Swiss Lung Cancer Trends 1989-2013 by Histologic Subtype

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Objective

• A comprehensive description of lung cancer incidence trends in Switzerland, with a focus on birth cohort-specific trends predictive of future incidence developments.

Background

• Despite widespread public awareness of the risks associated with smoking, supporting smoking cessation and preventive actions against smoking initiation are still needed, and careful monitoring of lung cancer incidence is one of the key requirements in planning and evaluation of the progress against tobacco-related diseases.

Data and Methods

This study is based on the National Cancer Dataset (NCD) managed by the National Institute for Cancer Epidemiology and Registration (NICER) with the purpose of national cancer monitoring in Switzerland. All Swiss Cancer Registries (CR) with 23 years of data were included, representing about 50% of the total population in Switzerland. Case numbers are extrapolated to whole Switzerland. Malignant primary diagnoses C33-C34 (ICD-10) were selected. The proportion of cases registered from death certificates was <4%, and the proportion of cases with microscopic confirmation was >90%. Diagnoses were divided by ICD-O-3 morphology into 6 groups: adenocarcinoma (**AD**), squamous cell carcinoma (**SQ**), small cell carcinoma (**SM**), large cell carcinoma (**LA**), other specified subtypes (**oth**), and un- or poorly specified cancer (**un**). CRs were divided into 2 groups: those covering predominantly German-speaking (**SA**), and predominantly French-speaking (**SL**) Swiss cantons. Incidence rates are expressed as events per 100,000 person-years. All rates, including age-specific rates, were age-adjusted applying the European standard population (1967). Trends and points in time with significant changes in trends were estimated with the Joinpoint Regression Program [1].

Trends for all lung cancer subtypes combined

N cases by Sex and Language region — **Rates** by Sex and Language region
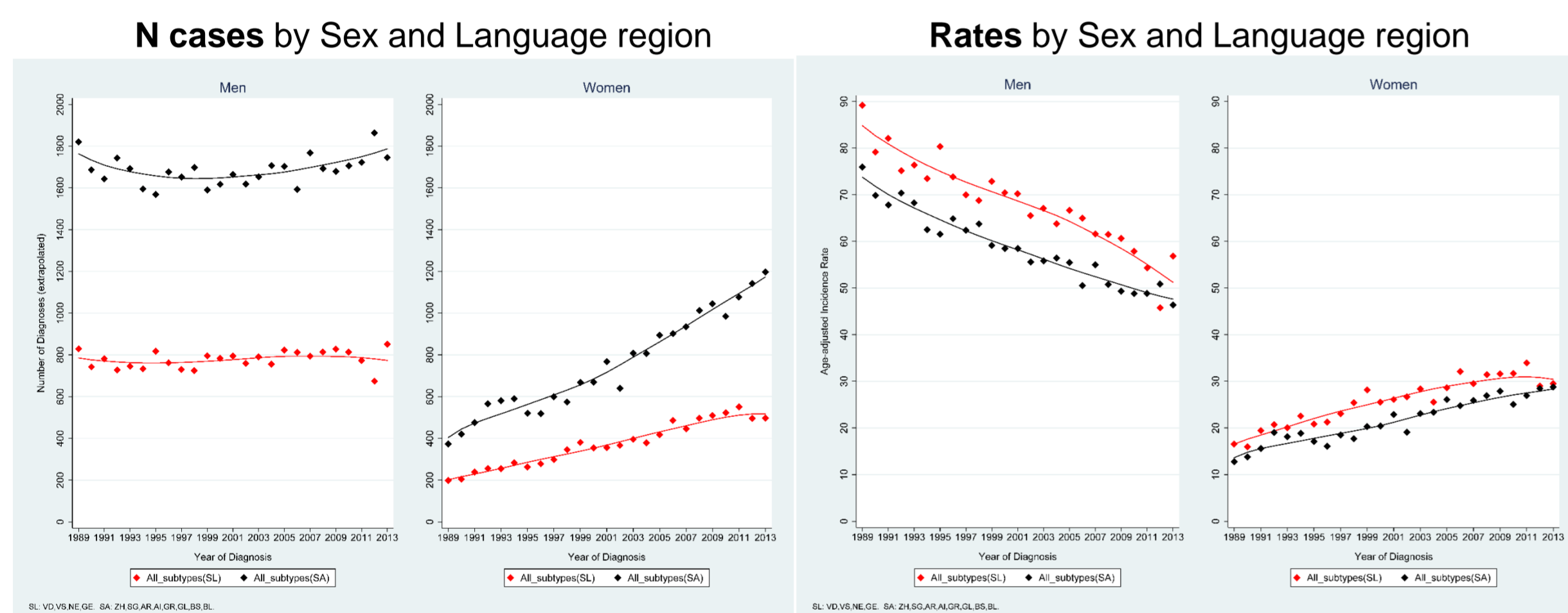
► There are larger annual case numbers in the German-speaking region (SA), due to the larger risk-population, but annual incidence rates are larger in the French-speaking region (SL), for both sexes.
► In Men, case numbers are more or less stable and age-adjusted incidence rates falling (1.5-fold). In contrast, prominent increases in case numbers (2.8-fold) as well as rates (2-fold) are observed in Women.
► Global trends are similar in both language regions (SL, SA).

