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Young people and cancer

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Young people and cancer

20 January 2022

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In recent years, the specific challenges related to the management of **adolescents and young adults (AYA)** with cancer are increasingly well recognised

The best thing you can feel is the awareness of having a future and being its master

The **Youth Project** of Pediatric Oncology ward of the Fondazione IRCCS Istituto Nazionale dei Tumori of Milan is dedicated to **adolescent patients and young adults with cancer**, with the aim of dealing not only with the disease, but with the lives of children.

This presentation will be accompanied by pictures by the Milan Youth Project, a scheme dedicated to young cancer patients (15-25 years old) with the dual purpose of optimizing medical aspects of their care while also paying attention to their quality of life (providing age-appropriate spaces in hospital and organizing creative activities (photography, music, creative writing, fashion design) that give patients special ways to express themselves


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REVIEW ARTICLE

Starting an Adolescent and Young Adult Program: Some Success Stories and Some Obstacles to Overcome

Andrea Ferrari, David Thomas, Anna R.K. Franklin, Brandon M. Hayes-Lattin, Maurizio Mascarin, Winette van der Graaf, and Karen H. Albritton


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DOI: 10.1002/pbc.26528

REVIEW

WILEY Pediatric Blood & Cancer SIOP aspho

International evolution in AYA oncology: Current status and future expectations

Andrea Ferrari[1] | Ronald D. Barr[2]

AYA oncology programs have been developed in several parts of the world (involving numerous organizations, healthcare providers, academic societies, and governments), with evident differences and similarities.

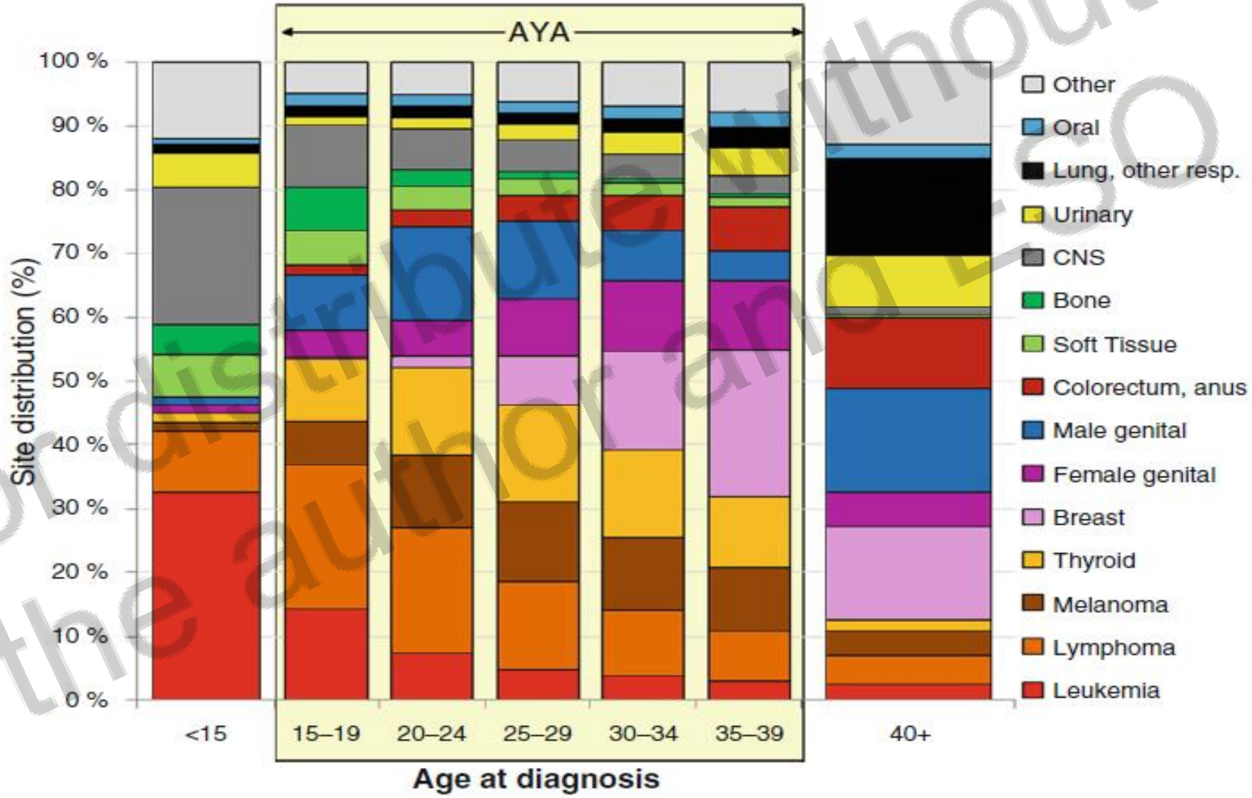
Noteworthy, these programs developed according to different local situations.
A dedicated AYA program should reflect not only an ideal but also acknowledge local realities, including variations in healthcare culture and resources. This will continue to generate an interesting heterogeneity of solutions.

Definition

	childhood	0 -14 yrs		
AYA	**adolescence**	15-19 yrs	more focus on common psychosocial aspects (fragility, immaturity, social and sexual experimentation, lack of a career or economic independence)	inclusion of more adult-type tumors (carcinomas) focus on clinical challenges (lack of specific biological understanding of AYA cancers, lack of access to specialised centres with age-appropriate multidisciplinary care, lack of inclusion in clinical trials)
	young adulthood	20-24 yrs		
		24-29 yrs		
		30-39 yrs		

Epidemiology

Unique epidemiology, with both paediatric-type and adult-type tumours



Need for multidisciplinary competencies with both paediatric and adult oncologists

Trama A, et al. Cancer Burden in Adolescents and Young Adults: A Review of Epidemiological Evidence. Cancer J. 2018

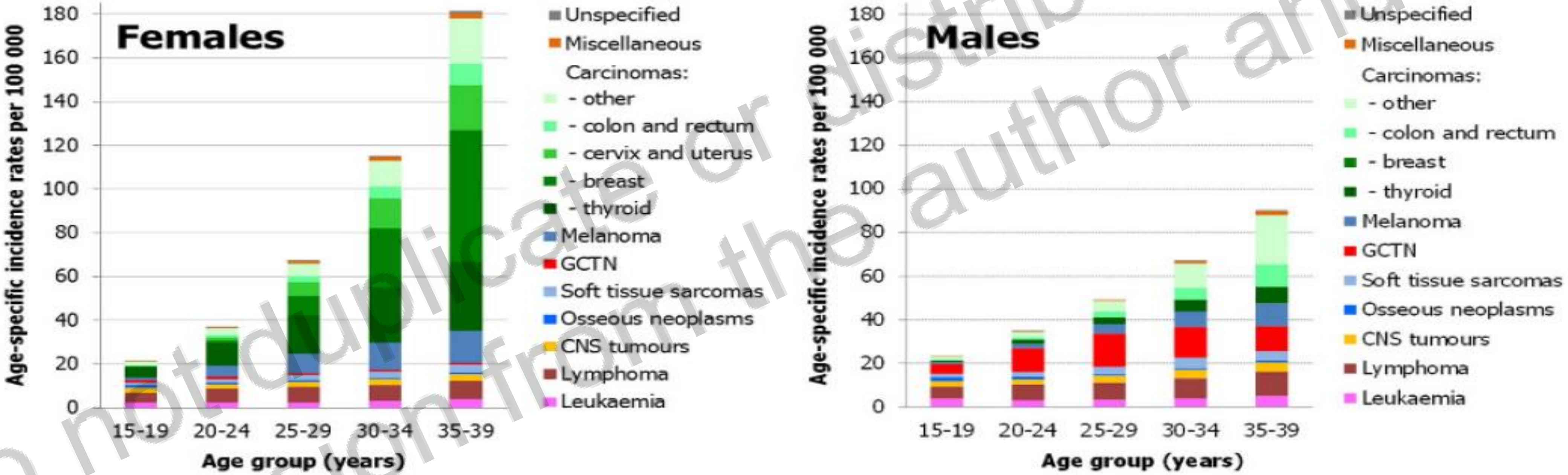


FIGURE 3. Age- and sex-specific cancer incidence rates in adolescents and young adults (aged 15–39 years) in the United States by adapted Classification Scheme for Tumours of AYA[34] in 2010–2014. Source: SEER 18 areas.[22] GCTN indicates germ cell and trophoblastic neoplasms.

Gupta et al. International Trends in the Incidence of Cancer Among Adolescents and Young Adults. JNCI J Natl Cancer Inst, 2020

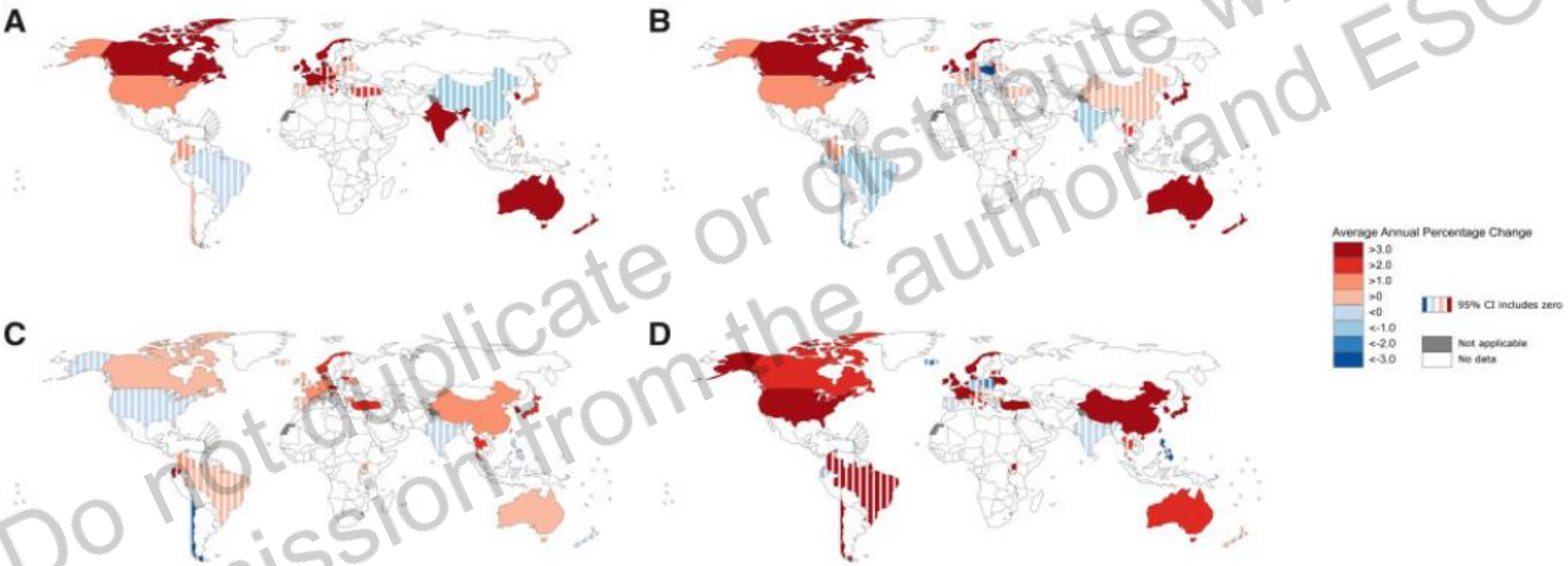
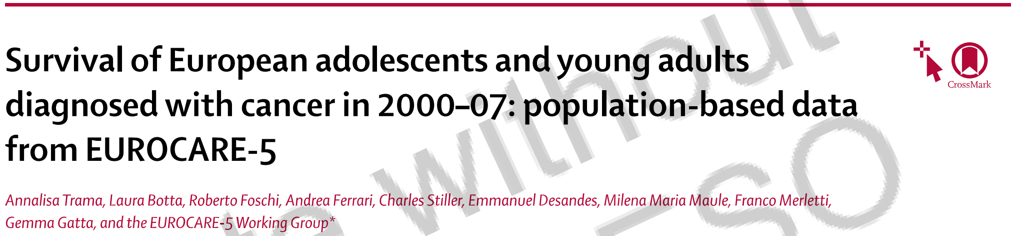


Figure 3. Average annual percentage change of colon cancer, rectoanal cancer, breast cancer, and kidney and renal cancer. **A)** Colon cancer for both sexes combined. **B)** Rectoanal cancer for both sexes combined. **C)** Breast cancer among females. **D)** Kidney and renal for both sexes combined.

