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Are the Fittest the Healthiest?: Proposing Ecological Fitness as an Operational Definition of Health

Javier Silva-Silva

javieresilva98@gmail.com

Servicio de Salud Metropolitano Sur Oriente

Elsa González San Martín

Pontificia Universidad Católica de Chile

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Abstract

This paper aims to explore different definitions of biological fitness to assess whether any could also serve as an operational definition of health. This inquiry is motivated by the fact that the concept of fitness has been linked to health in various ways since Darwin's *On the Origin of Species*. After laying out the desiderata that a definition of health should meet, we examine which definitions of fitness satisfy them, identifying vernacular, trait, and ecological fitness as candidates. Due to incompatibilities between the concept of health and both vernacular and trait fitness, we conclude that ecological fitness—an organism's capacity to survive the environmental challenges it encounters—is the only fitness definition that could serve as an operational definition of health. However, ecological fitness is not yet well-defined, so further work should focus on refining its definition to meet the criteria for a robust concept of health. Despite this limitation, ecological fitness may still prove useful as an operational definition of health for future research.

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1. Introduction

The various problems and debates in bioethics depend to a great extent on how the concepts of 'health' and 'disease' are defined. To illustrate, this can be observed in discussions related to medicalization, since if medicalization is treating a phenomenon that is not truly pathological as if it were a disease (Conrad 2007, 4), what counts as non-pathological is directly dependent on the definition of disease adopted. Similarly, medical ethics—the study of what is considered the correct course of action in medicine—depends on these definitions. For example, if health is defined as the absence of disease, it follows that medical ethics should focus on the treatment and prevention of diseases, whereas if health is defined as well-being, the focus of medical ethics would be the optimization or preservation of well-being (Silva-Silva and González 2025, 112).

The debate about what health is divided into two major theoretical currents. On one hand, there are those who consider that health should be an objective or natural concept, that is, definable based on necessary and sufficient objective criteria.[1] On the other hand, there are those who think that it should be a conceptual construct, based on the value judgments that a society or culture holds regarding certain biological states (Saborido 2020, 53–65). The most representative theory of the first group is Boorse's biostatistical theory (1977, 1982; Saborido 2020, 89–90), which states that health is a state in which the biological functions of an organism, in the absence of disease, contribute optimally to the organism's fitness. Regarding the group of constructivist theories, the most representative of them is Nordenfelt's holistic theory (1986, 2007; Saborido 2020, 109–110), according to which health is understood as the ability or capacity of the individual to achieve their most essential goals in life, given standard circumstances, which depends not only on the absence of disease but also on their psychological and social well-being. However, the aforementioned alternatives overlook some evident aspects of the property of health, namely, that health is not simply the absence of disease (WHO Interim Commission 1984, 100), but neither is it equivalent to biopsychosocial well-being (Hausman 2017, 28–29).

[1] In philosophy of medicine, naturalism does not necessarily refer to metaphysical, methodological, or political naturalism, but to the view that health and disease can be defined in objective terms.

As a consequence of the above, there is a conceptual gap regarding an appropriate definition of health, which is problematic for bioethics because health is a fundamental concept for the medical sciences and health professions (Silva-Silva and González 2025, 112), so that the absence of a clear definition makes it difficult to determine the correct course of action in medical practice, and not having a definition of health opens the possibility that incorrect definitions facilitate the true medicalization of human suffering or social problems, disease mongering, and the lack of clarity regarding the demarcation criterion between therapeutic intervention and enhancement—problems that pose their own ethical challenges. The objective of this paper is to contribute to strengthening the conceptual foundations of bioethics by reducing that conceptual gap, through the proposal of an operational definition of health—that is, tentative, revisable and correctible. To this end, the intuitive but hitherto not fully analysed relationship between the concept of health and that of biological fitness will be explored.[2]

