**EuroTech** Universities
Excellence in Science and Technology

# How to address

# gender and sex

## in Horizon Europe proposals

*A guide with examples from
the EuroTech Universities*

# What is gendered innovation?

**Gendered innovations** harness the creative power of sex, gender, and intersectional analysis for innovation and discovery.

Considering these approaches may add valuable dimensions to research. They may take research in new directions.

*References:*
*Tannenbaum, C., Ellis, R.P., Eyssel, F. et al. Sex and gender analysis improves science and engineering. Nature 575, 137–146 (2019).* *https://doi.org/10.1038/s41586-019-1657-6*

*European Commission, Directorate-General for Research and Innovation, Gendered innovations 2: How inclusive analysis contributes to research and innovation : policy review, Publications Office, 2020,* *https://data.europa.eu/doi/10.2777/316197*

# Why is it important?

- Understanding sex and gender in research and innovation allows us to address the diverse needs of people.

- It enhances the societal relevance of the knowledge, technologies and innovations produced and contributes to the production of greater goods and services.

- Integrating this gender dimension is now a mandatory requirement in all research and innovation projects (excellence criterion) across Horizon Europe, unless a topic explicitly specifies otherwise. Hence, the applicants might lose or win some points depending on how well they address this criterion.

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## Horizon Europe Programme

Standard Application Form (HE RIA, IA)

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**Describe how the gender dimension (i.e. sex and/or gender analysis) is taken into account in the project's research and innovation content [e.g. 1 page].**

If you do not consider such a gender dimension to be relevant in your project, please provide a justification.

Note: This section is mandatory except for topics which have been identified in the work programme as not requiring the integration of the gender dimension into R&I content.

# Methods of sex, gender, and intersectional analysis

**Example #1**

## Fair Treatment with AI

**The Challenge**
Today, artificial intelligence (AI) and machine learning are increasingly being used in our healthcare system. Doctors and radiologists use, for example, algorithms to support the decisions they make when diagnosing the patient. The only problem is that algorithms can be just as biased and prejudiced as people because they are based on data from previous observations. For example, if an algorithm has seen more examples of lung diseases in men than in women, it will be better trained to detect lung diseases in men.

**Method/Approach**
The project will investigate bias and fairness in artificial intelligence in medical applications. The aim is to develop fair algorithms to help provide fair treatment to everyone in the public health service.

In the project, the researchers will, for example, analyse the demographic data of all Danes diagnosed with depression in recent years. The researchers will test a hypothesis that the data contains imbalances—for example in how often Danes are diagnosed and the type of treatment they receive, based on gender, age, geography, and income. The researchers will then examine how to develop a fair health algorithm.

**Conclusions**
The results of this project were not available yet at the time when this e-booklet was produced. Please contact Aasa Feragen, Professor, DTU Compute, afhar@dtu.dk or Jakob Eyvind Bardram, Head of Sections, Professor, DTU Health Tech, jakba@dtu.dk for further information.