Cancer survival AYA

Trama A, et al. Lancet Oncol 2016



Survival of European adolescents and young adults diagnosed with cancer in 2000–07: population-based data from EUROCARE-5

Annalisa Trama, Laura Botta, Roberto Foschi, Andrea Ferrari, Charles Stiller, Emmanuel Desandes, Milena Maria Maule, Franco Merletti, Gemma Gatta, and the EUROCARE-5 Working Group*

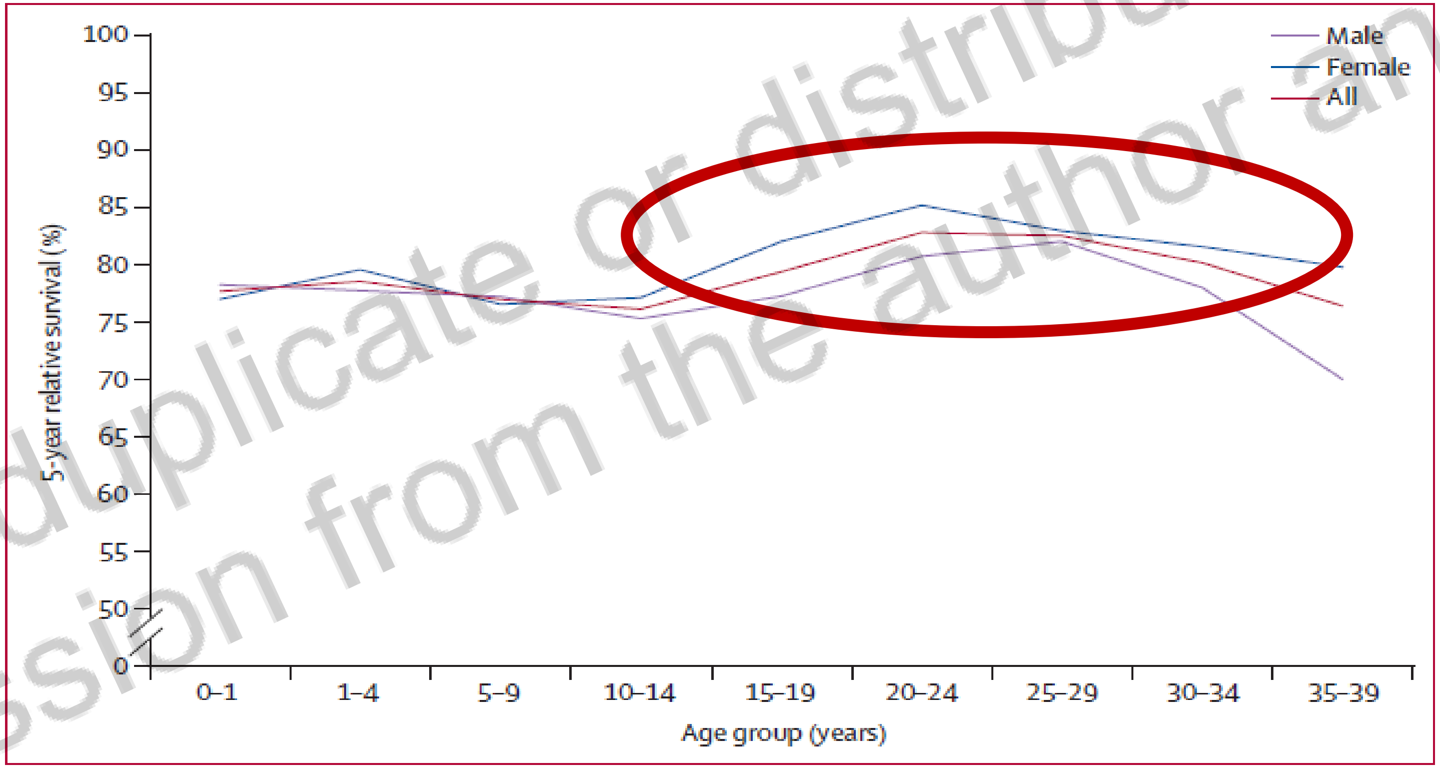
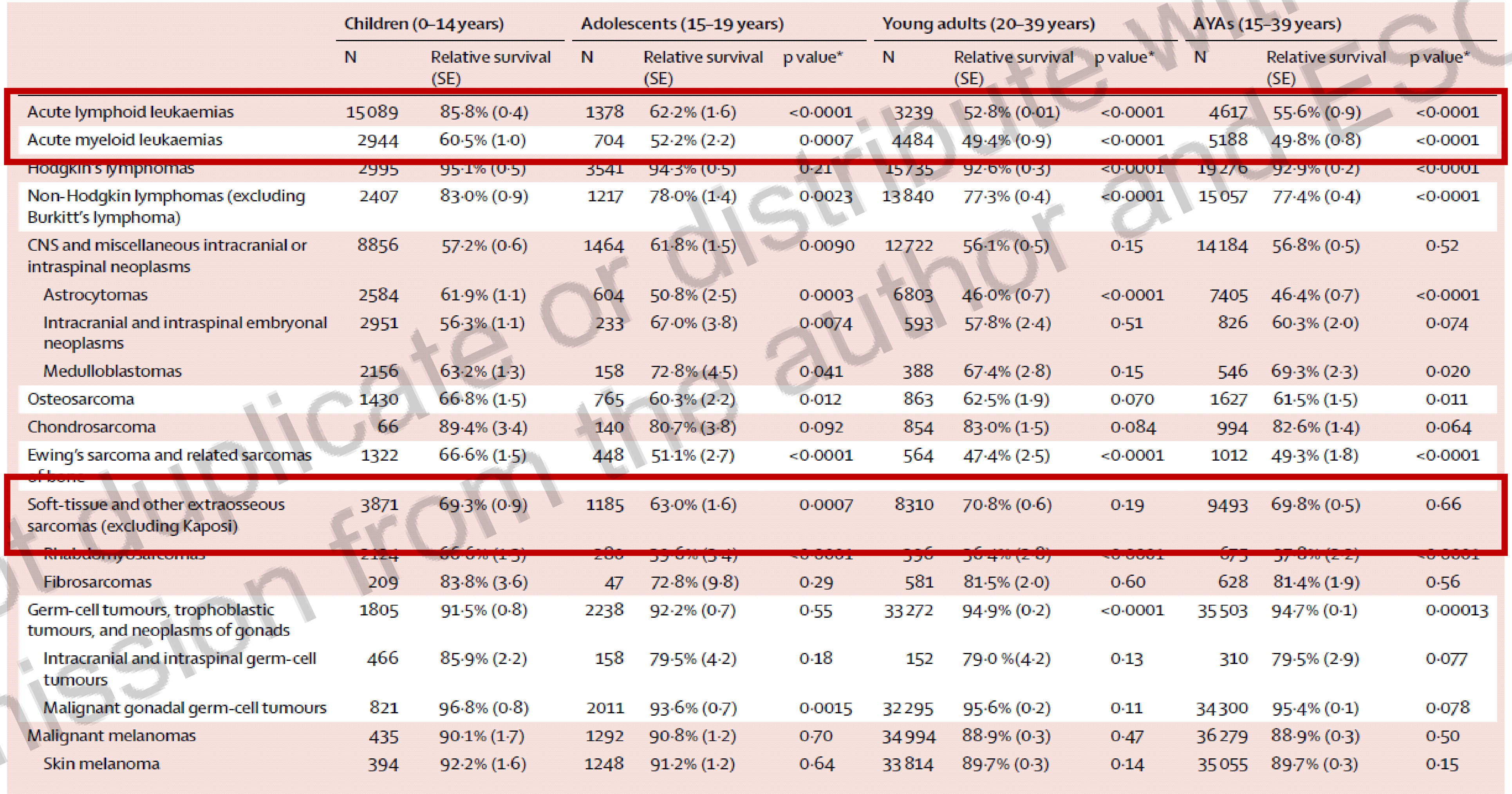


Figure 1: Population-weighted 5-year relative survival estimates by age at diagnosis and by sex, for all cancers combined, diagnosed in Europe in 2000–07

Trama A, et al. Lancet Oncol 2016

Cancer survival AYA vs children



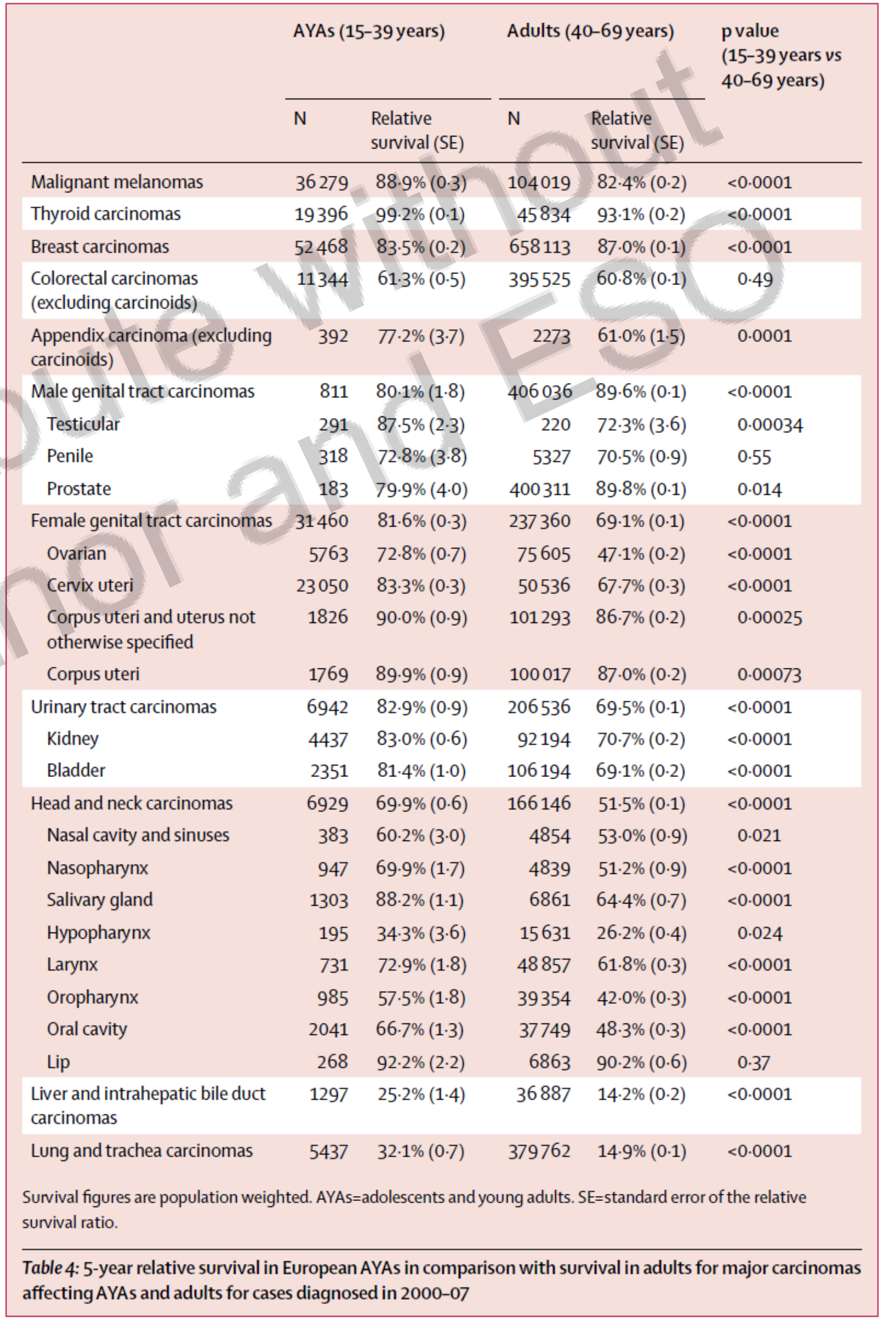
	Children (0–14 years)		Adolescents (15–19 years)			Young adults (20–39 years)			AYAs (15–39 years)		
	N	Relative survival (SE)	N	Relative survival (SE)	p value*	N	Relative survival (SE)	p value*	N	Relative survival (SE)	p value*
Acute lymphoid leukaemias	15 089	85·8% (0·4)	1378	62·2% (1·6)	<0·0001	3239	52·8% (0·01)	<0·0001	4617	55·6% (0·9)	<0·0001
Acute myeloid leukaemias	2944	60·5% (1·0)	704	52·2% (2·2)	0·0007	4484	49·4% (0·9)	<0·0001	5188	49·8% (0·8)	<0·0001
Hodgkin's lymphomas	2995	95·1% (0·5)	3541	94·3% (0·5)	0·21	15 735	92·6% (0·3)	<0·0001	19 276	92·9% (0·2)	<0·0001
Non-Hodgkin lymphomas (excluding Burkitt's lymphoma)	2407	83·0% (0·9)	1217	78·0% (1·4)	0·0023	13 840	77·3% (0·4)	<0·0001	15 057	77·4% (0·4)	<0·0001
CNS and miscellaneous intracranial or intraspinal neoplasms	8856	57·2% (0·6)	1464	61·8% (1·5)	0·0090	12 722	56·1% (0·5)	0·15	14 184	56·8% (0·5)	0·52
Astrocytomas	2584	61·9% (1·1)	604	50·8% (2·5)	0·0003	6803	46·0% (0·7)	<0·0001	7405	46·4% (0·7)	<0·0001
Intracranial and intraspinal embryonal neoplasms	2951	56·3% (1·1)	233	67·0% (3·8)	0·0074	593	57·8% (2·4)	0·51	826	60·3% (2·0)	0·074
Medulloblastomas	2156	63·2% (1·3)	158	72·8% (4·5)	0·041	388	67·4% (2·8)	0·15	546	69·3% (2·3)	0·020
Osteosarcoma	1430	66·8% (1·5)	765	60·3% (2·2)	0·012	863	62·5% (1·9)	0·070	1627	61·5% (1·5)	0·011
Chondrosarcoma	66	89·4% (3·4)	140	80·7% (3·8)	0·092	854	83·0% (1·5)	0·084	994	82·6% (1·4)	0·064
Ewing's sarcoma and related sarcomas of bone	1322	66·6% (1·5)	448	51·1% (2·7)	<0·0001	564	47·4% (2·5)	<0·0001	1012	49·3% (1·8)	<0·0001
Soft-tissue and other extraosseous sarcomas (excluding Kaposi)	3871	69·3% (0·9)	1185	63·0% (1·6)	0·0007	8310	70·8% (0·6)	0·19	9493	69·8% (0·5)	0·66
Rhabdomyosarcomas	2124	66·6% (1·3)	280	39·6% (3·4)	<0·0001	396	36·4% (2·8)	<0·0001	675	37·8% (2·2)	<0·0001
Fibrosarcomas	209	83·8% (3·6)	47	72·8% (9·8)	0·29	581	81·5% (2·0)	0·60	628	81·4% (1·9)	0·56
Germ-cell tumours, trophoblastic tumours, and neoplasms of gonads	1805	91·5% (0·8)	2238	92·2% (0·7)	0·55	33 272	94·9% (0·2)	<0·0001	35 503	94·7% (0·1)	0·00013
Intracranial and intraspinal germ-cell tumours	466	85·9% (2·2)	158	79·5% (4·2)	0·18	152	79·0 %(4·2)	0·13	310	79·5% (2·9)	0·077
Malignant gonadal germ-cell tumours	821	96·8% (0·8)	2011	93·6% (0·7)	0·0015	32 295	95·6% (0·2)	0·11	34 300	95·4% (0·1)	0·078
Malignant melanomas	435	90·1% (1·7)	1292	90·8% (1·2)	0·70	34 994	88·9% (0·3)	0·47	36 279	88·9% (0·3)	0·50
Skin melanoma	394	92·2% (1·6)	1248	91·2% (1·2)	0·64	33 814	89·7% (0·3)	0·14	35 055	89·7% (0·3)	0·15

