BACKGROUND: Severe treatment-related hearing loss (HL) is associated with devastating psychosocial/neurocognitive outcomes. Children with central nervous system (CNS) tumors are highly vulnerable to severe HL due to tumor location and treatment exposures. This is the first study to report national CNS tumor-specific rates and predictors of early severe HL. METHODS: We conducted a retrospective, population-based cohort study of all children ≤15yrs at diagnosis with CNS tumors between 2001-2019 using the Cancer in Young People in Canada registry. The primary outcome was Common Terminology Criteria for Adverse Events grade 3/4 HL ≤5yrs following diagnosis. We determined prevalence and probabilities of early HL; predictors were determined using multivariable logistic regression models. RESULTS: Among 3,201 children with CNS tumors, 5.1% experienced early HL. Children with medulloblastoma (N=570) and ATRT/other embryonal tumors (N=269) experienced disproportionate rates (16.1%, 15.2%, respectively); 85.4% (medulloblastoma) and 68.8% (ATRT/other embryonal) received cisplatin. 74.6% (medulloblastoma) and 52.1% (ATRT/other embryonal) were irradiated. In children with medulloblastoma, when controlling for follow-up, age ≤5yrs at diagnosis [odds ratio (OR) 2.4, 1.5-3.8], radiation (OR 3.5, 1.6-7.6), and cisplatin (OR 20.4, 1.3-329.7) predicted early HL. In children with medulloblastoma post cisplatin, age ≤5yrs at diagnosis doubled the probability of early HL in both irradiated (29.8%, vs 15.3% if >5yrs at diagnosis) and non-irradiated patients (10.6% vs 4.8% if >5yrs at diagnosis). In children with ATRT/other embryonal, cisplatin (OR 28.2, 1.7-472.1) was the only predictor of early HL. CONCLUSIONS: In the largest population-based study of early severe HL in children with CNS tumors, we report striking rates in children with embryonal tumors. Younger irradiated children had disproportionate probabilities of early HL, suggesting a novel additive interaction between age at diagnosis and radiation. Standardized otoprotection and research focusing on therapy de-escalation in young children with embryonal tumors are urgently needed.