DTU
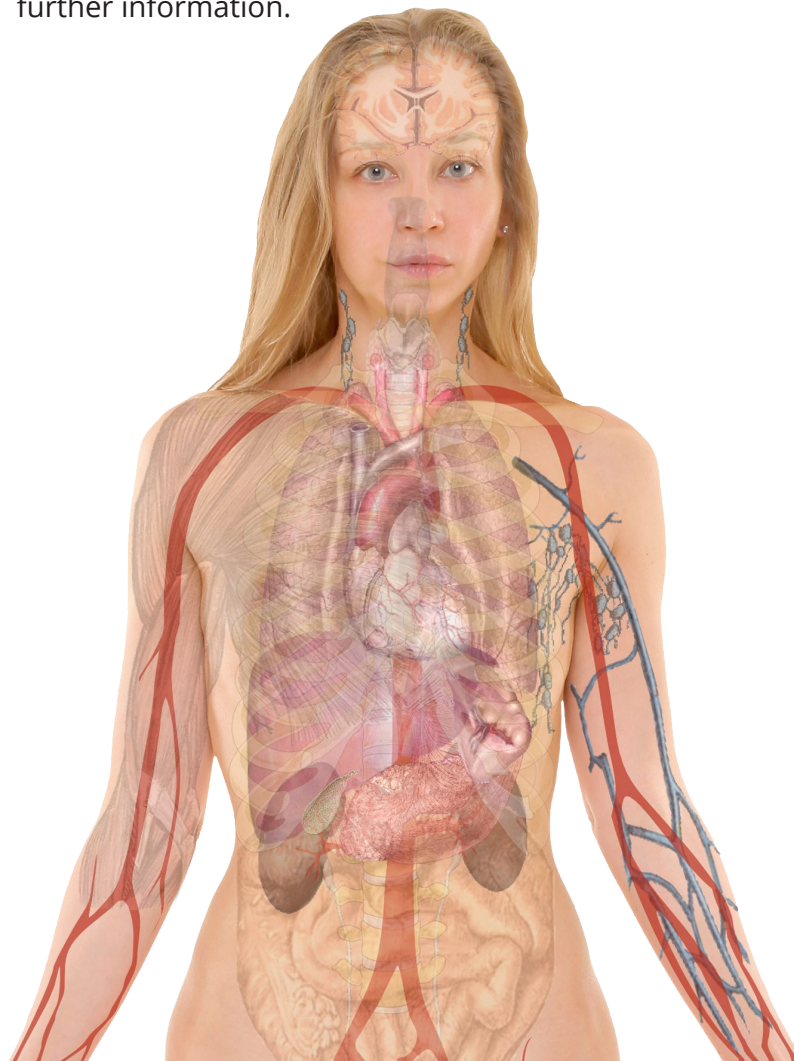
Example #2

# Gender differences in adaptation to heat in Spain (1983–2018)

## The Challenge

In Spain the average temperature has increased by 1.7 °C since pre-industrial times. There has been an increase in heat waves both in terms of frequency and intensity, with a clear impact in terms of population health. The effect of heat waves on daily mortality presents important territorial differences. Gender also affects these impacts, as a determinant that conditions social inequalities in health. There is evidence that women may be more susceptible to extreme heat than men, although there are relatively few studies that analyze differences in the vulnerability and adaptation to heat by sex.

## Method/Approach

An ecological time series study was carried out for the years 1983–2018 in 50 provinces that represent the administrative divisions of Spain. The variables of province code, year and sex were used (corresponding to men and women) for data classification and grouping.

Daily mortality data coded by all causes of death (ICD X: A00-R99) and according to sex occurred in each province during the period considered were used. The corresponding rates per 100,000 inhabitants were calculated from the daily mortality and population data. These data were provided by the National Statistics Institute (INE) through the agreement signed for the transfer of microdata.

With respect to the meteorological data corresponding to maximum daily temperatures, the data recorded for the maximum daily temperature corresponding to the reference observatories in each province were used. These data were supplied by the State Meteorological Agency (AEMET).

## Conclusions

MMT values were greater in men compared to women, which indicates greater vulnerability of women to high temperatures. Even though MMT increased for both sexes over time, the rate of increase in MMT was greater in women than in men. Therefore, we can say that women in Spanish provinces have better adapted to heat than men. The differences found were statistically significant.

On the other hand, the estimation of missing values for MMT permitted greater representativeness in the analysis, using more precise indicators.

Finally, due to the differences found in levels of adaptation in the different provinces, local level studies are needed in order to know which factors are keys to reducing social inequalities in health, and which therefore can allow for application of adaptation measures that include a gender perspective.

**Example #3**

# Isokinetic and Isometric Muscle Strength in a Healthy Population – with Special Reference to Age and Gender

## The Challenge

Muscle strength is an excellent indicator of general health when based on reliable measurements. Muscle strength data for a healthy population are rare or non-existent. The aim of the present study was to measure a set of normal values for isometric and isokinetic muscle strength for all the major joint movements of the body and, from these data, to create a basis for comparison of the muscle strength of an individual with the expected value in a normal population.

