

The 2020 Pandemic and the Preceding Decades of Revelatory Evidence

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Abstract The 2020 pandemic suddenly emerged and left devastating consequences on global societies; the origin is still debated as are treatments and preventive steps. This research had a goal of extracting a common denominator for the disease dominance and find important preceding evidence for its rising pathogenicity, all through public domain records. Systems science, based on biologic principles, was used to identify patterns in extracted data, categorize them into either, unhealthy states of chaos and entropy, or a health territory; those classifications led to knowledge creation. The identified long-term evidence has been pointing to an unfavorable resolution of the unhealthy states of global societies. This study highlights the upstream etiology to this downstream disease that lie in the vanished individual health, propelled by the extraordinarily persistent separation of decision-consequences learning loop; it is only an individual who can extract meaning and learn from each completed loop, thus gaining health; no amount of health care can ever do that.

Keywords: societal health, pandemic, perceptual reality, decision-consequences learning loop

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1. Introduction

Everyone thinks of changing the world, but no one thinks of changing himself.

Leo Tolstoy (1828-1910) [1]

He who would change the world should first change himself.

Socrates (470-399 BC) [2]

The state of societal health is consequential; it affects relationships, judgement, and collective decisions. The preponderance of healthy individuals must exist for any society to have a positive future; societal health, however, is a reflection of prevalent individual health.

Evolution-refined life epitomizes adaptation with capacity for sustaining growth, change, and eventual recycling of what falls outside of its principles/boundaries or when it finishes its biologic cycle; there are no exceptions within life's time-scale.

In Nature, ‘all interacts with all’ on many levels, mutually enhancing or compromising one another. Healthy human behavior has positive impact on its innumerable relationships with self and others; *vice-versa* is just as true: unhealthy behavior facilitates and converts most relationships to unhealthy ones, from other humans to viruses. [Figure 1] Humans represent only about 0.1 percent of ‘living biomass’, compared to over 80 percent

belonging to plants; if evolution massively favors plants over other forms of life, in its efforts for sustainability, shouldn't humans participate? [Figure 2]

A society is a system of living individuals that have similar anatomy but variable perceptual reality, the way they see and comprehend self and the world; this reality is distinct from reflexes and instincts, common in animal kingdom. In humans, this dichotomy of anatomy and perceptual reality, explains why we all are ‘same in biology’, but vastly ‘different in thoughts and expectations’, as these are cognitive constructs - never uniform, non-quantifiable, full of biases, and thus falling outside of traditional statistical inference.



Figure 1. Lwiro Primates Rehabilitation Center, Democratic Republic of the Congo, NatGeo, Sep16,'21

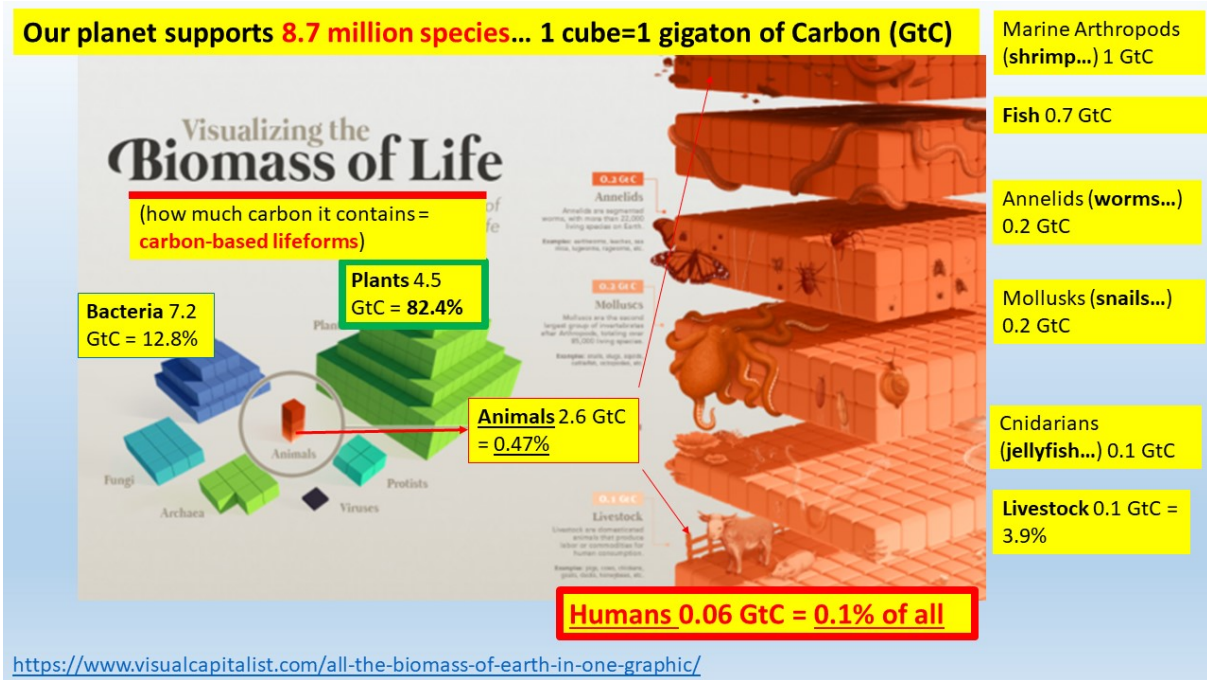


Figure 2. Biomass of life, (modified), from visualcapitalist.com

2. Research Questions

Existing gaps, in knowledge of health and its impact on sustainability of a society and its environment, are expressed in the following research questions, with special emphasis on the prevailing and confusing complexities of recent pandemic and public health responses:

What is societal health and how to measure it? What health-status information had been available in public domain prior to the pandemic of 2020, and were, potentially pandemic-relevant conclusions, made? What differentiate health from health care and which one is the most significant in human-pathogen encounter? What is the decision-consequences learning loop and is it being used by a society to gain perspective on its decision, thus gain resiliency?

3. Method

The data and information, available in public domain, have been used to assess the current societal health, the past decades leading to COVID-19 pandemic, and to estimate the likely future trend; they include:

Life expectancy – all-cause mortality – level of adult and pre-adult populations’ fitness – prevalence of use of prescription medication – volume of disease titles – trend of autoimmune diseases – extent and quality of relationship with self and others – COVID-19 publications – cognitive fitness through decisions-consequences learning loop – level of societal trust.