Cancer survival AYA vs children

Lack of improvement in **survival rates** as compared to other age groups. For some tumour types, survival in AYA is poorer than in children with the same disease

EUROCARE-5 2000-2007	**5-yr OS 15-19 year old**	**5-yr OS 0-14 year old**
LLA	56%	86%
High-grade glioma	46%	62%
Ewing sarcoma	49%	67%
rhabdomyosarcoma	38%	67%

Trama A, et al. Lancet Oncol 2016



	AYAs (15–39 years)		Adults (40–69 years)		p value (15–39 years *vs* 40–69 years)
	N	Relative survival (SE)	N	Relative survival (SE)	
Malignant melanomas	36 279	88·9% (0·3)	104 019	82·4% (0·2)	<0·0001
Thyroid carcinomas	19 396	99·2% (0·1)	45 834	93·1% (0·2)	<0·0001
Breast carcinomas	52 468	83·5% (0·2)	658 113	87·0% (0·1)	<0·0001
Colorectal carcinomas (excluding carcinoids)	11 344	61·3% (0·5)	395 525	60·8% (0·1)	0·49
Appendix carcinoma (excluding carcinoids)	392	77·2% (3·7)	2273	61·0% (1·5)	0·0001
Male genital tract carcinomas	811	80·1% (1·8)	406 036	89·6% (0·1)	<0·0001
Testicular	291	87·5% (2·3)	220	72·3% (3·6)	0·00034
Penile	318	72·8% (3·8)	5327	70·5% (0·9)	0·55
Prostate	183	79·9% (4·0)	400 311	89·8% (0·1)	0·014
Female genital tract carcinomas	31 460	81·6% (0·3)	237 360	69·1% (0·1)	<0·0001
Ovarian	5763	72·8% (0·7)	75 605	47·1% (0·2)	<0·0001
Cervix uteri	23 050	83·3% (0·3)	50 536	67·7% (0·3)	<0·0001
Corpus uteri and uterus not otherwise specified	1826	90·0% (0·9)	101 293	86·7% (0·2)	0·00025
Corpus uteri	1769	89·9% (0·9)	100 017	87·0% (0·2)	0·00073
Urinary tract carcinomas	6942	82·9% (0·9)	206 536	69·5% (0·1)	<0·0001
Kidney	4437	83·0% (0·6)	92 194	70·7% (0·2)	<0·0001
Bladder	2351	81·4% (1·0)	106 194	69·1% (0·2)	<0·0001
Head and neck carcinomas	6929	69·9% (0·6)	166 146	51·5% (0·1)	<0·0001
Nasal cavity and sinuses	383	60·2% (3·0)	4854	53·0% (0·9)	0·021
Nasopharynx	947	69·9% (1·7)	4839	51·2% (0·9)	<0·0001
Salivary gland	1303	88·2% (1·1)	6861	64·4% (0·7)	<0·0001
Hypopharynx	195	34·3% (3·6)	15 631	26·2% (0·4)	0·024
Larynx	731	72·9% (1·8)	48 857	61·8% (0·3)	<0·0001
Oropharynx	985	57·5% (1·8)	39 354	42·0% (0·3)	<0·0001
Oral cavity	2041	66·7% (1·3)	37 749	48·3% (0·3)	<0·0001
Lip	268	92·2% (2·2)	6863	90·2% (0·6)	0·37
Liver and intrahepatic bile duct carcinomas	1297	25·2% (1·4)	36 887	14·2% (0·2)	<0·0001
Lung and trachea carcinomas	5437	32·1% (0·7)	379 762	14·9% (0·1)	<0·0001

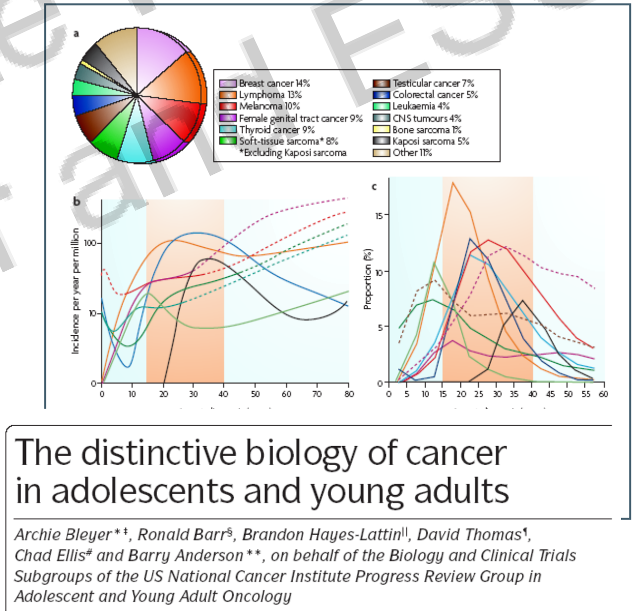
Survival figures are population weighted. AYAs=adolescents and young adults. SE=standard error of the relative survival ratio.

Table 4: 5-year relative survival in European AYAs in comparison with survival in adults for major carcinomas affecting AYAs and adults for cases diagnosed in 2000–07

Outcome

The reasons behind the worse survival of AYAs are multifactorial:

- possible differences in tumor biology
- differences in clinical management
  - diagnostic delay
  - failure to refer cases to expert centers
  - failure to include them in clinical trials
  - less intensive treatments



The distinctive biology of cancer in adolescents and young adults

Archie Bleyer‡, Ronald Barr§, Brandon Hayes-Lattin||, David Thomas¶, Chad Ellis# and Barry Anderson**, on behalf of the Biology and Clinical Trials Subgroups of the US National Cancer Institute Progress Review Group in Adolescent and Young Adult Oncology*

Outcome

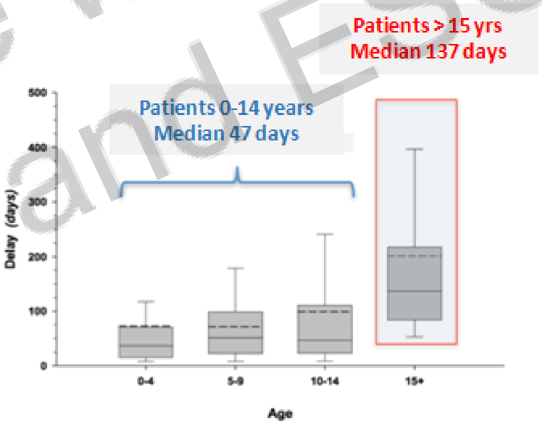
The reasons behind the worse survival of AYAs are multifactorial:

- possible differences in tumor biology
- differences in clinical management
  - diagnostic delay
  - failure to refer cases to expert centers
  - failure to include them in clinical trials
  - less intensive treatments

Pediatr Blood Cancer 2013;60:605–610

Symptom Interval in Pediatric Patients With Solid Tumors: Adolescents Are at Greater Risk of Late Diagnosis

Laura Veneroni, MS,[1,2] Luigi Mariani, MD,[3] Salvatore Lo Vullo, BSc,[3] Francesca Favini, MD,[1] Serena Catania, MD,[1]
Marco Vajna de Pava, MD,[1] Maura Massimino, MD,[1] and Andrea Ferrari, MD[1]*



Patients > 15 yrs
Median 137 days

Patients 0-14 years
Median 47 days

Pediatr Blood Cancer 2016;63:479–485

The Sooner the Better? How Symptom Interval Correlates With Outcome in Children and Adolescents With Solid Tumors: Regression Tree Analysis of the Findings of a Prospective Study

Andrea Ferrari, MD,[1]* Salvatore Lo Vullo, BSc,[2] Daniele Giardiello, MSc,[2] Laura Veneroni, MS,[1] Chiara Magni, MD,[1]
Carlo Alfredo Clerici, MD,[1,3] Stefano Chiaravalli, MD,[1] Michela Casanova, MD,[1] Roberto Luksch, MD,[1]
Monica Terenziani, MD,[1] Filippo Spreafico, MD,[1] Cristina Meazza, MD,[1] Serena Catania, MD,[1]
Elisabetta Schiavello, MD,[1] Veronica Biassoni, MD,[1] Marta Podda, MD,[1] Luca Bergamaschi, MD,[1] Nadia Puma, MD,[1]
Maura Massimino, MD,[1] and Luigi Mariani, MD[2]

Insufficient **awareness** that cancer may occur in this age group, among young people and their families, as well as physicians

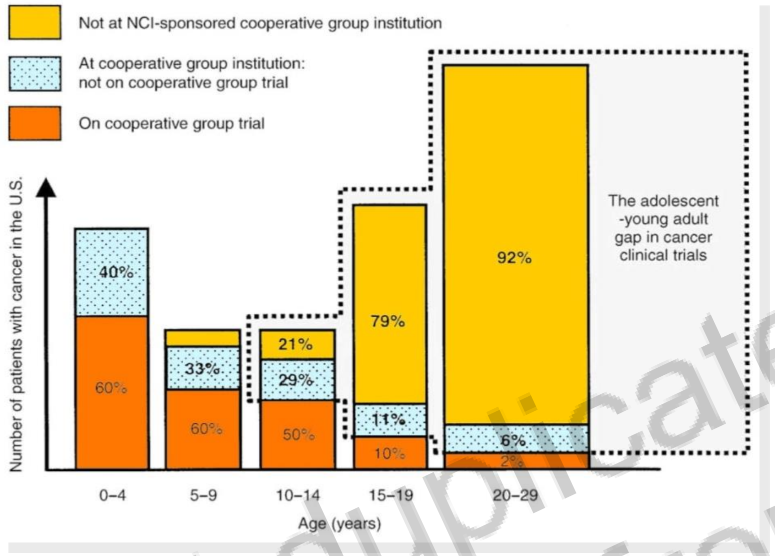
Complex pathway to diagnosis and risk of **diagnostic delay** and difficult access to specialised care

Limited participation in **clinical research**
(5% to 34% of AYA patients entering clinical trials)

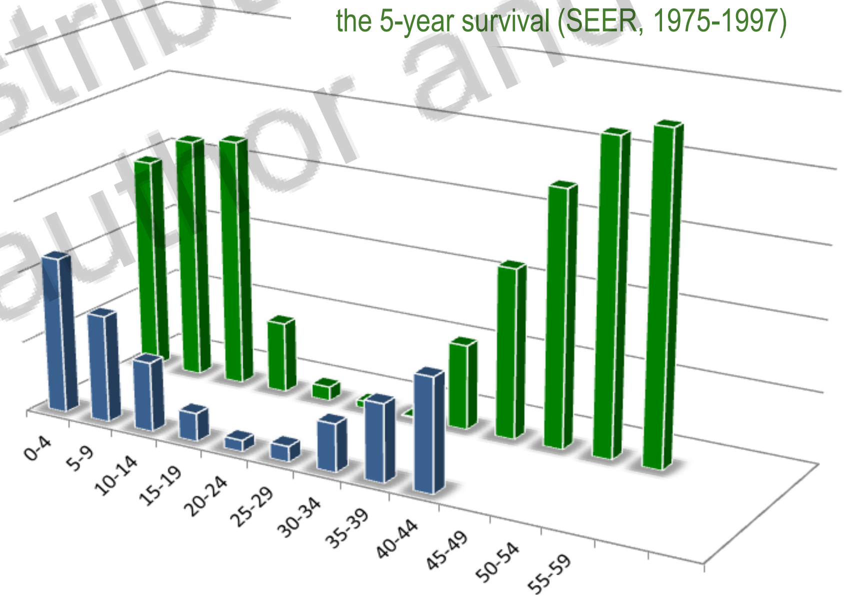

Cancer Treatment Reviews (2007) 33, 603–608

Participation of adolescents with cancer in clinical trials

Andrea Ferrari [a,*], Archie Bleyer [b]



Average annual percent change (AAPC) in the 5-year survival (SEER, 1975-1997)



Entries of 51,395 pts onto U.S. NCI treatment trials,1997-2003

- less availability of trials due to rare cancer types
- less awareness of available trials by physicians
- age barriers in eligibility criteria
- young patients treated where relevant trials are not open or cannot be accessed
- trial design not suitable for young people lifestyle commitments

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Where Are Adolescents with Soft Tissue Sarcomas Treated? An Italian Nationwide Study on Referrals Based on Hospital Discharge Records

Andrea Ferrari, MD,[1] Alice Bernasconi, MSc,[2] Giovanna Sironi, MD,[1] Luca Bergamaschi, MD,[1]
Laura Botta, MSc,[2] Stefano Chiaravalli, MD,[1] Michela Casanova, MD,[1] Gianni Bisogno, MD,[3]
Giuseppe Maria Milano, MD,[4] Maurizio Mascarin, MD,[5] Assunta Tornesello, MD,[6] Paola Quarello, MD,[7]
Maura Massimino, MD,[1] Gemma Gatta, MD,[2] and Annalisa Trama, MD[2]

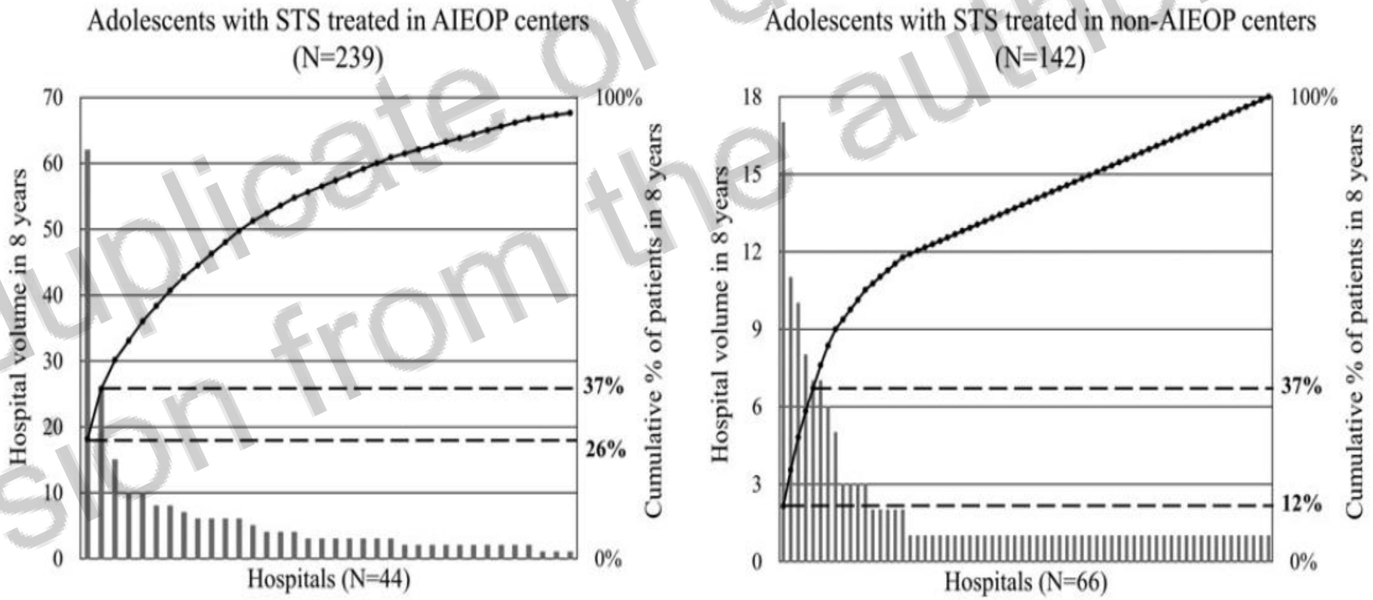

FIG. 2. Distribution of AIEOP and non-AIEOP hospitals treating adolescents with STS by volume of patients treated in 2007–2014, and cumulative percentage of patients treated in the years 2007–2014. STS, soft tissue sarcoma.

