeh Yazdinejad[1] M.Sc., Saeed Ghasemi-Esmailabad[1,2] M.Sc., Nina Narimani[1,3] M.D.

Nel mondo

Iran

Europa

Decline in sperm count in European men during the past 50 years

P Sengupta[1,2], E Borges Jr[3], S Dutta[4] and E Krajewska-Kulak[2]

SAGE

Article

The Disappearing Sperms: Analysis of Reports Published Between 1980 and 2015

Pallav Sengupta, MSc, PhD[1], Sulagna Dutta, MSc[1], and Elzbieta Krajewska-Kulak, MD, PhD[2]

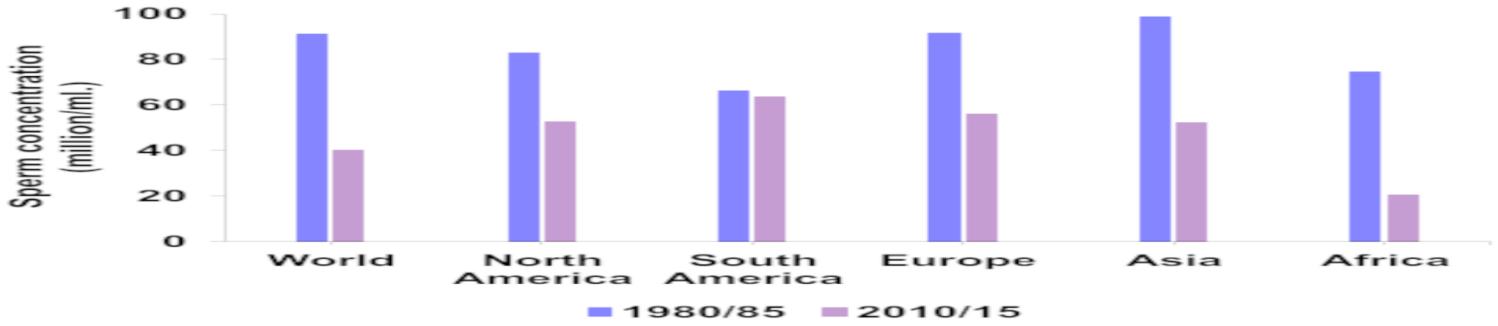
SAGE

SPERM DECLINE IN THE WORLD

Semen quality as a potential susceptibility indicator to SARS-CoV-2 insults in polluted areas.

Luigi Montano*, Ian Marc Bonapace , Francesco Donato , Pietro Massimiliano Bianco , Antonino Guglielmino , Marina Piscopo. Environmental Science and Pollution Research 28(Suppl 1) 2021

a



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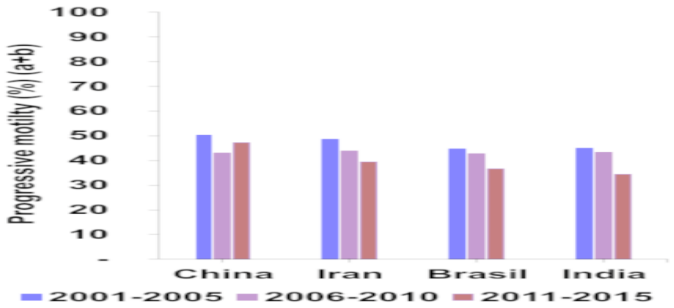

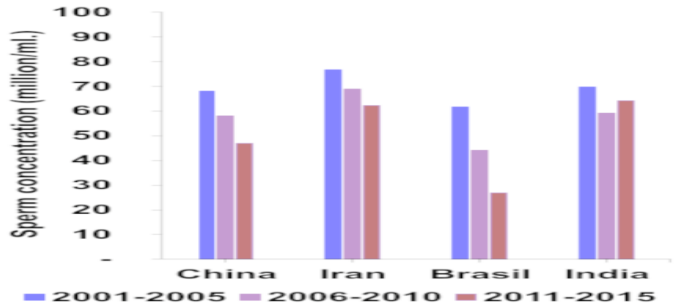

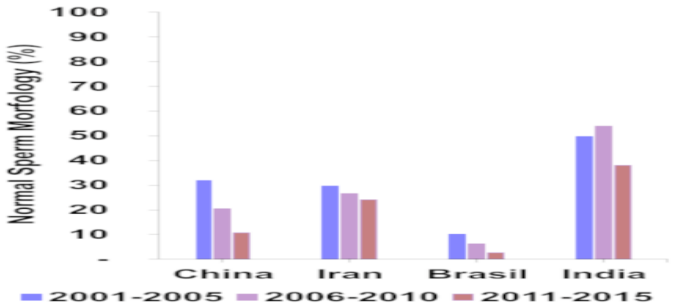

In addition to the sperm decline, there is a global increase in the incidence of: Hypospadias, Cryptorchidism, Testicular cancer

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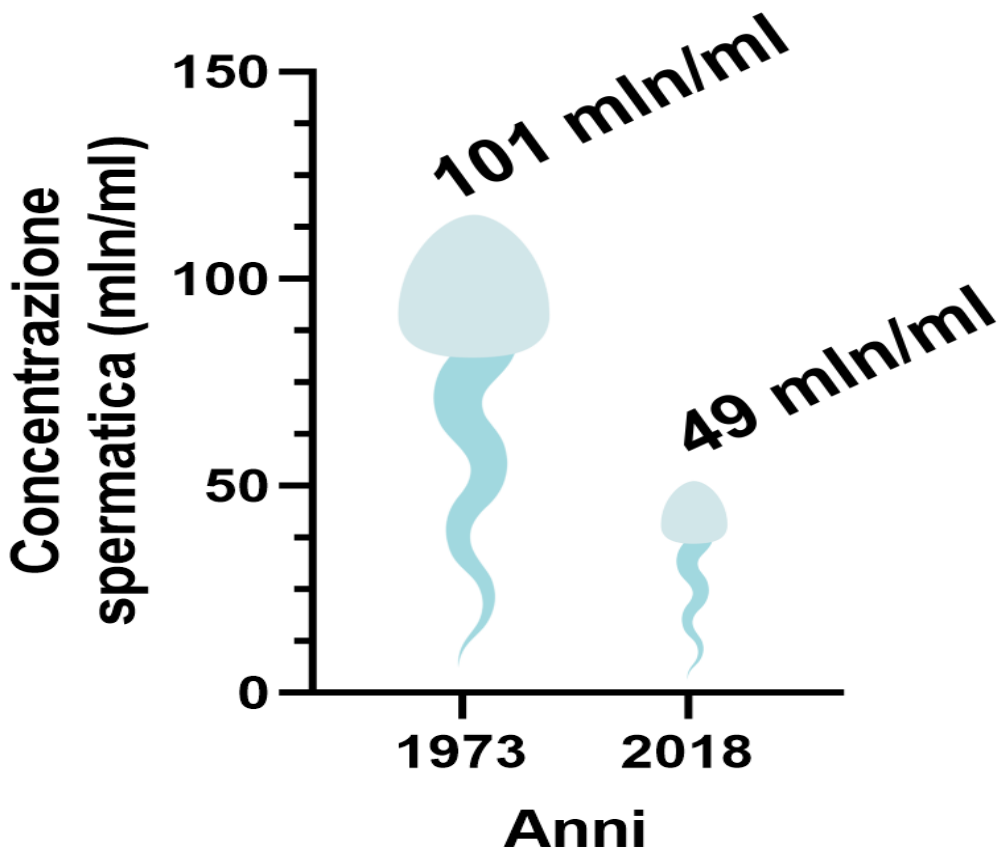
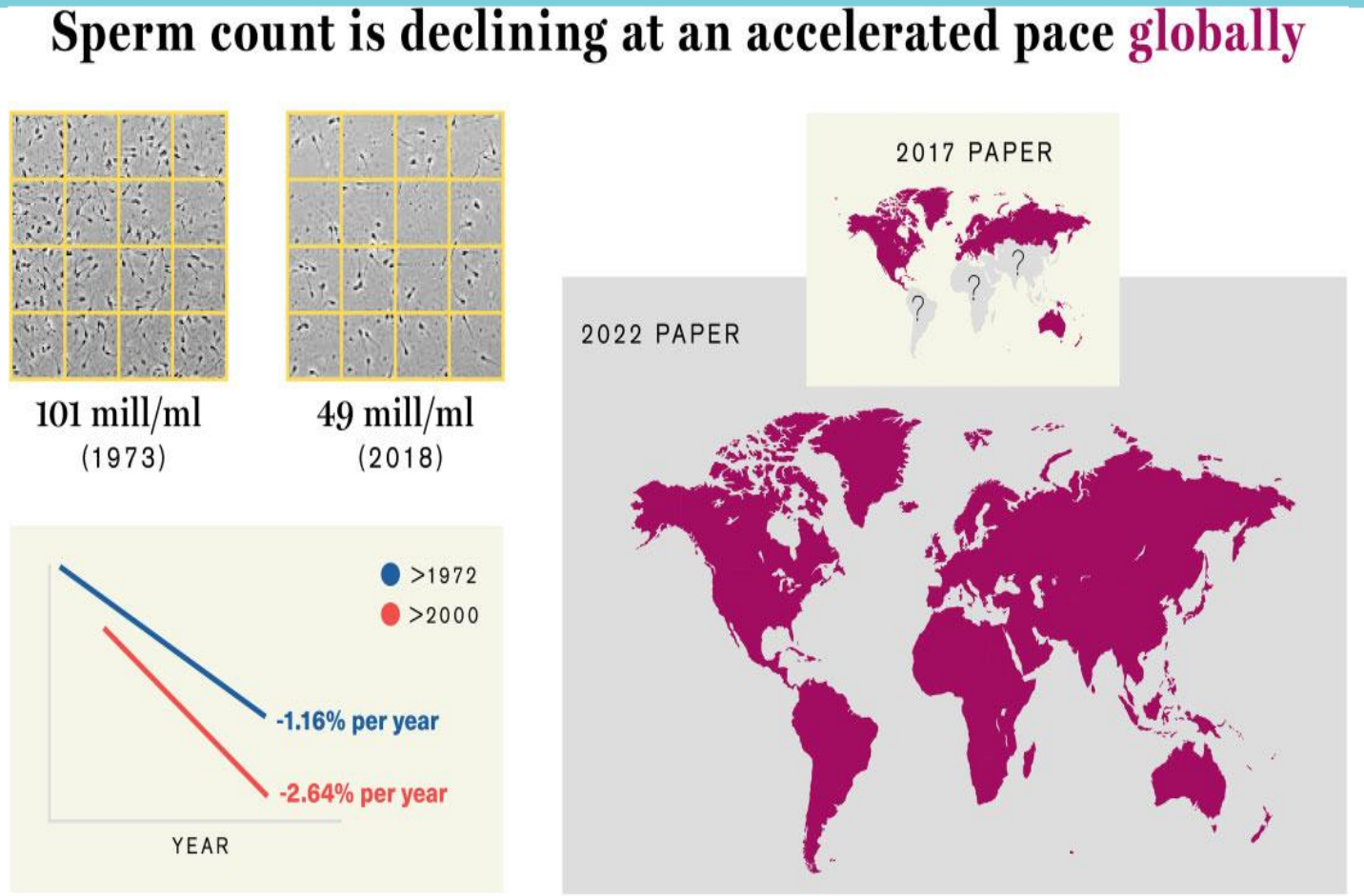
"The global sperm decline"

Levine et al. Human Reproduction Update, nov. 2022



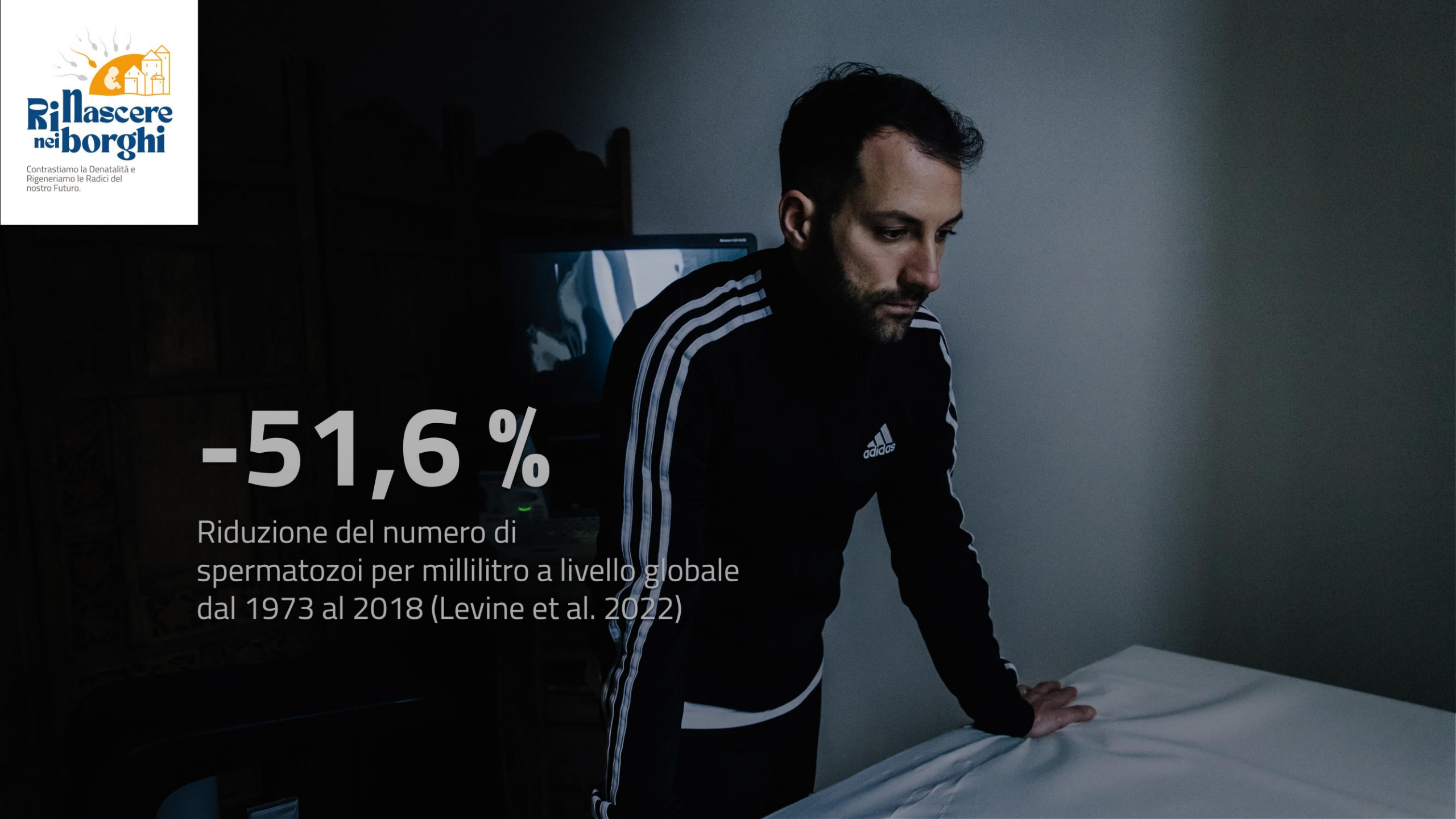
"From 1973 to 2018, globally:
•A decrease of 51.6% in sperm concentration per milliliter.
•A decrease of 62.3% in total sperm count."



The decline in sperm count also affects Africa, Asia, and South America. In fact, from 2000 to 2018, there has been an acceleration of the decline, with sperm count loss rates per year double that of the period from 1973 to 2000

Rinascere nei borghi

Contrastiamo la Denatalità e Rigeneriamo le Radici del nostro Futuro.



-51,6 %

Riduzione del numero di spermatozoi per millilitro a livello globale dal 1973 al 2018 (Levine et al. 2022)

Rinascere nei borghi

Contrastiamo la Denatalità e Rigeneriamo le Radici del nostro Futuro.

2,64

Tasso di perdita di spermatozoi per anno dal 2000 al 2018,
doppio rispetto al periodo 1973-2001
Un declino in accelerazione.
_ Levine et al 2022 _

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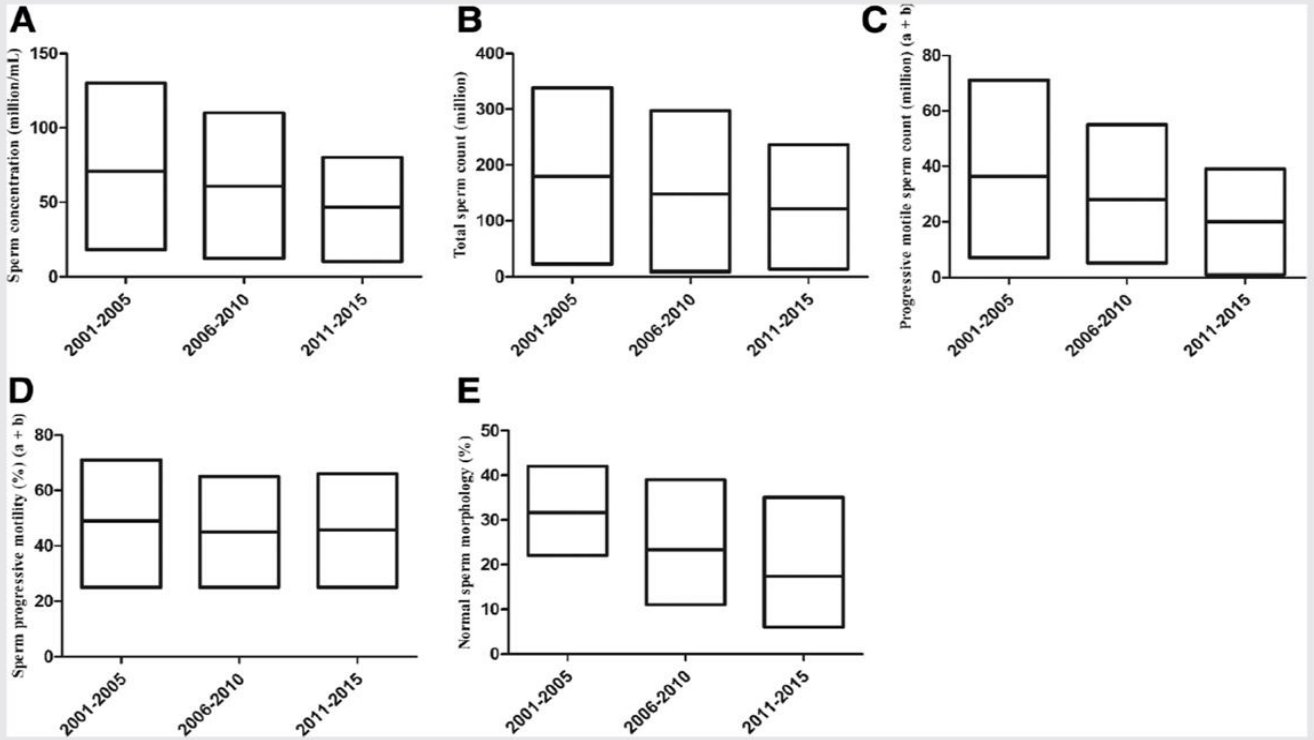
Decline in semen quality among 30,636 young Chinese men from 2001 to 2015

Fertility and Sterility® Vol. 107, No. 1, January 2017 0015-0282/$36.00

http://dx.doi.org/10.1016/j.fertnstert.2016.09.035

Chuan Huang, Ph.D.,[a] Baishun Li, B.S.,[b] Kongrong Xu, M.S.,[a] Dan Liu, M.S.,[a] Jing Hu, M.S.,[b] Yang Yang, B.S.,[b] HongChuan Nie, M.D., Ph.D.,[b] Liqing Fan, M.D., Ph.D.,[a,b] and Wenbing Zhu, M.D., Ph.D.[a,b]



Semen quality of 30,636 young men from the general population in Hunan, China. Semen parameters of Chinese young men from the general population. The bars show the 5th to 95th percentiles with median lines. (**A**) Sperm concentration, (**B**) total sperm count, (**C**) progressive motile sperm count, (**D**) sperm progressive motility, and (**E**) normal sperm morphology decreased during the 15-year period.

Huang. Declining semen quality in Chinese men. Fertil Steril 2016.

In just 15 years, there has been a 30% reduction in semen parameters in young Chinese men.

EcoFoodFertility

Trends in semen parameters of infertile men in South Africa and Nigeria. Scientific Report, apr. 2023

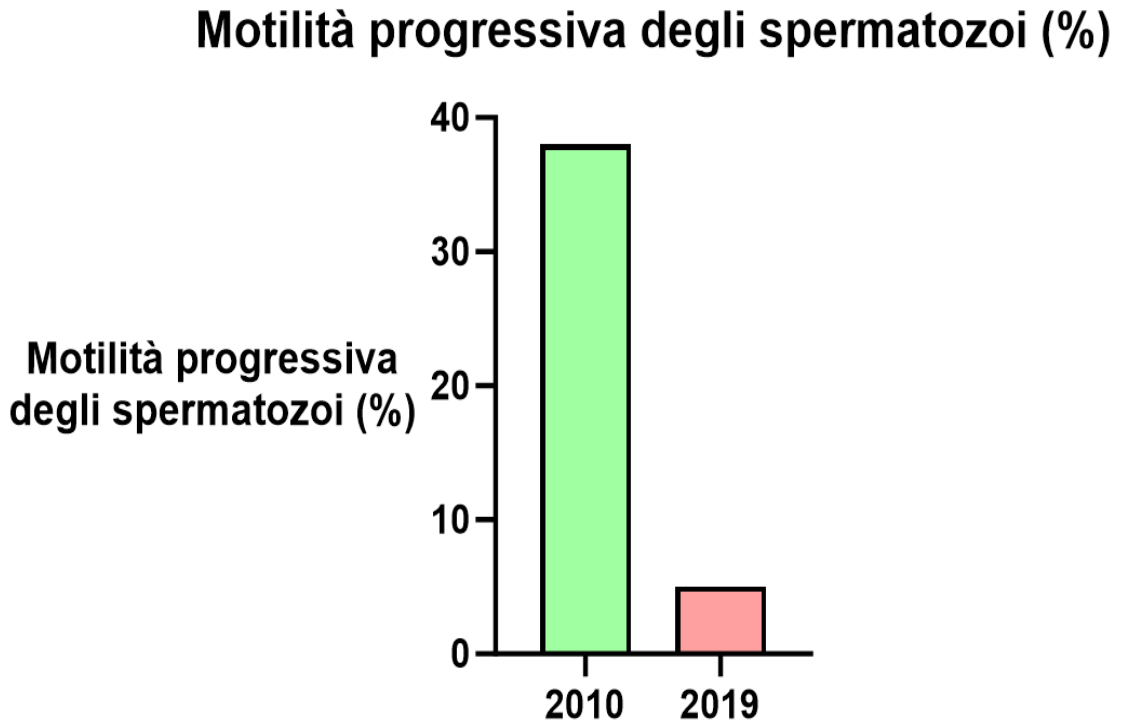
scientific reports

Check for updates

OPEN

Trends in semen parameters of infertile men in South Africa and Nigeria

Edidiong Nnamso Akang[1,2]✉, Chinyerum Sylvia Opuwari[3], Swesme Enyioma-Alozie[4], Lionel Wildy Moungala[5], Tamarapreye Emmanuel Amatu[6], Ibrahim Wada[6], Rose Ogeyi Ogbeche[7], Oluwatoyin Omolayo Ajayi[7], Mojisola Modupe Aderonmu[8], Olaitan Boluwatife Shote[8], Lateef Adekunle Akinola[9], Oladapo Adenrele Ashiru[8] & Ralf Henkel[3,10,11]✉

