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POLICY NOTES

# Artisanal compressor dive fishing: policy notes

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Artisanal compressor dive fishing: policy notes

## EVIDENCE to POLICY

| | FINDINGS FROM MAIN EVIDENCE* | POLICY RECOMMENDATIONS |
|---|---|---|
| 1 | Health facilities close to coastal areas typically provide standard first aid treatment for diving and other marine injuries. Currently, there are 20 private- and government-owned hyperbaric facilities in the Philippines that are able to provide treatment for DCI and other dive-related injuries. There is a need to establish an interagency health care referral and interfacility network to ensure seamless health care response to diving and other marine injuries. | Establish nationwide emergency referral networks, with a special focus on coastal areas where decompression illness and other marine injuries occur frequently. Identify strategically located hyperbaric facilities, and designate them as the primary referral centers within these networks. A referral network should encompass facilities that are well-equipped to manage a wide range of marine injuries and cases of decompression illness. |
| 2 | Safe diving practices must involve careful equipment maintenance and inspection. Malfunctions on the improvised compressor and breathing apparatus (i.e., kinked gas supply hose, sudden loss of air supply) may pose serious injuries to divers. | Allocate a portion of the revenue generated from the commercial trading of high-value marine resources to fund health care services for artisanal dive fishers.<br>Introduce a mandatory requirement for artisanal dive fishers to undergo thorough medical examination and screening conducted by certified medical practitioners who specialize in diving-related and marine injury-related illnesses. This evaluation will assess the divers' fitness for diving before they are granted diving licenses.<br>Educate dive fishers by conducting comprehensive training that integrates local knowledge and practices from dive fishing with the universal standards of scuba diving. This approach should encompass a thorough review and examination of safety measures and best practices, emphasizing diver well-being, while also respecting and preserving the cultural heritage and wisdom of artisanal fishers.<br>Enhance the self-awareness of dive fishers to check their physical fitness, identify symptoms of DCI and other dive-related injuries, and to seek health care for these symptoms. |
| 3 | Dive fishers, and members of the municipal/barangay Bantay Dagat Task Force, lack training on basic diving safety, including the recognition of signs and symptoms of decompression illness and other dive-related injuries. | Train dive fishers, first responders, members of the municipal/barangay Bantay Dagat Task Force, and medical and nursing staff of the health care facilities located in coastal communities on the emergency management of decompression illness (DCI) and marine injuries. Training can be provided and facilitated by diving medicine centers, as well as emergency medicine specialists who frequently manage patients with these types of conditions. |
| 4 | Consolidated data on the incidence of decompression illness and other dive-related injuries among fisherfolk in the Philippines is currently unavailable. | Establish a national database to track and record decompression illness and other dive-related injuries. Implement standardized data collection and reporting mechanisms to populate the database accurately.<br>Conduct regular data analysis and research to inform evidence-based policies and strategies for enhancing dive fisher safety and well-being. |

*Bañez MAB, Ramos JM. Artisanal compressor dive fishing. SPMC J Health Care Serv. 2023;9(1):5. http://n2t.net/ark:/76951/jhcs4ru7a8

## INTRODUCTION

In certain regions of the Philippines, compressor diving is commonly practiced among artisanal fishers. This method involves the use of homemade compressors to generate compressed air, which is then delivered to divers through a hose while underwater. However, the use of compressors in fishing, such as in pa'aling,[1] is prohibited under a local ordinance in Palawan,[2] highlighting the recognized risks associated with this practice.

Similarly, lampirong fishing, which involves the use of compressors, is regulated in Oton, Iloilo. Specific permits and clearances are required to engage in this fishing practice.[3] Despite the provisions stated in the Republic Act (RA) No. 8550, also known as The Philippine Fisheries Code of 1998,[4] and further amended by RA 10654,[5] which explicitly prohibit the use of active fishing gears, such as pa'aling, purse seines, or trawl nets, in municipal waters and bays, many small-scale fishers still persist in engaging in these prohibited practices.

Compressor dive fishers are exposed to various risks, including decompression illness (DCI), barotrauma, nitrogen narcosis, carbon monoxide poisoning, drowning, hypothermia, and injuries from dangerous marine animals.[6] Hence, it is imperative to adopt a comprehensive and integrated approach to tackle the challenges faced by compressor dive fishers. This approach should prioritize enhanced occupational safety and health measures while simultaneously addressing the environmental and legal issues associated with compressor fishing.

## MAIN EVIDENCE

The health care focus article by Bañez, et al. in June 2023 provides an in-depth examination of the current practices of compressor dive fishing among artisanal fishers in the Philippines, with a specific focus on Oton, Iloilo. The article delves into the working conditions of these dive fishers and explores the significant impact these conditions have on their health.[7] In certain areas of the country, compressor dive fishing has become widespread, particularly in municipalities where local government regulations are in place but weakly enforced. Many dive fishers rely on basic and makeshift dive fishing equipment, including compressors purchased from hardware stores, repurposed gas tanks, and thin plastic hoses.[8] This type of setup is highly prone to malfunction, posing significant risks of serious injuries to the dive fishers. Following a dive, these individuals may experience symptoms such as fatigue and muscle/joint pains. Unfortunately, they often fail to recognize that these symptoms are indicative of decompression illness (DCI). In the Southern Philippines Medical Center (SPMC), 17 patients with dive-related injuries, including severe DCI cases, have been treated since 2018. While the Philippines has 20 hyperbaric facilities dedicated to providing immediate treatment for DCI, there are currently no specialized facilities focusing on its treatment. There is currently a lack of comprehensive data regarding the frequency of DCI and other injuries associated with diving among fisherfolk in the Philippines.[7]

In the evidence-to-policy diagram, we list important findings described in the health care focus article,[7] and outline our policy recommendations based on these findings.

