Determinanti di genere nelle malattie croniche: dalle evidenze alle implicazioni per la sanità pubblica

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Evento in modalità virtuale

Lecture roadmap

From the male medical default to gender-responsive precision public health

01 **THE DEFAULT**

Sex, gender and the limits of the 70-kg male model

02 **THE DRIVERS**

Biological, social and commercial determinants

03 **THE EVIDENCE**

Dimorphic patterns across major chronic diseases

04 **THE BLIND SPOTS**

Bias in research, diagnosis and clinical care

05 **THE RESPONSE**

Data, practice, education and policy reform

DESTINATION **Gender-responsive precision public health**

The lecture moves from determinants and disease expression to the changes needed in public health systems.

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Milestone 01

The male medical default

Why medicine still treats the male body as the universal reference

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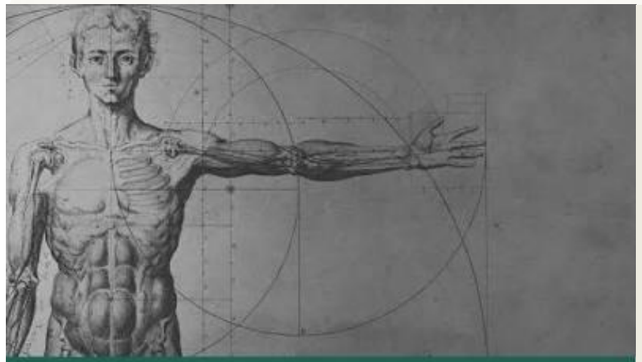

The baseline for medicine became *the 70kg male.*

For nearly two decades, life-saving drugs, cardiovascular medicine, and pain management were approved and dosed based almost entirely on male physiology.

CURRENT MILESTONE **THE DEFAULT**

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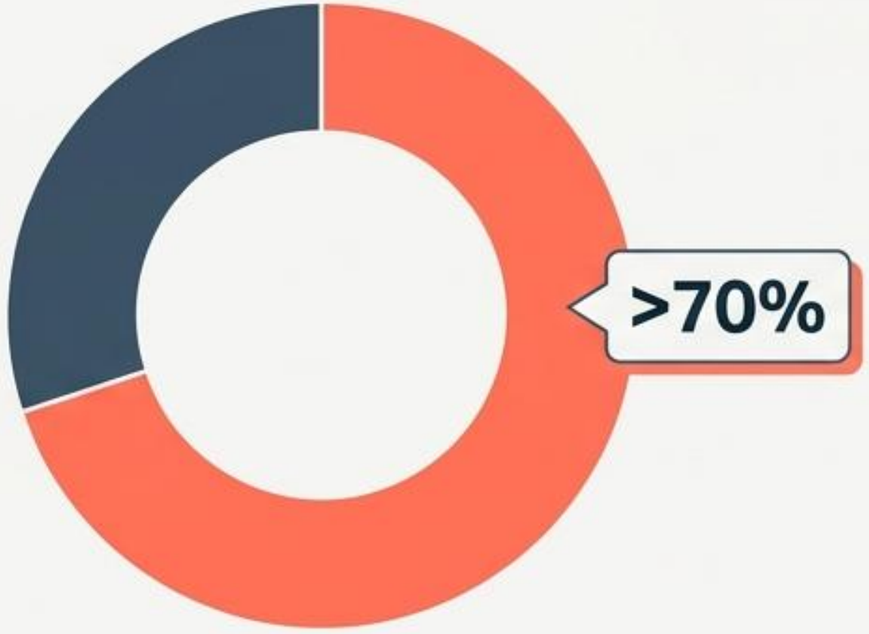
The Paradigm Flaw in Precision Medicine



Chronic diseases account for **>70%** of global mortality.

The Blind Spot:
Sex and gender are consistently overlooked in clinical practice, research, and diagnostic pathways.

We strive for precision medicine by understanding human diversity at the molecular level. But ignoring these foundational variables generates fatal inequalities; integrating them improves outcomes, lowers costs, and advances true equity.

