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Title: A Hidden Opponent: Should Athletes Need Pneumococcal Protection

Invasive pneumococcal disease is a preventable threat. Yet elite athletes remain off the radar for vaccination despite being a risk group[1-3]. This can be due to underlying co-morbidities or the nature of increased and intense travel schedules within the sports community. Athletes are also susceptible to infections due to reduced circulating memory T cells and upper airway dysbiosis[4]. Pneumococcal vaccination is not currently included in the UK's Green Book guidance for travel-related immunisation, nor is the travelling athlete listed as a risk group in chapter 25 amongst those who should be recommended for pneumococcal vaccination.

Athletes are frequently exposed to close-contact environments such as shared accommodation, team transport, and commercial flights[5,6]. These conditions, combined with the physical stress of intense training, disrupted circadian rhythms, and potential exposure to unfamiliar pathogens, may increase vulnerability to respiratory infections, including Streptococcus pneumoniae[7]. While invasive pneumococcal disease is uncommon in young healthy adults, recent outbreaks IPD across multiple continents remains a concern. Studies have demonstrated outbreaks of respiratory illness in military cohorts, often linked to close-contact living and strenuous activity[8]. Although sports teams are not routinely considered high-risk by public health guidance, the parallels are notable.

On the international stage, the 2002 Winter Olympics saw a short-lived influenza outbreak. Previous literature has highlighted the risk of meningococcal disease at the FIFA World Cup, with the need for robust vaccination regimes[9]. Despite recognition of other pathogens, pneumococcal disease remains under-researched, creating an important evidence gap, warranting further investigation in the current climate of evidence-based policy. A second outbreak in 2003 of pneumococcal infections was reported in a cohort of college students for which one of the risks was being part of the sports team. This infection was thought to be atypical with an absence of a polysaccharide capsule and at the time could not be serotyped [10]. In a study examining T cell profiles in Olympics athletes, T regulatory cell dysfunction with concomitant dysbiosis of the upper respiratory tract was a key driver in respiratory infections in this athlete population[4]. Disruption in T cell populations was thought to be driven partly by strenuous exercise when compared to healthy controls.

A systematic review of respiratory infections in athletes reported a rate of 4.7 athletes per 1000 athlete days becoming infected[11]. The majority of reporting has been on viral infections with few studies on bacterial disease[12]. Rates were higher in non-elite athletes with rates 0f 8.7 per 1000 athlete days. In a study reporting on illness in the Rio 2016 paralympic games respiratory infections were reported in 8 of the 511 participants[13]. Amongst the Olympic games in 2016, there were 346 respiratory tract infections[14]. When compared to the London 2012 paralympic, out of 157 infections, 50% represented respiratory tract infections, although

the causative organism was not reported on[15]. 61% of beach volleyball players reported respiratory infections at the London 2012 Olympics[16].

The 20 valent conjugate vaccine (PCV20) received approval from the Medicines and Health Regulatory Authority (MHRA) in May 2025 and is set to replace the polysaccharide vaccine (PPSV23) within the United Kingdom to mirror US vaccination procedures[17]. PCV20 can offer protection against 8 unique pneumococcal serotypes not covered in PPSV23, with the addition of serotypes 15,16 and 35 which are becoming increasingly resistant to antimicrobial therapy, and serotype 23 for which outbreaks have occurred in densely populated areas.

Invasive pneumococcal disease is a common and preventable infection amongst the sporting community, with vaccination requirements highlighted as a need over 30 years ago, public health interventions for this risk group are yet to be addressed within the UK[18]. We suggest that pneumococcal vaccination be considered in the pre-travel health assessments of athletes, particularly when extended stays, shared accommodation, or travel to low-resource settings are involved. Although briefly mentioned within the 2022 International Olympic Committee (IOC) consensus statement on acute respiratory illness in the athlete[19], vaccination in this group . With a great deal of national and international guidance for the covid-19 vaccine following the pandemic, the pneumococcal vaccination efforts are yet to receive similar recognition.

Existing literature on vaccination efforts amongst this cohort remains limited,[6] with few studies reporting on pneumococcal disease alone and rather respiratory infections as a whole. Through this work we aim to highlight the need to study further respiratory tract infections in elite athletes with attention to bacterial infections in order to adjust guidance on health screening and vaccination, particularly for those competing internationally or living in close-contact environments.

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