## Methods

A randomly selected group, aged 20–80 years, from the Copenhagen City Heart Study were studied. The group was subgrouped according to age and gender. Isometric and isokinetic muscle strength was measured in each subject across the main joints in the body. A statistical model was developed that encompassed the three main muscle groups: upper limbs, trunk and lower limbs.

## Conclusions

Muscle strength in healthy men decreases in a linear fashion from the age of 25 years down to between 54% and 89% at the age of 75 years, and seems not highly dependent on any other parameter than age. For women, the muscle strength is dependent on weight and is only related to age from around 40 years of age. The decrease in muscle strength from the age around 40 to 75 years is 48–92%. For most muscle groups, men are 1.5–2 times stronger than women, with the oldest men having strength similar to that observed among the youngest women.

**Example #4**

# Online Dating Quantification Practices: A Human-Machine Learning Process

The doctoral dissertation of Jessica Pidoux, entitled *Online Dating Quantification Practices: A Human-Machine Learning Process* addressed gender and sexuality questions from the perspective of algorithmic developing practices and the use of dating apps. Dr. Pidoux was co-advised by Prof. Daniel Gatica-Perez and Prof. Dominique Boullier.

Situated at the EPFL Digital Humanities Institute, an interdisciplinary setting of computer science and social sciences, the research applied concepts and methods from both disciplines to go in-depth in computing practices applied in matching systems and enquired the sociopolitical stakes around algorithms for finding a potential partner.

Through a quantitative analysis of user representations in almost 30 dating apps' graphical user interfaces for heterosexual and queer communities, the research showed how users' sexuality is coded into variables for assessing attractiveness, where imitation and counter-imitation dynamics for innovation are revealed in the technological industry. More specifically, the research revealed that women's body is coded based on heterosexual norms. The body is focused on upper attributes such as hair, eyes, breast, and waist, which eroticizes women based on stereotypes. Such diversity reduction shapes both dating apps' algorithmic matching outputs and how users evaluate their desirability for finding a date. However, while users engage to adopt the conventions coded by dating apps (e.g., for measuring, classifying, comparing profiles), users also build their own common knowledge about algorithms, which allow them to engage in offline practices instead of spending too much time online.

Finally, in a qualitative study of Tinder's matching system, the research showed specific coding practices in innovation patents of algorithms that amplify a patriarchal model in society where profiles of older and educated men are introduced more often to younger women with a lower education level.

*Link to Jessica Pidoux's doctoral dissertation:*
*https://infoscience.epfl.ch/record/288400?ln=fr*

EPFL

**Example #5**

# Combatting Diet Related Non-Communicable Disease Through Enhanced Surveillance (CoDiet)

## The Challenge

Unhealthy diets are associated with metabolic changes and increased risk of non-communicable diseases (NCDs). However, little is known about the dietary mechanisms that actually drive NCDs, and the tools used to collect dietary information are still inaccurate. There is also a lack of data among vulnerable groups, where NCDs are often over-represented. The EU-funded CoDiet project will address the knowledge gaps and develop a tool that will assess diet-induced NCD risk. Specifically, it will develop an enhanced method of dietary assessment using AI technologies. It will also develop a diet–NCD monitoring tool that will enable change in NCDs in response to diet to be monitored at the population level. The overall goal is to promote the uptake of an NCD-protective diet at a population level.

## Methods

CoDiet aims to explore the differences in gender, economic status and ethnicity effect on the response to diet and the biology behind these differences. The importance of sex is highlighted by observations men and women not only engage differently in behavioural risk factors, but also have different risk factor trajectories for both behavioural and biological risk factors over the life-course. Significantly higher percentages of men than women in most age groups engage in behavioural risk factors for NCDs. Higher prevalence in biological risk factors is observed among women in the older age groups than in men, while generally there is lower prevalence in younger age groups of women than in men. The percentages of men and women with multiple risk factors increase with each age group, but the increase for women often is more drastic, causing the differences in percentages between men and women to lessen with each ascending age group. While the percentages of men with multiple risk factors typically double from the youngest to the oldest age groups, the increase in the percentages of women is from three to 11 times greater between comparable age groups.

