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# The epidemiology of haematological cancers in Sarawak, Malaysia (1996 to 2015)

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## Abstract

**Background** Published epidemiological studies of haematological cancers are few. Hereby we present a 20-year epidemiological data of haematological cancers in Sarawak from a population-based cancer registry.

**Methods** Haematological cancer cases with ICD-10 coded C81-C96 and ICD-O coded /3 diagnosed from 1996 to 2015 were retrieved from Sarawak Cancer Registry. Adult was defined as those 15 years and above. Incidence rate (IR) was calculated based on yearly Sarawak citizen population stratified to age, gender, and ethnic groups. Age-standardised IR (ASR) was calculated using Segi World Standard Population.

**Results** A total of 3,947 cases were retrieved and analysed. ASR was 10 and male predominance (IR ratio 1.32, 95%CI 1.24, 1.41). Haematological cancers generally had a U-shaped distribution with lowest IR at age 10–14 years and exponential increment from age 40 years onwards, except acute lymphoblastic leukaemia (ALL) with highest IR in paediatric 2.8 versus adult 0.5. There was a significant difference in ethnic and specific categories of haematological cancers, of which, in general, Bidayuh (IR ratio 1.13, 95%CI 1.00, 1.27) and Melanau (IR ratio 0.54, 95%CI 0.45, 0.65) had the highest and lowest ethnic-specific IR, respectively, in comparison to Malay. The ASR (non-Hodgkin lymphoma, acute myeloid leukaemia, ALL, chronic myeloid leukaemia, and plasma cell neoplasm) showed a decreasing trend over the 20 years, -2.09 in general, while Hodgkin lymphoma showed an increasing trend of +2.80. There was crude rate difference between the 11 administrative divisions of Sarawak.

**Conclusions** This study provided the IR and ASR of haematological cancers in Sarawak for comparison to other regions of the world. Ethnic diversity in Sarawak resulted in significant differences in IR and ASR.

**Keywords** Haematological cancer, Sarawak, Borneo, Registry, Acute leukaemia, Lymphoma, Myeloma, Plasma cell, Chronic myeloid leukaemia

## Background

Published epidemiological studies of haematological cancers are few, more so in Asia and Southeast Asia. Sarawak, one of the current three entities forming Malaysia, is located on Borneo Island, the third largest island in the world. Sarawak is the largest state in Malaysia with an area of 124,450 km<sup>2</sup>. Its population grew from 1.86 million in 1996 to 2.54 million in 2015 and 2.91 million according to the latest census in 2020 [1]. It boasts 27 ethnic groups [2], of which the three major ethnic groups, as of the year 2010, are Iban (the biggest

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