

# Bibliography synthesis of an integrated approach to health

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The importance of an integrated approach to health seems to be a consensus amongst the veterinary and public health sectors and has led to the emergence of various concepts and movements promoting a holistic, interdisciplinary approach as it relates to the interactions between humans, animals and ecosystems (Duboz et al., 2018). Beginning with the concept of “One Medicine”, proposed in the 19<sup>th</sup> century and later advanced by Calvin Schwabe (Schwabe, 1984), this early interdisciplinary approach to health called for the integration of human and animal medicine due to the close systemic interactions between humans and animals for nutrition, livelihood and health (Zinsstag et al., 2011).

Today, as human population growth, rapid urban expansion, intensified livestock production, ecosystem encroachment and global trade and travel merge the interface between humans, domestic animals and wildlife (Zinsstag et al., 2011), studying vector borne disease (VBD) emergence and transmission demands more than merely a medical perspective (Duboz & Binot, 2017). For this reason, “One Medicine” has given rise to present-day movements such as: “One Health”, “EcoHealth” and “Planetary Health” which consider a more pragmatic, multidisciplinary approach, not only considering human-animal interdependence but also their respective links to the environment. Today they are used as health models by leading international health institutions, such as the FAO, OIE, and WHO (US Department for Health and Human Services).

While recognition of the added value of integrated approaches to health is growing, separate sectoral thinking, often between the human and veterinary medicine sectors, remains a common critique (Zinsstag et al., 2011). Where this traditional sectoral thinking promotes a focus on disease management, integrated approaches to health, on the other hand, focus on health promotion by searching for viable solutions to health problems (Duboz et al., 2018). An integrated approach therefore considers (1) the wider context in which these health issues can be found and (2) the different systems that come into play when solving said problems from a multidisciplinary, multisectoral and multi-geo-political-level (i.e. multi-level) perspective.

Considering the wider context of VBD emergence and transmission, management strategies must depend equally on environment usage and the agriculture industry, and therefore demands more

than merely a human and veterinary medicine perspective to determine factors related to VBD risk and how these pressing health issues must be managed (Duboz & Binot, 2017). In fact, Binot et al. (2015) argue that a successful integrated approach cannot be limited to “historical” *One Health* stakeholders (i.e. public health and veterinary medicine sectors), but must also extend to environmental and agricultural stakeholders, as well as the integration of the social and cultural elements of human behavior. Today, integrated approaches must merge various disciplines, including, but not limited to: natural, social and health sciences, humanities, economy, politics, agronomy, etc., to allow varying, and often diverging, perspectives to be considered when confronting complex health issues (Destoumieux-Garzón et al., 2018; Duboz et al., 2018; Duboz & Binot, 2017).

Often called “wicked problems” (Brown et al., 2010), complex health issues related to VBD are generally unique, difficult to define and a source of conflict with respect to stakeholder interest (Rittel & Webber, 1973). They are found within complex systems which involve a multitude of biophysical and social factors, as well as the close interdependence of humans and animals, and therefore must be studied conjointly both its social and ecological contexts (i.e. social-ecological systems (SESs)) to better how socioeconomics, politics and ecosystems play a role in disease management and prevention strategies at various geographic scales (Duboz et al., 2018; Ostrom, 2007; Roger et al., 2016).

Approaching health issues within a social-ecological system also welcomes a local, or territory-oriented perspective that considers the spatiotemporal heterogeneity of biophysical and social factors that may vary disease risk amongst diverse populations and therefore require the inclusion of new stakeholders and locally adapted solutions depending on the territory in question (Duboz & Binot, 2017). Duboz et al. (2018) argue that participatory modeling is a beneficial strategy when working within social-ecological systems at the territory level as it decentralizes power, involves local stakeholders and their knowledge, allows for successful collaboration between those affected by the problem and those charged with finding a solution and, finally, includes social science disciplines, often considered to be insufficiently represented in current integrated approach strategies.

As VBDs depend on multiple different factors, most notably a wide range of social and biophysical variables, management strategies must occur at the intersection of human, animal and

environmental health. This requires an integrated approach that prioritizes multidisciplinary, multisector and multilevel stakeholder participation to better understand the socio-ecological system that defines the health risks at hand, and the subsequent management strategies adaptable to variability within and amongst the territories in question. Considering these facts, information flow and efficient communication between different stakeholders is a key element in prevention and control of VBD in the future. Therefore, understanding stakeholder interaction via network mapping is a beneficial preliminary step to improve current and future VBD risk evaluation and policy creation that is relevant and applicable to a diverse set of territories.

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