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A review of the metrics for One Health benefits

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Summary
One Health as a concept has been with us for many years, yet it is only recently that it is actively being discussed as a way of mitigating risks in society. Initiatives in the use of this concept require methods to monitor the benefits gained from an holistic approach to health, yet there is an absence of adequate frameworks to measure One Health benefits. This paper explores the problem with a review of the available literature and an examination of methods used. It concludes that most published work on One Health describes how this concept is valuable without trying to estimate the size of benefit or type of value. A framework for measuring the advantages of a One Health approach is needed and, through the process of an international workshop and the development of a One Health business case, the authors are working towards its development.

Keywords
Benefits – Economics – One Health – Review.

Introduction

The conjectured importance of zoonoses has prompted the scientific community and decision-makers to look for holistic initiatives that incorporate the health and ecosystem sectors in order to improve our understanding of complex health relationships and to reduce national and global health risks. One Health recognises that the health of humans, animals and ecosystems is connected and advocates coordinated, collaborative, interdisciplinary and cross-sectoral approaches. A harmonised and integrated approach – One Health – to mitigate health risks is appealing.

However, worldwide recognition of One Health approaches for more effective protection of the global community from health threats has not led to the systematic allocation of resources for integrated disease mitigation programmes. The authors argue that, in part, this is due to a lack of studies which assess the economic efficiency of One Health approaches and therefore the business case for such a change has been poorly substantiated. While costs for One Health initiatives are easier to document, there is a lack of standardised and established methods to measure the benefits of integrated programmes.

Definitions

Several definitions of One Health have been presented since the term 'One Medicine' was considered inadequate, because it did not reflect the interactions between human and animal health that reach beyond individual clinical issues (1), and there is continuing debate about what constitutes One Health. In the past, it was mainly related to the interdependence of animal and human health, with the addition of environmental health. More recent definitions expand this to include other aspects that have an impact upon health and well-being; in particular, food security and poverty. For example, the Food and Agriculture Organization of the United Nations (FAO) sees One Health as 'a holistic vision to address complex challenges that threaten human and animal health, food security, poverty and the environments where diseases flourish' (2). Another definition of One Health perceives it as adding value through closer cooperation among professionals: 'added value in terms of human and animal health, financial savings or social and environmental benefits from closer cooperation of professionals in the health, animal and environment sectors at all levels of organisation' (3). The European Union (EU) uses a definition of One Health that refers to health hazards: 'the improvement of health and wellbeing through: *a)* the prevention of risks and the mitigation of effects of crises that originate at the interface

between humans, animals and their various environments, and *b)* promoting a cross-sectoral, collaborative, "whole of society" approach to health hazards, as a systemic change of perspective in the management of risks'. In a similar way to the previous definition, it implies that One Health has a value, i.e. it refers to the 'improvement' of health and well-being in comparison to a status quo (which is most likely a non-integrated, uni-sectoral or uni-disciplinary approach). Other definitions do not refer to added value, but rather describe the concept. For example, the American Veterinary Medical Association defines One Health as 'the integrative effort of multiple disciplines working locally, nationally, and globally to attain optimal health for people, animals, and the environment' (4). As a working definition for the purpose of this paper, the authors suggest the following broad definition, based on Miller *et al.* (5): 'One Health is a concept that addresses complex challenges to promote the health and well-being of all species through the integration of relevant sciences at the systems level.'

The problem

During the last five years, there has been a growing momentum, particularly from the international community, to request that health research, systems and services implement a One Health approach (6). Several projects and activities have been developed and are now working within this concept at the national, regional and global level (7), based on the expectation that a more holistic management of microbial health hazards will result in a more efficient use of the scarce resources available for mitigating zoonotic disease risk.

However, such a paradigm shift has not been supported by the systematic allocation of resources to integrated national or multinational programmes. At the national level, Ministries of Health and Agriculture (or Animal Health) remain largely separate, with individual budgets and agendas (6). This is partly due to a lack of convincing economic arguments in support of the One Health approach; the inertia of existing sectoral systems (6); barriers to information-sharing and reporting within and across institutions (8); a lack of agreement on leadership issues, resource allocation and task distribution among partners (9, 10); and insufficient indicators and measures of health (11). There has also been a dearth of studies to estimate the costs of such a change. Examples in which efficiency gains and the generation of net benefits to society have been demonstrated are mainly single projects or small-scale modifications of health systems, because no country has taken a decision towards major funding of institutions whose main activity is One Health (6). To further the One Health cause and promote its adoption globally, studies demonstrating the added value of One Health (in comparison to disciplinary, uni-sectoral or non-integrated) approaches are needed (12). Another challenge is that One Health initiatives have a strong disease focus, but often fail to address ecosystem components, malnutrition (both under- and over-nutrition), or poverty (12).

