



The burden of cancer in adolescents and young adults worldwide

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Introduction

- Cancer is an uncommon diagnose in adolescents and young adults (AYA) aged 15-24 years. Alston et all British Journal of Cancer 2007; 96: 1760-1766
- Increasing incidence rates for that specific age group is been described.
Bleyer et all. Journal of adolescent health 1997;21:366-73
- In the USA, it represents the fourth most common cause of death in that age group, accounting for 5.23% of all deaths.
Centers for Disease Control and Prevention National Center for health statistics National Vital Statistics Report march 7 2005 at: <http://www.cdc.gov/nchs/deaths.htm>
- At the global level, the number of AYA is increasing at an all time high of nearly 1.2 billion, not expected to decline before 2050.
United Nations expert group meeting on social and economic implications of changing population age structure. The diversity of changing population age structures in the world. August 2005

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- Cancer incidence patterns among adolescents and young adults are distinctive.
- In these age groups, a transition from predominantly pediatric histological subtypes to adult subtypes was observed for Hodgkin's disease, leukemia, ovarian cancer, and soft tissue sarcoma.
- Gender differences were found for Hodgkin's disease, melanoma of the skin, and thyroid cancer.

Cancer incidence in adolescents and young adults in the United States, 1992-1997. Wu XC, Chen VW, Steele B, Roffers S, Klotz JB, Correa CN, Carozza SE. J Adolesc Health. 2003 Jun;32(6):405-15

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Diagnostic group

- 1. LEUKEMIAS
- 2. LYMPHOMAS
- 3. CNS AND OTHER INTRACRANIAL AND INTRASPINAL NEOPLASMS (tumors with any behavior code were included)
- 4. OSSEOUS AND CHONDROMATOUS NEOPLASMS, EWING TUMOR, AND OTHER NEOPLASMS OF BONE
- 5. SOFT TISSUE SARCOMAS
- 6. GERM CELL AND TROPHOBLASTIC NEOPLASMS
- 7. MELANOMA AND SKIN CARCINOMAS
- 8. CARCINOMAS
- 9. MISCELLANEOUS SPECIFIED NEOPLASMS, NEC
- 10. UNSPECIFIED MALIGNANT NEOPLASMS, NEC

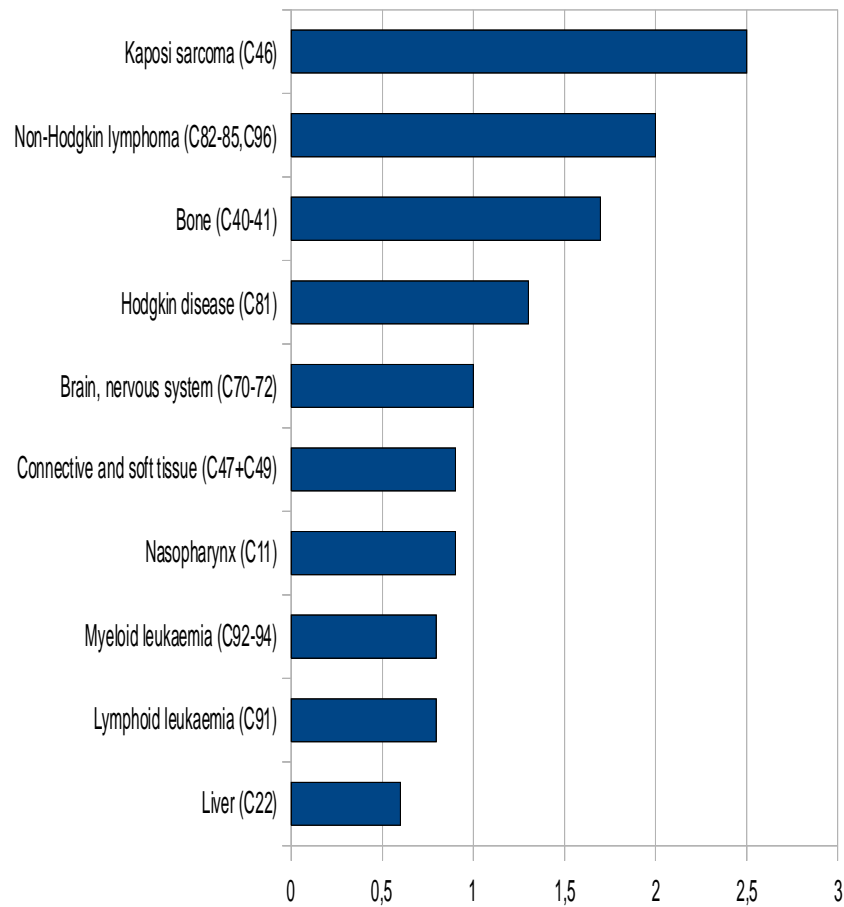
Classification schemes for tumors diagnosed in adolescents and young adults.
Barr RD, Holowaty EJ, Birch JM. Cancer. 2006 Apr 1;106(7):1425-30

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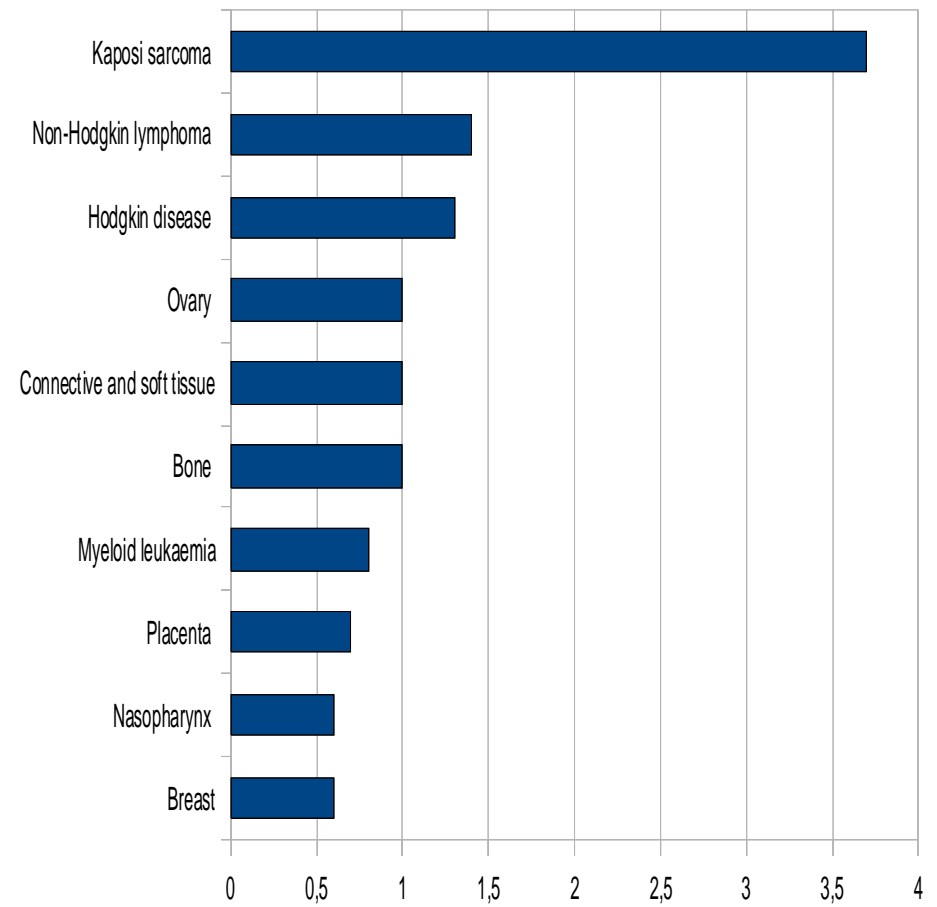
- The aim is to report the ten most common cancer diagnoses AYA aged 15 to 24 years by gender in all five continents in the period between 1998 to 2002 from cancer incidence in five continents volume IX.
- This data base has the codes based on conversion of ICDO3 and ICD10 base doesn't follow the classification proposed by Holowaty EJ, Birch JM which includes benign tumors of brain and osseous.