Franck Mauvais-Jarvis, et al.; Lancet, 2020

Milestone 02

The drivers of sex and gender disparities

How biology, social context and commercial forces interact

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CURRENT MILESTONE

THE DRIVERS

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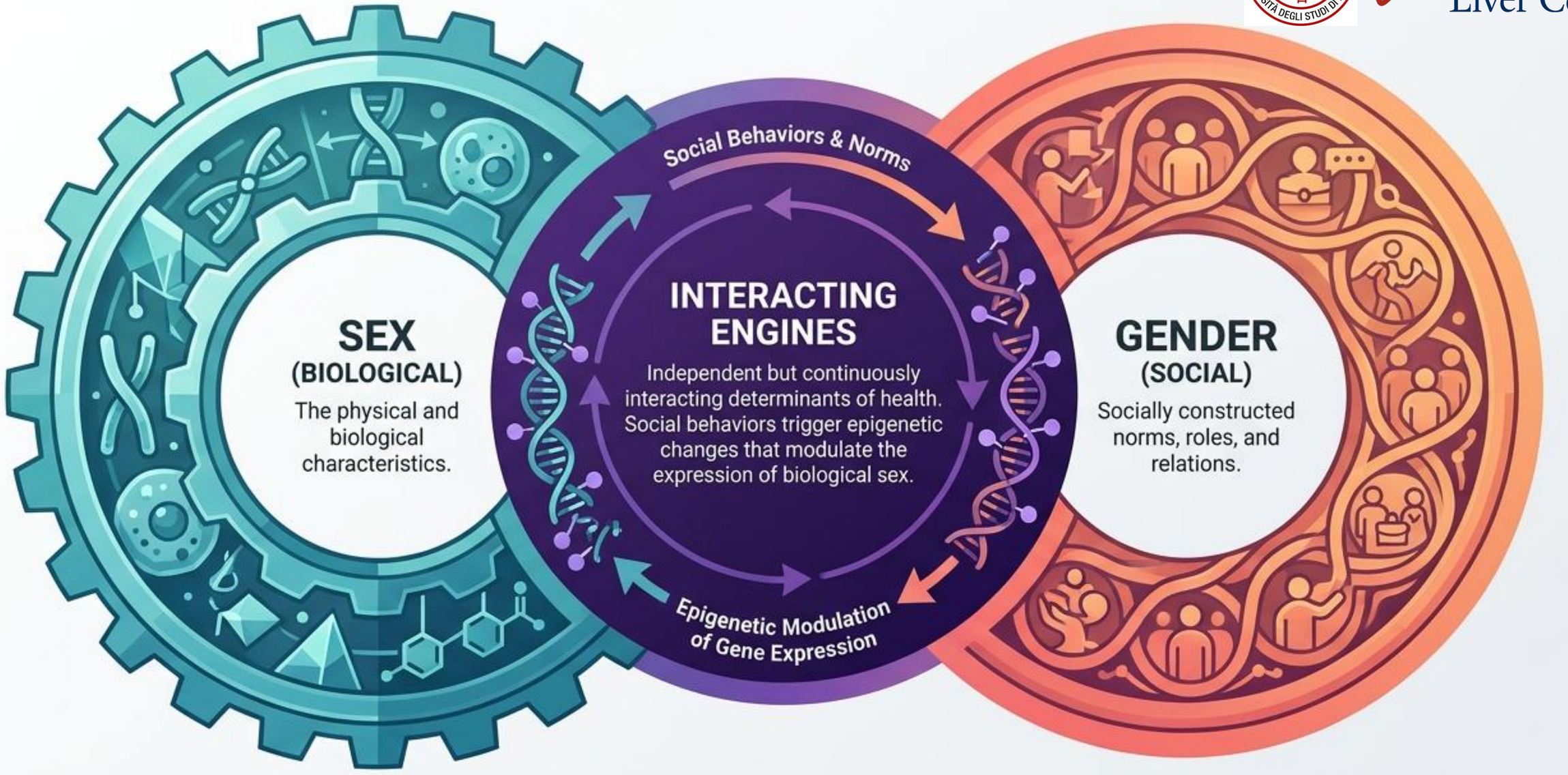

SEX
(BIOLOGICAL)
The physical and biological characteristics.
Social Behaviors & Norms
INTERACTING ENGINES
Independent but continuously interacting determinants of health. Social behaviors trigger epigenetic changes that modulate the expression of biological sex.
Epigenetic Modulation of Gene Expression
GENDER
(SOCIAL)
Socially constructed norms, roles, and relations.

