



**Medicine and Health:
say yes to
Gender Medicine**

<https://www.ifo.it/2023/01/27/osservatorio-medicina-di-genere-cresce-la-sensibilita-della-comunita-scientifica-alle-differenze-nellapproccio-alla-ricerca-biomedica-licenziati-due-documenti-per-promuovere-lequit/>

Gender Medicine



Definition:

Gender Medicine is an **approach** that keep into consideration sex and gender differences and thier interconnections influencing the individual's state of health and illness.

Gender Medicine **is not** a new discipline but concerns all medical disciplines. Gender Medicine **is not** women's medicine since some pathologies such as pediatric respiratory diseases or Parkinson's disease are more frequent in males.

Main goal:

Gender Medicine wants to guarantee the best medical health path and care for each person reinforcing the concept of «personalized medicine».

Specific goals:

- ❖ To identify the gender differences in diseases' physiopathologic
- ❖ To identify the mechanisms responsible for gender differences
- ❖ To pin-point gender-specific diseases' risk factors
- ❖ To develop gender-specific prevention, diagnostic and therapeutic itineraries

'Sex' and 'Gender'

"I was editing a paper on prostate MRI the other day, and they listed the subjects as x number of males. My first thought was that it was redundant. "Ink" is precious, so it is not intuitive that prostate patients would be men?"

Another paper the same day listed subjects by "gender." My first reflex was to use my editorial pen and change gender to sex."

Mark E Schweitzer, Journal of Magnetic Resonance Imaging, 2023

Definition of «Sex» and «Gender»

The World Health Organisation summarises the difference between sex and gender in the following way:
Sex refers to “the **different biological and physiological characteristics of males and females**, such as reproductive organs, chromosomes, hormones, etc.”

Gender refers to “**the socially constructed characteristics** of women and men – such as norms, roles and relationships of and between groups of women and men. It varies from society to society and can be changed. The concept of gender includes **five important elements: relational, hierarchical, historical, contextual and institutional**. While most people are born either male or female, they are taught appropriate norms and behaviours – including how they should interact with others of the same or opposite sex within households, communities and work places. When individuals or groups do not “fit” established gender norms they often face stigma, discriminatory practices or social exclusion – all of which adversely affect health.”

❖ **The European Institute for Gender Equality**, an autonomous body of the European Union, provides very extensive definitions of sex and gender:

“**Sex refers to the biological and physiological characteristics that define humans** as female or male. These sets of biological characteristics are **not mutually exclusive, as there are individuals who possess both**, but these characteristics tend to differentiate humans as females or males.”

“**Gender refers to** the social attributes and opportunities associated with being female and male and to the relationships between women and men and girls and boys, as well as to the relations between women and those between men. These **attributes, opportunities and relationships are socially constructed and are learned through socialisation processes. They are context- and time-specific, and changeable**. Gender determines what is expected, allowed and valued in a woman or a man in a given context. In most societies, there are differences and inequalities between women and men in responsibilities assigned, activities undertaken, access to and control over resources, as well as decision-making opportunities. Gender is part of the broader sociocultural context. Other important criteria for sociocultural analysis include class, race, poverty level, ethnic group and age.”

❖ <https://www.coe.int/en/web/gender-matters/sex-and-gender>

Sex and Gender specific-factors



SEX – **biological** characteristics defined at birth:

- Genetics (sexual chromosomes)
- Anatomical (internal and external reproductive organs)
- Physical
- Physiological (sexual hormones)

Sex influences physical aspect and reproductive capabilities.

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GENDER – **socially** defined characteristics:

- Social rules
- Social role
- Social relationships

Gender is a social construction based on behavioral, emotions, and cultural characteristics defining a person's sex.

Gender Medicine in Italy

1. In 2018, Italy become the first European country to formalize the introduction in medicine of the *gender* concept by approving the Article 3, Paragraph 1, of the **3/2018 Law**.

2. In 2019 Italy, also, approves the **National Plan** for the application and dissemination of the Gender Medicine on the national territory.

It defines:

1. Strategic goals
2. Involved stakeholders
3. Future actions

It identifies 4 working areas:

- a. Prevention, diagnosis, cure and rehabilitation clinical itineraries
- b. Research and innovation
- c. Professional training and continuing education
- d. Communication and information

3. In 2020, Italy approves the **National Prevention Plan 2020-2025** to introduce the gender approach in the ordinary practice of prevention pathways and to improve their appropriateness.



<https://www.salute.gov.it/portale/prevenzione/detaglioContenutiPrevenzione.jsp?id=5772&area=prevenzione&menu=vuoto>



