# A relative or absolute fear of death?


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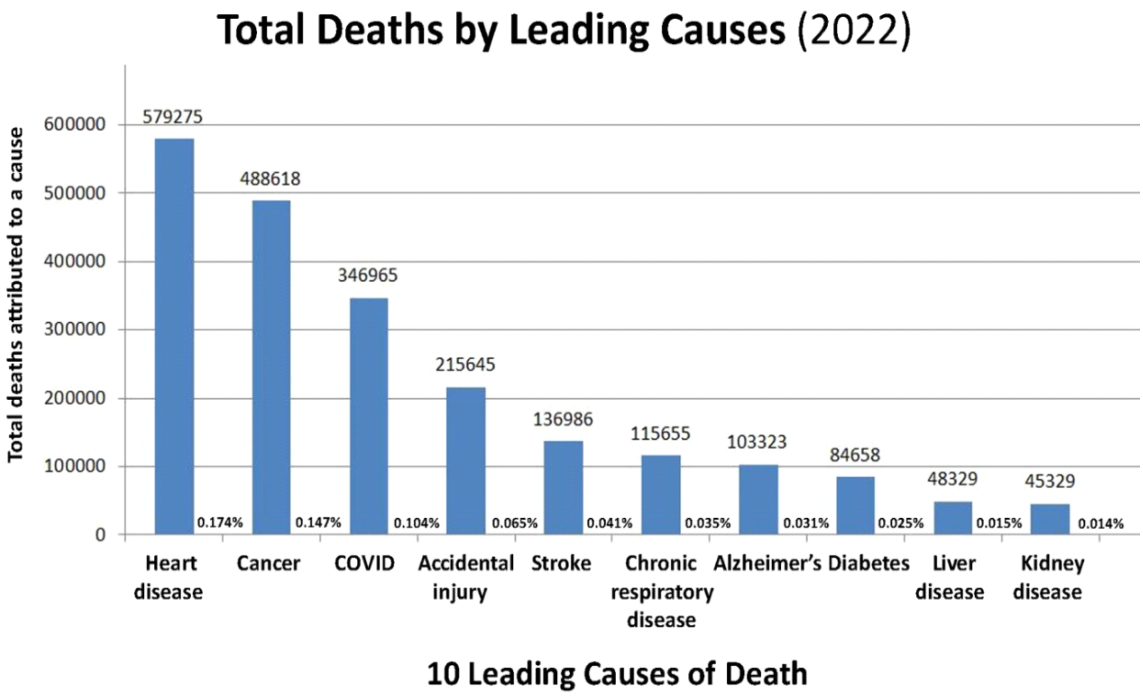
Everything in science and medicine media seems to be about "risk", a number derived from a complex set of statistical procedures that compare the changes in measures associated with a particular pathology or cause of death. If you look at government, pharmaceutical industrial, and medical industrial media and advertisements, the use of risk data is specifically intended to be alarming, to be frightening, to be sufficient to prompt action from the public or an individual. It is quite common to see media (*print and video*) regaling us with the dastardliness of the top ten causes of death. We generally barely pay any attention to these outlets, and we often do nothing with that information … especially if we don't feel sick or inconvenienced by our present physical status.

Death, however, is a real concern as risk of death is always present throughout every second, minute, hour, day, month, and year of life. Should we be afraid? Should we be stressed about it? Should we listen to the "experts"? Should we actually do anything about our own personal "risks"? Can we do anything?

First, let's discriminate between two terms of relevance; "relative risk" and "actual occurrence". Relative risk is a statistical procedure that correlates peripheral issues and phenomena with past changes in death rate. Basically, researchers investigating relative risk are looking for conditions that seem to be present more frequently in those who die versus similar individuals who survive. Relative risk is often presented as a percentage, intended to show that a research variable that is present, or, that a change of X units in that variable is correlated to mortality rates. This is where we get the outlandish statements in the media, "X causes a massive percent increase in likelihood of death". Relative risk makes for good headlines as very small absolute changes in very low frequencies of occurrence can be statistically presented in very large numbers or percentages – an amplification of a message of danger. While every death is tragic and we are all on a mission to improve survival rates, relative risk data is used to make the likelihood of an individual's death from some associated factor, not a causative factor, appear to be much greater than reflected in absolute, actual occurrence rates.