Africa 15-24 years

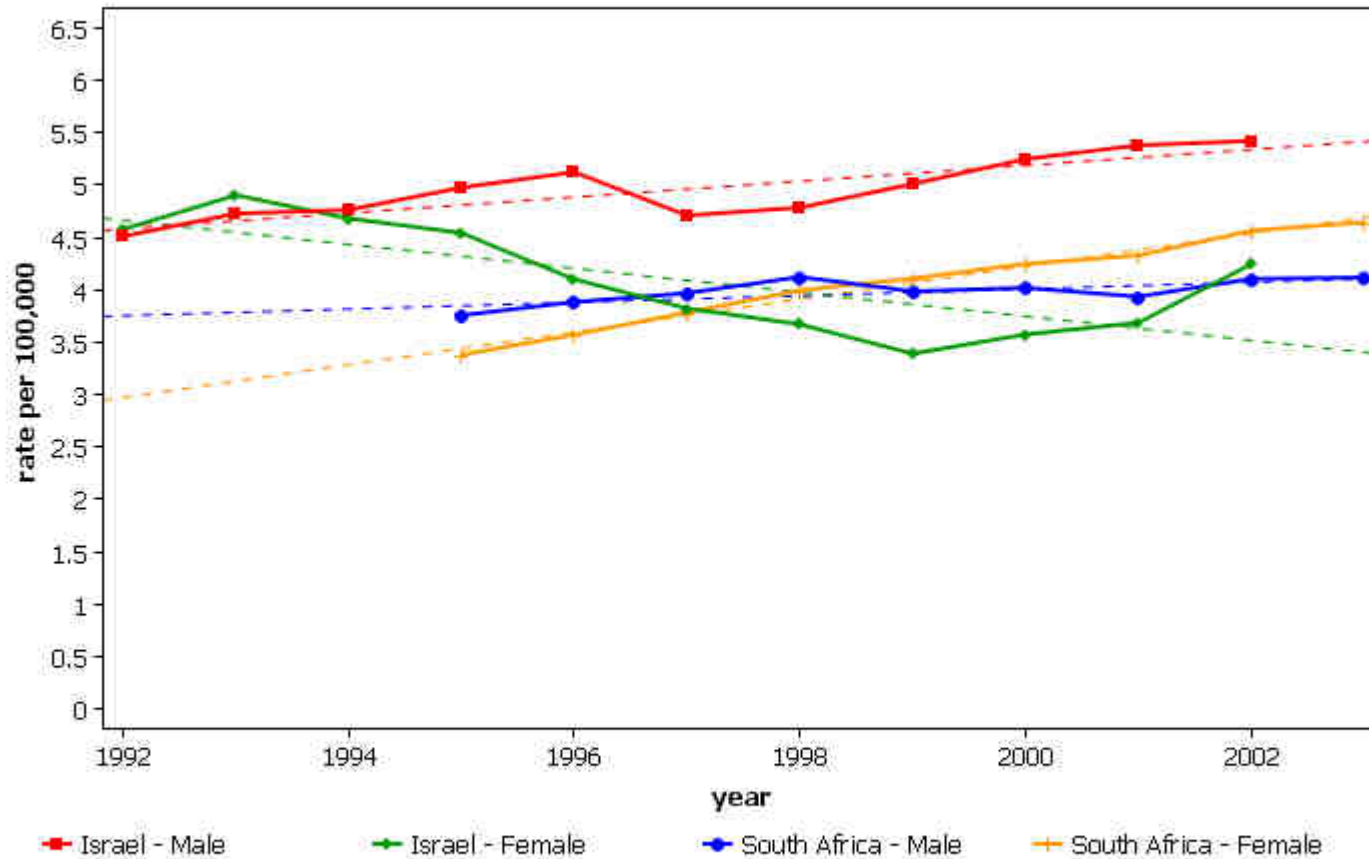
- (a) Males



- (b) Females



Mortality from All cancers but lung Age-standardized rate (World), age (15-24)



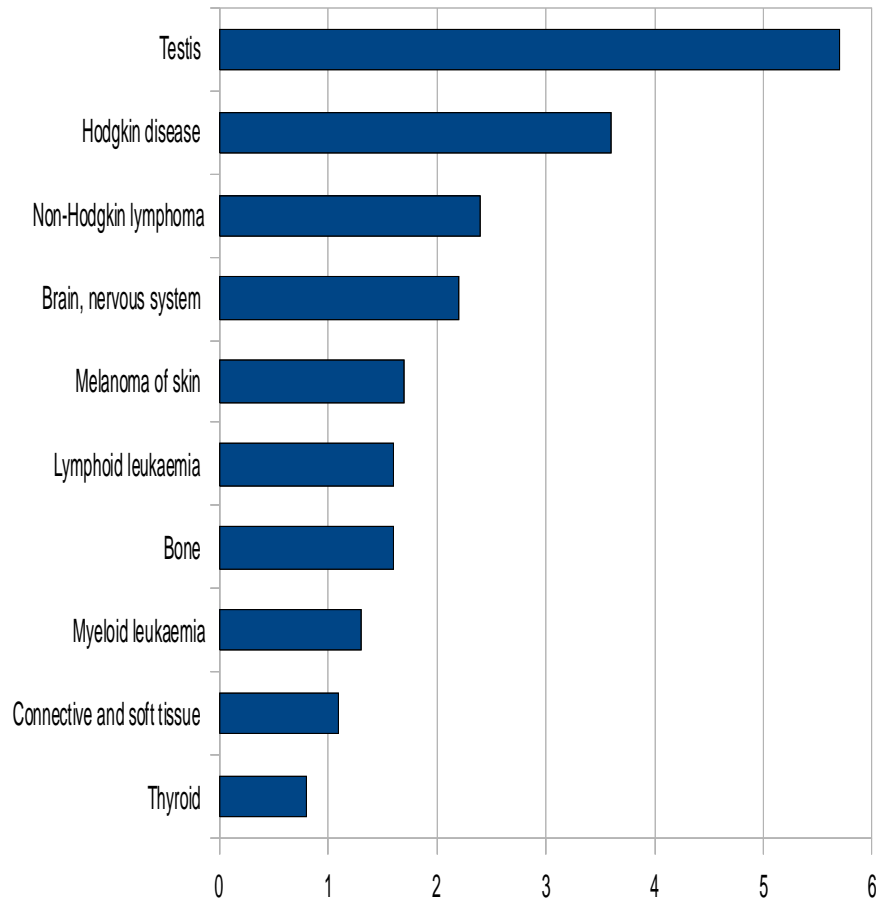
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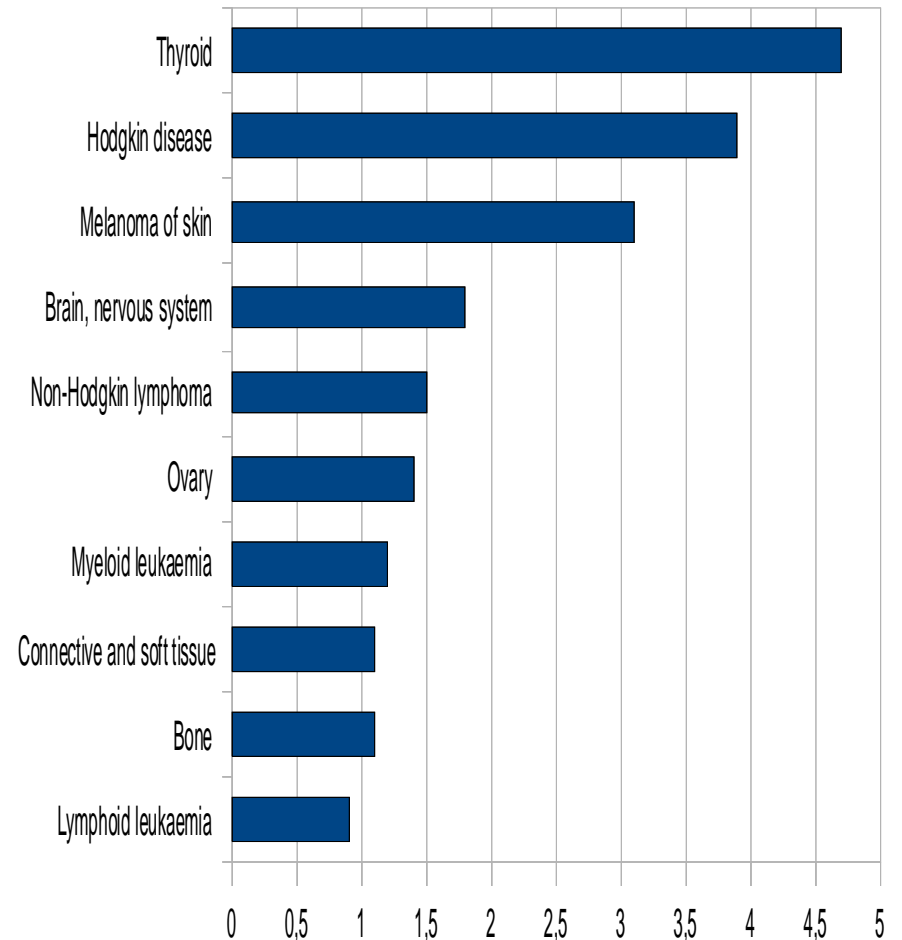