Following data collection, systems science, with focus on principles of living systems, was used to understand patterns within the extracted information gained from data, in order to reach a level of understanding about the prevalence of societal health and, in return, its impact on society; meaningful future steps are also considered. [Figure 3]

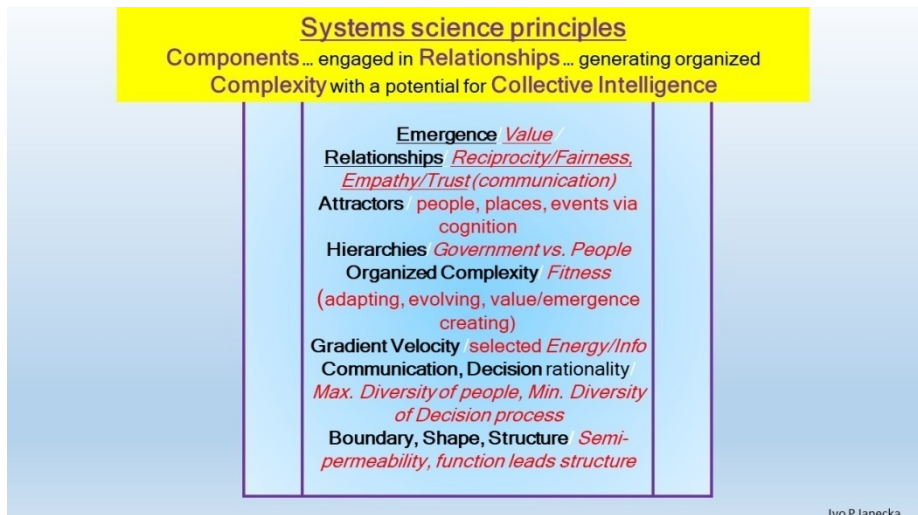


Figure 3. Systems science principles

The following patterns were searched for, as they support the development of a society where health is the foundation of collective intelligence and form a platform for value creation: health as value with efficiency, effectiveness, risk management and proportionate cost, relationships attractors and their impact on perceptual reality, debt, organized complexity, and value/health creation money supply and velocity, debt and trust.

4. Discussion

The estimated four billions years of life's evolution on planet Earth, provide a solid evidence of the validity of its principles, highlighted by systems science. Within the all-inclusiveness of Nature, humans represent only a small and a non-essential part. [Figure 4]

5. How to Measure Societal Health

All reported data are subject to interpretation, especially those related to human health or its absence; from data to information can be a long journey, from 'collection' through 'processing' to 'interpretation', filtered through numerous biases of involved individuals; on some level, this process resembles a childhood game of 'phone', where the first word spoken into it, the input, often has no resemblance to the last one heard, the output. The level of trust plays an important role in both the collection and structuring of data into information, as such a process is

heavily dependent on how the engaged individuals see the world; trust can connect the 'collector' with the 'interpreter' on the same level of purpose or leave them at a great disconnect; the final outcome, the extracted knowledge, reflects that relationship as well as the capacity of 'interpreters' to find the upstream meaning of patterns within the extracted information. [Figure 5a,b.]

Trust is an emergence of healthy relationships after antecedent steps of reciprocity, fairness, and empathy have been reached; generally, trust represents the softer aspects of human interactions, a social cohesion, and enhances well-being with the creation of social bonds; the opposite creates stress, illness, discord; but, trust is hard to measure. There are, however, existing numerical correlations, paralleling the level of social trust and they can be extracted from the financial markets, as those are 'people and their decisions'; the relationship between credit and debt, for example, is a useful measure, corresponding to a seesaw of trust-mistrust. Debt that is based on a solid credit, a sound collateral equity, can be considered healthy and trustworthy; however, debt that is based on already existing debt, is unhealthy, untrustworthy, speculative, and may have existential implication for individuals as well as a society. 'Buying on margin' is a widely available statistic from trading institutions; it represents, mostly, debt-on-debt borrowing, and this 'borrowed debt' is used for additional financial investments. For example, by June 2021, there has been a 300 percent increase of financial margin since 2010, representing a historic 'illusion of wealth/trust/value'. [Figure 6]

