

Editorial

One health and our oceans - not just idle words !



It has been stated that "... with 70% of the oxygen we breathe produced by marine plants in the ocean, every other breath depends on a healthy ocean" (2). Part of the

reason for this is that much of the earth's surface is covered by oceans. If we accept the caveat that we as humans are dependent on the oceans, then the animals living within these oceans can serve as sentinel species for the 'health' of these oceans and thus potentially human health. Clearly then, humans have a dependency on the oceans for numerous reasons which links their health with that of the species that occupy this environment. So logically, our environment and the species within it are all linked forming the basis of the 'one health' concept. The concept of 'One Health' has been around for centuries. However it has been getting more attention in the health care field of late. The term has been defined in many ways but essentially it has at its core the goal to link human, animal and environmental health. The One Health initiative website states that "The One Health Initiative is a movement to forge co-equal, all inclusive collaborations between physicians, osteopaths, veterinarians, dentists, nurses and other scientific-health and environmentally related disciplines" (1). The concept of a role for environmental factors impacting on human health is also not new as Hippocrates stated in his writings that public health depended on a clean environment (3).

Now you may be asking why bring up this topic as an editorial for a marine animal journal? Apart from the key role the oceans and their inhabitants play in human survival and well being, these oceans have also become a source of harmful pathogens and contaminants. As well, viruses and bacteria exist that transfer between species, either

terrestrial, aquatic or humans. Thus it seems only prudent to invoke a 'one health' approach. Consider the following examples: (a) harmful algae blooms are increasing in severity and frequency causing health issues to both the marine species and humans (2, 4); (b) antibiotic resistance is increasing and being reported in marine species such as dolphins as well as humans (5); (c) contaminants in our oceans are becoming more recognized for their long lasting effects, including suppression of the body's natural immunity which increases susceptibility to disease (5, 6).

Contaminants also have negative effects on other physiological systems such as reproduction which then impacts on the affected species population. Neurological effects can lead to increased strandings and other life threatening problems. For example, mercury has known neurological and reproductive effects (6). A review published in 2004 on global mercury levels in various marine mammals over a 30 year period demonstrated that despite legislation, a variety of species have mercury levels that continued to rise (6). Recent awareness for the role of multiple contaminants acting either together or even compounding their effects on those exposed has taken on new relevance for aquatic species and, by inference, humans since both are top predators of their environment. Contaminated food sources from our oceans can have devastating consequences for the human population as well. For example, in humans, Minimata disease was linked to mercury poisoning from the consumption of contaminated seafood, while cases of reported lead poisoning in humans have also been linked to the consumption of tainted food from the oceans. Recently reports of a rare chronic mycotic infection seen only in humans and dolphins has been reported in dolphins along the Atlantic coast of the USA, who also had high levels of mercury. Since this disease can be transferred to humans, the recent reports of this disease in dolphins



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could indicate an additional risk to humans and illustrates the connection between environmental factors, aquatic and human health (5). Further examples include protozoal infections that have been reported in sea otters who ingested infected shellfish originally contaminated from land animal waste runoff in coastal regions. This coupled with the risk to humans of consuming improperly prepared contaminated seafood illustrates the linkages with terrestrial animal, aquatic species and human health.

This editorial cannot do justice to the concept of "One Health" but is meant to stimulate some thought and curiosity to explore it further. In addition to the references sited, there are numerous well written articles on the general subject. With the large surface area of our planet occupied by oceans and our reliance on it, by applying the 'One Health' concept to our aquatic environment, conceivably we not only improve our understanding of how changes and stressors affect aquatic life but also how this could potentially affect human health and their quality of life.

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