North America 15-24 years

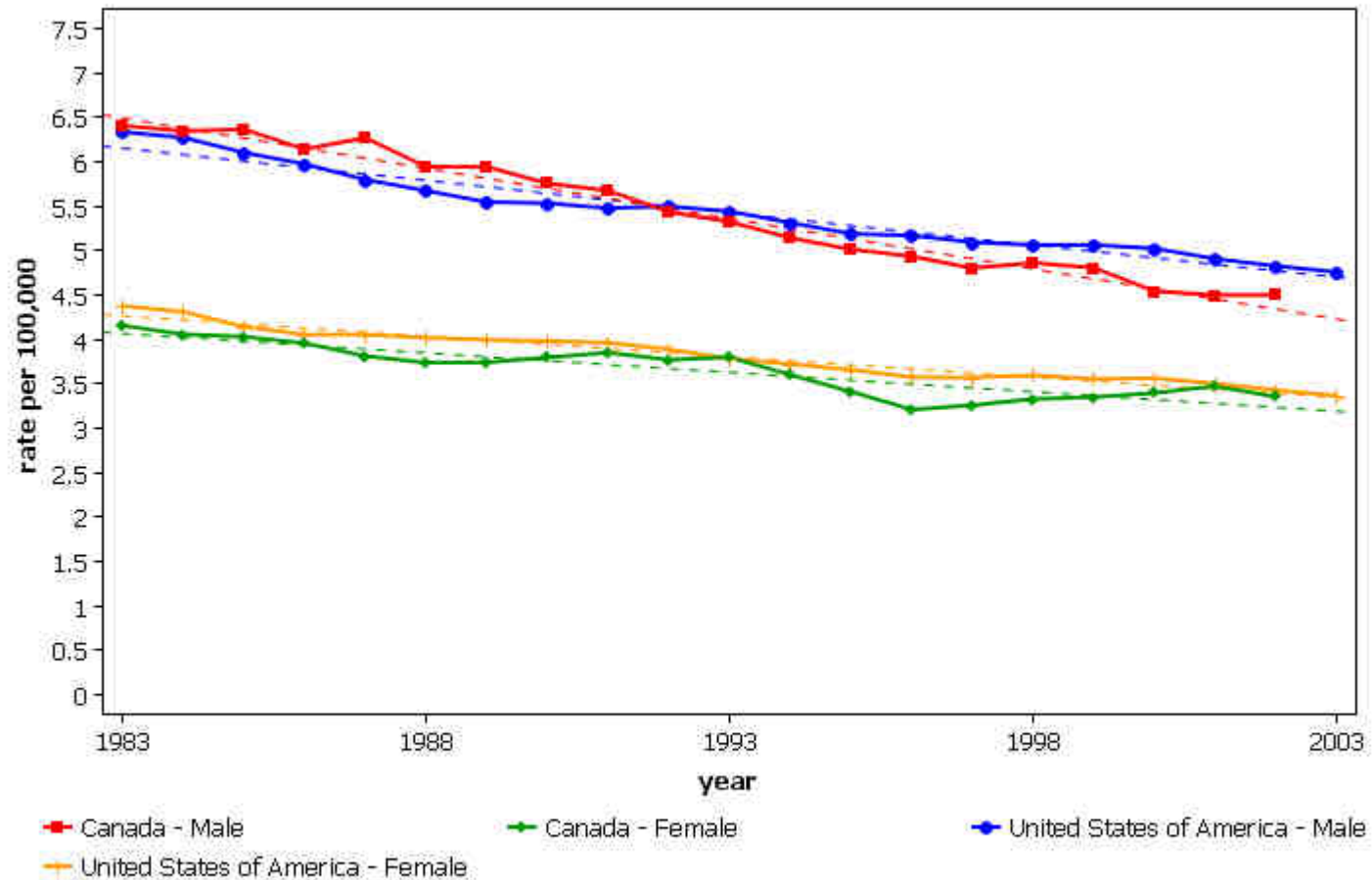
- (a) Males



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Mortality from All cancers but lung Age-standardized rate (World), age (15-24)



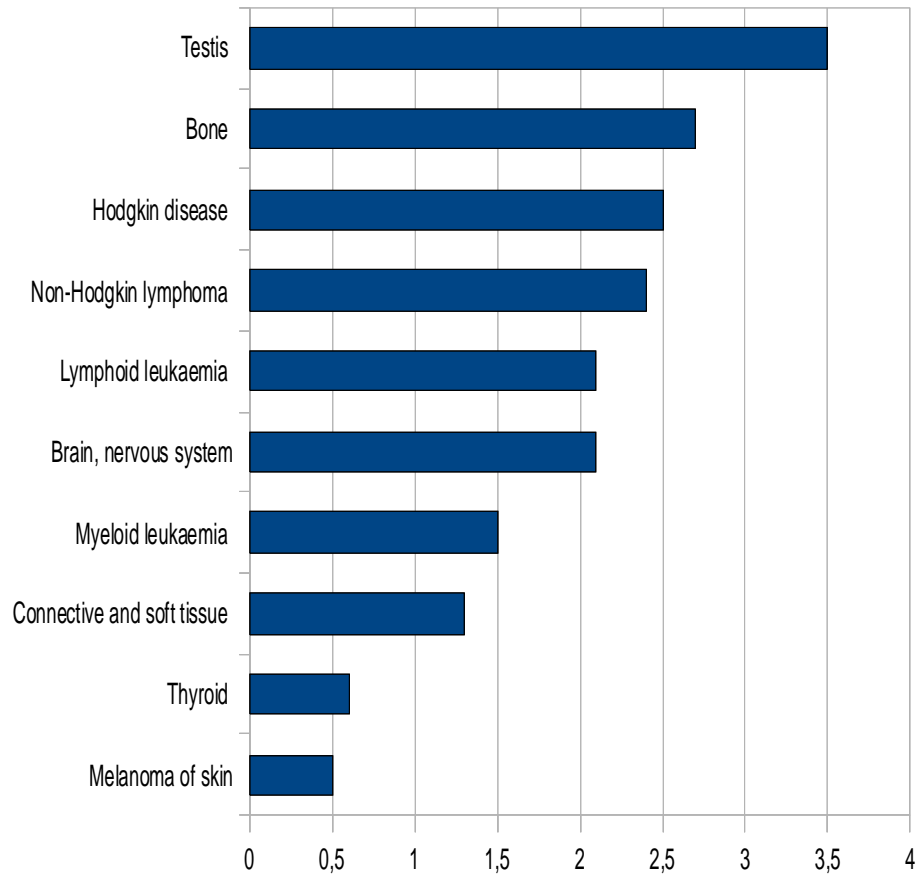
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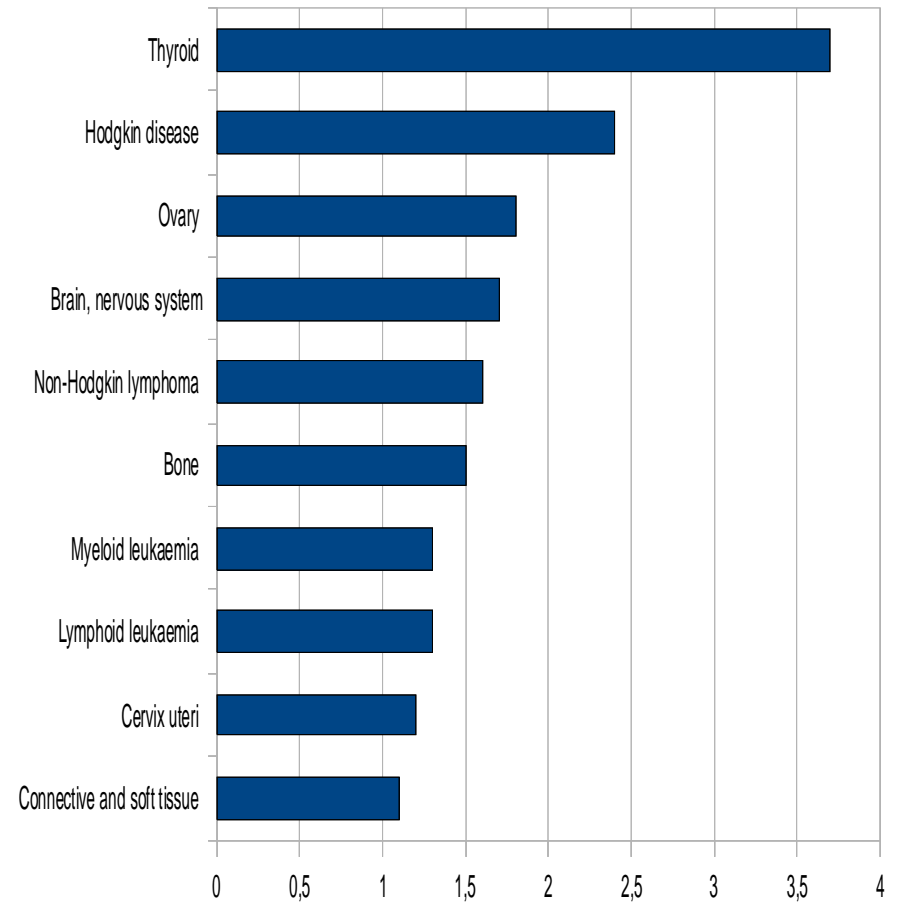


South America 15-24 years

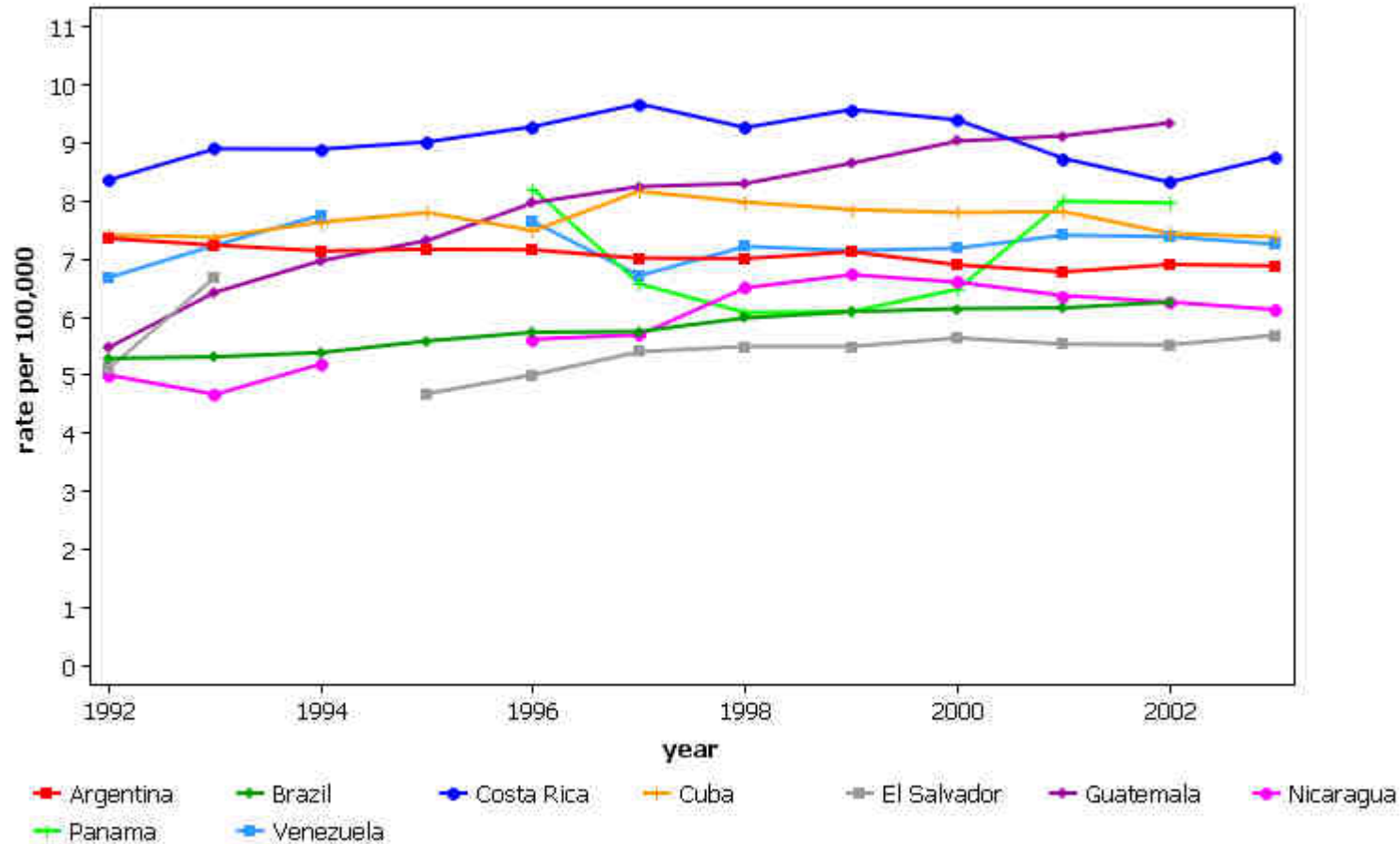
- (a) Males



- (b) Females



Mortality from All cancers but lung Age-standardized rate (World), Male, age (15-24)

