

# Diverging trends in breast cancer mortality within Switzerland

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**Background:** Substantial regional heterogeneity in the provision of cancer prevention and management services results from the decentralised Swiss healthcare system.

**Materials and methods:** Breast cancer mortality trends between 1980 and 2002 were compared in two French- and in two German-speaking female populations of Switzerland, aged 55–74 years, characterised by different access to, and use of, mammography screening.

**Results:** Since the early 1990s, a 30% fall was observed in the French-speaking regions of Vaud and Geneva, where mammography screening is widespread, with no decline in the German-speaking areas of Basel and Zurich.

**Conclusion:** Modification in breast cancer diagnosis and management in selected regions of Switzerland is urgently needed.

**Key words:** breast cancer, mortality, Switzerland, treatment, mammography screening

## introduction

Improved treatment and early detection have increased breast cancer survival such that mortality rates previously on the rise have now been declining for about 15 years in most westernised countries [1, 2]. These recent falls have been larger in younger than older women. The relative contribution of screening and better systemic treatment to this downward trend is complex to disentangle [1, 3]. The favourable impact of tamoxifen and other hormonal therapies, ovarian ablation and polychemotherapy has probably been observed earlier [4], but a relevant impact of screening on breast cancer mortality has recently been reported [5, 6]. Thus, mammography use was inversely related to trends in breast cancer mortality in various US states over the period 1985–2000, even after partial correlation allowance for adjuvant therapy use [7].

Breast cancer mortality in the age bracket 55–74 years is of particular interest to appreciate the effect of mammography screening among women aged 50–69 years. Within Switzerland, where breast cancer mortality has, overall, been declining since the early 1990s [8], healthcare delivery is organised at a regional level (Switzerland is a federal state of 23 regions, called cantons). This decentralised system has led to substantial

cantonal differences in the provision of cancer prevention and management services [9].

For instance, according to the 1992–93 Swiss Health Survey, about half of the 50–69-year-old female population of the French-speaking cantons of Vaud and Geneva were regularly covered by mammography screening around 1990. The first Swiss mammography screening programme was launched in Vaud in 1993 for women aged 50–69 [10], while opportunistic screening prevailed in Geneva [11]. In contrast, mammography rates have been lower in German-speaking Switzerland apart from Basel, which experienced a comparable coverage to the Vaud and Geneva cantons [12], and, to date, no organised screening programme exists in German cantons. In this report, we have contrasted breast cancer mortality trends among 55–74-year-olds in the two most populous French-speaking cantons with those in two large German-speaking cantons.

## materials and methods

The numbers of breast cancer deaths were obtained from the Swiss Statistical Office. During the calendar period considered (1980–2002), the change from the eighth to the 10th revision of the International Classification of Diseases (ICD) in Switzerland introduced a spurious fall in cancer death certification. Correction factors were thus developed [13] and applied to the numbers of breast cancer deaths notified before 1995 in order to obtain a comparable definition over time, in agreement with the ICD-10 rules. Correction factors for breast cancers are 2% under age 60, 4% for the 60–69 age group and 10%

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for the 70–79 age group [13]. Our analysis focused on the 55–74 age group. The above age-specific correction factors were applied. Age-standardised rates according to the world standard population were computed.

To enhance comparability across cantons and ensure sufficiently large numbers of deaths, the two largest French-speaking cantons of Switzerland (Geneva, ~220 000 female inhabitants, and Vaud, ~320 000) were contrasted with two of the most populous German cantons (Basel and Zurich, ~220 000 and ~630 000 female residents, respectively). This selection allowed the comparison of four cantons with a University hospital where, at least in principle, state-of-the-art medical treatment should be available.

The estimated annual percentage change (EAPC) of mortality rates and corresponding 95% confidence interval (95% CI) were calculated by fitting a least squares regression to the logarithm of annual rates using calendar year as the explanatory variable.

## results

Table 1 shows age-adjusted (on the world standard population) death rates from breast cancer in the four cantons for the triennial calendar periods 1980–82, 1990–92 and 2000–02. Mortality rates in the 55–74-year-old female population were stable between 1980–82 and 1990–92, except in the canton of Vaud (–12.6%), which, however, started with a higher death rate than the other cantons. Breast cancer mortality fell by approximately 30% in Geneva and Vaud between 1990–92 and 2000–02 [EAPC of –4.1% (95% CI –5.9% to –2.2%) over the 1991–2002 calendar period], but no decrease occurred over the last two decades in the cantons of Basel and Zurich [EAPC of –0.1% (–2.0% to 1.8%) and –1.3% (–3.0% to 0.4%) for the 1980–90 and 1991–2002 periods, respectively].

