

Building an Open Web-Based Bioinformatics System for Genomic Surveillance

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DESCRIPTION

Hepatitis B is a viral infection that poses a significant threat to Healthcare Professionals (HCWs) due to the nature of their work. Recognizing this risk, many countries, including Ghana, have implemented vaccination programs for HCWs to protect them from the hepatitis B virus. However, merely receiving the first vaccine may not be sufficient, as the level of immunity can vary among individuals. This study, conducted in Ghana's Ashanti Region, aimed to assess the prevalence of Hepatitis B Surface Antigen (HBsAg) and the seroconversion rate among vaccinated healthcare personnel. The research involved 424 HCWs who were administered a semi-structured, open-ended questionnaire for pretesting. Subsequently, 24.1% were anti-HBs seronegative. Intriguingly, 2.4% of participants had positive HBcAb results but negative HBsAg results, indicating a resolved hepatitis B infection. Another 8.5% had recovered from a prior HBV infection, attaining seroprotection. Key variables affecting seroconversion included age, the number of vaccine doses received, the administration of booster doses, and the maintenance of vaccination records. Furthermore, the 24.1% anti-HBs seronegativity rate indicates a vulnerability to infection among a considerable proportion of participants. The intriguing finding of participants with positive HBcAb results and negative HBsAg results indicates resolved infections, affirming the potential for recovery from hepatitis B. Additionally, the 8.5% who had recovered from prior HBV infection and achieved seroprotection underscore the resilience of the immune response post-infection. In conclusion, this study provides valuable insights into the seroconversion rates and prevalence of hepatitis B surface antigen among vaccinated healthcare professionals in Ghana's Ashanti Region. The identified risk factors and the percentage of individuals without adequate immunity underscore the importance of a comprehensive approach to hepatitis B vaccination programs. Continuous monitoring, post-vaccination serological testing, and awareness among healthcare professionals are crucial to enhancing immunity and minimizing the risk of hepatitis B infection in this high-risk population. Moreover, the study's demographic breakdown revealed an interesting distribution of

participants with 36.1% being male and 63.9% female. This distribution highlights the need for gender-specific considerations in vaccination strategies, recognizing potential variations in immune responses and susceptibility to infections. Exploring such nuances can contribute to more tailored and effective vaccination programs. The study's exploration of key variables impacting seroconversion provides crucial insights into optimizing vaccination strategies. Age, for instance, emerged as a significant factor, emphasizing the importance of considering age-specific immunity patterns. Understanding how age influences the response to hepatitis B vaccination can inform targeted interventions and booster dose recommendations. Furthermore, the quantity of vaccine doses administered played a pivotal role in seroconversion rates. This emphasizes the need for strict adherence to vaccination schedules and the importance of completing the recommended dosage. Healthcare systems should prioritize ensuring that healthcare professionals receive the full course of vaccinations, recognizing that incomplete regimens may leave individuals susceptible to infection. The administration of booster doses also emerged as a determinant of seroconversion. This finding underscores the potential necessity for booster vaccinations to reinforce and prolong immunity, particularly in high-risk settings where healthcare workers are continuously exposed to the virus. Integrating booster doses into routine vaccination programs could be a proactive measure to sustain long-term protection. Maintaining a vaccination record card was identified as another critical variable influencing seroconversion. This highlights the importance of effective record-keeping systems within healthcare settings. Regular monitoring of vaccination records can help identify individuals who may require additional doses or booster shots, ensuring continuous protection against hepatitis B. The study's identification of individuals who had recovered from prior HBV infection and achieved seroprotection is noteworthy. This resilience of the immune response post-infection suggests the potential for natural immunity and highlights the importance of understanding the dynamics of natural recovery. Further research into the long-term immunity conferred by natural infection could contribute valuable insights to complement vaccination strategies.

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