

About the Accumulation of Diseases in Certain People

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Editorial

It can be thought that the number of health problems per person is distributed homogeneously in a population, that is, that all people have a similar number of problems (perhaps the arithmetic mean). Alternatively, one can also think that the number of health problems or diseases per person are distributed in a "normal" way in the population (following a Gauss curve), that is, there are a small number of people who present very few diseases, another small group of people who have many diseases, and the vast majority of people who have an intermediate number of diseases. However, general practitioners have the impression, throughout continuous clinical practice, those patients' health problems "never come alone". There are certain patients who have many problems; when these people are in full crisis, more problems are added and everything seems to be shattered. "The lean dog is all fleas," says a Spanish proverb. That means misfortune attracts misfortune. With this phrase we refer to a person who in his life already has many problems, and if that were not enough, the ills accumulate. It seems that misfortunes never come alone and always attack the weakest [1,2].

Many naturally occurring and man-made phenomena demonstrate a non-uniform exponential distribution whereby a small set of common elements in a class represent the bulk of all uses of the class. This phenomenon has variously been referred to as the 80/20 rule or the Pareto principle (the great Italian economist Vilfredo Pareto, who in 1906 conducted a study on the distribution of land ownership in Italy) [3,4]. When 80% of the problems come from 20% of the patients and the rest of the problems (20%) come from 80% of the patients, then we have a distribution according to the Pareto Principle, also called power-law distribution. That is, simply any distribution in which a minority of elements captures almost all the relationships and the rest of the elements (a majority) has very few relations.

The fact that a system follows a power-law distribution is an important vulnerability. For example, consider two systems: The road system and the airport system. The first does not follow a power-law distribution, because we cannot say that there are certain nodes that monopolize almost all traffic while most have little traffic. In general, the traffic is distributed following a normal or Poisson distribution. The airport system follows a power-law distribution. For example, in the United States airports of New York, Chicago, Atlanta or Los Angeles account for almost all air traffic, while the other hundreds of airports have relatively small air traffic in comparison. Thus, a problem on the highway would only affect that particular highway and possibly the nearest cities, but a problem at a main airport would affect all air traffic.

However, what is really interesting for the general practitioner, is the fact that his patients follow a power-law distribution, is not that it supposes an important vulnerability (which is obvious), but that it also encloses its strength. The main use of know this power-law distribution

among the patients seen in the general medicine practice, is to be able to prioritize decision making and focus on the aspects whose improvement will have more impact, thus optimizing the efforts by focusing on this group of key individual patients [5].

Why this accumulation of health problems or diseases in certain people? The study of why a system follows a distribution of power-law is an area of active research. The accumulation of health problems are a complex condition and can occur as a result of a genetic predisposition (a natural tendency), environmental or unknown factors. We can outline the following hypotheses of accumulation of diseases:

- Causality, associations and linkages: 1) through a path of common origin (for example, many digestive diseases and related to the immune system are due to the accumulation of toxins in the intestine, which causes the syndrome of inflammation of the mucous membranes), or through a cortico-visceral or psychosomatic or holistic or psychosomatic pathway (the origin of many visceral diseases is found in alterations of the exteroceptive signaling) [6]; 2) through the accumulation of risk factors (for example, cardiovascular, age, hypertension, obesity, smoking and sedentary lifestyle, etc.); 3) through genetic bases (the accumulation of genetic and epigenetic alterations is a key causal process between the environment and diseases of complex etiology) [7]; 4) molecular and biological linkages (for example, all COPD multimorbidities studied here are related at the molecular and biological level, sharing genes, proteins and biological pathways) [8].
- Coincidences, Seriality, Synchronicity: the central idea is that, coexistent with causality, there is a non-causal non-physical principle active in nature; it is the simultaneous occurrence of two significant events that are not causally connected [9]. C. G. Jung and W. Pauli agreed that "there is a principle of non-causal attachment in nature that manifests itself through significant coincidences". That is to say: "there is a close relationship between internal and external events that we live; relationship that cannot be explained by the principle of cause and effect, but that nevertheless makes sense for the observer" [10].
- Chance or random; and, 4.- Due to our own interventions to solve other previous problems (such as pharmacological iatrogenesis or surgical sequelae).

The challenge for future research is to confirm these groupings, and work on those that are not due to chance. This fact is especially relevant for biologically plausible clusters or those that, even if they do not know the existing clinical relationship, are more prevalent and therefore potentially important for clinical practice and health cost.

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