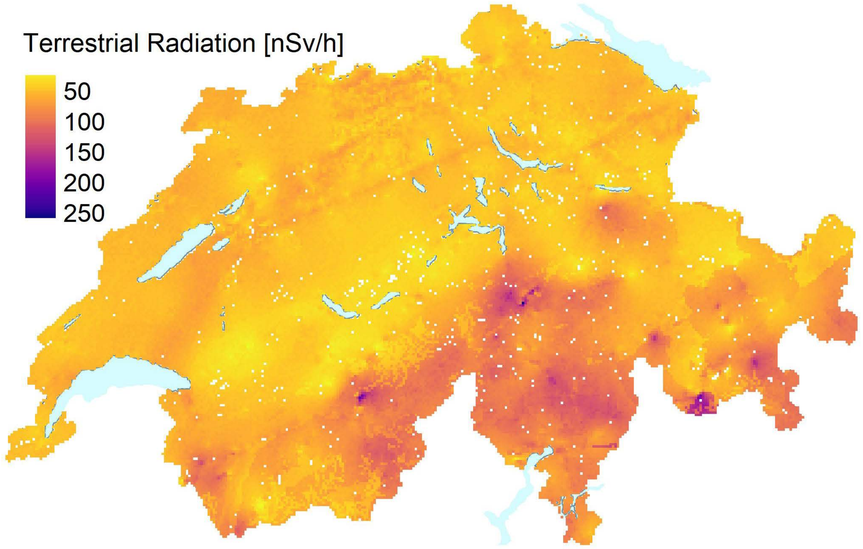
Low-dose Ionizing Radiation and Childhood Cancer - New Results from Switzerland

A. Mazzei-Abba[1], C. Folly[1], C. Kreis[1], R. A. Ammann[2,3], A. Cecile[4], E. Brack[2], M. Egger[1], C. Kühni[1], BD. Spycher[1]. Contact: antonella.mazzeiabba@ispm.unibe.ch

Conclusion: Our study suggests that background radiation increases the risk of childhood cancer, particularly Leukemia and CNS tumors.

1. Background

- The population is exposed to low doses of ionizing radiation from natural sources
- Children are a susceptible population, but health effects from low-dose radiation are unclear



See poster from C.Folly on "Exposure to natural background radiation" for more details on the map

2. Aim

To assess possible associations between childhood cancer risks and exposure to external background radiation

3. Methods

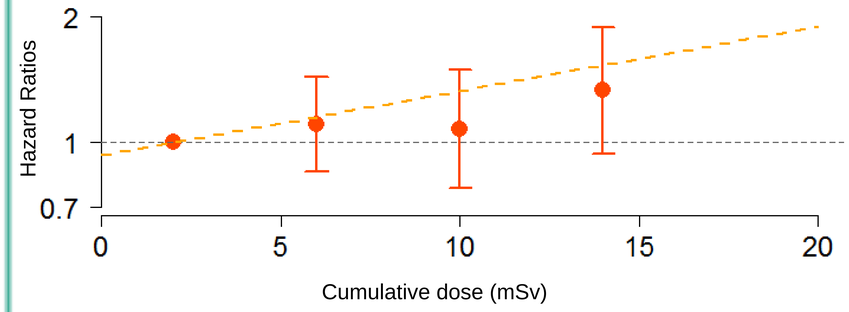
- **Design:** census-based nationwide cohort study (Swiss National Cohort)
- **Follow-up:** 1990-2015
- **Population:** children registered in census 1990, 2000, 2010-2015
- **Cases:** identified by probabilistic linkage with the Swiss Childhood Cancer Registry
- **Exposure**: total dose rate from terrestrial and cosmic radiation and Cs-137 deposition at children's place of residence
- **Confounders**: NO_2, socioeconomic index and degree of urbanization

4. Results

Hazard ratios for childhood cancer per unit increase in cumulative equivalent dose (mSv) of background radiation

Outcome	Cases	HR (95% CI)
All cancers	3055	1.04 (1.02, 1.06)
Leukemia	951	1.04 (1.00, 1.09)
ALL	754	1.03 (0.97, 1.08)
AML	133	1.07 (0.98, 1.17)
Lymphoma	495	1.02 (0.97, 1.07)
CNS	701	1.06 (1.01, 1.11)
Other	908	1.03 (0.99, 1.07)

Hazard ratios for childhood cancer by cumulative doses using a categorized exposure



The reference category is < 4 mSv. The orange line shows the fitted HR with a linear exposure term.

[1] Institute of Social and Preventive Medicine, University of Bern; [2] Division of Pediatric Hematology/Oncology, Inselspital, Bern University Hospital; [3] Kinderaerzte KurWerk, Burgdorf, [4] Onco-hématologie pédiatrique, Centre hospitalier universitaire vaudois

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