The idea of a relationship between fitness and health seems evident, since it is apparently correct to state that a good state of health is associated with greater probabilities of survival and reproduction. However, what remains unclear about this supposed relationship is whether health is identical to fitness or whether health simply contributes in a certain way to it. In this regard, Darwin's original work is not explicit. With few mentions of the concept of health throughout *On the Origins of Species*, the only relationship established between health and fitness is that organisms with greater fitness are vigorous, healthy, and happy (Darwin 2018, 92). This statement is ambiguous, as it can be interpreted in two ways. The first is that the vigorous, healthy, and happy are the fittest—that is, that the four terms are interchangeable. The second interpretation is that vigor, health, and happiness are biological properties that contribute to fitness, increasing it. Although subsequent works have explored the intuitive connection between health and fitness, a clear consensus regarding the nature of their relationship has not been reached (e.g., Boorse 1977, 555; Canguilhem 1991, 200; Dubós 1979, 137; Ryle 1947, 5). This is sufficient justification to examine whether any definition of fitness is a good candidate for also being an operational definition of health, at least until a better alternative is available.

The methodology will be as follows; section 2 will be a conceptual analysis of the concept of health; section 3, of the different concepts grouped under the umbrella term biological fitness; section 4 will be an analytical comparison between health and the different concepts of biological fitness, through which it will be evaluated whether any one of the latter is compatible with what is expected of a definition of health; section 5 is a discussion of the results; section 6 concludes the article.

2. Conceptual Analysis of 'Health'

According to Hausman, it is a matter of consensus and a trivial question to affirm that health generally contributes to an individual's well-being, but he considers the equivalence between health and well-being to be questionable (2017, 28). One of the reasons for holding that health and well-being cannot be equivalent is that, while diseases can be detrimental to the well-being of some individuals, what contributes to or harms each person's well-being is relative to each of them, which is why some diseases might not be detrimental to all (Boorse 1982, 7; Hausman 2017, 28). By way of illustration, Sacks (1995, 1–38) describes the case of an artist who acquired achromatopsia, the inability to distinguish colors, and although it would be expected that this condition would be detrimental to an artist, the patient described by Sacks considered that what happened to him was favorable, since the qualitative change in perception allowed him to adopt a different and positive way of perceiving visually, enhancing his creative capacity. In this case, it can be stated that the individual lost health but gained

[2] For the purposes of this article, 'fitness' is used solely to refer to the different definitions of biological fitness found within the framework of standard evolutionary theory.

well-being. Another reason to consider that health and well-being are not equivalent is that a fully autonomous individual can make decisions that they know harm their health but adopts in favor of their well-being (Veatch and Guidry-Grimes 2020, 114). An example of this is the case of people who refuse in-hospital therapies for terminal illnesses in order to devote their remaining time to carrying out a final set of activities with their loved ones. Similar criticisms can be made of other subjective criteria usually considered useful for defining health and disease, such as disability or perceived harm, which shows that subjective well-being does not always go hand-in-hand with health. Similarly, well-being criteria often depend on the cultural values of different societies, while health appears to be something independent of the cultural context in which the individual is immersed (Hausman 2017, 29). For example, no matter how different the cultural characteristics of two people may be, if both suffer from tuberculosis, both would be considered unhealthy.

Stating that health is equivalent to well-being implies accepting that health depends on subjective valuations, that is, that it implies value judgments that do not necessarily depend on the objective biological characteristics of an organism. However, the above considerations favor the position that the concepts of health and well-being, although they may be related to each other, are in principle independent, which is why the supposed subjective nature of health does not follow from the subjective nature of well-being. In fact, the above arguments suggest that health is an objective or natural property, independent of subjective or cultural appreciations.

It is also important to understand why some scholars reject the supposed equivalence between health and absence of disease—reasons that motivated the formulation of the World Health Organization's definition of health, which defines health as complete biological, psychological, and social well-being (WHO Interim Commission 1948, 100).

