

Staying ahead of the tide: Novel vaccinations preventing infectious diseases at sea

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ABSTRACT

Introduction: Seafarers face unique health challenges due to their demanding work environment, which can impact their immune systems. Factors such as prolonged periods at sea, isolation, exposure to various environmental stressors, and limited access to healthcare can weaken their natural defenses. The confined spaces on ships and close living quarters can also contribute to the rapid spread of infectious diseases, leading to potential outbreaks. Furthermore, the global nature of seafaring exposes individuals to diverse geographical regions with varying disease risks, particularly mosquito-borne illnesses prevalent in tropical and subtropical areas. While studies indicate a higher prevalence of overweight and certain lifestyle factors among seafarers, this abstract will focus on the role of weakened immunity, outbreak dynamics, and geographical risks in the context of novel vaccinations relevant to this population. The isolation and the limited possibilities for direct medical intervention on board increase the potential severity of infectious diseases.

An aging trend within the maritime workforce also means a larger proportion of seafarers are in age groups more susceptible to certain infections.

New vaccinations for seafarers

Shingles and Shingrix: Shingles, or herpes zoster, is caused by the reactivation of the varicella-zoster virus, with the risk increasing with age. Given the aging seafarer population, this poses a significant concern. The Shingrix vaccine, approved in the European Union (EU) in March 2018, is a non-live, recombinant vaccine that is highly effective in preventing shingles and postherpetic neuralgia (PHN) in adults aged 50 years and older. The primary vaccination schedule consists of two doses of 0.5 mL each administered with a 2-month interval.

Dengue and Qdenga: Dengue fever is a mosquito-borne viral infection prevalent in tropical and subtropical regions. While a first dengue infection typically causes mild to moderate illness, subsequent infections with a different serotype can lead to severe dengue, also known as dengue hemorrhagic fever or dengue shock syndrome. Seafarers frequently travel to dengue-endemic areas, increasing their risk of infection. The Qdenga vaccine was approved in the European Union in December 2022 for individuals aged four years and older. It has shown an overall efficacy of approximately 80% after 12 months. The vaccination course consists of two subcutaneous injections, given 3 months apart.

Chikungunya and Ixchiq: Chikungunya is a mosquito-borne disease causing fever and severe, potentially long-lasting joint pain. Outbreaks occur in many regions visited by seafarers. The chronic joint pain associated with chikungunya can significantly impair their physical abilities and lead to prolonged work incapacity. The Ixchiq vaccine received marketing authorization in Europe in 2025. Clinical trials demonstrated high seroresponse rates ($\geq 96\%$) for at least 6 months after vaccination. Ixchiq is administered as a single injection.

Pneumococcal disease and Prevenar-20: Pneumococcal disease can lead to serious conditions like pneumonia, meningitis, and sepsis, with increased risk in older adults and those with underlying health issues. Older seafarers and those with chronic conditions are at higher risk of severe pneumococcal disease. Prevenar-20 was approved in the EU in February 2022 for adults and children aged 6 weeks and older. It protects against 20 serotypes of the pneumococcal bacterium, offering broader coverage than previous vaccines. In adults, Prevenar-20 is given as a single intramuscular injection.

Conclusions: Seafarers are particularly vulnerable to infectious diseases due to factors affecting their immune system, the potential for outbreaks in confined environments, and exposure to geographically diverse disease risks. The availability of new vaccines like Shingrix, Qdenga, Ixchiq, and Prevenar-20 represents a significant advancement in protecting this population against shingles, dengue, chikungunya, and pneumococcal disease.

Keywords: vaccinations, infectious diseases, prevention