DOI: 10.1002/pbc.28566

Pediatric Blood & Cancer SIOP aspho WILEY

LETTER TO THE EDITOR

Where are adolescents with cutaneous melanoma treated? An Italian nationwide study on referrals based on hospital discharge records

Andrea Ferrari[1]
Alice Bernasconi[2]
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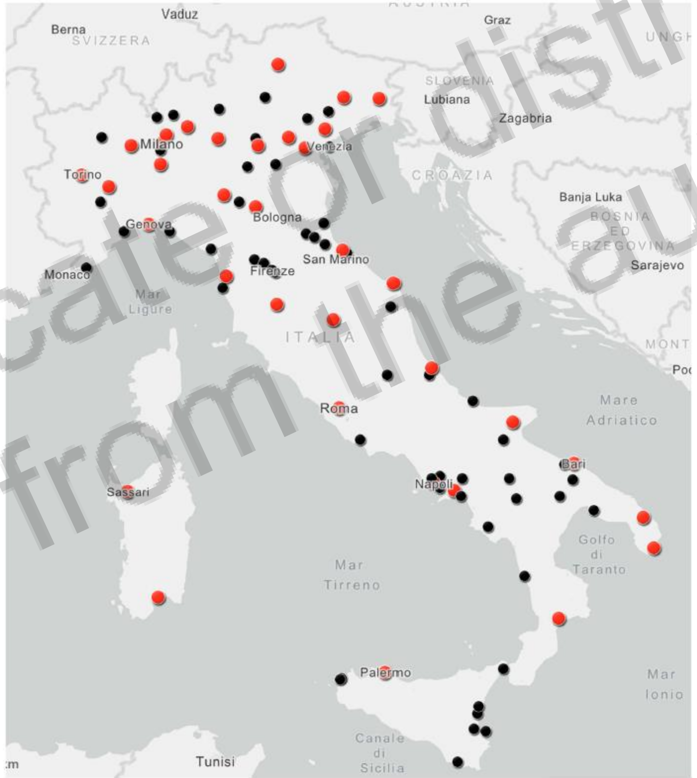
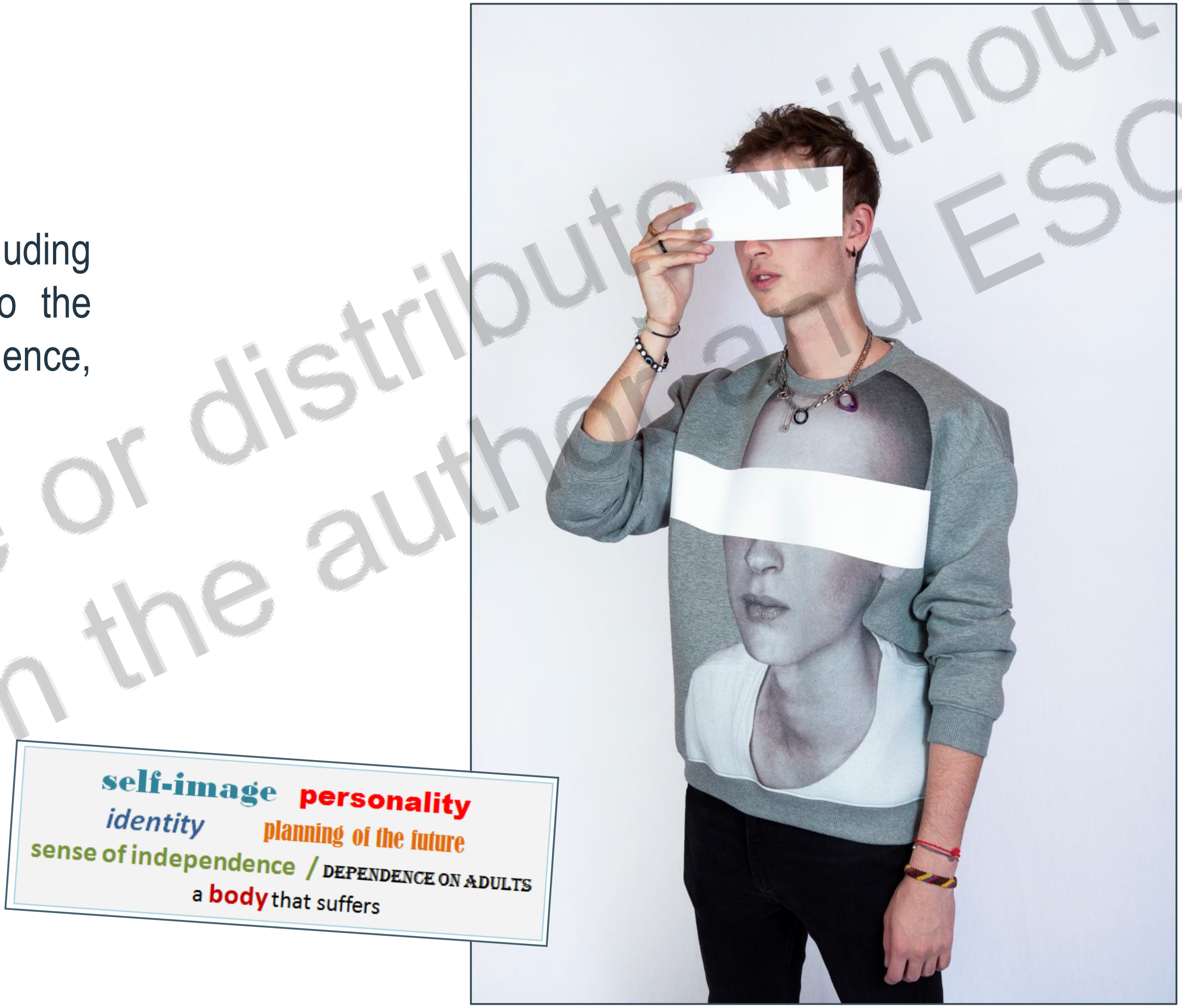


FIGURE 1 Map of Associazione Italiana Ematologia Oncologia Pediatrica (AIEOP; red dots) and non-AIEOP (black dots) centers treating adolescents with melanoma in Italy

418 adolescents newly diagnosed with cutaneous melanoma in Italy over a period of 8 years (from 2007 to 2014), referred to 137 different hospitals.

Psychosocial needs

Unique (and often unmet) **psychological needs**, including those related to physical changes and sexuality, to the development of identity, relationships, and independence, to privacy and risk-taking behaviors



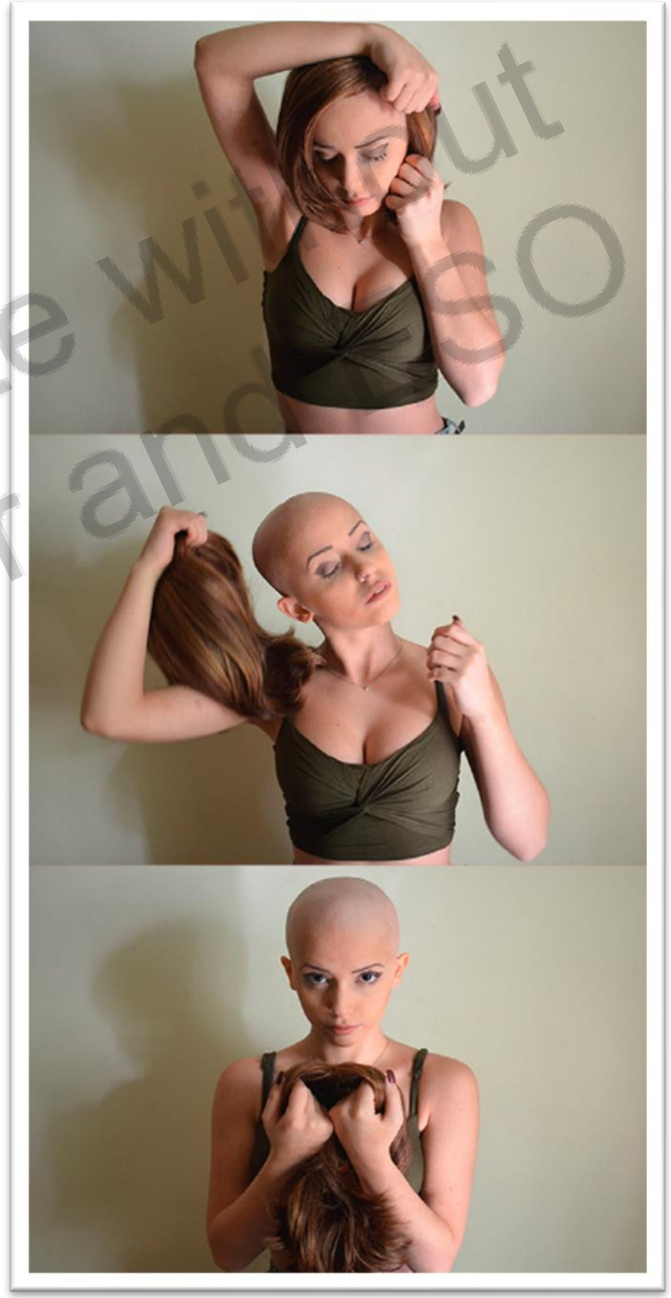
Psychosocial needs

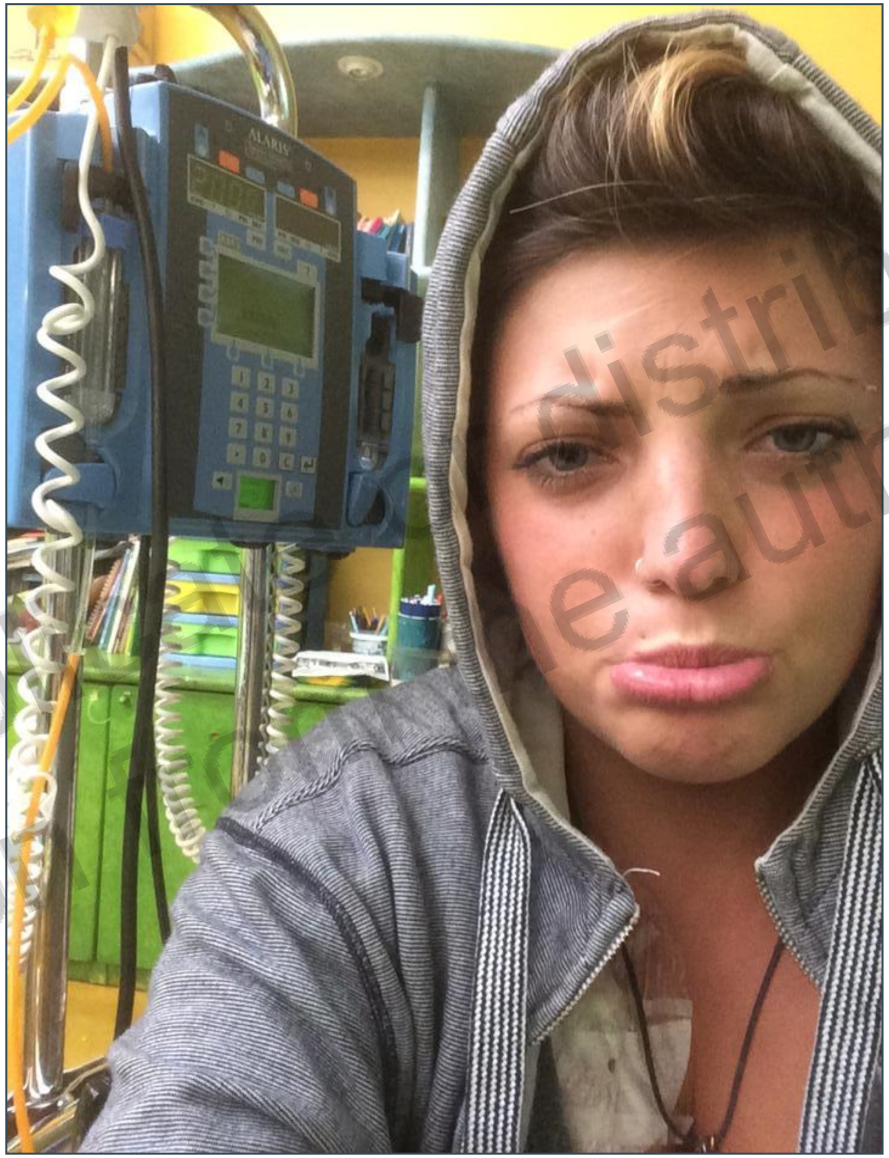
“responding to the needs of adolescents with cancer”

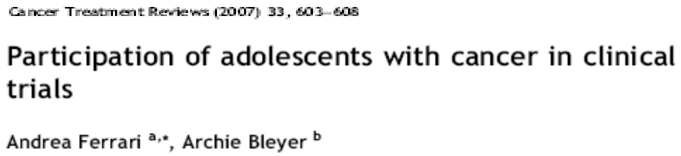
do we know their needs?