On the one hand, it appears that health professionals think of health as a quantitative property, since judgments regarding an individual's health are relative comparisons with other individuals or with the same individual at another time, allowing for an ordering of the degree of health among them. There are situations or actions that can improve an individual's health, and others that can worsen it, and it is possible to establish that one individual has better or worse health than another (Schramme 2023; Schroeder 2013). On the other hand, an individual's health does not correlate directly with the fact that they are sick or not, since (i) two individuals without diseases can have different health, (ii) two individuals with the same disease can have different health, and (iii) an individual with a disease can be considered healthier than an individual without diseases (Schramme 2017). The following examples illustrate the previously mentioned situations:

i. Two individuals without disease have different degrees of health: one of them engages in periodic physical activity and eats a balanced diet, while the other maintains a sedentary life and their diet is based mainly on saturated fats.
ii. Two individuals with type 2 diabetes mellitus have different degrees of health: one of them adheres to their treatment, engages in regular physical activity, and maintains a low-carbohydrate diet, while the other does not take their medication, maintains a sedentary life, and their diet consists of large amounts of carbohydrates and saturated fats.
iii. An individual with type 2 diabetes mellitus has greater health than another individual without diseases: the former adheres to their treatment, engages in regular physical activity, and eats a balanced diet, while the latter does not exercise, eats at irregular hours, and whose diet is rich in saturated fats.

It can be appreciated, from the examples mentioned, that the presence or absence of disease does not directly determine who enjoys greater or lesser health. Nevertheless, it is relevant to remember that

diseases do affect health, since (iv) two individuals with the same lifestyle, but of whom only one suffers from a disease, have different health, as illustrated in the following example:

iv. Two individuals engage in the same physical activity and adhere to the same diet, but one of them suffers from a cancer with a poor prognosis and the other does not suffer from diseases.

With these situations in mind, it is difficult to defend that health is only the absence of disease. First, the use of the concept of health in the biomedical sciences is not qualitative but quantitative. The definition of health as 'absence of disease' is incompatible with the concept of health, since it considers that health is a property that one can have or not have, whereas the biomedical disciplines consider that health can decrease with different events, even if these are not diseases, but it is not a property that is completely lost. Health would be a property of organisms that would only be lost when they die, in the same way that the property of 'being alive' is lost upon death. Second, the supposed equivalence between health and absence of disease fails to consider other aspects that can affect health. Some habits, such as certain types of diet and physical activity, are associated with better health in humans, while other habits are associated with worse health. Generalizing the relevant aspects of the previous example, some changes in the physicochemical characteristics of an individual, both due to internal and external causes, can increase or decrease their health, without these changes necessarily being diseases. In other words, health appears to be a property that, at the very least, presents a relationship of modal covariation with the physicochemical characteristics of organisms. However, it is also important to consider that the direction in which the acquisition of a disease displaces health is toward its decrease. That is, having a disease decreases an individual's health.

From all the above, it is possible to obtain the following desiderata:

I. *Independence from the concept of well-being*: the definition must not depend on subjective aspects or conventional value judgments centered on well-being or related concepts.
II. *Quantitativity*: health must be a quantitative property of organisms.
III. *Modal covariation with physicochemical characteristics*: the value or degree of health must covary with the physicochemical characteristics of organisms.
IV. *Decrease in health in the presence of disease*: the greater (or more) disease(s), the lesser the health in an organism.

3. Conceptual Analysis of 'Fitness'

Fitness, in evolutionary theory, is generally defined as the probability of an organism surviving and reproducing in a given environment (Abrams 2009a, 21; Pence 2021, 6; Sober 2020, 2; Triviño 2024, 3), although other definitions of the concept have been proposed (Abrams 2009a, 22; 2012, 1; Bourrat et al. 2024, 2; Doulcier et al. 2021, 1).

The definition of fitness generally accepted by biologists and philosophers of biology—namely, the probability of survival and reproduction—has been named 'vernacular fitness' (Matthen and Ariew, 2002, 56; Pence 2021, 16), and is characterized as a biological property of the organism distinct from its actual reproductive success (Jeler 2024, 2, 4). Although vernacular fitness is conceived as an individual's property, it depends on the organism's genotype, phenotype, and environment (Abrams 2009a, 22).

