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Women in science

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The association



Marie Curie
1867-1934

Significant scientific advances by women

Emilie du Chatelet (1706-1749)	studying mathematics and physics, translated Newton's Principia – still used today
Caroline Herschel (1750-1848)	discovered 8 comets, compiled catalogue of nebulae; 1 st British woman to get paid for science
Mary Anning (1799-1847)	Paleontologist, collected and described hundreds of fossils
Mary Somerville (1780-1872)	studies in math and science, magnetism, member of Royal Astronomical society
Maria Mitchell (1818-1889)	Astronomy, 1 st woman of American Acad. Of Arts & Sci.
Lise Meitner (1878-1968)	Studied radioactivity, close work with Otto Hahn, calculated the energy released in the reaction and named the phenomenon "nuclear fission." Hahn received Nobel prize
Irene Curie-Joliot (1897-1956)	MC's Daughter, structure on atom, Nobel prize in Chemistry 1935, like mother-leukemia caused-death by radioactivity
Barbara McClintock (1902-1992)	Advances in genetics
Dorothy Hodgkin (1910-1994)	determined the X-ray structures of penicillin, vitamin B12 and insulin
Rosalind Franklin (1920-1958)	made X-ray images of DNA-showed it to J. Watson who published structure finding in Nature; Nobel P 1962 –w/o Franklin

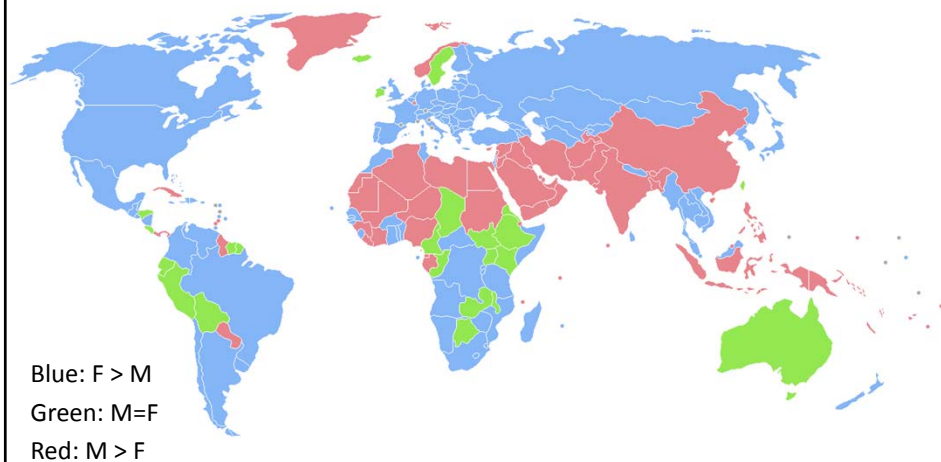
<https://www.smithsonianmag.com/science-nature/ten-historic-female-scientists-you-should-know-84028788/>

Barabara McClintock

- Observed the pattern of coloration of maize kernels over generations of plants
- Genes could move within and between chromosomes
- Finding didn't fit conventional thinking of genetics at the time – finding were ignored
- Early 1980s : jumping genes were found in microorganisms, insects, human
- McClintock receive Lasker Prize in 1981 and Nobel Prize in 1983



Human Sex Ratio (101 M to 100 F)



