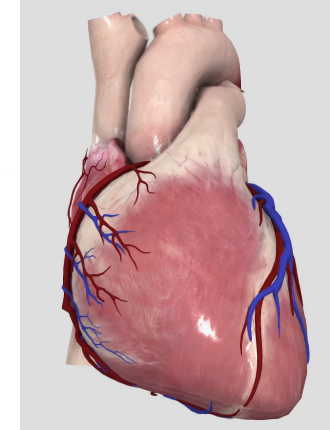




Hôpitaux  
Universitaires  
Genève



# Les maladies cardiovasculaires



# CARDIOVASCULAR DISEASE

## THE WORLD'S NUMBER 1 KILLER

Cardiovascular diseases are a group of disorders of the heart and blood vessels, commonly referred to as **heart disease** and **stroke**.



**18.6** deaths every year from CVD  
**MILLION**

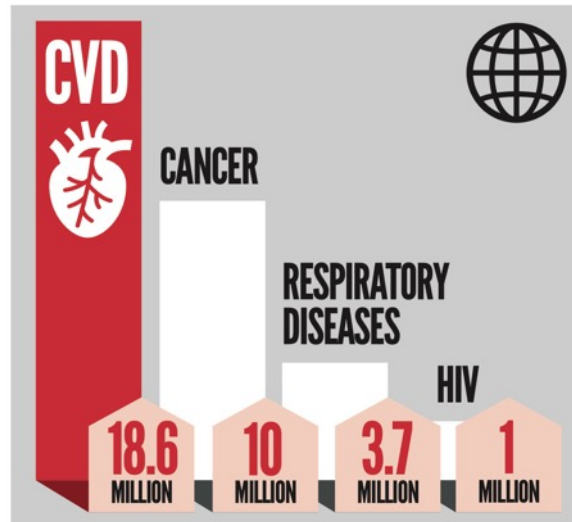


**33%** of all global deaths



**>75%** of CVD deaths take place in low- and middle-income countries

## GLOBAL CAUSES OF DEATH



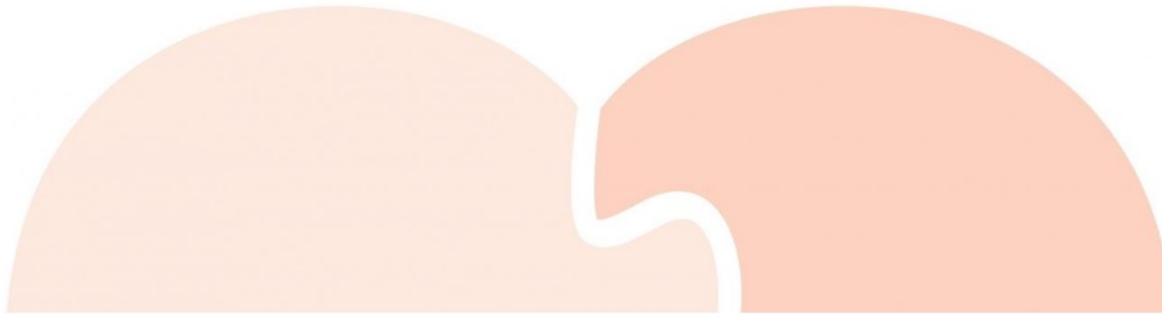


# HUG CARDIOVASCULAR CENTER (CV-Center)

n° 21 Octobre Décembre 2022 / Réseau de santé / Abonnement & newsletter / Impressum / **HUG** Hôpitaux Universitaires Genève

## Pulsations

Recherche par mots-clés



### Actualité

OCTOBRE 2021  
TEXTE: CLÉMENTINE FITAIRE  
PHOTOS: ISTOCK

## « Dès le début, j'ai été pleinement intégré aux décisions »

Faire bénéficier les patient-es des investigations diagnostiques et des traitements nécessaires dans les meilleures conditions et délais, voici la mission du Centre cardiovasculaire.



# MISSION of the HUG CV-Center

The HUG Cardiovascular Center is a center of excellence

The CVC ensures the best care by adapting to the individual patients needs and conditions.

All medical decision are following scientific recommendations and best medical practice guidelines and are based on multidisciplinary expertise supported by the academic and university environment.

Decision-making and rapid intervention are ensured by the 24/7 presence of the center's doctors.

The CVC multidisciplinary team meetings are open to all doctors who wishes to discuss and present a patient: including all HUG doctors and private GP, cardiologists and angiologists as well as to the medical team @CERN



Journée du cœur 2023  
Christoph Huber, CCV HUG



UNIVERSITÉ  
DE GENÈVE

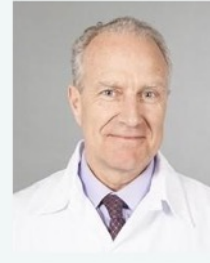


# COMITEE of the HUG CV-Center



**Pr Christoph Huber**

Chef du centre cardiovasculaire  
et  
Médecin-chef du Service de  
chirurgie cardiovasculaire



**Pr François Mach**

Médecin-chef du Service de  
cardiologie

**&TEAMS**



**Pr Marc Righini**

Médecin-chef du Service  
d'angiologie et d'hémostase



**Pr Pierre-Alexandre Poletti**

Médecin-chef du Service de  
radiologie

**Case Manager : Maryam Drame Drammeh**

**Secrétariat : Evelyne Omezere, [+41 \(0\)22 372 72 16](tel:+41223727216), [evelyne.omezere@hcuge.ch](mailto:evelyne.omezere@hcuge.ch)**



# HUG CARDIOVASCULAR CENTER



## INFO

Les colloques multidisciplinaires portent sur :

- ▶ les maladies des artères des membres inférieurs (lundi)
- ▶ les sténoses carotidiennes et le foramen ovale perméable (mardi)
- ▶ les maladies cardiaques pédiatriques (mercredi)
- ▶ la cardio-chirurgie - *Heart Team* (jeudi)
- ▶ les cas complexes (chaque 2<sup>e</sup> lundi du mois).



