WAITING PERIOD FROM DIAGNOSIS FOR MORTGAGE INSURANCE ISSUED TO CANCER SURVIVORS

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Introduction

- In 2016, "*le droit à l'oubli*" was adopted in France
- Belgium followed in 2019
    - In Belgium, patients must still declare it but insurers cannot take it into consideration ($\neq$ France)

- Some questions remain:
    1. The thresholds of 10 and 5 years are arbitrary and does not reflect survival of the diseased persons
    2. Some ambiguity about what is considered as treatment
       $\rightarrow$ what marks the end of a therapeutic protocol?
       $\rightarrow$ when the patient will start to benefit from this right?
    3. This right is binary and not flexible
- As in France, Belgium also started to reduce the periods but we are much less advanced in this effort

- Reproduce results obtained in France on Belgian data
  - In particular, demonstrate that survivors can access life insurances at standard rates
  - With melanoma and thyroid as examples
  - Apply the methodology to other types of insurance products?
- Promote a **waiting period starting at diagnosis** rather than at the end of the therapeutic protocol
  - → avoid disputes in case of death
  - → less uncertainty from patient's side

Data

- Data from the Belgian Cancer Registry (BCR)
- Melanoma and thyroid cancers as illustrations (many cases before the age of 40 and relatively high survival rate)
- Other cancer sites left for future research?
- 19,848 melanoma and 9,146 thyroid cases
- Diagnosed between 2004 and 2016, follow-up until July 2018
- Belgian population life tables obtained from Statbel (the Belgian statistical office) for mortality in the general population

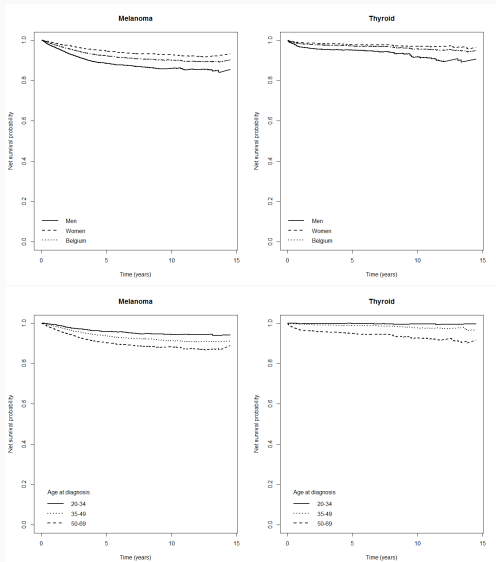# Methods

From biostatistics:

- Estimation of the survival of cancer patients
    - Overall survival
    - Relative survival
    - Proportional excess hazards
    - Flexible parametric model
    - Cure models
- Time-to-cure: time after which a patient still alive is considered as cured (Boussari et al., 2018)

From actuarial sciences:

- Application to mortgage insurance
- Premium rates for cancer patients are computed from excess mortality, and according to time elapsed since diagnosis
- We determine the length of the waiting period as the time needed to get back to standard premium rates (based on Belgian regulatory life tables commonly used by insurers)
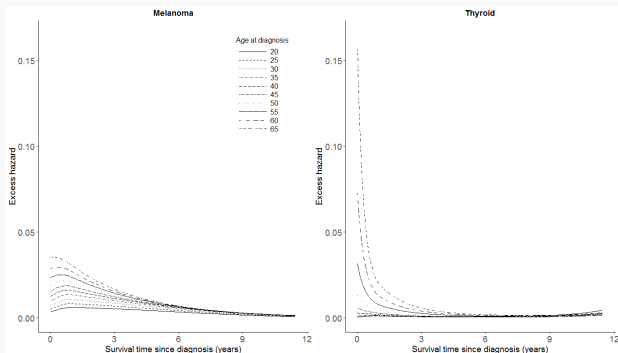
Results

Relative survival

Flexible paramatric model

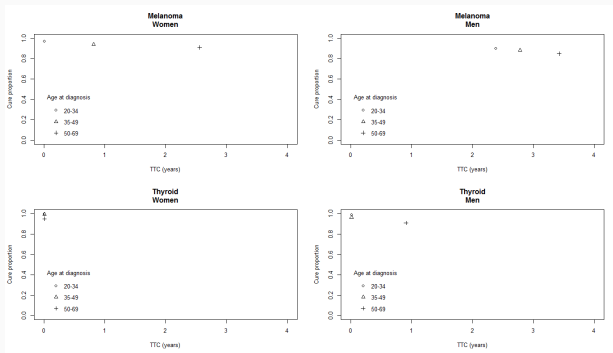Excess hazard estimated with a non-linear and non-proportional hazard model:

⇒ Excess mortality hazard:

- increases with age at diagnosis
- decreases with time since diagnosis

Cure proportion vs. time-to-cure (shortest time from which the
probability of being cured ≥ 0.95):

$\Rightarrow$ Favorable outcomes for:

- women with melanoma cancer aged 20-49
- all thyroid cancer patients

- All results are similar to the ones obtained with French data
- Remember that we took the date of diagnosis as the starting date
- We now determine the length of such a waiting period as the time needed to get back to standard premium rates
  - Where standard rates are based on 3 different life tables commonly used on the Belgian market, which have 3 different levels of conservatism
- How do we know it is back to standard rates?
  - Thanks to the expected present value (EPV)—which is the current value of a future sum of money or stream of cash flows

EPV of a life insurance contracted by a 30 and 50-year-old cancer patient for a period of 20 years with interest of 1% and benefit of 100,000:
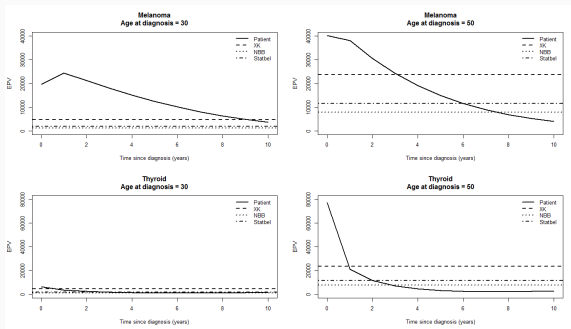
$\Rightarrow$ Back to standard premiums (XK level) after:

- 1 year after diagnosis for thyroid cancer patients
- 3 years for 50-year-old patients; 9 years for 30-yo patients

11

Conclusion

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- Results are in line with the reduced waiting period specified in the AERAS convention and Belgian legislation
- However, all analyzes here are based on the time since diagnosis instead of the end of the therapeutic protocol
    - ⇒ More favorable for patients (less uncertainty, in particular as treatment durations are heterogeneous, unpredictable and at risk of relapse)
- Moreover, the right to be forgotten is no longer a binary decision
- To ensure that the coverage cost of cancer patients remains acceptable for the insurance industry, further constrains could be imposed in terms of sum insured

Future research

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Again using tools from biostatistics such as:

1. number of years of life lost due to cancer (YLL_C), with and without a waiting period
2. disability-adjusted life year (*DALY*)
3. multi-states model (*MSM*)

we would like to show how they can be used to re-think the access of cancer patients to assurance products, with a focus on financial contracts with finite horizon:

- **loan**: small YLL_C = limited losses for insurers and market can absorb the extra mortality due to cancer
- **life annuity**: due to their reduced lifetime, cancer patients may be eligible for reduced premiums when buying insurance products including benefits in case of survival

Thank you!
Questions?