The 2019 National Plan of Gender Medicine

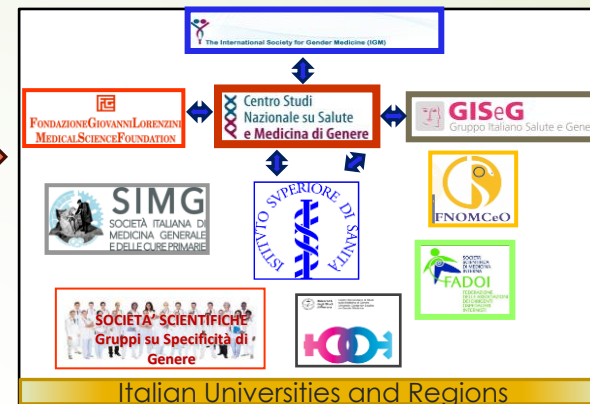
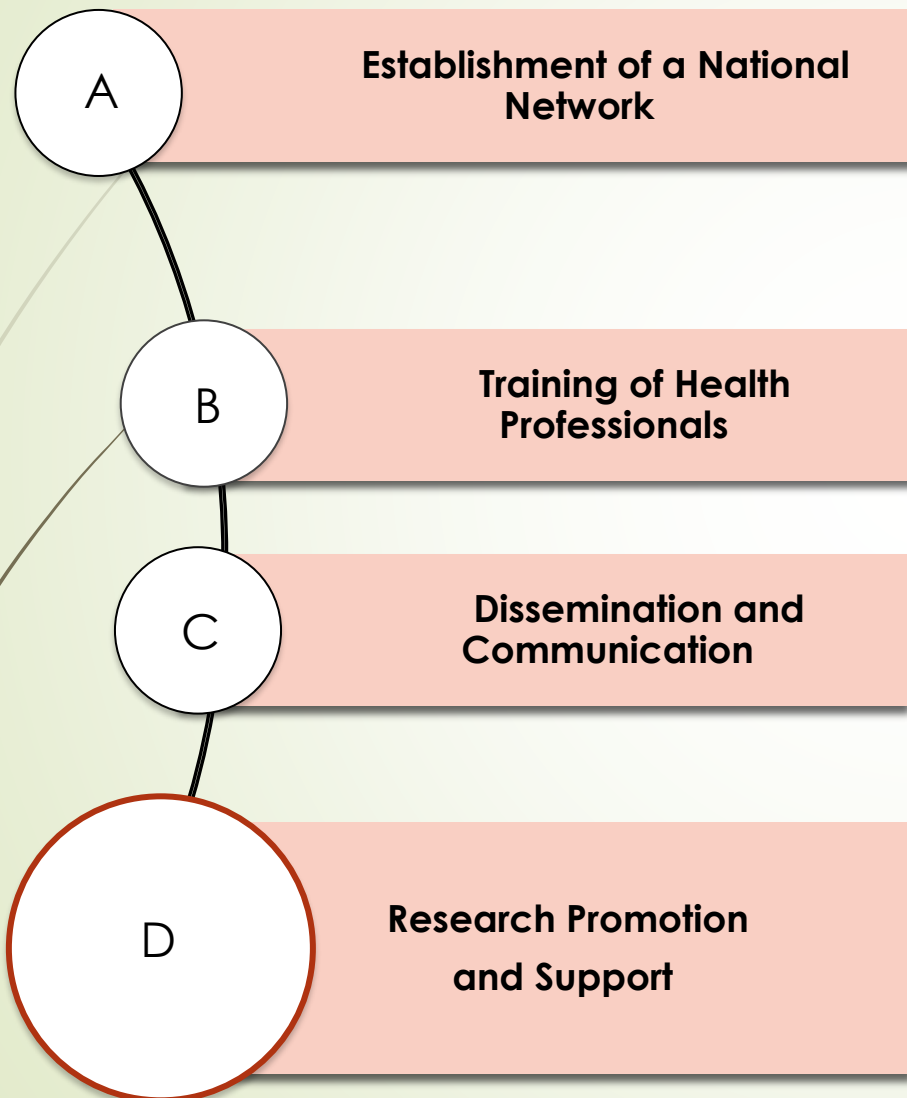
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The National Plan for Gender Medicine was born from the joint work of:

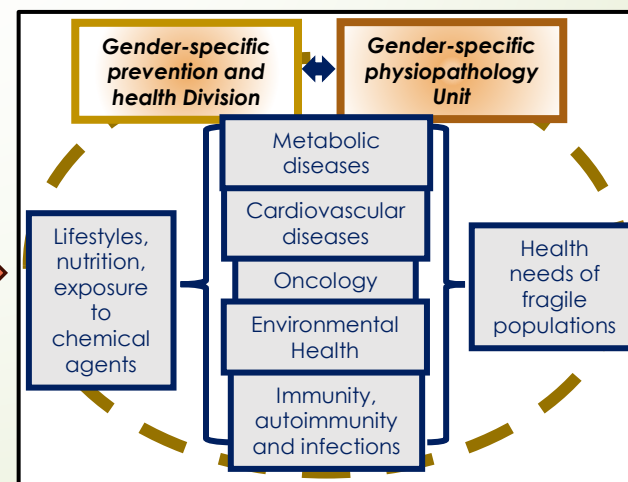
- ❖ five different Directorates General of the **Italian Ministry of Health**
- ❖ **Reference Center for Gender Medicine** of the Istituto Superiore di Sanità established in **2017**
- ❖ a technical-scientific table of **Regional experts**
- ❖ representatives of the network of the *Istituti di Ricovero e Cura a Carattere Scientifico (IRCCS)*, *Agenzia Nazionale per i Servizi Sanitari Regionali (AGENAS)* and *Agenzia Italiana del Farmaco (AIFA)*.





- ❖ Distance Learning Courses (FAD), with ECM credits, for healthcare professionals
- ❖ Scientific Conferences

- ❖ Television and radio broadcasts.
- ❖ Newsletter on the Istituto Superiore di Sanità website
<https://www.epicentro.iss.it/medicina-di-genere/aggiornamenti>
- ❖ ISSalute website: <https://www.issalute.it>
- ❖ Meetings with citizens





The «Osservatorio» at the Italian National Institute of Health

In **2020**, a Government Decree institutes the «**Osservatorio**», made up of members appointed by the Italian National Institute of Health.