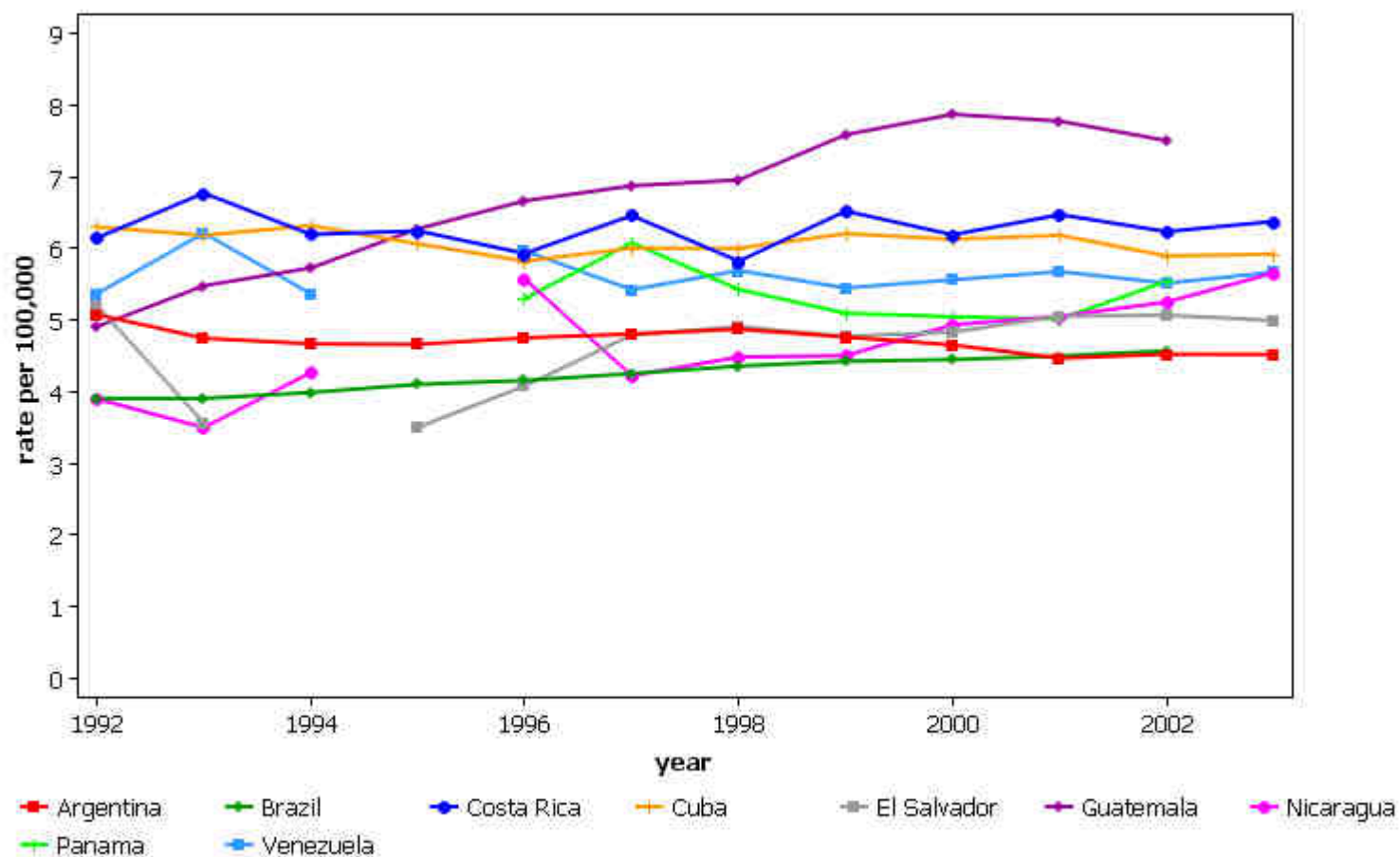


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Mortality from All cancers but lung Age-standardized rate (World), Female, age (15-24)



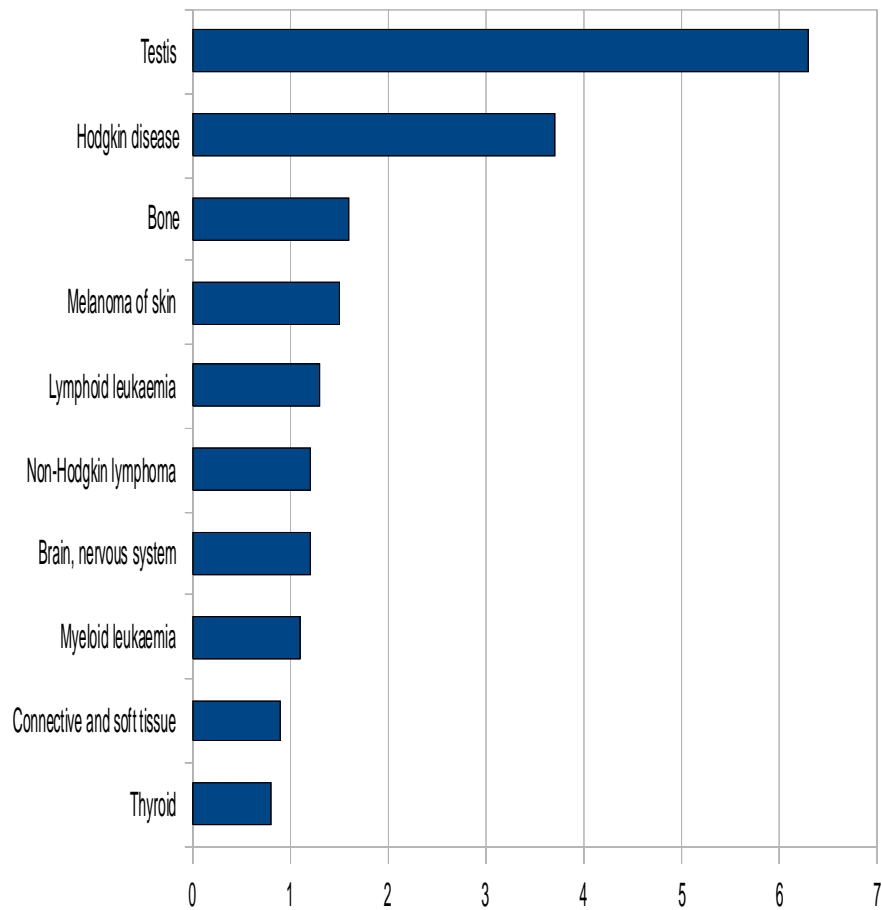
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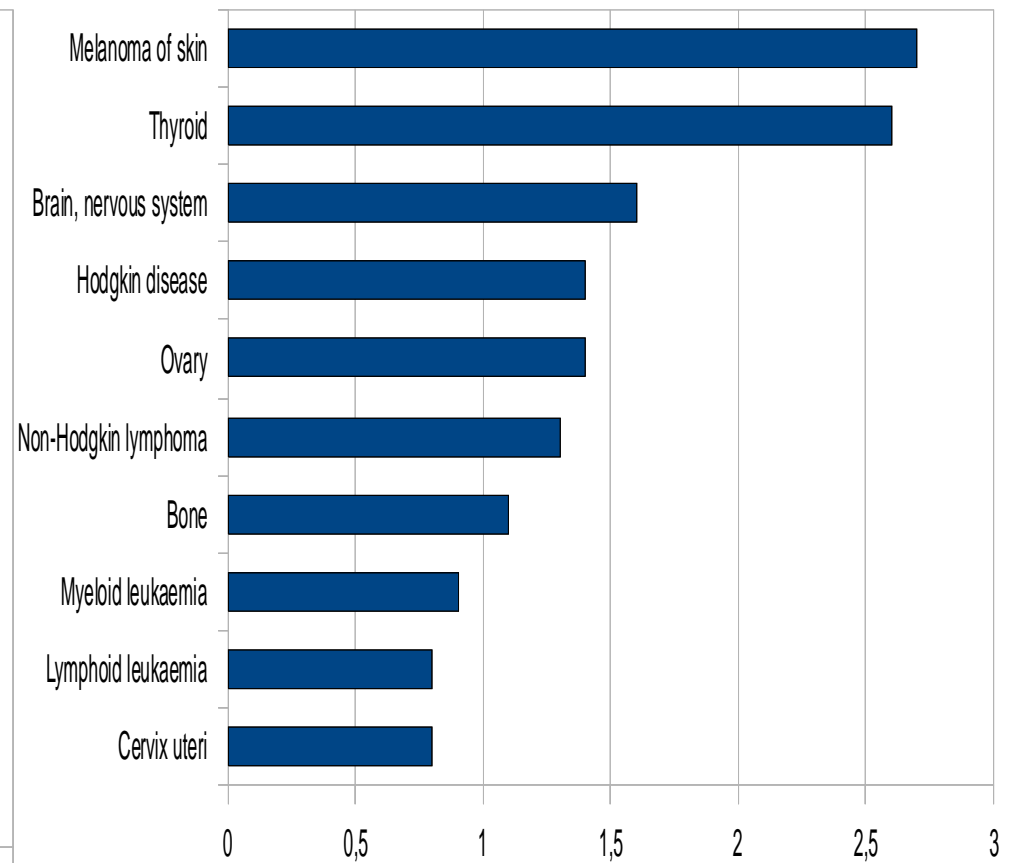