Some economic evidence for One Health benefits exists. In particular, this evidence involves cost savings and risk mitigation programmes for endemic zoonotic diseases, in which a strategic greater allocation of budgetary and other resources provides sufficient financing to control disease along the livestock value chain, leading to benefits in humans (6, 13, 14, 15). However, there is very sparse evidence about the economic efficiency of One Health surveillance systems, analysed either as independent strategies or incrementally; or about the prevention of disease emergence (6). Economic analyses of One Health benefits from strategies to reduce poverty or address malnutrition are hard to find.

The authors argue that the problem of limited and partial economic evidence on One Health lies in the absence of standardised methods to fully capture the complexity of the benefits gained from a more holistic health approach. This is largely due to a disconnection between disciplines in the past, resulting in specific disciplinary metrics that fail to appreciate other disciplines. To date, health impact assessments, environmental impact assessments, agricultural impact evaluations and socio-economic impact analyses have been performed. While some overlap exists across these approaches, there is no systematic methodology to reflect the intertwined nature of health impacts across the animal and human health sectors, the environment and agriculture. For example, in agriculture and animal husbandry, productivity is commonly used as a measure. Databases such as the Global Livestock Impact Mapping System, hosted by FAO, provide background data on biophysical, livestock population and production, socio-economic, animal health and trade parameters, but do not explicitly link productivity losses to disease incidence or human health impacts. Similar problems are seen in the field of human health, in which Disability-Adjusted Life Years are used to rank disease impacts, but do not take into account impacts on livestock production, health and welfare, or the impact of a zoonotic disease on livestock or the results of the threat of its emergence on people's livelihoods or wider societal aspects, related to constraints in livestock sector development and food supply. Disability-Adjusted Life Years also provide no information on expenditure caused by the presence or risk of disease or the lost opportunities in markets or the use of sub-optimal technologies in food systems (compared with animal disease impact assessments). This disciplinary isolation constrains the development of integrated data collection protocols and databases, and limits information on the priority of problems to be tackled and potential intervention points.

Consequently, there is a lack of combined metrics in complex systems that allow us to assess the benefits of One Health initiatives in terms of their health (human and animal), economic, social, biological, environmental and cultural benefits. The development of such metrics is not only a prerequisite for assessing whether One Health adds value compared to traditional approaches, but also provides an important tool to assess the impact of multiple ongoing One Health initiatives at various levels.

Aim

One Health promotes integrative health risk management at the systems level to provide a comprehensive, strategic approach to future health challenges. Current impact assessments do not cover the continuum of human through to animal health problems, and those that attempt it are often led by prioritisation processes dominated by expert opinion. This too often results in a stubborn institutionalisation of programmes and the preferential treatment of certain types of health problems. Questions need to be posed, therefore, about how we can estimate the benefits of One Health in a standardised way to provide the economic evidence that decision-makers need to allocate their resources effectively (16).

Commonly mentioned benefits of One Health to mitigate zoonotic disease risks include:

– increasing the benefit gained per resource unit used, by sharing resources in the field

– more accurate measurement of societal benefits through the integrated valuation of the impact of disease mitigation on human and animal health

– a reduction in the likelihood of zoonotic disease emergence and establishment

– a reduction in uncertainty in disease mitigation decisions

– improved information, data, knowledge and collaboration.

The long-term aim of the authors is to develop a framework that explicitly incorporates the heterogeneity of One Health and allows the measurement of all dimensions of One Health benefits in a standardised and consistent way, allowing for adequate comparisons and even meta-analyses in the future. As a first step towards this aim, a review of the literature has been conducted to identify the metrics and associated methods presented so far in the scientific literature for assessing the benefits of One Health activities.

