4. Data

For the present study, the screened SCD cases records, environmental data, socio demographic data were obtained for the period of 1997-2012 and climatic data was obtained for the period of 22 years (1990-2012).

4.1 Sickle Cell Disease (SCD) data

The data for the study include both trait and disease cases of sickle cell anaemia between 1997 to 2012 (n=2,867) which was drawn from three NGO’s in the Nilgiri district. The data for Gudalur taluk (342) was obtained from ASHWINI (Association for health welfare in the Nilgiris) which is the only hospital that serves the tribal population in Gudalur taluk. The data for Kotagiri taluk (1423), Ooty taluk (189), Coonoor taluk (317) and Kundah taluk (52) was obtained from NAWA (Nilgiris Adivasi Welfare Association) and from Centre for Tribal Research Development (CTRD) for Pandalur taluk (544), Tamil Nadu. A total of 2,867 sickle cell cases of both disease and traits of different age groups were studied. Detailed information relating to the patient such as age, sex, village, year of disease notification and tribal community were recorded during the study. The tribal population data at village level was obtained from 2011 population census and NGO’s. The total tribal population of the Nilgiri district was 32,813 (Census of India, 2011).

4.2 Climatological data

The climatological data namely mean monthly rainfall (mm), monthly maximum and minimum temperature (°Celsius), relative humidity (percentage) for the four blocks was obtained from the Horticulture Department Ooty, Botanical garden Ooty, District Collectorate and Meteorological station (rain gauge station: 12) of the Nilgiris for a period of 22 years from 1990 to 2012. The altitude point of each hamlet was derived from Shuttle Radar Telemetry Mission (SRTM) which gives altitude values from a specific terrain. Using the altitude points, the barometric pressure (kPa), partial oxygen pressure (PaO₂kPa), saturation of oxygen (SaO₂) was calculated using altitude oxygen calculator (www.altitude.org).
4.3 Socio-demographic information

The socio demographic data such as age, occupation, average monthly income, marital status and education, for each patient pertaining to the communal village was obtained from personal interview of SCD patients and through interaction with NGO’s of the Nilgiri district.

4.4 Spatial data

1. The Survey of India (SOI) toposheets 58 A/2, 6, 7, 8, 10, 11, 12, 13 and 15 at the scale 1:50,000 were used to digitize the district and taluk boundaries.

2. The taluk wise village map for each taluk was obtained from the District Survey Department and Village Administrative Offices.

3. The geographical locations and addresses of the recorded cases were identified through NovAtel CORRECT™GPS and Google Map locators.

4. The Indian Remote Sensing Satellite (IRS-1D) LISS-III satellite data, at a resolution of 23.5 meters of 2009 was downloaded from ISRO Bhuvan and was used for image processing analysis.