The importance of disaggregation by sex and age becomes apparent when significant differences are found to be hiding in the aggregated percentages of risk factors for men and women. Importance of an in-depth gender analysis of existing sex-disaggregated data together with other variables in identifying NCD risk-factor differences not only between men and women, but also among men and women.

Many ethnicities NCD's are overrepresented in ethnic groups. This is interconnected with economic status. However, there is very little good quality dietary data that informs the role of nutrition in the excess representation NCD in many ethnicities. Similarly recent studies show overwhelming evidence that socioeconomic inequalities in health exist in the region and that the poor are

disadvantaged in terms of self-rated health status, mortality, noncommunicable disease, health behaviours and access to health care. CoDiet will ensure that sex, economics and ethnicity are explored as part of the central drive for the project.

**Conclusions**

This project has started 1st of January 2023 and will end 31st of December 2026. Please follow this link [https://cordis.europa.eu/project/id/101084642] to access the results closer to the project's end date.

**Example #6**

# Antimicrobial Nanostructured Biomaterials for Complex Wound Healing (NABIHEAL)

## The Challenge

Complex wounds are a global health problem with significant impact on the health care economy. In developed countries alone, they impact the quality of life of more than 2% of total population. Complex wounds, including chronic wounds or major burns, are highly susceptible to microbial infection and biofilm formation, and difficult to treat. Moreover, silver is a widely used metal in antimicrobial products to treat wound infections. However, silver-based products are expensive, and show several drawbacks due to costs, as well as environmental and safety concerns.

The NABIHEAL project will develop multifunctional biomaterials, from proof-of-concept (TRL 3) to the preclinical regulatory stage (TRL 5), to improve wound management. The resulting biomaterials will enable affordable treatment of wound infections or prevention of complications during all phases of the wound healing (WH) process.

In the short and medium term, NABIHEAL will develop at least two innovative multifunctional wound-healing biomaterials, using affordable EU-based manufacturing technologies. In the long term, NABIHEAL could become a game-changing alternative to silver in wound-healing dressings.

A consortium comprising 5 SMEs and 9 academic institutions, with expertise in wound healing product development, evaluation and commercialization, nanotechnology, safety, and regulatory affairs, will join forces to address these ambitious objectives.

## Methods

Analysis of sex and gender in complex WH and infection processes: Complex wounds affect both men and women, however, WH times can be different depending on sex. In terms of sex and gender dimension, several studies reported differences in WH and infection between males and females. In terms of wound healing, these studies pointed out that sex steroid hormones (estrogens and androgens), play a pivotal role in skin maintenance of homeostasis, e.g., modulating effects on inflammation and immune response. Overall, androgens promote local inflammatory responses and lengthen healing time, whereas estrogens exhibit anti-inflammatory effects and shorten healing times, having androgens and estrogens broadly opposite effects on healing. However, these observations were potentially tissue dependent: whereas healing of acute skin wounds tends to be more slowly in males, healing of mucosal wounds, by contrast, is reported to be more slowly in females. In a similar way, since sex hormone quantities vary significantly with age, wound healing progress can depend on age.

Therefore, a sex and gender dimension to the project will be incorporated in terms of:

- Analysis of sex: Females and males will be included in all stages of the biomaterial development, from early cell, tissue, and animal testing to human clinical trials. It will allow to understand if there are sex differences in efficacy, toxicity, and safety, and to adapt, when necessary, for sex-specific treatment. Although not every experiment needs to be designed

to evaluate sex differences, the sex of the tissues and cells will be noted and reported for every experiment (WP3 and WP5), to ensure that experiments are reproducible and that findings (in one sex) are not overgeneralised (to the other sex). The same principle will be carried out in lab animal research, and the sex of each animal will be noted and reported for every experiment (WP3 and WP5).

