

One Health: The driver of solutions to 21st century health challenges

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The One Health concept emphasises a holistic and interdisciplinary approach to health, particularly at the interface of human and animal health. It allows for synergistic collaborations to reduce the burden of diseases, particularly infectious, which may benefit South Africa.

Keywords: One Health, zoonoses, rabies, brucellosis

The One Health concept

The notion that human, animal and environmental health are linked has been accepted for well over two hundred years.¹ Although the idea of relationships between health spheres has been around for two centuries, the term “One Health” is a recent development. The term evolved from the “One Medicine” concept that emphasised the link between human and animal health, and that was first coined “One Health” in 1973 by Dr Calvin Shwabe.

One Health (OH) calls for the creation of transdisciplinary teams that come together to create new solutions for 21st century health challenges. These teams should consist of not only people who are considered healthcare workers, but also those who can contribute to the holistic improvement of health, such as architects, engineers, social workers, etc. In order for these teams to be created, small incremental steps need to be taken to prepare professionals to work in OH teams. These steps include creating awareness of the benefits of OH teams, creating OH networks of professionals within the same geographical area, and setting broad objectives for these OH teams to work towards.

As described by Zinsstag et al.,² projects that collaborate using an OH approach are able to achieve better results than those that work individually within silos. The idea of arithmetic synergy is that two silos working seamlessly together are better geared to produce a result far greater than the sum of the individual effects; in other words, “1+1=3”. When evaluating public health networks (PHN), the benefits of these team efforts are realised through lower costs, shared resources and increased knowledge-sharing, which ultimately increase the value of the PHN.³

South Africa human healthcare system

According to the Gini index, South Africa (SA) is ranked the most unequal society in the world in terms of income distribution.⁴ Due to this inequality, health care available to different socio-economic groups is vastly different. Currently, the public healthcare system services approximately 80% of the population, while the remaining 20% is serviced by the private sector. The public

sector spends \$150 USD per person, compared to the private sector of \$1 500 USD per person.⁵ According to the World Health Organization (WHO), around 70% of doctors work in the private sector and only 30% work in the public sector, leading to severely over-worked public health doctors.

SA also has one of the largest immune-compromised populations. Whilst the country contributes only 0.7% of the global population, we have 17% of the total number of HIV-positive people, which accounts for 7.5 million people living with the disease.⁶ Most of this immunocompromised population live in marginalised communities and around the poverty line where their living conditions are unhygienic and in close contact with animal populations. They are more likely to suffer from malnutrition and zoonotic diseases while relying on the overburdened public healthcare system. Immunocompromised people are more at risk of becoming hosts for viral mutations.⁷ The potential long-term impact by those that live on the margins is further burdening the healthcare system. The creation of OH teams could make a fundamental difference to the burden of disease.

Zoonotic diseases in South Africa

Zoonotic diseases account for approximately 70% of all new infectious disease currently found in humans.⁸ Since the COVID-19 pandemic, emerging zoonotic diseases have been placed high on national and global policy setting agendas due to their crippling impact on countries. During the height of the global COVID-19 pandemic in 2020, the world economy contracted by 4.9%,⁴ the largest contraction in the last eight decades. Not only did SARS-CoV-2 have devastating impacts on the economy, but it has placed healthcare systems across Africa, especially SA, under overwhelming strain.⁹

In South Africa, the very way that communities are set up promotes the spread of zoonotic diseases. There are two zoonoses that could benefit from an OH approach to disease control in particular, these being brucellosis and rabies.

Brucellosis causes an illness that presents with a variety of non-specific clinical signs that impact the ability of people to work

and places a burden on the healthcare system.¹⁰ It is considered one of the most economically important zoonotic diseases, with over 500 000 cases reported annually,¹¹ with under-reporting in humans being a major barrier to disease eradication.¹² Under-reporting is due to under-diagnosis of the disease, which is attributed to the lack of knowledge at the human health level. In addition, there are no lines of communication between human and animal health practitioners to inform each other of disease outbreaks in communities. Interaction can lead to awareness of the disease and help with early recognition and diagnosis. The disease itself within humans, once detected, is treatable. Here, an OH approach, with animal control programmes funded by animal and human health government organisations, could have a significant impact on human health.

Rabies, which targets the nervous system, is responsible for over 60 000 deaths every year. Once clinical signs are apparent, the disease is invariably fatal, but appropriate post-exposure prophylaxis (PEP), in the form of Rabies Immune Globulin (RIG), can prevent death. Dog-mediated transmission of rabies is the main source of human infection in South Africa. On average the cost of PEP in humans is R1 000 per dose, with three doses needed to ensure survival. In comparison, the cost of rabies vaccination in dogs is approximately R2.50 with two doses needed to ensure protection in 70% of the dog population. During outbreaks of rabies within dog populations, information regarding the disease is well communicated to the public. Unfortunately, there is a lack of continuous communication regarding the disease and the knowledge of the correct treatment protocol. In a recent example, a veterinarian bitten by a dog was advised to only receive a vaccination and not the correct RIG. On post-mortem, the dog was confirmed to have rabies. Fortunately, the veterinarian was able to source RIG directly and have it administered which saved her life.

The above examples touch on the obvious connection regarding zoonosis. However, the OH approach can be expanded to cover many topics such as antimicrobial resistance and climate change. Through the creation of a shared resource philosophy and the creation of OH teams, the overburdened human healthcare system could receive support from outside health disciplines. In this manner, health challenges may be understood in context, allowing for innovative solutions to be developed. In lower- and middle-income countries (LMIC), the implementation of these innovative solutions may help to spread the cost of human health across multiple spheres and result in a larger impact.

One Health for the future

The OH concept should be seen as a vehicle for change and as a method to help general practitioners solve complex health problems experienced within their daily working environment. The OH concept in South Africa can provide the opportunity to change how we view health and how we treat it. It can help us move away from silo thinking to a holistic interconnected understanding, ultimately benefitting the general health of the population. To achieve this, the creation of transdisciplinary networks through different associations and the raising of awareness of the OH concept and its benefits need to take place.

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