

Impact of the Covid-19 pandemic on the incidence and mortality of cervical cancer in Canada. Projections from OncoSim-HPV/Cervical cancer.

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Introduction: In March 2020, the Covid-19 pandemic interrupted HPV vaccination and cervical cancer screening globally. This study aimed to project the impact of these interruptions on cervical cancer outcomes in Canada.

Methods: We conducted the analysis using OncoSim-HPV/Cervical cancer, a mathematical model that simulates HPV infections and cervical cancer in Canada. We assumed 76.6% screening participation rates and an annual HPV vaccination for 12-year-old girls with 60% vaccination coverage before the pandemic. We modelled four scenarios: a no interruption scenario (i.e. uninterrupted HPV vaccination and cytology screening) and three scenarios where screening and vaccination were delayed for 2 years and resumed with different screening strategies in 2022: (i) cytology every 3 years (regular PAP); (ii) switch to HPV testing every 5 years without genotyping (HPV-DNA); and (iii) switch to HPV testing with oncogenic genotyping for HPV-16/18 (oncogenic-HPV). All three scenarios also assumed vaccination resumes and catch-up vaccination occurs in 2022. Outcomes included age-standardized incidence (ASI) and mortality (ASM), and colposcopy demand.

Results: The analysis projected that Covid-19 pandemic-related interruptions on cervical cancer screening would lead to higher cervical cancer incidence and mortality by 2023, as compared to no interruptions (Figure 1 and Figure 2). Resuming screening with oncogenic-HPV every 5 years could reduce incidence and mortality (vs. no interruptions) starting in 2026, but would require more colposcopies initially; the additional colposcopy demand would diminish by 2027 (Figure 3). Due to very low prevalence of cervical cancer, estimates on the incidence and mortality over time are subject to a high degree of Monte Carlo uncertainty.

Conclusions: Covid-19 pandemic delays on cervical cancer screening were projected to increase cervical cancer incidence and mortality in the short term. Switching from cytology primary screening to oncogenic HPV testing after screening interruptions could mitigate the pandemic delays-related harms and further improve cervical cancer outcomes.