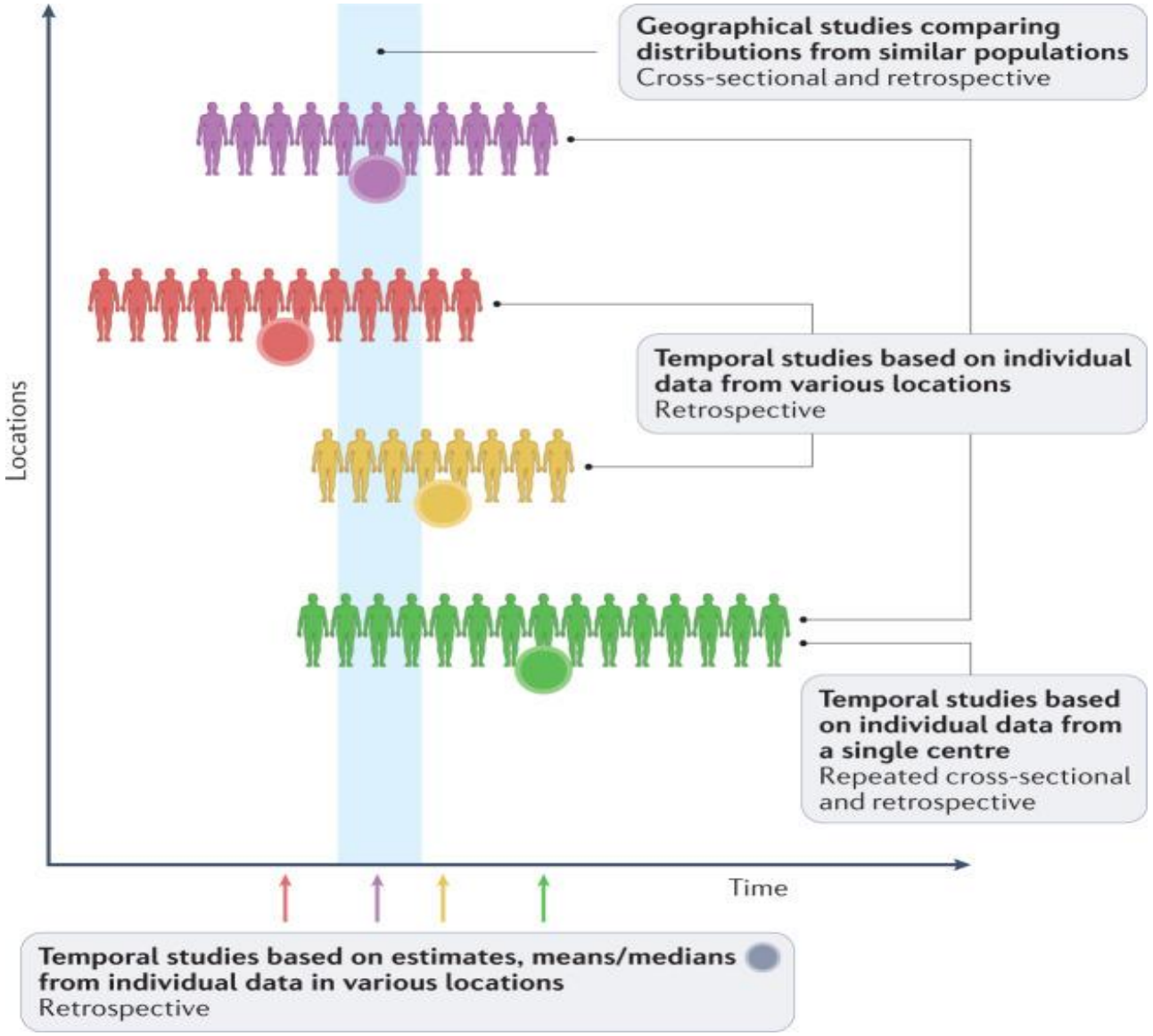


Spatiotemporal trends in human semen quality

Jacques Auger et al. Nature Review Urology, 2022 Oct; 597-626

Conclusions

The **existence of geographical contrasts** in human semen quality is unambiguous and is present at various levels: continental, national and, possibly, **even regional.** Some evidence from studies **with a complete set of quality criteria indicate a decline in sperm production for several decades in specific populations**. However, these centre-specific findings **cannot be generalized to represent a worldwide trend.** Despite their attractive design, the existing multicentre studies that rely on compilation of retrospective and aggregated data such as mean values, have not sufficiently controlled for study heterogeneities, including spatial contrasts or their possible effect-modifier role, and are overall inconclusive. Although future worldwide studies are, most likely, unrealistic, studies conducted in **well-delimited areas**, minimizing the well-known biases and combined **with the assessment of men's exposome** are recommended to advance our understanding of these interrelated factors.



Effects of a Lifestyle Change Intervention on Semen Quality in Healthy Young Men Living in Highly Polluted Areas in Italy: The FASt Randomized Controlled Trial.

Montano L*. et al. Eur. Ur. Focus Feb. 2021

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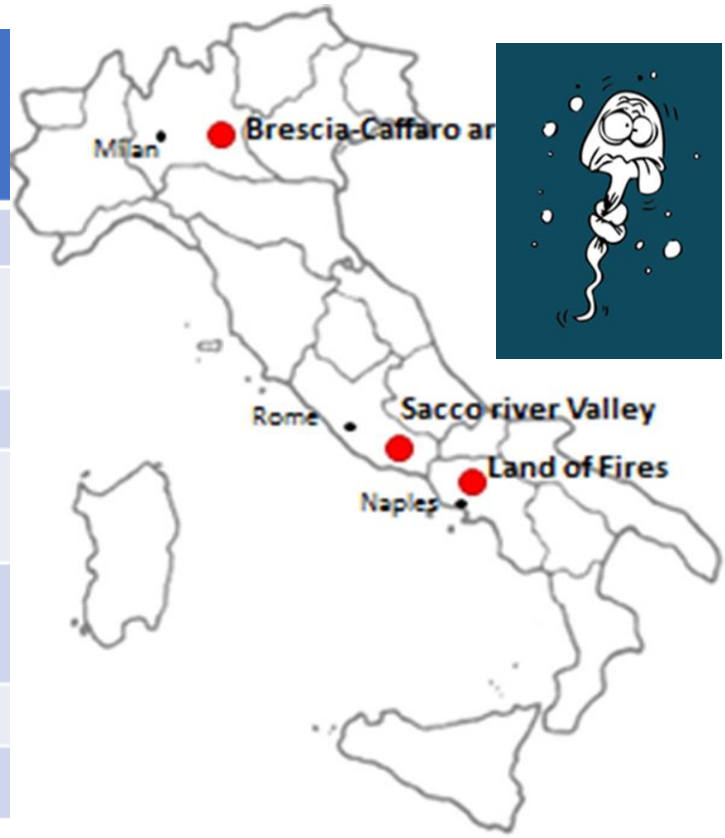
Sperm Parameters in risk areas of Italy.

FASt Study

Fertility, Environment, LifeStyle,

Semen parameters	Brescia mean ± SD	Land of Fires mean ± SD	Sacco River mean ± SD	Whole cohort mean ± SD	p*
Volume (ml)	2.90 ± 1.39	2.53 ± 1.13	2.81 ± 1.50	2.73 ± 1.32	0.0976
Sperm concentration (10^6/ml)	67.30 ± 45.86	45.23 ± 32.89	50.32 ± 36.07	55.29 ± 40.52	0.0001
Total motility (%)	40.86 ± 19.37	45.43 ± 24.08	31.43 ± 23.17	41.0[illegible] ± 22.5	0.0003
Progressive motility (%)	27.88 ± 17.78	30.74 ± 19.32	20.40 ± 17.56	27.75 ± 18.69	0.0015
Cell with normal morphology (%)	6.58 ± 4.37	7.42 ± 7.05	5.63 ± 3.16	6.76 ± 5.51	0.1249
Round cells (10^6/ml)§	5.03 ± 3.28	6.81 ± 5.60	5.95 ± 4.68	6.12 ± 4.89	0.3166
TAC (mM) #	1.14 ± 0.22	0.97 ± 0.27	1.02 ± 0.30	1.06 ± 0.26	0.0001



The majority of healthy, non-smoking, non-alcoholic young individuals with an average age of 19, who are homogeneous in terms of body mass index, have average values below the normal limits, especially for the parameter of progressive motility (30% according to the WHO 2021 manual)

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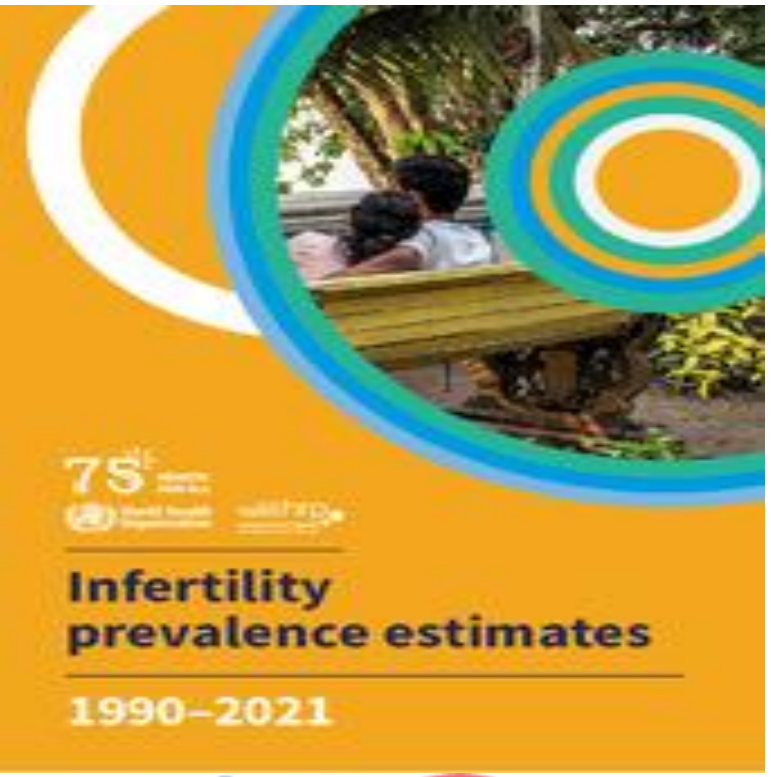
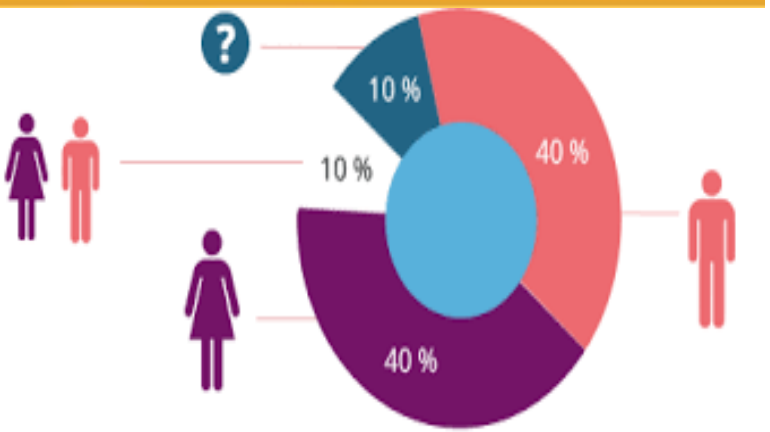
3 Aprile 2023

Report OMS su prevalenza infertilità basata sU 133 studi a livello globale, dal 1990 al 2021 (1 COPPIA SU 6 INFERTILE)





1) **Il fenomeno è globale con una prevalenza del 17.5 %**
2) **Variazione limitata di prevalenza fra regioni, stimata al 17,8% nei paesi ad alto reddito e al 16,5% nei paesi a basso e medio reddito.**
3) **monito ai governi per attivare politiche e finanziamenti pubblici adeguati per campagne di prevenzione, per percorsi diagnostici adeguati e cure, comprese il trattamento con tecnologie di riproduzione assistita spesso inaccessibili per molti a causa dei costi molto elevati**

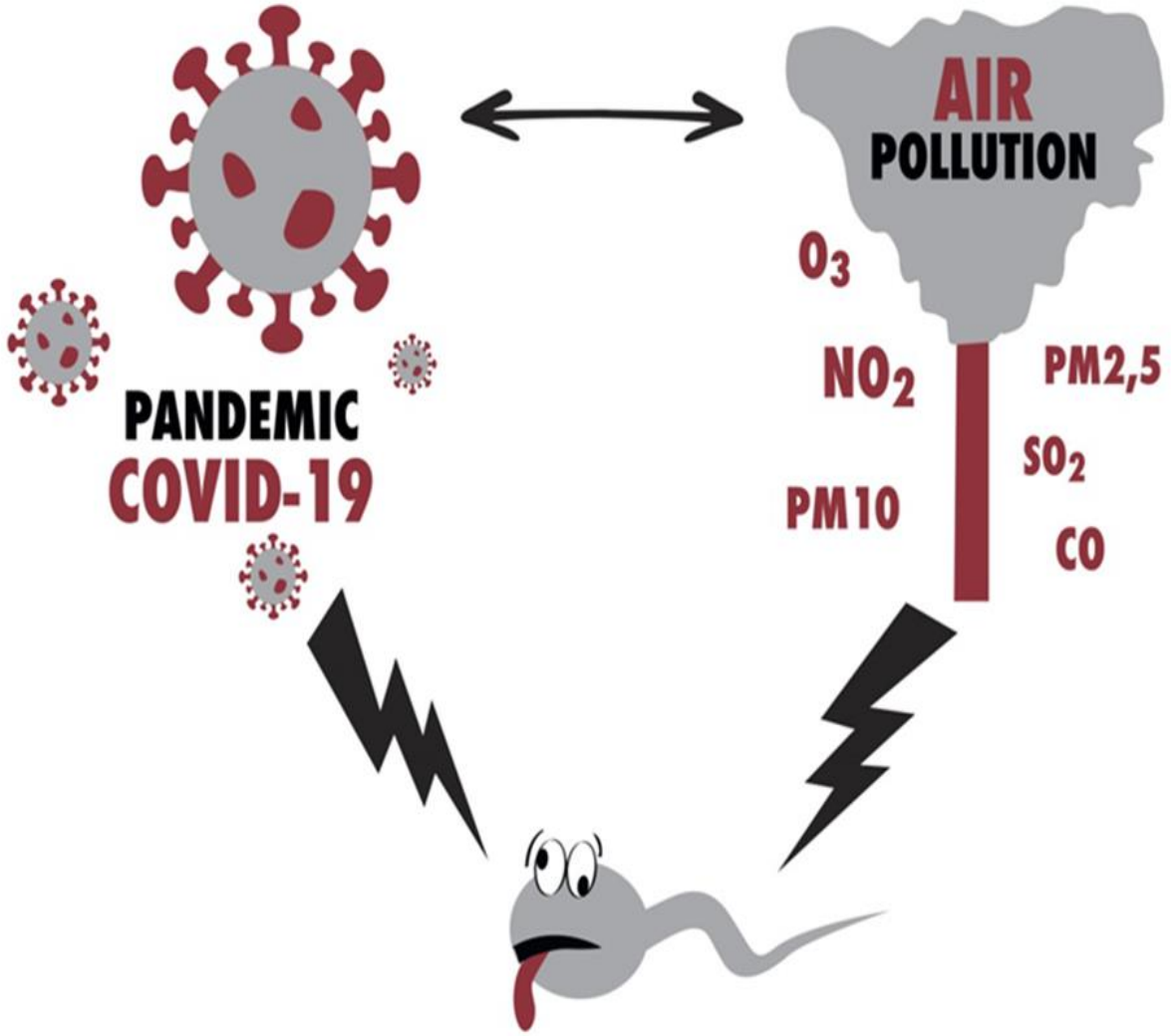
MA IL FENOMENO E' SOTTOSTIMATO...PERCHE'

- ***Studi prevalentemente basati sull'infertilità femminile, pochi sulla coppia ed ancor meno sul fronte maschile, che oggi sembra prevalente***
- ***Mancanza di dati da diversi paesi molto popolosi come India, Bangladesh, diversi africani e sudamericani***
- ***Sono dati prepandemia***

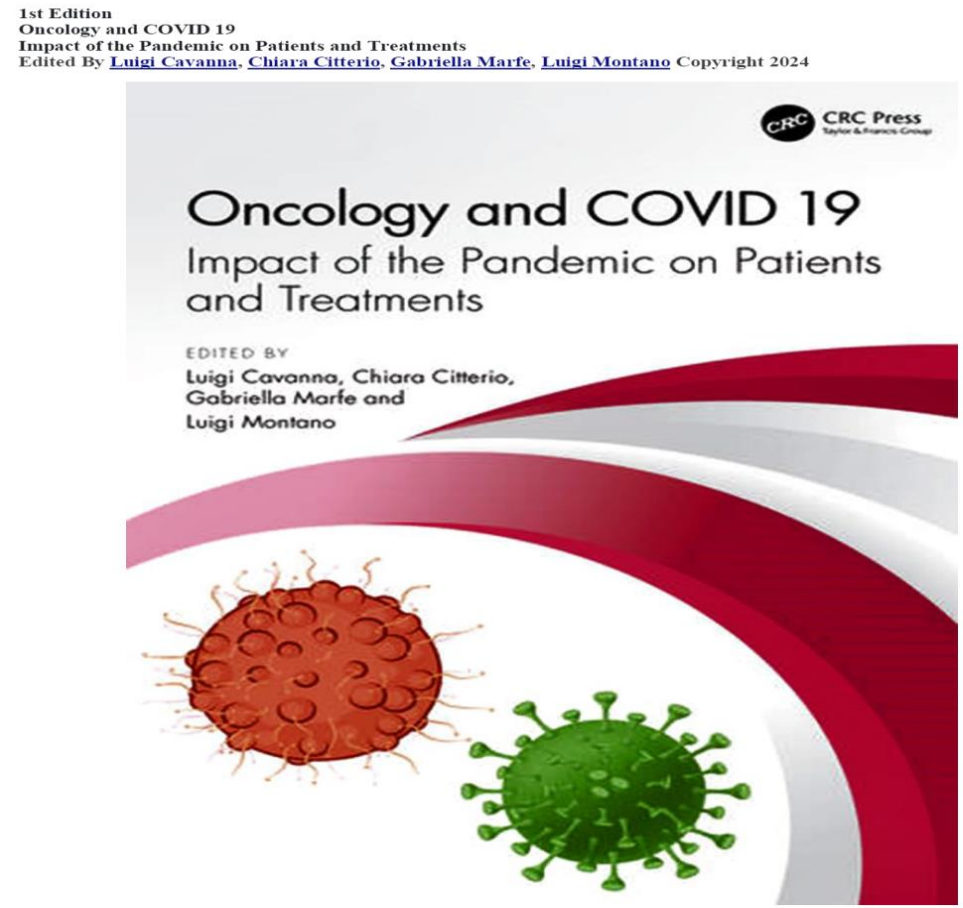
Air pollution and COVID-19: a possible dangerous synergy for male fertility

Luigi Montano*, et al. Int. J. Environ. Res. Public Health 2021, 18, x. https://doi.org/10.3390

Air pollution represents a significant co-factor for COVID-19 impact and has negative effects on the male reproduction system, through pro-oxidant, inflammatory and immune-dysregulating mechanisms. Recently was reported that chronic exposure to PM2.5 causes overexpression of the alveolar ACE2 receptor, the entry route of SARS-CoV-2 into the organism shared by the lungs and testis where expression is highest in the body. In the testis, the ACE2/Ang-(1–7)/MasR pathway plays an important role in the regulation of spermatogenesis and an indirect mechanism of testicular damages could be due to the blocking of the ACE2 receptor by SARS-CoV-2. This prevents the conversion of specific angiotensins, and the excess of these causes inflammation with excessive pro- duction of cytokines. In addition, PM2.5-induced overexpression of the alveolar ACE2 receptor could in turn increase local viral load in patients exposed to pollutants, producing ACE2 receptor depletion and compromising host defenses. The aim of our manuscript is to interpret in an overall view of epidemiological data and molecular mechanisms the possible synergistic effects of both air pollution and COVID-19 on male reproductive function, by warning how the enormous spread in the fertile age of SARS-CoV-2, represents a significant and urgent threat to global reproductive health. All of this should be of great concern especially for men at the age of maximum reproductive capacity and be an important topic of debate for policy makers, as altered environmental conditions together with the direct and indirect short and long-term effects of viral infection could cause a worsening of sperm quality with important consequences on male fertility, especially in those areas with higher environmental impact



Libro: Prossima uscita dal 16 ottobre 2023



https://www.routledge.com/Oncology-and-COVID-19-Impact-of-the-Pandemic-on-Patients-and-Treatments/Cavanna-Citterio-Marfe-Montano/p/book/9781032423845

Chapter 11

Air Pollution and COVID-19 A Synergistic Effect Accelerating Male Infertility and Cancer