# Activities and Collaborations of the HUG CARDIOVASCULAR CENTER

**Journée mondiale  
du cœur**

L'innovation au  
cœur de la santé  
cardiovasculaire

**Vendredi  
29 septembre  
2023**

Ateliers, dépistage  
et conférences  
Entrée principale HUG,  
de 10h à 17h

CHARGE  
MINUTE COMPTE!  
144

**HUG** Hôpitaux  
Universitaires  
Genève

**WORLD  
HEART  
FEDERATION**

**SAVE A LIFE**

Fondation  
privée des  
**HUG**

<https://www.lemanbleu.ch/fr/Emissions/107676-AVC-et-sante-cardiovasculaire.html>



Journée du cœur 2023  
Christoph Huber, CCV HUG



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<https://www.hug.ch/centre-cardiovasculaire-hug>



https://www.hug.ch/centre-cardiovasculaire-hug

f t y in @ CONTRASTE CONTACT FRANÇAIS APPELER LE 144 SERVICES D'URGENCES

HUG Hôpitaux Universitaires Genève PATIENTS & VISITEURS PROFESSIONNELS DE SANTÉ RECHERCHE & FORMATION LES HUG

PATIENTS & VISITEURS

CENTRE CARDIOVASCULAIRE DES HUG



What's missing?

Listen to your 





Listen to your 

- Chest pain/oppression
- Shortness of breath
- Dizziness and loss of consciousness
- Palpitations
- Fatigue & lower limb oedema



Seek specialized medical advice



# Listen to your

Discomfort or tingling in arms, back, neck, shoulder or jaw



Sudden dizziness



Heartburn-like feeling

Most common IN MEN...

## Watch for

# THE SIGNS

Additional symptoms, most common IN WOMEN...



Cold sweat

Chest pain



Shortness of breath



Nausea or vomiting



Unusual tiredness



# Cardiovascular disease is the leading cause of death in women worldwide

**Cardiovascular disease (CVD) is the leading cause of death in women worldwide.**

Women with CVD continue to be under-diagnosed and under-treated due to misconceptions and lack of awareness among both patients and doctors.

Young women are more likely to die following a heart attack than young men.



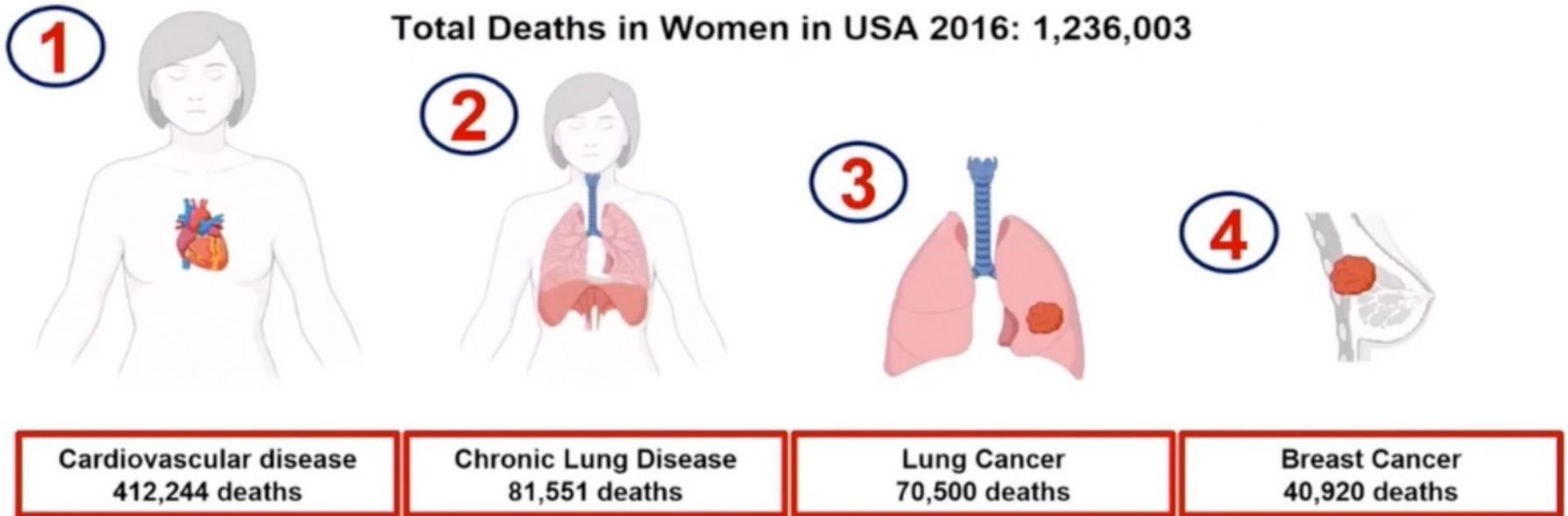
High blood pressure is the  
**number 1** risk factor for CVD  
in women