General goal:

Guarantee and monitor the start-up of the promotion, application and support actions for Gender Medicine envisaged in the 2019 National Plan.

Specific goals:

- ❖ Engaging national representatives and institutions
- ❖ Defining appropriate indicators to be up-dated in time
- ❖ Prompting the coordination of actions for gender medicine dissemination among Regional Departments.

The «**Osservatorio**» with its 6 working groups publishes also documents for the Gender Medicine dissemination and application:

1. The establishment of Gender Medicine working group with scientific societies and technical-scientific associations of the health professions.
2. Suggestions for the drafting of pre-clinical and clinical-epidemiologic protocols that include sex/gender determinants.
3. The Gender Medicine Glossary.
4. Descriptive analysis of the health of migrant people from a gender perspective.

Gender Medicine and the Italian Regions



Tuscany: LR n.16/2009, modified by the LR n.4/2011, insituting the Regional Table for the Gender Policy Coordination.

LR n.40/2015, establishing the Regional Coordination Centre.

Emilia-Romagna: LR n.182/2014, for equality and against gender discrimination.

DGR n. 1423/2017, approving the Regional Socio-health Plan 2017-2019.

Veneto: LR n.23/2012, approving the Regional Socio-health Plan 2012-2016.

LR n.48/2018, approving the Regional Socio-health Plan 2019-2023.

Lombardia: DGR n.XI/2498/2019, approving the Lombardy Integrated Socio-health Plan 2019-2023.

Sicily: DGR n.681/2021, Regional Plan for the applicatin and dissemination of Gender Medicine.

Abruzzo: Piano Regionale 2021 and DGR n.14/2022 for the Gender Medicine application and dissemination.

Puglia: DGR n.1466/2021, approving strategic document approval and the Regional Tchnical Table.

Piemonte: DGR n. 17-4075/2021, receiving the Plan for the application and diffusion of Gender Medicine.


Umbria: DGR n.129/2021, receving of the Ministry of Health Decree - Implementation plan.


DD n.2190/2021, the Regional Tchnical Table establishment.


Liguria: Delibera del Commissario Straordinario n.18/2021 appointment of the regional representative.


Autonomous Region of Sardinia: DGR n.36/43/2021, receiving the Plan for the application and diffusion of Gender Medicine.


Gender-specific susceptibility to diseases, infections, vaccinations and environmental factors in the Italian population


 Asthma (from birth until puberty)

 Autism Spectrum Disorders
Tourette's Syndrome
Attention Deficit Hyperactivity Disorder
Dyslexia


 Amyotrophic lateral sclerosis
Parkinson's disease
Stroke
Schizophrenia (early incidence)


 Cancers developed in larynx, oesophagus, and bladder
Non-reproductive cancers


 MERS-CoV
SARS-CoV2 (lethality)
Hepatitis B virus
Tuberculosis


 PM2.5 exposure
Caffeine consumption associated to protective effect for Parkinson's disease
Cognitive domain deficits associated to endocrine disruptors exposure





 Sjogren's syndrome
Systemic lupus erythematosus
Autoimmune thyroid disease
Scleroderma
Myasthenia gravis
Multiple sclerosis
Rheumatoid arthritis
Systemic sclerosis
Asthma (after puberty)







 Phobias, obsessive compulsive disorder and eating disorders

 Alzheimer's disease
Depression and Anxiety disorder
Phobias, obsessive compulsive disorder and eating disorders
Schizophrenia (late biased)

