Temporal trends in cervical lesions from 2000 to 2023: evidence from Hospital-Based Cancer Registries in São Paulo State, Brazil

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BACKGROUND

São Paulo State is transitioning from thirty years of opportunistic, cytology-based cervical cancer screening toward an organized program. Without representative state-level incidence data, hospital-based cancer registries provide essential baseline evidence to support this transition.

OBJECTIVE

To analyze temporal trends in cervical lesions and stage at diagnosis from 2000–2023 across different age groups.

METHODS

- **Study design:** Retrospective analysis of precursor lesions and invasive cervical cancers diagnosed between 2000–2023 among residents treated in the public health system.
- **Data source:** Central Hospital-based Cancer Registry of São Paulo State (FOSP)
- Precursor/invasive lesions and stage were analyzed across four age groups: <25, 25–39, 40–64, and ≥65 years.
- Temporal trends assessed using Joinpoint regression, estimating Annual Percent Change (APC) with 95% confidence intervals.

RESULTS

Overall Burden (2000–2023)

- 27,121 invasive cancers (ICD-O histologic types: squamous cell carcinoma, adenocarcinoma, and adenosquamous carcinoma)
- 23,722 precursor lesions (histologic types: CIN3, adenocarcinoma *in situ*, carcinoma *in situ*, and other in situ lesions)
- Few cases in <25 years (4.6%) and ≥65 years (12.9%)

Precursor Lesions

Increased early in the temporal series across all age groups, except among women aged <25 years.

Invasive Cancers

- **25–39 years:** increased from 2014–2023, APC = 4.30% (95%CI 1.85–10.19)
- **40–64 years:** slow increase from 2002–2023, APC = 0.37% (95%CI 0.17–0.76)

Stage at Diagnosis Trends

- Stage III followed these patterns: 25–39 showed a renewed increase after 2014 (APC=3.10%; 95%CI 0.11,6.18), whereas 40–64 experienced sustained decline (APC=–1.30%; 95%CI –1.71, –0.91).
- Among women ≥65 years, stage III declined from 2005–2023 (APC=–1.66%; 95%CI –7.82, –1.29), while stage IV continued to rise (APC=5.90%; 95%CI 5.22, 6.80).

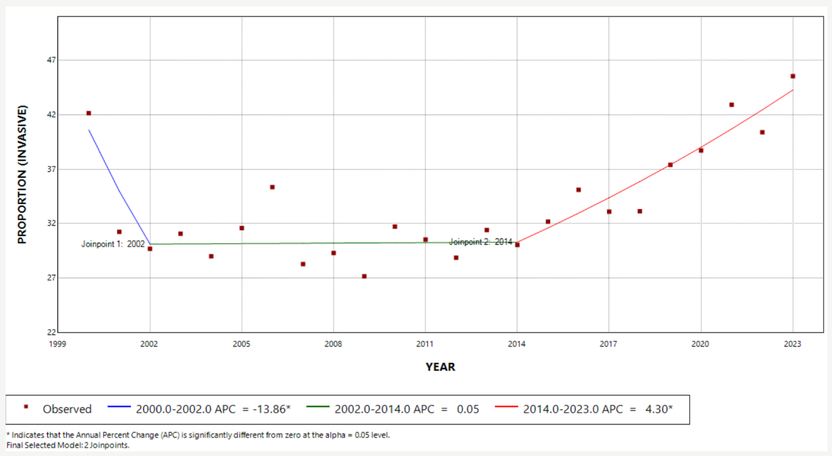


Figure 1. Trends in invasive lesions among women aged 25-39 years

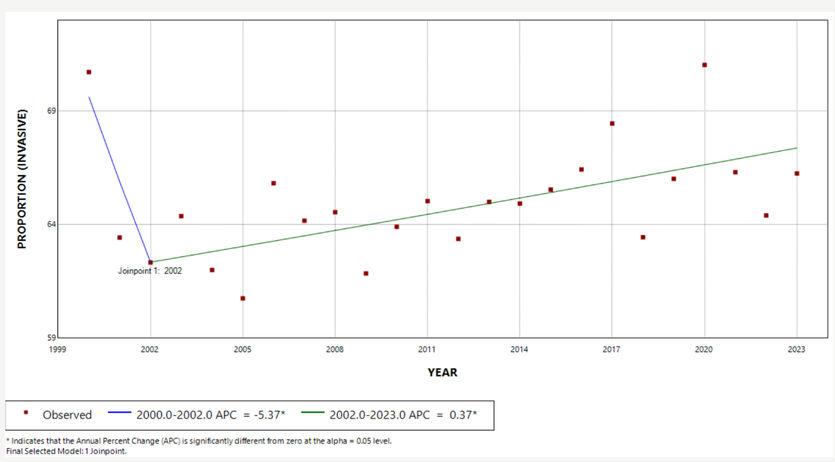


Figure 2. Trends in invasive lesions among women aged 40-64 years

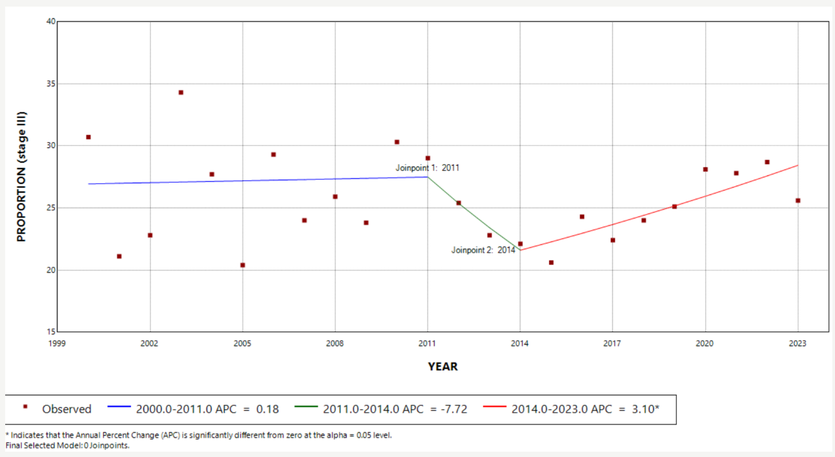


Figure 3. Stage III trends among women aged 25-39 years

CONCLUSIONS

- Age-specific trends reveal distinct patterns in cervical lesion detection.
- 40–64 years: decline in advanced disease suggests improved detection or follow-up.
- 25–39 years: increase in late-stage diagnoses indicates emerging gaps in screening or access.
- ≥65 years: In this age group, the decline in stage III suggests some improvement; however, it remains insufficient to prevent progression to stage IV.
- These patterns may reflect historical disparities in screening participation, healthcare access, and follow-up, shaped by the limitations of a long-standing opportunistic screening model.

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