Abstract: Noncommutative geometry and semiclassical analysis are two very active area of research within the larger scope of quantum theory. It's only recently that links between these two fields have begun to emerge. In this talk, I will explain how the semiclassical Weyl's law on the semiclassical behaviour of counting functions of Schrödinger operators ultimately holds for a very large class of noncommutative manifolds. This improves and simplifies earlier results of McDonald-Sukochev-Zanin. We will then explain how this enables us to get semiclassical Weyl's laws for equiregular sub-Riemannian manifolds. In fact, thanks to recent results of Colin de Verdière-Hillairet-Trélat and Androulidakis-Mohsen-Yuncken these results can be further extended to singular examples, including Schrödinger operators associated to Grushin operators.