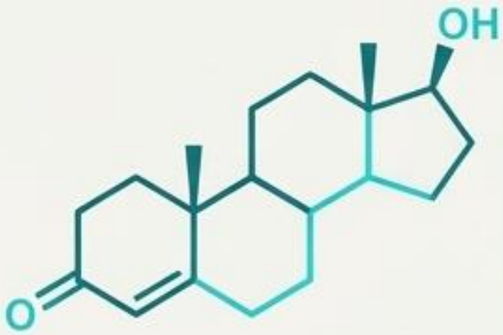
Biological Mechanisms of Sex Differences

Genetics

Chromosomal complement (XX/XY), Y-encoded genes (SRY), and incomplete X-inactivation.

Epigenetics

Parent-of-origin imprinting and the epigenetic programming of male cells in-utero.



Hormones

Testicular testosterone surges and distinct sex-specific drug metabolism rates.

Franck Mauvais-Jarvis, et al.; Lancet, 2020

Social Mechanisms & Health Behaviors

How societal constructs directly translate into physical health outcomes.

OCCUPATIONAL EXPOSURE

Gendered work environments (e.g., toxic industrial exposure vs. physical caregiving tolls).

HEALTH-SEEKING BEHAVIORS

Delayed care among men driven by masculinity norms; symptom dismissal in women.

NUTRITIONAL HABITS

Gendered dietary expectations and lifestyle risk factors.

GENDERED STRESS

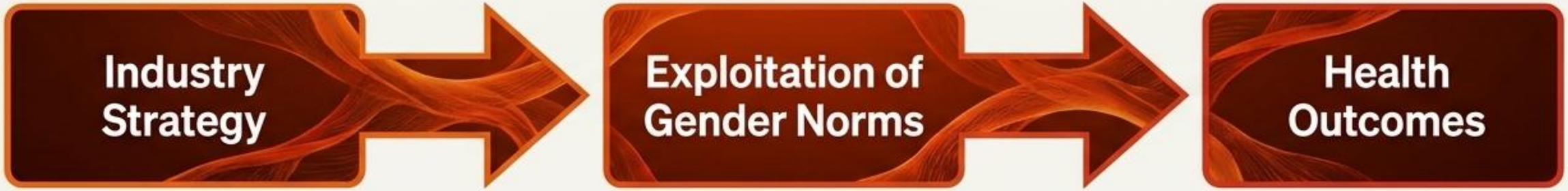
Caregiving burdens and societal expectations disproportionately falling on women.

SOCIETAL ROLES

A healthcare workforce where 75% are female, but leadership is overwhelmingly male.

Dawn L DeMeo et al.; Int J Chron Obstruct Pulmon Dis. 2018

Commercial Determinants: Monetizing Gender Identity



The Mechanism: Corporate actors manipulate gender norms to drive product consumption, directly skewing the 'lifestyle choices' that cause chronic disease.

Case 1: The Tobacco Industry

- **Targeting Men:** Marketing linking smoking to male independence, ruggedness, and rebellion.
- **Targeting Women:** Marketing linking smoking to female empowerment, liberation, and weight control (driving COPD spikes).

Case 2: The Alcohol Industry

- **Exploiting** concepts of toxic masculinity, risk-taking, and dominance to increase consumption rates, leading to higher male rates of alcoholic liver disease and injury.

The Impact: These commercial determinants create artificial public health crises that cannot be solved by biology alone.

Dawn L DeMeo et al.; Int J Chron Obstruct Pulmon Dis. 2018

Women became an early growth market for tobacco

Advertising translated gendered pressures into product promises

ARCHIVAL ADVERTISING

THE MARKETING LOGIC

01 — Identify the pressure

Body image, social freedom and stress

02 — Shape the promise

Slimmer, lighter, confident and feminine

03 — Adapt the product

Mild language, flavours and a refreshing taste

KEY MESSAGE

The industry treated women's social and bodily pressures as a market opportunity.

Dawn L DeMeo et al.; Int J Chron Obstruct Pulmon Dis. 2018

The Synthesis: Driving Disease Expression

Biological Sex: Pathophysiology

+

Social Gender: Risk Exposure & System Interaction

=

Disease Susceptibility, Clinical Presentation, & Treatment Response

Result: Men and women do not just experience different diseases; they experience the same diseases entirely differently.