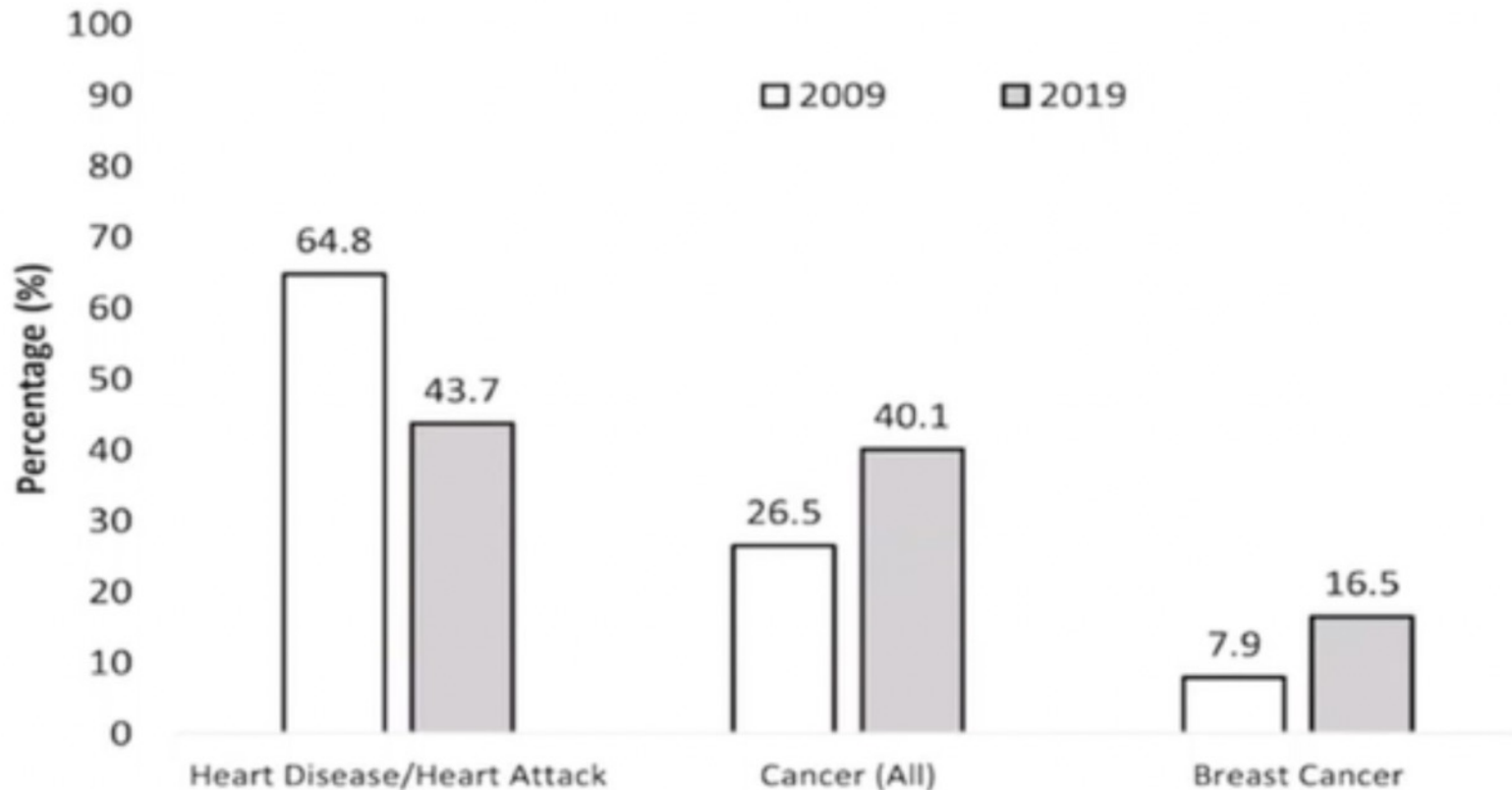
# Cardiovascular disease is the leading cause of death in women worldwide