 Thyroid cancers
Lung cancer in nonsmokers

 Better response to various vaccines

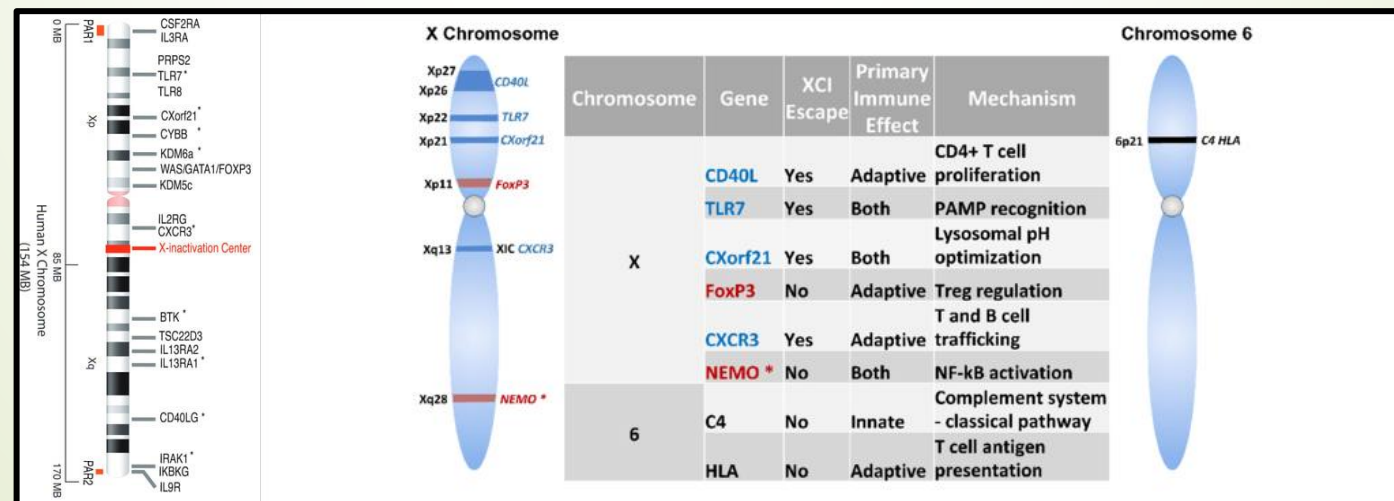
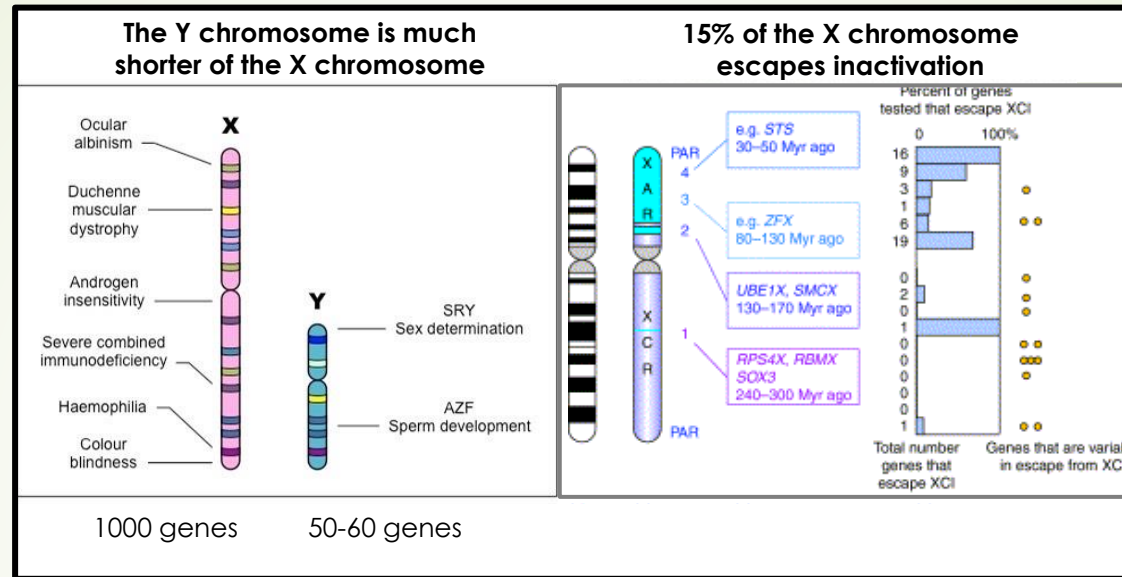
 Cigarette smoke
Caffeine consumption associated to protective effects for stroke, dementia and depression
Better response after treatment of small cell-lung cancer
Domain of emotionality deficits associated to endocrine disruptors exposure

 Autoimmune diseases
  Neurodevelopmental disorders
  Neurodegenerative and neurological disorders
  Cancer
  Infections and vaccinations
  Environmental factors

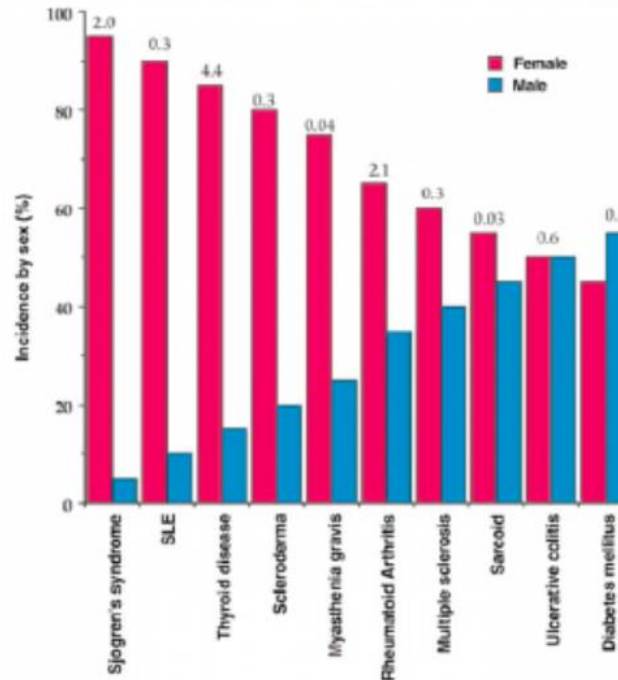
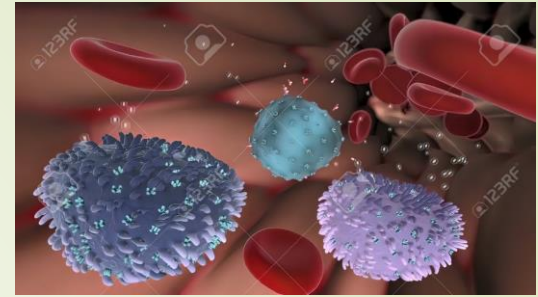
Main causes of death in the Italian population



