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Survival and Prevalence of Cancer in Adolescents and Young Adults (AYAs) in Switzerland: a nationwide study

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Introduction

**Adolescents and young adults
(AYA, aged 15-39y)**

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graph TD; A[Adolescents and young adults (AYA, aged 15-39y)] --> B[AYA cancers];
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AYA cancers

- **Different composition of cancer types and biology** compared to children and older adults [Bleyer et al., 2008]
- **Survival historically lower** than in younger and older patient groups, but **nowadays similar to younger and older patients** (84% in Europe during 2010-2014 [Trama et al., 2024])

Introduction

**Adolescents and young adults
(AYA, aged 15-39y)**

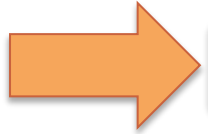
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graph TD; A[Adolescents and young adults (AYA, aged 15-39y)] --> B[AYA survivors of cancer];
```

AYA survivors of cancer

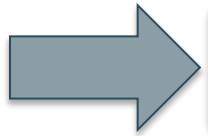
- **Growing population** due to increasing incidence and improved survival [Trama et al., 2018]
- In need of psychosocial support and targeted follow-up care [Fardell et al., 2018]
- No European study has estimated the size of this population

Aims

Study AYA cancer epidemiology in Switzerland



Survival by age, sex and cancer type



Prevalence of having a previous diagnosis of cancer among the AYA population

Using all available **cancer registry data**

Methods

Target population

AYAs residing in Switzerland
during 1980-2019

Data sources

- cancers at age 0-19y:
Swiss Childhood
Cancer Registry
- cancers at age 20-39y:
National Agency for
Cancer Registration

Cancer classification

By Barr et al. (2020)
specific for AYA cancers

Exclusion criteria

- In situ cancers
- Non-melanotic skin
(ICD-10 C44)
- Death certificate only
(DCO)

Vital status follow-up

Until
December 31, 2019

Methods

Net survival

Estimator:

- Pohar Perme et al. (2012)

Trends:

- cohort monitoring for early periods
- period monitoring otherwise
[Brenner & Gefeller, 1996]

Prevalence

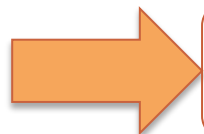
Step 1 – Count number of observed prevalent persons

Step 2 – Impute unknown vital status at index date
[Royston and Parmar, 2002]

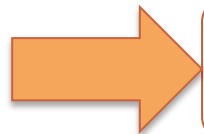
Step 3 – Weight counts according to cancer registry coverage

Step 4 – Calculate prevalence proportions

Conclusions – Net survival



Survival increased for almost all cancers during 1995-2019



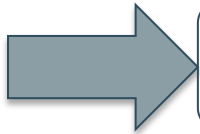
Net survival high for most frequent cancers



Lower for lung and stomach carcinomas

Conclusions – Prevalence

In Switzerland on December 31, 2019:



Prevalence increased over time and is higher for older AYAs

Thank you!

UNIVERSITÄT
LUZERN



Schweizerische Eidgenossenschaft
Confédération suisse
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u^b UNIVERSITÄT
BERN

Eidgenössisches Departement des Innern EDI
Bundesamt für Statistik BFS



Nationale Krebsregistrierungsstelle
Organe national d'enregistrement du cancer
Servizio nazionale di registrazione dei tumori
National Agency for Cancer Registration



Kinderkrebsregister
Registre du cancer de l'enfant
Registro dei tumori pediatrici
Childhood Cancer Registry

Funding

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- Krebsliga Zentralschweiz Switzerland
- Avenira Stiftung Switzerland



krebsliga

Avenira Stiftung

**PALATIN
STIFTUNG**



krebsliga zentralschweiz

References

- Bleyer A, Barr R, Hayes-Lattin B, et al. The distinctive biology of cancer in adolescents and young adults. *Nat Rev Cancer*. 2008;8(4):288-298. doi:[10.1038/nrc2349](https://doi.org/10.1038/nrc2349)
- Trama A, Botta L, Stiller C, et al. Survival of European adolescents and young adults diagnosed with cancer in 2010–2014. *European Journal of Cancer*. 2024;202:113558. doi:[10.1016/j.ejca.2024.113558](https://doi.org/10.1016/j.ejca.2024.113558)
- Trama A, Botta L, Steliarova-Foucher E. Cancer Burden in Adolescents and Young Adults: A Review of Epidemiological Evidence. *Cancer J*. 2018;24(6):256-266. doi:[10.1097/PPO.0000000000000346](https://doi.org/10.1097/PPO.0000000000000346)
- Fardell JE, Patterson P, Wakefield CE, et al. A Narrative Review of Models of Care for Adolescents and Young Adults with Cancer: Barriers and Recommendations. *Journal of Adolescent and Young Adult Oncology*. 2018;7(2):148-152. doi:[10.1089/jayao.2017.0100](https://doi.org/10.1089/jayao.2017.0100)
- Barr RD, Ries LAG, Trama A, et al. A system for classifying cancers diagnosed in adolescents and young adults. *Cancer*. 2020;126(21):4634-4659. doi:[10.1002/cncr.33041](https://doi.org/10.1002/cncr.33041)
- Perme MP, Stare J, Estève J. On Estimation in Relative Survival. *Biometrics*. 2012;68(1):113-120. doi:[10.1111/j.1541-0420.2011.01640.x](https://doi.org/10.1111/j.1541-0420.2011.01640.x)
- Brenner H, Gefeller O. An alternative approach to monitoring cancer patient survival. *Cancer*. 1996;78(9):2004-2010.
- Royston P, Parmar MKB. Flexible parametric proportional-hazards and proportional-odds models for censored survival data, with application to prognostic modelling and estimation of treatment effects. *Stat Med*. 2002;21(15):2175-2197. doi:[10.1002/sim.1203](https://doi.org/10.1002/sim.1203)