Age-adjusted period trends by subtype
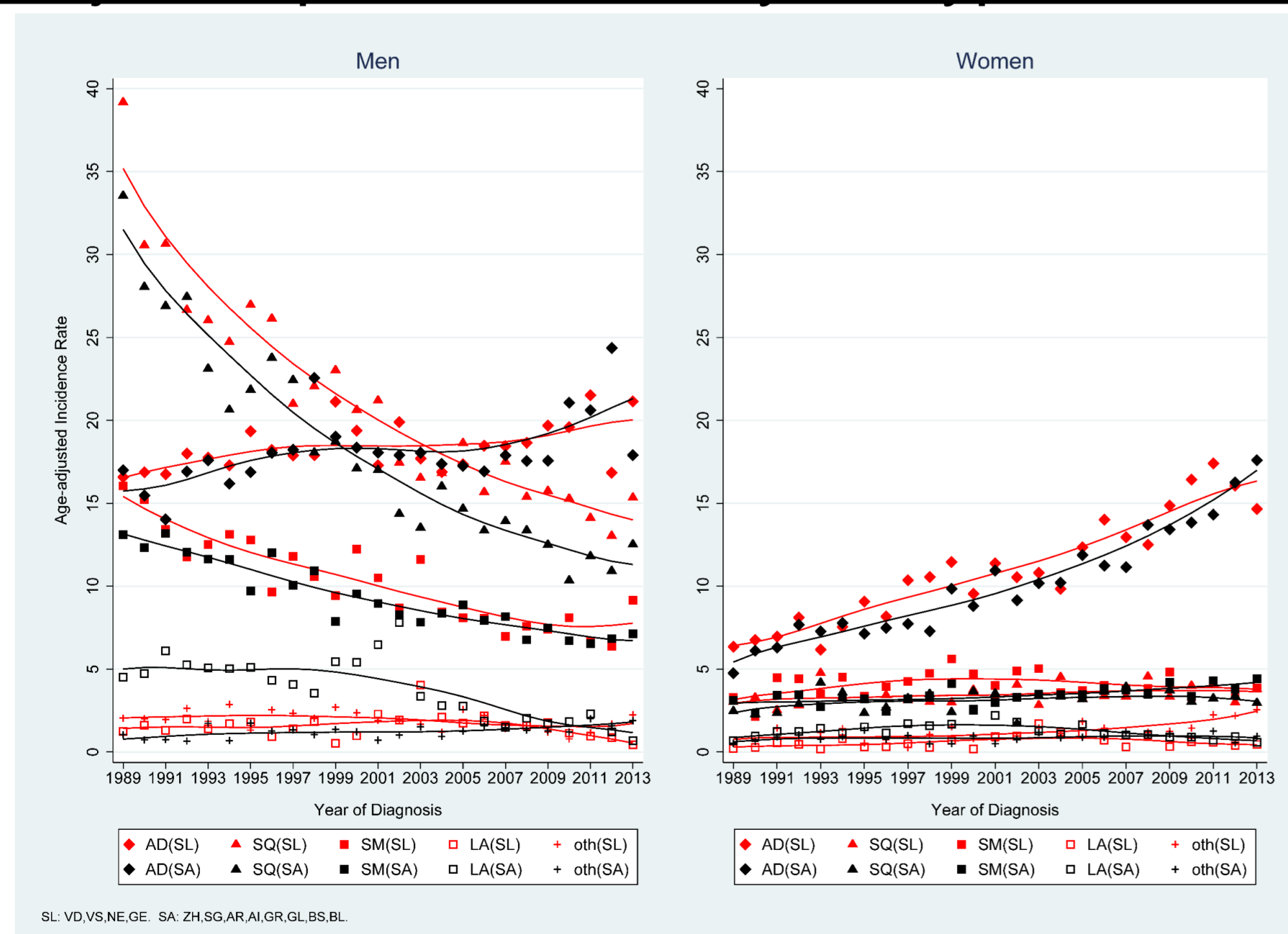
► Squamous cell carcinoma (SQ) was initially predominant in Men, but is replaced by adenocarcinoma (AD) in more recent years. In Women, AD is always the predominant subtype.
► AD is the only subtype with increasing rates in both sexes. The sex-specific incidence patterns became more similar over time.
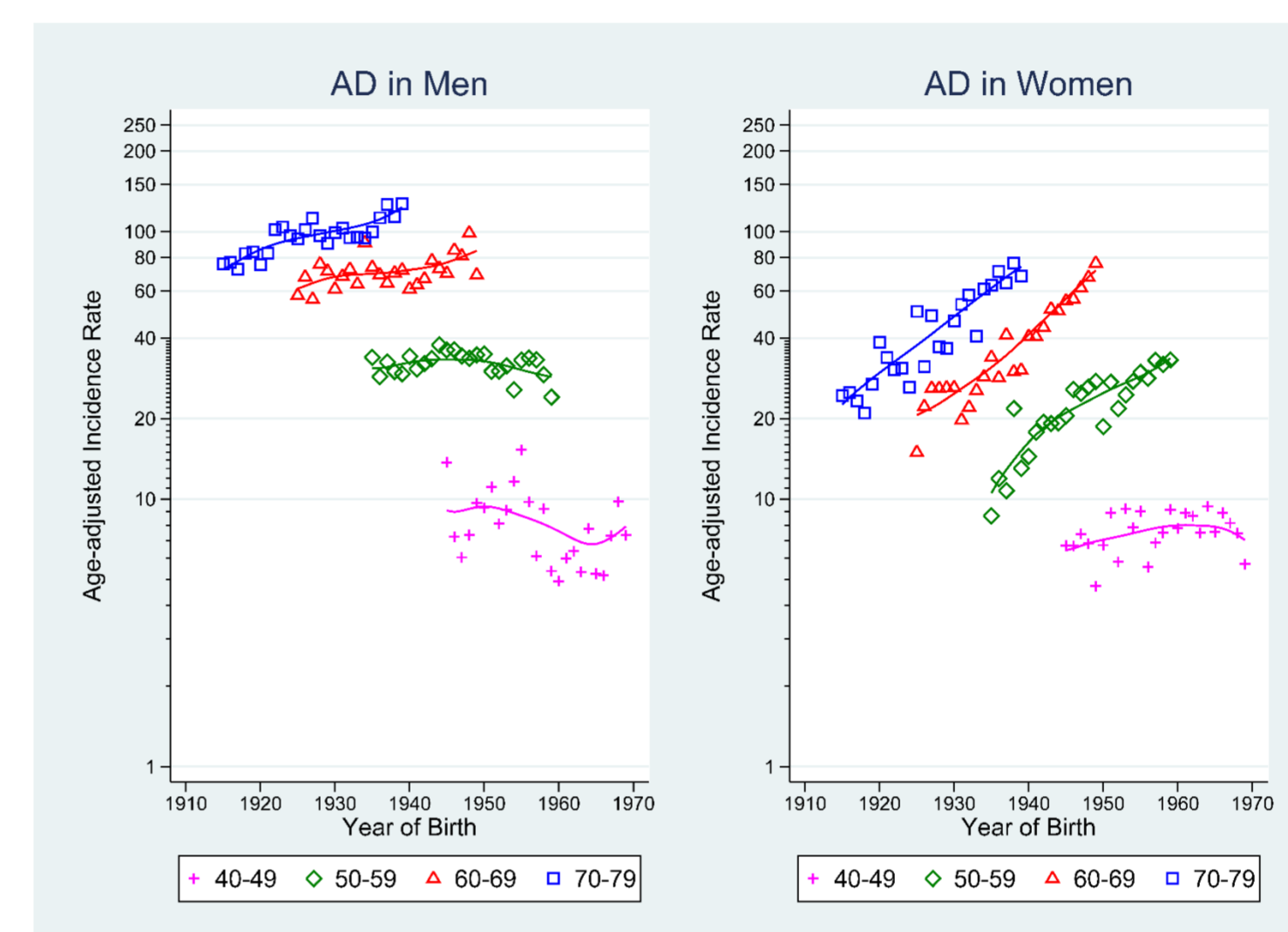► Subtype-specific trends are similar in both language regions (SL, SA).