Autoimmune diseases and sex chromosomes

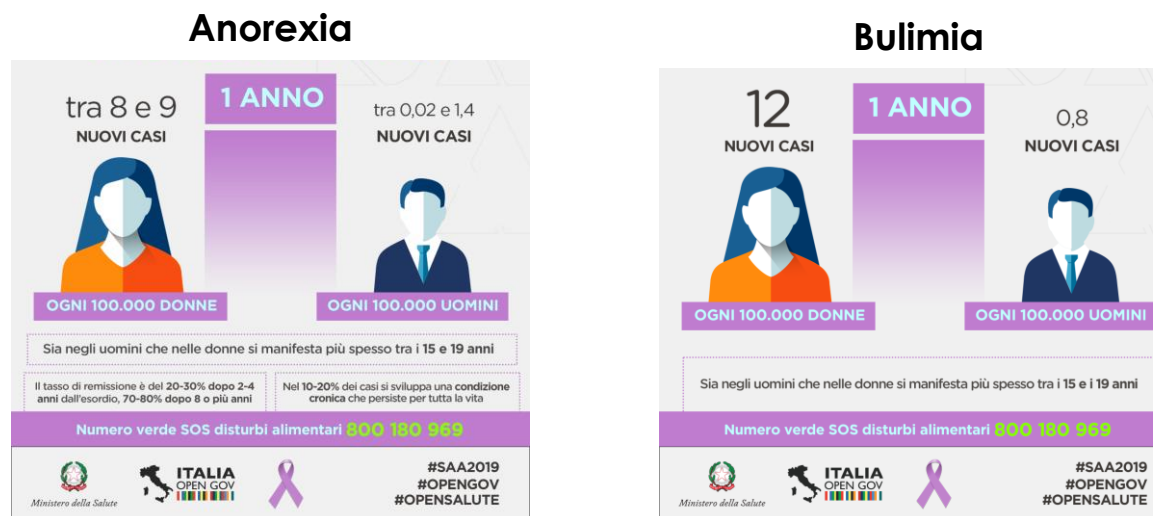


Women are generally more susceptible to autoimmune diseases than men



DR. DIMITRIS TSOUKALAS, MD
MEDICINA METABOLICA™
CLINICA PER MALATTIE AUTOIMMUNI E CRONICHE

Eating disorders



https://www.salute.gov.it/portale/documentazione/p6_2_5_1.jsp?lingua=italiano&id=392

Uncontrolled eating disorders

	Uomini	Donne	Totale
Popolazione Istat 1° gennaio 2021*	19.707.983	19.911.095	39.619.078
<i>Prevalenza (%)**</i>			
Sovrappeso	40,40	24,78	(32,53)
Obesità	11,06	9,69	(10,37)
Totale eccesso ponderale	51,46	34,47	(42,90)
<i>Numero</i>			
Sovrappeso	7.962.025	4.933.969	12.895.994
Obesità	2.179.703	1.929.385	4.109.088
Totale eccesso ponderale	10.141.728	6.863.354	17.005.082

(*) Popolazione di 18-69 anni residente in Italia. Fonte: Istat: <https://demo.istat.it>; (**) Prevalenze medie annue 2020-2021. Fonte PASSI

Determinants of eating disorders

Individual Factors

Reasons
Religion
Socio-economic level
Cultural level



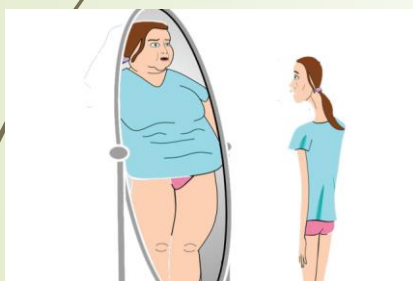
Biological Factors

Physiology (hormones)
Sensory perception



<https://specialistudio.corriere.it/gurupposandonato/controlobesita-storie-di-pazienti-che-ce-lhanno-fatta/>

Eating habits and lifestyles



Because of social stereotypes, women always feel like they have to go on a diet

Physical Aspect



Italian women practice less physical activity than men. The numbers from the CUORE Project (ISS) say that in Italy 34% of men and 46% of women between 35 and 74 years old do not carry out any physical activity.

Physical Activity



Despite smoking less, women have a lower quit rate than men. They are also more susceptible to smoking-induced damage, probably because they have lower levels of enzymes capable of eliminating toxic products (e.g. glutathione-S-transferase).

Smoke



Faced with more modest use, women have a more rapid evolution towards addiction, with more serious consequences than men. Gastric alcohol dehydrogenase activity is LOWER in women: at the same dose, blood levels of ethanol are > in women.

Alcohols

Pathologies with gender differences



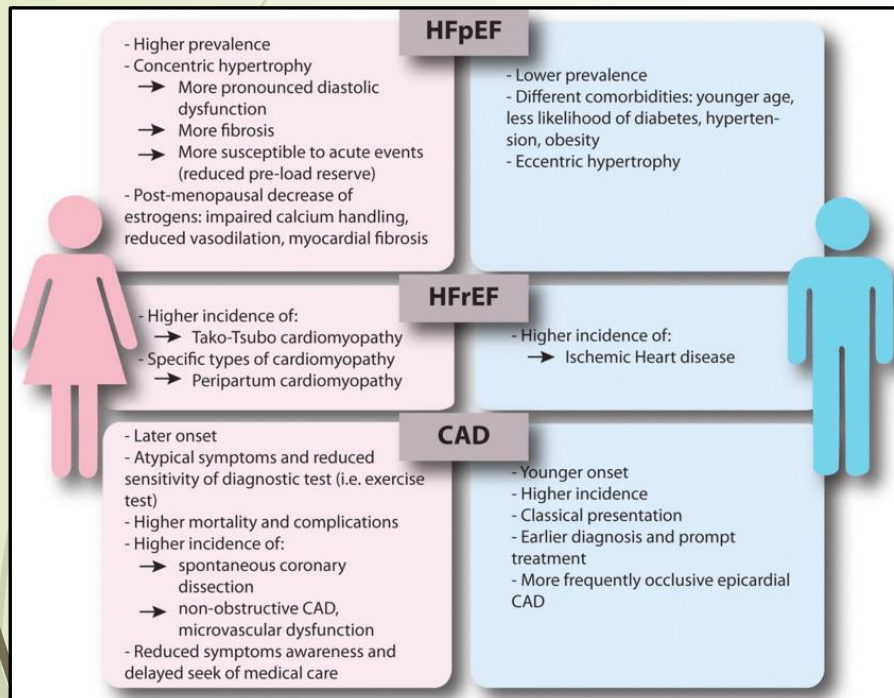
https://www.iss.it/genere-e-salute/-/asset_publisher/X4Y4v97kQM26/content/differenze-di-genere-nella-malattia-oncologica