Joy L Johnson et al.; Int J Equity Health 2009

Milestone 03

Evidence across chronic disease

Where sex and gender reshape risk, presentation and outcomes

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CURRENT MILESTONE

THE EVIDENCE

Cardiovascular Disease & Stroke: The Diagnostic Gap

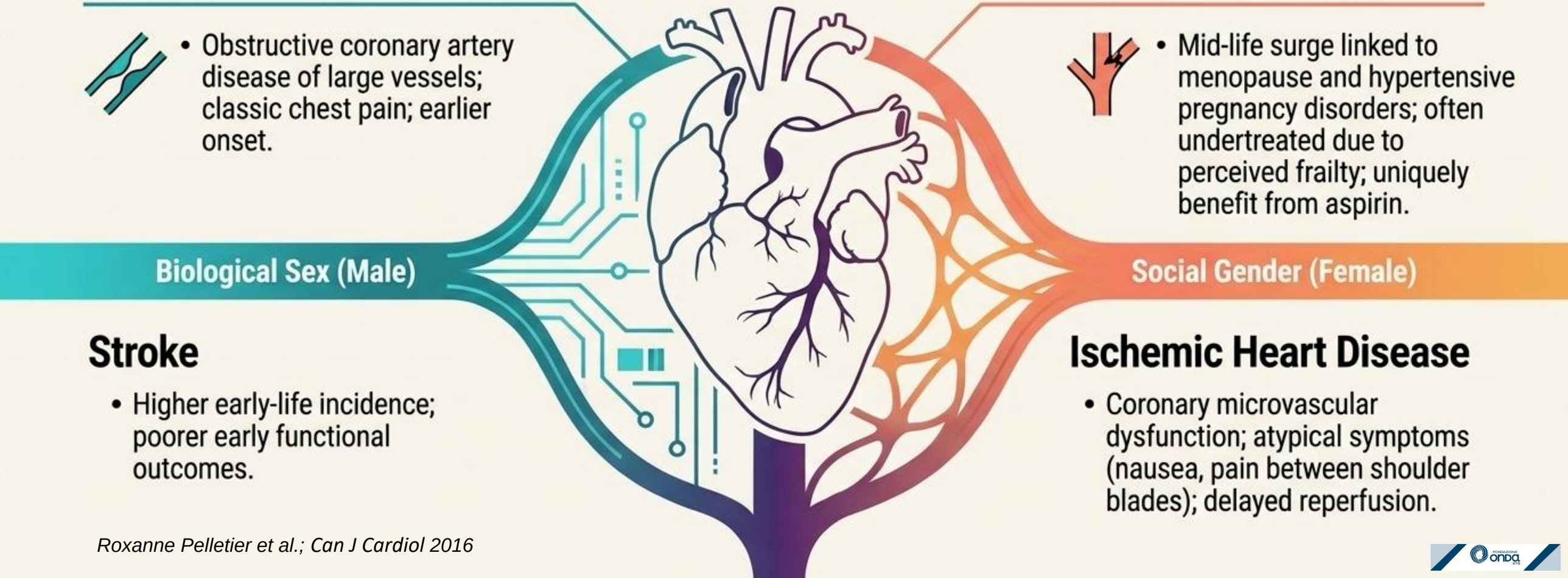
Dimorphic Disease Matrix

Ischemic Heart Disease

- Obstructive coronary artery disease of large vessels; classic chest pain; earlier onset.

Stroke

- Mid-life surge linked to menopause and hypertensive pregnancy disorders; often undertreated due to perceived frailty; uniquely benefit from aspirin.



Biological Sex (Male)

Social Gender (Female)

Stroke

- Higher early-life incidence; poorer early functional outcomes.

Ischemic Heart Disease

- Coronary microvascular dysfunction; atypical symptoms (nausea, pain between shoulder blades); delayed reperfusion.