Methodology

The authors conducted a review of the scientific and grey literature to create an inventory of One Health benefits and the metrics used to measure those benefits. For the scientific literature search, they used Scopus, PubMed and Web of Science, using a title and abstract search, without any restrictions in terms of language, year, or similar. The search terms used were (['One health' OR ecohealth] AND [effectiv* OR efficien* OR useful* OR benef* OR profit OR utility OR gain OR advantage OR value OR 'losses avoid*' OR 'cost avoid*' OR 'costs avoid*' OR 'cost sav*' OR 'costs sav*']). All references were extracted into a Mendeley reference manager and screened independently by two researchers, using primary exclusion criteria. When no abstract was available, the title was used to take a decision for inclusion or exclusion. The exclusion criteria were:

– the reference did not refer to Ecohealth or One Health as a concept, and

– the reference did not refer to any kind of benefit or value.

No secondary screening was considered necessary and all the articles were downloaded for a full text review and the extraction of information of interest. The same search terms were used in Google, where result pages were screened for relevant publications of any type (e.g. web presentations, reports, peer-reviewed publications) until three subsequent pages did not produce any further relevant results. These publications were added to the list of papers for full text review. Any other relevant publications found while reading the full text were added to the review. In addition to the publication details, the following information (where applicable) was extracted in the full text review:

– the output (e.g. intervention, programme, database, collaboration, etc.)

– the benefits: type of benefit (free text), plus categorisation into economic, social, environmental, human health, animal health, or other benefit

– the type of article: conceptual, applied or other

– was a metric used to measure benefits? yes/no

– if a metric was used, what was/were the: study objective, method/technique, target groups, data used, software, limitations, advantages?

Results

In Scopus, 513 articles were found; 411 were found in PubMed and 80 in Web of Science (379 were duplicates, which resulted in a total of 625 articles for the primary

screening). Of these, 111 were kept for the full text screening. Thirty-three additional publications were added from the Google search and ten from the full text review.

One Health benefits

The various One Health benefits described in the publications reviewed are presented in Table I. Economic, social, technical, animal and human health, environmental and information benefits are listed. The majority of benefits fell into the groups of more effective disease control and/or biosecurity measures (often related to infectious disease) and improvements in both animal and human health and well-being, as well as economic benefits.

These benefits range from rather specific measures, focusing on one type of output (e.g. a 15% reduction in costs), to all-inclusive expected benefits, referring to one or more hazards that could be disaggregated into their respective outcomes (e.g. preventing, detecting and combating future pandemics of H1N1) and very broad aspects that are difficult to disaggregate (e.g. ecosystem resilience). Also, many of the benefits described are intermediaries (e.g. improved coordination, knowledge, skills, capacity, and management) that contribute to the final benefits of improved health or economic efficiency.

Metrics and associated methods used

In the majority of studies, the expected or perceived benefits stemming from One Health were listed in a descriptive or conceptual way, and only a small number of studies reported a benefit that was 'measured', either in monetary or non-monetary terms. These exceptions are listed in Table II.

Table I
One Health benefits described in the publications found in the literature search

Benefit described	Observation	Ref.
Early detection of threat and timely, effective or rapid response, e.g. – using pets as sentinels (e.g. to detect lead poisoning) – the use of mobile technology for integrated data collection – preventing, detecting and combating future pandemics based on experience from H1N1 – an improved understanding of health problem emergence and re-emergence in order to respond in a proportionate and timely manner	Mostly an intermediary benefit, with an expectation that early detection leads to a rapid and effective response and therefore smaller outbreaks with smaller outbreak costs	17, 18, 19, 20, 21, 22, 23, 24, 25, 26
Better/improved/more effective disease control and/or biosecurity measures (often related to infectious disease), e.g. – an improved understanding of the virulence mechanism, disease pathogenesis and disease epidemiology – coordinated risk assessment – tackling infectious disease problems in those animal and human populations where it will be most effective – enhancing knowledge to effectively address the public health aspects of emerging and re-emerging infectious diseases – more effective policies – integrated study designs that investigate the health status of humans and animals simultaneously allow instantaneous identification of the source of a zoonotic disease – improved diagnosis of diseases through sharing knowledge and facilities (e.g. the inclusion of brucellosis as a differential diagnosis for malaria and typhoid fever in an area where raw milk consumption is still prevalent) – (improved) management or control of diseases in animals and/or humans – an effective understanding and prevention of disease evolution requires a multidisciplinary or One Health approach	The benefits described largely refer to technical intermediary outputs without describing the final outcome, which would, for example, be less mortality or morbidity, higher productivity, etc.	1, 3, 9, 16, 17, 19, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39

Table I (cont.)