Gender Imbalance /Gender gap

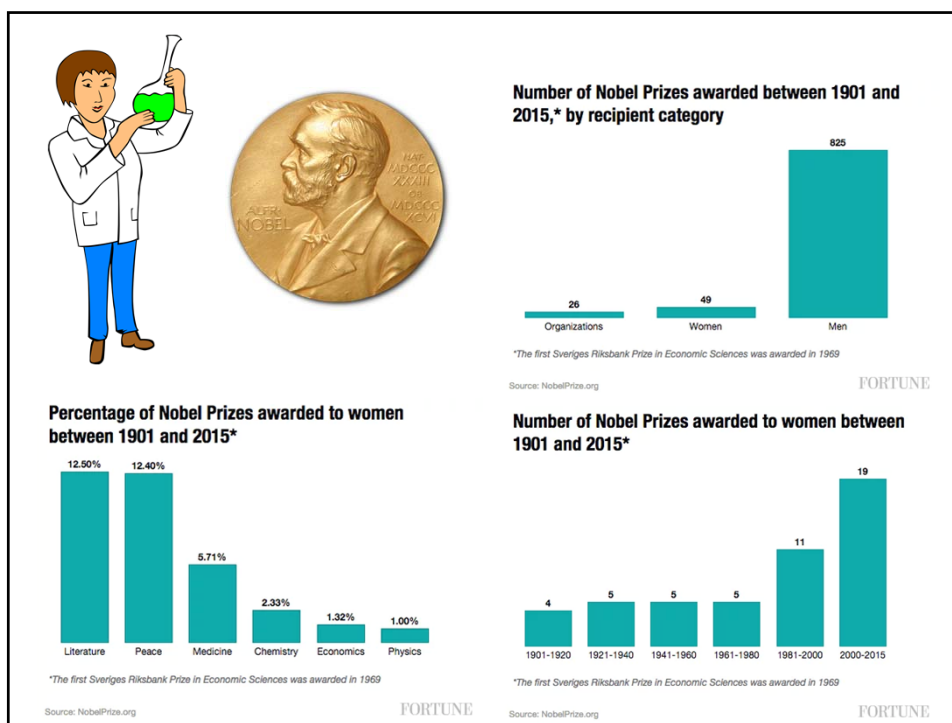
- Disparity between males and females in a population
- Certain underlying processes contribute or cause an unequal effect to woman or men

Gender Discrimination

- Existing prejudice based on a person's sex (Sexism)
- Can affect either gender but it particularly documented as affecting women and girls

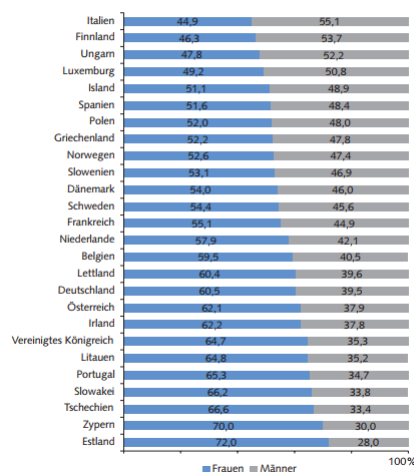


Both types of effects on gender present in science; they affect each other



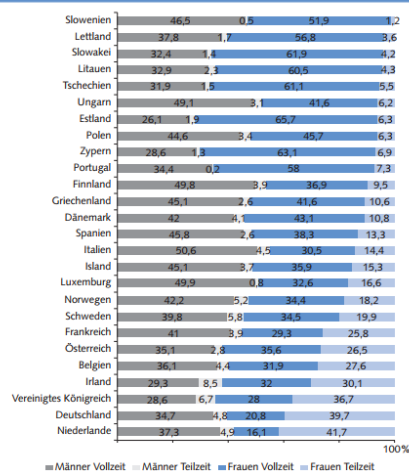
Low paid job - gender correlation?

Abb. 1: Niedriglohnbeschäftigte nach Geschlecht* – in % –



https://www.boeckler.de/wsimit_2011_10_george.pdf

Abb. 5: Niedriglohnbeschäftigte nach Beschäftigungsumfang* – in % –



Part-time jobs are less well paid

The Telegraph

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Business

Oct.19th, 2017

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Business

One in four people 'trapped' in low-paid jobs with 'little chance of escape'

“Young people, and particularly young women, are getting stuck on low pay and have little hope of finding a way out... be especially hard for young mums...low pay means an hour's childcare can cost more than an hour's wages.”

- Who makes those social rules? Who lets this happen? - State

Who is the state?

- German Home Secretary meeting – December 8th, 2017 – group picture



Replace Home secretary with Dean of German Medical School

Reasons lie deeper than in science

- Patriarchy
- Cultural preferences for male heirs
- Access to power is often limited for women
= cultivated, inherited patriarchy

General injustice towards women in today's society

Why are there (longer) lines only outside women's bathrooms ?



- Pictures we impose on young children, expectations we have
- Feeding aspirations



Girl's and Boy's Days

Girls'Day am 26.4.2018
Mädchen-Zukunftstag

What is STEM (Science Technology Engineering Math)?

Decide if a STEM education is right for your child



Though women now represent 47% of the workforce, as compared to 38% in the 1970s, only 12% of engineers are female.