- Analysis of gender: Gender influences the development of cells and tissues before they are removed from a donor. Therefore, when using ex vivo models coming from human donors (WP3 and WP5), the gender of human skin explant's donor will also be noted and reported, as far as possible.

- Influence of sex and gender in signalling: Biological mechanisms, such as sex hormones, influence the nervous and immune systems and thus the signalling, perception and expression of pain, and response to treatment of it. Gender roles and norms also influence pain. Studying the underlying biological mechanisms of pain in female-typical bodies and male-typical bodies. A better understanding of the influence of biological sex on the nervous and immune systems might help researchers design sex-specific pain treatments.

Therefore, NABIHEAL research and innovation activities will explore, analyse, and respond to possible sex and gender differences, incorporating the gender dimension into research content. NABIHEAL will generate and use in vitro and in vivo data from animals of both sexes and use ex vivo tissues from male and female patients. Principles of gender medicine will be included in all tasks. Thus, gender differences in sensitivity, gender specific variables such as sex hormones influence in wound healing impairment, or selection and cut-off values of biomarkers will be evaluated. Overall, sex and gender analysis integration into research and innovation will add value to the research and increase the societal relevance of the project and the potential results.

## Conclusions

This project has started 1st of January 2023 and will end 31st of December 2026. Please follow this link [https://cordis.europa.eu/project/id/101092269] to access the results closer to the project's end date.

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of Technology

**Example #7**

# Novel Health Care Strategies for Melanoma in Children, Adolescents and Young Adults (MELCAYA)

## The Challenge

In childhood, adolescence and young adults (CAYA), melanoma is under-studied, and non-existing tailored clinical guidelines and standardized approaches lead to a very low diagnostic accuracy. The MELCAYA project aims to understand risk factors and determinants of melanoma to improve the prevention, diagnosis and prognosis of melanomas in CAYAs through a strong international consortium with experts from 10 countries in different disciplines (e.g. dermatology, oncology, paediatrics, geneticists, epidemiologist, policymakers, engineers, ethics,...), and sectors (e.g. academic centers, SMEs, hospitals, patient associations).

MELCAYA will work on different approaches.

1) By integrating existing reference European cohorts and registries, studies of genetic and environmental risk factors and progression of melanoma in CAYA will be performed through different omic methods, and a novel taxonomy of CAYA melanoma will be generated.

2) MELCAYA will also develop image-based robust and trustworthy machine learning tools and a pan-European second-opinion platform for better diagnosis specifically designed for CAYA.

3) Moreover, the validation of minimally and non-invasive disruptive tools based on artificial intelligence and volatilomics detection from exhaled breath and skin will lead to earlier detection and more accurate prognosis of melanoma in CAYA.

4) Finally, through the evidence gathered, MELCAYA will design and implement public health strategies and will actively involve patients and the general population. The results of MELCAYA will maximize its impact by making its data and results accessible and re-usable through integration into UNCAN. eu. This action is part of the Cancer Mission cluster of projects on "Understanding".

## Method

European melanoma incidence rates are 1.2x higher in women, similar to the slightly higher female sex incidence in L/GCMN (male/female ratio 1:1.17-1.4). Also, there is a significant difference in the age of onset, and women have a higher risk of developing melanoma at young age (20-24). This prevalence could be related not only to sex (biology) but to gender (sociocultural behaviours and attitudes), e.g. young women are more likely to be exposed to ultraviolet radiation through tanning beds and sunbathing. The anatomical location of melanoma also differs between men and women, as women are more prone to get melanoma on the legs while melanoma in men is more often on the torso. In addition, the mortality rate is higher in men, while on the other hand, studies on immunomodulatory drugs show that men generally respond better to treatment.