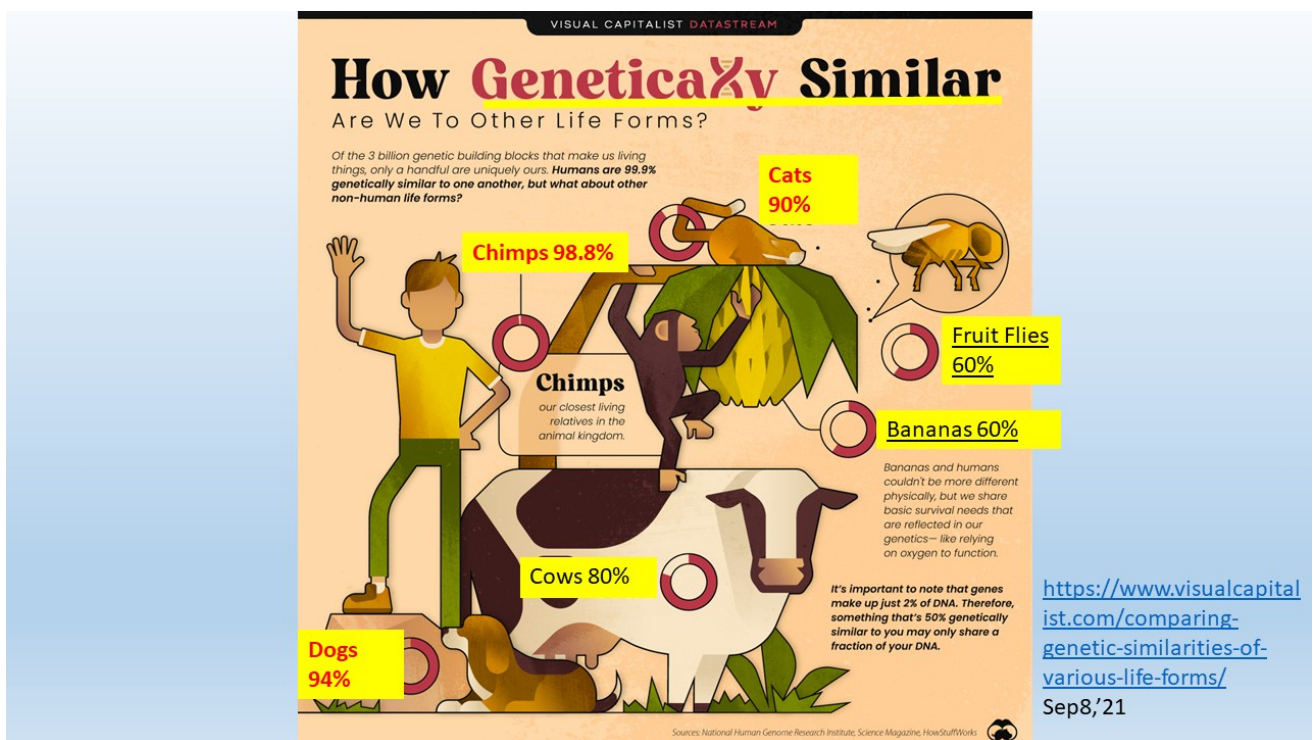


Figure 4. Genetic similarity of life

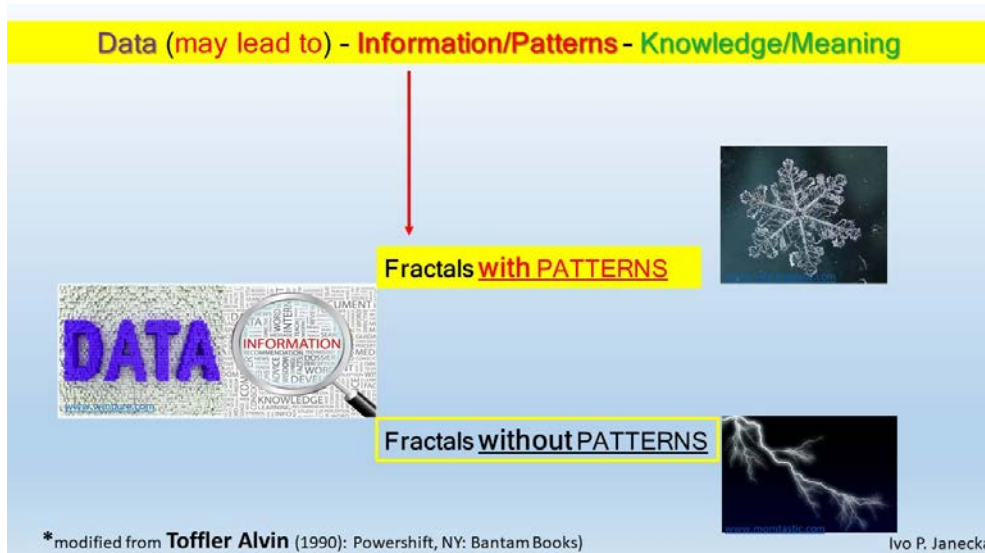


Figure 5a. Data into information

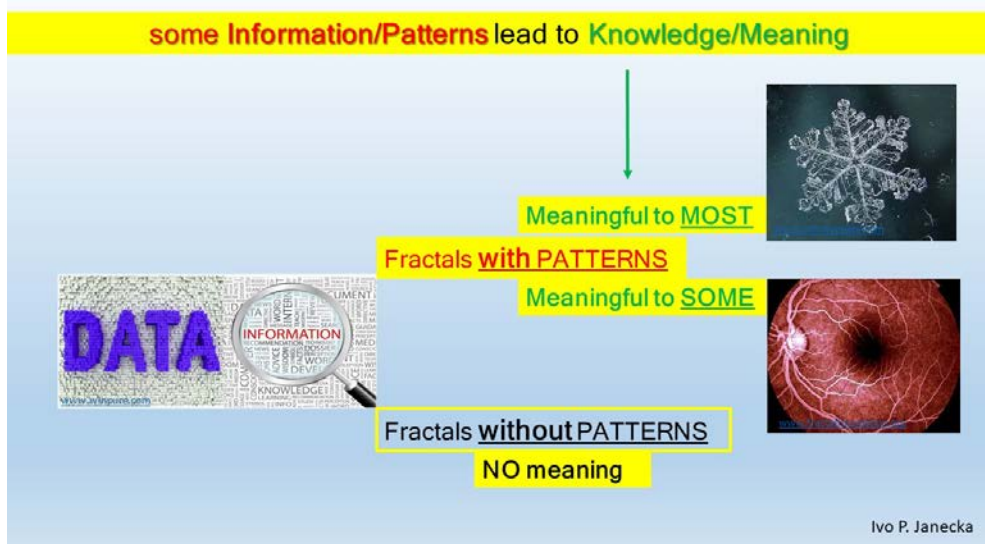


Figure 5b. Information into Knowledge



Figure 6. Margin debt

A 2018 study reported that among US adults, trust reached its lowest level since 1972; in the review, trust was highlighted as an indicator of social cohesion with a link of similar expectations of truthfulness that is shared in a community; and, social cohesion has already been associated with better physical and mental health, including mortality. [3]

Societal trust has vanished, alongside trust that people have in their own bodies, the epigenetic machinery that create human form and function, impacted by our decisions. People still consider it prudent to be able to separate their private decisions from societal consequences, while in the process silencing the messages of the epigenome; this functional genome has no judgement, people do; deferring to a 'social net' to handle such consequences, is a massive delusion. Without full comprehension of the decision-consequences immutable connection, e.g. bad decisions lead to bad health, and no amount of rationalization will gain health back.

Transgenerational influence represents epigenetic encoding, from prior lineage decisions that is being carried forward via reproduction, though can be modified by new decisions in adulthood; such transference is highly significant not only for an individual but also for a society, as it expands either the healthy or the unhealthy segment of a society in geometric progression; for example, full competence of inherited innate immunity is vital to any new life, which also facilitates the subsequent development of adaptive immunity; without immune competence, immune dysfunction ensues, representing a failing biologic system's internal boundary, and posing an ongoing existential threat to the entire living entity and by expansion, society as a whole.

If the societal segment of reproductive generation of women is mostly obese, so will their offsprings, male and female, and start their new life with metabolic handicap of malfunctioning mitochondrial DNA, which is only inherited from mothers; and, if the early years are under the cultural influence of obese environment, this new generation will grow up obese, with all the consequences that they entails; cycles continue.

