

Medics and Marine Mammals – An Unlikely but Important Connection for Humanity's Survival

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Abstract

Marine mammals, as top predators in the marine food web, are sentinels of changes in the oceans and public health. Pollution in the sea and overfishing of seafood resources affects these organisms just as much as it affects human beings. Medics, especially doctors, have an influential reach to patients, and are in an ideal position to get better acquainted with ongoing marine environmental issues and subsequently disseminating such information to them. While seemingly an out-of-the-box approach, it is one that can help with environmental conservation and preservation for the future of humanity.

Keywords: *conservation, environment, marine mammal, public health*

Marine mammals, one of the most charismatic group of animals on earth, comprise the pinnipeds (seals, sea lions, walrus), cetaceans (whales, dolphins, porpoises), sirenians (manatees, dugongs), sea otter and polar bear. In Malaysian seas, at least 26 species of cetaceans and one species of sirenian (dugong) has been recorded, either from live sighting or stranded dead animal records (1). These endothermic, air-breathing organisms, as their name suggests, spend most, if not their entire lives in the marine environment. Being mammals, they sit at the top of the marine food web, feeding on fish, crustaceans, cephalopods (cuttlefish and squid), and even their own kind (e.g., some populations of killer whales prey on whales, porpoises, and seals). Due to their prime position within the food web, marine mammals therefore have the ability to bioaccumulate pollutants and anthropogenic toxic compounds in the marine environment such as polybrominated diphenyl esters (PBDEs) and polychlorinated biphenyls (PCBs) through a process called bio-magnification. In summary, these compounds progressively move through the food chain and increase in amounts each time they enter a new trophic level, which means that by the time they reach the top (i.e., in marine mammals), their concentrations are generally quite high.

Marine mammals, therefore, with their commanding position at the top of the food web, long lifespans and unique fat reserves that have high ability to store toxic compounds are deemed

as indicators of change in the marine environment and sentinels for public health and the health of our oceans (2). Studies on the presence and levels of organic contaminants in marine mammals essentially provide us with a means to assess the potential risks and exposures to our species (3). A recent ecotoxicological study on a species of coastal dolphin in Brazil showed that octocrylene (OCT), an ultraviolet (UV) filtering agent found in commercially manufactured sunscreen products, was detected in high concentrations in the dolphins' livers (4). In the southeastern estuarine waters of the United States of America, two dolphin populations were found to carry a high load of chlorinated pesticides and polyaromatic hydrocarbons (PAHs), amongst other organic contaminants, at levels that have reported adverse effects on wildlife and humans (5). In Kuala Sepetang, Perak, extensive exophytic cutaneous lesions and cutaneous nodules have been observed on the skin of coastal dolphins inhabiting the area (6), some similar to the cases reported by Van Bresse et al. (7,8). Such are possible indicators of a compromised and degraded marine environment (7). A decline in fisheries resources has also had an impact on certain marine mammal populations. For example, in the Mediterranean Sea, heavy human exploitation of prey species such as anchovies and sardines also saw a 25-fold decrease in the number of common dolphins that were encountered over a seven years period (9).

Let's take a moment to consider what such

results of these toxicological studies and prey resource depletion of marine mammals imply for the human race. Marine mammals live in an environment so heavily utilised and shared by humans. We put development in coastal and offshore areas, fish in all zones of the seas, discharge anthropogenic pollutants into the waters, and convert sea areas into our recreational playgrounds. In the simplest and most essential sense of public health and food security, if contaminants are showing up in the bodies of marine mammals, and various populations of marine mammals around the world are declining as a result of a lack of food resources, then, surely it cannot bode well for our species' viability. In an age where the notion "You are what you eat" is quite an obsession, we have to question that if dolphins are accumulating toxic compounds in their bodies, then, the fish they are eating, which for the most part is also the fish that we eat, also contains the same toxins. According to information presented by the World Wide Fund for Nature in Malaysia (WWF-Malaysia) on their "Save Our Seafood (SOS)" campaign website (10), Malaysians are found to be the top consumers of seafood in Southeast Asia, and within the top five in Asia. At the same time, WWF-Malaysia also reported in their SOS website that our fishery resources have declined by 82% over the last 40 years.

How are these information presented here, relevant at all to you who are in the medical field? If I were a medic, I would probably find it difficult to make the connection too. I quote Thomas Goetz, an American public health practitioner, who on his TEDMED talk titled "It's time to redesign medical data" stated that, "Better health is not a science problem, it's an information problem" (11). For the lack of information dissemination to the general public on the actual state of our marine environment and how it is ultimately linked to our overall welfare, one cannot expect the general public to be aware and want to care about the environment. In the context of this seemingly odd and irrelevant editorial piece, medics, especially doctors could perhaps consider revamping the way they encourage their patients to lead healthier and more sustainable lifestyles. In my own personal experience, I have found that my family members and close friends tended to take advice better from their doctors than from others around them who are not medical professionals. While medics are usually extremely busy individuals, there is no loss in taking some time to consider the implications of ongoing environmental issues on humanity. A simple advice about the environment

from medical doctors to their patients can go a long way for its conservation and preservation. It could be as simple as encouraging the patient to consume more fish over red meats, but that they should be more attentive to the source from which the fish comes, and in which category the fish belongs (e.g., code red means the species is overfished and not sustainable, therefore to avoid eating it at present (10)). Subsequently, informing patients about how pollution in the sea has effects on our seafood resources, therefore affecting overall human health and susceptibility to diseases can open a new dimension on public awareness for marine conservation.

Safeguarding our marine resources and ocean health is not the sole responsibility of conservationists or marine biologists. It is, in fact, everyone's responsibility as citizens of Earth. Medics, as practitioners for healthcare and healing, are inadvertently in the position to help heal the environment through the proper dissemination of environmental information to those whom they come into contact at the workplace.

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