Despite these known sex and gender-related differences, current guidelines do not consider these factors for any aspect of melanoma diagnosis and care in CAYA. In fact, at young age, gender is only very rarely considered in everyday clinical decision making. To overcome this, MELCAYA project

will consider sex assignment at birth based on genetics and morphology, and, if divergent from this sex assignment, gender (and any hormonal treatments), as declared by patients and their families, will also be used in order to distinguish any influential genetic or environmental factors on patient outcomes.

Furthermore, fertility, QoL, long-term toxicity and secondary cancer development of CAYA patients with advanced melanoma treated with anti PD-1 therapies will be considered under a gender point of view (WP4). Overall, the sex and gender-related implications of the research activities will be carefully evaluated throughout the whole duration of the project (Task 10.3). A balanced number of women and man will be included to understand how the risk factors affect the existing sex/gender patterns of the disease (WP1, 2, 4), and contribute to the reproducibility, and ultimately to the societal relevance of the results (WP7, 9). Also, to have sex/gender disaggregated data collection and statistics analysis will help to achieve future sex based personalised treatments for melanoma patients through in-depth understanding of sex and gender specific disease profiles (WP1). The amount of tissue samples obtained from patients will be balanced in order

to avoid any shortcut learning based on factors like skin thickness or amount of body hair (WP3). Importantly, AI-based algorithms for image analysis and diagnostic assistance tools for early detection will be carefully monitored to avoid any potential gender, racial and ethnic origin bias (WP5, 6).

**Conclusions**
This project has started in 2023 and will end 31st of December 2026. Please follow the link [www.melcaya.eu] to the project's website or this link [https://cordis.europa.eu/project/id/101092269] to access the results closer to the project's end date.

Example #8

# Robot's Gendering Trouble: A Scoping Review of Gendering Humanoid Robots and its Effects on HRI

**The Challenge**

Gendered design is common in machines and objects, for instance, in medical devices, as well as children's toys, and is oftentimes deemed necessary to accommodate individual differences and users' preferences. More often than not, however, gendered design is redundant and conducive of stereotypes and binary perspectives on gender (i.e., the understanding that gender includes only two discrete and opposite categories of female and male). The inherent binarism of gender has been heavily contested with the emergence of feminist and queer theory for its normative power and exclusionary potential. Gendered robots are a particularly interesting case of gendered design as their "gender" often derives from their humanoid shape, and is thus deeply entangled with the human body. There is still little knowledge about what exactly it means to "gender" a humanoid robot and how the gendering of robots impacts users' perception and interaction with them. In this scoping review, we are particularly interested in the emergence of the practice of gendering humanoid robots in Human-Robot Interaction (HRI) research to assess its feasibility and consequences and identify ways to move forward.

**Method**

In order to identify the papers to include in this scoping review, we performed an electronic search in the following databases: IEEE Xplore, Scopus, ISI Web of Science (WoS), PsycINFO, and Science Direct. We included 35 papers written between 2005 and 2021 in our scoping review. The papers obtained from the electronic search (N=553) were screened against the following eligibility criteria: (i) the papers were written in English, (ii) included the manipulation of at least two "genders" of the robot (e.g., studies including only female robots were excluded), (iii) manipulated the robot's genderedness through the same robotic platform (e.g., studies manipulating two "genders" but with different robotic platforms were excluded), (iv) focused on physical humanoid robots or virtual instantiations of humanoid robots, (v) did not focus on sex robots, and (vi) reported experimental results. As a result of the selection pipeline, we included 35 papers written between 2005 and 2021 in our scoping review. Out of these 35 papers, 7 were journal papers, 17 were full papers included in the proceedings of a conference, 10 were short papers included in the proceedings of a conference, and 1 was a workshop paper.