let our patients be the ones who tell us their needs

let them to tell us their stories





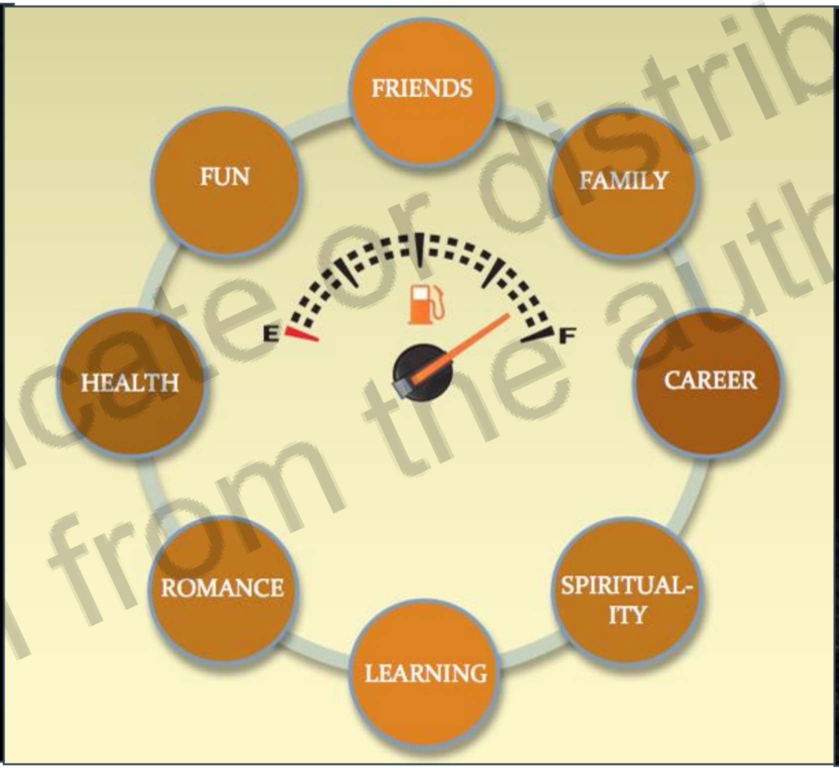


Cancer Treatment Reviews (2007) 33, 603–608

Participation of adolescents with cancer in clinical trials

Andrea Ferrari [a,*], Archie Bleyer [b]

“treating adolescents with cancer”
is very different from
“treating cancer in adolescents”



ON CHILDREN, BLOOD, AND CANCER

WILEY Pediatric Blood & Cancer

Shout in fury but smile at life: A portrait of an adolescent with cancer on the Youth Project in Milan

Andrea Ferrari[1] | Sefora Marino[1]* | Paola Gaggiotti[2] | Veronica Garavaglia[2] |
Matteo Silva[1] | Laura Veneroni[1] | Maura Massimino[1]

ON CHILDREN, BLOOD, AND CANCER

WILEY Pediatric Blood & Cancer SIOP aspho

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Correspondence

From the seventh floor to seventh heaven

Laura Veneroni, PsyD[1], Paola Gaggiotti[1], Davide Ciceri[1], Edoardo Rosati, MD[2], Maura Massimino, MD[1] and Andrea Ferrari, MD[1]


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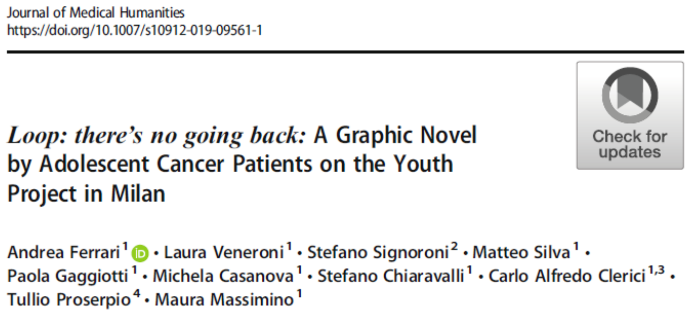
SHORT COMMUNICATION

Online Only

Winners' Cup: a national football tournament brings together adolescent patients with cancer from all over Italy

Matteo Silva[1], Marco Chisari[1], Stefano Signoroni[2], Alberto Bassani[3], Luca Tagliabue[4], Angelo Ricci[5], Mirco Daversa[5], Massimo Achini[4], Filippo Spreafico[1], Michele Murelli[1], Giuseppe Maria Milano[6], Gianni Bisogno[7], Luca Coccoli[8], Massimo Conte[9], Alberto Garaventa[9], Paolo Indolfi[10], Silverio Perrotta[10], Marco Spinelli[11], Federico Mercolini[7], Pietro Soloni[7], Marta Pierobon[7], Andrea Di Cataldo[12], Teresa Perillo[13], Maurizio Mascarin[14], Elisa Coassin[14], Laura Veneroni[1], Michela Casanova[1], Maura Massimino[1], Andrea Ferrari[1]


SLIDE AND ROLL
CERVEZA ESCORPION



Journal of Medical Humanities
https://doi.org/10.1007/s10912-019-09561-1

Loop: there’s no going back: A Graphic Novel by Adolescent Cancer Patients on the Youth Project in Milan

Andrea Ferrari[1] • Laura Veneroni[1] • Stefano Signoroni[2] • Matteo Silva[1] • Paola Gaggiotti[1] • Michela Casanova[1] • Stefano Chiaravalli[1] • Carlo Alfredo Clerici[1,3] • Tullio Proserpio[4] • Maura Massimino[1]

Original Research Article

"What shall I do when I grow up?" Adolescents with cancer on the Youth Project in Milan play with their imagination and photography

Paola Gaggiotti[1], Laura Veneroni[1], Stefano Signoroni[2], Matteo Silva[1], Marco Chisari[1], Michela Casanova[1], Stefano Chiaravalli[1], Giovanna Sironi[1], Carlo Alfredo Clerici[1,3], Tullio Proserpio[4], Maura Massimino[1] and Andrea Ferrari[1]

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ISSN 0300-8916
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SHORT COMMUNICATION

Online Only

“Christmas Balls”: a Christmas carol by the adolescent cancer patients of the Milan Youth Project

Andrea Ferrari[1], Stefano Signoroni[2], Matteo Silva[1], Paola Gaggiotti[1], Laura Veneroni[1], Chiara Magni[1], Michela Casanova[1], Stefano Chiaravalli[1], Mirko Capelletti[1], Pietro Lapidari[1], Carlo Alfredo Clerici[3,4], Maura Massimino[1]

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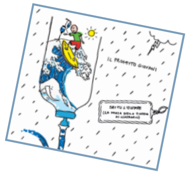
[2] Unit of Hereditary Digestive Tract Tumours, Fondazione IRCCS Istituto Nazionale dei Tumori, Milan - Italy
[3] Clinical Psychology Unit, Fondazione IRCCS Istituto Nazionale dei Tumori, Milan - Italy
[4] Oncology and Hemato-Oncology Department, University of Milan, Milan - Italy

SPECIAL REPORT

WILEY Pediatric Blood & Cancer
SIOP
aspho The American Society of Pediatric Hematology/Oncology

“Summer is you”: Adolescents and young adults with cancer sing about their desire for summer

Stefano Signoroni[1] | Laura Veneroni[2] | Elena Pagani Bagliacca[2] | Paola Gaggiotti[1] | Matteo Silva[2] | Michela Casanova[2] | Stefano Chiaravalli[2] | Carlo Alfredo Clerici[2,3] | Maura Massimino[2] | Andrea Ferrari[2]



“Christmas together with those who’re left,
here at my side, in spirit,
our star lighting our way.
You’ll be my answer,
I’ll start again, become stronger”

Original Research Article

Tumori Journal

Tumori Journal
1–6
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SAGE

Adolescents with cancer on privacy: Fact-finding survey on the need for confidentiality and space

Matteo Silva[1], Francesco Barretta[2], Roberto Luksch[1],
Monica Terenziani[1], Michela Casanova[1], Filippo Spreafico[1],
Cristina Meazza[1], Marta Podda[1], Veronica Biassoni[1],
Elisabetta Schiavello[1], Stefano Chiaravalli[1], Nadia Puma[1],
Luca Bergamaschi[1], Giovanna Gattuso[1], Giovanna Sironi[1],
Annarita Adduci[1], Paolo Grampa[1], Maura Massimino[1]
and Andrea Ferrari[1]

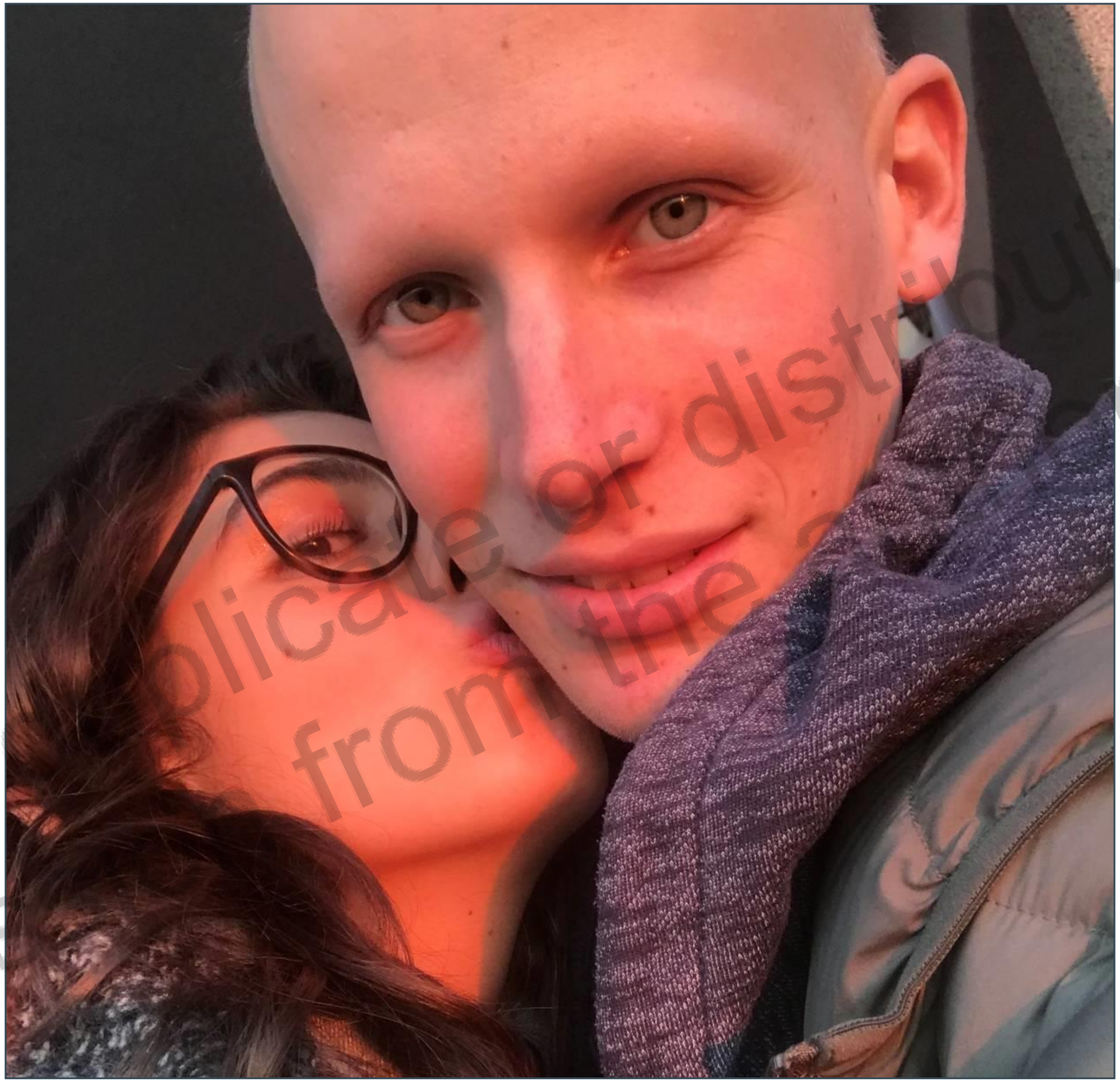
VOLUME 35 · NUMBER 19 · JULY 1, 2017

JOURNAL OF CLINICAL ONCOLOGY

ART OF ONCOLOGY

Searching for Happiness

Andrea Ferrari, Paola Gaggiotti, Matteo Silva, Laura Veneroni, Chiara Magni, Stefano Signoroni, Michela Casanova, Roberto Luksch, Monica Terenziani, Filippo Spreafico, Cristina Meazza, Carlo Alfredo Clerici, and Maura Massimino