Luigi Montano, Marina Piscopo, Carlo Brogna, Maria Luisia Chiusano

Book Oncology and COVID 19

Edition 1st Edition

First Published 2023

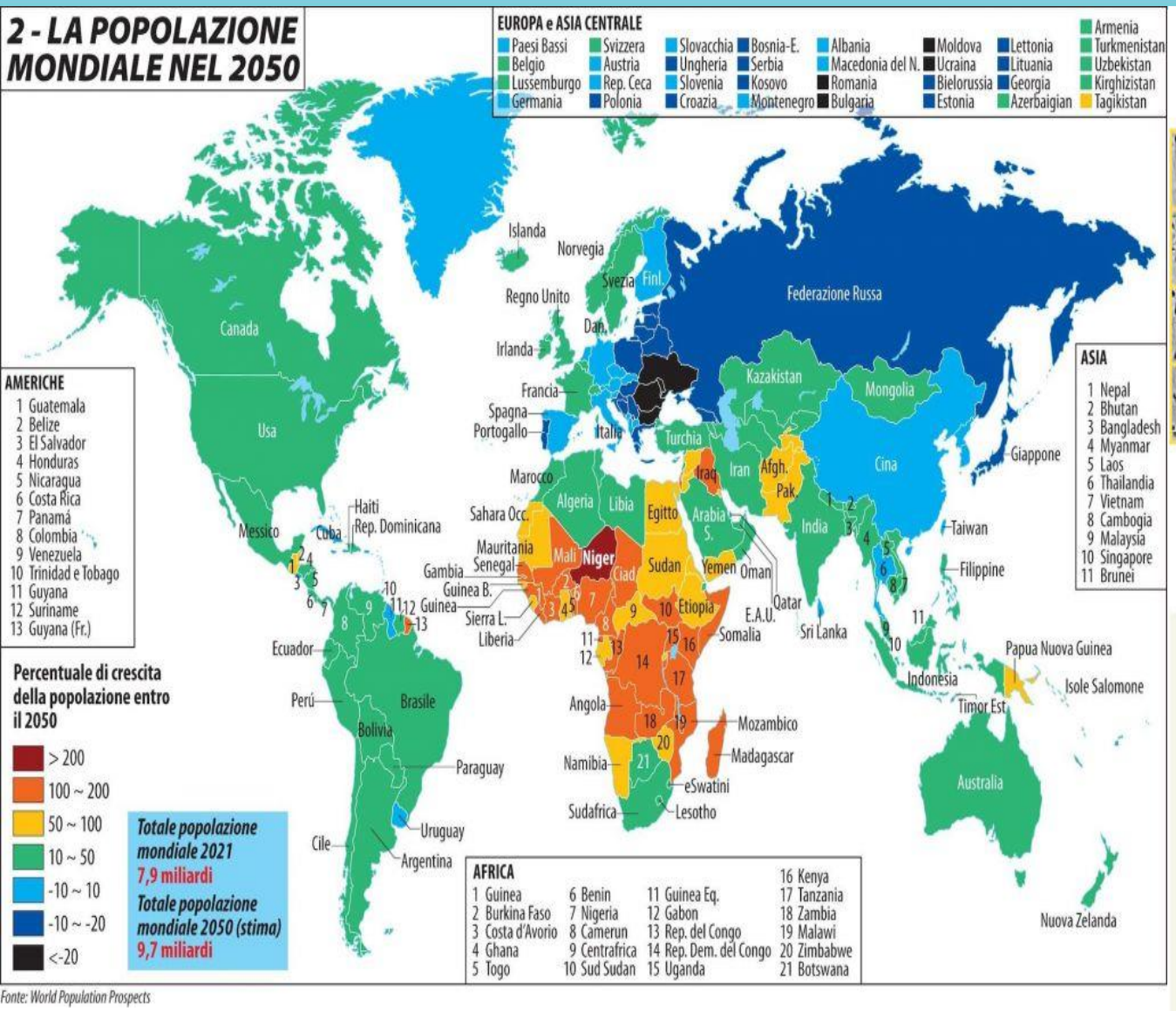
Imprint CRC Press
Pages 23

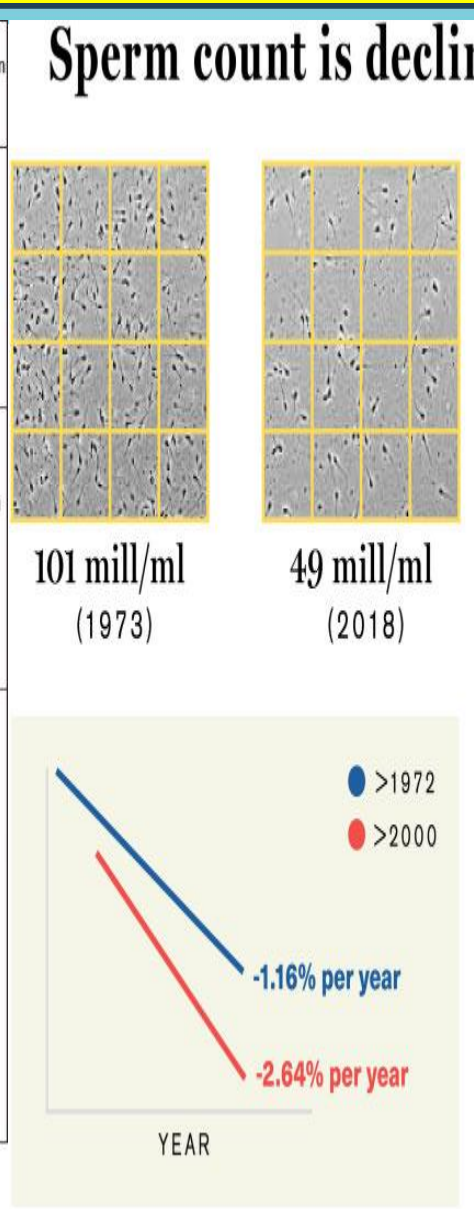
eBook ISBN 9781003362562

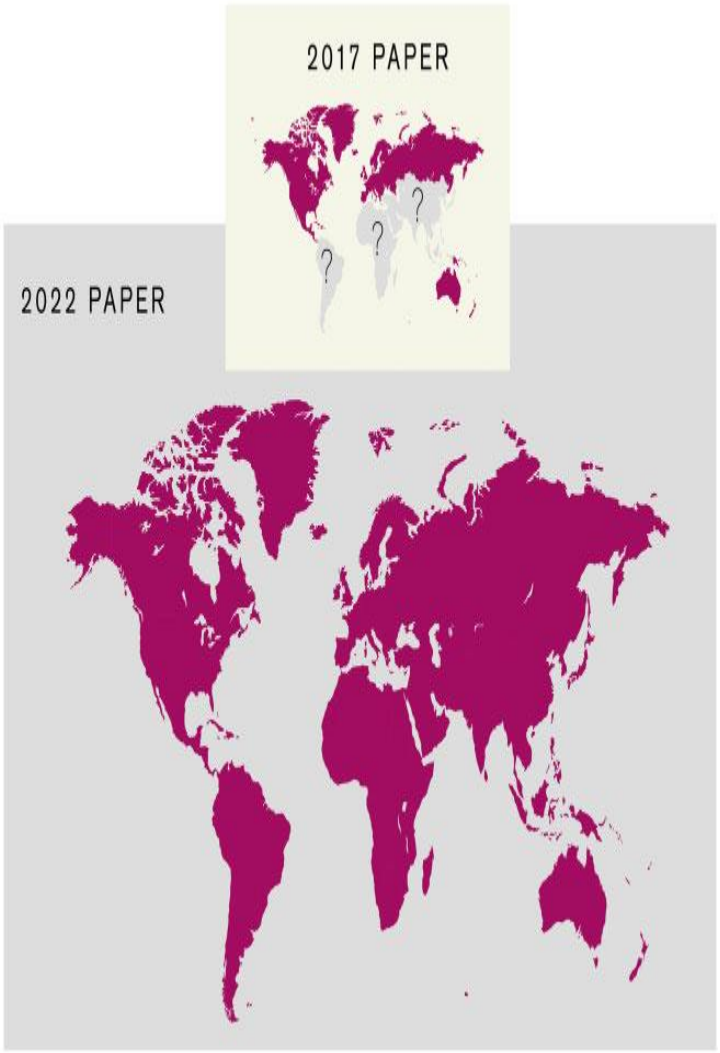
EcoFoodFertility

Gli studi demografici fanno proiezioni al 2050, con una crescita fino a 9.7 Miliardi di persone considerando i tassi di natalità sopra i 2.1 in AFRICA .

MA NON SI CONSIDERA IL TASSO DI INFERTILITA' CRESCENTE IN PARTICOLARE MASCHILE







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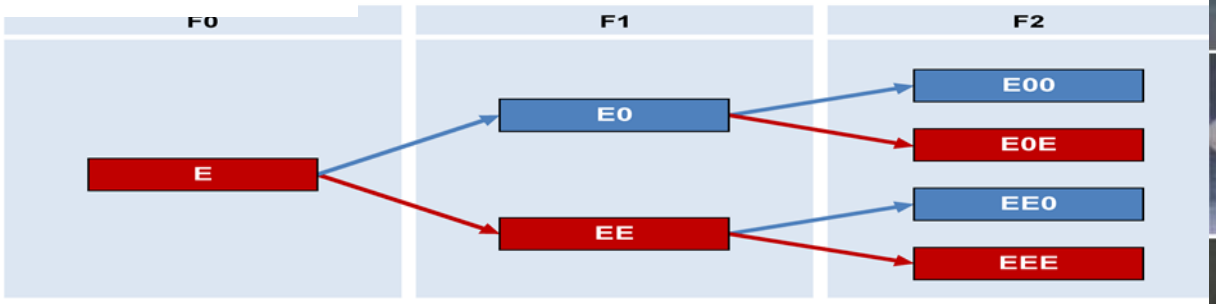
Germline and reproductive tract effects intensify in male mice with successive generations of estrogenic exposure. Tegan S. Horan et al. 2017. Plos Genetics

PLOS | GENETICS

A

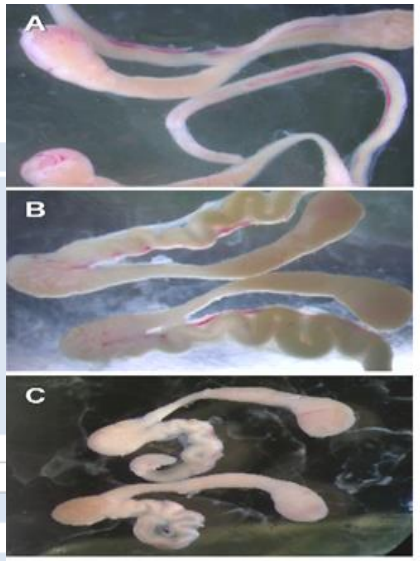


B

Abbreviation	Generation	Generations Exposed	Individual(s) Exposed
E	F0	1	Self
E0	F1	1	Father
EE	F1	2	Father and Self
E00	F2	1	Grandfather
E0E	F2	2	Grandfather and Self
EE0	F2	2	Grandfather and Father
EEE	F2	3	Grandfather, Father, and Self

C

	Family 1	Family 2	Family 3	Total
F0	1	1	1	3
F1	17	21	17	55
E0	9	12	9	30
EE	8	9	8	25
F2	42	56	55	153
E00	11	12	12	35
E0E	17	13	13	43
EE0	4	12	11	27
EEE	10	19	19	48



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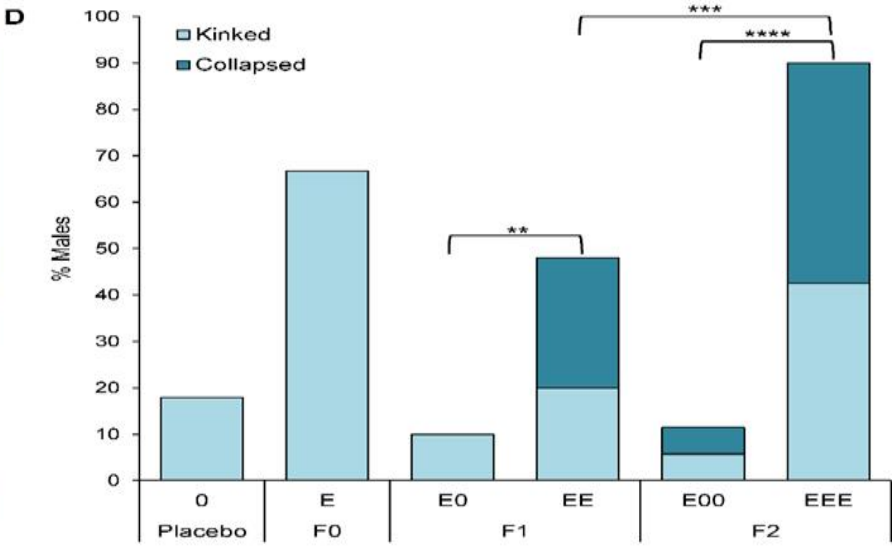
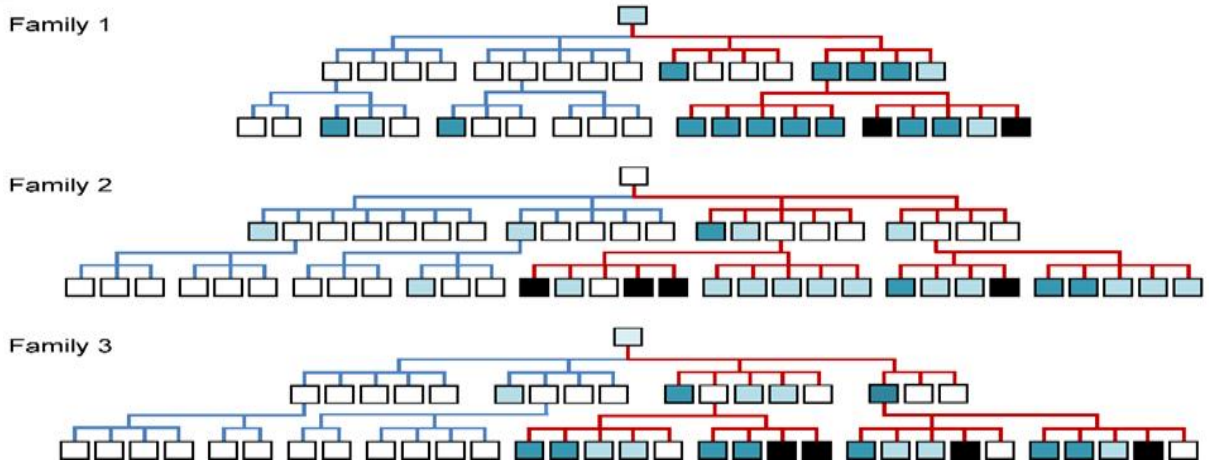


E



The male sensitivity to environmental estrogens is increased by successive generations of exposure

- Generalmente gli studi di esposizione per la valutazione dell'effetto transgenerazionale comporta l'esposizione di una generazione e generalmente esponendo ad una sostanza data durante il periodo embrio-fetale (considerando le alterazioni indotte durante la riprogrammazione cellulare e quindi incidendo alla base della formazione in utero dei tessuti per esempio germinali) il monitoraggio degli effetti nelle generazioni successive non esposte.
- Utilizzando un modello murino allevato ed un marcatore sensibile quantitativo dello svilppo della liena germinale, durante la ricombinazione meitoica e quindi in una finestra ben precisa postnatale,si è somministrato oralmente un estrogeno sintetico etinilestradiolo- Un complesso protocollo di esposizione di tre generazioni ha permesso di confrontare gli effetti di individuo, paterno e nonno (ancestrale)
- L'esperimento di esposizione nel periodo postnatale e quindi non in utero, indica che la linea germinale non solo risente dell'effetto, ma questo effetto è trasmissibile per la generazione dei gameti successivi, ed anzi, l'esposizione continua anche a dose più basse esacerba gli effetti, con maggiore incidenza e gravità del tratto riproduttivo.
- In sintesi la **sensibilità maschile agli EDC aumenta di generazione in generazione** e ci permette di dare una spiegazione al progressivo peggioramento che si registra in termini di calo della qualità spermatica ed aumento di incidenza di tutte le patologie dell'apparato riproduttivo, che rappresenta la spia e quindi specchio fedele di quanto tali sostanze stanno progressivamente alterando la fisiologia umana e del perché dell'aumento esponenziale di tutte le patologie cronico-degenerative.

EcoFoodFertility

I Figli degli Uomini

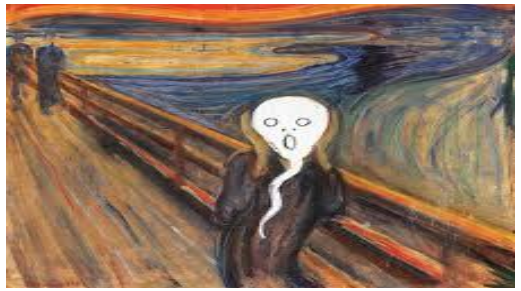
L'ultimo Spermatozoo

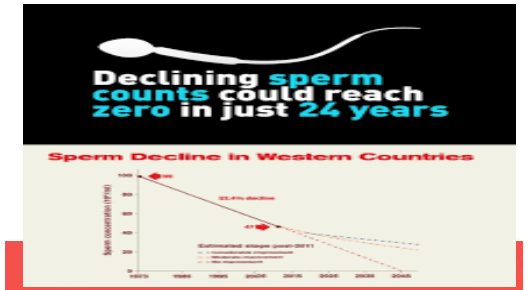
Nel 1992 la scrittrice inglese P.D. James pubblicò I figli degli uomini, da cui l'omonimo FILM (2006) descrivendo un'umanità condannata all'estinzione per infertilità maschile

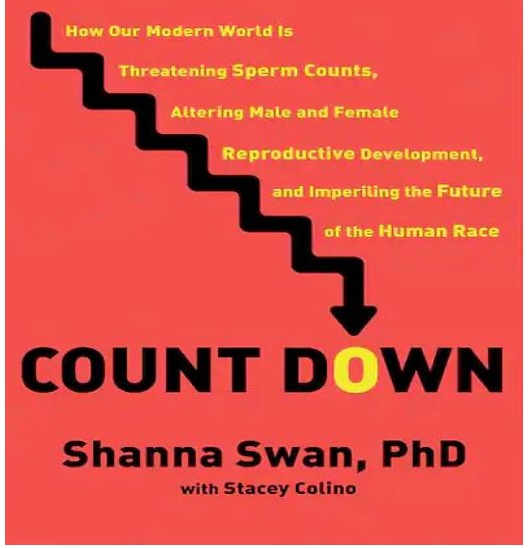
Johansson nel **2019**, neuroscienziato svedese del Karolinska Institute in riferimento all'impatto oltre che chimico anche elettromagnetico prevede che «*La progressiva diminuzione spermatica diventerà una infertilità irreversibile* ***entro le prossime 5 generazioni***»

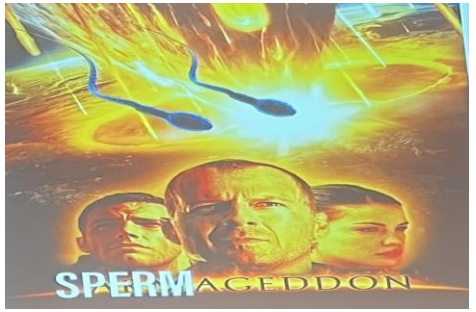
EcoFoodFertility

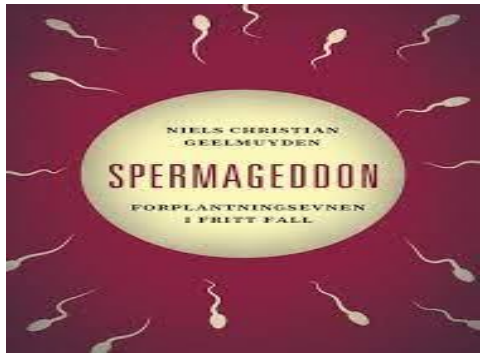
Are we near to extinction?



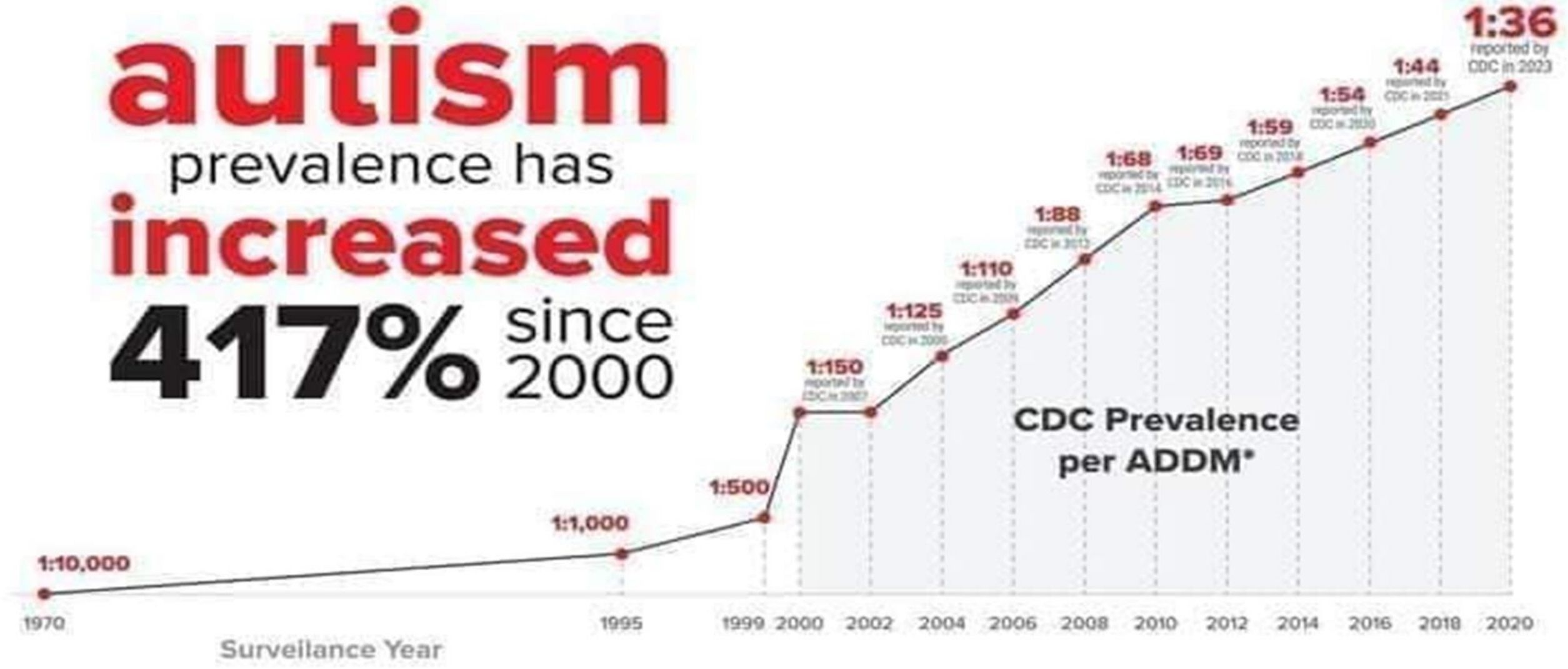








autism prevalence has increased 417% since 2000

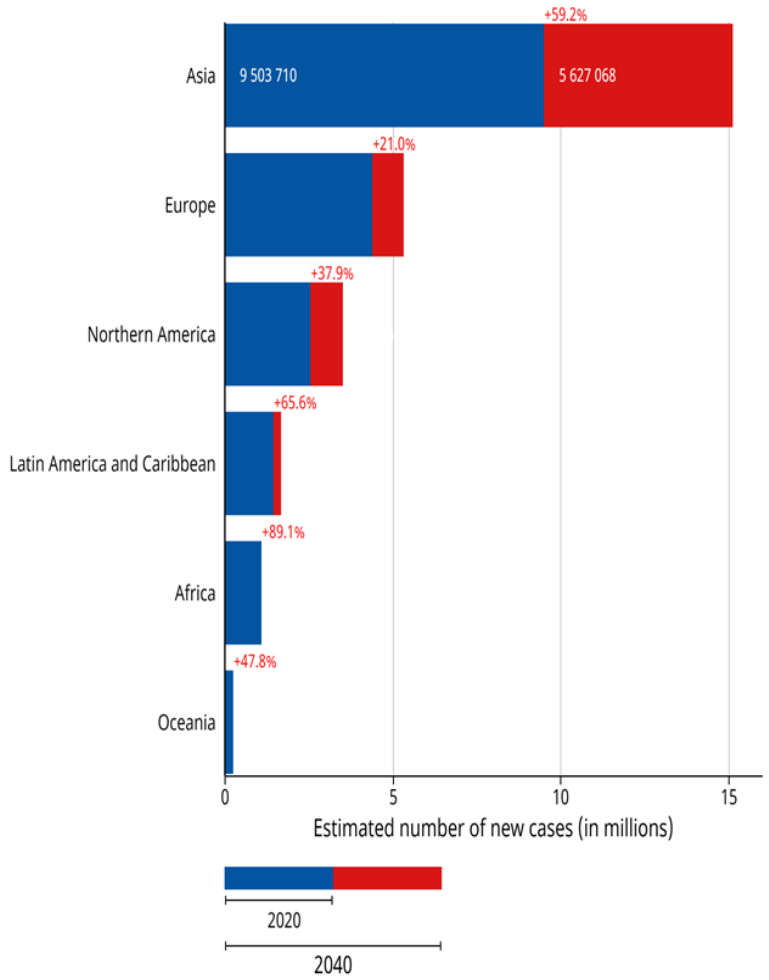


*ADDM (Autism and Development Disabilites Monitoring Network)

EcoFoodFertility

Estimated number of new cases from 2020 to 2040, Both sexes, age [0-85+]
All cancers