Benefit described	Observation	Ref.
Economic benefit/increase in economic efficiency, e.g. – a cost-effective reduction in disease transmission and incidence – cost savings through sharing resources (e.g. reduction of logistic costs by 15%) – human and animal health being investigated as a single social system makes control more cost effective (e.g. rabies, brucellosis – in comparison to looking at economic efficiency in one sector only) – improved vaccination coverage at the same or less cost – efficient animal and human health systems – economic growth	Few studies report a demonstrated increase in economic efficiency due to One Health and these are referenced in the various publications many times	1, 3, 5, 13, 14, 15, 16, 25, 26, 27, 36, 38, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50
Improvement in human or animal health or well-being, e.g. – a reduction of disease risk for humans and/or animals – a reduction in pandemic risk – improved public health globally – improved well-being because of the human–animal bond – increased physical activity from dog ownership – a stronger motivation to quit smoking because it endangers the health of a pet – improved food safety	These are final benefits or outcomes that can be measured directly	14, 26, 28, 29, 38, 42, 51, 52, 53, 54, 55, 56
Higher quality or larger quantity of information and data and improved knowledge or skills, e.g. – more information and insights (e.g. through knowledge exchange and transfer) – improved knowledge – comparative medicine: the cross-fertilisation of veterinary and human medical disciplines – new skills and experience – capacity building	These are mainly intermediary outputs, of limited value if they are not used to do things in a better way (e.g. more knowledge or more accurate data are only of benefit if they are used in some way). A measurement of the final outcome is often lacking	1, 3, 13, 15, 26, 29, 36, 57, 58, 59
Ecosystem benefit, e.g. – ecosystem resilience – wildlife conservation – environmentally friendly approaches – the inclusion of the wider habitat, e.g. a community- based approach	No studies describe a more concrete outcome, e.g. an increase in animal populations	60, 61, 62
Personal or social benefits, e.g. – more professional opportunities – greater individual responsibility – a reduction in poverty and health-related inequalities – food security – evidence-based decisions – greater social cohesion – the empowerment of local communities – trust	These are benefits that increase the well-being of people through various pathways, such as feelings of trust, pride or safety, stronger bonds or improved nutrition	10, 27, 38, 62, 63, 64, 65
Other – the fostering of new ideas and innovation through collaboration and exchange		29, 66, 67

Table II
Summary of measured One Health benefits

Benefit	Metric	Method	Outcome	Ref.
A cost-sharing initiative between medical and veterinary vaccination campaigns in rural Chad. Mobile veterinary vaccination teams had already visited pastoral livestock keepers in this area to administer veterinary vaccines	Monetary unit	Cost evaluation	15% reduction in operational costs compared with separate vaccination campaigns; cost per vaccinated child reduced from €30.3 to €11.9	46
Chad: a joint vaccination programme for humans and cattle had a higher human uptake, particularly among women and children, when animal vaccination was offered concurrently	Technical measure	Measurement of vaccination rate	A mean of 140 people were vaccinated a day during joint vaccination rounds compared with 100 people a day when veterinarians were absent	45
A reduction in vector density; greater individual responsibility for dengue control actions	*Pupae* per person index Perception: who is responsible for dengue control	Measurement of *pupae* per person; survey questionnaire	The mean *pupae* per person index was significantly different in treatment and control areas, i.e. 0.19 vs 0.73 ($p = 0.024$), and 0.05 vs 0.26 ($p = 0.019$), more people in the control area felt that dengue control was a shared responsibility	30
A demonstrated benefit for human and animal health from vaccinating livestock against brucellosis	Disability-adjusted life years (DALY), cost of programme per DALY averted	Cost–benefit and cost-effectiveness analyses	Cost–benefit analysis indicated that as an animal health intervention brucellosis vaccination of animals was not efficient. But, when considering the public health sector too, brucellosis control in livestock was a highly efficient intervention Achieved with a cost of less than US$25 per DALY gained	14
Echinococcosis mitigation in Spain was achieved by education on the disease risk in the human population, chemotherapy of all owned dogs in the area, euthanasia of stray dogs, sanitary disposal of offal from slaughterhouses and safe disposal of dead sheep by constructing pits	Monetary units for programme costs and benefits from the prevention of human cases and the improvement of sheep production	Cost–benefit analysis	By year eight of the programme, the cumulative benefit-cost ratio had exceeded 1, indicating that costs had been recouped	15
A new mitigation programme for schistosomosis in China, integrating case detection and morbidity control in humans, molluscicide treatment, health education, surveillance, environmental management and livestock control initiatives, resulted in effective disease control	Monetary units for programme costs and benefits from the prevention of human cases	Cost–benefit analysis	The integrated programme created a net benefit for society of US$6.20 per US$1 invested	13
Rabies control achieved in Chad through vaccination of the dog population to avoid human cases and post-exposure treatment	Monetary units for programme costs and non-monetary units (number of exposures averted, number of cases averted)	Cost-effectiveness analysis; estimation of break-even point	Costs of US$50 per DALY were averted; an effective dog mass-vaccination campaign, capable of interrupting disease transmission, becomes cost effective after six years, reaching US$32 per DALY	48
Early detection of *E. coli* O157:H7 outbreaks leads to societal benefits	Monetary units	Cost–benefit analysis	Through early detection of a single outbreak and preventing at least 15 human cases through the recall of 25 million pounds of potentially contaminated beef, the surveillance and response system would recover all costs for the five years of start-up and operation	49

