'Corona' versus 'coronary'

The similarities and differences of CORONA virus and Coronary Artery Diseases are presented and discussed.

> 'Hello Mister Brown, in two days you will be admitted for your coronary angiography...'
>
> 'No, no, there must be a mistake. I do not have the coronavirus; I have just done the swab'.
>
> 'But, Mister Brown, this is different. As you know, we have to take a look at your coronary arteries'
>
> 'But why? I swear. I don't have coronavirus!'
>
> 'This has nothing to do with the virus; it is to prevent a possible heart attack!'
>
> 'Oh, my goodness, then I'll come. Thanks!'

This may not be an unusual conversation but rather a common misunderstanding. For sure, the words *corona* and *coronary* sound similar, particularly for patients on the phone at the present time of the coronavirus outbreak.

There is no doubt that the meanings of these two words are different. However, in a way, the above-reported telephone conversation refers to two distinct epidemics which, apart from the name, share similarities and differences warranting consideration.

The meaning of the word *epidemic*

Epidemic comes from the Greek language $\epsilon\pi\iota\delta\eta\mu\iota\alpha$. It means above (*or on top of*) people. In a medical context, an epidemic describes a sudden increase in the incidence and prevalence of a disease above its normal rate, affecting a large number of individuals and spreading worldwide or over a large area. Usually, but not exclusively, an epidemic refers to an infectious disease that affects, almost simultaneously, a given population with a sizeable distribution in time and space. Although epidemiologists consider epidemic outbreaks synonymous with epidemic, for the public, the latter has a more serious, often terrifying meaning, which is what is happening today for the coronavirus. The word *epidemic* also applies to non-communicable diseases, such as degenerative diseases, cancer, and cardiovascular diseases (CVD) which are responsible for the majority of deaths worldwide, much more than the COVID-19 outbreak, as shown in *Table 1*.

COVID-19 and cardiovascular diseases: similarities and differences

Both COVID-19 and CVD predominantly affect the elderly but can also occur in the young. Both are present worldwide. Both are the consequences of drastic cultural and social changes and ways of living. Both affect the whole society rather than a single individual but with a difference. COVID-19 is a communicable disease, and its outbreak requires immediate and drastic measures, such as a population lockdown along with all the related consequences including the economic crisis that will follow. This, of course, is immediately perceived by the whole society. The same is not true for CVD, which is perceived as a disease of a single person rather than a global problem although it is even a bigger global problem than COVID-19. Governments do not impose drastic measures to reduce the known causes of CVD. They simply suggest to patients how to prevent CVD. Paradoxically, measures to reduce risk factors for diabetes, obesity, and hypertension are less drastic than a lockdown and yet, would save significantly more lives!

The question is: why? Why are people more worried about COVID-19 than a CVD epidemic or other more deadly diseases? Mainly for three reasons: habits, knowledge, and care.

Table 1 Comparison of the worldwide impact of many diseases

	No. of deaths
COVID-19	≈700 000
CVD	≈10 400 000
Malignant neoplasms	≈5 200 000
Infectious and parasitic disease (other than COVID-19)	≈3 200 000
COPD	≈1 700 000
Road injury	≈817 000
Tuberculosis	≈754 000