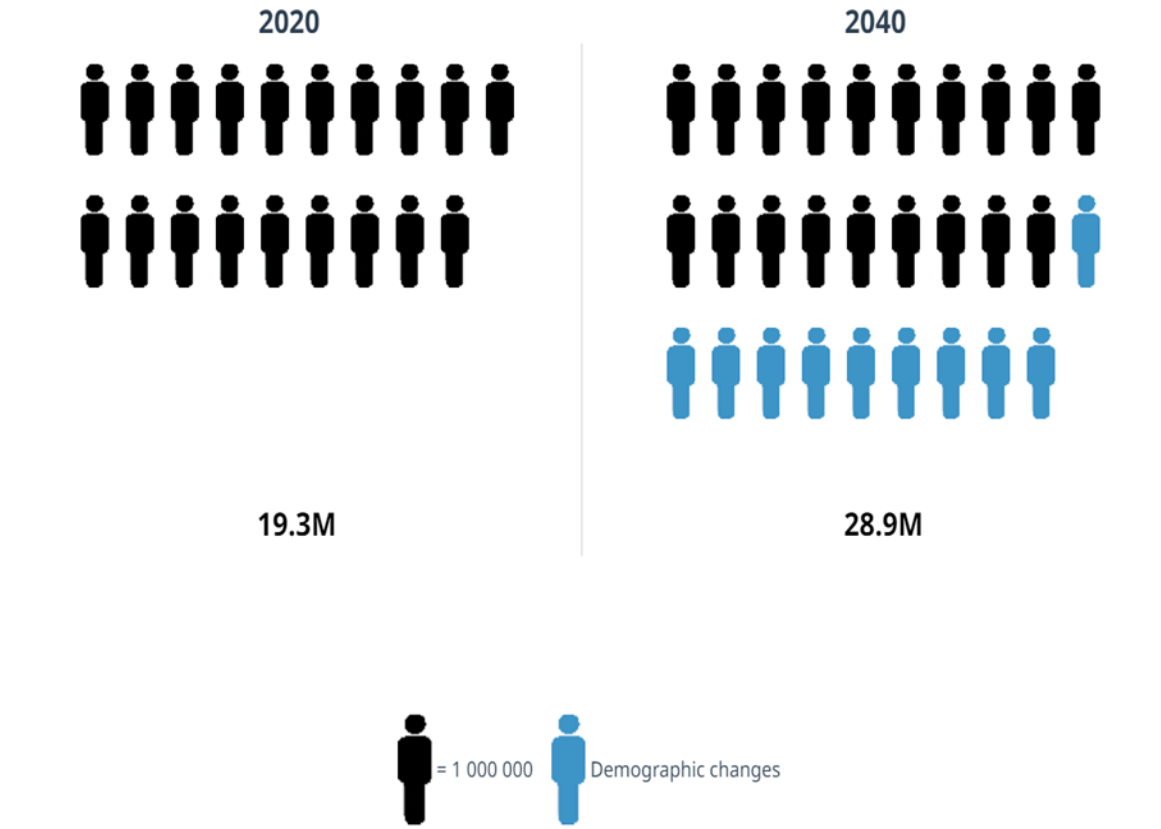
GLOBAL CANCER OBSERVATORY



International Agency for Research on Cancer
World Health Organization

Estimated number of new cases from 2020 to 2040, Both sexes, age [0-8
All cancers
Africa + Latin America and Caribbean + Northern America + Europe + Oceania + Asia

GLOBAL CANCER OBSERVATORY



International Agency for Research on Cancer
World Health Organization

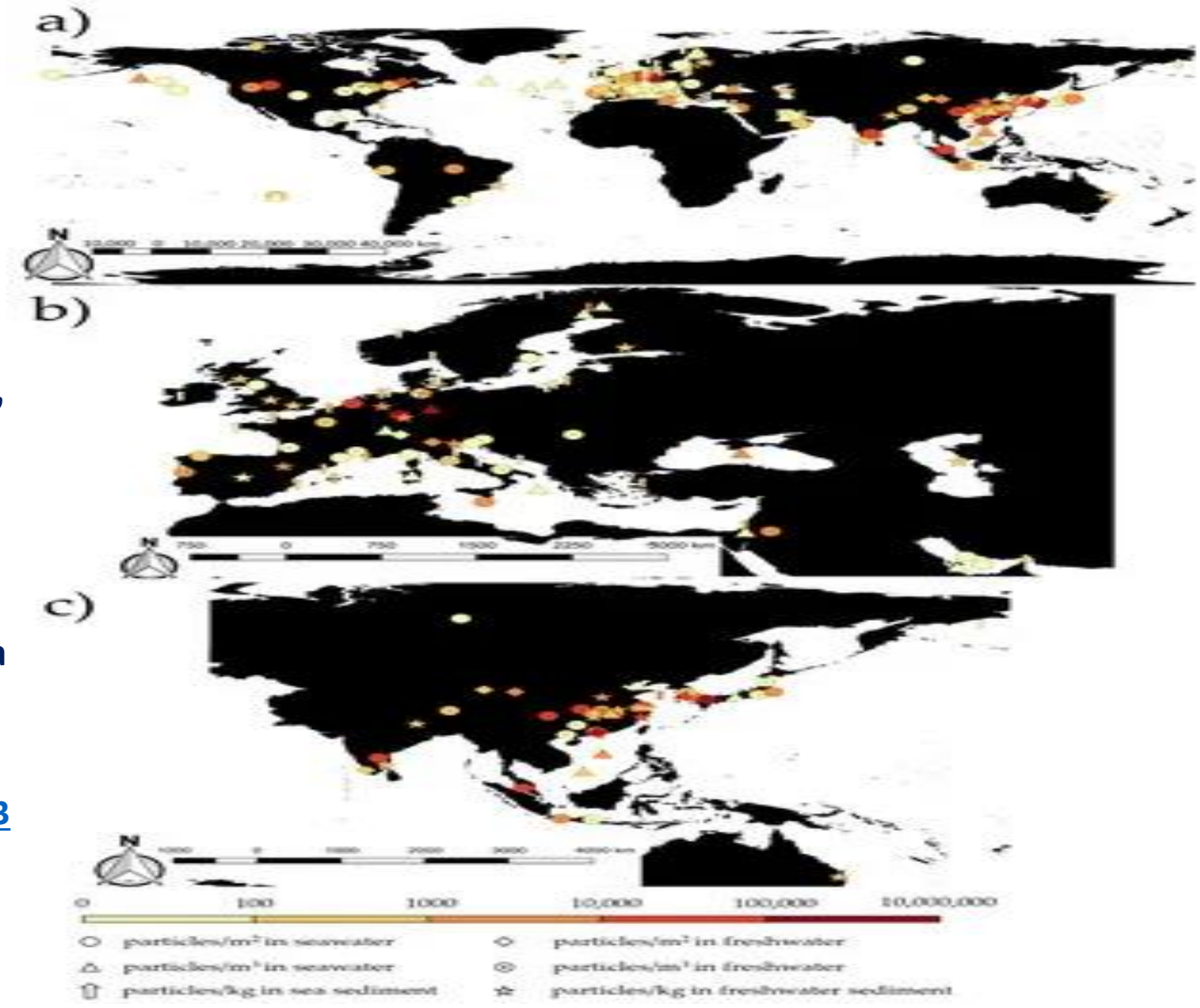
EcoFoodFertility

water

Microplastics Analysis in the Aquatic Environment: Occurrence, Persistence, Analisys, and Human Exposure

Maria Ricciardi , Concetta Pironti , Oriana Motta, Ylenia Miele, Antonio Proto and Luigi Montano

Water 2021, 13(7), 973; https://doi.org/10.3390/w13070973

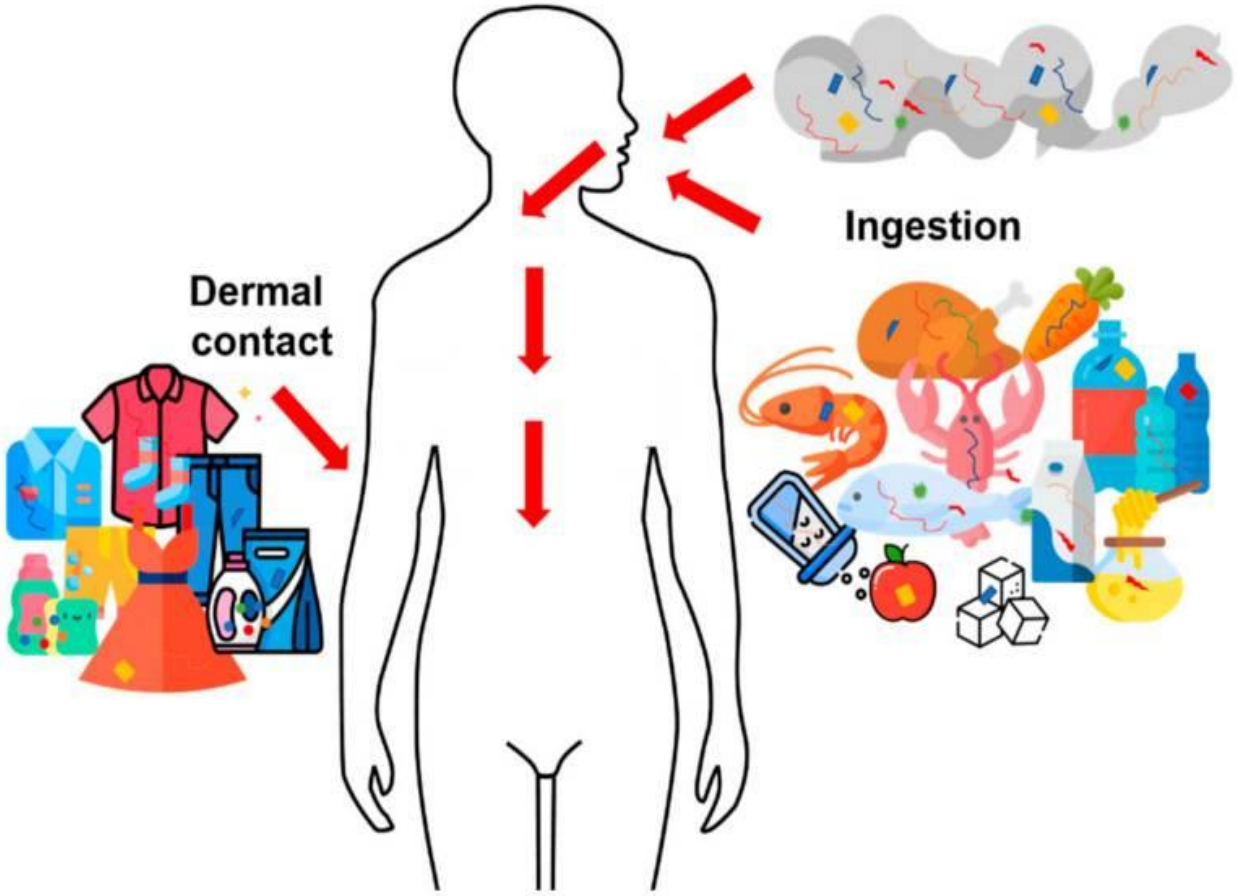


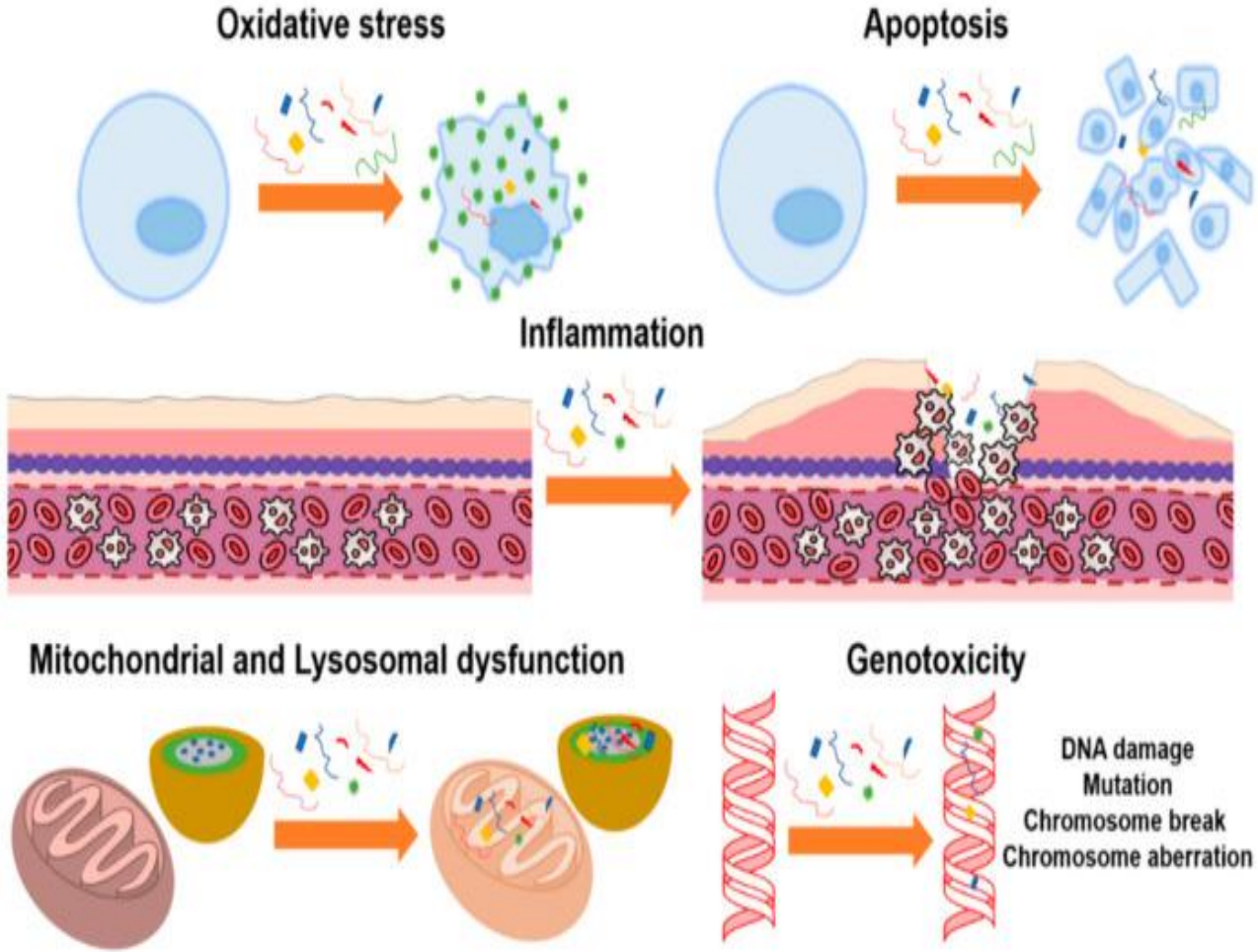
EcoFoodFertility

Microplastics in the Environment: Intake through the Food Web, Human Exposure and Toxicological Effects

Concetta Pironti, Maria Ricciardi, Oriana Motta*, Ylenia Miele, Antonio Proto, and Luigi Montano. **Toxics. 2021**

toxics





MICROPLASTICS IN HUMAN URINE (JAN 2023)

EcoFoodFertility

toxics

MDPI

Article

First Evidence of Microplastics in Human Urine, a Preliminary Study of Intake in the Human Body

Concetta Pironti [1,†], Valentina Notarstefano [2,†], Maria Ricciardi [3], Oriana Motta [1,*], Elisabetta Giorgini [2] and Luigi Montano [4,5,*]

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2 Department of Life and Environmental Sciences, DiSVA, Università Politecnica Delle Marche, 60121 Ancona, AN, Italy
3 Department of Chemistry and Biology, University of Salerno, Via Giovanni Paolo II, 84084 Fisciano, SA, Italy
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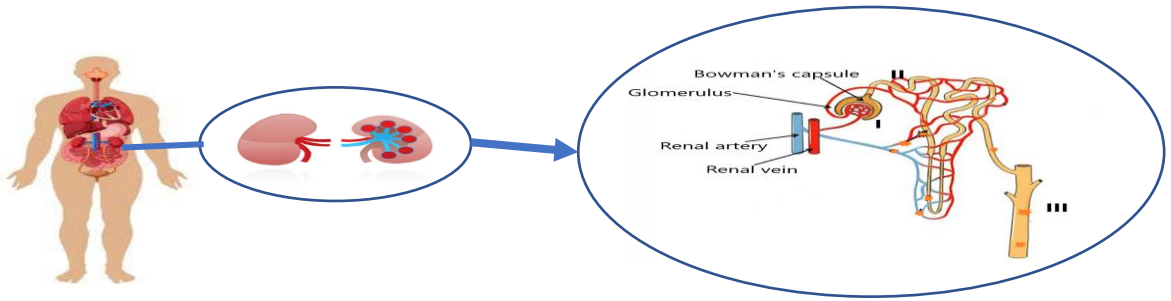
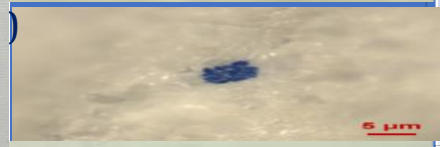
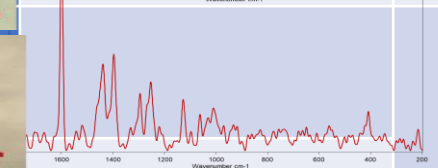
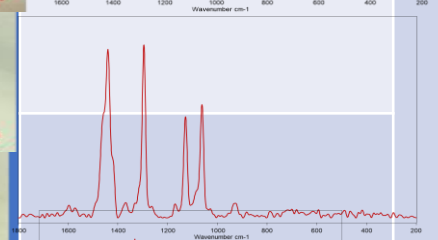
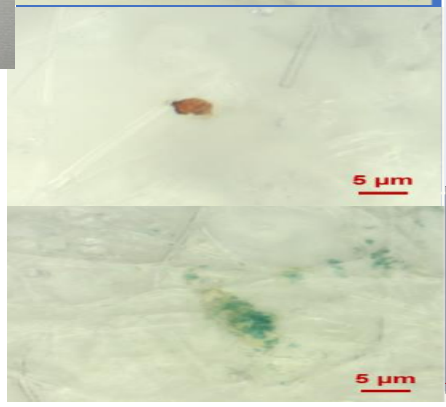
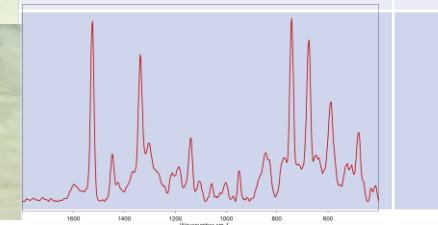
5 PhD Program in Evolutionary Biology and Ecology, University of Rome "Tor Vergata", 00133 Rome, RM, Italy
* Correspondence: omotta@unisa.it (O.M.); l.montano@aslsalerno.it (L.M.); Tel.: +39-089-963-083 (O.M.)
† These authors contributed equally as first author.



Sample	Micro-imags	Raman spectrum and identified polymer matrix
		polyethylene vinyl acetate
		polyvinyl chloride
		polypropylene
		polyethylene
		polypropylene

MICROPLASTICS IN HUMAN URINE (Jan 2023)

"The urine analysis of 6 volunteers identified four pigmented fragments (size 4-15 µm), irregular in shape, which were characterized in terms of morphology and chemical composition. Polyethylene vinyl acetate (PVA), polyvinyl chloride (PVC), polypropylene (PP), and polyethylene (PE) were found in four samples (PVA and PVC in one female sample, and PP and PE in three male samples). This preliminary study suggests that microplastics may pass through the gastrointestinal tract and be eliminated through biological processes."

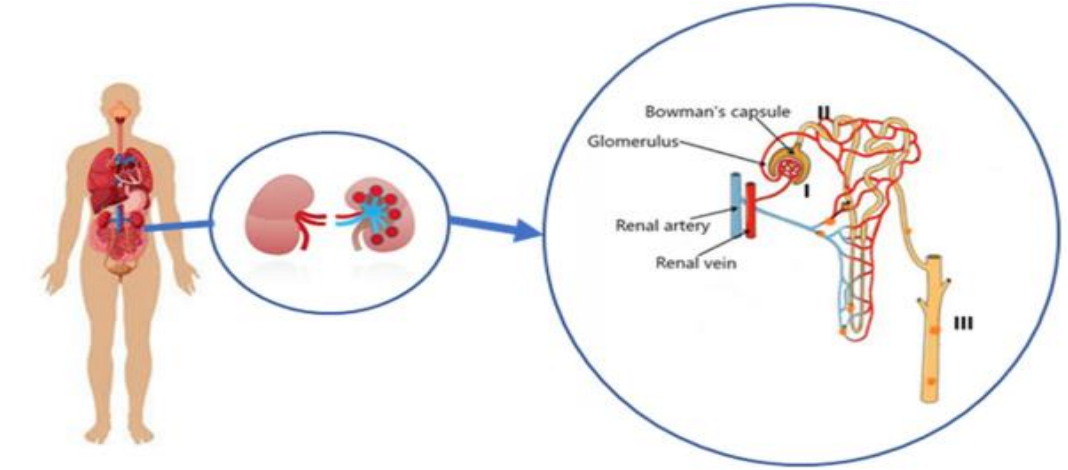


Figure 1. Description of the renal excretion of MPs: (I) through the bloodstream, MPs can flow inside of the glomerular tuft, without passing across the intact filtration barrier due to their size; (II) MPs are uptaken by the epithelial cells of the proximal convoluted tubules through endo- or macropinocytosis and then secreted into the tubular lumen; (III) MPs pass through the tubular system to be excreted with urine [39–42].

Table 1. MPs presence in individual samples, including morphology, size, color, and polymer matrix.

Sample	N. of MPs	Shape	Size	Color	Polymer Matrix
#1 Female	0	-	-	-	-
#2 Female	2	irregular fragment	~15 µm	transparent	polyethylene vinyl acetate
		sphere	~7 µm	brown	polyvinyl chloride
#3 Female	0	-	-	-	-
#4 Male	3	irregular fragment	~5 µm	blue	polypropylene
		irregular fragment	~10 µm	blue/grey	polypropylene
		irregular fragment	~15 µm	green	polypropylene
#5 Male	1	irregular fragment	~4 µm	red	polyethylene
#6 Male	1	irregular fragment	~10 µm	green	polypropylene

MICROPLASTICS IN HUMAN SEMEN (JUL 2023)

Science of The Total Environment
Volume 901, 25 November 2023, 165922

Raman Microspectroscopy evidence of microplastics in human semen

Luigi Montano [a b 1], Elisabetta Giorgini [c 1], Valentina Notarstefano [c], Tiziana Notari [d], Maria Ricciardi [e], Marina Piscopo [f 2], Oriana Motta [g 2]

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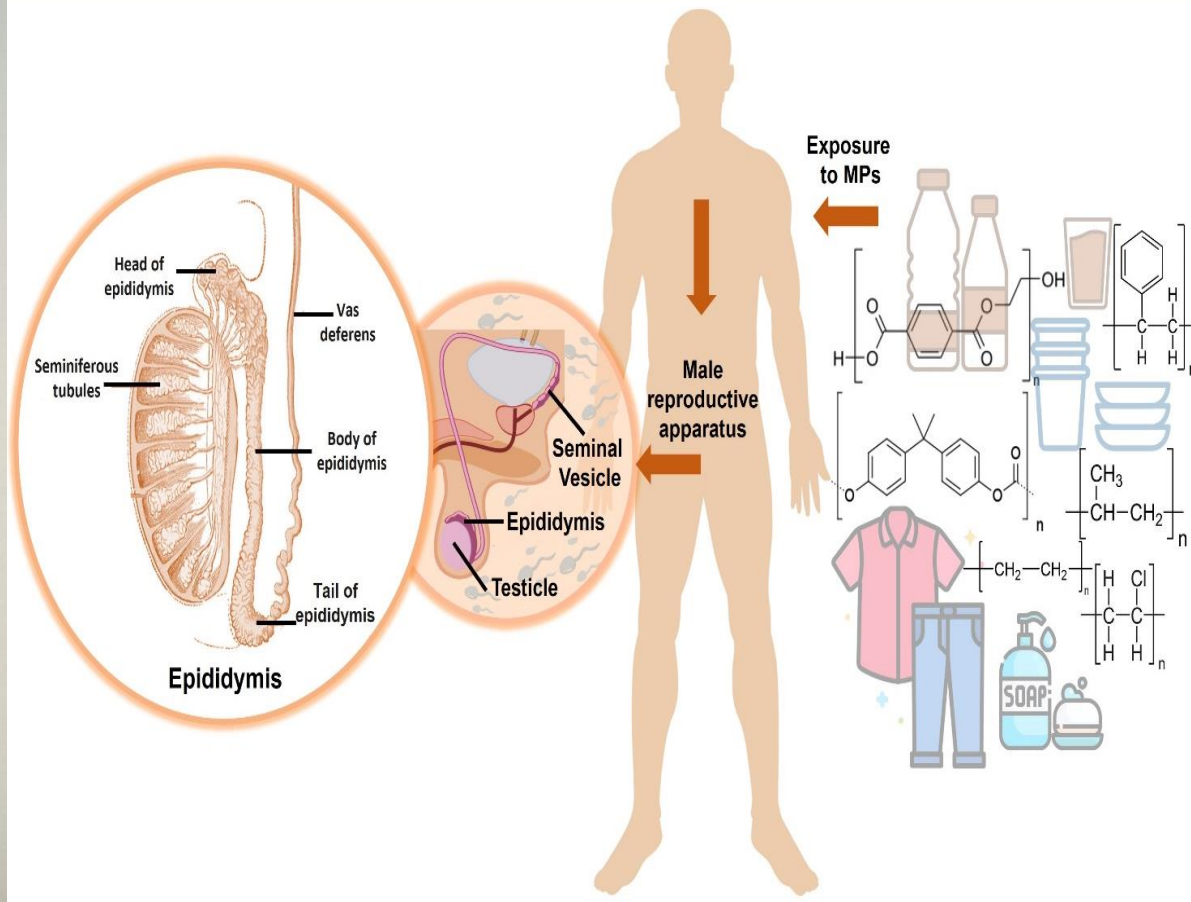


In this study, human semen samples, collected from consenting men, were analyzed by Raman Microspectroscopy to evaluate the presence of microplastics. In total, **16 pigmented microplastic fragments (ranging from 2 to 6 µm in size**), with spheric or irregular shape were found in six out of ten samples; all microplastic particles were characterized in terms of chemical composition and morphology. Chemical composition showed the presence of PP, PE, PET, PS, PVC, PC, POM and acrylic, suggesting ingestion and/or inhalation as a route of exposure to environmental MPs. In this paper, we propose for the first time a mechanism through which MPs pass the testicular barrier, epididymis, seminal vesicles and prostate gland reaching the semen.

