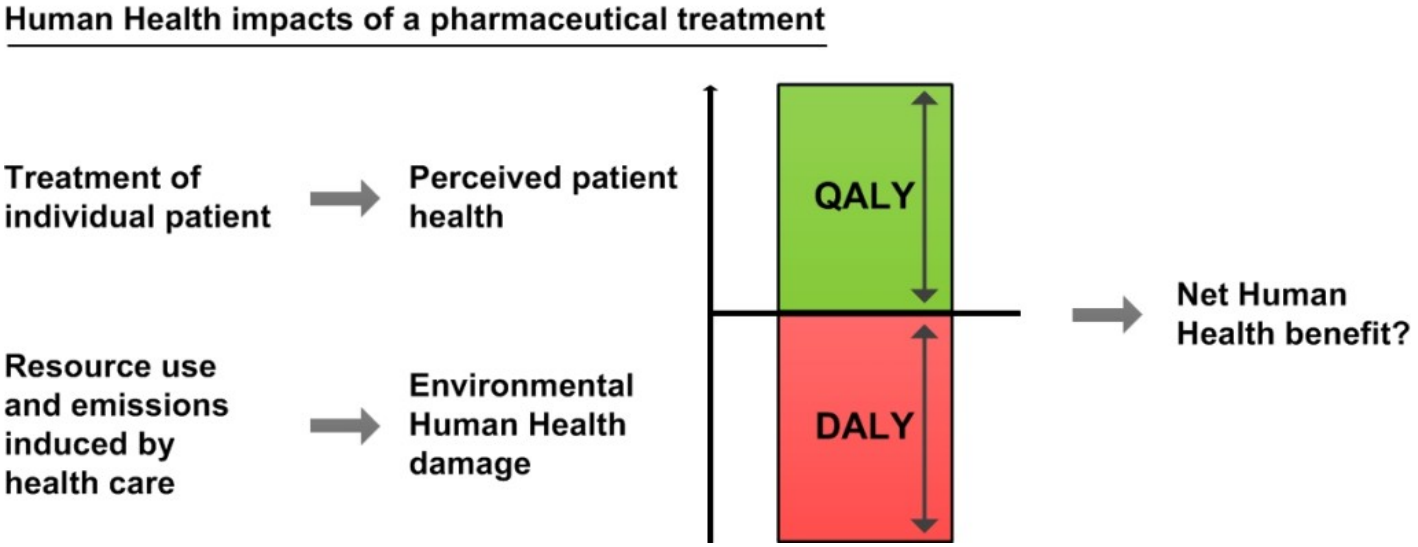
# A holistic human health assessment of pharmaceutical treatments

Present-day economy looks more and more to environmentally sustainable products and services in order to safeguard the future of our society. Not only is an environmentally-friendly product better for the planet, it frequently goes hand in hand with economic benefits, such as the reduced use of expensive fossil resources. In order to quantify the extent to which a product or service contributes (or reduces its contribution) to the global environmental damage, a Life Cycle Assessment of the product is performed. This analysis takes into account all the underlying industrial processes required to manufacture the product. In order to go from the industrial operations to an impact on the environment, a so-called environmental cause-effect chain is used. All industrial operations finally contribute to a negative impact on three Areas of Protection: Natural Resources, Natural Environment and Human Health. These are commonly defined as the aspects humanity wishes to protect in the light of the environmental changes that are occurring. The last Area of Protection, Human Health, is caused by the emission of particulate matter, toxic and ozone-depleting compounds and Global Warming, which causes Human Health damage in terms of draughts, natural disasters and failed crops.




This means that it is possible to calculate the damage to global Human Health for every product or service imaginable. However, there is a unique sector that adds another dimension to this: pharmaceuticals. Pharmaceutical products have a very clear and quantifiable benefit as they create Human Health benefits for the patient. This benefit is used by companies in order to compare various medicines with one another and to argue for price setting and reimbursement with governments. Currently, the two main aspects under consideration in deciding whether to reimburse a medicine or not are the Human Health benefits versus the impact on the yearly health budget. However, as environmental issues gain importance, it may be that before long the ecological performance of medicines is also taken into account in these discussions.

In this study, we defined a framework with which to compare both the Human Health burdens and benefits of a pharmaceutical treatment on a common scale. This enables the scoring of a pharmaceutical treatment in terms of both individual and global Human Health performance. The methodologies for assessment of both benefits and burdens have guidelines for the employment of a time horizon, discounting and the inclusion of future or indirect effects. Both research areas have struggled with these concepts over the last decades. In order to facilitate a fair comparison, these aspects have to be harmonised in order to enable a single-score integration. We proposed to use the concept of monetization to provide the common ground for this integration. We concluded that the proposed framework should be validated with a case study that includes the full supply chain of a pharmaceutical treatment and all its benefits.

## Publication

Human health benefits and burdens of a pharmaceutical treatment: Discussion of a conceptual integrated approach.
Debaveye S, De Soete W, De Meester S, Vandijck D, Heirman B, Kavanagh S, Dewulf J.
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