COVID-19 data refer to the period from January to July 2020. The number of deaths from other diseases in the same period are calculated according the latest Global Health Estimates by the World Health Organization.
Sources: https://www.ecdc.europa.eu/en/covid-19-pandemic https://www.who.int/healthinfo/global_burden_disease/estimates/en/.
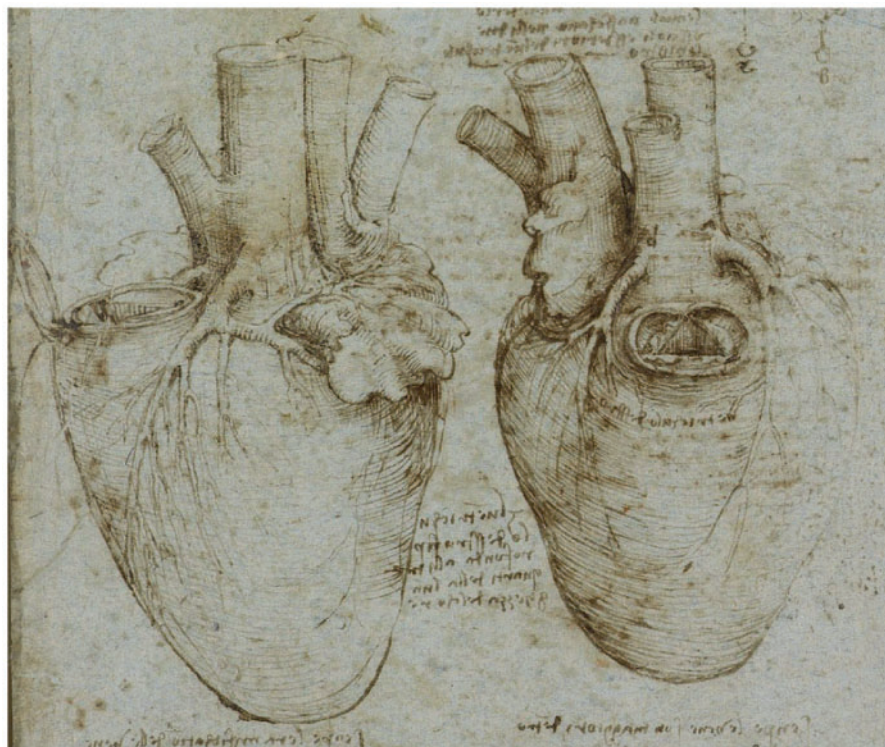
Figure 1 Leonardo Da Vinci. The heart and coronary vessels c.1511–13, K&P: Keele, K., and Pedretti C 1979. Leonardo da Vinci: corpus of the anatomical drawings in the Collection of Her Majesty the Queen at Windsor Castle. 4 vols, London. Public domain Wikimedia Commons.

Perception of COVID-19 and cardiovascular diseases: a matter of habits and knowledge

The (*ancient*) Egyptians had coronary artery disease and were aware of it[1]! The Medical Community has had ample opportunities to become accustomed and to study CVD for centuries. Our knowledge on the pathophysiology of CVD is quite advanced. We know the causes and how to prevent and treat CVD. Cardiologists often celebrate their success in treating CVD that have contributed for at least 7 years, to the 10-year-increase in life expectancy.[2] However, CVD have not been defeated but simply delayed, contributing to aging of the population, and CVD remain the first cause of death worldwide.

In one word, there is ample awareness of CVD. We are accustomed to their existence, we do accept them and, apart from some governmental impositions, such as the anti-smoking law, everyone is free to decide which *lockdown* to impose on oneself to control blood pressure, reduce weight, perform regular exercise, or go on a diet. In addition, contrary to COVID-19, CVD might have a genetic origin and people are resigned to an unfortunate heritage with little that can be done about it. Therefore, through the years, the community has learnt to accept the current epidemic of CVD. To be *affected* or to die from CVD is considered sad but expected and natural. Differently, we tend to believe that the spillover of a virus from animals to humans should not happen and when it does in a pandemic proportion, everybody is surprised and unprepared. This is the case of the COVID-19 outbreak.

It does not matter whether we have already experienced previous coronavirus epidemics: the MERS and the SARS.[3] We have not learnt how to treat or prevent them and, as soon as these epidemics become endemic in some areas, we have removed their existence and ignored that other spillovers could and, sadly, will happen. We know that a huge number of viruses live quietly in our body, not to mention, that in a glass of marine water there are more viruses and bacteria than in the entire animal world population and they could kill all of us in a few weeks. Basically, we do not realize that, on our planet, we are a transient, complex, and rather weird species. We accept CVD as the heart is a needed component of our species. But a virus from another animal is not and even worse, it is invisible.

Perception of COVID-19 and cardiovascular diseases: a matter of care

The Scientific Community is aware of CVD and is organized to deal with them. Networks of hub and spoke hospitals to treat myocardial infarction have been set up; guidelines for the best therapies are available as well as surgical and interventional methods to deal with CVD. The Cardiology Community has performed hundreds of trials to provide evidence-based solutions. The industry is interested in developing new—*and profitable*—tools and drugs for CVD. The opposite is true for the COVID-19 outbreak. Health systems across the world were

found to be unprepared to deal with this new, unknown disease. Despite the reaction of the scientific world is planetary with more than 2000 trials started in a few months, so far there are neither specific treatments nor vaccines. The virus and its effects remain unknown and shrouded in mystery. There is not a clear enemy to combat such as a coronary plaque or a leaking or stenotic valve (*Figure 1*). Psychologically, the unknown generates fear and anxiety. It follows that perception of the COVID-19 pandemic is worse than that of CVD although the consequences and the number of victims between the 2 are incomparable.