This diverging trend between Geneva and Vaud on the one hand, and Basel and Zurich on the other hand, is illustrated in Figure 1. The gap in mortality rates between the two regions started in the early 1990s and increased afterwards.

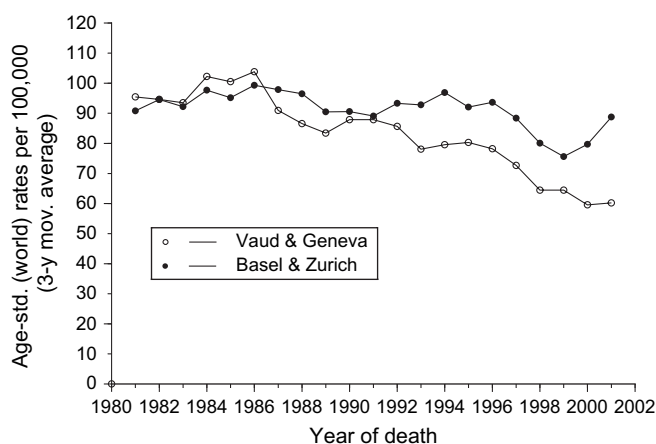
## discussion

This ecological study highlighted the emergence of substantial regional differences in breast cancer mortality among 55–74-year-old Swiss women since the early 1990s. Breast cancer mortality rates were comparable in the cantons of Basel, Geneva, Vaud and Zurich around 1990. Afterwards, a steady decline occurred in the two French-speaking cantons, but not in the two German-speaking ones.

These large differences cannot be ascribed to changes in death certification over time or to differing breast cancer incidence. The 1993–97 world-adjusted incidence rates for women aged 50–69 were 313.1/100 000 (95% CI 297.2–329.0) for Vaud and Geneva cantons combined and 254.2/100 000 (95% CI 243.2–265.1) for those of Basel and Zurich. Of note, no significant difference in incidence rates was observed between these two regions among younger [30–49 age group: 93.9/100 000 (95% CI 86.5–101.2) and 81.9/100 000 (95% CI 76.4–87.4)] and older women [age 70 or over: 346.5/100 000 (95% CI 322.8–370.3) and 322.5/100 000 (95% CI 305.1–339.9)] [14]. The diverging pattern in incidence and mortality is again indicative of a relevant role of mammography in breast cancer rates in these different Swiss populations.

**Table 1.** Corrected age-adjusted (world population) mortality rates from breast cancer in four Swiss cantons per 100 000 women aged 55–74 in 1980–82, 1990–92 and 2000–02, and corresponding changes in rates

Cantons	1980–82	1990–92	2000–02	Percentage change	
				1990–92/ 1980–82	2000–02/ 1990–92
Basel	85.8	86.4	94.0	0.8	8.8
Zurich	92.8	90.1	86.7	–2.9	–3.8
Geneva	90.0	89.8	63.4	–0.2	–29.4
Vaud	98.8	86.4	58.1	–12.6	–32.8



**Figure 1.** Comparison of breast cancer mortality trend among women aged 55–74 in the combined Vaud and Geneva cantons and Basel and Zurich cantons, 1980–2002.

This increasing differential breast cancer mortality in middle-aged women is a public health concern. Expressed in numbers of deaths, this difference amounts to an excess of about 350 deaths in women aged 55–74 in the two cantons of Basel and Zurich since 1991 (about 30 deaths/year). Causes of these diverging trends are likely to be multifactorial and difficult to quantify and disentangle. Differences in attitudes and beliefs of women towards healthcare and particularly early detection, as well as in medical attitude towards mammography and adoption of the most effective therapy regimens exist between these two Swiss communities. In particular, adoption of adjuvant therapies, which had an earlier impact on mortality trends [4], has manifestly occurred earlier in French-speaking regions. The contribution to these diverging trends of the earlier and more widespread adoption of mammography screening in French-speaking Switzerland cannot, therefore, be precisely quantified in this descriptive study. The overall impact of screening may become more discernible within a few years and hence contribute to increase this differential mortality risk. So far, the largest mortality fall was observed in Vaud (about 40% decline over the last two decades), which has the highest self-reported use of mammography screening and the longest-standing organised mammography screening programme in Switzerland [10, 12].

These uncertainties notwithstanding, this descriptive analysis indicates an urgent need to improve breast cancer diagnosis and management in selected regions of Switzerland.

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