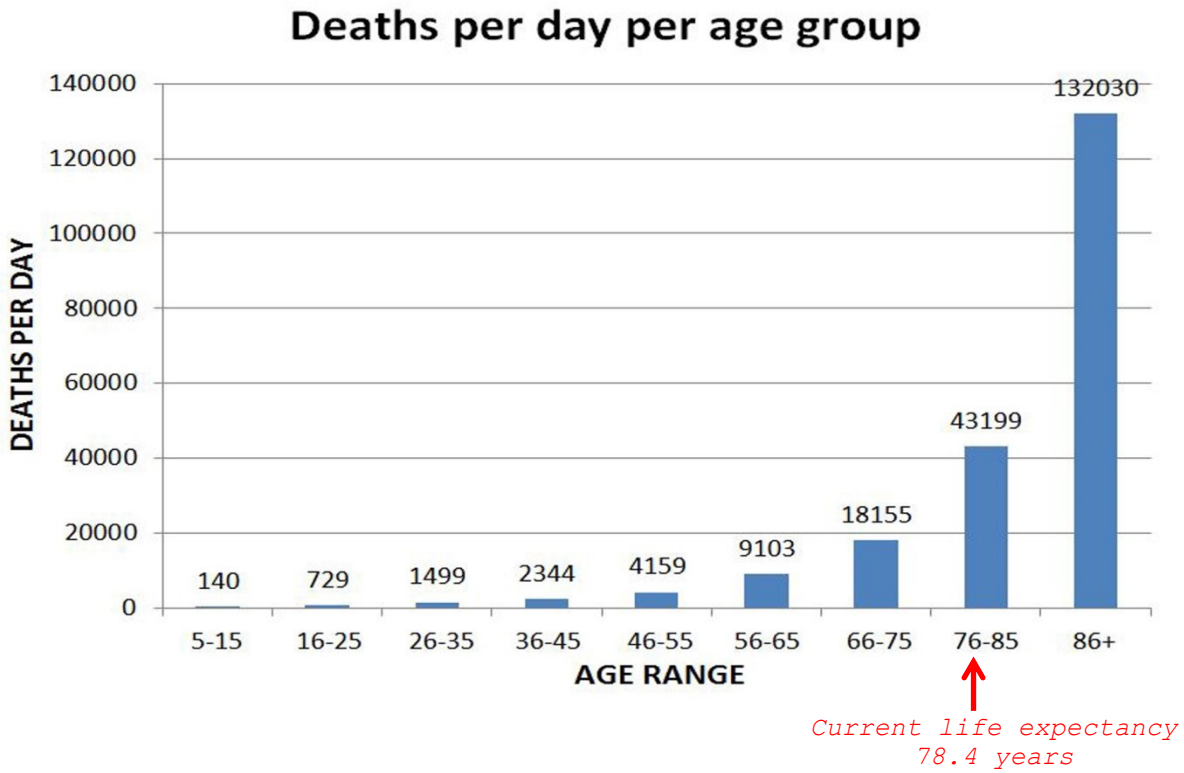
Real numbers on mortality (*actual occurrence of death*) for the USA in 2022 showed a total of 3,279,857 deaths (*total of all causes*). That means that about 0.098% of the total USA population die each year while about 99.902% survive. That is a great survival rate as less than a fraction of a $10^{th}$ of a single percent (*less than 0.1%*) of the population dies each year. We do need to remember death is real and according to current statistics, each day 8,986 people die from some cause that is designated on medical records and death certificates. None of us want to be part of that statistic.

If we do consider the top ten causes of death per data from the Centers for Disease Control and Prevention (CDC), about half of the deaths in the USA in 2022 were from just four causes listed on death certificates and hospital reporting systems: (1) heart disease, (2) cancer, (3) COVID, and (4) accidental injury.




** Percentages to the bottom right of each bar are the percentage of the population that died from the identified cause. Note that the highest rate of death is 174 thousandths of one percent for heart disease.*

So why is it that most Americans don't do anything to abate our risk of death? Is it generally because from birth to about 45 years of age, the rate of death is very low and only increases arithmetically (*slow addition of instances as age advances*)? We don't see or feel the silent killers lurking and gaining a biological foothold in the first half of our life spans, so no action is deemed necessary. Our voluntary inaction is thus a likely explanation, at least a partial one. Further, the mismatch between the public health and media message – that health doom and death is imminent – and what the public actually sees around them daily creates a sense of distance between the average citizen and the message from self-appointed authorities. "It doesn't apply to me" seems to be the actual interpretation of the public.




But by the time we are in our late 50s we begin to see a geometric and thereafter a rapid increase in the number of annual and daily deaths. It is at this point that the inattention we gave to our physical condition over the first few decades of life manifests in the emergence of symptoms of the pathologies or syndromes that may cause our ultimate demise. When our age group peers begin dying at a faster rate, we start noticing.