Jungen-Zukunftstag
Boys'Day
26.4.2018

No job for a man? Meet the male midwives

Men have been allowed to work as midwives for three decades, but only around 100 do so and many expectant mothers remain unsure about having one for their birth. Theo Merz meets the men in a woman's world



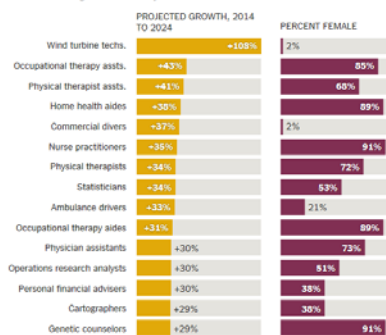
A female midwife said she was opposed to the idea of men 'mucking in' on one of the few women-dominated fields. Photo: Agency

Measures against

- Talk about general injustice
- Lived equality from the start
- Better support for single parents
- Equal and free access to educational resources
- Close career gaps due to childbirth
- Secure spots for woman in decision making panels
- No toleration everyday sexism

Women Are Gaining Jobs; Men Are Losing Them

With a few exceptions, the fastest-growing jobs are predominantly female, while the fastest-declining ones are mostly male.



Source: Bureau of Labor Statistics, PayScale.

Why Germany's New Quota for Women On Boards Looks Like a Bust

Gender imbalance Scientific Research

JCBFM Journal of Cerebral Blood Flow & Metabolism

J Cereb Blood Flow Metab 2012 Dec; 32(12): 2100–2107.
Published online 2012 Oct 3. doi: [10.1038/jcbfm.2012.141](https://doi.org/10.1038/jcbfm.2012.141)

PMCID: PMC3519418

Sex differences in stroke

Roy A.M. Haast,¹ Deborah R. Gustafson,^{2,3} and Amanda J. Kilian^{1,*}

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Abstract

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Sex differences in stroke are observed across epidemiologic studies, pathophysiology, treatments, and outcomes. These sex differences have profound implications for effective prevention and treatment and are the focus of this review. Epidemiologic studies reveal a clear age-by-sex interaction in stroke prevalence, incidence, and mortality. While premenopausal women experience fewer strokes than men of comparable age, stroke rates increase among postmenopausal women compared with age-matched men. This postmenopausal phenomenon, in combination with living longer, are reasons for women being older at stroke onset and suffering more severe strokes. Thus, a primary focus of stroke prevention has been based on sex steroid hormone-dependent mechanisms. Sex hormones affect different (patho)physiologic functions of the cerebral circulation. Clarifying the impact of sex hormones on cerebral vasculature using suitable animal models is essential to elucidate male–female differences in stroke pathophysiology and development of sex-specific treatments. Much remains to be learned about sex differences in stroke as anatomic and genetic factors may also contribute, revealing its multifactorial nature. In addition, the aftermath of stroke appears to be more adverse in women than in men, again based on older age at stroke onset, longer prehospital delays, and potentially, differences in treatment.

Keywords: epidemiology, gender, pathophysiology, risk factors, steroids, stroke

Biol Sex Differ. 2014; 5: 15.
Published online 2014 Oct 3. doi: [10.1186/s13293-014-0015-5](https://doi.org/10.1186/s13293-014-0015-5)

PMCID: PMC4360141

NIH initiative to balance sex of animals in preclinical studies: generative questions to guide policy, implementation, and metrics

Louise D McCullough,¹ Geert J de Vries,² Virginia M Miller,^{3,4} Jill B Becker,⁵ Kathryn Sandberg,⁶ and Margaret M McCarthy⁷

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Abstract

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In May of 2014, the NIH Director together with the Director of the Office of Research on Women's Health announced plans to take a multi-dimensional approach to address the over reliance on male cells and animals in preclinical research. The NIH is engaging the scientific community in the development of policies to improve the sex balance in research. The present, past, and future presidents of the Organization for the Study of Sex Differences, in order to encourage thoughtful discussion among scientists, pose a series of questions to generate ideas in three areas: 1. research strategies, 2. educational strategies, and 3. strategies to monitor effectiveness of policies to improve the sex balance in research. By promoting discussion within the scientific community, a consensus will evolve that will move science forward in a productive and effective manner.

