

# WORLD CONGRESS ON RHEUMATIC HEART DISEASE

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**Title:** RHEUMATIC HEART DISEASE IN SCHOOL ATTENDING NEPALESE CHILDREN: A DESCRIPTIVE ANALYSIS OF THE NATIONAL HEART SCREENING DATABASE

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**Background & Aims:** Rheumatic Heart Disease (RHD) remains a significant public health problem with high morbidity and mortality in children and young adults from lower-middle income countries like Nepal. However, a nation-wide database of the disease is lacking for designing effective future prevention and control programs and strategies. The aim of our study is to estimate the prevalence of RHD in school-going Nepalese children, describe its demographic profile, estimate severity of RHD and evaluate its valvular involvement.

**Methods:** We performed a cross-sectional descriptive analysis of a nationally representative database of Nepal Heart Foundation (NHF) national RHD screening program which included school-attending Nepalese children between five and sixteen years of age. The screening was conducted between May 2015 and March 2020 in various schools, representing all administrative and ecological zones of Nepal. Schools were selected on basis of randomized convenience sampling method. All children underwent clinical survey and cardiac auscultation followed by transthoracic two-dimensional echocardiography performed in selected children with more than grade one murmur on auscultation. Sonosite M-Turbo PORT echo machine with phase array cardiac transducer of 1-5 MHz was utilized. World Heart Federation 2012 RHD criteria and 2012 Australian RHD guidelines were followed. We estimated the prevalence of RHD as the number of RHD cases per 1, 000 school-attending children with a 95% confidence interval.

**Results:** The database included a total of 107, 340 children in 236 different schools from all seven provinces, across all three ecological zones of Nepal. Among them, 10, 600 (9.9%) underwent transthoracic two-dimensional echocardiography. The overall prevalence of RHD was 2.22 cases per 1000 school-attending children (95% CI : 1.94 - 2.50). The highest prevalence was observed among children living in the southern Terai ecological zone i.e., (2.89 per 1000, 95% CI (2.32 - 3.46)) of Nepal. Among the provinces, Karnali had the highest prevalence of RHD (3.45 per 1000, 95% CI (2.42-4.48)). Among the districts screened, Kalikot had the highest RHD prevalence (5.47 per 1000, 95% CI (3.02 - 7.92)).

The prevalence of RHD was significantly higher in the age group of 11-16 years i.e., (2.61 per 1000, 95% CI (2.22-3.00)) than in the 5-10 year age group (1.64 per 1000, 95% CI (1.26-2.02)) with a significant p value of 0.010. Fewer children in the privileged group had RHD (1.47 per 1000, 95% CI: 1.03 - 1.91) in comparison to the underprivileged group (2.50 per 1000, 95% CI: 2.15 - 2.85) ( $p = 0.0016$ ). However, no such differences were observed in the prevalence between males and females (1.76 vs 1.89,  $p = 0.651$ ).

Among the 239 detected RHD cases, 47 (19.7%) children had borderline RHD, whereas 192 (80.3%) had definitive RHD with mild RHD (82.8%) cases taking the predominant share. The most common valvular lesion was an isolated mitral regurgitation (70.7%).

**Conclusions:** RHD is a significant public health problem in Nepal. The disease is prevalent in all three ecological zones of Nepal, predominantly in the southern Terai zone. It is more common in underprivileged children from remote and underdeveloped districts and provinces. Therefore, primordial and primary prevention strategies and secondary prevention programs should pay special attention to targeting these regions of Nepal. Potential interventions to combat RHD in these high-risk, underprivileged districts are essential.