Europe 15-24 years

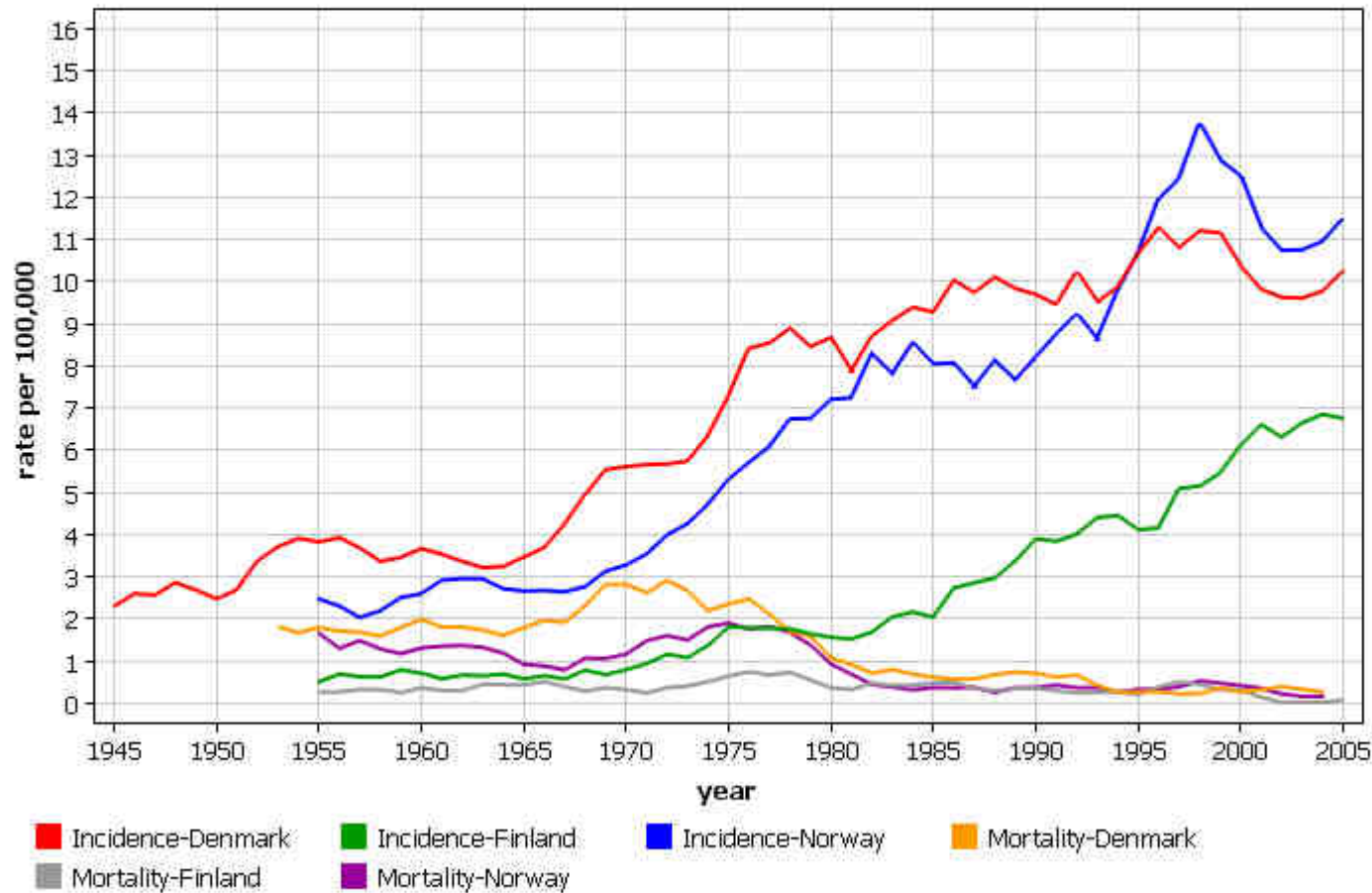
• (a) Males



(b) Females

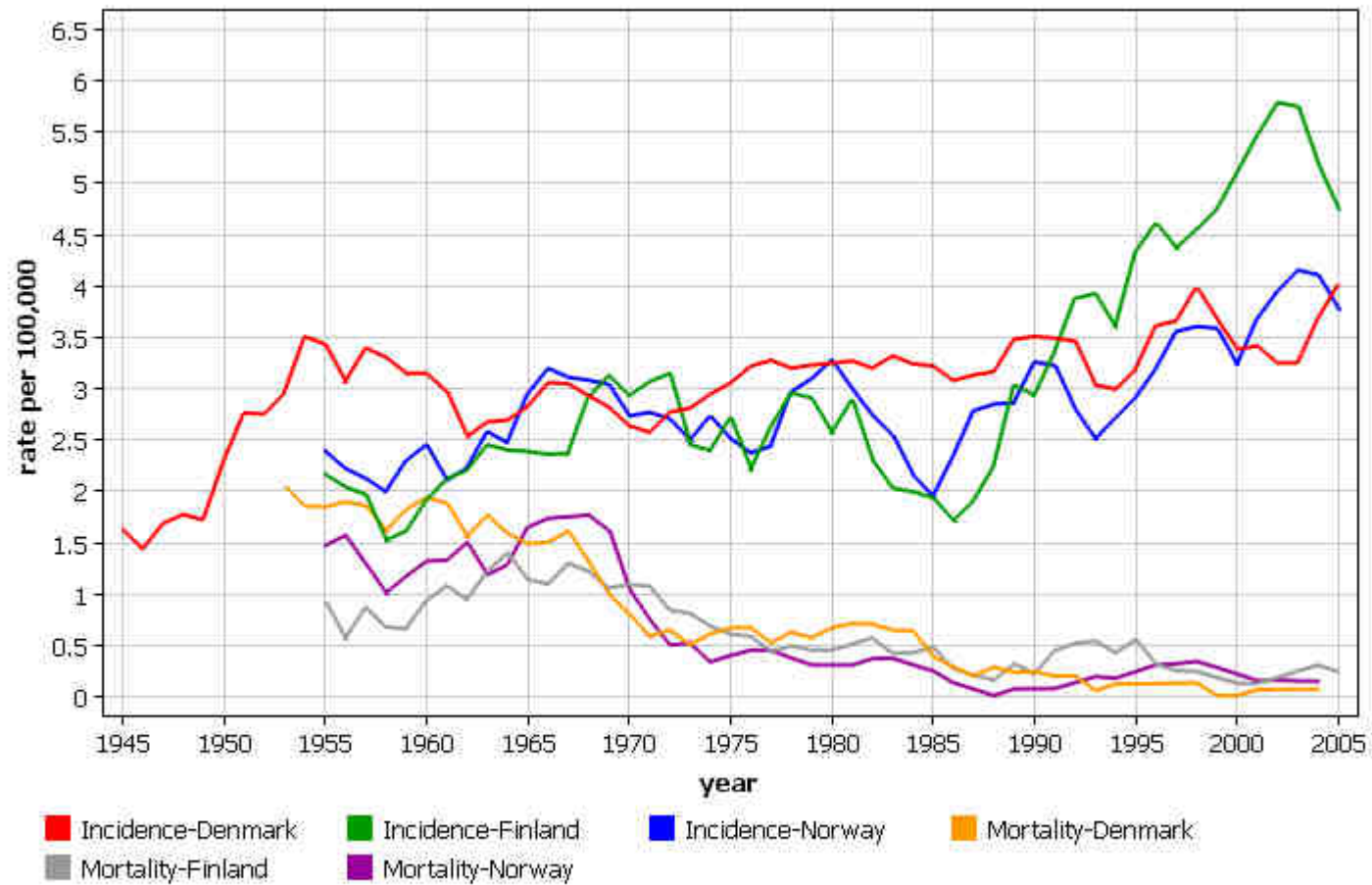


Testis ASR (World) age (15-24)



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Hodgkin lymphoma ASR (World), Male age (15-24)