Age-specific cohort trends of major subtypes
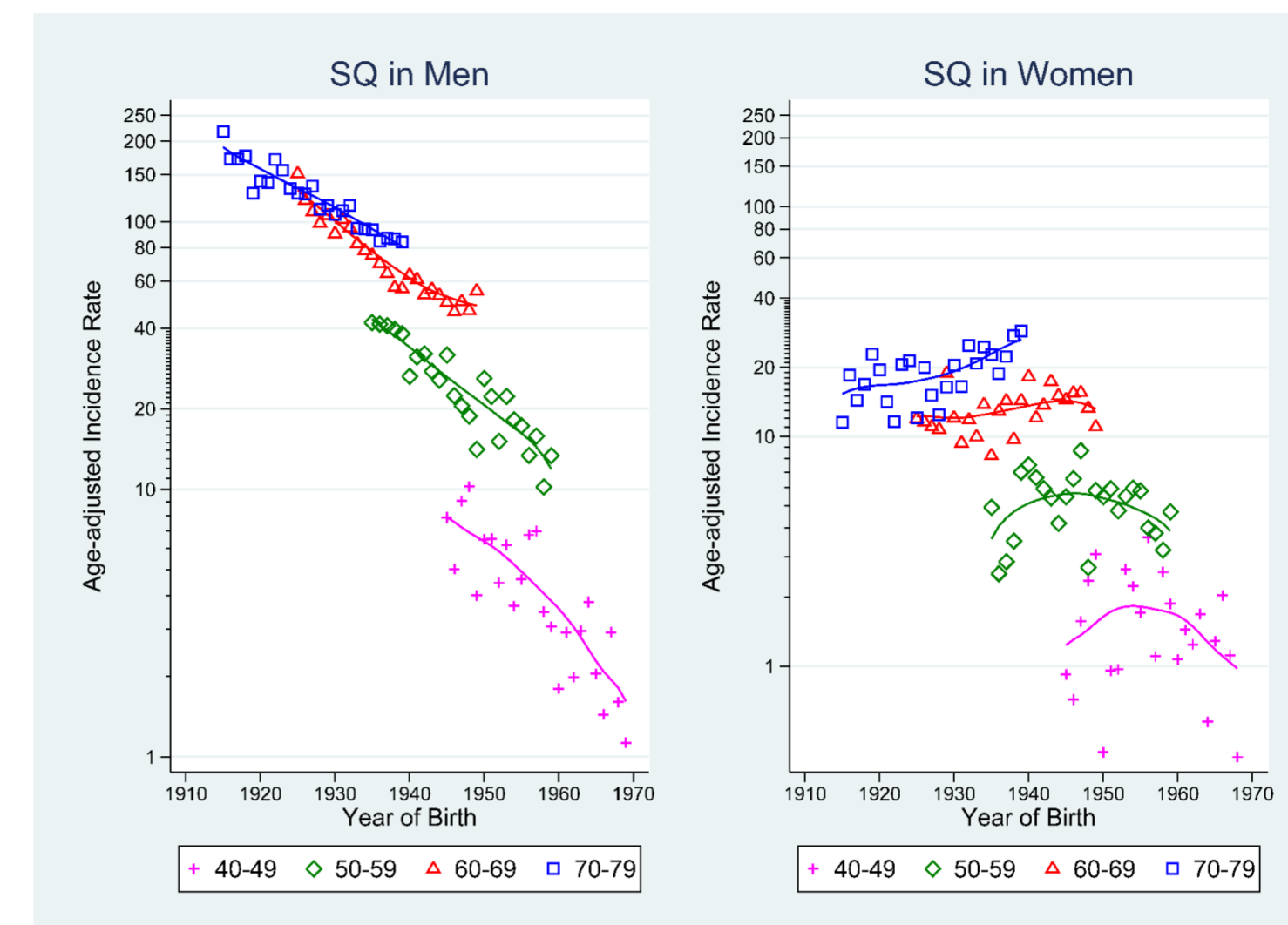
Squamous cell carcinoma:

► Increasingly steep negative trends in subsequent birth cohorts in Men, indicating trend changes for birth cohorts <1915.
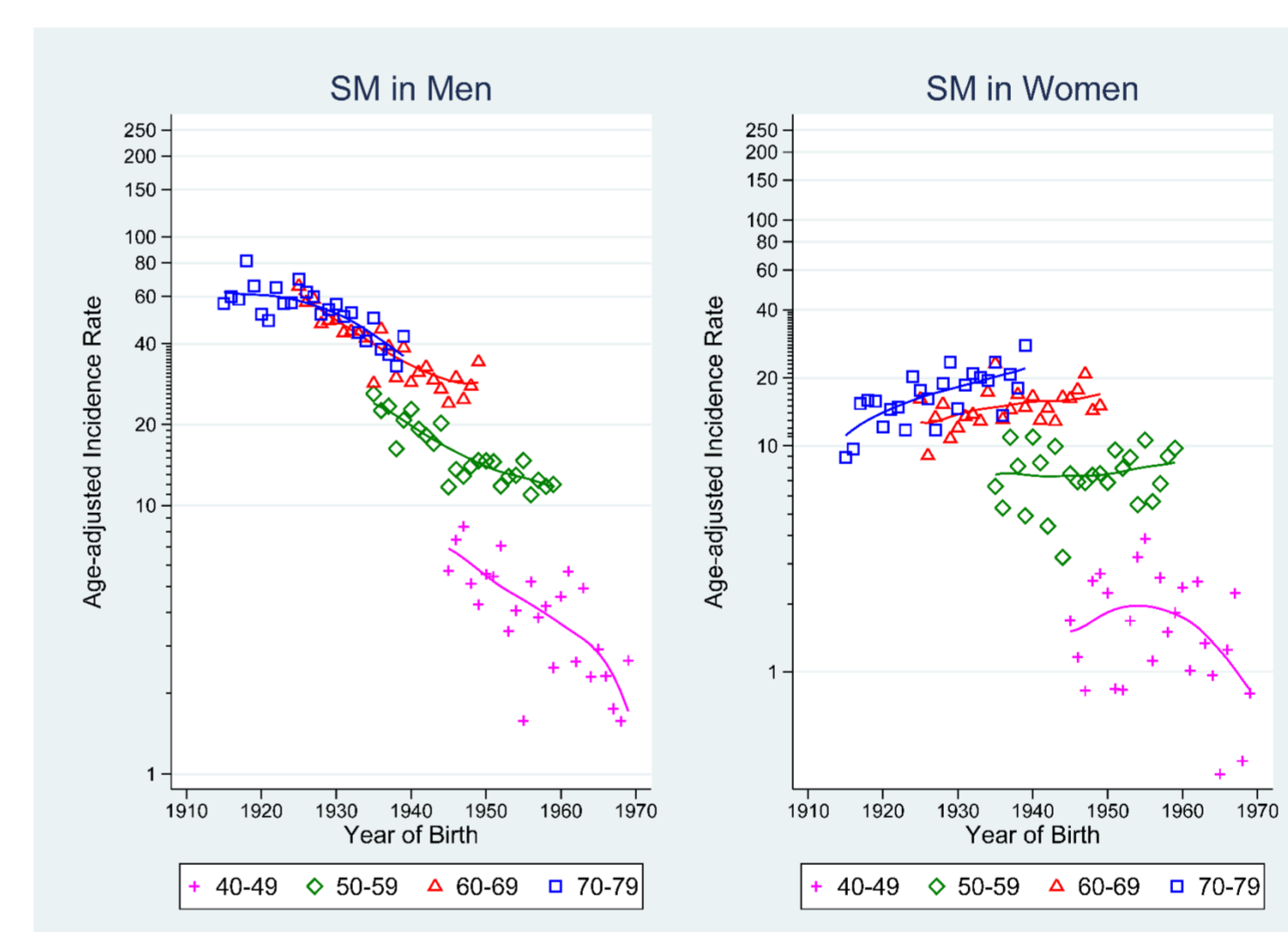
► Indication* of trend change for cohorts of Women born in the 1950s.