Pence and Ramsey (2013) propose defining vernacular fitness as the propensity to generate lineages with different degrees of success, in which the greater the probability of success of their

lineages, the greater the individual's vernacular fitness.[3] This change resolves various counterexamples to the traditional definition of vernacular fitness, such as cases in which an individual's offspring are sterile (Pence and Ramsey 2013, 857), or cases in which vernacular fitness differs depending on how soon different organisms can reproduce, despite having the same expected number of offspring (858). In any case, it is clear that a central aspect of vernacular fitness is that the organism possesses a certain degree of fertility.

Another relevant point about vernacular fitness is that it cannot be dynamic—that is, it cannot increase or decrease over time—since it is a probabilistic value of reproductive success throughout the entire life of a given organism. If vernacular fitness varied during an organism's life, it could not be used as a predictive property (Ramsey 2006). Vernacular fitness is used in evolutionary theory to predict the reproductive performance of organism X from the reproductive performance of organism Y with similar biological characteristics. If vernacular fitness were dynamic, varying throughout an organisms' lives, two organisms X and Y with similar biological characteristics could have very different vernacular fitness at a given moment, which would undermine the predictive potential of this property (Abrams 2009b, 489). For this reason, some propose that vernacular fitness cannot be a property whose value differs according to the instant of time in an organism's life. Rather, it is convenient to conceive vernacular fitness as a property whose value remains constant throughout an individual's ontogeny.

An alternative definition, which has received greater attention in recent years, is the definition of fitness as a property of biological traits, which predicts whether the trait will increase or decrease its relative frequency in future generations (Doulcier et al. 2021, 3; Pence 2021, 16). This definition will be referred to as 'trait fitness'.

The definition of trait fitness is characteristic of population genetics and finds its utility within the theoretical framework of the modern synthesis, in which trait fitness represents a statistical measure of the change in the frequency of genes in a population (Krimbas 2004, 199; Matthen and Ariew 2002, 56). In more general terms, trait fitness is a statistical value about how the representation of a given trait in a population is expected to behave over time, which can be any type of entity. This implies that trait fitness is substrate-neutral, since it can be applied to any biological substrate other than an organism, whether it be a gene, a chromosome, a karyotype, a tissue, or an organ, among others (Abrams 2012, 4–5; Bourrat et al. 2024, 5; Doulcier et al. 2021, 3; Pence 2021, 16). Furthermore, although it can be an explanatory property, trait fitness is characterized as a non-causal property (Matthen and Ariew 2002, 79–83; Pence 2021, 8; Walsh 2010, 168).

As can be noted, trait fitness is not a property of each individual organism, although it is possible to argue that the conjunction of the different trait fitnesses of an organism can result in a distinctive property corresponding to vernacular fitness. This would have similarities with cases in physics in which it is argued that different forces give rise to a total resultant force (Matthen and Ariew 2002, 57). However, there is also the possibility of adopting a constructivist position regarding trait fitness, interpreting it as an abstraction of particular biological events and that, therefore, has no relevance for determining vernacular fitness (Matthen and Ariew 2002, 82; Pence 2021, 8).

Bouchard and Rosenberg (2004; Rosenberg 2006), faced with some of the problems that evolutionary theory confronts as a consequence of the vernacular definition of the concept of fitness, propose that the results of natural selection are a consequence of another biological property that is not vernacular fitness, but ecological fitness. For them, 'ecological fitness' is defined as the ability of an organism to solve the problems it encounters in its environment with a certain degree of success. A greater degree of success would reflect greater ecological fitness (Bouchard and Rosenberg 2004, 699–700; Bourrat et al. 2024, 4; Rosenberg 2006, 165).

[3] See also Bourrat et al. (2024, p. 6) and Pence (2021, pp. 38–39).