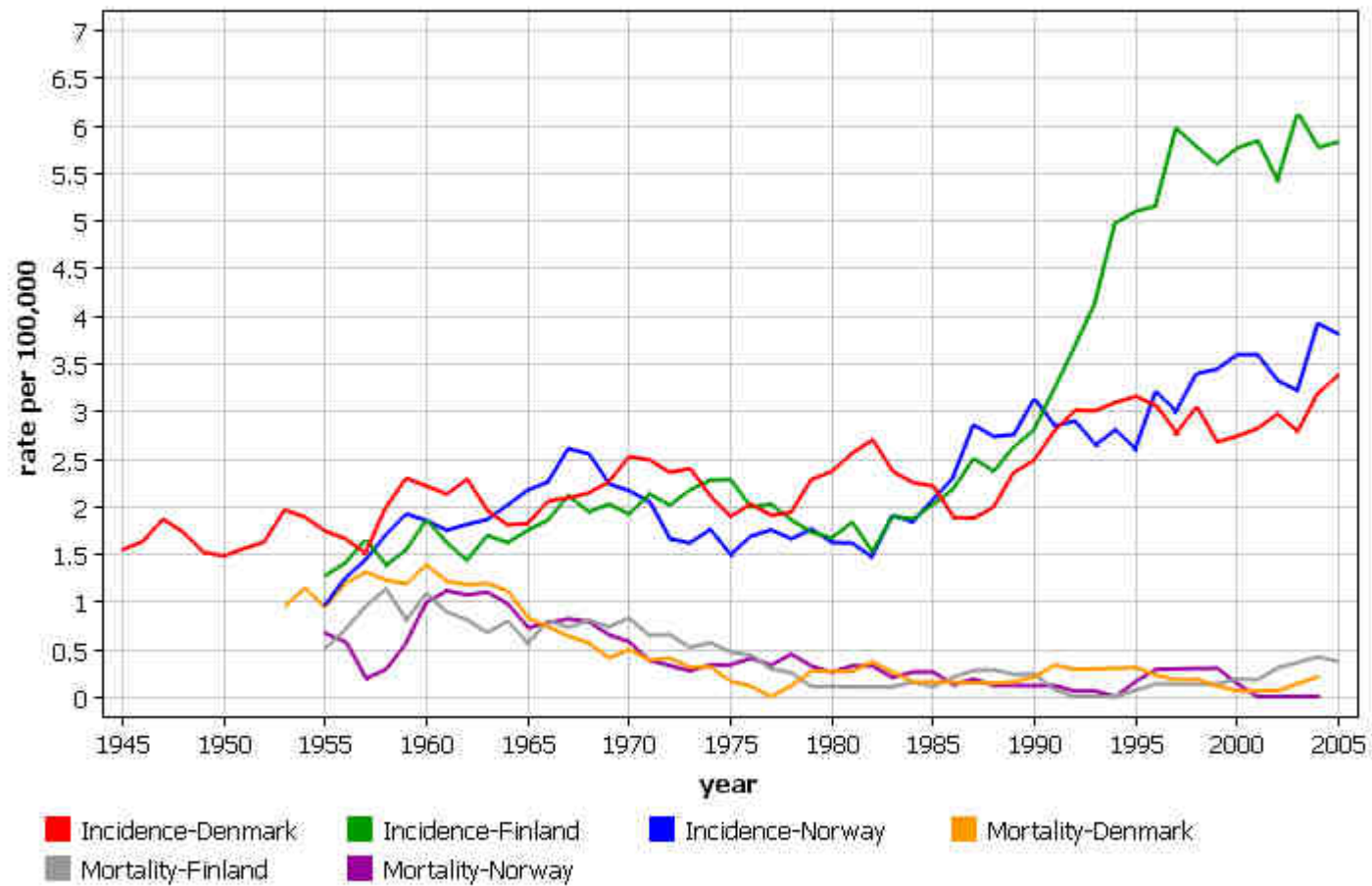


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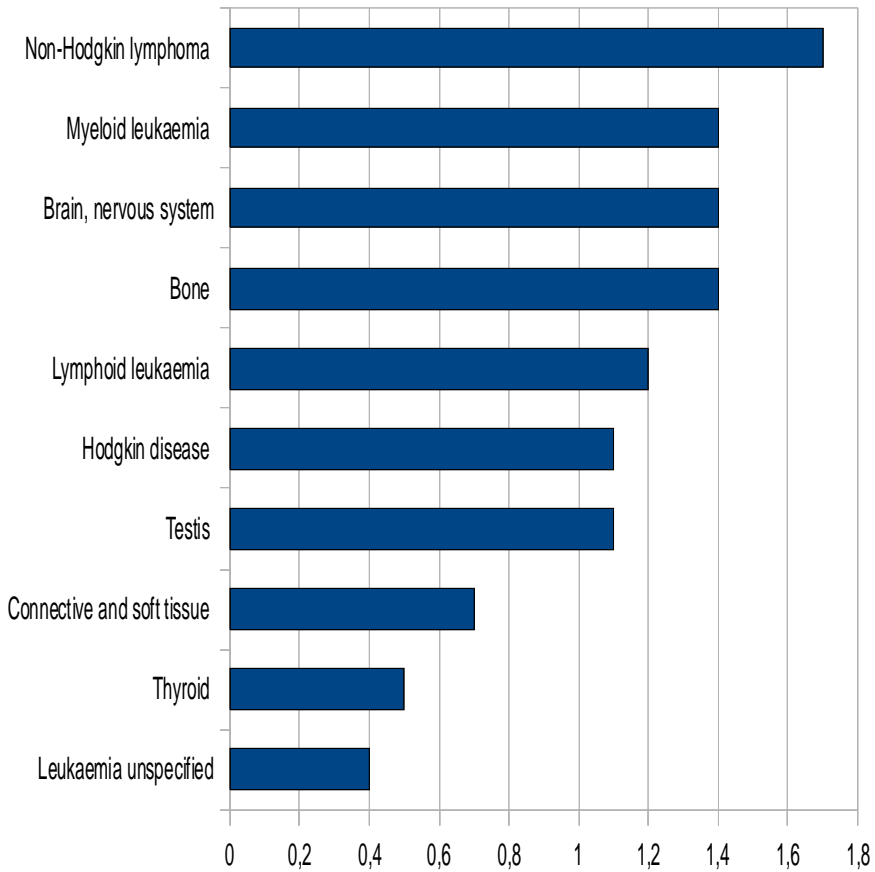
Hodgkin lymphoma ASR (World), Female age (15-24)



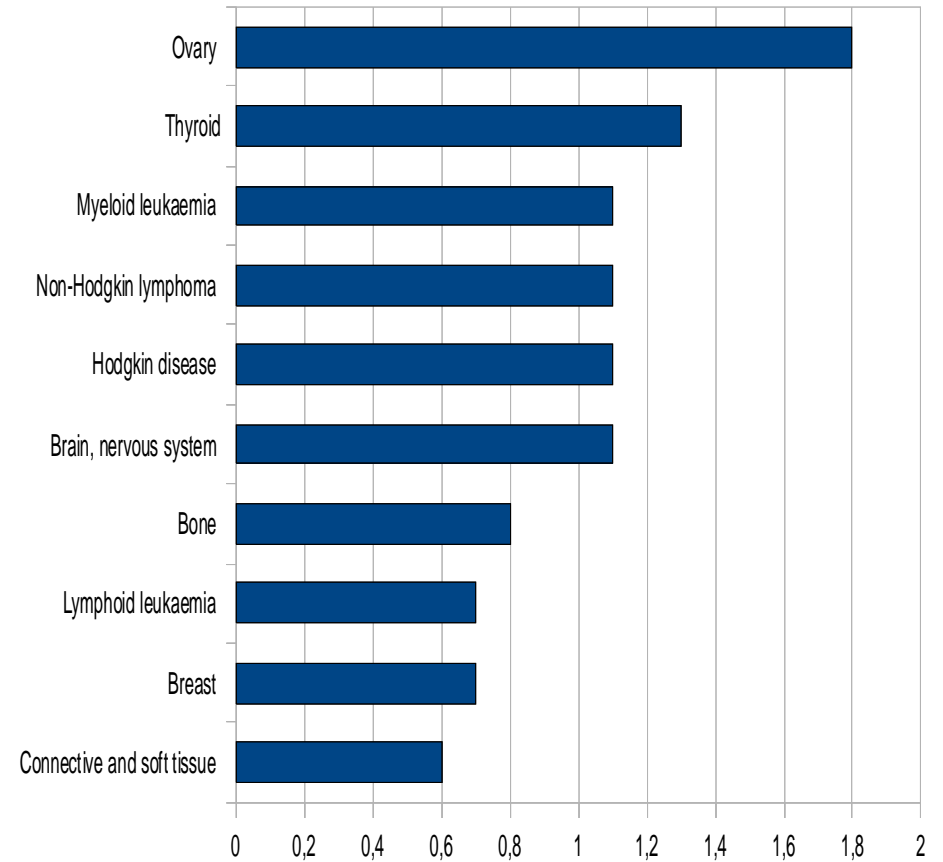
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Asia 15-24 years