Keywords: Gender, Sexual dimorphism, Sex differences

NIH policy on the consideration of sex as a biological variable. Anticipated changes to FY2016 research grant applications, to be in effect for FY2017 funding, will include accounting for sex as a biological variable in the Research Strategy section. In this section, applicants are asked to "explain how relevant biological variables, such as sex, are factored into research designs and analyses for studies in vertebrate animals and humans." Furthermore, "strong justification from the scientific literature, preliminary data, or other relevant considerations, must be provided for applications proposing to study only one sex." Anticipated changes to review criteria will include evaluation of the adequacy of the research plan with regard to consideration of sex as a biological variable.

But differences in male or females – it's complicated

- Estrogen and testosterone receptors throughout the human body

[Home](#) > [UCSF News Center](#) > [Estrogen Plays Key Role in Male Brain Development](#)

Estrogen Plays Key Role in Male Brain Development


By [Jeffrey Norris](#) on October 01, 2009



Not testosterone, but rather estrogen, the "female" hormone, is most directly responsible for the development of brain circuits in males that guide aggressive and territorial behaviors – at least in mice.

- Males are more likely to be diagnosed with autism, attention deficit disorder and Parkinson's disease, for instance.

Is there such a thing as gender discrimination against men?




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Depression in women: Understanding the gender gap

Products and services



Depression in women: Understanding the gender gap

About twice as many women as men experience depression. Several factors may increase a woman's risk of depression.

By Mayo Clinic Staff

Women are nearly twice as likely as men to be diagnosed with depression. Depression can occur at any age.

Some mood changes and depressed feelings occur with normal hormonal changes. But hormonal changes alone don't cause depression. Other biological factors, inherited traits, and personal life circumstances and experiences are associated with a higher risk of depression. Here's what contributes to depression in

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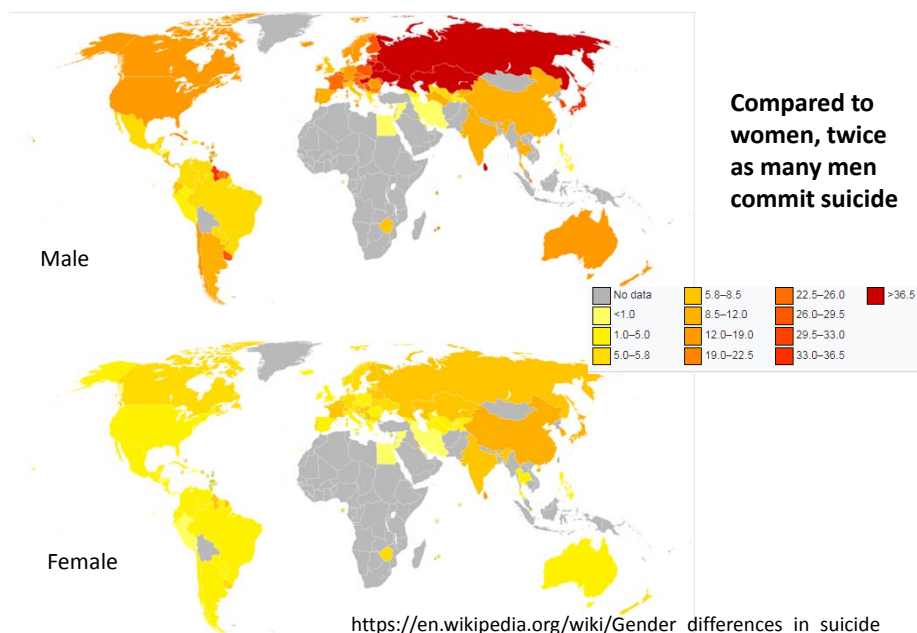
[4 Simple Steps to a Joy-Filled Life](#)
[NEW! Mayo Clinic Guide to Int](#)

Gender Differences

- Women experience depression at roughly twice the rate of men.[3]
- Girls 14-18 years of age have consistently higher rates of depression than boys in this age group.[5]

- Girls hit **puberty** earlier
- **Premenstrual problems**
- **Pregnancy** (unwanted, lack of social support, infertility, relationship problems)
- **Postpartum depression** (low self-esteem, anxiety, sleep problems, inability to care, problems daily functioning, change of social circle)
- **Life circumstances and culture** (status, work overload, sexual abuse)
- **Menopause** (weight gain, low self-esteem, anxiety, poor sleep, stressful life events)

Suicide completers



Media portrait of male suicide



Suicide Statistics

While this data is the most accurate we have, we estimate the numbers to be higher. Stigma surrounding suicide leads to underreporting, and data collection methods critical to suicide prevention need to be improved. [Learn how you can become an advocate.](https://www.afsp.org/about-suicide/suicide-statistics/)



- Men die by suicide 3.5x more often than women.
- White males accounted for 7 of 10 suicides in 2015.
- The rate of suicide is highest in middle age – white men in particular.