MICROPLASTICHE NELLO SPERMA UMANO (luglio 2023)

EcoFoodFertility

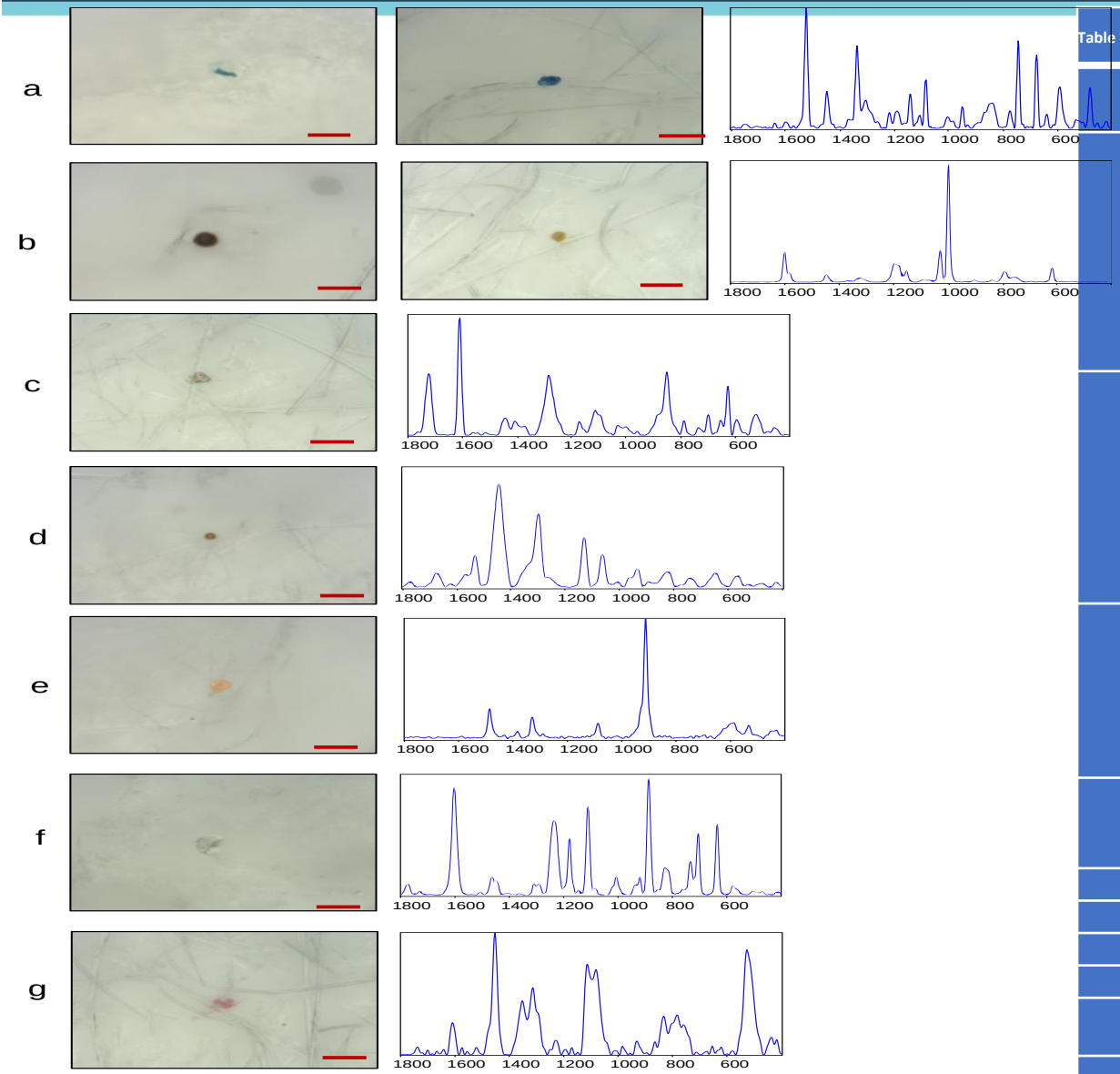


Table 1. Number, morphological (shape, size, color) and chemical (polymer matrix) features of MPs found in human sperm samples.

Sample	N. of MPs	Shape	Size	Colour	Polymer Matrix
#1	5	elongated fragment	~4 µm	green	polypropylene
		sphere	~4 µm	black	polystyrene
		irregular fragment	~3 µm	grey	polyethylene terephthalate
		sphere	~2 µm	orange	polyethylene
		irregular fragment	~3 µm	orange	polyoxymethylene
#2	4	irregular fragment	~6 µm	green	polyethylene terephthalate
		irregular fragment	~3 µm	black	polycarbonate
		irregular fragment	~5 µm	clear	polycarbonate
		irregular fragment	~4 µm	orange	polyvinylchloride
#3	3	irregular fragment	~3 µm	grey	polystyrene
		irregular fragment	~4 µm	blue	polyethylene
		irregular fragment	~3 µm	orange	polypropylene
#4	2	irregular fragment	~6 µm	blue	polyethylene
		sphere	~2 µm	yellow	polystyrene
#5	0	-	-	-	-
#6	0	-	-	-	-
#7	0	-	-	-	-
#8	0	-	-	-	-
#9	1	irregular fragment	~5 µm	blue	polypropylene
#10	1	irregular fragment	~4 µm	magenta	acrylic

EcoFoodFertility

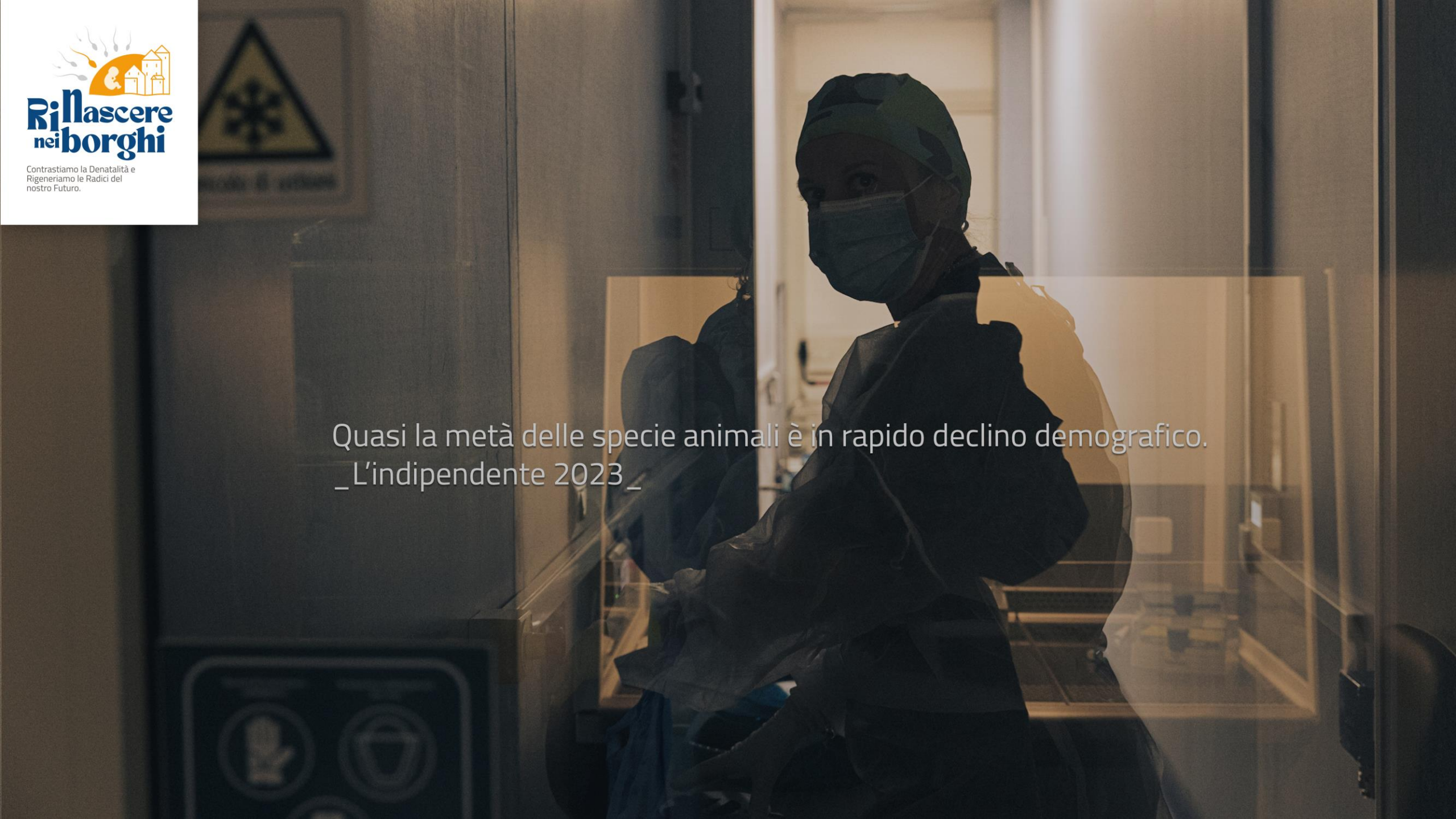
MICROPLASTICHE NELLO SPERMA UMANO (luglio 2023)

Table 2. Results of spermiograms on participants' samples.

ID	Volume (mL)	N°SPS/mL	Rapidly Progressive (%)	Slowly progressive (%)	Non-progressive (%)	Immotile (%)	Morphology (%)	Round cells
#1	2.0	0	0	0	0	0	-	0
#2	2.2	12	5	10	5	80	3	3
#3	1.3	6	25	10	30	35	3	3
#4	1.1	45	20	25	10	45	5	8
#5	1.9	96	15	15	25	45	5	14
#6	2.5	42	25	30	15	30	6	2
#7	3.5	112	35	20	25	20	9	2
#8	2.5	55	25	25	10	40	7	2
#9	3.3	74	30	10	25	35	6	4
#10	2.3	66	20	25	15	40	5	3

Rinascere nei borghi

Contrastiamo la Denatalità e Rigeneriamo le Radici del nostro Futuro.



Quasi la metà delle specie animali è in rapido declino demografico.
L'indipendente 2023

Rinascere nei borghi

Contrastiamo la Denatalità e Rigeneriamo le Radici del nostro Futuro.

Quasi la metà delle specie animali è in rapido declino democrafico

L'indipendente del 5 Agosto 2023

Rinascere nei borghi

Contrastiamo la Denatalità e Rigeneriamo le Radici del nostro Futuro.

Biodiversità, il 45% delle piante che fioriscono è a rischio estinzione

10 Ottobre 2023

Rinascere nei borghi

Contrastiamo la Denatalità e Rigeneriamo le Radici del nostro Futuro.

Entro il 2100

La popolazione mondiale subirà un brusco calo.
E nell'ipotesi peggiore l'intera società potrebbe collassare
_ da Focus 2023 _

EcoFoodFertility

5th SENTIERI REPORT June 12, 2018
SITES OF NATIONAL INTEREST (SIN)

EPIDEMIOLOGIA & PREVENZIONE
Rivista dell'Associazione italiana di epidemiologia

SENTIERI - Studio Epidemiologico Nazionale dei Territori e degli Insediamenti Esposti a Rischio da Inquinamento

S.E.N.T.I.E.R.I.

Living in contaminated sites (AROUND 6 MILLION PEOPLE) results in a 9% increase in malignant tumors between 0 and 24 years of age. In particular, the "excess incidence" compared to peers living in areas considered "not at risk" is 62% for soft tissue sarcomas, 66% for acute myeloid leukemias, and 50% for Non-Hodgkin lymphomas

EcoFoodFertility

6th SENTIERI REPORT (2023)

Sesto Rapporto | Sixth Report

S.E.N.T.I.E.R.I.

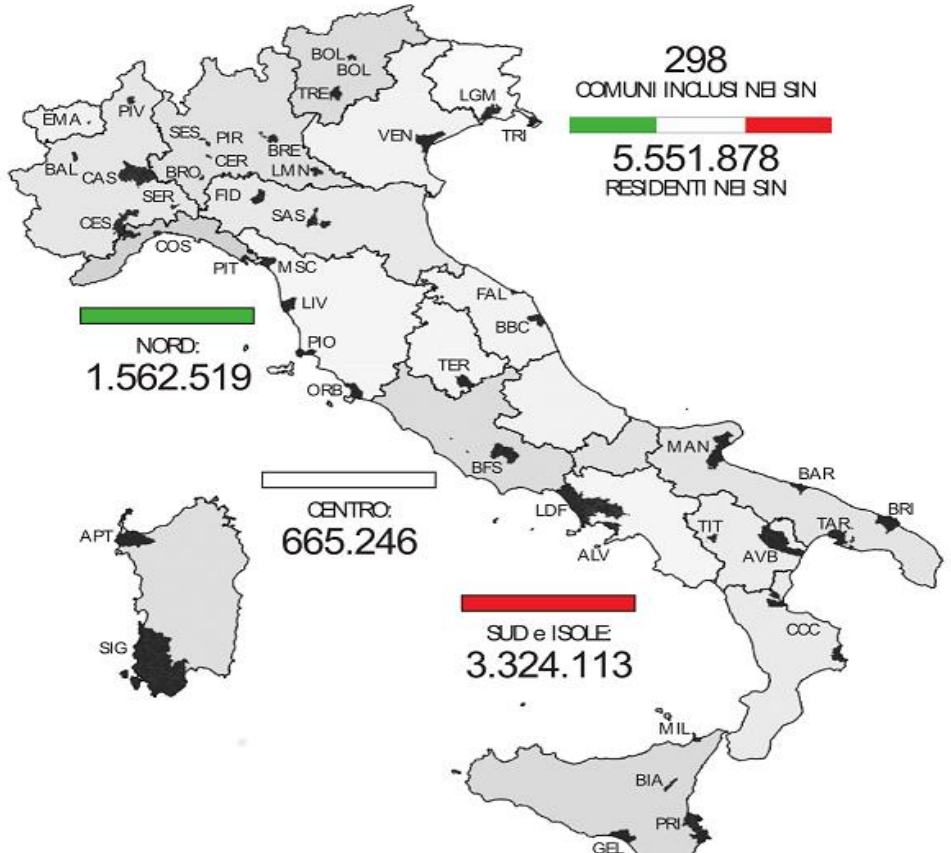
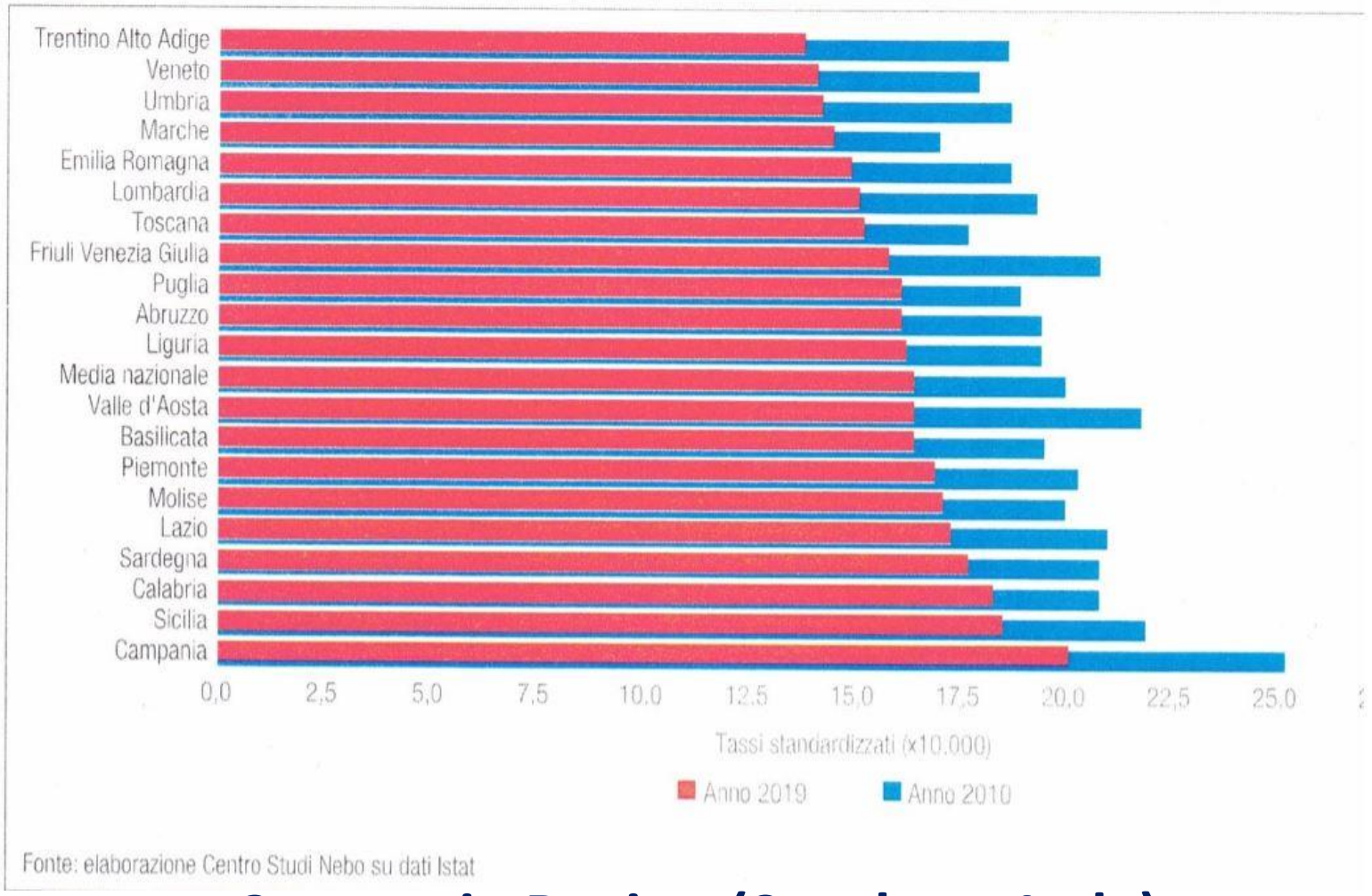


Figura 4c.5. Mortalità evitabile 0-74 anni per Regione. Tassi standardizzati per 10.000 residenti

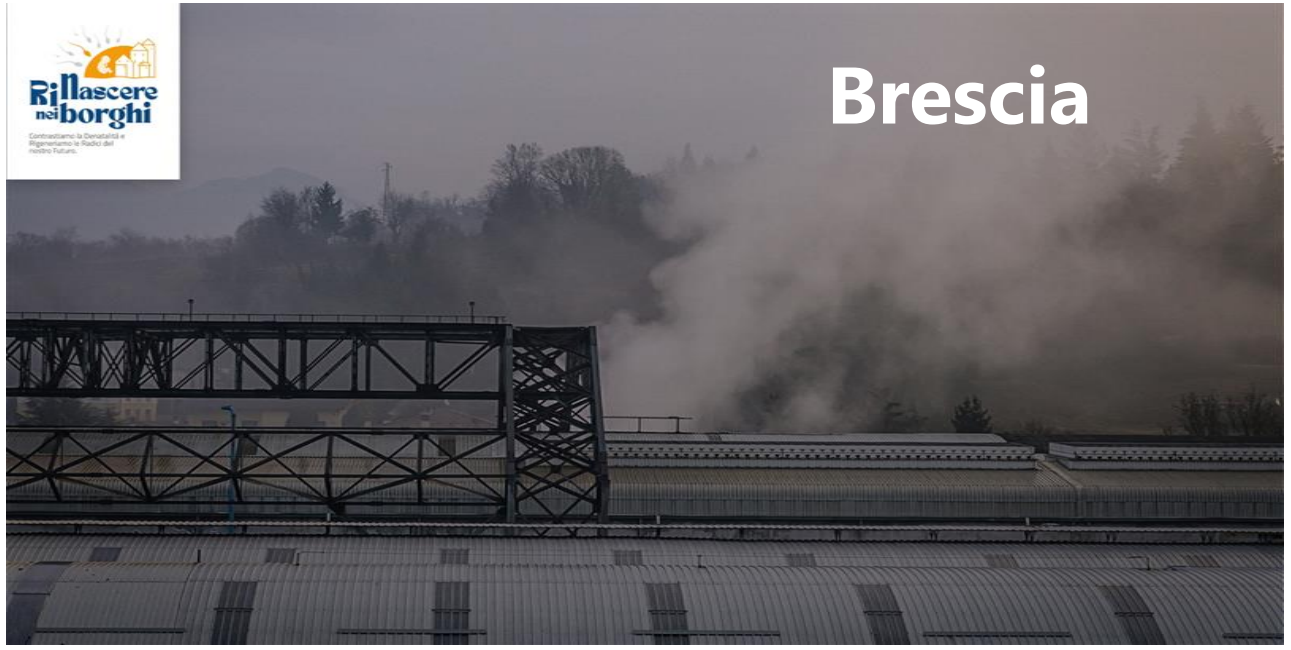


Fonte: elaborazione Centro Studi Nebo su dati Istat

Campania Region (Southern Italy)


Terra dei fuochi


Taranto


Brescia


Valle del Sacco (FR)

La Campania è la regione che presenta il più alto livello di biodiversità vegetale al mondo

ma ha anche «TERRA DEI FUOCHI»

This research, supported by several environmental groups of the territory and involving different public research institutions, represents an example of active citizenship and scientific innovation. It was born as a response to an environmental and health crisis in the "Land of Fires", an area of Southern Italy ill-famed for the multiple sources of pollution. "EcoFoodFertility" responds to the need of clarity in the face of contradicting findings and media reports which generated a great deal of distrust in the healthcare system as well as anxiety within the population. It's a biomonitoring study, expanding to other risk areas of Italy and Europe; it studies the alterations of human semen, "environmental and health marker", as a key to understand both the level of environmental quality and its long term modifications, to set out early health risks for populations in relation with their living environment, diet and lifestyle. Currently the the project is in progress but this "research model" has already contributed to the development of other studies and initiatives by regional institutions and also to build a nationwide network of action in other environmentally-challenged areas.

EcoFoodFertility
ambiente, alimentazione, fertilità

Luigi Montano, MD, UroAndrologist, President of Italian Society of Human Reproduction has his expertise in Environmental Pathology and LifeStyle Medicine and his interest is focused on the reproductive and environmental health. In fact he is the creator and Coordinator of EcoFoodFertility project is starting up in several environmental risk areas.