	Health Status	Sex and Gender Differences		
		Incidence	Progress	Symptoms
	Cardiovascular Diseases	Yes	No	Yes
	Neurodegenerative Diseases	Yes	Yes	Yes
	Autoimmune Diseases	Yes	Yes	No
	Infectious Diseases	Yes	Yes	No
	Cancers	Yes	Yes	No
	Respiratory Diseases	Yes	No	No

Cardiovascular diseases: a paradigmatic example of pathologies with gender differences

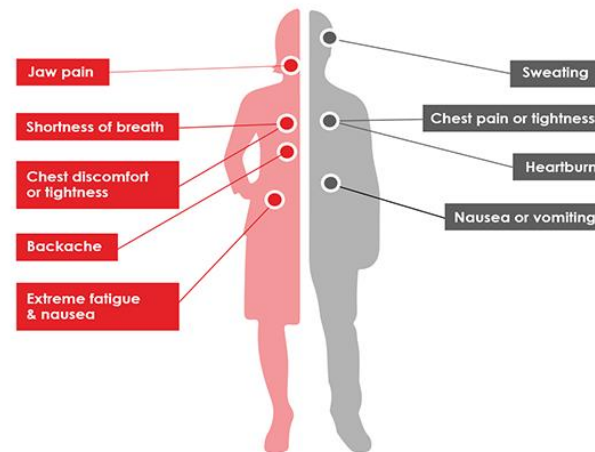


Prevalence



Symptomatology

Most frequent warning signs differ between women and men



Response to drugs

Hypertension:

- Calcium channel blockers are more effective in women.
- Angiotensin-converting enzyme (ACE) inhibitors significantly reduce mortality in men but not in women.

Myocardial infarction:

- Acetylsalicylic acid (ASA) significantly reduces the risk in men, less so in women.

De Bellis A. et al., Heart Failure Reviews, 2020

Sex and Gender differences in oncology

Sex and gender make the difference

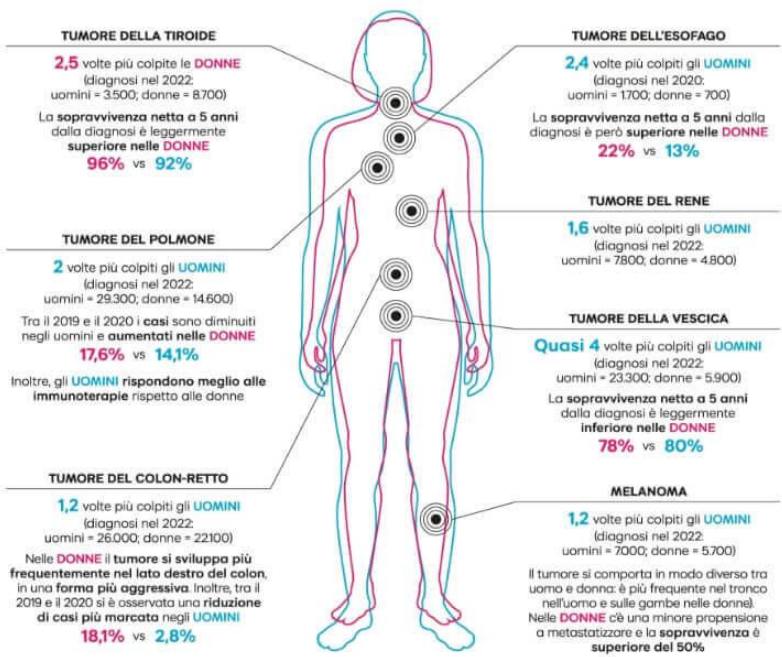


Il sesso determina lo sviluppo di tumori esclusivi (ovaio, utero, prostata, testicolo) o quasi (mammella), ma anche il modo in cui alcuni chemioterapici vengono metabolizzati. Questo fa sì che alcuni eventi avversi legati alle terapie siano più gravi nelle donne.

Una diagnosi di tumore stravolge la vita del paziente e dei familiari e comporta la necessità di grande supporto emotivo e organizzativo. Il genere gioca un ruolo importante in questo, e alle donne è spesso attribuito il ruolo di caregiver. Le donne caregiver soffrono di più alti livelli di stress, depressione e ansia rispetto agli uomini.

SESSO GENERE

Studi epidemiologici hanno evidenziato significative differenze di genere nell'incidenza, nell'aggressività, nella progressione, nella prognosi e nella risposta alla terapia in molte tipologie di tumori comuni ai due sessi.