<https://afsp.org/about-suicide/suicide-statistics/>

ORIGINAL ARTICLE

Altered expression of glutamate signaling, growth factor, and glia genes in the locus coeruleus of patients with major depression

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Locus coeruleus gene expression alterations in major depression
 R Bernard et al

Table 1 List of demographical and clinical characteristics of included subjects

Diagnosis	Subject	Race	Age	Sex	PMI (h)	Agonal factor	Brain pH	Cause of death	Medication
MDD	2208	Caucasian	72	F	21	0	7.13	Suicide	Non-SSRI
MDD	2267	Caucasian	19	M	18	0	7.11	Suicide	No
MDD	3064	Caucasian	46	M	27	0	6.91	Sudden med. cond.	Non-SSRI
MDD	3169	Caucasian	35	M	24.75	0	7.04	Accident	Non-SSRI
MDD	3365	Caucasian	47	M	29	0	7.25	Suicide	No
MDD	3426	Caucasian	63	M	28.5	0	7.17	Sudden med. cond.	No
MDD	3031	Caucasian	49	M	27	0	7.19	Suicide	No
MDD	2315	Caucasian	58	M	24	0	6.93	Suicide	SSRI
MDD	2944	Caucasian	52	M	16	0	6.82	Sudden med. cond.	SSRI
MDD	3071	Caucasian	49	M	31	0	7	Unknown	SSRI
MDD	3168	Caucasian	39	M	27.5	0	6.79	Suicide	SSRI
MDD	3481	Caucasian	66	M	32	0	7.05	Sudden med. cond.	SSRI
BPD	2311	Caucasian	23	M	9	0	7.12	Suicide	Lithium
BPD	2466	Caucasian	26	M	19	0	6.92	Suicide	Lithium
BPD	3085	Caucasian	63	M	40	0	6.87	Accident	No
BPD	3241	Caucasian	59	M	15.5	0	6.99	Sudden med. cond.	Lithium
BPD	2566	Caucasian	56	F	29	0	6.83	Suicide	No
BPD	3079	Caucasian	32	M	23.75	0	6.94	Suicide	SSRI

Abbreviations: BPD, bipolar disorder; F, female; M, male; MDD, major depressive disorder; med. cond., medical condition; PMI, post-mortem interval; SSRI, selective serotonin reuptake inhibitor.
 Averages \pm s.e.m. are: age—control (50.7 ± 5.6), MDD (49.6 ± 4.2) and BPD (43.2 ± 7.4); PMI—control (20.0 ± 1.3), MDD (25.5 ± 1.4) and BPD (22.7 ± 4.4); pH—control (6.94 ± 0.04), MDD (7.03 ± 0.04) and BPD (6.95 ± 0.04).

News > Psychiatry

Higher Depression Rates in Women a Myth?

Fran Lowry

August 29, 2013

Original Investigation

FREE

October 2013

The Experience of Symptoms of Depression in Men vs Women Analysis of the National Comorbidity Survey Replication

Lisa A. Martin, PhD¹; Harold W. Neighbors, PhD²; Derek M. Griffith, PhD^{3,4}

» Author Affiliations | Article Information

JAMA Psychiatry. 2013;70(10):1100-1106. doi:10.1001/jamapsychiatry.2013.1985

Conclusions and Relevance When alternative and traditional symptoms are combined, sex disparities in the prevalence of depression are eliminated. Further study is needed to clarify which symptoms truly describe men's experiences of depression.

The Legion Lonely

BY STEPHEN THOMAS

Over the past few decades, loneliness has reached almost epidemic levels, with men uniquely suffering its effects. How and why has isolation become such a threat?

- In the Chicago heat wave of Summer 1995, 739 people died; majority poor, old people who lived alone
- Census: twice as many old females lived alone in Chicago at the time
- Male victims of the heat wave outnumbered female by factor 2



<https://hazlitt.net/longreads/legion-lonely>