PEDIATRIC HEMATOLOGY AND ONCOLOGY
https://doi.org/10.1080/08880018.2020.1712502

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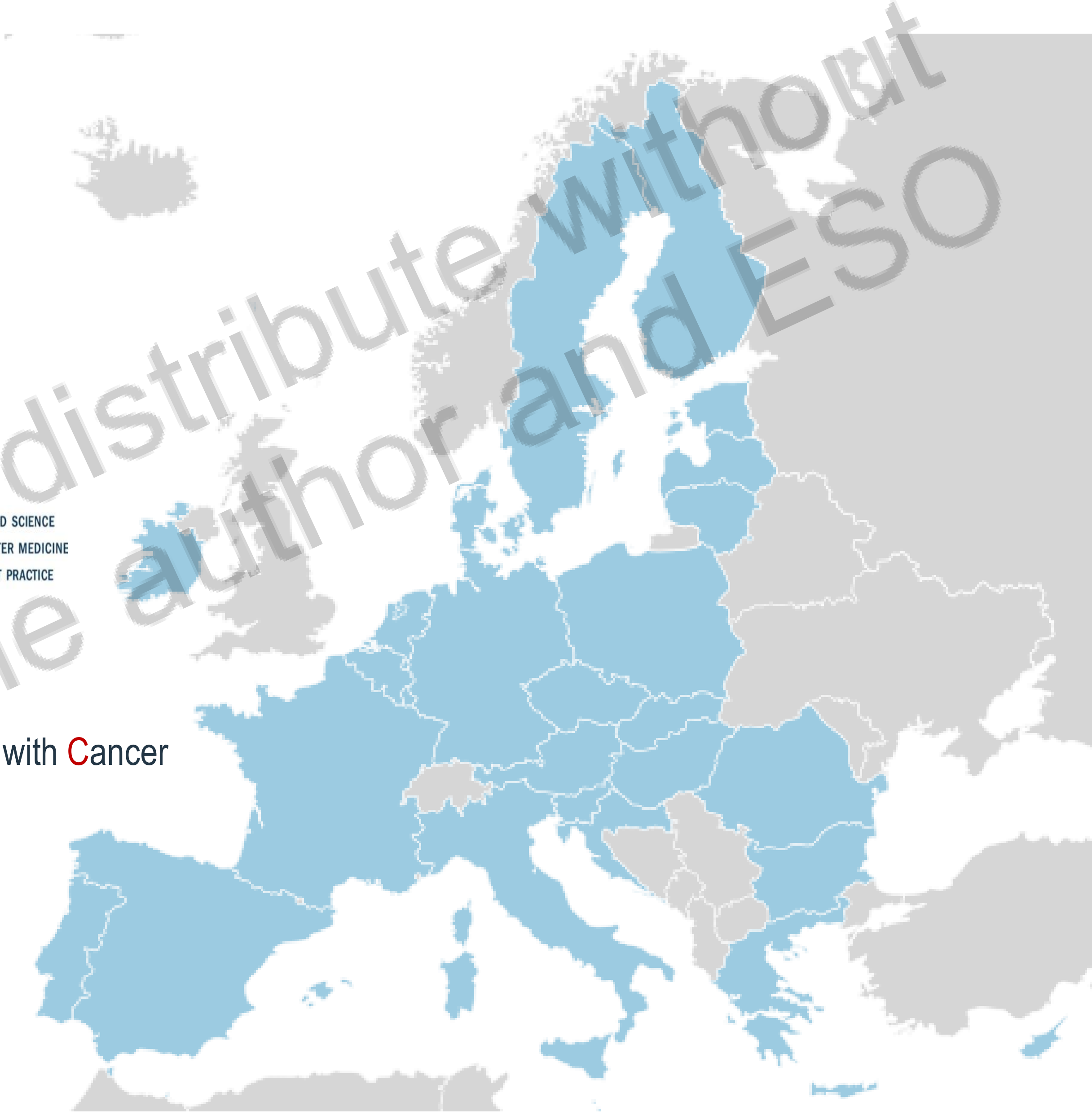
Investigating sexuality in adolescents with cancer: patients talk of their experiences

Laura Veneroni[a], Elena Pagani Bagliacca[a], Giovanna Sironi[a], Matteo Silva[a], Michela Casanova[a], Luca Bergamaschi[a], Monica Terenziani[a], Jessica Trombatore[a], Carlo Alfredo Clerici[b,c], Antonio Prunas[d], Marco Silvaggi[e], Maura Massimino[a], and Andrea Ferrari[a]



1 **SIOP-E AYA Committee**

SIOP Europe
the European Society for Paediatric Oncology

2 **SIOP-E / ESMO AYA Working Group**

GOOD SCIENCE
BETTER MEDICINE
BEST PRACTICE

3 **ENTYAC - European Network for Teenagers and Young Adults with Cancer**

SIOP-E / ESMO AYA Working Group

This Working Group was initially founded for mainly educational purposes:

- to raise awareness and train adult and pediatric oncology communities;
- to enhance/exchange knowledge on specific issues in AYAs;
- to organize joint programs, integrating adult and pediatric oncology groups;
- and ultimately to improve the standard of care for AYAs with cancer all over Europe.

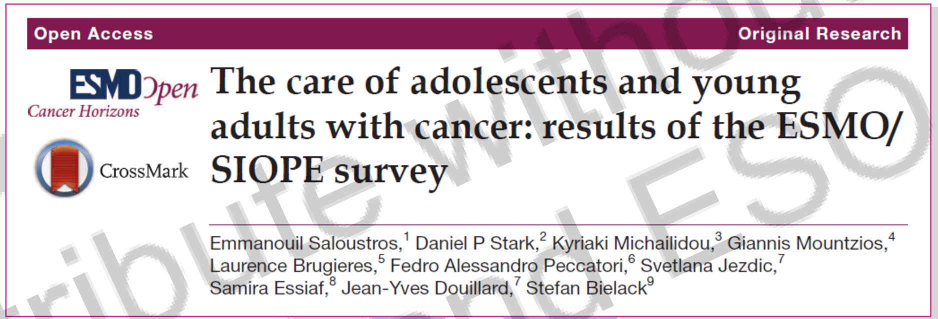
This effort has since evolved, with both international societies recognizing the need to take shared action to influence healthcare policy regarding AYA cancer care and research in Europe by promoting schemes on a national or EU Parliament level.

SIOP-E / ESMO AYA Working Group

Great disparities in AYA cancer care across Europe

One of the first actions taken by the ESMO-SIOPE Working Group was to promote a **survey** describing the training and different practices of European healthcare providers regarding AYAs, and the availability of specialized services for this age group.

The survey revealed a severe under-provision and inequity of specialized cancer care for AYAs across Europe, with over two-thirds of respondents (67%) reporting that their patients had no access to services specifically for AYAs with cancer, or that such services were still not being developed. This figure rose to 87% in Eastern and South-Eastern Europe, while it was 55% and 40% for Western and Northern Europe, respectively



Open Access **Original Research**

ESMO Open Cancer Horizons

CrossMark

The care of adolescents and young adults with cancer: results of the ESMO/SIOPE survey

Emmanouil Saloustros,[1] Daniel P Stark,[2] Kyriaki Michailidou,[3] Giannis Mountzios,[4] Laurence Brugieres,[5] Fedro Alessandro Peccatori,[6] Svetlana Jezdic,[7] Samira Essiaf,[8] Jean-Yves Douillard,[7] Stefan Bielack[9]

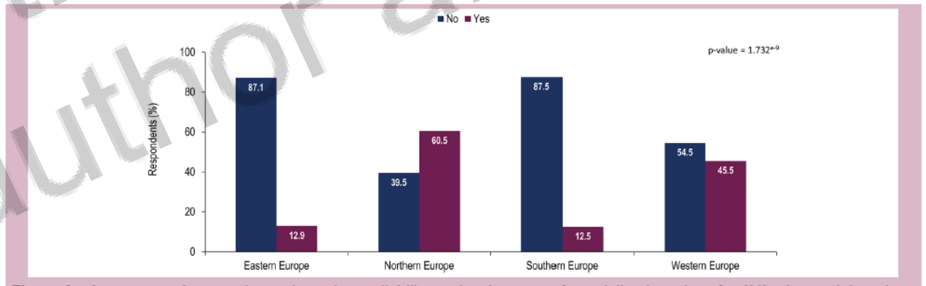


Figure 2 Awareness of respondents about the availability or development of specialised services for AYA where adult and paediatric cancer specialists work together to plan treatment and deliver care.

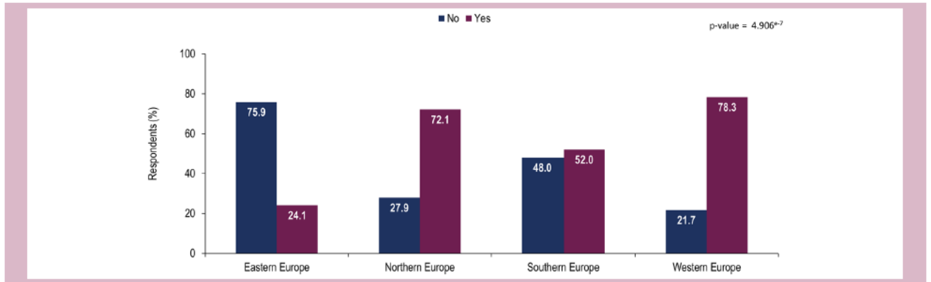


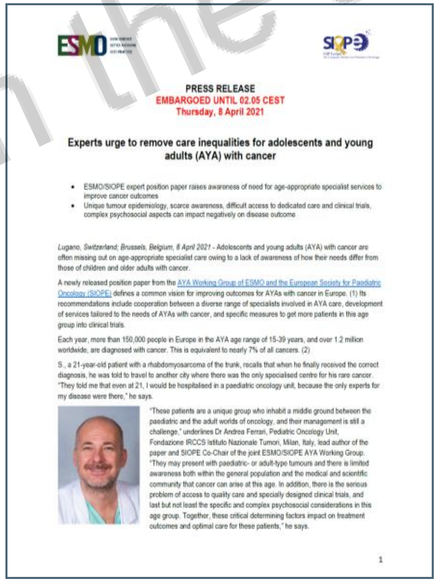
Figure 3 Availability of a fertility specialist providing consultation to adolescents and young adults willing to have children after their cancer treatment at respondent's institution.

SIOP-E / ESMO AYA Working Group

The ESMO-SIOPE Working Group more recently published a **position paper**, which summarizes the challenging aspects of managing AYAs with cancer.

It illustrates the vision shared by the two scientific societies on the subject, and what steps must be taken jointly to deal with the most delicate issues.

The publication of such a position paper becomes an important tool for raising awareness of the need for age-appropriate specialist services to improve cancer outcomes



PRESS RELEASE
EMBARGOED UNTIL 02.05 CEST
Thursday, 8 April 2021

Experts urge to remove care inequalities for adolescents and young adults (AYA) with cancer

- ESMO/SIOPE expert position paper raises awareness of need for age-appropriate specialist services to improve cancer outcomes
- Unique tumour epidemiology, scarce awareness, difficult access to dedicated care and clinical trials, complex psychosocial aspects can impact negatively on disease outcome

Lugano, Switzerland; Brussels, Belgium, 8 April 2021 - Adolescents and young adults (AYA) with cancer are often missing out on age-appropriate specialist care owing to a lack of awareness of how their needs differ from those of children and older adults with cancer.

A newly released position paper from the AYA Working Group of ESMO and the European Society for Paediatric Oncology (SIOPE) defines a common vision for improving outcomes for AYAs with cancer in Europe. (1) Its recommendations include cooperation between a diverse range of specialists involved in AYA care, development of services tailored to the needs of AYAs with cancer, and specific measures to get more patients in this age group into clinical trials.

Each year, more than 150,000 people in Europe in the AYA age range of 15-39 years, and over 1.2 million worldwide, are diagnosed with cancer. This is equivalent to nearly 7% of all cancers. (2)

S., a 21-year-old patient with a rhabdomyosarcoma of the trunk, recalls that when he finally received the correct diagnosis, he was told to travel to another city where there was the only specialised centre for his rare cancer. "They told me that even at 21, I would be hospitalised in a paediatric oncology unit, because the only experts for my disease were there," he says.

"These patients are a unique group who inhabit a middle ground between the paediatric and the adult worlds of oncology, and their management is still a challenge," underlines Dr Andrea Ferrari, Pediatric Oncology Unit, Fondazione IRCCS Istituto Nazionale Tumori, Milan, Italy, lead author of the paper and SIOPE Co-Chair of the joint ESMO/SIOPE AYA Working Group. "They may present with paediatric- or adult-type tumours and there is limited awareness both within the general population and the medical and scientific community that cancer can arise at this age. In addition, there is the serious problem of access to quality care and specially designed clinical trials, and last but not least the specific and complex psychosocial considerations in this age group. Together, these critical determining factors impact on treatment outcomes and optimal care for these patients," he says.

1

GOOD SCIENCE
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ESMO OPEN CANCER HORIZONS

REVIEW

Adolescents and young adults (AYA) with cancer: a position paper from the AYA Working Group of the European Society for Medical Oncology (ESMO) and the European Society for Paediatric Oncology (SIOPE)

A. Ferrari[1*†‡], **D. Stark**[2*†‡], **F. A. Peccatori**[3], **L. Fern**[4], **V. Laurence**[5], **N. Gaspar**[6], **I. Bozovic-Spasojevic**[7], **O. Smith**[8], **J. De Munter**[9], **K. Derwich**[10], **L. Hjorth**[11], **W. T. A. van der Graaf**[12], **L. Soanes**[13], **S. Jezdic**[14], **A. Blondeel**[15], **S. Bielack**[16], **J.-Y. Douillard**[14], **G. Mountzios**[17] & **E. Saloustros**[18†]

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It is well recognised that adolescents and young adults (AYA) with cancer have inequitable access to oncology services that provide expert cancer care and consider their unique needs. Subsequently, survival gains in this patient population have improved only modestly compared with older adults and children with cancer. In 2015, the European Society for Medical Oncology (ESMO) and the European Society for Paediatric Oncology (SIOPE) established the joint Cancer in AYA Working Group in order to increase awareness among adult and paediatric oncology communities, enhance knowledge on specific issues in AYA and ultimately improve the standard of care for AYA with cancer across Europe. This manuscript reflects the position of this working group regarding current AYA cancer care, the challenges to be addressed and possible solutions. Key challenges include the lack of specific biological understanding of AYA cancers, the lack of access to specialised centres with age-appropriate multidisciplinary care and the lack of available clinical trials with novel therapeutics. Key recommendations include diversifying interprofessional cooperation in AYA care and specific measures to improve trial accrual, including centralising care where that is the best means to achieve trial accrual. This defines a common vision that can lead to improved outcomes for AYA with cancer in Europe.

Key words: adolescents and young adults, cancer, clinical trials, education, interdisciplinary

INTRODUCTION

In recent years, the specific challenges related to the management of adolescents and young adults (AYA) with cancer are increasingly well recognised.[1] These challenges include inequitable access to oncology services which provide expert cancer care and consider their unique needs as AYA. In addition, the complex psychological, social and financial impact of a cancer diagnosis during a period of rapid physiological, personal and psychological growth affects well-being in significant ways.[2] Consequently, survival gains have improved only modestly compared with adult and childhood cancers.[3]

The challenges of appropriate models of care for AYA with cancer have been appreciated by the scientific community[4] and it is now well documented that traditional health care models do not meet the unique needs of AYA.[5,6]

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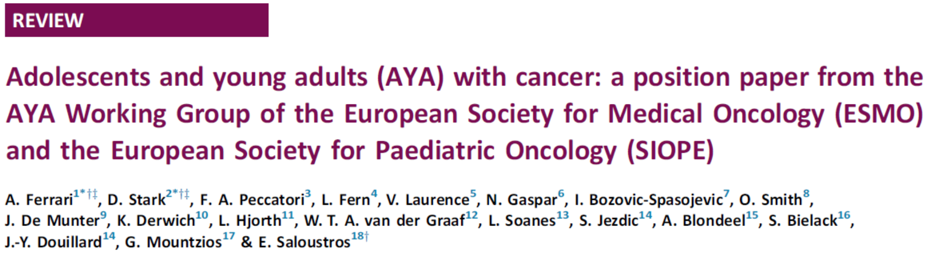
E-mail: education@esmo.org; office@siope.eu (A. Ferrari and D. Stark).