Referenze
 Siegel RL, et al. CA Cancer J Clin. 2022;72(1):7-33.
 Ketcher D, et al. J Fam Nurs. 2020;26(2):126-137.
 I numeri del cancro in Italia 2022.
 Epicentro - Il genere come determinante di salute: lo sviluppo della medicina di genere per garantire equità e appropriatezza della cura. Quaderni del Ministero della Salute n. 26, aprile 2016.

Clinical trials and pre-clinical studies

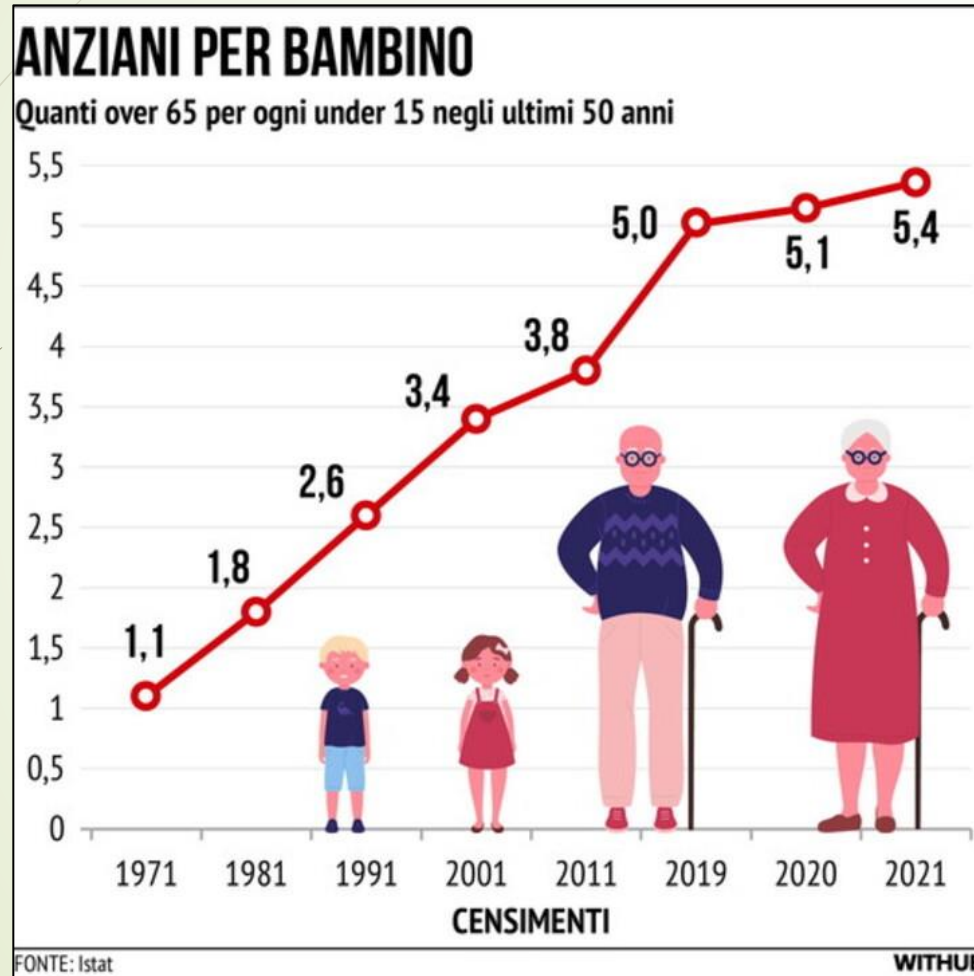
- ❖ Women are still underrepresented in clinical trials: less than 40% of individuals enrolled in clinical trials are women.
- ❖ Gender Medicine needs to extend our knowledge in women medicine.
- ❖ Pre-clinical studies and clinical trials need to analyze the data stratifying by sex and also by gender, including andropause/menopause, sexual hormones levels, menstrual phases, etc.



<https://www.utmedicalcenter.org/patients-visitors/clinical-trials/directory>

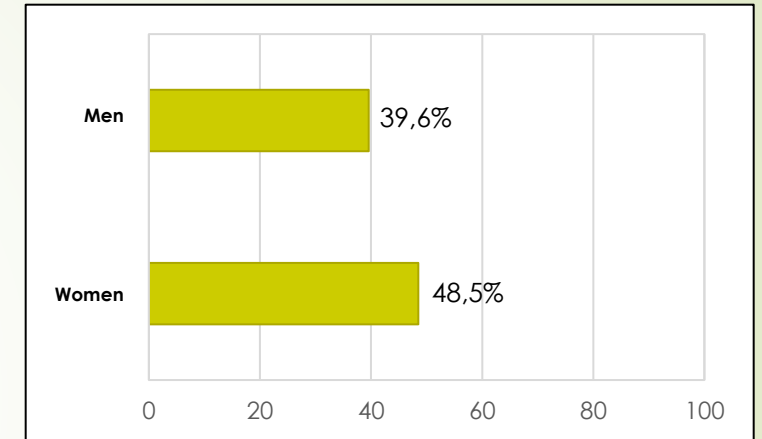
Longevity and disease-free life in the elderly Italian population

