Given an integral variation of Hodge structure of K3 type over a complex quasi-projective curve, it is a classical result of Green-Oguiso that the corresponding Hodge locus is a countable dense subset when the variation is simple and non-trivial. In this talk, I will explain an equidistribution result of this locus with the respect to the natural measure induced by integration of the first Chern class of the Hodge bundle. An asymptotic estimate of the number of points on the base which admits a Hodge class of given norm is obtained. Then I will discuss some applications to the distribution of elliptic fibrations in families of K3 surfaces above complex quasi-projective curves.