Roxanne Pelletier et al.; Can J Cardiol 2016

Oncology & Respiratory Diseases: The Dimorphic Response

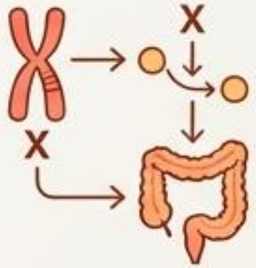
Genetic Susceptibility

ONCOLOGY

Biological Sex
(Male)

- **2:1 to 4:1 incidence predominance in non-reproductive cancers,** driven by cell-autonomous genetic predispositions (Y-encoded *RBMY* oncogenes).

Social Gender
(Female)

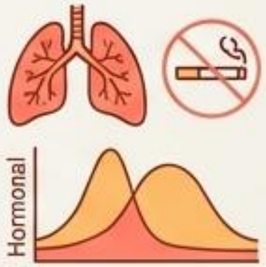


- **Higher expression of X-encoded tumor suppressors,** but **distinct metabolic signatures** lead to worse outcomes in specific cancers like right-sided colon cancer.

Biological Sex
(Male)

- **Men show higher pre-pubertal asthma rates.**

Social Gender
(Female)

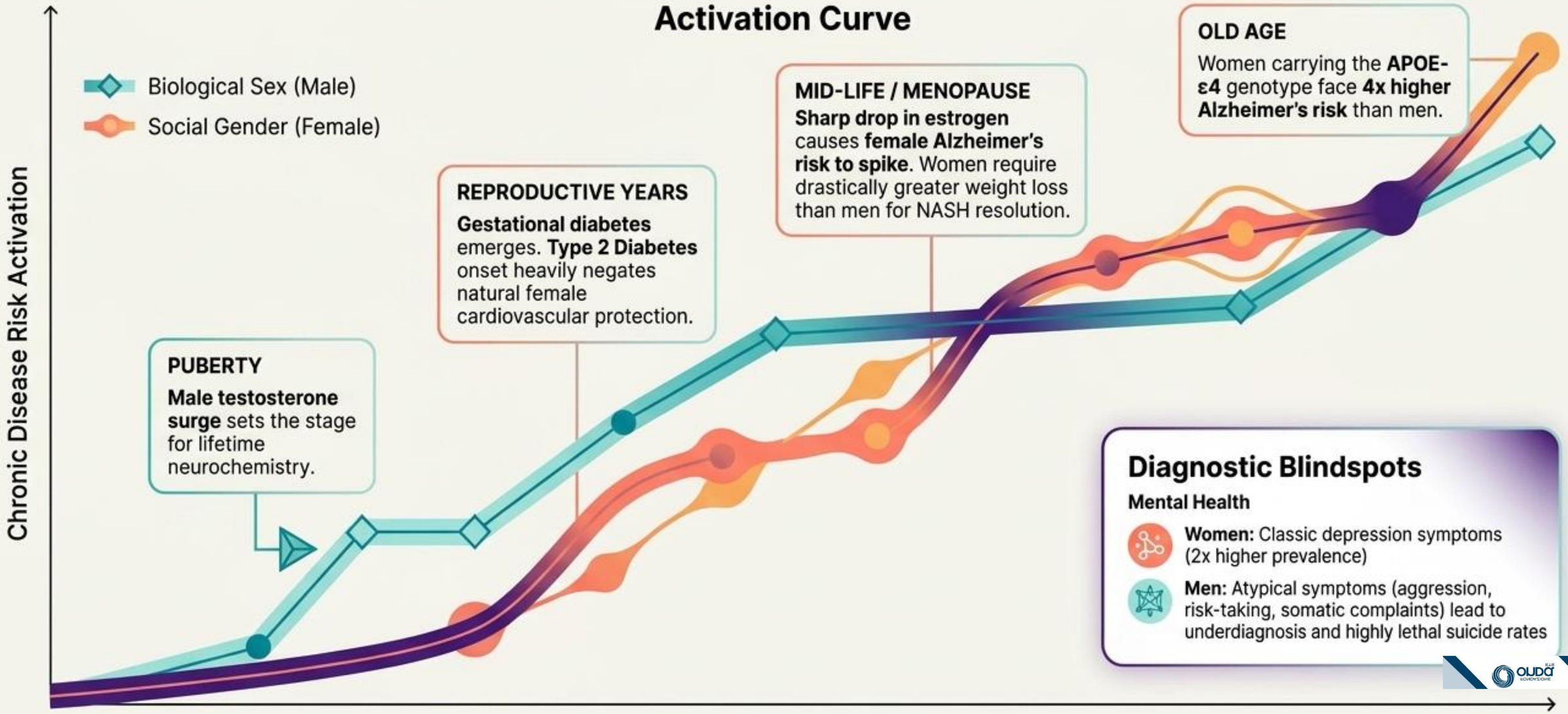


- **Women develop COPD earlier and with significantly lower tobacco exposure** (biological susceptibility + 1960s targeted marketing).
- Asthma severity spikes in middle age (premenstrual drops in progesterone).