Adenocarcinoma:

► Significant trend change for cohorts born in the mid 1940s in Men.

► First indication of plateauing trend for cohorts born in the 1960s in Women.

Small cell carcinoma:

► Significant trend change for cohorts born in the mid 1920s in Men.

► Indication* of trend change for cohorts born in the 1950s in Woman.

* Not statistically significant

Summary

• Men have a complex subtype-specific trend pattern, with mostly negative trends, except for AD. In Women, the AD subtype is predominant and strongly increasing.
• There was a temporal sequence of trend changes by subtype in Men as well as in Women: SQ followed by SM, followed by AD.
• Women seem to recapitulate trend changes observed in Men with about 30 years delay.

Conclusion

• **The national study confirms regional reports [2,3]. It extends previous findings by the novel observation of peak lung cancer risks among Swiss Women associated with the early 1960s birth cohorts. Thus, incidence rates among Women might be expected to start decreasing in the late 2020s.**

Contact

References

1. Joinpoint Regression Program, Version 4.4.0.0 - Jan 2017; Surveillance Research Program, National Cancer Institute.
2. Levi F. et al. Lung Carcinoma Trends by Histologic Type in Vaud and Neuchatêl, Switzerland, 1974-1994. *Cancer* 1997; **79**: 906-914.
3. Oberli L. et al. 31 years of lung cancer in the canton of Zurich, Switzerland: incidence trends by sex, histology and laterality. *Swiss Med Wkly.* 2016; **146**: w14327.

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