**Results**

The HRI scholarship most often manipulated the robot's genderedness through its voice, name, and facial features. These cues were mostly used in interactive studies enlisting the use of a physical robot. In the majority of cases the manipulation of the robot's genderedness with voice, name, and facial features yielded the expected results in terms of gendered perceptions (i.e., successful manipulation check). However, it often failed to produce a main effect of the robot genderedness on the dependent variables. The most successful gender cues in influencing people's perceptions of robots (those that elicited a significant main effect of the robot's genderedness on the dependent variables under study) were body proportions, and facial features. However, these cues

were used in picture-based studies, and it is not sure the results they yielded extend to more interactive study. From the exploration of the literature, we could also notice that the robot's genderedness was mostly successful in eliciting gender stereotypes of communion, agency and task preference/suitability, but did not yield notable significant effects on crucial HRI constructs, such as competence, likability, and acceptance. As such, we concluded that, while we as humans cannot help but gender objects and robots alike since we are part of highly gendered societies (at least in the Western part of the world), gendering robots has mostly negative effects (i.e., stereotyping) and does not improve social constructs crucial for the HRI, as it perhaps does with voice assistants.

**Conclusions**

In its conclusion, the paper identifies several gaps in the literature that warrant further investigation and proposes twelve guidelines that could improve the methodological soundness of HRI studies on gendered robots and their inclusivity.

*Perugia, G., & Lisy, D. (2022). Robot's Gendering Trouble: A Scoping Review of Gendering Humanoid Robots and its Effects on HRI. arXiv preprint arXiv:2207.01130.*

**TU/e** EINDHOVEN UNIVERSITY OF TECHNOLOGY

Example #9

# Relation between Gender and Concomitant Medications with Erythropoietin-Treatment on Wound Healing in Burn Patients

## The Challenge

Burns are leading causes of mortality and morbidity, including prolonged hospitalization, disfigurement, and disability. Erythropoietin (EPO) is a well-known hormone causing erythropoiesis. However, EPO may play a role in healing acute and chronic wounds due to its anti-inflammatory and pro-regenerative effects. Therefore, the large, prospective, placebo-controlled, randomized, double-blind, multi-center clinical trial "EPO in Burns" was initiated to investigate the effects of EPO versus placebo treatment in severely burned patients.

## Method

The primary endpoint of "EPO in Burns" was defined as the time elapsed until complete re-epithelialization of a defined split skin graft donor site. Additional analyses of post hoc defined subgroups were performed in view of the primary endpoint. The verum (n 45) and control (n 39) groups were compared with regard to the time it took for study wounds (a predefined split skin graft donor site) to reach the three stages of wound healing (re-epithelialization levels). In addition, the effects of gender (females n 18) and concomitant medications insulin (n 36), non-steroidal anti-inflammatory drugs (NSAIDs) (n 41), and vasopressor agents (n 43) were tested. Life tables were used to compare study groups (EPO vs. placebo) within subgroups. The Cox regression model was applied to evaluate interactions between the study drug (EPO) and concomitant medications for each re-epithelialization level.

## Conclusions/Results

Using our post hoc defined subgroups, we observed a lower chance of wound healing for women compared to men (in terms of hazard ratio: hr100%: 5.984 [95%-CI: (0.805–44.490), p = 0.080]) in our study population, regardless of the study medication. In addition, results indicated an earlier onset of re-epithelialization in the first days of EPO treatment (EPO: 10% vs. Placebo: 3%). Moreover, the interpretation of the hazard ratio suggested EPO might have a positive, synergistic effect on early stages of re-epithelialization when combined with insulin [hr50%: 1.307 (p = 0.568); hr75%: 1,199 (p = 0.715)], as well as a stabilizing effect on critically ill patients [reduced need for vasopressors in the EPO group (EPO: 44% vs. Placebo 59%)]. However, additional high-quality data from clinical trials designed to address these endpoints are required to gain further insight into these effects.