Environmental Exposure

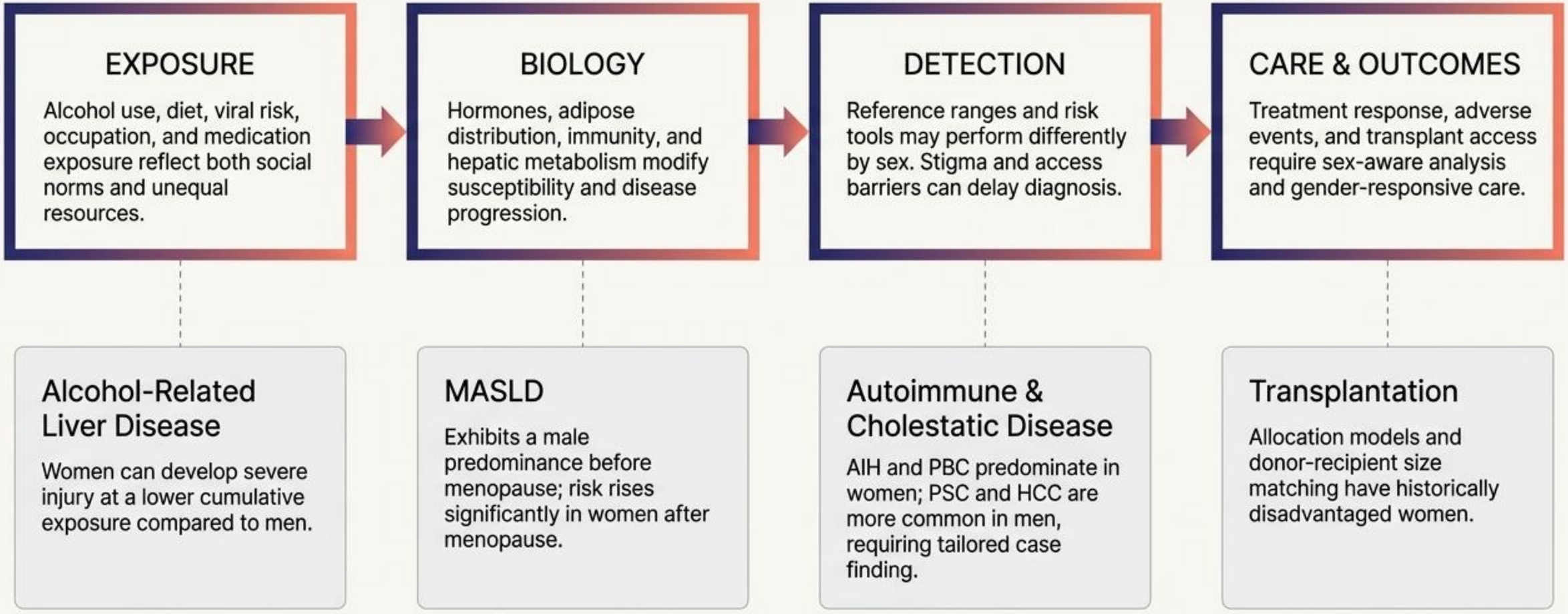
Daiana Stolz et al.; Chest 2019

Metabolic & Brain Health: Diverging Risks Across the Lifespan



Tracy L Bale et al.; Nat Neurosci. 2015

Sex and gender act across the entire **liver disease pathway**



Melonie Heron et al.; Natl Vital Stat Rep. 2019

Milestone 04

Systemic blind spots

How research and healthcare systems reproduce inequity