Statistics are used for looking at a large group, such as a society, in order to estimate, for example, the percentage of 'surviving vs. dying' population, information that is valuable for decision-making by any governing vertical hierarchy. This approach, however, is not beneficial to an individual, who cannot, for example, live 70 percent and simultaneously die 30 percent. A large group can have an 'attrition percentage' while, simultaneously, continuing with a 'percentage of the living', but without deterministic allocation of individuals to each 'living vs. dying' group; clinical trials, using test groups, suffer from the same handicap. It is noteworthy that over 80 percent of many cancer treatments that follow reported survival-prolonging Phase III trial results, did not achieve that goal; over 50 percent of the initially reported positive trials were subsequently found to be false-positive. [4]

Quoting only 'society-applicable chances' to an individual, is meaningless and confusing, because of the above example of '70:30' ration and, also, because most individuals, when quoted 'statistics', presume that they will surely be in the 'most favorable' group; for example, any treatment, administered to a large group, with only '38 percent

effectiveness' quoted, will likely be accepted by many patients because, they presume that it will 'help them 38 percent'; but that is an individual illusion; the '38 percent' benefit is never evenly distributed to each member of a group; most members will get none; in addition, as treatments have potential complications, e.g. 20 percent, indicating that not only most patients can miss on the potential 38 percent effectiveness, but 20 percent of them will develop complications; 'self-optimism' maybe lauded but it doesn't equal rationality in recovering one's health and is of limited benefit to a society.

In the recent past, most studies of efficacy of treatments (drugs, vaccination, etc.) have been done on an accelerated timeline, randomizing people with known morbidities causing differing immune system dysregulation; if such a system interacts with a pathogen, it will likely be in an unpredictable way; we already know over 100 different autoimmune diseases with mutable spectrum of immune problems, implying that finding the answer to any initial study-question, e.g. efficacy of treatment under such circumstances, is analogous to 'finding a needle in an infinite haystack'.

All reported outcomes of any intervention, should always be distilled to a single fundamental question: 'does it work?' Biologic systems and their components are all on a path of their evolution-determined cycles; they must be allowed to reach their completion; otherwise, surrogate markers likely miss the message of any larger trend. A quote from the September 2021 issue of the British Medical Journal, addresses this issue: *Surrogate markers, [also reframed as] subgroup analyses, composite outcomes, and secondary outcomes, are great deceivers in clinical trial design and reporting; the promise of drugs approved on the basis of surrogate outcomes is mostly unsupported by [full] trials and meta-analyses that use hard clinical outcomes.* [5]

6. Collective Intelligence and the Relationship with Self

Any 'collective', a cluster, reflects the predominance of individual contributions, of health, intelligence, etc., determining the group's rationality and responsibility, observed in evolving decisions.

The 'reality' that people are 'certain about', is a nebulous concept due to the fact that it combines the 'physical world', registered by senses that offer only processing, and the 'cognitive world' of interpretation, creating the individualized perceptual reality, how we see the world. When a certain perceptual reality is widespread, it assumes a high level of common reality and believability, a 'collective mind', in spite of the fact that it may be 100 percent intangible, such as money.

Balanced cognitive threshold is the foundation for a healthy perceptual reality; an excessive information input, e.g. from social media, is unhealthy, as its massive inflow saturates cognition and leaves little capacity for individual thoughts; it frames individual perceptual reality per others' agenda; and that is the true loss of freedom. There cannot be healthy cognitive fitness without tight decisions-consequences learning loop. On all levels, Nature runs this loop within evolving

ecology; humans, mostly, disregard it to their existential detriment.

At present, there are close to 200 known ‘cognitive confirmation biases’, representing deviations of rational judgment that can only come from intelligence of a healthy biologic system. On a cellular level, autoimmune diseases show irrational relationship of immune cells to other tissues, creating ‘auto-diseases’; biased reasoning generates errors of cognitive judgement that cascade, through the epigenome, to malfunctioning of the immune system. [6]

For each individual, perceptual reality creates an existential milieu of either safety or stress-generating danger, asking its biologic system for ‘defense’, the proverbial ‘fight or flight’ syndrome; the immune system is a key cellular protector that heed such a call, real or imagined.

Individual perceptual reality chooses what attractors are engaged to form any relationship with self and society; dominant attractors that are healthy, create organized complexity with positive impact on the individual as well as the larger societal system; unhealthy attractors, those of dominance or despair, are states of chaos or entropy, generating disorganized complexity with vanishing value creation, where both individuals and society suffer.

Through its epigenome, human body is always in synch with its ‘mind’, the perceptual reality, for better or worse; if the ‘mind minds’, so will the body, an inseparable cause and effect link, ending with corresponding morphology. This ‘mind-body’ connection allows for a venue to measure societal ‘state of the mind’, by looking at its ‘state of the body’.

Perceptual reality exists in spite of objective, unchanging facts; for example, identical mammograms, recorded in digitized images, represent unchanging physical reality; the cognitive interpretation by multiple radiologists, however, represents the influence of their perceptual reality; a reported study recorded a range of their findings to be, in over 50 percent of cases, either false negative (no cancer) or false positive (breast cancer). [7]

The level of human physical fitness becomes evident by determining individual, and in an aggregate, collective endurance, speed, strength and flexibility. Cognitive fitness, the prevailing societal perceptual reality, is evident through examining the categories of preferences for societal engagements/entanglements with chosen attractors. In relationships, there exist choices: either healthy that optimize individual as well as societal system, or unhealthy, where the choices are primarily to egoistically maximize self without regard for its impact on society.

In a broader sense, the COVID-19 pandemic didn’t really start in Wuhan, China, in December 2019 or on March 11, 2020, when WHO (World Health Organization) officially announced it; the pandemic surge at that timeframe was a result of culmination of chaos, the ‘last straw’, within the multi-societal epidemics of ‘un-health’.

Societal or systems-optimizing/healthy decisions are those that facilitate self-organization, and in the process, create organized complexity capable of generating value as their emergence; such decisions are exceptionally rare in societies with poor health of their members; indeed,

there is a dynamic correlation between one’s health and optimizing decisions. Unfortunately, many societies have fully severed the relationship between individual decisions that are considered private, and consequences, which have been socialized/distributed; as a result, the fundamental evolutionary learning loop, the tight linkage between decisions-consequences dominant in Nature, has been discontinued by humans to their detriment; however, ongoing evolution is not possible without this tightly integrated learning loop among all living entities; eventually, Nature restores balance to species not in compliance with such a law.