Total Deaths in Women in USA 2016: 1,236,003





# Lack of cv risk awareness in women and awareness is further diminishing

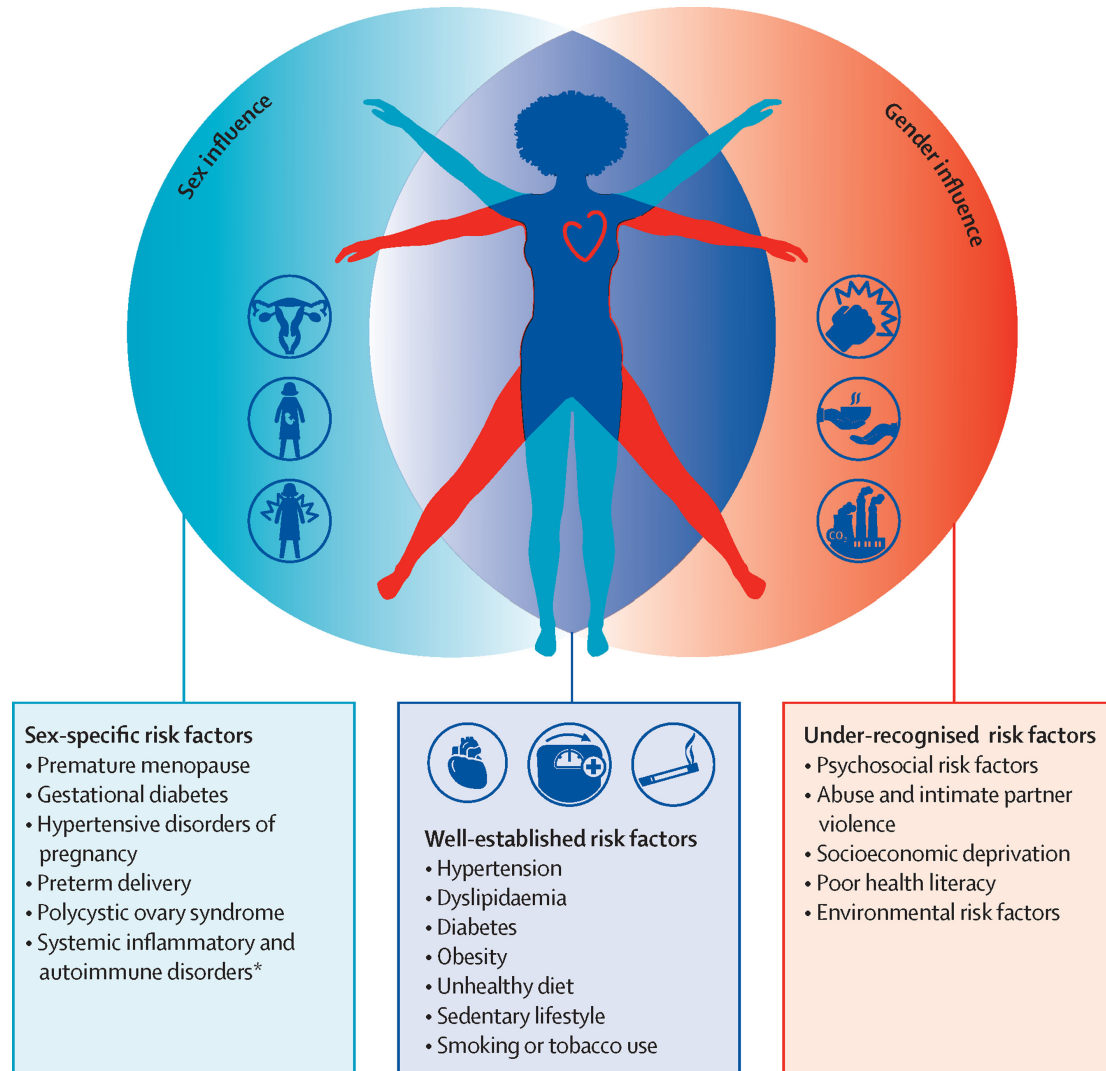


Benjamin EJ, Muntner P, Alonso A; American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. Heart Disease and Stroke Statistics-2019 Update: A Report From the American Heart Association. *Circulation*. 2019 Mar 5;139(10):e56-e528.