*Reference: Günter, C. I., Ilg, F. P., Hapfelmeier, A., Egert-Schwender, S., Jelkmann, W. W., Giri, S., … & Machens, H. G. (2022). Relation between Gender and Concomitant Medications with Erythropoietin-Treatment on Wound Healing in Burn Patients. Post hoc Subgroup-Analysis of the Randomized, Placebo-Controlled Clinical Trial "EPO in Burns ". Frontiers in Pharmacology, 2246.*

*Link: https://www.frontiersin.org/articles/10.3389/fphar.2022.812888/full*

Example #10

# Gender Differences in a German Fracture Liaison Service (FLS)

**The Challenge**

Osteoporosis is a disease that affects significantly more women than men (Hernlund et al. 2013; Kanis et al. 2005). However, male osteoporosis exists and the risk of complications as well as the mortality rate is even higher in men than in women. Nonetheless there is a notable gender difference in assessment and treatment rates to the disadvantage of male patients (Alswat 2017; Rinonapoli et al. 2021).

**Methods**

Fracture liaison services (FLS) are secondary care programs that aim to reduce the risk of future fractures in patients presenting with osteoporotic fractures. Funded by the LGL, 241 out of 507 contacted patients with osteoporotic fractures were recruited by the FLS of the interdisciplinary osteoporosis center (IOZ; head: Prof. Dr. Vanadin Seifert-Klauss) of the Technical University of Munich and followed up for one year.

**Results**

75,9% of the participants were female, 24,1% were male. No participants identified as non-binary in this study. The terms gender and sex are used synonymously.

With 31,1% of the female vs. 29,3% of the male patients presenting to the osteoporosis outpatient clinic, women and men attended the IOZ equally often, despite its location in the women's hospital basement. Thus the claim for gender-neutral osteoporosis-care was met by the FLS at the IOZ (IOZ-FLS) (Haasters et al. 2015). Another FLS in Canada came to similar results (Jaglal et al. 2012).

But there are also FLS that showed a lower participation rate for men (van den Berg et al. 2019).

Women had received a bone density measurement with dual-x-ray-absorptiometry (DXA) prior to FLS-attendance significantly more often than men (72,5% vs. 42,9%), which emphasizes the osteoporosis care gap of male patients in regular health care (Haasters et al. 2015; Khosla et al. 2008; Majumdar et al. 2008). Attending the IOZ-FLS led to an increase of DXA scans in the male patients and thereby to an alignment of osteoporosis assessment rates (57,4% of the women vs. 64,7% of the men received a DXA scan during participation). A Scottish FLS also showed such alignment between genders (McClellan et al. 2011).

Focusing on treatment rates prior to FLS-attendance, male sex was associated with lower basic treatment (consisting of vitamin D and calcium) rates as well as specific osteoporosis-treatment rates (basic therapy: 50,3% of the female vs. 28,6% of the male patients; specific therapy: 21,9% of the female vs. 10,9% of the male patients). These results on therapy rates are in line with the results of other studies (Sampl et al. 2011; Feldstein et al. 2003; Häussler et al. 2007). In our population, the intervention by the FLS resulted in an alignment of basic therapy rates between female and male attendees: 80,8% of the women and 79,4% of the men were under basic osteoporosis therapy during the participation, hence the difference between the sexes was no longer significant. This was not the case for the specific osteoporosis therapy: whereas the treatment rates in both males and females

increased, a difference still remained (51,2% of the women vs. 30,3% of the men). However, a French FLS also led to an alignment of specific therapy rates (Dehamchia-Rehailia et al. 2014). This might originate from a significantly lower age and more traumatic fractures in the male attendees at the MRI-FLS. These circumstances may have led to a lower estimation of the prospective fracture risk and consequently to a lower number of specific osteoporosis therapy administrations.

**Conclusions**
FLS have the potential to improve the secondary fracture prevention for all osteoporosis patients, but especially the treatment rates for male patients. Thus, FLS can support the process leading to a gender-neutral osteoporosis care.

*Reference:*
*https://mediatum.ub.tum.de/1637583*
*Brandhorst, H. (2022). Entlass-Management verbessern und Sektorengrenzen überwinden: warum ein ‚Fraktur-Liaison-Service (FLS)' sinnvoll ist (Doctoral dissertation, TU Munich).*

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