Table II (cont.)

Benefit	Metric	Method	Outcome	Ref.
Investment in One Health systems for the prevention and control of zoonotic diseases offers high expected benefits, with high rates of return	Monetary units	Cost–benefit analysis	Estimated efficiency gains at a global level of between US$184 million and US$506 million per year, or 10% to 16% if cooperation is established between the sectors through One Health	25
Use of an *E. coli* O157:H7 cattle vaccine to prevent human illness caused by eating beef	Monetary units	Cost–benefit analysis	Vaccinating the entire United States herd at a cost of between US$2.29 and US$9.14 per unit (depending on overall effectiveness of the vaccine) would be a cost-effective intervention for preventing *E. coli* O157:H7 illness in humans	50

Discussion

The problem of limited and partial evidence on the added value of One Health identified by the present study was not solved through a systematic review of information on One Health and its benefits. The authors recognise that this may, in part, be related to the way in which the search was carried out. In particular, by explicitly searching for the terms 'One Health' or 'Ecohealth', some initiatives that would fall under the One Health definition, but were not labelled as such, would have been missed, and, in turn, any measurements of the benefits of such activities. Nevertheless, previous (non-systematic) reviews reporting on the economics of One Health have failed to identify additional studies. Consequently, there seems to be a real lack of studies reporting on the added value of One Health and its measurement.

While there seems to be a broad consensus about the value of One Health in the published studies, there is an evident lack of metrics and associated methods to estimate One Health benefits in a systematic way. There are slightly different needs in this regard. A large-scale change in the allocation of government resources needs clearly defined metrics on the costs of inputs to One Health and also measurable and comparable outcomes. This would require changes in the ways in which governments carry out data collection, as well as the use of econometric methods to define the productivity gains from such a major shift in policy.

At the grassroots level, the needs are different and only a few studies use a scientific approach to measure and demonstrate the value of One Health. However, there are no studies that use randomised control trials or a case-control study design to actively investigate whether there is, in fact, an added value resulting from One Health. From a strictly scientific point of view, such studies would be needed to generate the necessary evidence and basis for larger investments in One Health. This would require some element of comparison – as used, for example, in case-control study designs or modelling approaches that compare the scenario of interest with a counterfactual. Since many One Health initiatives are already under way, both large and small, relevant data collection protocols should be established now to enable us to make use of the data being generated during the change to a more comprehensive disease management approach.

Owing to their holistic nature, One Health activities can result in a wide range of benefits, spanning aspects from the social (e.g. empowerment, poverty reduction) to the economic (e.g. cost reduction, economic growth) and environmental (e.g. ecosystem resilience, wildlife conservation) to health (e.g. improved well-being and public health). From the literature review, five large categories of benefits crystallise:

– protection of the environment and healthier ecosystems

– enhanced social and cultural values

– improvements in human and animal health and well-being, and animal welfare

– better/improved/more effective/more rapid disease control and/or biosecurity measures

– a higher quality or quantity of information and data; more knowledge and better skills.