## RELATED EVIDENCE

Despite the significant economic contribution of artisanal dive fishers, particularly in the trade of high commercial value marine species, there is a lack of effective development policies aimed at improving their living conditions in a sustainable manner. As a result, the economic and health needs of dive fishers are not adequately addressed, leading to a higher risk of dive accidents and injuries. This not only jeopardizes their well-being but also adds to the existing burden they face.[9]

Dive fishing, in itself, is a risky activity, but with the use of compressors, it has become more detrimental to the health of fishers. The risk of developing diving injuries such as DCI, and the occurrence of carbon monoxide poisoning in dive fishers, remains an inherent problem not only in the Philippines, but also in other parts of the world where autonomous diving for fisheries is being practiced.[10] There is a sufficient number of reported cases that may be related to DCI or other dive injuries but are not diagnosed or are underdiagnosed.[7] This may be attributed to a lack of training, improper dive fishing equipment, which are oftentimes poorly maintained, and the accompanying health and psychological conditions of fishers that increase the risk of diving injuries. All of these factors may contribute to a significant but underreported

number of diving accidents,[10] especially in low- to middle-income countries.

Diving accidents and injuries are worsened by the lack of immediate medical attention, especially in emergency cases. Access to healthcare is limited for most fishers, as hyperbaric chambers are not readily available in coastal communities. Fishers in geographically isolated and disadvantaged areas often have to travel long distances to reach the nearest health facility. Even in urban areas with hyperbaric chambers, the lack of highly qualified and experienced medical specialists and personnel to operate these equipment poses a challenge. Immediate, accessible, and appropriate treatment of DCI is important to increase the patient's chances of a better outcome after a diving incident[11 12] Improving knowledge on the treatment of DCI and other dive injuries is crucial for dive fishers, first responders, and medical staff in coastal communities to minimize poor patient outcomes. It is essential to establish formal education programs for physicians and nurses, particularly in areas near large dive fishing communities, to enhance their understanding of diving risks, decompression avoidance, and early recognition and treatment of DCI. Ensuring access to first-aid care, especially in remote communities, will significantly increase the chances of survival and recovery of patients with DCI or other dive-related injuries.[13-15]

Effective inter-institutional and inter-facility coordination among health facilities, government agencies, and other relevant stakeholders is crucial in ensuring a systematic and coordinated approach to the management of patients with DCI and other dive-related injuries. This collaboration should involve sharing of information, resources, and expertise to provide comprehensive and timely care to affected individuals. Furthermore, establishing seamless communication channels with local maritime search and rescue units is essential to enable swift response and assistance in cases of diving accidents, ensuring that rescue operations and medical interventions are carried out promptly and effectively.[10]

Despite the efforts of the national and local government to ban the use of compressors for fishing in many regions of the Philippines, as promulgated in the Department of the Interior and Local Government Memorandum Circular 2002-129,[16] the practice of using compressors among dive fishers has persisted for the past 50 years.[8] The ongoing use of compressors among dive fishers necessitates the promotion of safety diving measures to ensure the well-being of these individuals.

The lack of proper training and failure to follow safety practices have resulted in numerous cases of disability and fatalities among fishers. Artisanal dive fishers rely on rudimentary diving equipment, often without proper maintenance. Furthermore, they of[-ten neglect to regulate their dive times and exceed the recommended depth limits, putting themselves at greater risk.[10] Dive fishers frequently lack awareness of the signs and symptoms of DCI, both immediate and delayed, and have limited knowledge of standard first aid procedures.[17] Only a limited number of dive fishers receive training, if any, to comprehend the long-term health risks and complications associated with DCI.

Hence, local government units, in collaboration with other departments and institutions, should regularly provide training on safe diving techniques, accident prevention, and health recovery in case of diving injuries and accidents. It would be beneficial to develop free multi-course training programs conducted by retired fishers and competent diving instructors, aiming to promote safe diving practices and enhance dive-related emergency response capacity. Practical guides, with illustrations and in the Filipino language or local dialect if feasible, could also be created. The importance of recognizing the early signs and symptoms of DCI and other dive-related injuries cannot be overemphasized. Educating dive fishers on how to perform a rapid neurological exam and standard first aid to identify and initially manage DCI and other conditions should also be emphasized.

During a 2015 world summit, 193 United Nations member-states, including the Philippines, adopted the 17 Sustainable Development Goals (SDGs).[18] SDG 3 aims to ensure "Good Health and Well-being" for all by 2030,[19] while SDG 14, "Life Below Water," covers—among others—the provision of access for small-scale fishers to marine resources and markets.[20] Investing in the promotion of a safe and secure working environment for dive fishers through dive safety programs ensures the achievement of these sustainable development goals for the small-scale fisheries trade.[9 21]

Artisanal fishers dive as a means of livelihood and daily sustenance. Fishing with the use of compressors continues to be prevalent because compressor fishing trips are more productive, thus are more profitable.[22] Dive fishers are often impervious to the risks associated with diving activities. Therefore, in areas where the local government benefits from the trade of high-value species, it is crucial to develop and implement targeted and effective policies. These policies should strive to achieve favorable outcomes, encompassing not only environmental sustainability and economic viability of the practice, but also the optimal well-being of the dive fishers.

**Contributors**
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