† Contributed equally.
‡ Co-primary authors.

https://doi.org/10.1016/j.esmoop.2021.100096

SIOP-E / ESMO AYA Working Group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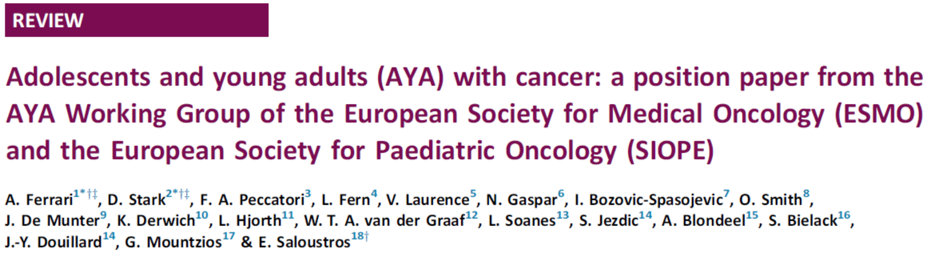
Two main areas:

1. The access to clinical trials
2. The definition of the minimal essential requirements for AYA centers

SIOP-E / ESMO AYA Working Group



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Two main areas:

1. **The access to clinical trials**
2. The definition of the minimal essential requirements for AYA centers

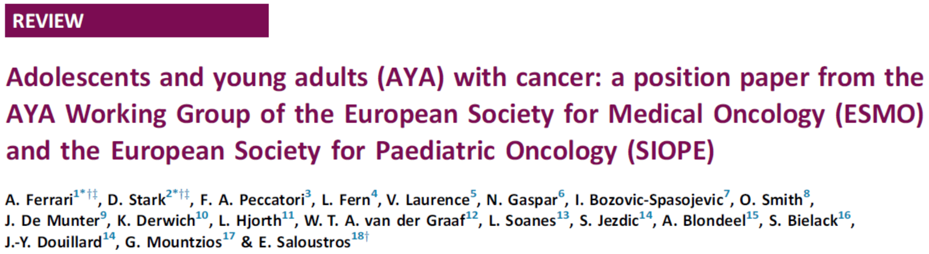
A multifaceted strategy

- trial design driven by drug mechanism-of-action (rather than eligibility driven by cancer type or age)
- inclusion of adolescents in early phase I/II clinical trials from puberty
- inclusion of young adults in paediatric protocols for paediatric-type malignancies
- encourage multicentre and paed/adult cooperation, reducing competing protocols
- raise awareness (public and health care professionals) of the importance of clinical trial entry for AYA
- engage AYA patients in the design of research projects

Available, accessible, aware, appropriate, and acceptable: a strategy to improve participation of teenagers and young adults in cancer trials

Lorna A Fern, Jennifer A Lewandowski, Katy M Coxon, Jeremy Whelan, for the National Cancer Research Institute Teenage and Young Adult Clinical Studies Group, UK

SIOP-E / ESMO AYA Working Group



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Two main areas:

1. The access to clinical trials
2. **The definition of the minimal essential requirements for AYA centers**

- sustainable programmes for AYA, with strong referral pathways and standards of care from the clinical, patient and health care authorities' position
- a large multidisciplinary team with professionals from different clinical disciplines; and the involvement of both paediatric and adult medical oncologists/haematologists

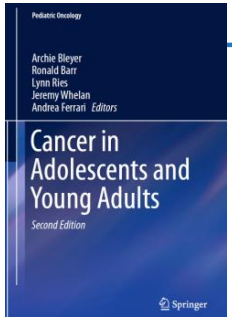
  involvement of wider professional age-specific skills: mental health specialists; clinical nurse specialists; clinical trial managers; palliative care specialists; social workers; physiotherapists; occupational therapists; experts in nutrition, fertility and sexuality; youth workers

  Special **staff training** and continuous professional education
- clinical trial availability and disease expertise for the variety of tumour types
- flexible age ranges for access to AYA care
- age-specific environment designed around AYA needs (e.g. access to peers, provision of social/arts activities, education, etc)
- age-appropriate psychosocial support
- genetic counselling and testing

- fertility preservation
- late effect/survivorship clinics
- primary health care engagement
- transition programmes
- age-specific palliative care services

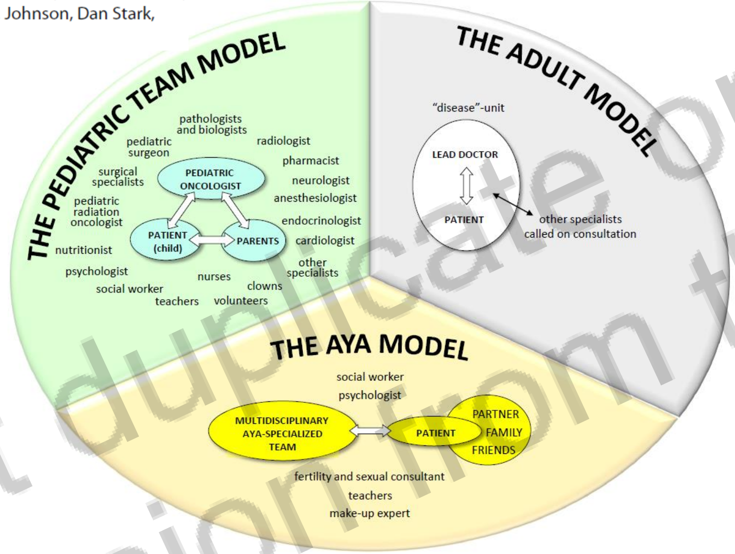
SIOP-E / ESMO AYA Working Group

Need for **holistic approach**


Pediatric Oncology
Archie Bleyer
Ronald Barr
Lynn Ries
Jeremy Whelan
Andrea Ferrari *Editors*
Cancer in Adolescents and Young Adults
Second Edition
Springer

Access and Models of Care

Andrea Ferrari, Karen Albritton, Michael Osborn, Ronald Barr, Rebecca H. Johnson, Dan Stark, and Jeremy Whelan



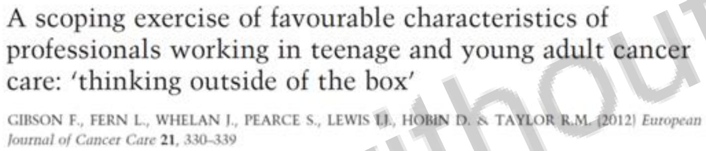
- Complex **communication** challenges, shared decision-making, compliance and treatment adherence
- Give young people "**voice and choice**"; importance of partnership with patients advocates

- sustainable programmes for AYA, with strong referral pathways and standards of care from the clinical, patient and health care authorities' position
- a large multidisciplinary team with professionals from different clinical disciplines; and the involvement of both paediatric and adult medical oncologists/haematologists
    - involvement of wider professional age-specific skills: mental health specialists; clinical nurse specialists; clinical trial managers; palliative care specialists; social workers; physiotherapists; occupational therapists; experts in nutrition, fertility and sexuality; youth workers
- clinical trial availability and disease expertise for the variety of tumour types
- flexible age ranges for access to AYA care

- age-specific environment designed around AYA needs (e.g. access to peers, provision of social/arts activities, education, etc)
- age-appropriate psychosocial support
- genetic counselling and testing

- fertility preservation
- late effect/survivorship clinics
- primary health care engagement
- transition programmes
- age-specific palliative care services (hard adjustment to short life expectancy)

SIOP-E / ESMO AYA Working Group

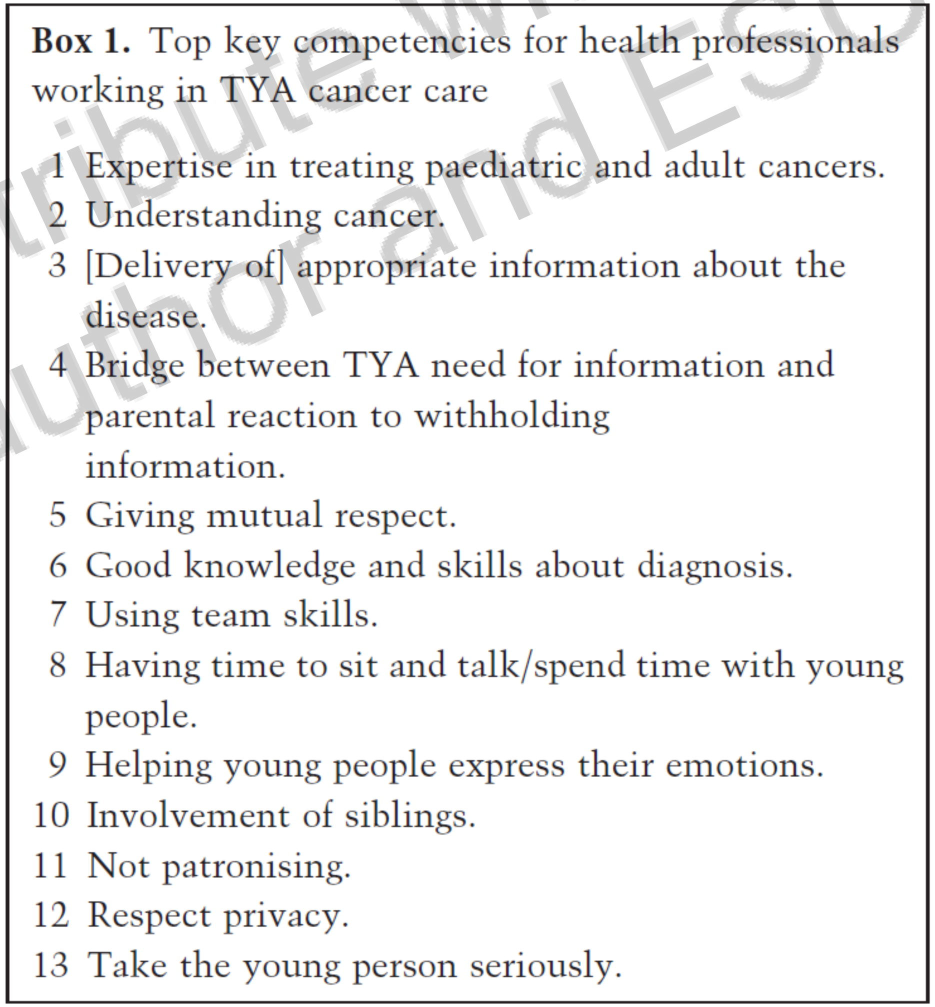


A scoping exercise of favourable characteristics of professionals working in teenage and young adult cancer care: 'thinking outside of the box'

GIBSON F., FERN L., WHELAN J., PEARCE S., LEWIS I.J., HOBIN D. & TAYLOR R.M. (2012) *European Journal of Cancer Care* **21**, 330–339

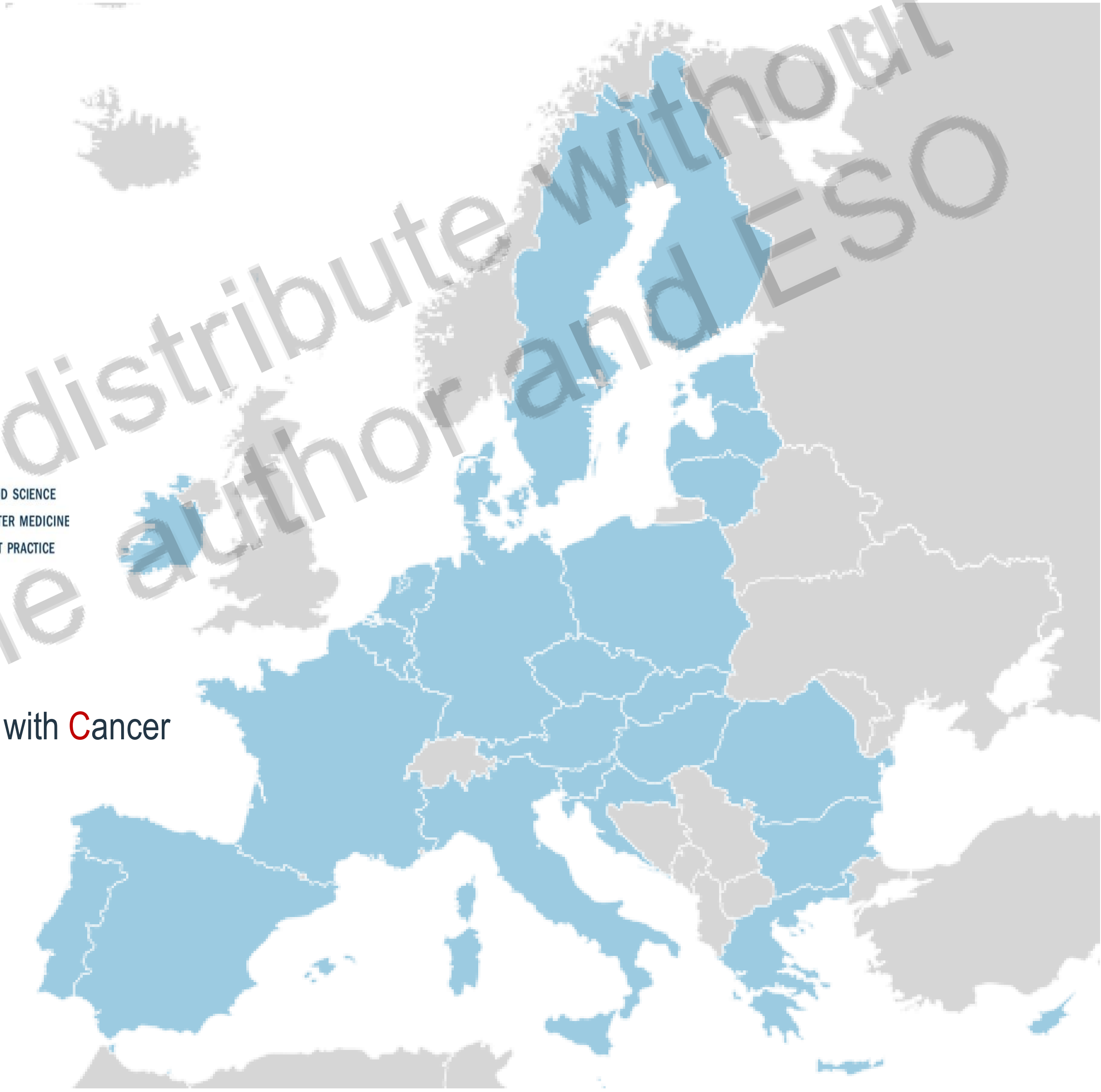
Need for **holistic approach**

"We have learned from our patients that there comes a time when clinical trials are not enough: there are other things – hidden smiles and laughs, eyes brimming with tears, eyes that make contact, silences, scribbled notes, a vibrating smartphone, the touch of a hand, little lies and tremendous truths – that we cannot leave to others"



Box 1. Top key competencies for health professionals working in TYA cancer care

1 Expertise in treating paediatric and adult cancers.
2 Understanding cancer.
3 [Delivery of] appropriate information about the disease.
4 Bridge between TYA need for information and parental reaction to withholding information.
5 Giving mutual respect.
6 Good knowledge and skills about diagnosis.
7 Using team skills.
8 Having time to sit and talk/spend time with young people.
9 Helping young people express their emotions.
10 Involvement of siblings.
11 Not patronising.
12 Respect privacy.
13 Take the young person seriously.