7. Results

In history books, it is very likely that 2010 will come to be known as the precipice year, the time when ‘all the charts were screaming with evidence of incoming societal harm’: life expectancy started to decline – unhealthy population reached majority – trust and societal cohesiveness had an inverse relationship - the rise in new financial debt exceeded all historic levels, representing primarily ‘debt on debt’ – money supply and money velocity have gone in opposite directions – the younger generational cohort started to mirror the poor health of adults, etc.

All recognized diseases are summarized in the Official Codebook of the American Medical Association’s ICD-10-CM; in 2021, it had 1205 pages and weighed 5.42 pound, a very ‘obese book’, indeed; by comparison, the older 2001 edition, had ‘only’ 779 pages with weight of 3.2 pounds, a growth of 426 pages and 2.22 lbs. in two decades, implying that health care adds 40 plus pages of diseases per year, which do represent existing patients with morbidities. [8]

7.1. Population’s Health - Examples from the Early 21st Century

Close to 80 percent have unhealthy weight

Over 40 percent are pre- or fully diabetic (increasing by 1.5 million per year), demonstrating insulin resistance, its cellular misuse, and metabolic syndrome with 2.66 times increased risk for major depression

100 million have fatty liver disease

Over 40 percent of adults had at least one adverse mental/behavioral health problem in 2020

The percentage of children born to addicted mothers increased 82% annually (2010 – 2017)

Alcohol consumption has led to 3 percent of cancer deaths, about 20,000, annually (2013-2016)

More than 93,000 opioid deaths occurred in 2020, almost a 30 percent increase from 2019

Death certificates, in 2018, listed 122,019 deaths from Alzheimer’s disease

More than 100 autoimmune diseases exist

Healthy economy cannot exist without healthy people; this tight bi-directional link, between economy and population’s health, allows for assessing the health of a society by measuring the health of its economy, by, for example, looking at either ‘money’ or ‘labor force participation’; there exist data about money supply, as

well as the degree of ongoing of societal creations from the available supply of money, described as money velocity; in general, money supply is available to support creativity but money velocity is what is actually being converted to creativity; the disconnect between a parabolic rise of money supply and similarly impressive and simultaneous drop in money velocity, is a red herring to be heeded as it indicates, with high probability, stalling economy and continuing decline of population health. The decline of labor force participation started in 2000.

7.2. Epidemics as Consequences of ‘War on Self’: Details

Obesity is rampant and has been visible to all since 1990s. It was estimated in 2020 that almost 2 billion people in the world are obese with about 400 million children, whose spectrum of diseases is now the same as in adults. [9]

Obesity-associated metabolic syndrome affects nearly 30 percent of the U.S. population and increases the risk for type 2 diabetes, heart disease and stroke, etc. [10]

Over 40 percent of Americans are already diabetic or pre-diabetic; the American Diabetes Association predicts 1.5 million new cases each year; a fatty liver disease, a related condition that affect up to 100 million Americans, results from fat build up in liver. [11]

Ultra-processed foods now comprise 2/3rd of calories in diets of children and teens; this figure jumped from 61% to 67% of total caloric intake from 1999 to 2018.

Johns Hopkins University and the WHO Global Health Observatory, jointly reported that the global 2.5 million COVID-19 deaths, have been mostly in countries where more than half the population is classified as overweight; by contrast, in Vietnam, which has one of the lowest death rates, only about 18 percent of the population qualifies as overweight. Data from more than 160 countries show a linear correlation between nation's COVID mortality and obesity rate; also finding that no country with an obesity rate below 40 percent reported high death rates. Per reports, the United States has an official obesity rate of about 67 percent and sits at second place in COVID-19 global death rates at about 152 deaths per 100,000; when one includes overweight population, in addition to obesity, about 80% of adults have unhealthy weight. [12]

A large study from Sweden confirms the obesity-death correlation in COVID-19 patients. [13]

Obesity has a cascading negative impact not only on metabolism, due to insulin resistance / cellular misuse, but it also generates unhealthy microbiome in the gut with consequential production of unhealthy neurotransmitters that are ferried, via the vagus nerve, into the brain's synaptic neuro-net. Unhealthy diet greatly encourages the growth of unhealthy bacteria, viruses, fungi on external as well as internal bodily surfaces.

Unhealthy gut microbiome, due to high-fat diet, diminishes the capacity of cells to generate needed surface markers in order for them to be recognized by immune cells for recycling; the subsequent increasing accumulation of non-functioning elements offers strong evidence of biologic systems entropy; immune system competency represents the essential healthy internal boundary of a living system.

7.3. Mental State Epidemic

In 2020, a survey of US adults revealed that over 40 percent reported at least one adverse mental or behavioral health problem.

Children born to addicted mothers suffer from neonatal abstinence syndrome, a withdrawal following birth; the proportion, per 1000 births, increased 82 percent between 2010 and 2017, while maternal opioid-related diagnoses increased 131 percent.

Alcohol consumption accounted for 4.8 percent of cancer cases (75,200) and 3.2 percent of cancer deaths (18,950) annually, during 2013 to 2016.

About 10 years before the pandemic, between 2001 and 2013, among people 65 and older, the rate of alcohol use disorder increased 107 percent.

From 1999 to 2019, mortality rate from Alzheimer's disease (AD) doubled from 16 to 30 deaths per 100,000, an 88 percent increase. In 2018, death certificates listed 122,019 deaths from AD.

Opioid overdose increased by 28.5 percent in 2020, leading to more than 93,000 opioid deaths, almost 30 percent increase from 2019.

7.4. Cognition – the Creator of Individual Perceptual Reality

Cognitive threshold represents the maximum speed of sensory input that allow understanding; it is about 60-110 bits per second, approximating a conversational speed; any input over that level is mostly lost to comprehension. Oversaturated cognitive threshold, secondary to mostly indiscriminate sensory input, leaves little or no capacity for subsequent independent thoughts and decisions; this implies that ‘excessive input’ of either information or misinformation, e.g. from social media, frames perceptual reality of a larger segment of population.