978-3-330-08295-3

Luigi Montano

ECOFOODFERTILITY Project: From the Crisis to the Model

A new model for environmental impact assessment and for primary prevention in risk areas

LAMBERT Academic Publishing

PERCHÈ IL PROGETTO

ESIGENZA DI VERITÀ

STATO DI SALUTE DELLA POPOLAZIONE

- Verificare con strumenti omici, su organi sentinella, gli indici più precoci di Rischio Biologico
- Valutazione di biomarcatori di esposizione (stato di bioaccumulo di contaminanti nel sangue e sperma)
- Valutazione di biomarcatori di effetto e suscettibilità in campioni omogenei di popolazione residenti in aree a differente impatto ambientale

PROTEGGERE LA POPOLAZIONE e avviare una VERA PREVENZIONE PRIMARIA

In attesa dei tempi lunghi di risanamento territoriale proporre delle strategie innovative di prevenzione primaria e approcci nutrizionali di compensazione del danno (Bonifica dell'Uomo)

EcoFoodFertility

NUOVI STRUMENTI ANALITICI
BIOMONITORAGGIO UMANO SU SISTEMI ORGANO-FUNZIONALI SENTINELLA

- Per capire le nuove vulnerabilità ambientali ed alimentari NON ci si può solo affidare agli strumenti classici di ieri come

l'analisi epidemiologica di eventi patologici maggiori, come cancro e malformazioni, congenite

i cui tempi non sono compatibili con una così urgente necessità di protezione

- Bisogna ricorrere ai nuovi strumenti analitici di oggi, che identifichino:

- **SISTEMI ORGANO-FUNZIONALI SENTINELLA**
  - **che indichino stadi precoci e anche reversibili di rischio clinico.**
- **BIOMARCATORI**
  - per identificare segni precoci di modificazione funzionale o strutturale **prima che si manifesti il danno clinico**
  - valutare la suscettibilità individuale (polimorfismi genetici funzionali) in una coorte di individui residenti in aree ad alto rischio

BIOMONITORAGGIO UMANO

- Strumento per la valutazione dell'esposizione individuale e dell'associazione tra inquinanti e danno precoce
- Indaga la suscettibilità specie in aree contaminate o intorno a sorgenti puntuali di inquinamento.
- Rappresenta un prezioso completamento, se non un superamento, del processo di stima dell'esposizione basata su misure ambientali
- Costituisce un approccio fondamentale nella caratterizzazione e nella gestione del rischio per la salute.
- Misura direttamente la quantità di una sostanza chimica nel corpo di un individuo
  - tenendo conto di processi spesso scarsamente compresi, quali il bioaccumulo, escrezione, metabolismo e assorbimento, attraverso differenti vie metaboliche di esposizione, piuttosto che ogni sorgente di esposizione individuale.

TALI DATI RISULTANO MOLTO PIÙ PERTINENTI PER LA VALUTAZIONE DEL RISCHIO RISPETTO ALL'ESTRAPOLAZIONE DA CONCENTRAZIONE DI INQUINANTI NEL SUOLO, ARIA, E ACQUA.

"L'INQUINAMENTO DIVENTA PERSONALE", CIOÈ RISPECCHIA MAGGIORMENTE LA REALE ESPOSIZIONE COMPLESSIVA DELL'INDIVIDUO A QUEL DETERMINATO INQUINANTE.

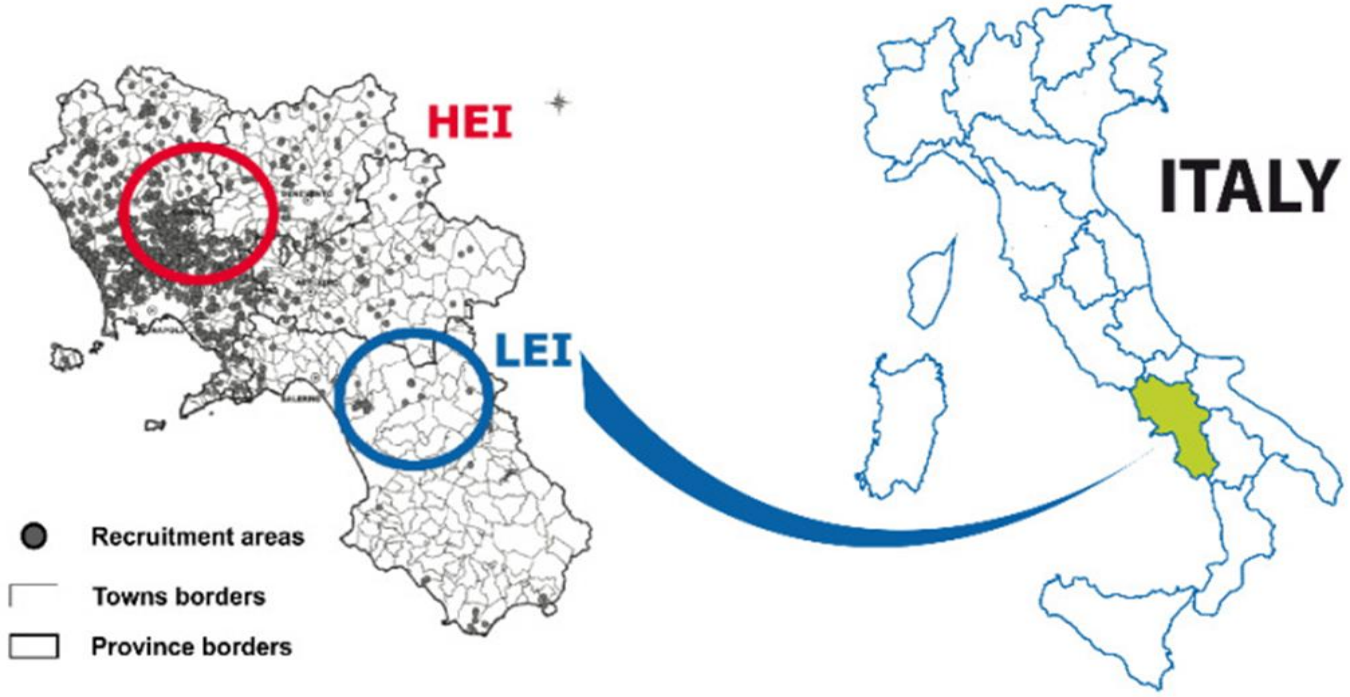
GLI INDICATORI BIOLOGICI O BIOMARKERS SONO GENERALMENTE DELLE CARATTERISTICHE BIOCHIMICHE, GENETICHE, IMMUNOLOGICHE O FISIOLOGICHE, OSSERVATE IN SISTEMI BIOLOGICI .

Health Status of Population in «*Land of Fires*»

a) Classical epidemiology assesses health risk by "counting" the final outcomes of health damage (mortality, incidence, hospitalization for diseases, tumors, etc. through registers) with a long latency

b) Evaluating the earliest signs of functional or structural modification, before clinical damage occurs.

c) Biomonitoring study (biomarkers of exposure, damage/effect in blood and semen and susceptibility in blood)



Epidemiological and toxicological data show how the male reproductive system is particularly sensitive to the pollution

MALE REPRODUCTIVE SYSTEM: SENTINEL ORGAN

THE DUAL FUNCTION OF HUMAN SEMEN
"Environmental and Health Marker"

Environmental Marker

Bergamo P,..Montano L*.. 2016. Human semen as an early, sensitive biomarker of highly polluted living environment in healthy men: a pilot biomonitoring study on trace elements in blood and semen and their relationship with sperm quality and RedOx status. Reprod Toxicol., 66:1-

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Montano L*. Reproductive biomarkers as early indicators for assessing environmental health risk. BenthamScience Publishers eBook eISBN 978-981-14-5474-5 (2020) Doi: 10.2174/97898114547451200101

Health Marker

Jensen TK et al. 2009. Good semen quality and life expectancy: a cohort study of 43,277 men. Am J Epidemiol

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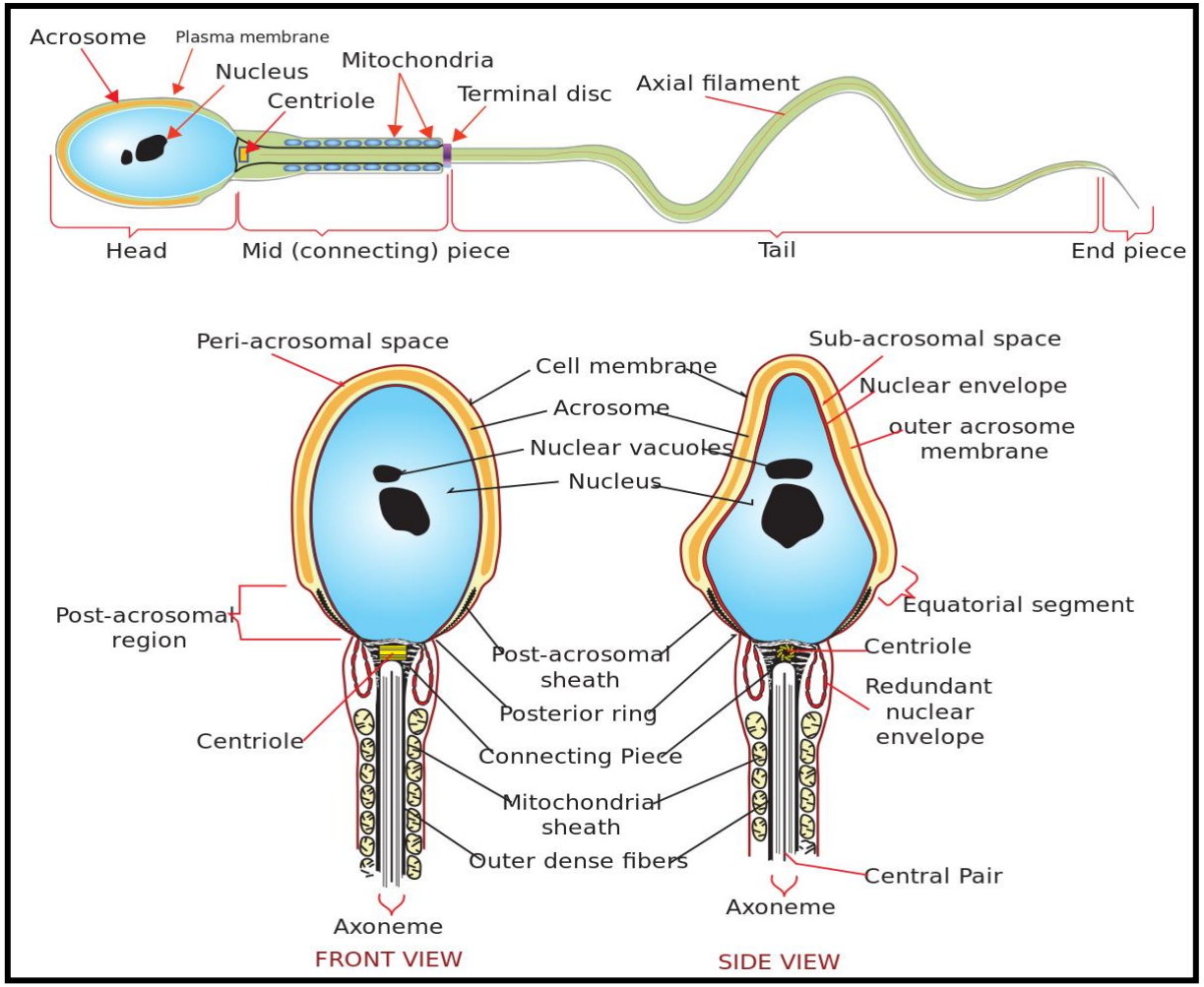
Eisenberg ML et. al. 2015 elationship between semen production and medical comorbidity. Fertil Steril.

Latif T et al.2017. Semen quality is a predictor of subsequent morbidity. A Danish cohort study of 4,712 men with ong-term follow-up. AmJEpidemiol.

Barnhart KT et al. 2018 Introduction: Fertility as a window to health. Fertil Steril. 2018 Oct;110(5):781-782.

HUMAN SEMEN IS AN EARLY AND SENSITIVE ENVIRONMENTAL AND HEALTH MARKER

- **Easy availability**
- **Bioaccumulator**
- **Biondicator**
- **High susceptibility to endogenous and exogenous factors**



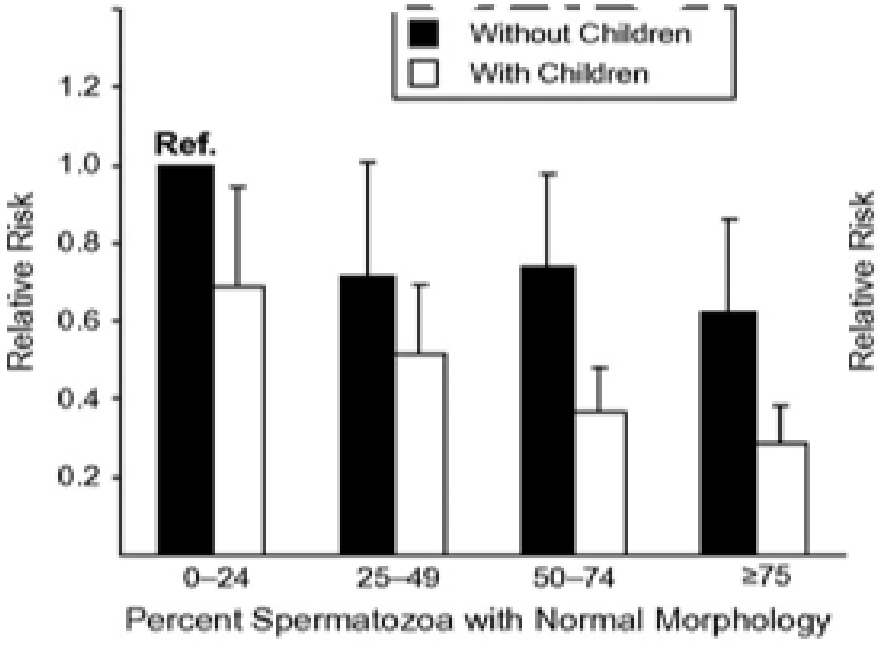
Sperm cells are more susceptible to oxidative stress compared to oocytes due to the presence of polyunsaturated fats, which are notoriously more sensitive to oxygen free radicals (ROS), as well as their reduced cytoplasm and lower quantities of internal antioxidants. [Aitken RJ et al. 2016]

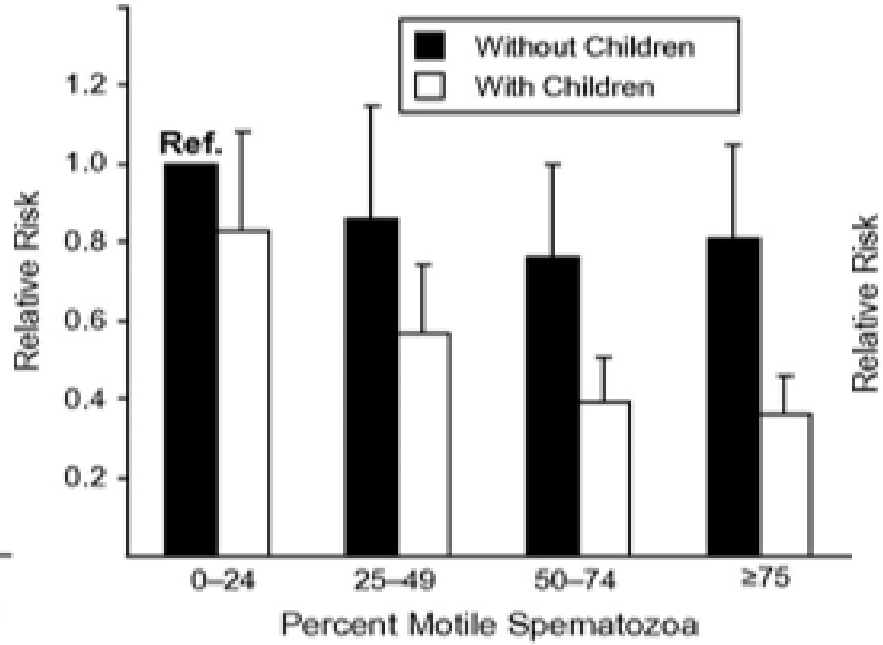
Unlike oogenesis (the ovarian reserve in women is present at birth and depletes over time until menopause), spermatogenesis is a continuous process from puberty onwards. Consequently, both endogenous and exogenous insults are more likely to act during these phases, making the accumulation of mutations more readily induced [Justin P et al. 2007, Ségurel L et al. 2014

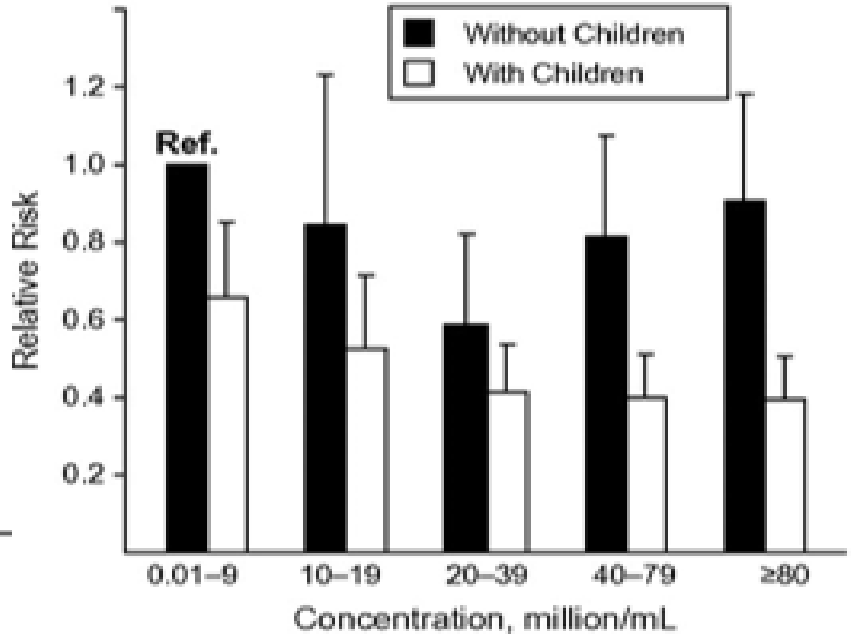
An excellent key to better assess the relationship between environment and human health

EcoFoodFertility

HEALTH BIOMARKER

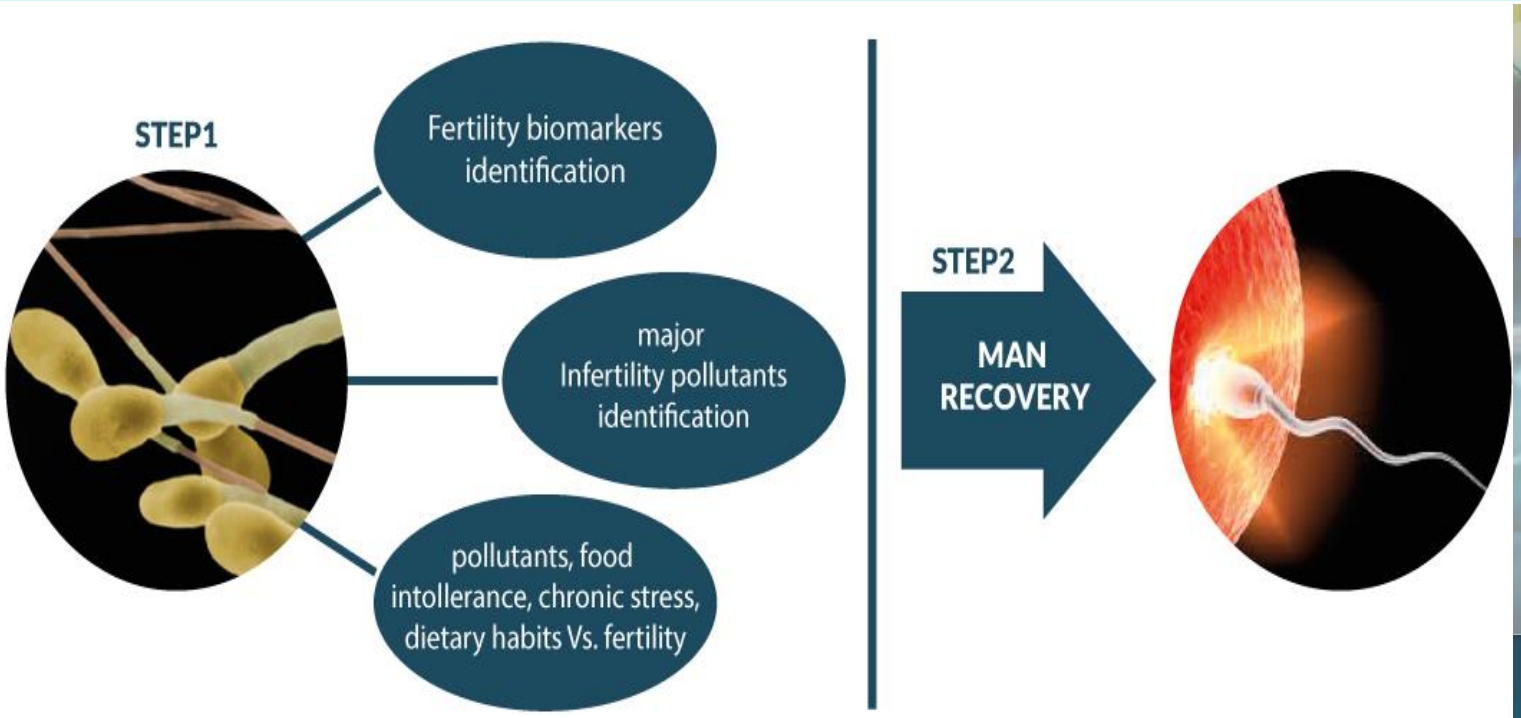


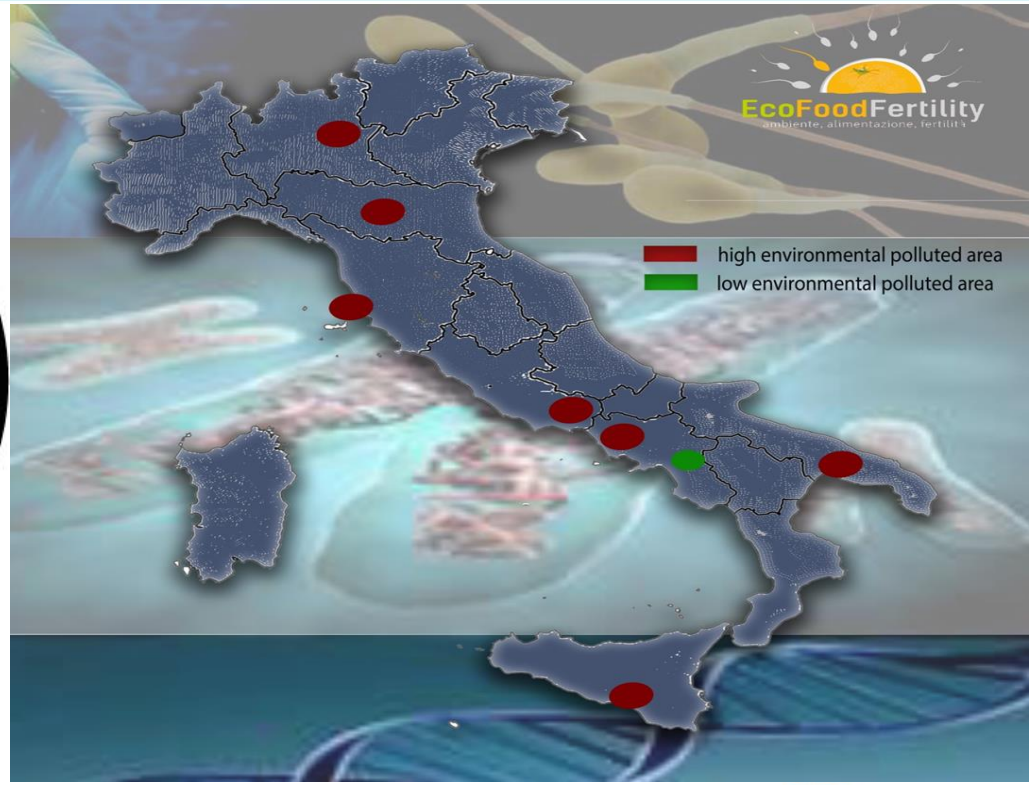




- Jensen TK et al. Good semen quality and life expectancy: a cohort study of 43,277 men. Am J Epidemiol ;170: 559–565
- Eisenberg ML et al. Semen quality, infertility and mortality in the USA. Hum Reprod., 29:1567-74
- Eisenberg ML relationship between semen production and medical comorbidity. Fertil Steril. 103:66-71.
- Latif T et al. Semen quality is a predictor of subsequent morbidity. A Danish cohort study of 4,712 men with long-term follow-up. Am J Epidemiol. 2017 May 11.
- Barnhart KT. Introduction: Fertility as a window to health. Fertil Steril. 2018 Oct;110(5):781-782. elative risk of death according to fertility statut