Bouchard and Rosenberg recognize that the adoption of ecological fitness as a relevant property for biology requires dealing with some unresolved issues, such as determining what the different environmental problems are, determining how to measure the degree of success of individual organisms' problem-solving, defining a common unit for measuring ecological fitness, and possible objections to the suggestion of teleology or adaptationism in the notion of a problem that is solved with greater or lesser success (Bouchard and Rosenberg 2004, 700). However, these difficulties are not enough to deny the theoretical utility of ecological fitness, rather only suggest that the concept stands in need of further refinement. For example, ecological fitness could be characterized as a property that contributes, in a certain sense, to vernacular fitness, insofar as greater ecological fitness increases the probability of an organism reproducing and giving rise to more successful lineages. Ecological fitness, in fact, echoes Darwin's original idea of fitness, in which organisms and their environment can fit in different ways, and those with *better fit* are those that survive and reproduce more (Ariew and Lewontin 2004, 348; Krimbas 2004, 186).[4] This individual-environment fit would have a high correspondence with Bouchard and Rosenberg's proposal of ecological fitness. It is also interesting how examining the origin of the concept of fit in Darwin points the way to resolving some of the problems of the concept of ecological fitness. Initially, Spencer (1852, 500) considered that organisms in which the power of self-preservation were greater would be those that tended to increase their numbers at the expense of other organisms. Darwin adopted this idea and incorporated it into *On the Origin of Species*, a work in which fitness would be the ability of an organism to survive the challenges of its environment (Peacock 2011, 100).[5] Thus, ecological fitness can be understood as the conjunction of any trait, propensity, or property that an organism possesses and that allows it to remain alive in that environment (Peacock 2011, 101). With this, it can be specified that greater success in solving environmental problems is achieving greater success in staying alive, which could be measured in terms of probabilities of survival, compared to optimal models for each species, and restricted to the typical problems that each species faces—that is, the problems that each individual of a species usually encounters most frequently, relative to the ecological environment in which it finds itself. Alternatively, organism-environment system models could facilitate the objective evaluation of the level of fit of an individual with the environmental problems it faces (e.g., Milocco and Uller 2023). These options are possible strategies for expressing less ambiguously concepts such as 'better fit,' which could dissolve the problems related to the definition of ecological fitness.

4. Analytical Comparison Between 'Health' and 'Fitness'

Using the previously obtained desiderata I–IV, it is possible to evaluate which definition of fitness is compatible with the concept of health.

Desideratum I does not eliminate any definition, since none resort to establishing an equivalence between health and certain types of positive subjective appreciations.

Desideratum II, quantitativity, appears to be satisfied by all definitions, at least at first glance. How vernacular fitness and trait fitness can be quantified is trivial and, as has been argued, there is potential for quantifying ecological fitness in terms of probability of survival, compared to optimal models, or by using organism-environment system models. However, part of the desideratum—and of desideratum III—is that the property of health should be a property of the organism, something that is not compatible with trait fitness. Thus, only vernacular fitness and ecological fitness remain as adequate candidates.

[4] See Darwin (2018, 93–102).
[5] See Darwin (2018, 76).

Desideratum III, modal covariation with the physicochemical characteristics of organisms, is incompatible with vernacular fitness. As explained earlier, vernacular fitness cannot be dynamic—that is, it cannot increase or decrease over time—since vernacular fitness is the propensity that the organism has to have fertile offspring throughout its entire life. This differs from the property of health, which can increase or decrease over time according to the physicochemical changes the organism experiences. This problem also arises from the analysis of compatibility of vernacular fitness with desideratum IV, the inverse relationship between disease and health, since the presence or absence of disease would not modify the organism's vernacular fitness. This is consistent with another incompatibility between vernacular fitness and the concept of health, since an intuitive aspect of health, already present in Darwin's work (e.g., Darwin 2018, 329–331), is that it is perfectly conceivable that there are infertile organisms with a high degree of health.

Ecological fitness then remains as the only alternative compatible with the concept of health, such that health can be operationally defined as the capacity of individuals to deal with the problems they encounter in their environment, and further work on the matter of defining health can take this definition as its starting point.