As an analogy of perception and action, let's consider the effects of a misaligned front end on your car. Misalignment eats tires fairly quickly which causes minor steering and ride issues. In general, no corrective action is taken until the severity of issues increases to the point of functional disruption. You can replace the tire and the car will drive better – you have treated the symptom – but the underlying systemic problem, unaligned wheels on the axle, is not fixed. As a result, the rapid and uneven tire wear is repeated on the new tire and the axle wheel assembly also continues to abnormally wear. At some point, after several tire replacements, the axle/wheel assembly will fail (*die*) unless worn parts are replaced and an alignment of the wheels is performed.

When thinking of it in this way, replacing a tire is like treating a symptom of a disease or syndrome without curing it. Repairing and aligning the wheels on axle, however, is much like a cure, removing the root cause of the problem. In this analogy, how the car feels to us when steering and the visual appearance of uneven tire wear takes a while to become severe enough to notice. This is similar to our early life inattention to taking care of our bodies. Such inattention leads to symptoms such as obesity, pain, and metabolic dysfunction manifesting

and being noticed during later middle age … or as we drive over time in our automotive analogy.

When we take most drugs for specific diseases and syndromes, we are changing tires; we are treating a symptom, and not taking a cure for what ails us. Antibiotics cure infections but anti-hypertensives treat a symptom (*elevated blood pressure*). For heart disease, a massive number of those diagnosed with it could have benefitted from participating in exercise and/or sport throughout their life at all ages; applying the prevention or cure rather than depending on a later symptom abatement treatment using pharmaceuticals. Keeping the body physically challenged and highly functioning is a powerful early life preventative and later a moderately strong curative for a solid percentage of those diagnosed with conditions placing them at risk of dying from heart disease – and many of the other contributors to the 8,986 deaths per day.

But in large part, the population is overwhelmingly sedentary. Why don't we do anything about not dying?

- We ignore it as above
- It is perceived as hard, inconvenient, expensive, and time consuming.

Such complacency is the norm in modernity. Lots of people think they are powerless in the face of death, if they think about it at all. Rather than considering keeping their fitness and health, they spend countless hours on various computing or communication devices working, playing, communicating, or doom scrolling into the night.

This acceptance of mortality is an ancient belief. Homer, in the Odyssey wrote, "Not even the gods can defend a man, not even one they love, that day when fate takes hold and lays him out at last." In modern words we could summarize this as if we can't do anything about it, why worry? Or why fight death if it is inevitable? While not true, this is still a common mentality in respect to pushing back against our own mortality.

Homer was only situationally correct, such as in accidental death and war, as we can neither retreat inside safe, isolated, and nurturing walls every hour of our life, nor recuse ourselves from aiding and protecting that and whom for which we care. These remain moderately true today. And so does complacency regarding doing anything personally to stave off an early approach of our end of days. John Green, in his book "The Fault in Our Stars", wrote "if the inevitability of human oblivion worries you, I encourage you to ignore it. God knows that's what everyone else does."

There seems to be things we can do as there are lots of dubious and spurious ideas and lots of media advice about two phrases that are essentially synonymous; "life extension" and "prevention of death" (*death = mortality*).

**Life extension** – "A 0.3-year annual increase in period life expectancy at birth based on historical improvements in $e_{(0)}$ in long-lived populations in the twentieth century" (*Oeppen and Vaupel, Science 296: 1029-1031, 2002*).

**Mortality prevention** – This has two sub-definitions; (1) ***Preventable mortality*** defined as "causes of death that can be mainly avoided through effective public health and primary prevention interventions". (2) ***Treatable mortality*** defined as "causes of death that can be mainly avoided through timely and effective health care interventions" (*European Commission, OECD/Eurostat lists, 2022*).

The former definition, life extension, infers that given a finite limit to the maximum age possible in humans (*often suggested to be 122 years*) that as modern medicine and available quality of life technology develops there will be a small increase in lifespan for each birth after such a development. It has however been suggested that life extension methods will not, in any broad population, result in lifespans averaging more than about 85 years of age (*88 for females and 82 for males*). This does not mean that some will not make the centenarian mark, about 10% of women and 5% of men are conjectured to potentially reach or exceed 100 years of age (*Olshansky et al, Science 291: 1491-1492, 2001*). Note that there a numerous "life extension" products, procedures, and methods on the market at present. Most of these address items that are conjectured to be related to healthy aging but have not been causally investigated and do not presently have data demonstrating increased lifespans. Frequently the results noted by those using such techniques are subjectively cosmetic or perceptual.

