Abstract: Let L be a holomorphic line bundle on a compact normal complex space X of dimension n, let  $\Sigma = (\Sigma_1, \ldots, \Sigma_l)$  be an *l*-tuple of distinct irreducible proper analytic subsets of X, and  $\tau = (\tau_1, \ldots, \tau_l)$  be an *l*-tuple of positive real numbers. We consider the space  $H_0^0(X, L^p)$  of global holomorphic sections of  $L^p := L^{\otimes p}$  that vanish to order at least  $\tau_j p$  along  $\Sigma_j$ ,  $1 \leq j \leq l$ , and give necessary and sufficient conditions to ensure that dim  $H_0^0(X, L^p) \sim p^n$ . If  $Y \subset X$  is an irreducible analytic subset of dimension m, we also consider the space  $H_0^0(X|Y, L^p)$  of holomorphic sections of  $L^p|Y$  that extend to global holomorphic sections in  $H_0^0(X|Y, L^p) \sim p^m$ . When L is endowed with a continuous Hermitian metric, we show that the Fubini-Study currents of the spaces  $H_0^0(X|Y, L^p)$  converge to a certain equilibrium current on Y, and we apply this to the study of the equidistribution of zeros in Y of random holomorphic sections in  $H_0^0(X|Y, L^p)$  as  $p \to \infty$ . This is joint work with George Marinescu and Viêt-Anh Nguyên.