# Lack of cv risk awareness in women



# Higher risk of death among women with cardiovascular disease

10 years older @ presentation

More risk factors and co-morbidities @ presentation

CV consequences of diabetes mellitus more important

Higher risk of dying in the year following a myocardial infarction

Less likely to undergo dedicated cardiovascular exams

First presentation more often in an emergency setting

More frequent conservative treatment

Undervaluation of cardiovascular risk by the patient and her doctor

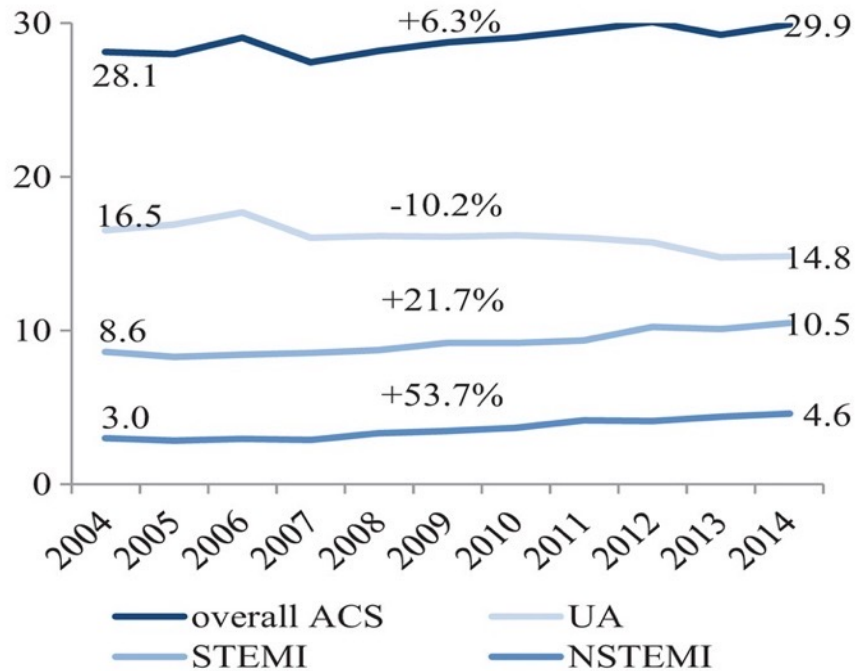
No-respect of best medical practice

Anatomical and physiological differences



# Increase of myocardial infarction in french women of less than 65 years of age

**A** Among French women aged under 65 years

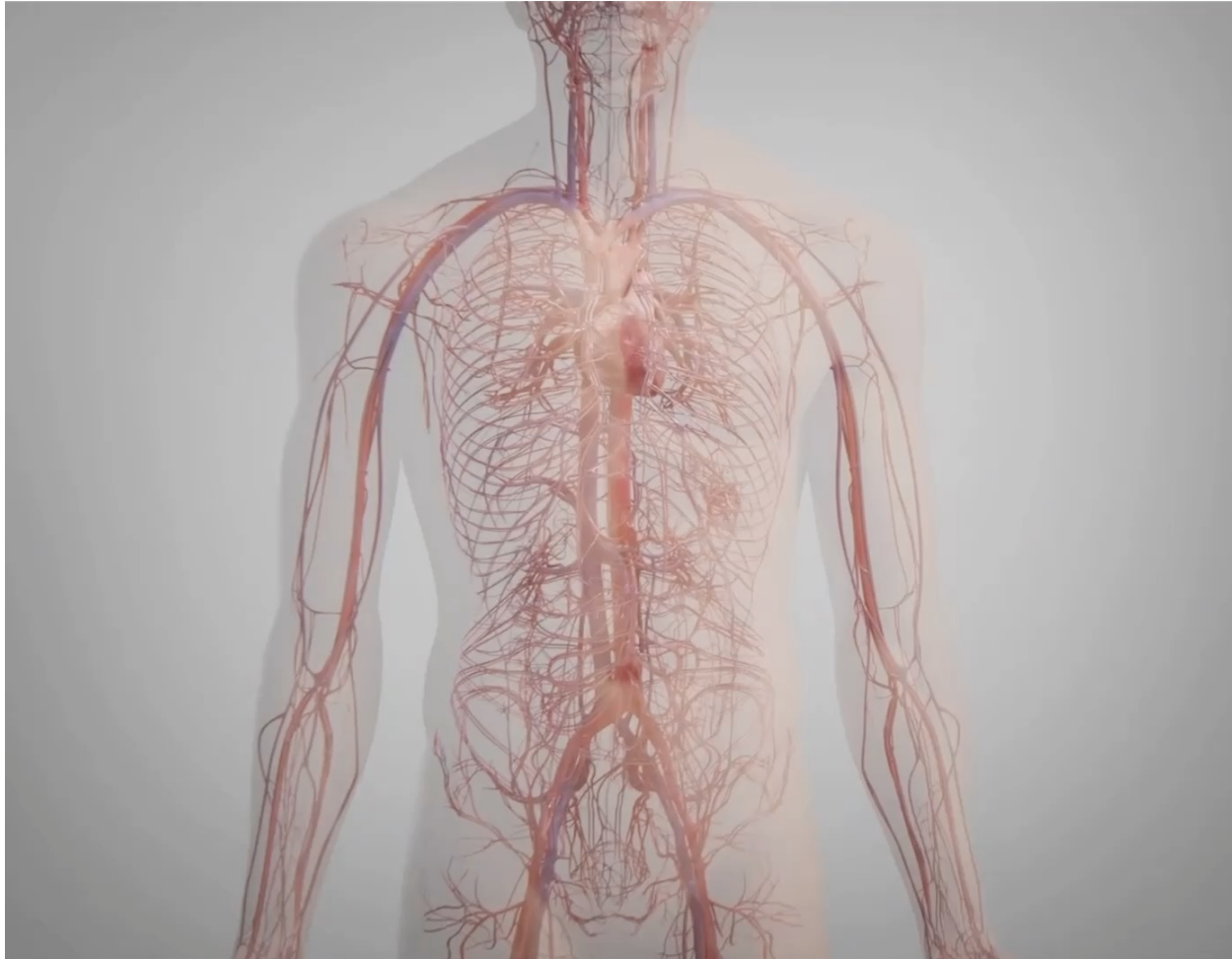


Highest increase observed in women between 45 and 65 years (+1.7%/year)

Gabet A, Danchin N, Juillière Y, Olié V. Acute coronary syndrome in women: rising hospitalizations in middle-aged French women, 2004-14. Eur Heart J. 2017 Apr 7;38(14):1060-1065.

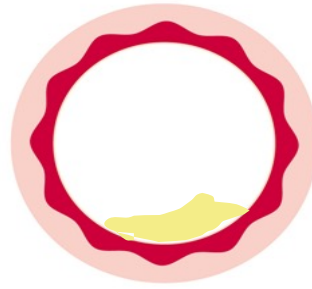
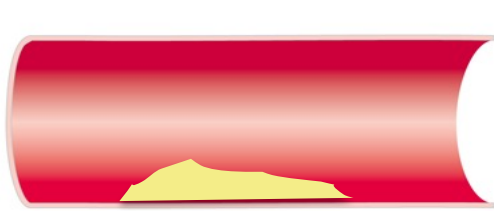


# Atherosclerosis

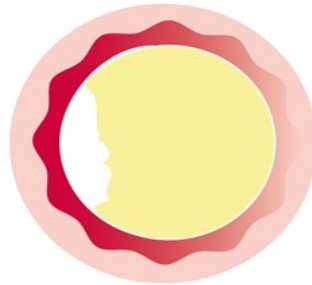
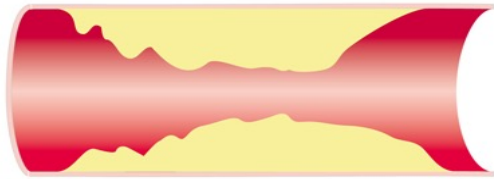




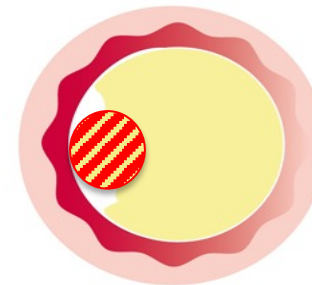
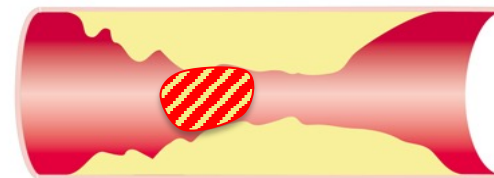
# From stenosis to occlusion