5. Discussion

If health were equivalent to ecological fitness, then the healthiest organisms would be those most successful in solving the problems they encounter in their environment. This could account for how changes in the physicochemical characteristics of the organism can generate greater or lesser health, since changes in the organism's traits would modify their contribution to the capacity to solve environmental problems. Similarly, this would allow accounting for how diseases decrease health, since diseases usually generate physicochemical changes that decrease their survival capacity. For example, blood loss, decreased aerobic capacity, loss of muscle mass, loss of nutrients, or decreased sensory acuity, among many other examples of situations generally considered pathological, are related to a decrease in the capacities or probabilities of survival of organisms. This is, in turn, compatible with naturalistic theoretical proposals for the definition of disease.

The best-known naturalistic theory of disease is Boorse's (1977; 1982; 2014), according to which a biological dysfunction is a lower performance in the way a trait contributes to an individual's vernacular fitness, compared to its reference class—species, sex, and age. Thus, many diseases would be a situation related to a lower capacity for survival, which is compatible with the operational definition of health as ecological fitness. On the other hand, a more recent theory, the organizational theory of biological dysfunction (Saborido and Moreno 2015; Saborido et al. 2016), considers that a disease is a decrease in the performance range in which a trait contributes to the maintenance of the system and the maintenance of the trait itself. Given that system maintenance is equivalent to the organism's survival in the organizational framework, diseases would be those physicochemical changes that decrease the survival capacity of organisms, which, again, is compatible with the operational definition of health as ecological fitness.

Another point to consider is that an equivalence between health and ecological fitness could explain the two possible relationships between the concepts of health and fitness mentioned above—namely, that they could either be interchangeable or one could contribute to the other. As previously mentioned, ecological fitness is a property that contributes to vernacular fitness or, in other words, vernacular fitness depends on ecological fitness. It follows from this that, if health and ecological fitness were equivalent, health would be a property that contributes to vernacular fitness. The confusion about the two possible relationships between health and fitness would arise from not specifying the type of fitness to which reference is made. Consequently, health as a biological property would not be of interest

only to the biomedical sciences, since if health were equivalent to ecological fitness, it would be relevant for both ecologists and biologists dedicated to evolutionary theory.

Other discussions about the concept of health, which have not had much presence in the analytical tradition, have pointed in a direction similar to that which guides the provisional definition of health as ecological fitness. Canguilhem (1991) points out that health is a margin of tolerance for the inconsistencies of the environment (197), that being in a good state of health is being able to become ill or face organic crises and recover (198–200), and that being healthy is being adapted to the environment and its demands (200)—aspects analogous to facing obstacles in the environment and being able to overcome them. Similarly, Menatti and colleagues (Menatti et al. 2022; Bich and Menatti 2026) consider that health is the way in which organisms cope with the environment. In relation to Menatti's thesis, a recent paper has proposed a similar concept to ecological fitness to define the so-called ecosystemic health—a metaphorical concept aimed to guide environmental ethics. In it, the authors define health as the capacity of an individual to adapt to its environment, and explore the consequences that such an approach would have to guide ecosystemic interventions related to conservation and restoration (Silva-Silva et al. 2026). These approaches are not identical. Canguilhem (1991) makes subjective experience central to health, a criterion absent from an operational definition of health as ecological fitness, while Menatti and colleagues' proposal (Menatti et al. 2022; Bich and Menatti 2026) emphasize adaptive mechanisms, which renders it narrower in focus. Nevertheless, the intention here is not to conflate these views, but to highlight that independent scholars have converged on similar conclusions to those reached in this paper, through different means, reinforcing the plausibility of an ecological fitness account. A provisional equivalence between health and ecological fitness therefore appears to be a productive step that can enrich ethical, philosophical, and theoretical inquiry into health.