Aging of the population

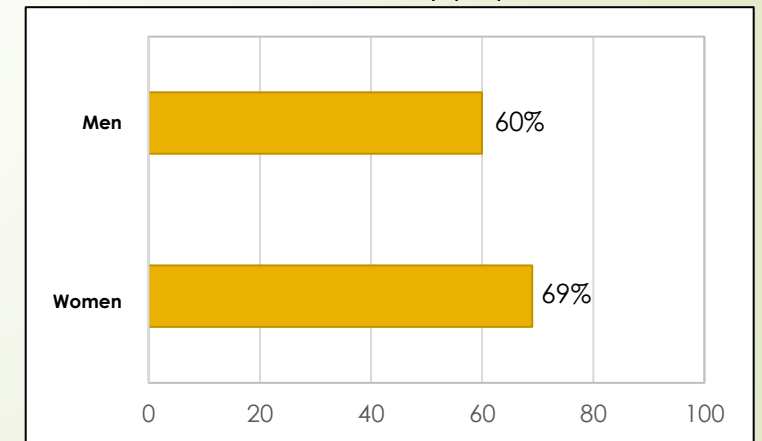


Elderly people affected by chronic pathologies

Young elderly population (65-74 years)



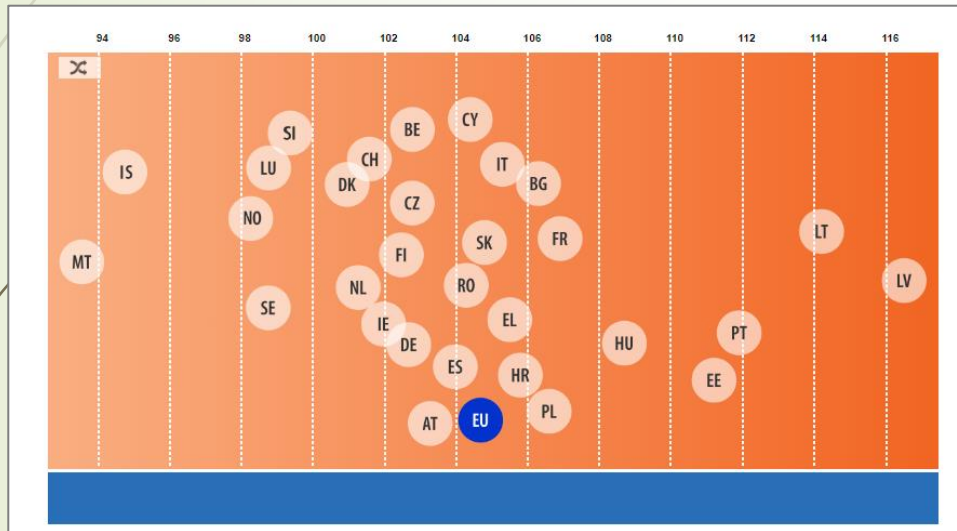
Over 85 elderly population



ISTAT 2019

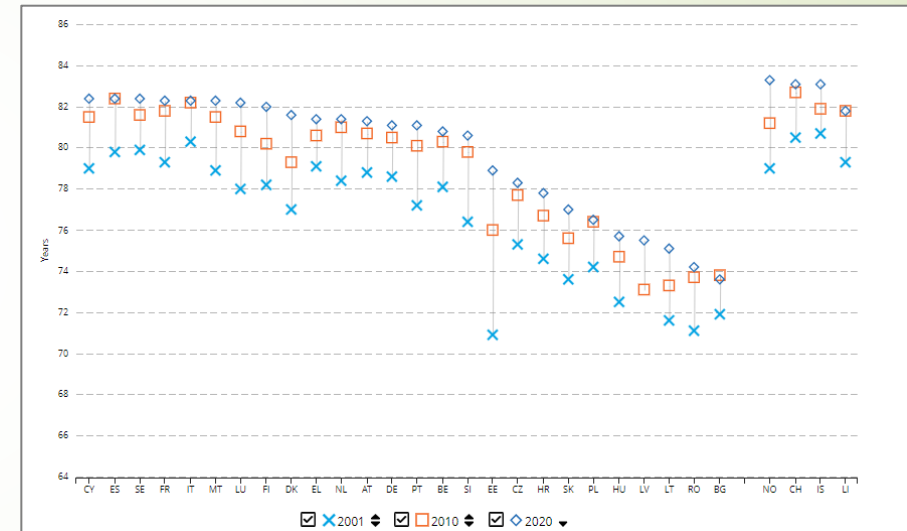
European and Italian Population: National Institute of Statistics Data (2020)

More Women than Men



IT: 105,3 women vs 100 men
 EU: 104,7 women vs 100 men

Women live longer than men



IT: 85,3 years per woman; 81 years per men
 EU: 84 years per woman; 78,5 years per men



**A SEX AND GENDER MEDICINE STRATEGY ARE FUNDAMENTAL TO IMPROVE THE
HEALTH OF THE POPULATION.**

**SEX AND GENDER MEDICINE CONTRIBUTES TO THE DEFINITION AND IMPLEMENTATION
OF PERSONALIZED MEDICINE AND CAN HAVE A POSITIVE IMPACT ON THE HEALTHCARE
SYSTEM BOTH IN TERMS OF EFFECTIVENESS AND IN ECONOMIC TERMS.**

**TO PROMOTE GENDER MEDICINE IN THE HEALTH POLICIES OF EU MEMBER STATES
CAN OPERATE AS ACCELERATOR TO ACHIEVE THE HEALTH EUROPEAN PROGRAM
GOALS.**





Sara Baccarini, PhD

Oncology, Immunology, Environmental Health,
Virology, Vaccines

Reference Center for Gender Medicine
Istituto Superiore di Sanità

Sara.Baccarini@iss.it