The COVID-19 outbreak, often concentrated in limited areas, has rapidly transformed individual undertakings to a *mass* scenario which is communicated daily in numbers of infected or deaths on television and social media with the result that everybody has lost sight, significance, and importance of every single death within an epidemiological forest of numbers. In front of this, the medical-scientific world remains stunned. It implodes, with a lack of ideas on how to react. The defence strategy consists of *hiding* and shutting down society, despite the knowledge that this cannot last, and the price might be even higher than the disasters caused by the virus which, in any case, are significantly less than those of other epidemics, as the one of CVD. However, CVD does not reach the interest of the media. We are simply used to it.

Two epidemics at the same time are too much: *the collateral damage*

Emphasis on COVID-19 has created concerns about contracting the infection during a hospital stay, ultimately causing a series of collateral damages.[4] This is true for all diseases, but particularly so for CVD and more specifically, for acute coronary syndromes (*ACS*), a time-dependent pathology.

All over Europe and the USA, during the early days of the epidemic, fewer patients reached the hospitals for ACS and...ACS were not prevented by the coronavirus, despite the proposal that the lockdown had results in less stress and therefore, less ACS or infarcts. This is not true, actually, the opposite may be true: less exercise, fewer laboratory, or other tests and probably more weight gain is likely to increase rather than decrease ACS during a lockdown.

But, more than anything else, the anxiety generated by the *unknown* and the fear of acquiring SARS-COV-2 infections in the hospitals has prevented patients from seeking effective medical interventions, compromising CV care. The results are more sudden cardiac death, more complications of acute myocardial infarction (*often experienced at home*), more heart failure, and, eventually, more deaths.[5,6] Therefore, actually, the COVID-19 outbreak has negatively affected CVD by shifting the attention of patients like Mr Brown from his coronary problems to those related to the new coronary virus. Sorry *corona* not *coronary* virus! This is where the confusion lies.

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References

1. Ferrari R, Pavasini R, Camici PG, Crea F, Danchin N, Pinto F, Manolis A, Marzilli M, Rosano GMC, Lopez-Sendon J, Fox K. Anti-anginal drugs-beliefs and evidence: systematic review covering 50 years of medical treatment. *Eur Heart J* 2019;**40**:190–194.
2. Ferrari R, Ferrara I. Introduction: why and how do cardiologists need to take an interest and lead prevention programmes? *Eur Heart J* 2017;**38**:3255 3257.
3. Ferrari R, Di Pasquale G, Rapezzi C. 2019 CORONAVIRUS: what are the implications for cardiology? *Eur J Prev Cardiol* 2020;**27**:793–796.
4. Onder G, Rezza G, Brusaferro S. Case-fatality rate and characteristics of patients dying in relation to COVID-19 in Italy. *JAMA* 2020;**323**:1775–1776.
5. Baldi E, Sechi GM, Mare C, Canevari F, Brancaglione A, Primi R, Klersy C, Palo A, Contri E, Ronchi V, Beretta G, Reali F, Parogni P, Facchin F, Bua D, Rizzi U, Bussi D, Ruggeri S, Oltrona Visconti L, Savastano S. Out-of-hospital cardiac arrest during the Covid-19 outbreak in Italy. *N Engl J Med* 2020;**383**:496–498.
6. De Rosa S, Spaccarotella C, Basso C, *et al* et al Reduction of hospitalizations for myocardial infarction in Italy in the COVID-19 era. *Eur Heart J* 2020;**41**:2083–2088.

Roberto Ferrari MD
Corresponding author
Chair of Cardiology, Azienda
Ospedaliero-Universitaria di Ferrara,
Ospedale di Cona, Via Aldo Moro 8,
44124 (Cona),Ferrara, Italy.
Centro Cardiologico Universitario di Ferrara,
Maria Cecilia Hospital, Cotignola (RA), Italy
Email: fri@unife.it
Telephone: +39 0532 239882

Prof. Claudio Rapezzi
Centro Cardiologico Universitario di Ferrara,
University of Ferrara, Ferrara, Italy.
Maria Cecilia Hospital, Cotignola (RA), Italy
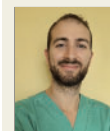
Dr Paolo Cimaglia.
Maria Cecilia Hospital,
Cotignola (RA), Italy

Heart Failure 2019

Insights From the National Society of Cardiology Journals

Introduction

Most studies on heart failure (HF) management published in 2019 by high-ranking impact factor international journals focus on drug therapy. This included administration of sacubitril-valsartan with initiation during the index admission and the benefits of SGLT2 inhibitors in reducing cardiovascular mortality and HF. Most of these studies, targeting a broad readership, fail to characterize important local issues.