

Ciguatera fish poisoning a significant public health concern

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(Phys.org)—A team of international marine scientists has reported a 60 per cent increase in the incidence of cases of Ciguatera poisoning among people living in Pacific Island nations.

Ciguatera is a human condition of fish poisoning caused by toxins produced by some [microscopic algae](#) known to cause [harmful algal blooms](#). The toxins concentrate in larger [reef fish](#) which, if consumed, cause acutely painful and debilitating effects in the human nervous system, stomach, gut and heart that can last for months.

In a paper published in the journal *PLoS Neglected Tropical Diseases*, researchers from Australia and the UK investigating the medical records of Pacific Island countries have estimated that Ciguatera [fish poisoning](#) could have affected as many as half a million people over the past 35 years, making it a much more serious public health issue than previously thought.

"Within the 35 year period (1973-2008)... there was a clear increase in the incidence of ciguatera poisoning," the researchers stated. Six nations – Fiji, French Polynesia, Vanuatu, Kiribati, the Cook Islands and Tokelau – each reported over 2000 cases per 100,000 people per year. In all the team tracked down almost 40,000 cases in the eleven years to 2008.

Co-author Tom Brewer of the ARC Centre of Excellence for Coral [Reef Studies](#) and James Cook University says "It all points to a pretty

significant increase, and it makes Ciguatera more than just a minor health issue.

"While fatalities may be rare, ciguatera poisoning makes people dreadfully ill, so much so they often cannot earn a living for weeks or even months. So it has big social and [economic implications](#). It also restricts the kinds of seafoods than can be eaten.

"Furthermore the numbers indicate that if you live in the Pacific you now have a 25% chance of suffering ciguatera poisoning in your lifetime."

The poison originates in particular [dinoflagellates](#) which grow on, or in the vicinity of [seaweeds](#) that are replacing [coral reefs](#) across the Pacific as the corals are stressed by human impacts including increased nutrients from land and ocean warming. Consumed initially by small herbivorous fishes and invertebrates, the toxin then works its way up the marine food chain, making big predatory reef fish the most risky for humans to eat.

The team think that the main causes of ciguatera outbreaks include coral loss and algae growth, nutrient run-off from the land, overfishing and ship wrecks, and the microscopic algae that can be distributed in ships' ballast water. However, researchers have previously found the prevalence of ciguatera poisoning increases dramatically when sea surface temperatures rise to 28 or 29 degrees and above, making a strong link between the disease and the high temperatures found in lagoon waters that surround islands which might be exacerbated by global warming, Mr Brewer adds.

"Given changes in global climate patterns, increased degradation of coastal marine environments through coastal development and land run-off, and growing exploitation of coastal marine resources, the incidence of Ciguatera cases is predicted to continue to increase in the future," the

researchers warn in their paper.

There are no easy ways to manage the problem, Mr Brewer says, as there are many factors involved in disease outbreaks, and each outbreak location may have a different set of causes. Monitoring susceptible locations for outbreaks is the best means of preventing poisoning and yet there is only one microalgal toxin unit based in French Polynesia currently monitoring outbreaks for the whole South Pacific.

"Ciguatera occurs in up to 400 different fish species – and there is no way of knowing if a particular fish has the poison. A detection test was previously developed, but has proven unreliable, and any future test would likely be unaffordable to most Pacific Islanders. As to managing the disease itself, the best approach may be to try to keep coral reefs intact, with minimal algae cover and to curb nutrient runoff from the land," lead author Mark Skinner of the University of Queensland states.

The article 'Ciguatera Fish [Poisoning](#) in the Pacific Islands (1998 to 2008)' by Mark P. Skinner, Tom D. Brewer, Ron Johnstone, Lora E. Fleming and Richard J. Lewis appears in the journal *PLOS Neglected Tropical Diseases* and is online at:
www.plosntds.org/article/info%3Adoi%2F10.1371%2Fjournal.pntd.0001416.

Provided by ARC Centre of Excellence in Coral Reef Studies

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