Consequently, metrics from many different disciplines are needed to measure the resulting outputs and/or outcomes. Disciplinary approaches and methods for measurement are manifold; a wide range of methods are used for economic impact assessment (e.g. cost–benefit analysis, economic surplus analysis, mathematical programming, general or partial equilibrium models); economic evaluation of health and healthcare economics (e.g. costs of illness, cost-minimisation analysis, cost-effectiveness analysis, cost-utility analysis, cost–benefit analysis); or to value ecosystem services (e.g. market-price method, productivity

method, hedonic pricing, travel-cost method, substitute-cost method, benefit-transfer method). Furthermore, there are disciplines that offer a multitude of validated metrics and approaches but are usually not considered in One Health assessments, such as nutrition science. Yet another complication arises through the fact that some benefits are realised quickly, while other benefits of a One Health approach may only become evident in the long term and thus require the discounting of different values. This can be problematic when trying to compare natural and monetary units, for example.

Consequently, the key task does not seem to focus on the development of new metrics, but rather on finding ways of integrating the established disciplinary metrics that are standardised and commonly used, as well as on combining qualitative and quantitative data sets. Only with a standardised approach that has been accepted and applied by the scientific community can the necessary evidence base be generated to assess the real value of One Health.

In summary, three key challenges follow from the above considerations, which need to be urgently addressed by the scientific community:

– the development of protocols to capture ongoing change

– the integration of available disciplinary metrics

– data collection that captures One Health inputs and outcomes.

To address the scarcity of metrics and associated methods to estimate the One Health benefits identified in the literature review, as well as the shortcomings described above, the authors organised a workshop of international experts in public health and zoonotic diseases, as well as economists who work on health issues. The findings of this workshop, which was held in London in September 2013, focus on how frameworks to capture benefits can be developed and applied; a summary of the discussions is available online (http://www.lcirah.ac.uk/node/141). There is an urgent need for such work in the development of a One Health business case. Therefore, the authors and colleagues are establishing an international, interdisciplinary Network for Evaluation of One Health (NEOH) that aims to enable future quantitative evaluations of One Health activities, and to further the evidence base by developing and applying a science-based evaluation protocol in a community of experts (further information available from the authors on request).

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Examen des méthodes de mesure des bénéfices de l'approche « Une seule santé »

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Résumé

Le concept « Une seule santé » nous est connu depuis longtemps, mais sa prise en compte en tant que méthode de réduction des risques qui pèsent sur la société est assez récente. Les initiatives visant à appliquer ce concept devraient disposer de méthodes pour évaluer les bénéfices d'une approche holistique de la santé ; or, il n'existe pas de cadres adéquats pour mesurer les bénéfices associés à « Une seule santé ». Les auteurs examinent cette question en passant en revue la littérature existante sur le sujet et en analysant d'autres méthodes de mesure possibles. Il ressort de leur examen que la plupart des travaux publiés sur « Une seule santé » valorisent ce concept, sans toutefois tenter d'en quantifier les bénéfices ni d'évaluer véritablement la nature de sa valeur. Il est donc nécessaire de disposer d'un cadre permettant de mesurer les avantages de l'approche « Une seule santé » ; les auteurs s'y emploient, à travers l'organisation d'un atelier international dédié à ce thème et l'élaboration d'une étude de rentabilité « Une seule santé ».

Mots-clés

Analyse – Bénéfices – Économie – Une seule santé.

Estudio sobre la cuantificación de los beneficios derivados de «Una sola salud»

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Resumen
Aunque el concepto de «Una sola salud» nos acompaña como tal desde hace muchos años, hace poco que se viene hablando de él como posible expediente para mitigar los riesgos que afronta la sociedad. Toda iniciativa encaminada a utilizar este concepto requiere métodos para aprehender los beneficios de trabajar sobre la salud desde una óptica holística, y pese a ello no hay referentes adecuados para cuantificar los beneficios de «Una sola salud». Los autores examinan el problema pasando revista a la bibliografía existente y a otros posibles métodos, tras lo cual llegan a la conclusión de que la mayoría de los trabajos publicados sobre el tema afirman cuán valioso resulta el concepto, sin tratar empero de cuantificar sus beneficios ni de definir en qué consiste exactamente dicho valor. Se necesita un sistema de referencia para cuantificar las ventajas del planteamiento de «Una sola salud». Los autores trabajan ahora en esta línea, para lo cual se valen del proceso de un taller internacional y formulan argumentos que avalen el interés que, en clave empresarial y económica, reviste el concepto de «Una sola salud».

Palabras clave
Beneficios – Economía – Estudio – Una sola salud.

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