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GEOGRAPHIC INFORMATION SYSTEM AIDED MALARIA RISK MAPPING IN SRI LANKA.

Precise information on spatial distribution of malaria is important for planning disease control strategies. With help of Geographic Information System (GIS) technology we produced a malaria map over the period of 5 years (1996-2000) at Divisional Secretary Division (DSD) level of Sri Lanka with the objective to identify risk areas, population at risk, and environmental risk factors of malaria. Laboratory confirmed malaria case data recorded by the national Malaria Control Programme only were used in this exercise, as private sector data are not available. In conflict areas in the north and east of the island, data were missing for some DSDs or data were available at a lower resolution. In those cases we interpolated district data.

In a preliminary analysis, we classified malaria endemicity into the following categories: malaria free (API<1), malaria controlled (API=1-10) and malarious (API>10). This map revealed that 9,200,963 people (nearly half of the country's population) live in the 111 malaria free DSDs, which covered 19% of the country's, land area. In 97 DSDs (representing 29% of the population and 28% of the total land area) malaria endemicity is "controlled". We found that 3,919,075 people (21% of the country's population) live in 108 malarious DSDs covering an area of 34715.19 km2 (53 % of the total land area). The mean altitude of each DSD was extracted from a digital elevation model of Sri Lanka. We observed that DSDs above a mean altitude of 951 meters above sea level are malaria free and all malarious DSDs are below 556 meters. An overlay with an agro-ecological zone map of Sri Lanka identified that malarious DSDs are in zones where the annual rainfall is below 900 mm.

The produced risk map could help target disease control interventions in allocating limited resources more precisely and in a more cost-effective manner. Further, in a similar approach, GIS could be applied in monitoring and evaluation of the control measures as well as in detailed risk factor analysis and in developing a disease forecasting system for malaria.