A NEW MODEL FOR ASSESSING ENVIRONMENTAL IMPACT ON HUMAN HEALTH, PRIMARY PREVENTION AND RESILIENCE IN RISK AREAS

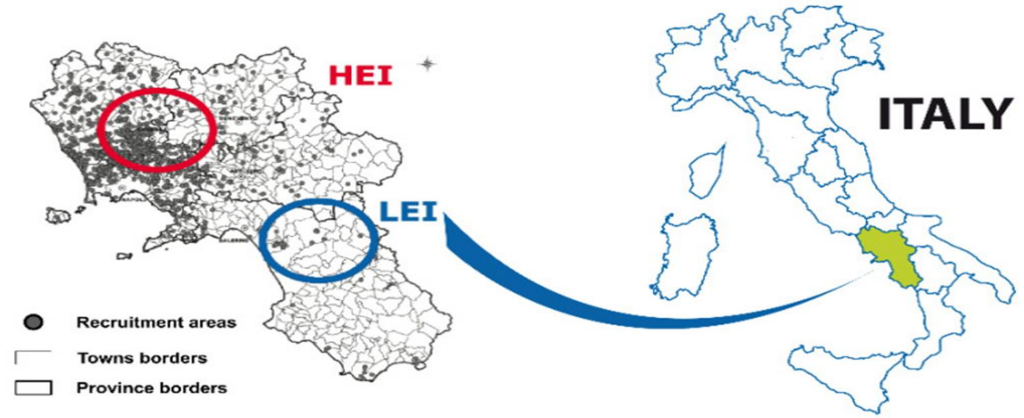




Human biomonitoring study with omics multidisciplinary approaches involving, environment, life-style and diet, with the aim of:

i) **developing a better understanding of the effects of environmental pollutants on human health considering reproductive biomarkers, especially human semen, as early flags of environmental pressure and enhanced risk of chronic adverse effects on health**

ii) **identifying dietary, nutraceutical and/or functional food approaches to reduce or modulate the effects of pollutants on human health**



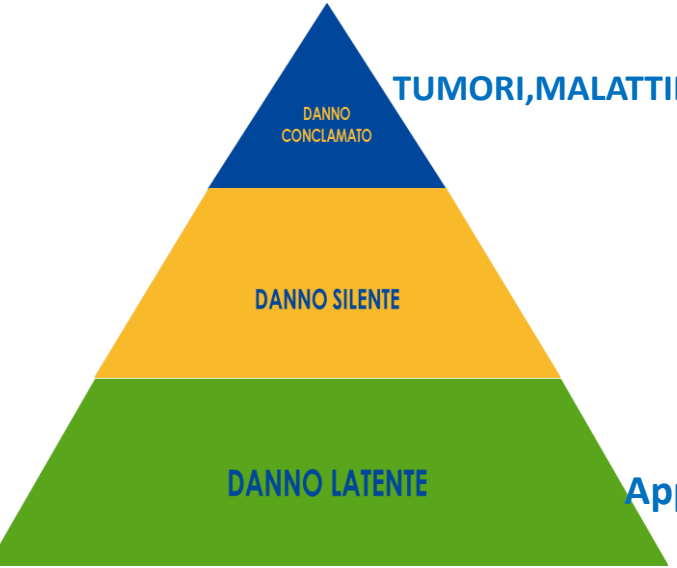
EcoFoodFertility

STUDIO DI BIOMONITORAGGIO UMANO MULTICENTRICO ED INTERDISCIPLINARE CHE UTILIZZA IL SEME UMANO PER MEGLIO COMPRENDERE GLI EFFETTI COMBINATI SULLA SALUTE UMANA DI: INQUINAMENTO AMBIENTALE,DELLE ABITUDINI ALIMENTARI, DEGLI STILI DI VITA

PRIMA FASE

Valutazione del danno ambientale precoce alla salute attraverso lo **studio del liquido seminale «SENTINELLA» della Salute Ambientale e Generale** come biomarcatore sensibile e predittivo di patologie nell'adulto e alla progenie attraverso un ampia serie di analisi omiche (contaminanti ambientali, marker ossidativi, protemomici, inmmunologici,proteomici,epigenetiici, lipidomici, metabolomici) su differenti matrici biologiche, in particolare, sul SEME UMANO

Cambio di Paradigma per la Prevenzione



TUMORI,MALATTIE CARDIOVASCOLARI

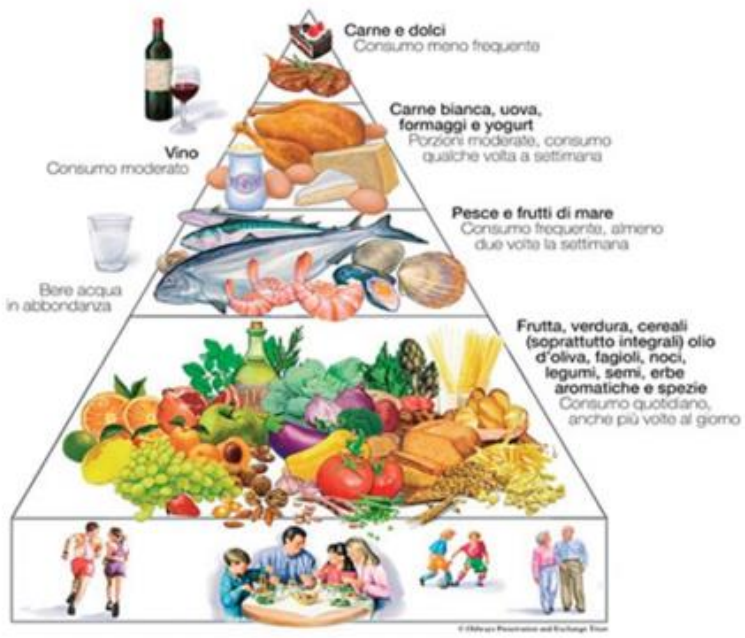
Organo Spia:
Apparato riproduttivo

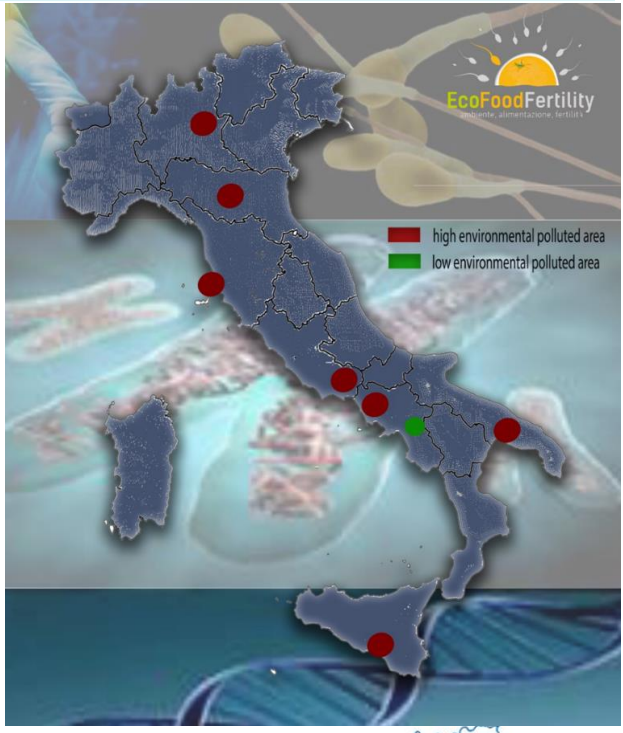
SECONDA FASE

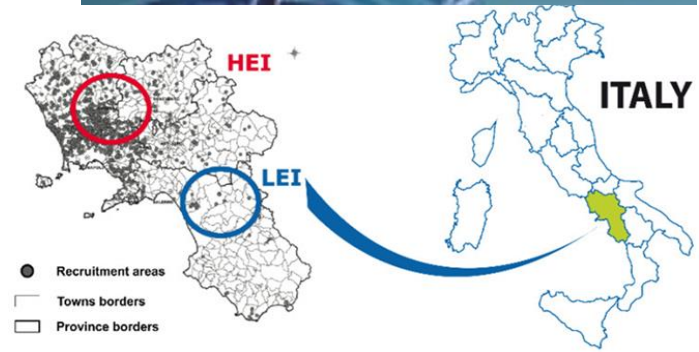
Detossificazione da inquinanti ambientali

«BONIFICA UOMO INQUINATO»

misure individuali di compensazione, contrasto e/o di modulazione del danno da inquinamento chimico e fisico (Dieta Mediterranea con Alimenti BIO (MEDEUBIOTICA) e/o alimenti funzionali e/o nutraceutici)







https://www.ecofoodfertility.it/chi-siamo/pubblicazioni-scientifiche

EcoFoodFertility

Brescia, Modena, Valle del sacco, Terra dei Fuochi, Taranto, Vicenza (HIGH Impact)
Valle del Sele (SA), Provincia Campobasso, Area Madonie (LOW Impact),

RECRUITING SUBJECTS

18-35 healthy men and women, no smokers, no drinkers , no professional exposed, no chronic deseases

Clinical examination

Withdraw

Food and LifeStyle Questionnaire

SEMEN | Urine | BLOOD | Hair | Microbiome | Female Protocol Follicular fluid

Semen analysis (number, motilty, morphology); sperm nDNA and mtDNA integrity.
Heavy metals, PAHs, Dioxins, PCBs, PCB-Dioxin-like, nanoparticles, Bisphenols, Phthalates, Parabens,Pfoas,Pesticides,Mycotoxins, Microplastics
RedOx status, antioxidant enzymes, sperm lipidomic status, epigenetics, metabolomics, proteomics.

Blood analysis and hormone dosage Heavy metals, PAHs, PCBs, Pcb-Dioxin-like,Dioxins, nanoparticles, bisphenols, Phthalates, Parabens, Pesticides; Micotoxins, Microplastics.
Polymorphisms of genes involved in the metabolic detoxification mechanisms and DNA repair (individual susceptibility);
RedOx state, epigenetics, eritrocyte lipidomic status, epigenetics, metabolomics, proteomics

FASE DUE DEL PROGETTO

APPROCCIO NUTRIZIONALE E ALTRE STRATEGIE DI DIFESA DALL'INQUINAMENTO

STUDI CLINICI RANDOMIZZATI (RTC) PER VALUTARE L'EFFETTO DELLE MODIFICHE DI DIETA, STILI DI VITA E/O SOSTANZE NUTRACEUTICHE-FUNZIONALI E/O ALIMENTI FUNZIOANLI SUI BIOMARCATORI DI ESPOSIZIONE ED EFFETTO

- Gruppo di INTERVENTO
- Gruppo di CONTROLLO A
- Gruppo di CONTROLLO B

OBIETTIVO

- Favorire l'eliminazione di sostanze tossiche,
- aumentare i meccanismi di cito-protezione e detossificazione,
- migliorare gli indici dei biomarcatori ossidativi, immunologici, epigenetici, proteomici lipidomici, metabolomici

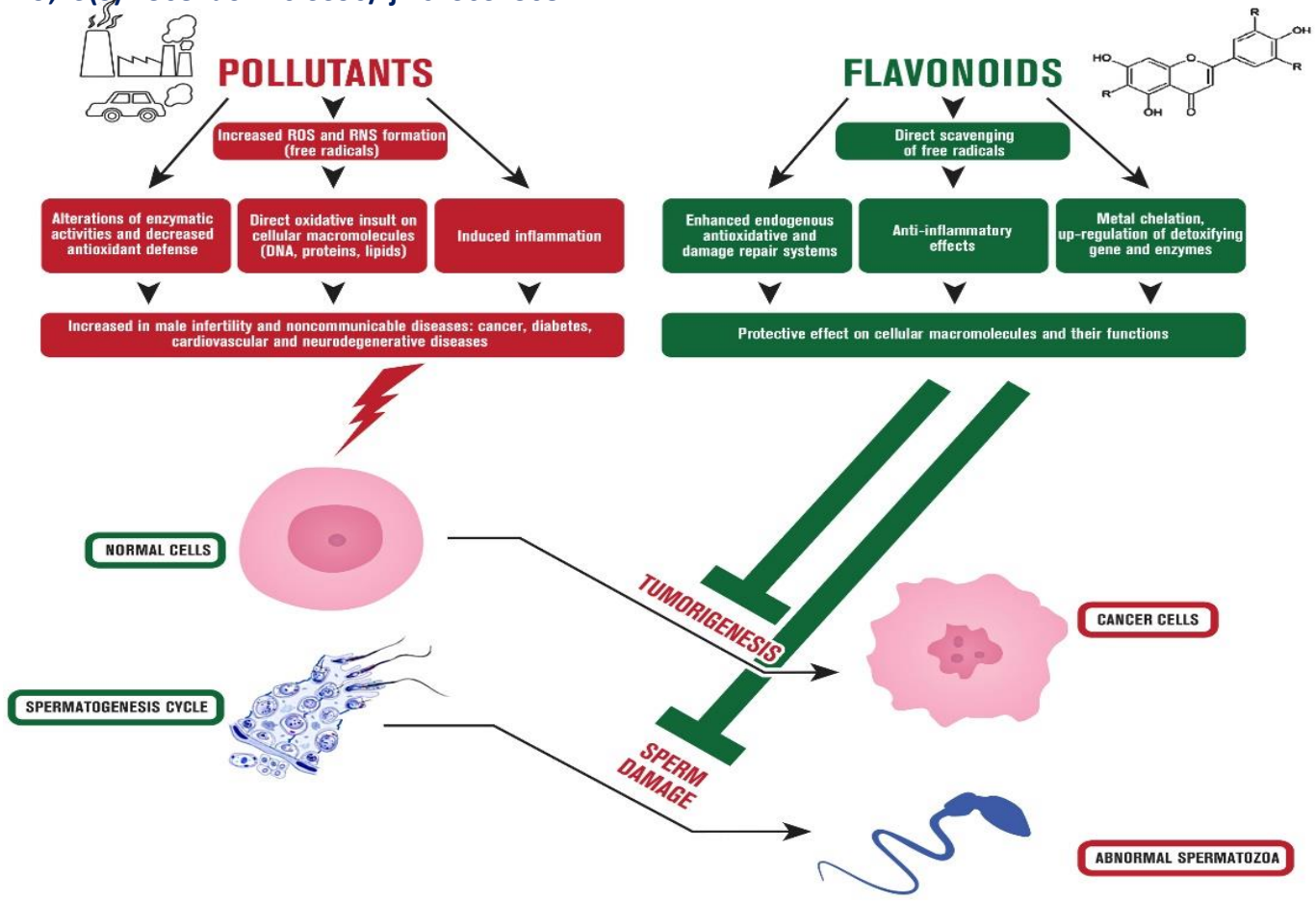
FARE PREVENZIONE PER PATOLOGIE CRONICO-DEGENERATIVE

Mediterranean Diet as a Shield against Male Infertility and Cancer Risk Induced by Environmental Pollutants: A Focus on Flavonoids.

Montano L, Maugeri A, Volpe MG, Micali S, Mirone V, Mantovani A, Navarra M, Piscopo M.

Int J Mol Sci. 2022 Jan 29;23(3):1568. doi: 10.3390/ijms23031568.

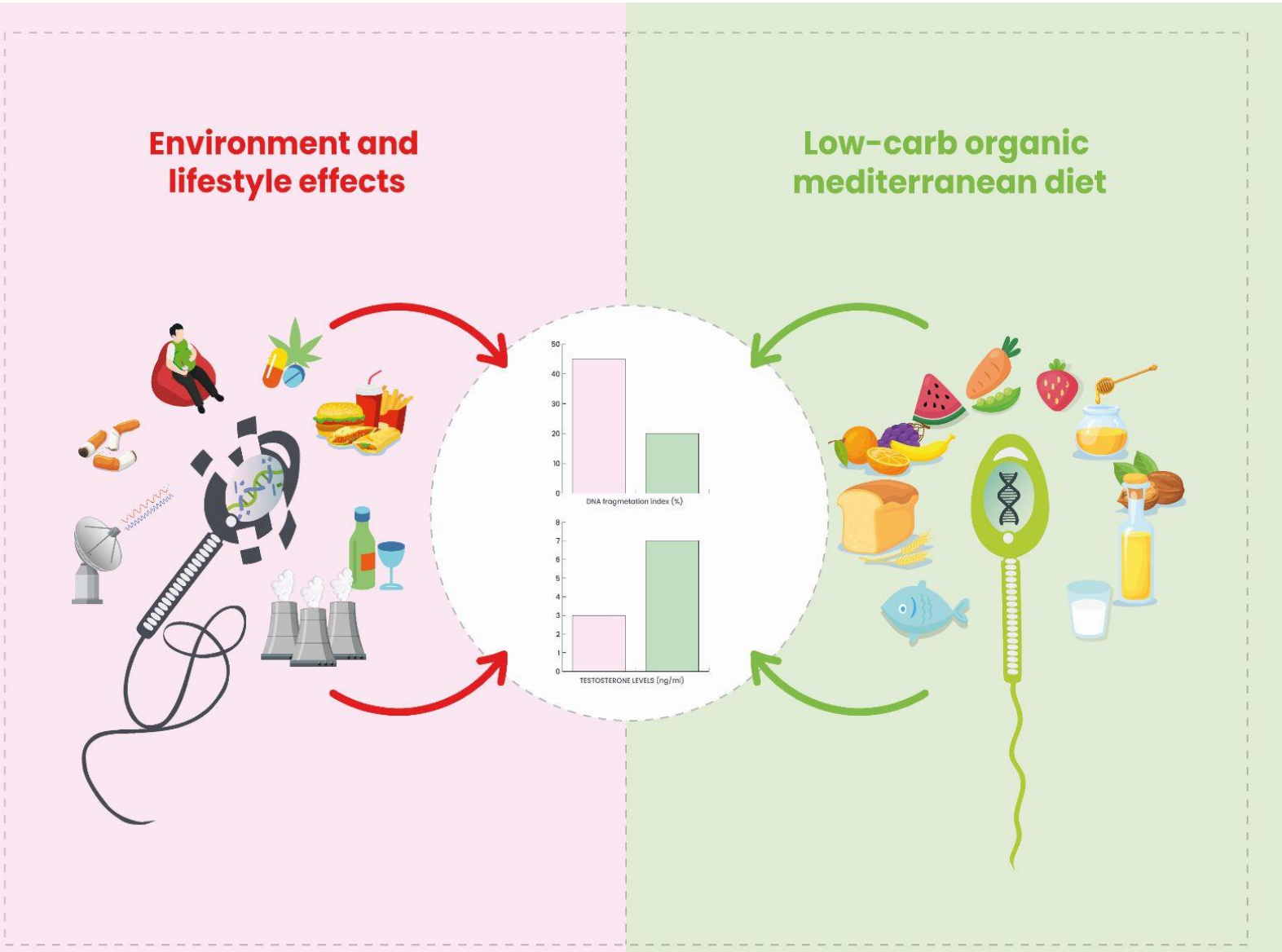
- Regarding to resilience and countermeasures against environmental pollutants that can cause infertility and cancer, the Mediterranean diet, especially with organic products, because it is richer in vegetables and therefore phytonutrients such as flavonoids with antioxidant, detoxifying, and anti-inflammatory properties, can represent a useful measure to promote the elimination of pollutants or mitigate their effects on human health through mechanisms such as the chelation of toxic metals and the activation of detoxifying and antioxidant pathways.



EcoFoodFertility

Effects of the low-carb organic Mediterranean diet on testosterone levels and Sperm DNA fragmentation

*Veronica Corsetti[1], Tiziana Notari[2] and Luigi Montano[3,4]**

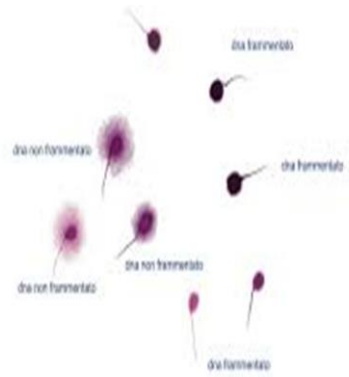


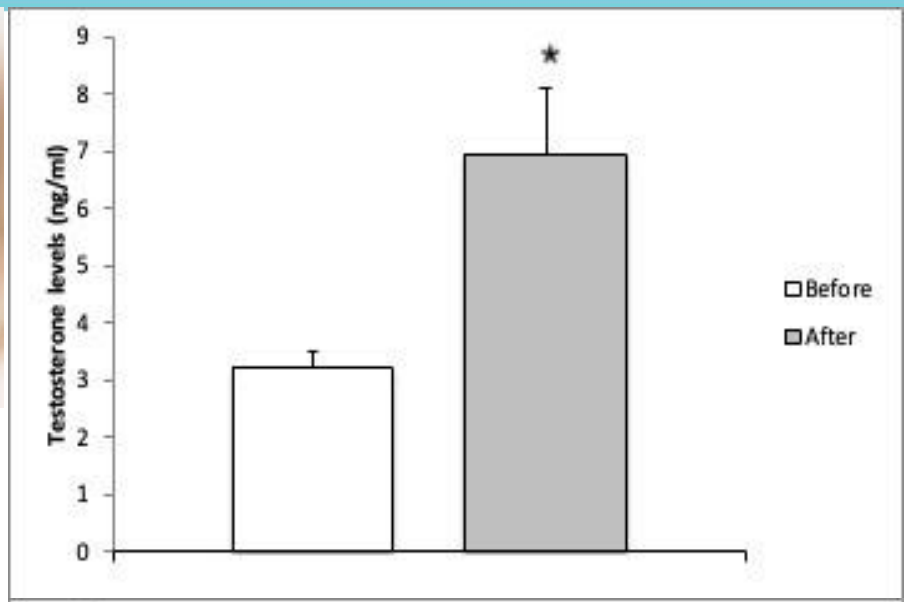
IN PRESS ON

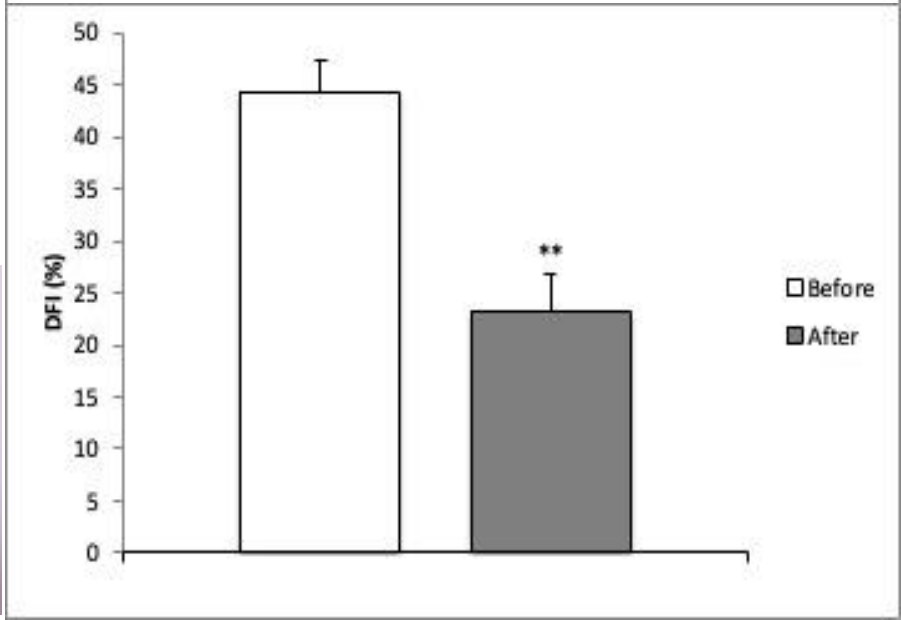
Effects of the low-carb organic Mediterranean diet on testosterone levels and Sperm DNA fragmentation