No symptoms  
stealth mode



Stable  
symptoms



Infarction






# With these steps you can help prevent CVD and reduce your lifetime cardiovascular risk:

- **Maintain a healthy diet:** A balanced and healthy diet that is low in saturated and trans fats, cholesterol, and sodium can help prevent CVD. Include plenty of fruits, vegetables, whole grains, and lean protein in your diet.
- **Exercise regularly:** Regular physical activity can help lower blood pressure, improve cholesterol levels, and reduce the risk of CVD. Aim for at least 150 minutes of moderate-intensity aerobic activity per week.
- **Maintain a healthy weight:** Being overweight or obese increases the risk of CVD. Losing weight through a healthy diet and regular exercise can help reduce this risk.
- **Don't smoke:** Smoking is a major risk factor for CVD. Quitting smoking is one of the best things you can do for your heart health.
- **Manage other health conditions:** High blood pressure, high cholesterol, and diabetes can all increase the risk of CVD. Managing these conditions through medication, lifestyle changes, or both can help reduce the risk.
- **Manage stress:** Chronic stress can contribute to the development of CVD. Managing stress through relaxation techniques, exercise, and other stress-reducing activities can help reduce this risk.
- **Get regular check-ups:** Regular check-ups with your doctor can help identify and manage risk factors for CVD.

**By taking these steps to prevent CVD throughout your lifetime, you can significantly reduce your risk of developing this serious and potentially life-threatening condition.**

# The next quantum leap in Cardiovascular Medicine

The background of the slide is a vibrant, futuristic digital landscape. It features a dark blue and black color palette with numerous glowing light trails in shades of cyan, blue, and white. These trails curve and flow across the frame, creating a sense of motion and depth. Interspersed throughout the scene are vertical columns of binary code (0s and 1s) in a light blue color, some appearing to float or fall like rain. The overall effect is one of high-tech, data-driven innovation.





# Digitalization to increase patient safety and quality of care

- *Almost 25% of the US healthcare budget is being wasted due to multiple factors such as lack of coordination, overtreatment or low-value care, complex administrative procedures, and failure to provide care.*
- *Cardiovascular diseases are the leading cause of death globally, taking an estimated 17.9 million lives each year.*

• Shrank, W. H., Rogstad, T. L., and Parekh, N. (2019). Waste in the US health care system: estimated costs and potential for savings. JAMA 322, 1501–1509.

• doi: 10.1001/jama.2019.13978

• [https://www.who.int/health-topics/cardiovascular-diseases#tab=tab\\_1](https://www.who.int/health-topics/cardiovascular-diseases#tab=tab_1)





# An app a day keeps the doctor away



# An app a day keeps the doctor away

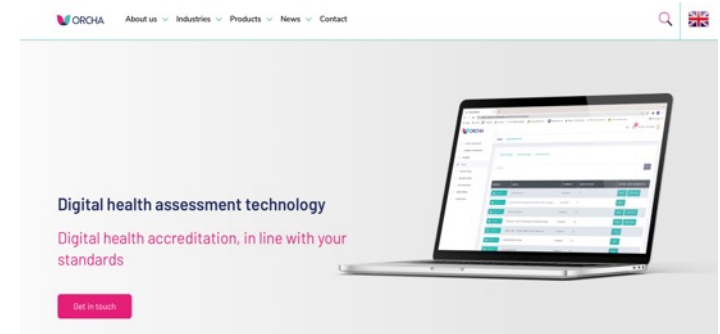
5Mio health app downloads/d

365'000 health app

only 20% meet eligibility criteria's

prescription for health apps instead of drugs?

Data generation by apps and governance – data ownership?



# Wearable devices



Krittanawong C, Rogers AJ, Johnson KW, Wang Z, Turakhia MP, Halperin JL, Narayan SM. Integration of novel monitoring devices with machine learning technology for scalable cardiovascular management. *Nat Rev Cardiol.* 2021 Feb;18(2):75-91. doi: 10.1038/s41569-020-00445-9.

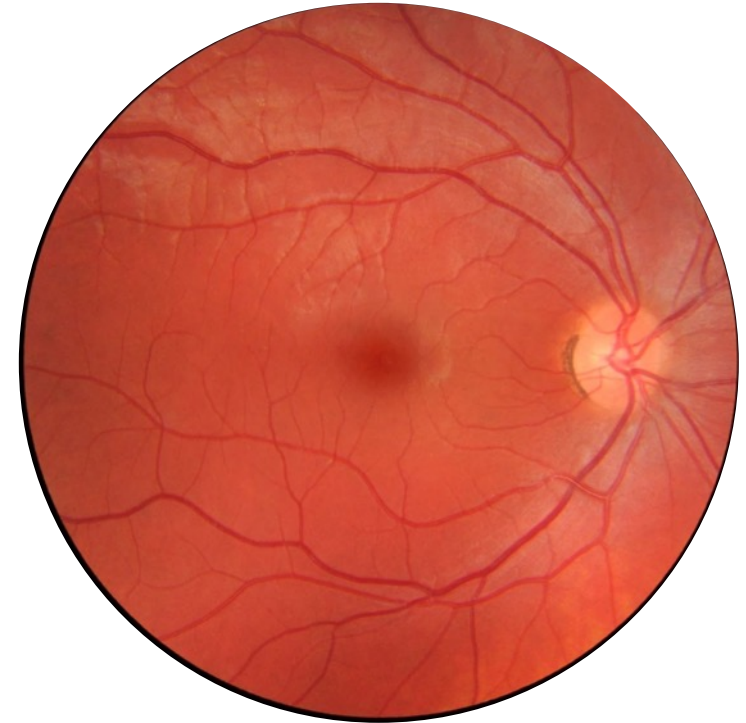


gender

# The retina @ AI

The best retina experts have a 50% chance to guess the gender of the patient. With AI the likelihood increases to 98%