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THE BLIND SPOTS

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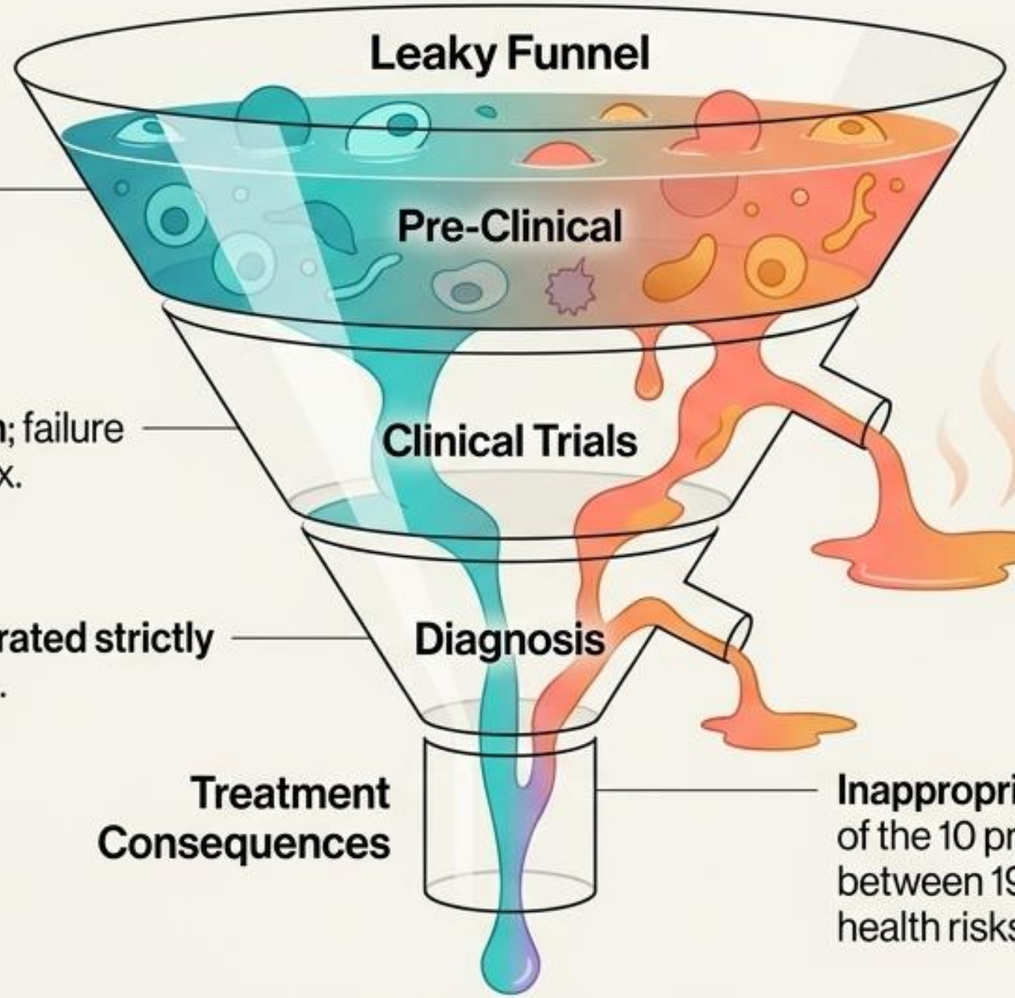
Systemic Bias in Research & Healthcare

The entire medical pipeline systematically discards dimorphic biology.



Over-reliance on male cells and **male animal models** in basic research.

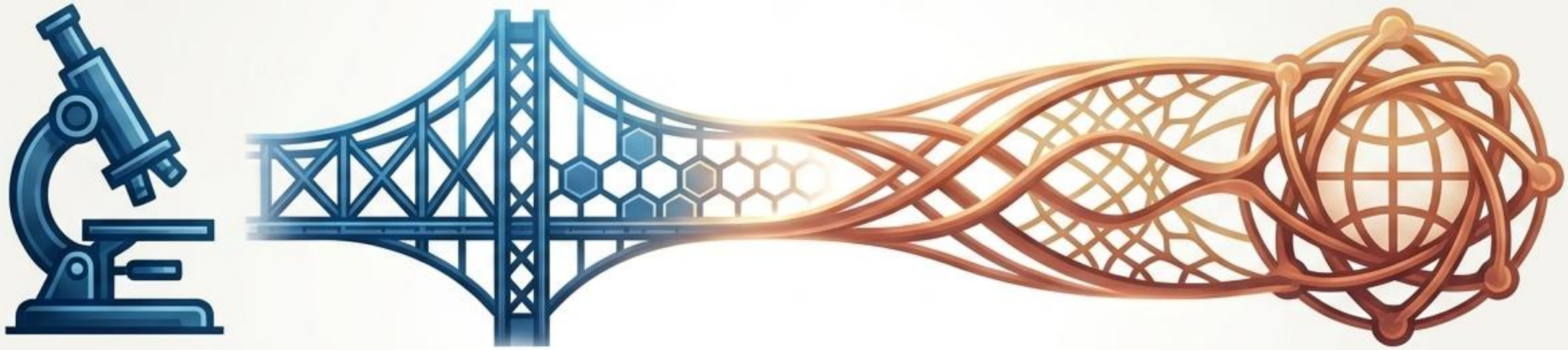
Historical exclusion of women; failure to disaggregate trial data by sex.