Regarding the bioethical consequences of adopting an equivalence between ecological fitness and health, the most immediate is that the focus of medical attention, and therefore the most fundamental ethics of medical practice, should center on the maximization or optimization of patients' capacity to solve the problems they encounter in their environment. This is something that physicians already do insofar as doctors seek to cure diseases, stop their progression, or palliate the disability they generate, and promote lifestyle habits that increase the capacity to adapt to the environment. However, what physicians do in practice is better captured by the ecological definition of health than by defining it as mere absence of disease or as biopsychosocial well-being. For instance, disease prevention or treatment is not required for a physician to recommend lifestyle changes, and physicians do not always seek to alleviate suffering or pain, as in the case of non-pathological grief due to bereavement (Solomon 2026, 6), which constitutes a type of suffering that medicine would not seek to alleviate or avoid in itself. This could be explained by considering that subjective aspects, including suffering or pain, could on some occasions affect the capacity to resolve the environmental problems an individual faces in a negative way, but on other occasions do so positively, which could serve as an interesting point for a further theory on the concept of 'mental health.'[6] In this way, the treatment or alleviation of pain would be a medical duty only in the case that it decreases an individual's capacity to resolve the problems encountered in their environment, which generally happens when an individual suffers from a disease. Of course, this does not imply that help cannot be offered to the patient who suffers from non-pathological causes. Rather, it is emphasized that doctors do not necessarily have a role in treating *all* types of suffering, since there are situations in which it can be better addressed by other agents, such as psychologists, social workers, or religious leaders. At the level of public health, a definition of health equivalent to ecological fitness could reorient national health programs toward new goals, such as

[6] On this view, mental health could be defined as an individual's mental capacities or characteristics that mediate the solution of the problems encountered in their environment. Better mental health would entail having mental capacities or traits that contribute more optimally to solving environmental problems.

improving the perception of people's capacity to resolve environmental problems—measurable through functional independence scales, complementing the current focus centered on epidemiological and well-being goals.

In addition to the above, establishing an equivalence between health and ecological fitness would allow health to position itself as a bridge concept between different disciplines of the life sciences. Health is a fundamental concept for the biomedical sciences, since it guides clinical practice and biomedical research, while ecological fitness is a concept of utility for both ecology and evolutionary biology. For the latter, ecological fitness would be a property that contributes to the reproductive success of fertile organisms, from which it could be concluded that ecological fitness, and therefore health, contributes to vernacular fitness. Thus, health would be a property to consider when explaining the evolution of new traits and new species. Finally, as Bich and Menatti (2026) mention, organizational theories—the set of theories that seek to establish what the common elements of all living systems are—have begun to increasingly emphasize the close relationship between life and the capacity to adapt to environmental demands, from which it can be proposed that health is a fundamental property for understanding life in a broader sense.

6. Conclusions

In this work, arguments have been given in favor of adopting the strategy of establishing an equivalence between the concepts of health and ecological fitness—that is, proposing that an individual's health is their ecological fitness—with the aim of advancing the project of reaching a clear definition of the concept of health. This proposal is compatible with the desiderata presented in this work, which correspond to desirable aspects of any proposed definition of health, and is consistent with previous proposals that highlight the relationship between health and adaptivity.

A limitation of the concept of ecological fitness is the lack of clarity about how to determine what the different environmental problems are, how to measure the degree of success of individual organisms' problem-solving, and how to define a common unit for measuring ecological fitness. With this, it is not argued that assuming an operational definition of health as ecological fitness is a bad strategy. On the contrary, the arguments presented favor considering this strategy as a fruitful direction. However, much work is required to increase the precision of the definition of ecological fitness, which should be carried out in future work. As suggested, one possible way to avoid ambiguities regarding this concept is to relate it to probabilities of survival, compared to optimal models for each species, restricted to the problems that individuals of each species encounter most frequently. Another possibility is to resort to organism-environment system models, with which an organism's response to environmental perturbations can be predicted.

In any case, with a more precise definition of ecological fitness—and therefore of health—it would be expected that the foundations of bioethics would acquire greater robustness. Understanding health as ecological fitness can be a useful starting point to enrich research about the concept of health and offer new therapeutic approaches based on improving people's adaptation to their environment, adding this goal to current clinical practice, which hitherto focuses more on the prevention or cure of diseases or on improving people's well-being.

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