***Life extension*** intends to push life expectancy beyond average durations. Death prevention intends to prevent or intervene in disease processes to prevent death prior to average lifespan. They both represent efforts to attain longer life spans.

Some common life extension methods touted in the media are:

- *Gene therapy* – Modification of genes present in an individual, with costs ranging from about $400,000 to over $4,000,000.
- *Stem cell therapy* – Administration of undifferentiated cells that can reproduce to create new cells and with costs ranging from $5,000 to $50,000 per treatment.
- *Senolytic pharmaceutical therapy* – The cost of taking drugs that target and eliminate old/dysfunctional cells can run upwards of $8,000 per month.

There is one very common life extension method that is not firmly entrenched in the affordability domain of the rich and wealthy; *Caloric restriction,* otherwise known as eating less food or dieting, is the cheapest such method. Further it is also a central element to common ***mortality prevention*** strategies:

- *Sanitation* – Access to appropriately hygienic sources of food, water, and shelter.
- *Access to medicine and medical care* – Timely receipt of care, both prophylactic and therapeutic, prevents deaths.
- *Proper diet* – Access to and eating foods that are healthy, meaning those foodstuffs that are lesser processed and present all required nutrients for life, consumed in a manner that does not drive consistent and long term weight gain.
- *Exercise* – Performing physical exercise in some form to a level of exertion that improves, or at a minimum maintains, neuromuscular function and skeletal robustness.
- *Lifestyle mediation* – The avoidance of destructive personal habits in favor of including constructive personal habits.

With the exception of access to medicine and medical care, the costs of these strategies can be exceptionally low. This makes them the poor man's life extension plan, IF they are voluntarily implemented and consistently practiced by the individual. Unfortunately, the public does not avail themselves of the benefits of these strategies beyond publicly provided sanitation and commercially provided medical care, made more expensive by the neglect of the other strategies listed. With each omitted strategy, we become less resilient and spiral towards mortality.

Let's be glib in reference to that spiral of doom. William Goldman, in the "Princes Bride", wrote, "You see, there's different kinds of dead: there's sort of dead, mostly dead, and all dead." We can build on this comedic line delivered by Miracle Max. Starting at the immutable end point, death, we can back track through the lifespan to the point of origin to describe some related terms:

- When we pass from this mortal coil we are "all dead"
- When we are fully into old age, are sedentary, have allowed disease states to set in, and have become dependent on others, we have become "mostly dead"
- When we pass mid-life and we have not been active, eaten appropriately, and are beginning to acquire hypokinetic diseases and physical limitations, we have become "sort of dead"
- When as children or as adults we get sick or injured we are "mostly alive"
- When we are born we are "alive"

***NOTE**: The above is a simplification and satire*

Extending the diagnostic categories practiced by Miracle Max is a mildly cavalier concept, but a concept that contains hope. We can do things to mitigate the onset or presence of being sort of or mostly dead. Max brings the Dread Pirate (*Wesley*) back from being mostly dead using magic. Some people may argue that modern pharmaceuticals are equivalent to magic, but unless they are cures they are not even close. Those that reduce symptoms only are simply stopgap measures that ease our passage and provide comfort along the downslope through Miracle Max's stratifications of degree of death.

We can move up the scale of death fairly simply without magic or drugs … but not easily. Everything about mortality prevention, staying alive and mostly alive as we age requires effort, dedication, and patience. If you are unwilling to invest even the slightest amount of time and effort into physical activity, exercise, or sport – the pseudo-magic of physical fitness – then the decay toward "all dead" status will proceed unabated. Similarly, if we over or under-consume calories, macronutrients, and micronutrients we place ourselves in a nutritionally and metabolically compromised condition that also provokes further decay of our status towards "all dead".

The take home point here can be that we should not obsess about the fear of death. Individually our risk of death is actually quite low when we consider absolute numbers showing the actual occurrence rate. However, we should move to reduce or eliminate negative factors that accelerate our mortality and I would argue that "move" is the most important operant term describing such efforts. Prohibitively expensive drugs and therapies are far less important. The second, very important factor is what we eat and drink; nutritional support from wise choices power exercise, fitness, health, and survival. If we can get just these two things under control, through our own individual and independent decisions and actions, we can live a bit longer and have a higher quality of a life that reaches and exceeds national lifespan expectations.

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