Clinical guidelines calibrated strictly to the 70-kg male default.

Inappropriate dosing for women. 8 of the 10 prescription drugs withdrawn between 1997 and 2000 posed greater health risks for women than men.

Franck Mauvais-Jarvis, et al.; Lancet, 2020

The Blueprint: Transitioning to Precision Public Health



- Focuses purely on individual biology, genetics, and biomarkers.
- Necessary, but insufficient to solve systemic disparities.

- Integrates structural equity, commercial determinants, gender norms, and population-level data.
- Moves from precision treatment to precision prevention.

The Goal: A health system that delivers better clinical outcomes, lowers systemic costs, and ensures structural equity for all gender identities.

Milestone 05

The precision public health response

What must change to deliver equitable prevention and care

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Pillar 1 Action Pillar 1: Eradicating Data Gaps

Vital Statistics

Urgently strengthen Civil Registration and Vital Statistics (CRVS) systems globally to capture accurate, accurate, gender-inclusive life event data.

Mandated Analysis

Enforce strict mandates for sex-disaggregated data analysis in all clinical, epidemiological, and pre-clinical research.

Survey Evolution

Redesign global population surveys to capture nuanced nuanced gender norms, roles, and identities, moving beyond simplistic binary sex checkboxes.

Geeta Rao Gupta et al.; Lancet, 2019

Pillar 2

Action Pillar 2: Transforming Clinical Practice

Diagnostic Thresholds

Establish distinct, sex-based diagnostic norms and thresholds (e.g., re-evaluating baseline biomarkers that differ between sexes).

Reproductive History as Risk

Integrate reproductive history—specifically events like pre-eclampsia, gestational diabetes, and early menopause—as standard, mandatory cardiovascular and chronic disease risk assessment tools.

Tailored Care Pathways

Create gender-responsive care pathways that account for differing symptom presentations, drug metabolisms, and caregiving burdens.

Geeta Rao Gupta et al.; Lancet, 2019

Pillar 3 Action Pillar 3: Workforce & Education Reform

Curriculum Overhaul

Radically reform medical and public health curricula to embed sex and gender differences across all organ systems, far beyond reproductive health.

Institutional Culture

Actively dismantle the “organisational plaque” of traditional, male-dominated values that stifle inclusivity in hospital environments.

Leadership Parity

Address the stark imbalance where men occupy >70% of global health leadership positions. Close gender pay gaps and eliminate the “men cure, women care” occupational segregation.

Katherine Hay, et al.; Lancet, 2019

Pillar 4

Action Pillar 4: Policy, Accountability & Political Will

Multisectoral Policy

Recognize broad social policies—such as tuition-free education and mandated paid parental leave—as direct, high-impact public health interventions.

Corporate Accountability

Implement rigorous mechanisms to hold commercial actors and industries liable for gender-exploitative marketing that drives chronic disease.

The Path Ahead

True precision prevention requires confronting the political realities of health. The medical community must leverage its influence to demand structural power balances.

A-Reum Jung et al.; Health Marketing Quarterly, 2016

The Blueprint for Equity

Sex and gender are independent but intersecting determinants of chronic disease across the lifespan.	Ignoring these factors generates deep structural inequalities, missed diagnoses, and suboptimal care.

Gender-sensitive medicine is not medicine for women. It is better medicine for everyone.