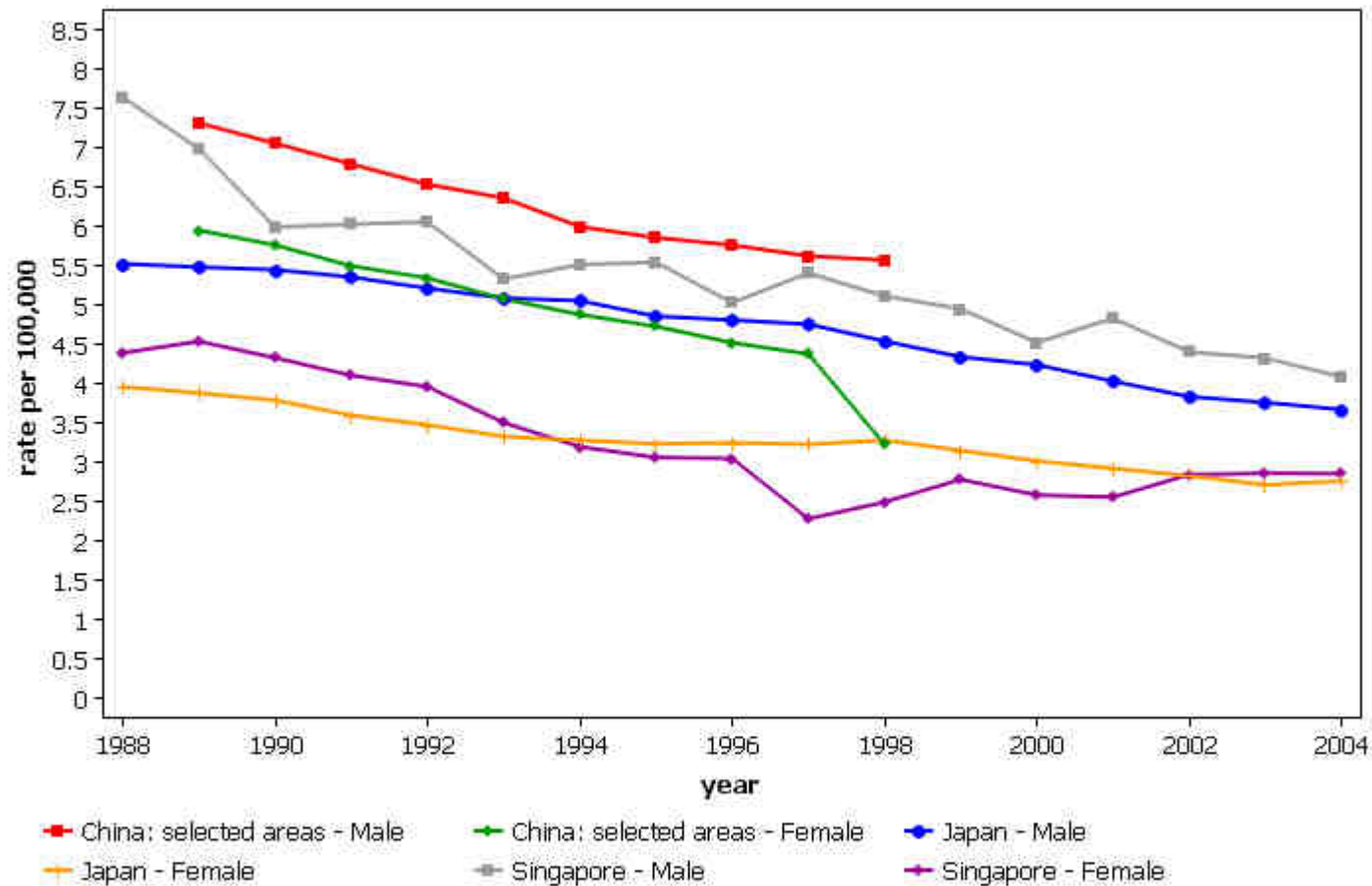
- (a) Male



- (b) Females



Mortality from All cancers but lung Age-standardized rate (World), age (15-24)



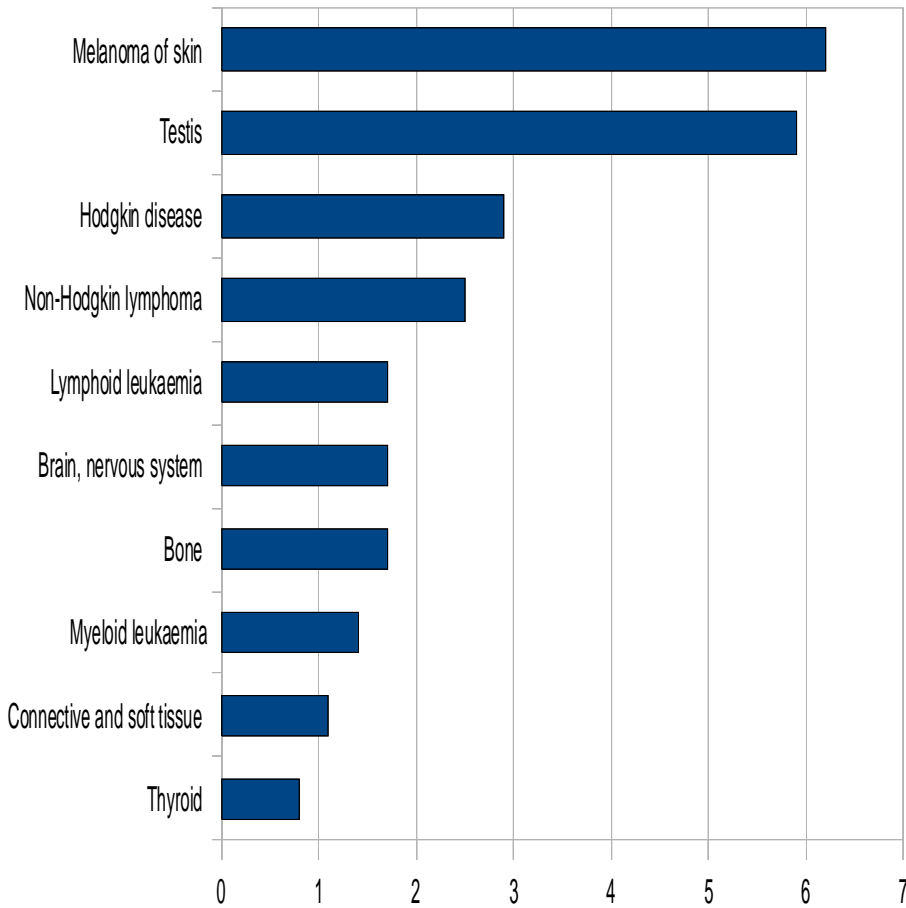
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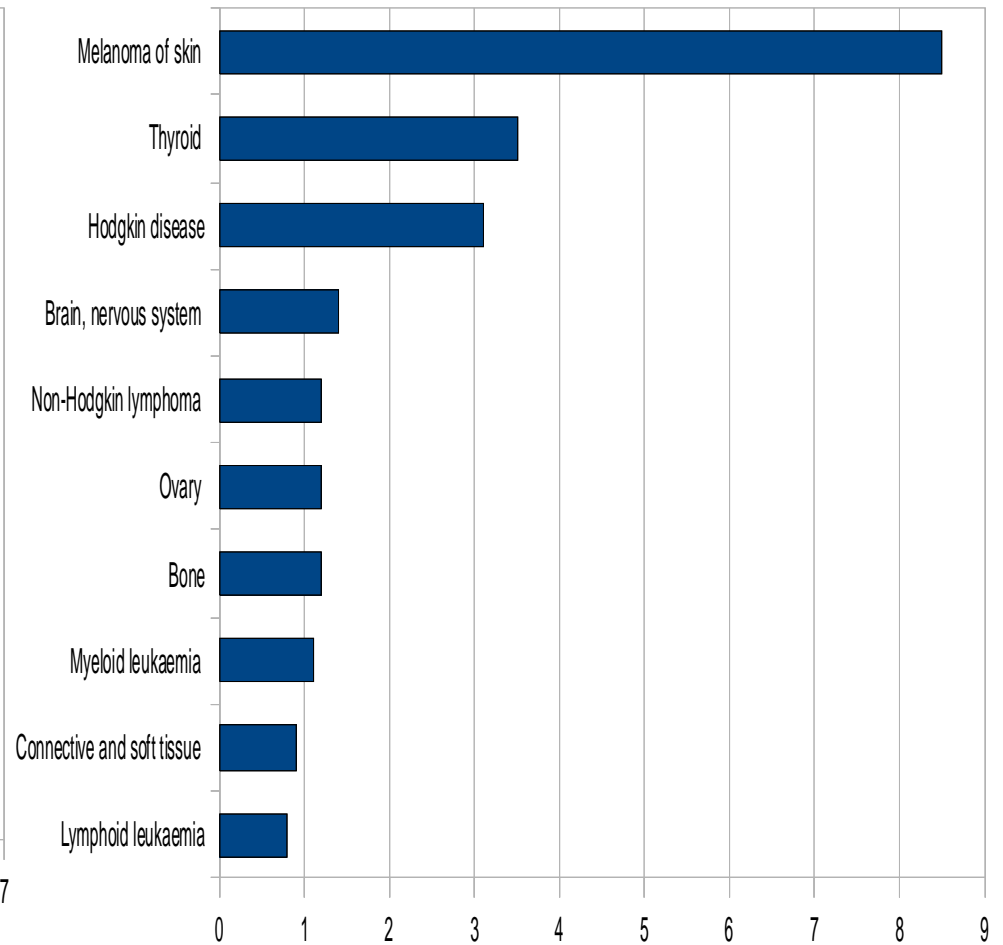