AI can diagnose a large variety of early-stage disease like diabetes or artherosclerosis, kidney disease and Alzheimer's disease

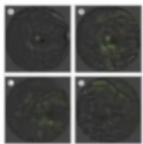


Actual: female  
Predicted: female

## What the Machine Sees in the Retina

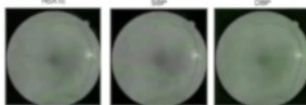


### Kidney Disease



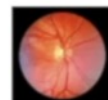
A deep learning algorithm to detect chronic kidney disease from retinal photographs in community-based populations  
*Lancet Digital Health* May 12, 2020

### Diabetes and Blood Pressure Control



Actual: non-diabetic Predicted: 6.7%  
Actual: 148.0 mmHg Predicted: 148.0 mmHg  
Actual: 78.5 mmHg Predicted: 80.8 mmHg  
Prediction of cardiovascular risk factors from retinal fundus photographs via deep learning  
March 2018  
biomedical engineering

### Alzheimer's Disease



A system based on AI will score the retina for signs of Alzheimer's  
AlzEye  
University of Cambridge

### Predicting course and intervention for AMD



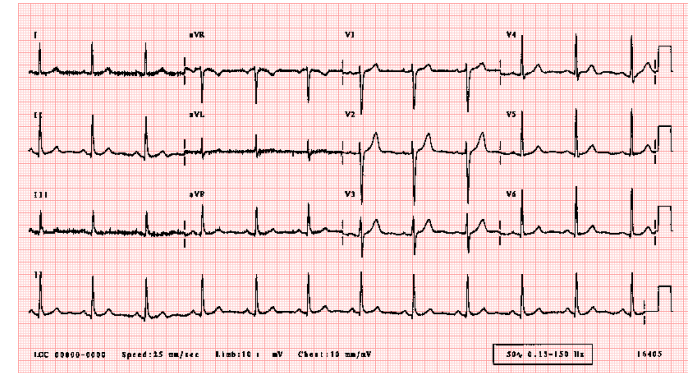
Predicting conversion to wet age-related macular degeneration using deep learning  
May 2020  
nature medicine




# ECG & AI

Cardiologist can diagnose many conditions by reading the ECG like infarction or arrhythmias.

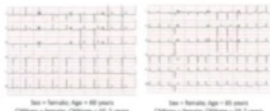
But AI can diagnose heart function, age and sex of the patients or anaemia and much more.




### What the Machine Sees in the ECG



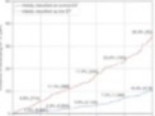
**Age and Sex**




**Anemia**



**Cardiac**



**Difficult Diagnoses**



**Age and Sex**

Screening for cardiac comorbidity distribution using an artificial intelligence-enabled electrocardiogram

**Cardiac medicine**

Atiba et al  
Jan 2019

**Anemia**

A deep learning algorithm for detect anemia with ECG: A retrospective, multicentre study

**Lancet Digital Health 2020;**  
2: e358-67

**Automated and Interpretable Patient ECG Profiles for Disease Detection, Tracking, and Discovery**

Wang et al  
Sep 2019



# Artificial intelligence assisted acute patient journey



Digital health tec  
Tel med  
Health monitoring  
Wearable devices  
Automated alert systems

Digital health tec  
Tel med  
Health monitoring  
Wearable devices  
Automated alert systems