Chronic hyperglycemia, due to insulin resistance/cellular misuse from high carbohydrate (carbs) diet, impairs working memory; the key anatomic areas, hippocampus and the anterior cingulate cortex, have been found to be ‘hyper-synchronized’, generating rising errors; healthy neuro-net components function in synchrony, with control of volume and timing of input, highlighting the importance of limits set by cognitive threshold in order to optimize biologic system's thought output; lack of ‘coherent strategy and rational perspective’ for any societal group can likely be traced to non-optimized memory. [14]

A substantial proportion of all dementia cases worldwide are attributable to modifiable risk factors. They can be assessed by dementia risk score, the Lifestyle for Brain Health (LIBRA) index; high risk score is associated with markers of general brain atrophy, cerebrovascular pathology, and worse cognition, suggesting that LIBRA meaningfully summarizes individual lifestyle-related brain health.

Excessive dietary carbs do enter cells but in such a volume that it create intracellular devastation by damaging mitochondria and hijacking insulin to store carbs as fat, instead of facilitating the physiologic metabolism of carbs. [15]

7.5. Social Illnesses

Almost 3 million US children have a parent who is incarcerated, and more than 5 million children—7 percent of all US children—have had a parent in prison or jail at some point.

Driving under the influence of drugs is outpacing drunk driving; in addition, a sizable number of adults use both marijuana and other drugs while under the influence of alcohol, as noted in 2016-2018 national survey. National Institutes of Health found in 2016 that among people killed in driving accidents, 43.6 percent of drivers who were drug tested, had positive results, with 50.5 percent, who were positive for two or more drugs, and 40.7 percent were positive for alcohol.

National drug overdose deaths rose to over 70,000 by 2019.

The U.S. murder rate rose 30% between 2019 and 2020, representing the largest one-year increase in more than a century.

Biggest drop in current college enrolment in half a century has been recorded; it is estimated that by 2024, there will be 500,000 fewer students each year in college, representing the potential university-aged cohort a “demographic cliff”.

7.6. Dysfunctional System Boundaries

Alzheimer's neurodegenerative disease is likely precipitated by deficiency of blood-brain barrier, a key biologic boundary; unhealthy diet induces liver to make beta-amyloid, and when the blood-brain barrier is deficient, too porous a boundary, it allows the toxic protein to enter brain. [16]

New Orleans, and its experience with hurricanes, is a massive societal example of the importance of semi-permeability of a system boundary, within the entire Mississippi river basin; the sediment that the water normally carries, must be allowed to flow downstream without rigid boundaries, in this example, multiple dams. Pristine rivers are semipermeable for the sediment, as they gradually deposit some at each turn of its winding course. New Orleans' hurricane destruction is a very visible illustration of a downstream consequence of an upstream etiology and loss of resiliency. Similar concerns are developing with Shanghai and the Yangtze River dams.

Mucosa, which is lining bodily openings, including the nasopharynx, is an essential boundary of biologic systems, a barrier to entry, offering protection to the entire system and its various bodily cavities; it selectively communicates with the environment and its pathogens, representing human body as an open system. The nasopharyngeal microbiome can reveal specific viral load, a degree of immune response and numerous ACE-2 receptors, to which the spiky SARS-CoV-2 binds; altered microbiota, in the symptomatic patients, impacts their immune response to the virus. In retrospect, the swabs, obtained during ‘COVID-19 virus’ testing, if tested for bacteria, could have revealed additional important information; analysis of bacteriology would have likely helped in selecting people who would belong to the category of non-significant encounters. [17]

7.7. Autoimmune Diseases - Another Epidemic

The many already known autoimmune diseases are expressions of a variable dysfunctional immune systems leading to also different pathologic characteristics; as a consequence, they respond unpredictably to new encounters with pathogens and in turn, they adapt by generating innumerable mutations.

In 2021, another autoimmune disease has been added to the list, one that is emerging after an encounter with SARS-CoV-2.

Increasing to 16 percent of the population, antinuclear antibodies often herald autoimmune diseases; though not a 100 percent accurate, in a society, this test reveals its prevalence, available for comparison with other timeframes.

7.8. Malady - Vanishing Wellness

More than 80 percent of the world's adolescent population is insufficiently physically active; they have a 20 to 30 percent increased risk of death.

A twenty-five-year-long longitudinal study of adults, aged 45 years and older, revealed that 90 percent of individuals had developed multiple morbidities during their lifetime. [18]

Centers for Disease Control and Prevention estimate that over 50 percent of adults and 30 percent of children and teens live with at least one chronic illness.

Nearly 50 percent of adults (over 100 million) in the United States have hypertension but only about 1 in 4 have it under control. Americans eat on average about 3,400 milligrams of sodium per day, in spite of the fact that it takes only 2 grams to make immune T-cells dysfunctional; hypertension has been the main co-morbidity of many COVID-19 ICU admissions and deaths. [19]

7.9. Motionlessness / Sluggishness

It is general knowledge that exercise promotes health, yet 50 percent of adults and 73 percent of high school students, do not meet minimal levels of physical activity; among current adults, 70 percent never exercise in their leisure time and this societal cohort will be replaced by mostly unhealthy ‘next generation’; the end of ‘societal diseases/pandemics tunnel’ is not in sight.

Motionlessness, a profound absence of physical activity, is quite deadly; it more than doubles the risk of dying from COVID-19, in spite of the fact that it take only 150 minutes per week of moderate physical activity to comply with prevailing guidelines.

Insufficient physical activity for health, increases risk of developing COVID-19 infection by over 200 percent and prevents healthspan to approximate lifespan.

7.10. COVID-19

Toward the end of 20st Century, many societies shifted from smoking to over-eating, not because of cancer statistics in smokers, as those had been known during prior decades, but because over-eating offered multi-

sensory gratification over smoking, even though, the consequential excess weight, has had far greater negative impact on person's and nation's health than smoking. As the societal epidemic of obesity achieved a 'new normal', and thus mostly ignored, it facilitated, with its causative impact on immune system dysregulation, the virus pandemic on global scale. The 'Flu epidemic of 1918', emerged at the peak of exceptional time of misery due to four years of war (WWI); it was also known as the Spanish Flu, Great Influenza Epidemic, due to H1N1 Influenza A, causing over 20 million deaths; at that time, the public health measures included: 'hand washing, masks and distancing'. Same measure have been instituted for the 2020-21 pandemic, in societies with similarly massive prevalence of poor health. One hundred years ago, it was WWI, the still-evolving pandemic of 2020, could be characterized to occur during a 'war on self' (massive over-eating, over-drinking, over-dosing with drugs, over-saturation of cognition with data/information, etc.); in spite of 100 years of scientific progress, the public health measures have been identical.