Oceania 15-24

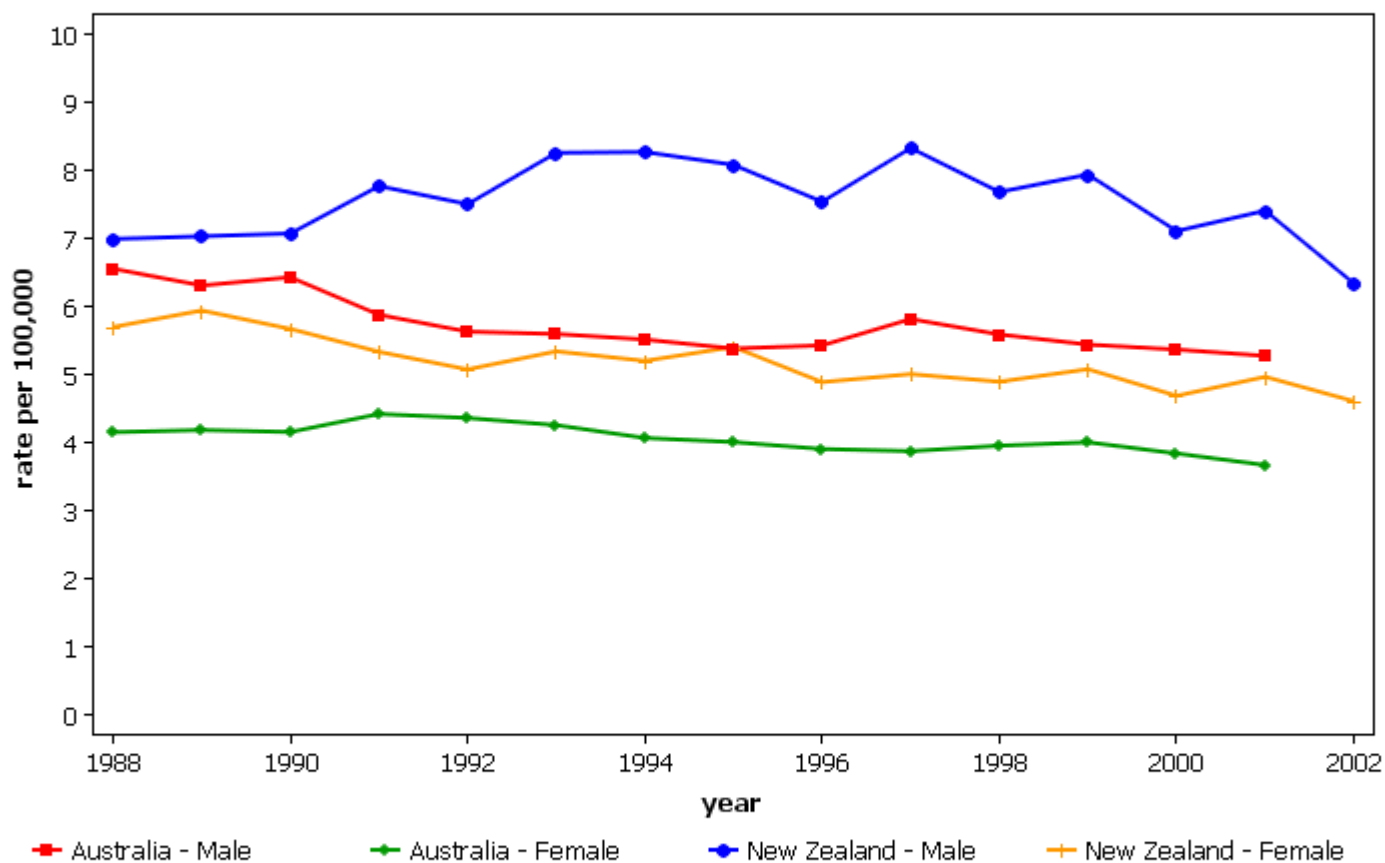
- (a) Males



- (b) Females



Mortality from All cancers but lung Age-standardized rate (World), age (15-24)

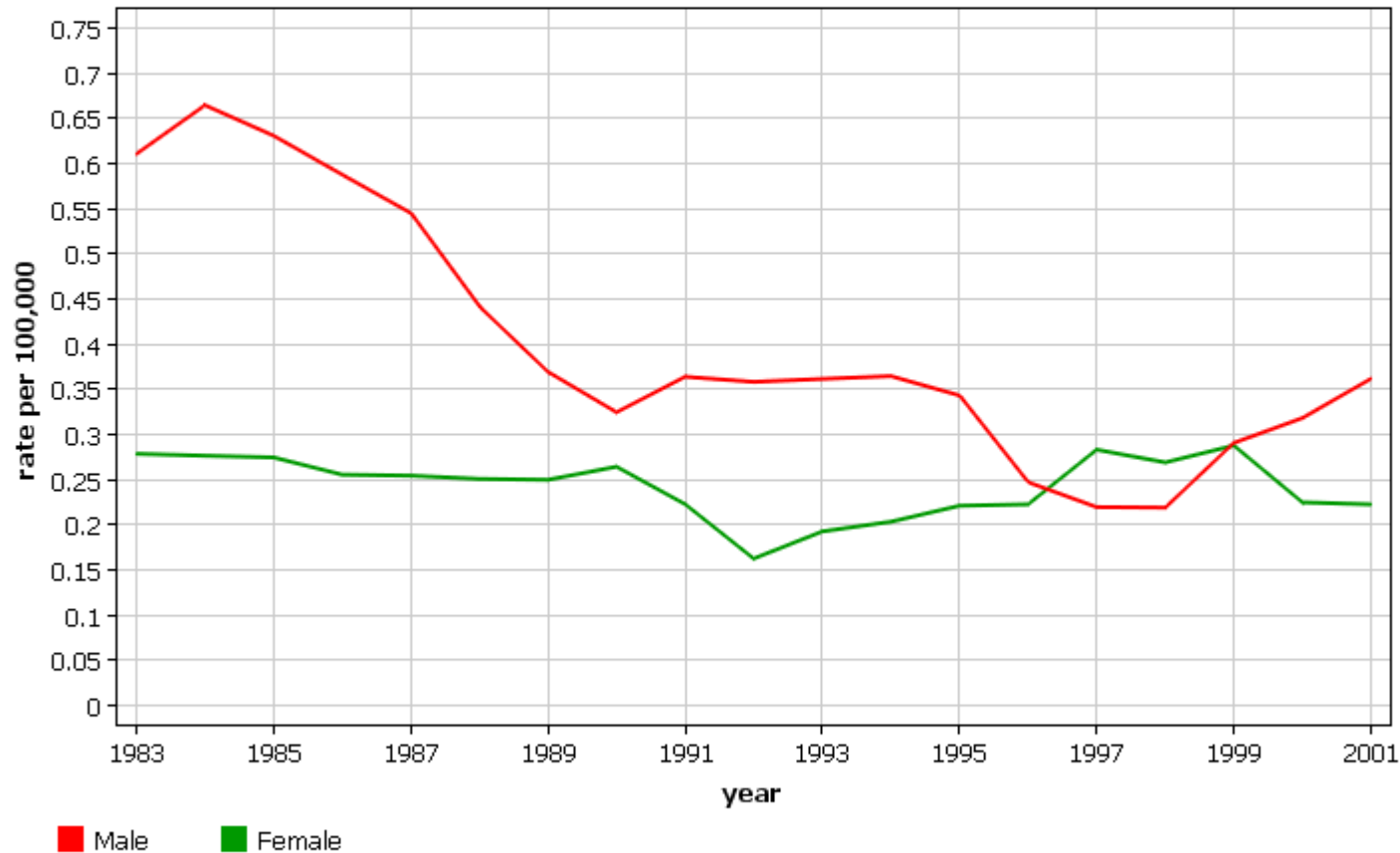


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Mortality from Melanoma of skin Australia Age-standardized rate (World), age (15-24)



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Summary of the top five cancer diagnoses for males worldwide

15-24 years old						
	Africa	North America	South America	Asia	Europe	Oceania
1 st	Kaposi Sarcoma	Testis	Testis	Non-Hodgkin lymphoma	Testis	Melanoma of skin
2 nd	Non-Hodgkin lymphoma	Hodgkin disease	Bone	Bone	Hodgkin disease	Testis
3 rd	Bone	Non-Hodgkin lymphoma	Hodgkin disease	Brain, Nervous system	Bone	Hodgkin disease
4 th	Hodgkin disease	Brain, Nervous system	Non-Hodgkin lymphoma	Myeloid leukemia	Melanoma of skin	Non-Hodgkin lymphoma
5 th	Brain, Nervous system	Melanoma of skin	Brain, Nervous system	Lymphoid leukemia	Lymphoid leukemia	Bone

Summary of the top five cancer diagnoses for females worldwide

15-24 years old						
	Africa	North America	South America	Asia	Europe	Oceania
1 st	Kaposi Sarcoma	Thyroid	Thyroid	Ovary	Melanoma of skin	Melanoma of skin
2 nd	Non-Hodgkin lymphoma	Hodgkin disease	Hodgkin disease	Thyroid	Thyroid	Thyroid
3 rd	Hodgkin disease	Melanoma of skin	Ovary	Brain, Nervous system	Brain, Nervous system	Hodgkin disease Brain, Nervous system
4 th	Bone	Brain, Nervous system	Brain, Nervous system	Hodgkin disease	Ovary	Nervous system
5 th	Connective and soft tissue	Non-Hodgkin lymphoma	Non-Hodgkin lymphoma	Non-Hodgkin lymphoma	Hodgkin disease	Bone

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- In **Africa** the HIV related cancers showed the highest rates, being Kaposi sarcoma the major cancer diagnose for both sexes followed by non-Hodgkin's lymphoma also in both.
- In **North America** testis was the most important cancer diagnosis for males, followed by Hodgkin disease and non-Hodgkin's lymphoma. For females, thyroid had the highest incidence rate, followed by Hodgkin disease and melanoma of skin.

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- In **South America** males showed testis cancer, bone cancer and Hodgkin disease as the major diagnoses. Females presented thyroid, Hodgkin disease and ovary cancer.
- In **Europe** the major cancer diagnose for males was testis, followed by Hodgkin disease and bone cancer. Females presented melanoma of the skin as the most incident cancer, followed by thyroid cancer and central nervous system tumor.

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- **Asian** males was non-Hodgkin's lymphoma , followed by myeloid leukemia, central nervous system tumor and bone. Asian females showed high rates for ovary cancer, followed by thyroid and myeloid leukemia.
- In **Oceania** melanoma of the skin was the major cancer diagnose for both sexes. In males skin cancer was followed by testis cancer and Hodgkin disease. In women the second most incident cancer was thyroid, followed by Hodgkin disease.

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- Adolescents and young adults aged 15-24 years old have a distinctive distribution of types of cancer within each continent.
- Nearly 280.000 new cases of cancer were registered in the world for that age group in the five years period studied.
- The types of cancer that occur in AYA shows a heterogeneous pattern around the world.