*Veronica Corsetti[1], Tiziana Notari[2] and Luigi Montano[3,4]**

Mediterranean diet, characterized by high intakes of vegetables, fruits rich in detoxifying and antioxidant substances, as well as polyphenols, flavonoids, carotenoids, microelements, especially with organic food and a lower carbohydrate regimen are the fundamental points of this work. The aim of this study was to vary the diet of 50 subfertile men, providing them a specific nutritional plan, which included 80% the consumption of organic foods, the introduction of whole grains and low glycemic load, the elimination of refined carbohydrates, the daily consumption of green leafy vegetables and red fruits, the reduction and/or elimination of dairy products, the consumption mainly of grass-fed meat and Wild caught seafood, the elimination of saturated fats preferring fats such as olive oil and avocado and nuts. After three months of adherence to the low-carb food plan, testosterone levels were significantly increased with a simultaneous reduction of sperm DNA fragmentation







EcoFoodFertility

Progetto FAST

Fertilità, Ambiente, Alimentazione, Stili Vita

Progetto realizzato con il supporto finanziario del Ministero della Salute – capitolo 3174

Un modello di intervento per la prevenzione dell'infertilità maschile in aree a forte impatto ambientale

Presentazione dei risultati su indici di Fertilità, contaminazione umana da inquinanti ambientali, stili di vita, strategie di contenimento del danno ambientale, prevenzione dell'infertilità e delle patologie cronico-degenerative nell' **Area Nord di Napoli** (Campania), **Brescia-Caffaro** (Lombardia), **Valle del Sacco** (Lazio)

Venerdì 21 febbraio ore 17.30

Teatro Italia Via Castaldi, ACERRA

EcoFoodFertility®
ambiente, alimentazione, fertilità

Patrocini Scientifici

SIRU Società Italiana di Riproduzione Umana

SOCIETA' ITALIANA di UROLOGIA fondata nel 1908

Ordine Nazionale Biologi

SIA Società Italiana di Andrologia

EUROPEAN LIFESTYLE MEDICINE ORGANIZATION

EcoFoodFertility

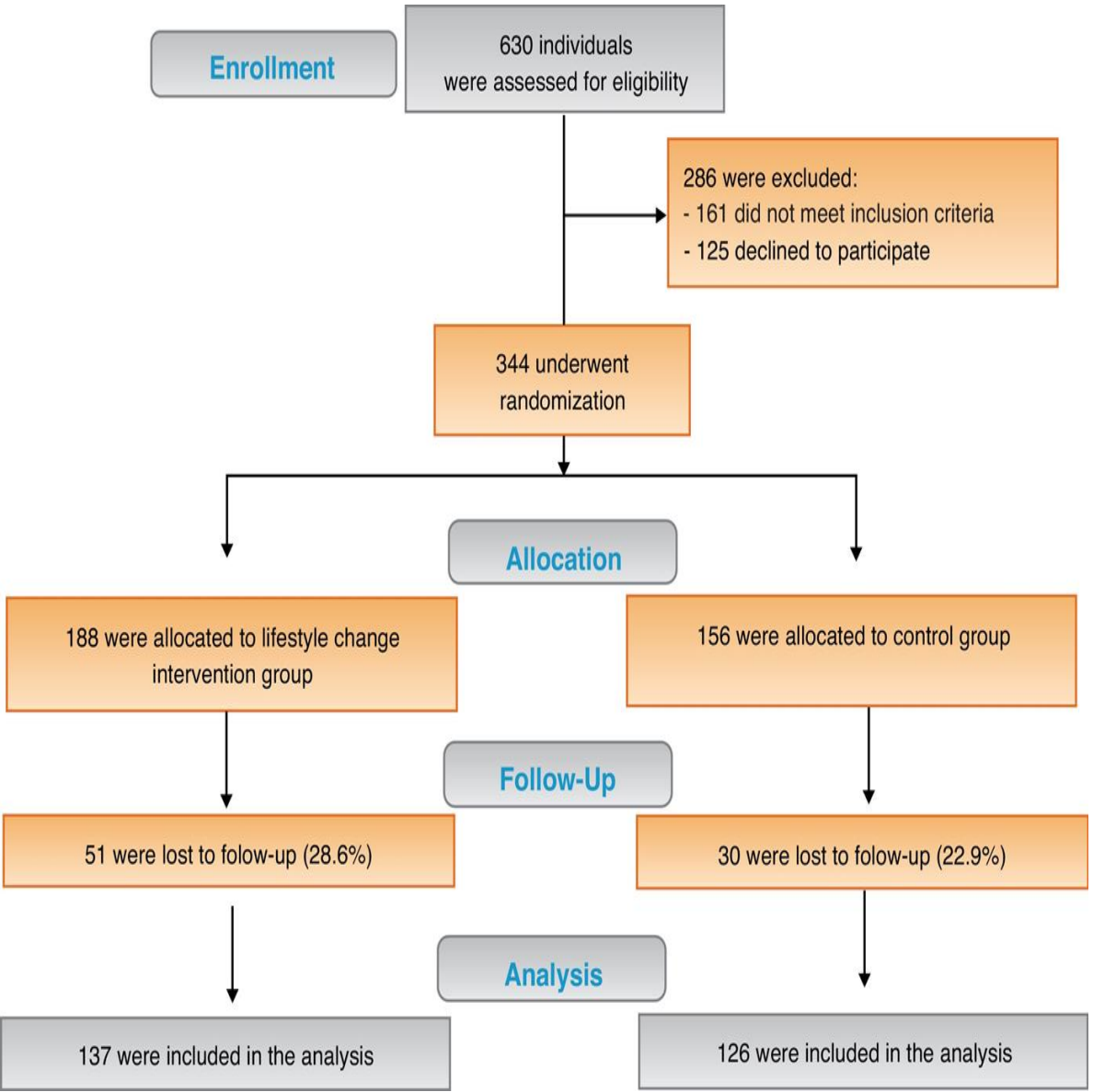
RECLUTAMENTO E CRITERI DI INCLUSIONE

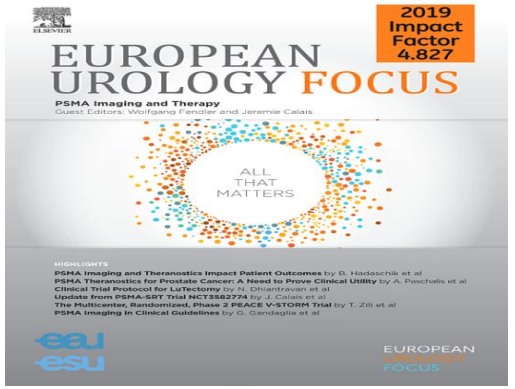
CRITERI DI INCLUSIONE

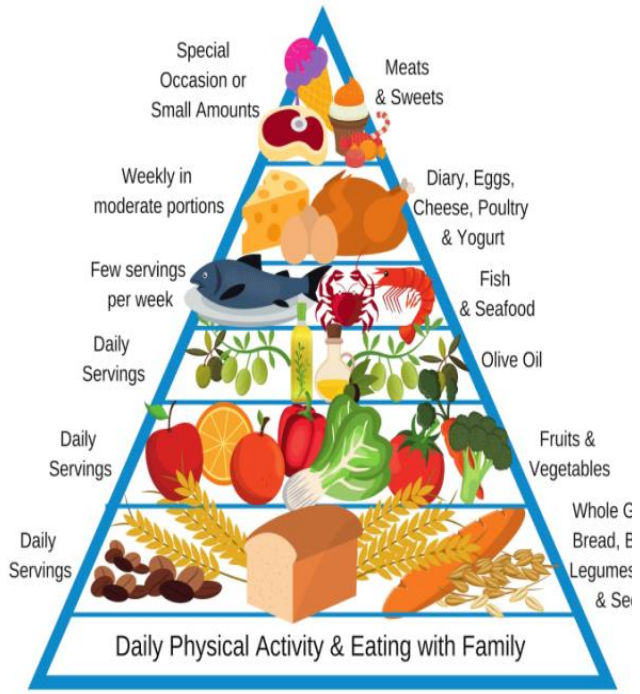
- Giovani maschi di 18-22 anni in buona salute
- Non azoospermici, non criptospermici
- Non bevitori abituali di alcolici (≤ 5 unità alcoliche /sett)
- Non fumatori abituali di tabacco o ecig (≤ 5 sig./sett.)
- Non consumatori di droghe (≤ 3 volte/mese di marijuana)
- Non pregressi interventi alla sfera genitale (criptorchidismo, varicocele), per varicocele > 1 anno
- Non pregresse patologie oncologiche
- BMI 18,5-25 (normopeso)
- Circonferenza addominale < 102 cm e vita < 84 cm.

Effects of a Lifestyle Change Intervention on Semen Quality in Healthy Young Men Living in Highly Polluted Areas in Italy: The FASt Randomized Controlled Trial. Montano L*. et al. Eur. Ur. Focus Feb. 2021.

EcoFoodFertility







MEDITERRANEAN DIET

EcoFoodFertility

Effects of a Lifestyle Change Intervention on Semen Quality in Healthy Young Men Living in Highly Polluted Areas in Italy: The FASt Randomized Controlled Trial.

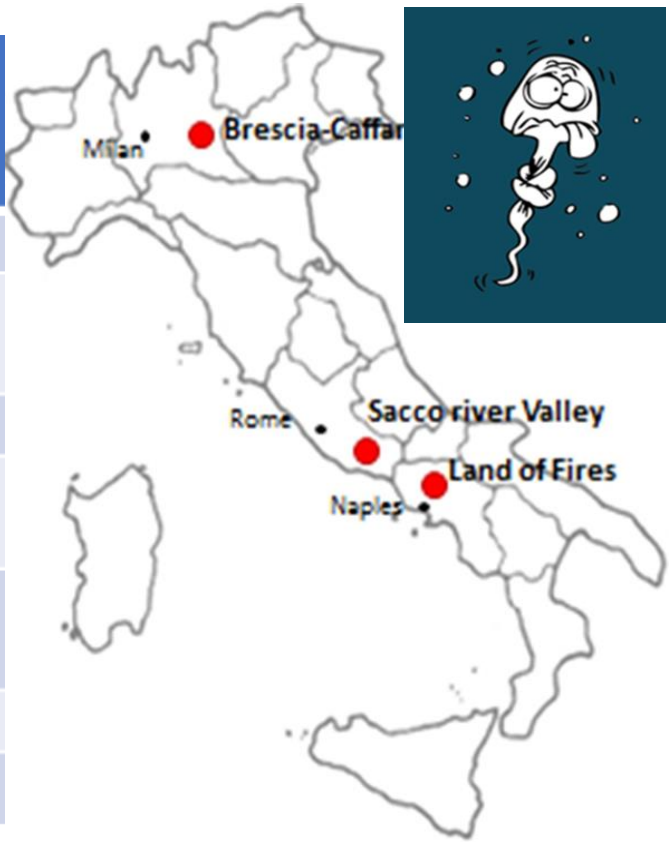
Montano L*. et al. Eur. Ur. Focus Feb. 2021

Parametri spermatici nelle aree a rischio in ITALIA

Semen parameters	Brescia mean ± SD	Land of Fires mean ± SD	Sacco River mean ± SD	Whole cohort mean ± SD	p*
Volume (ml)	2.90 ± 1.39	2.53 ± 1.13	2.81 ± 1.50	2.73 ± 1.32	0.0976
Sperm concentration (10^6/ml)	67.30 ± 45.86	45.23 ± 32.89	50.32 ± 36.07	55.29 ± 40.52	0.0001
Total motility (%)	40.86 ± 19.37	45.43 ± 24.08	31.43 ± 23.17	4[illegible]09 ± 2[illegible].55	0.0003
Progressive motility (%)	27.88 ± 17.78	30.74 ± 19.32	20.40 ± 17.56	27.75 ± 18.69	0.0015
Cell with normal morphology (%)	6.58 ± 4.37	7.42 ± 7.05	5.63 ± 3.16	6.76 ± 5.51	0.1249
Round cells (10^6/ml)§	5.03 ± 3.28	6.81 ± 5.60	5.95 ± 4.68	6.12 ± 4.89	0.3166
TAC (mM) #	1.14 ± 0.22	0.97 ± 0.27	1.02 ± 0.30	1.06 ± 0.26	0.0001

STUDIO FASt

Fertilità, Ambiente, Stili di Vita



The majority of healthy, non-smoking, non-alcohol-consuming adolescents with an average age of 19, homogeneous in terms of body mass index, exhibit mean values below the normal limits, particularly with respect to the progressive motility parameter (30% according to the WHO 2021 manual).

Effects of a Lifestyle Change Intervention on Semen Quality in Healthy Young Men Living in Highly Polluted Areas in Italy: The FASt Randomized Controlled Trial.
Montano L*. et al. Eur. Ur. Focus Feb. 2021

Effects of the intervention on semen parameters

Semen parameters	Group	t0 mean ± SD	t4 mean ± SD	P INT vs CTRL (t4)
Volume (ml)	INT	2.84 ± 1.43	2.88 ± 1.50	0.3558
	CTRL	2.74 ± 1.27	2.71 ± 1.52	
Sperm concentration (10^6/ml)	INT	60.44 ± 38.61	62.72 ± 39.04	0.0278
	CTRL	54.85 ± 44.71	52.55 ± 35.16	
Total motility (%)	INT	43.25 ± 19.92	46.55 ± 19.82	<0.0001
	CTRL	38.43 ± 23.45	34.98 ± 24.04	
Progressive motility (%)	INT	29.55 ± 17.71	33.31 ± 18.19*	<0.0001
	CTRL	26.06 ± 18.61	22.34 ± 17.51*	
Cells with normal morphology (%)	INT	7.26 ± 4.33	7.34 ± 3.88	0.0002
	CTRL	5.89 ± 3.98	5.56 ± 3.86	
Concentration of round cells (106/ml)	INT	6.68 ± 4.68	4.47 ± 3.86***	0.0632
	CTRL	6.33 ± 5.37	5.52 ± 4.11	
TAC (total antioxidant capacity) (mM)	INT	1.05 ± 0.26	1.07 ± 0.29	0.10
	CTRL	1.11 ± 0.21	1.00 ± 0.30**	

CONCLUSIONS

- "A high percentage of healthy young adults, non-smokers, non-alcohol consumers, and non-obese individuals have semen quality parameters below WHO limits.
- Some differences are observed among young individuals residing in the three studied areas for semen quality parameters.
- No relationship is observed between dietary habits, physical activity, and semen quality.
- Lifestyle intervention has led to a positive and significant change compared to the control group:

A)in the quality and quantity of nutrients consumed and in physical activity

B)in semen quality (sperm concentration and motility, proportion of abnormal cells)

C) in total antioxidant capacity in semen.

"The lifestyle intervention has led to a positive and significant change compared to the control group

Comparison between Macro and Trace Element Concentrations in Human Semen and Blood Serum in Highly Polluted Areas in Italy.

Aldo Di Nunzio, Antonella Giarra, Maria Toscanesi, Angela Amoresano , Marina Piscopo, Elisabetta Ceretti, Claudia Zani, Stefano Lorenzetti, Marco Tirfuoggi* amd Luigi Montano*. Int J Environ Res Public Health, sept 2022

"The blood and semen of young, healthy male individuals from three high-impact environmental areas were assessed for 27 trace elements (Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Li, Mg, Mn, Na, Ni, Pb, Rb, Sb, Se, Sn, Sr, U, V, and Zn).

RESULTS

Significant, statistically significant differences were found in the concentrations of various metals in the semen and blood of the three groups of young individuals recruited from the three areas. These **differences were more pronounced in semen compared to blood, confirming EcoFoodFertility's studies on semen as a bioaccumulator of metals and an early indicator of environmental exposure**."

CONCLUSIONS

"Considering the homogeneity of the sample across the three areas, the differences observed in their samples in the three areas suggest that these differences are likely due to the environmental conditions of the areas and may have a significant impact on fertility.

STUDIO FASt
Fertilità, Ambiente, Stili di Vita

Environmental Research and Public Health

MDPI

Article

Comparison between Macro and Trace Element Concentrations in Human Semen and Blood Serum in Highly Polluted Areas in Italy

Aldo Di Nunzio [1,†], Antonella Giarra [1,†], Maria Toscanesi [1], Angela Amoresano [1,2], Marina Piscopo [3], Elisabetta Ceretti [4], Claudia Zani [4], Stefano Lorenzetti [5], Marco Trifuoggi [1,*,‡] and Luigi Montano [6,7,*,‡]

- **"Healthy males,**
- **Average age 19 years,**
- **Not professionally exposed to toxic metals;**
- **Non-smokers;**
- **Not engaged in drug and alcohol consumption, etc**

Research Project

EXPOMap

Exposomic Mapping of External/Internal Chemical Exposure in Two Areas with Different Environmental Pressure in Campania"

“Land of Fires”
(high pollution area)

“Sele Valley”
(low pollution area)

- *ECOFOODFERTILITY EXPOMAP (chiuso)*

- *ECOFOODFERTILITY FOR WOMEN (in corso)*

ECOFOODFERTILITY FOR JURISTS (in corso)

- *ECOFOODFERTILITY MeDETOX (presentato)*

- *ECOFOODFERTILITY MEDBIODETOX (in programma)*

- *ECOFOODFERTILITY FOR DIABETES TYPE 1 (in programma)*

- *ECOFOODFERTILITY FOR FUTURE GENERATIONS (in programma)*

- *EUBIOHEALTH FOR AGROECOLOGY (in programma)*

Levels of contaminants in healthy young males of three polluted areas of Italy. First preliminary results on the blood of a little cohort (FASt project)

Dott.F.Bertola-MODENA-21.9.2022 9

AREA DI VICENZA

INTERNATIONAL SOCIETY OF DOCTORS FOR ENVIRONMENT
ISDE
SEZIONE PROVINCIALE VICENZA

NOME DELLO STUDIO EPIDEMIOLOGICO:

STUDIO CASO CONTROLLO SULLA SALUTE RIPRODUTTIVA IN GIOVANI UOMINI PROVENIENTI DA ZONE AD ALTO INQUINAMENTO DA PFAS.

SIGNIFICATO SCIENTIFICO DELLO STUDIO:

Se riusciremo a raggiungere gli obbiettivi previsti:

900 partecipanti allo studio

- si tratta dello studio epidemiologico più esteso e completo finora pubblicato su questo argomento,
- condotto su una popolazione OMOGENEA con alti livelli sierici di PFAS,
- perché esposta per decenni a contaminazione principalmente tramite acqua potabile.

EcoFoodFertility

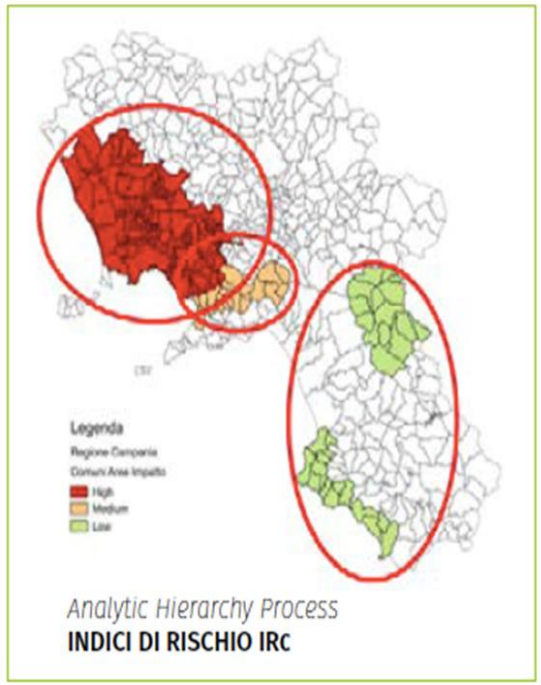
Preliminary results

Modena

PCB	sample blood					
µg/L	110	111	112	113	114	115
tri_pcb31	0,1	0,09	0,09	0,1	0,1	0,1
tri_pcb28	0,1	0,1	0,09	0,09	0,08	0,08
tri_pcb18	0,1	0,1	0,09	0,1	0,09	0,09
tetra_pcb81	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
tetra_pcb77	0,57	0,51	0,41	0,41	0,24	0,04
penta_pcb99	5,98	6,37	5,69	6,03	6,24	5,81
penta_pcb95	3,52	3,87	3,33	3,58	3,54	3,75
penta_pcb126	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
tetra_pcb52	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
penta_pcb123	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
tetra_pcb44	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
esa_pcb167	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
esa_pcb157	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
penta_pcb118	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
penta_pcb114	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
penta_pcb110	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
esa_pcb156	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
esa_pcb153	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
penta_pcb105	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
esa_pcb151	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
penta_pcb101	0,06	0,07	0,07	0,07	0,08	0,08
epta_pcb189	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
epta_pcb187	0,03	0,03	0,03	0,03	0,03	0,03
esa_pcb149	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
esa_pcb146	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
epta_pcb183	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
esa_pcb138	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
esa_pcb128	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
epta_pcb180	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
esa_pcb169	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
epta_pcb177	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
epta_pcb170	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
Sum	1,49	1,48	1,42	1,46	1,43	1,37

EcoFoodFertility

Sul modello di biomonitoraggio umano in aree a diversa pressione ambientale per la valutazione del rischio residenziale di EcoFoodFertility e sulla rete di enti di ricerca (CNR di Avellino, CNR di Pisa, Lab di Epigenetica Univ. di Milano, Fondazione Pascale) già operanti per EcoFoodFertility si è basato il Progetto SPES dell'Istituto Zooprofilattico di Portici che ha campionato 4200 soggeti dai 18 ai 50 anni in aree ad alto, medio e basso impatto ambientale della Campania.



ALTO IMPATTO

MEDIO IMPATTO

BASSO IMPATTO

Natural breaks

SPES
STUDIO DI ESPOSIZIONE NELLA POPOLAZIONE SUSCETTIBILE

EcoFoodFertility

Take home message

APPARATO RIPRODUTTIVO ORGANO SENTINELLA

- IL SEME UMANO COME SENSORE DELLA QUALITÀ AMBIENTALE E DELLA SALUTE GENERALE
  - LA FERTILITA' IN GENERALE QUALE INDICATORE FONDAMENTALE DI SALUTE
  - Salvaguardare l'integrità dei gameti significa fare Prevenzione Primaria e PREprimaria per tutte le malattie cronico-degenerative per le presenti e future generazioni
  - PRESIDIO DI PREVENZIONE PRIMARIA E PRE-PRIMARIA PER TUTTE LE MALATTIE CRONICO-DEGENERATIVE DELL'ATTUALE E FUTURA GENERAZIONE
  - NUOVO RUOLO DELLA FERTILITA' VISTA IN UNA PROSPETTIVA PIÙ AMPIA DI PROTEZIONE DELLA SALUTE PUBBLICA
- OPERATORI DEL MONDO DELLA RIPRODUZIONE SONO AL PRIMO LIVELLO DI PREVENZIONE COL PIÙ ALTO LIVELLO DI RESPONSABILITÀ

UN'ALLEANZA FRA ISTITUZIONI MEDICI DI MEDICINA GENERALE, PEDIATRI, BIOLOGI PER LA TUTELA DELLA SALUTE RIPRODUTTIVA DEI GIOVANI DI OGGI E DI DOMANI

- VERSO UN PERCORSO STRUTTURALE ED ISTITUZIONALIZZATO PER LA PREVENZIONE ANDROLOGICA CHE CONSENTA A TUTTI GLI ADOLESCENTI DI EFFETTUARE LA VISITA ANDROLOGICA E LO SPERMIOGRAMMA

«La salute è troppo importante per lasciare che se ne occupino solo i medici»
Verso la One Health!

Thanks for your kind attention