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**Title**

*Age-period-cohort modeling of primary mental health and substance use service delivery in British Columbia*

**Priority 1 (Research Category)**

Healthcare Services, Delivery, and Financing

**Presenters**

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**Abstract**

Context: Despite increased supply of physicians between 1996 and 2017, there is a lack of supply of primary care services in British Columbia, Canada. There is a need to understand whether supply deficiencies are the result of demographic ageing among physicians, differences in the work preferences of graduating cohorts of physicians, or secular changes in the context surrounding physician practice (e.g., socio-political context). Objective: This research aims to explain primary care physicians' supply of mental health and substance use (MHSU) services as a function of physician age, generational cohort, and time period. Study Design and Analysis: We analyzed the billing data from primary care physicians in British Columbia using three models of age-period-cohort (APC) effects. These models explain the extent to which changes in MHSU service provision occurs as a function of these three variables. Setting or Dataset: Billing data was provided by Population Data BC and includes records on physician billing through BC's publicly funded healthcare system between the 1996/97 and 2016/17 fiscal years. Population Studied: In each year, we included all physicians who identified as a general practitioner or family physician, had active practices, and were not missing data on their self-reported gender, age, or year of graduation from medical school. Intervention/Instrument: We estimated three APC models: the hierarchical APC model, median polish, and orthogonal polynomials. The median polish approach assumes an epidemiological definition of cohort, whereby cohort is modeled as the interaction between age and time period, while the other two models do not. Outcome Measures: Count of MHSU contacts. Results: All three modelling approaches provide evidence in favor of age effects, minimal evidence for period effects, and no evidence of cohort effects. Conclusions: These findings suggest that changes in the supply of primary MHSU services over the last 20 years can be attributed to the ageing of the physician workforce – findings that are robust across three different analytic methods with different assumptions about the nature of cohort effects. The dialogue that more recent cohorts of physicians are practicing in fundamentally different ways is not borne out by this analysis. Given this, workforce planning solutions should be focusing on mitigating the effects of workforce ageing to address the labour shortage.