AI/ML aided  
surgery

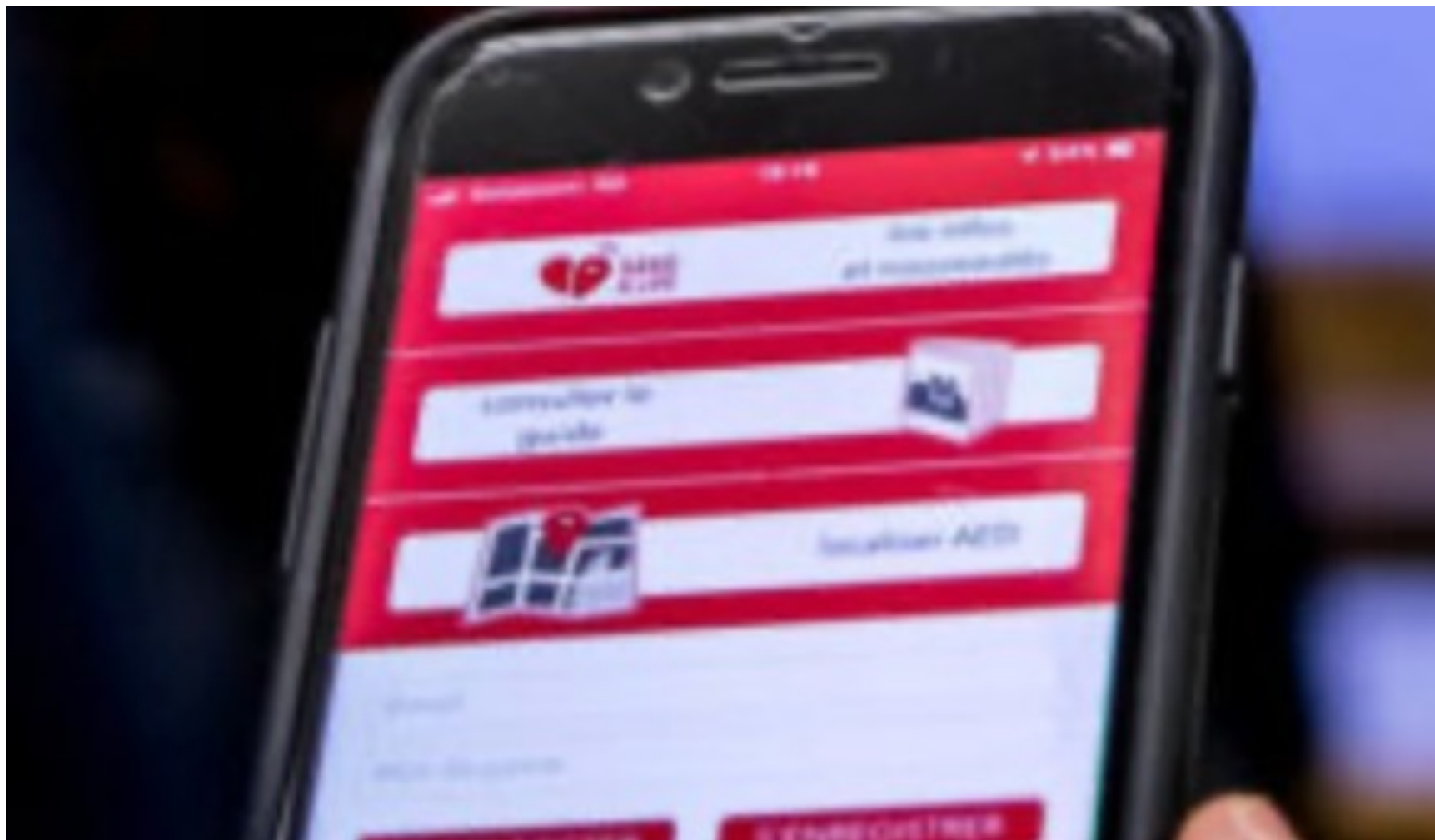
Improved use of diagnostic data  
Improved clinical documentation

Continuous  
clinical  
monitoring





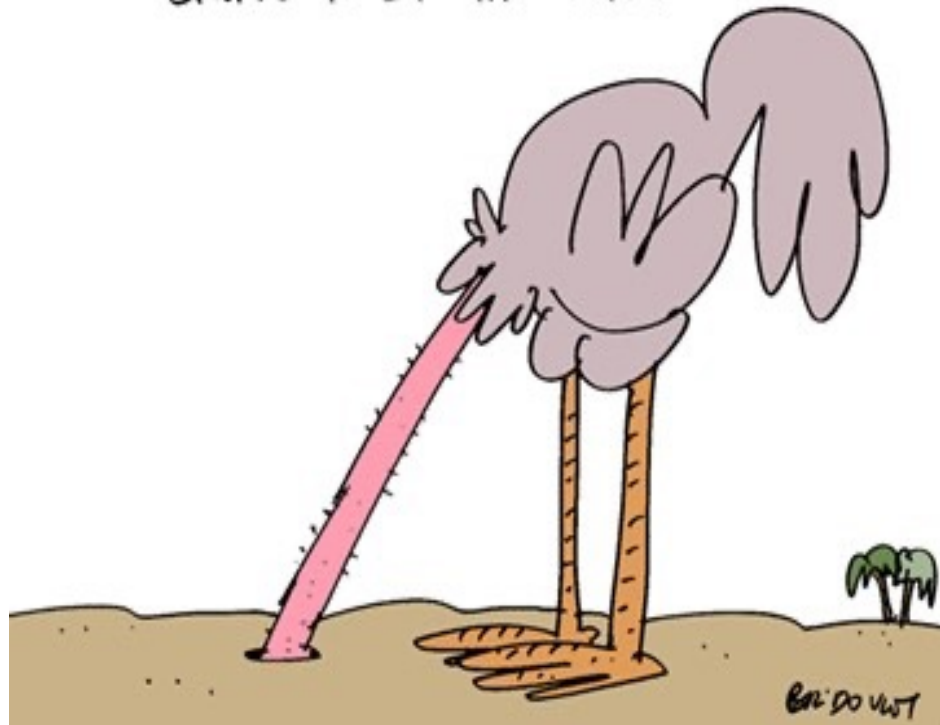
# Save a Life – app – Swiss emergency responders association





# No comments

JEU: UNE AUTRUCHE EST CACHÉE DANS CE DESSIN!  
SAURAS-TU LA TROUVER!??





# Take care of your heart health





# World Heart Day 29th September 2023 @ HUG



Created by the [World Heart Federation](#), World Heart Day informs people around the globe that CVD, including heart disease and stroke, is the world's leading cause of death claiming **18.6 million lives each year**, and highlights the actions that individuals can take to [prevent](#) and control CVD. It aims to **drive action to educate people** that by controlling [risk factors](#) such as [tobacco use](#), [unhealthy diet](#) and physical inactivity, at least 80% of premature deaths from heart disease and stroke could be avoided.



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# Evènements HUG



**SAVE A LIFE**



# WORLD HEART FEDERATION



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