Wars, in their historic devastations, have been 'on each other'; 'war on self' represents most modern version but with different target and likely will surpass history in its total human cost.

Many theories have been considered for the origin of SARS-CoV-2, from absurd to plausible. What has not hit the headlines, however, is the possibility that the zoonotic jump was from humans to animals, a process well-known from studies of gut microbiomes, when animals, living in their captive proximity to people, eventually develop, to their detriment, similar gut bacteria.

Recent veterinarian study showed that carnivores, e.g. mink, dogs, cats, etc. once farmed as captives, lose the functionality of several intestinal anti-inflammatory genes that are key to handling pathogens; without such protein complexes, the animals become 'disease reservoirs' with risk to all other living creatures, including back to humans. And, what is apparent in the fauna, is likely true in the flora as well. [20]

In 2010, ten years before the pandemic was officially declared in 2020, life expectancy uptrend has been reported to reverse.

Life expectancy is a foundational measure of overall societal health within timeframe of decades. Simple study of centenarians and super-centenarians, those living to 100 and over 110 years of age respectively, reveals that they all lived healthy lives. By contrast, shortening life expectancy means that the 'lives lived' were not healthy.

The state of individual health can be easily measured, based on the level of fitness; such detailed and ongoing assessment, however, is not manageable on a societal level. In order to achieve a valid measure of societal health, any technique must be accurate, non-invasive and non-intrusive, and, applied as close to real-time as possible; it must accomplish a quantitative assessment of qualitative lifestyle choices.

A 2015 Mayo Clinic study revealed that 70 percent of adult Americans take at least one prescription medication for their co-morbidities, and more than half take at least two; by 2019, with an annual projected growth of about 8 percent, a real-time peak of 'societal absence of health' was reached, and simply morphed into the start of the

2020 pandemic; by 2019, just about everyone had an active morbidity and was being treated with prescription medication (cardiac agents, proton-pump inhibitors, muscle relaxants, antibiotics, antidepressants, opioids, etc.); by 2021, it became well-known that co-morbidities were most dominant in COVID-19 patients that ended up in an intensive care unit or died. [21]

For decades, societies have been endlessly searching for external consumption rewards, while, in the process, exhausting their own production of the essential neurotransmitter dopamine leading to neurodegeneration; in healthy people, dopamine normalizes the activity of immune system's lymphocytes but in deficient individuals, the appearance of a 'cytokine storm' with severe COVID-19 illness is understandable as is the overall relentless rise in autoimmune diseases in the population. In addition, chronic stress accelerates usage of dopamine for production of adrenalin/nor-adrenalin, diminishing body availability.

Since the year 2000, the death rate from Parkinson's disease, another neurodegenerative illness, has risen about 63 percent in the United States; the number of people who died from the disease increased from 5.4 per 100,000 people in 1999 to 8.8 per 100,000 people in 2019, amounting to the average annual increase of 2.4 percent.

8. Conclusions

Health is the highest form of life, an organized complexity of a living entity, capable of generating value for self and others; it is favored by evolution because it facilitates harmony in Nature. As such, it should be the premier goal for an individual and societies; everything else is counterproductive to life itself - the most unique experience in the Universe.

Health is physical and cognitive fitness, achieved through continuous personal effort; its loss leads to disease and, for a society, it poses existential threat. A key feature of a healthy society, and a foundation for its advance, is collective intelligence with rationality and responsibility.

Epidemics of poor health across the world are prerequisites for pandemics and, in spite massive health care expenditure in US, a multi-decade decline in health has been in evidence; the segment of today's society that is healthy and fit, likely represents the vanishing number of '1 percent of the 1 percent'.

The tragedy of the early 21st Century is expressed in the following interconnected sequence: over-consumption of high-fat/high-carbohydrate food, salt and alcohol, leading to diseases, such as pre- and full diabetes with increased insulin resistance, due to its cellular misuse for fat storage, depriving key organs, muscles and brain, of the primary energy source, the insulin-supported glucose; this sets the stage for a prevailing societal 'sluggishness' and the rise of Alzheimer's disease. Increase of morbidities (heart, liver, cancer, mental issues, etc.) and immune system dysfunction, have also been in evidence, especially, as the dominant influence on critically ill and dying patients from a hyper-inflammatory 'cytokine storm' during COVID-19 illness. Looking back, it is hard to pin the cause of the pandemic on the 'virus' *per se*, because the

global unhealthy populations ‘set the stage’ and the virus ‘accepted the invitation’, offering a capacity for endless mutations. Only a massive restructuring of nation’s ‘health debt’ (not health-care), will right the ‘socio-economic’ system, returning it to organized complexity and value creation.

All diseases have an upstream etiology, in spite of a common but incomplete concept that ‘it is all in our inherited genes’, the building blocks of biologic systems; what we do with the ‘blocks’, however, is up to our decisions. Choices affect human body through its epigenome, the ‘on/off’ transcriptional functionality of genes, which is always in synch with the ‘mind’, the perceptual reality, the way we see and interact with the world and self; if the ‘mind minds’, so will the body. Similarly, societal ‘state of the mind’, reflected in the decisions that it generate, can be directly visualized by looking at the collective ‘state of the body’, nations health statistics, because again, as the ‘body is’, so has been the mind.

Many societies express characteristics of entropy with accumulation of non-functionality, rising immune and metabolic dysregulation, reflecting disorganized/unhealthy complexity, which fails to create value and sustain societal cohesion via trust; this state of ‘systems’, from individuals to societies, is visible on all levels including related sub-systems, such as ill-body parts in individuals and ill-societal sectors.

The loss of societal health can be traced to the abandoning of the evolutionary learning loop, the separation of decisions from consequence, with highlights of privatizing decisions but socializing consequences, allowing for maximizing intake without regard for consequences, thus creating unhealthy/unbalanced lifestyle, impacting memory and original thoughts, metabolism, disease frequency, resistance to pathogens, and, consequently, ending with shortened lifespan and economic and political disharmony.

Health is not health care, which is simply a business of societal assistance; health is a personal issue, from decisions to consequences, starting with a responsibility for mitochondria, the cellular energy-generator, and ending with accountability for immunity, biologic system’s boundary, all affected by lifestyle choices.

Notes

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References

- [1] Leon Tolstoy. www.brainyquote.com/authors/leo-tolstoy-quotes, accessed Sep 15, 2021.
- [2] Socrates. <https://www.goodreads.com/author/quotes/275648.Socrates?page=2>.
- [3] Giordano, G.N., Jan Mewes, J., Alexander Miething, A., “Trust and all-cause mortality: a multilevel study of US General Social Survey data (1978-2010)”, *Journal of Epidemiology & Community Health*, 73. 50-55. October 2018.
- [4] Shen, G., Ferro, E.G., Xu, H., Kramer, D.B., Patell, R., Dhruv S. Kazi, D.S., “Underperformance of Contemporary Phase III Oncology Trials and Strategies for Improvement”, *Journal of the National Comprehensive Cancer Network*, 19 (9). 1072. 2021.
- [5] Abbasi, K., “The next step in immortality: charging to create and cure disease”, *British Medical Journal*, 374 (n2268). September 2021.
- [6] Desjardins, J., “Every Single Cognitive Bias in One Infographic”, <https://www.visualcapitalist.com/every-single-cognitive-bias/> August 26, 2021.
- [7] Kahneman, D., Sibony, O., and Sunstein, C.R., *Noise: A Flaw in Human Judgement*, New York: Little, Brown, 2021.
- [8] AMA, *ICD-10-CM 2021/2002: The Complete Official Codebook*, American Medical Association, Chicago, 2021/2002. https://www.amazon.com/ICD-9-CM-2002-International-Classification-Diseases/dp/1579472079/ref=sr_1_60?dchild=1&keywords=ICD+9&qid=1629118662&s=books&sr=1-60.
- [9] Tam, B.T., Morais, J.A., Santosa, S., “Obesity and ageing: Two sides of the same coin”, *Obesity Reviews*, <https://www.sciencedaily.com/releases/2020/02/200225122954.htm>.
- [10] Wilkinson, M.J., Manoogian, E.N.C., Zadourian, A., Lo, H., Fakhouri, S., Shoghi, A., et al. “Ten-Hour Time-Restricted Eating Reduces Weight, Blood Pressure, and Atherogenic Lipids in Patients with Metabolic Syndrome”. *Cell Metabolism*, 2019 <https://www.sciencedaily.com/releases/2019/12/191205141731.htm>.
- [11] Chaix, A., Deota, S., Bhardwaj, R., Lin, T., Panda, S., “Sex and age-dependent outcomes of 9 hour time-restricted feeding of a western high-fat high-sucrose diet in C57Bl/6J mice”, *Cell Reports*.
- [12] Kompaniyets, L., Goodman, A.B., Belay, B., Freedman, D.S., Sucusky, M.S., Lange, S.J., et al. “Body Mass Index and Risk for COVID-19–Related Hospitalization, Intensive Care Unit Admission, Invasive Mechanical Ventilation, and Death — United States, March–December 2020”, *CDC*, March 8, 2921 https://www.cdc.gov/mmwr/volumes/70/wr/mm7010e4.htm?s_cid=mm7010e4_x.
- [13] Sjögren, L., Stenberg, E., Thuccani, M., Martikainen, J., Rylander, C., Wallenius, V., Olbers, T., Kindblom, J.M. “Impact of obesity on intensive care outcomes in patients with COVID-19 in Sweden—A cohort study”. *PLOS ONE*, 16 (10): e0257891. 2021. <https://www.sciencedaily.com/releases/2021/10/211013152136.htm>.
- [14] Wirt, R.A., Crew, L.A., Ortiz, A.A., McNeela, A.M., Flores, E., Kinney, J.W., Hyman, J.M., “Altered theta rhythm and hippocampal-cortical interactions underlie working memory deficits in a hyperglycemia risk factor model of Alzheimer’s disease”. *Communications Biology*, 4 (1). 2021. <https://www.sciencedaily.com/releases/2021/09/210928121324.htm>.
- [15] Istfan, N., Hasson, B., Apovian, C., Meshulam, T., Yu, L., Anderson, W. and Corkey, B.E., “Acute Carbohydrate Overfeeding: A Redox Model of Insulin Action and Its Impact on Metabolic Dysfunction in Humans”. *Am J Physiology*. October 2021.
- [16] Lam, V., Takechi, R., Hackett, M.J., Francis, R., Bynevelt, M., Celliers, L.M., Nesbit, M., et al. “Synthesis of human amyloid restricted to liver results in an Alzheimer disease–like neurodegenerative phenotype”. *PLOS Biology*, 19 (9): e3001358.
- [17] Kolhe, R., Sahajpal, N.S., Vyavahare, S., Dhanani, A.S., Adusumilli, S., Ananth, S., Mondal, A.K., et al. “Alteration in Nasopharyngeal Microbiota Profile in Aged Patients with COVID-19”. *Diagnostics*, 11 (9): 1622. 2021. <https://www.sciencedaily.com/releases/2021/09/210928074951.htm>.
- [18] Licher, S., Heshmatollah, A., van der Willik, K.D., Stricker, B.H.C., Ruiter, R., de Roos, E.W., et al. “Lifetime risk and multimorbidity of non-communicable diseases and disease-free

- life expectancy in the general population: A population-based cohort study". *PLoS Med* 16(2): e1002741. 2019.
- [19] Muntner, P., Hardy, S.T., Fine, L.J., et al. "Trends in Blood Pressure Control Among US Adults With Hypertension, 1999-2000 to 2017-2018". *JAMA*. 324(12): 1190-1200. 2020. <https://jamanetwork.com/journals/jama/currentissue>.
- [20] Digby, Z., Tourlomis, P., Rooney, J., Boyle, J.P., Bibo-Verdugo, B., Pickering, R.J., Webster, S.J., et al. "Evolutionary loss of inflammasomes in the Carnivora and implications for the carriage of zoonotic infections". *Cell Reports*, 36 (8): 109614. 2021.f
<https://www.sciencedaily.com/releases/2021/08/210824121049.htm>.
- [21] Kantor, E.D., Rehm, C.D., Haas, J.S., Chan, A.T. and Giovannucci, E.L. "Trends in Prescription Drug Use among Adults in the United States from 1999–2012", *JAMA*, 2015 Nov 3; 314(17): 1818-1831, 2015.



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