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3 **ENTYAC - European Network for Teenagers and Young Adults with Cancer**

ENTYAC - European Network for Teenagers and Young Adults with Cancer

Wider engagement, a sort of federation where existing health care professional societies, national AYA professional groups, Non-Governmental Organisations (patients, advocates and their families) that have a stake in AYA cancer can co-operate and grow

Dedicated working groups of scientific societies

SIOP Europe
the European Society for Paediatric Oncology

ESMO GOOD SCIENCE BETTER MEDICINE BEST PRACTICE

EUROPEAN ONCOLOGY NURSING SOCIETY

EHA EUROPEAN HEMATOLOGY ASSOCIATION

National AYA groups

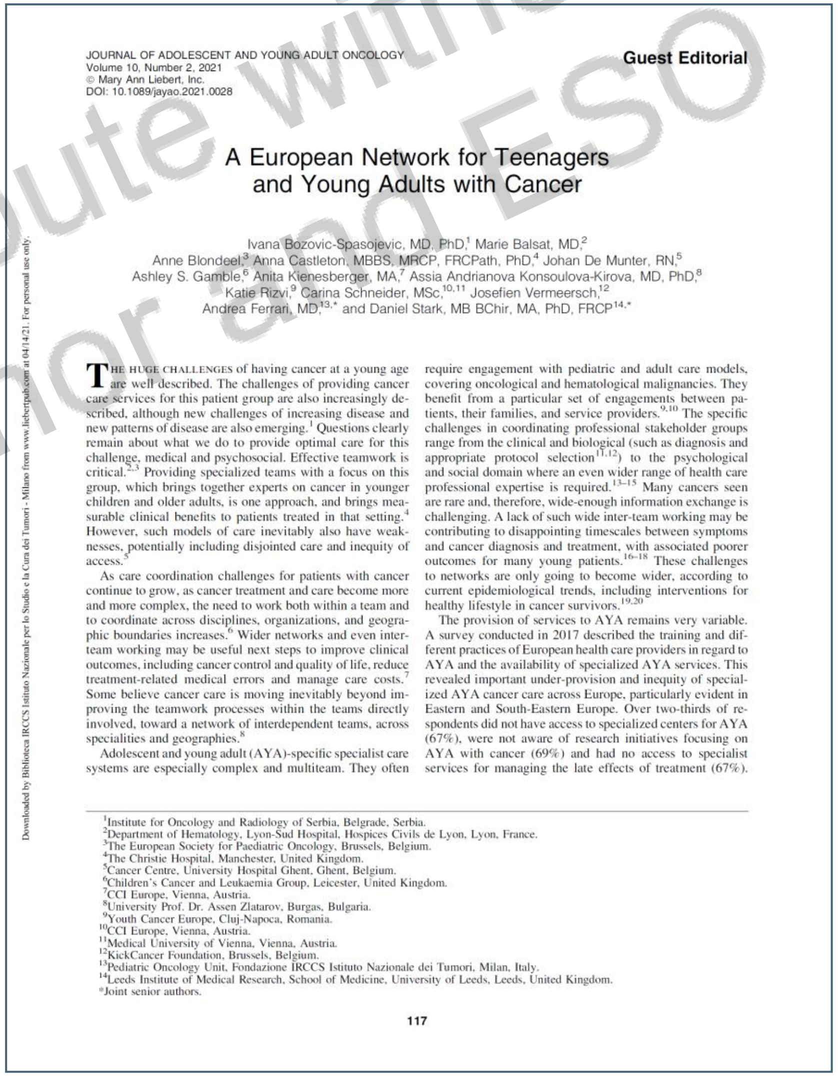
from UK, France, Italy, Spain, the Netherlands, etc

Stakeholders

Childhood Cancer International EUROPE

YOUTH CANCER EUROPE

TEENAGE CANCER TRUST



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Guest Editorial

A European Network for Teenagers and Young Adults with Cancer

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Anne Blondeel,[3] Anna Castleton, MBBS, MRCP, FRCPath, PhD,[4] Johan De Munter, RN,[5]
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Katie Rizvi,[9] Carina Schneider, MSc,[10,11] Josefien Vermeersch,[12]
Andrea Ferrari, MD,[13,*] and Daniel Stark, MB BChir, MA, PhD, FRCP[14,*]

THE HUGE CHALLENGES of having cancer at a young age are well described. The challenges of providing cancer care services for this patient group are also increasingly described, although new challenges of increasing disease and new patterns of disease are also emerging.[1] Questions clearly remain about what we do to provide optimal care for this challenge, medical and psychosocial. Effective teamwork is critical.[2,3] Providing specialized teams with a focus on this group, which brings together experts on cancer in younger children and older adults, is one approach, and brings measurable clinical benefits to patients treated in that setting.[4] However, such models of care inevitably also have weaknesses, potentially including disjointed care and inequity of access.[5]

As care coordination challenges for patients with cancer continue to grow, as cancer treatment and care become more and more complex, the need to work both within a team and to coordinate across disciplines, organizations, and geographic boundaries increases.[6] Wider networks and even inter-team working may be useful next steps to improve clinical outcomes, including cancer control and quality of life, reduce treatment-related medical errors and manage care costs.[7] Some believe cancer care is moving inevitably beyond improving the teamwork processes within the teams directly involved, toward a network of interdependent teams, across specialities and geographies.[8]

Adolescent and young adult (AYA)-specific specialist care systems are especially complex and multiteam. They often require engagement with pediatric and adult care models, covering oncological and hematological malignancies. They benefit from a particular set of engagements between patients, their families, and service providers.[9,10] The specific challenges in coordinating professional stakeholder groups range from the clinical and biological (such as diagnosis and appropriate protocol selection[11,12]) to the psychological and social domain where an even wider range of health care professional expertise is required.[13–15] Many cancers seen are rare and, therefore, wide-enough information exchange is challenging. A lack of such wide inter-team working may be contributing to disappointing timescales between symptoms and cancer diagnosis and treatment, with associated poorer outcomes for many young patients.[16–18] These challenges to networks are only going to become wider, according to current epidemiological trends, including interventions for healthy lifestyle in cancer survivors.[19,20]

The provision of services to AYA remains very variable. A survey conducted in 2017 described the training and different practices of European health care providers in regard to AYA and the availability of specialized AYA services. This revealed important under-provision and inequity of specialized AYA cancer care across Europe, particularly evident in Eastern and South-Eastern Europe. Over two-thirds of respondents did not have access to specialized centers for AYA (67%), were not aware of research initiatives focusing on AYA with cancer (69%) and had no access to specialist services for managing the late effects of treatment (67%).

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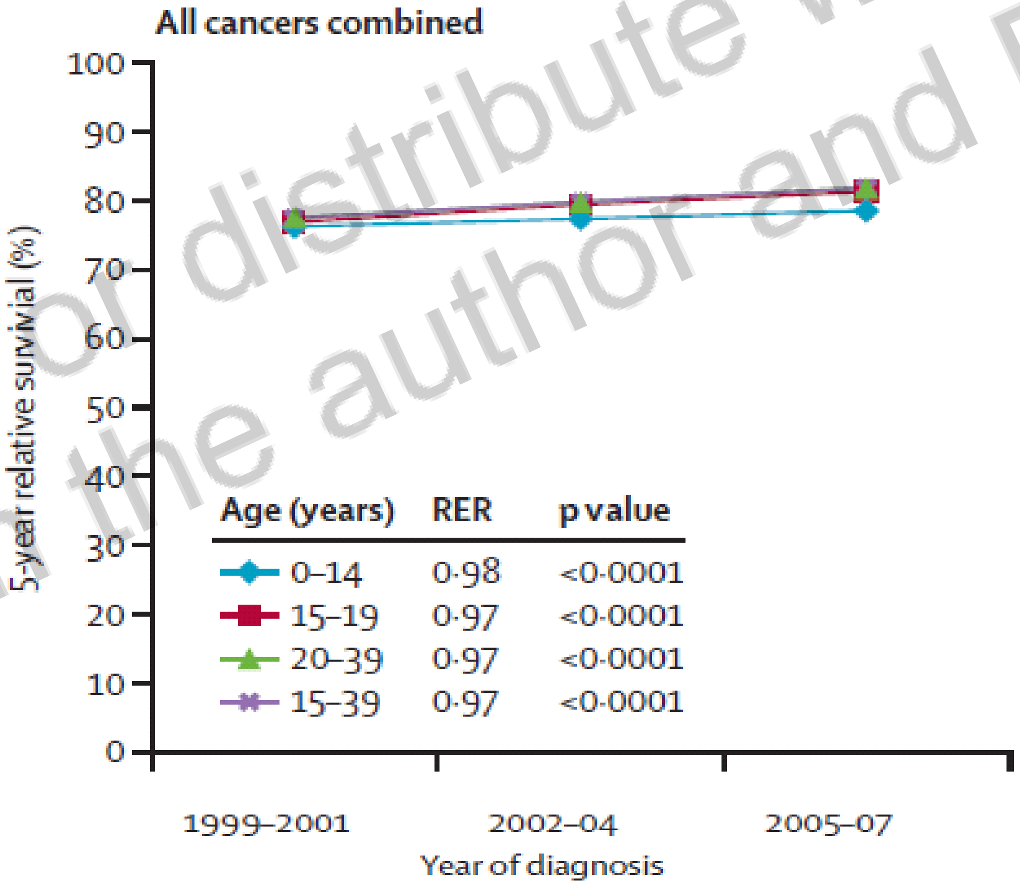
Survivorship

AYA cancer survival is increasing



Age (years)	RER	p value
◆ 0–14	0·98	<0·0001
■ 15–19	0·97	<0·0001
▲ 20–39	0·97	<0·0001
✱ 15–39	0·97	<0·0001

Long-term Risk of Hospitalization for Somatic Diseases in Survivors of Adolescent or Young Adult Cancer

Kathrine Rugbjerg, PhD; Jørgen H. Olsen, MD, DMSc

IMPORTANCE Survivors of adolescent and young adult cancers are at risk for treatment-induced late adverse effects; however, to our knowledge, the long-term risk of hospitalization in this specific group of cancer survivors has not been thoroughly evaluated.

OBJECTIVE To examine relative and absolute excess risk for hospitalizations up to 34 years after diagnosis of adolescent and young adult cancer compared with population comparisons.

DESIGN, SETTING, AND PARTICIPANTS This was a cohort study, conducted in Denmark, of 33 555 five-year survivors of adolescent or young adult cancer, diagnosed from 1943 through 2004, when they were 15 to 39 years of age, and 228 447 population comparisons, matched to the survivors by sex and year of birth.

MAIN OUTCOMES AND MEASURES Cancer survivors and comparisons were followed up for hospitalizations in the Danish Patient Register through December 2010. Standardized hospitalization rate ratios (RRs) and absolute excess risks (AERs) were calculated.

RESULTS After a median follow-up of 14 years, we identified 53 032 hospitalizations in cancer survivors, whereas 38 423 were expected, resulting in an overall RR of 1.38 (95% CI, 1.37-1.39). The data analysis was started in January 2015 and ended in June 2015. Additional data analyses requested by the reviewers were conducted in August 2015. The highest risks were found for the main diagnostic groups of diseases of blood and blood-forming organs (RR, 2.00; 95% CI, 1.87-2.14), infectious and parasitic diseases (RR, 1.69; 95% CI, 1.61-1.77), and malignant neoplasms (RR, 1.63; 95% CI, 1.59-1.68). The overall AER was 2803 (95% CI, 2712-2893) per 100 000 person-years; the highest AERs were found for malignant neoplasms, diseases of digestive organs, and diseases of the circulatory system (18%, 15%, and 14% of total AER, respectively). Survivors of the 10 most common cancers in adolescents and young adults were at significantly increased risk for diseases in the 12 main diagnostic groups. The highest risks were those of survivors of leukemia (RR, 2.21; 95% CI, 2.02-2.42), brain cancer (RR, 1.93; 95% CI, 1.86-2.00), and Hodgkin lymphoma (RR, 1.87; 95% CI, 1.80-1.94).

CONCLUSIONS AND RELEVANCE The large number of survivors and the use of hospital discharge diagnoses made it possible to draw a comprehensive picture of the complex inpatient disease burden experienced by survivors of adolescent and young adult cancer. The findings underscore a great diversity of cancer-related health problems that physicians and patients should be knowledgeable about.

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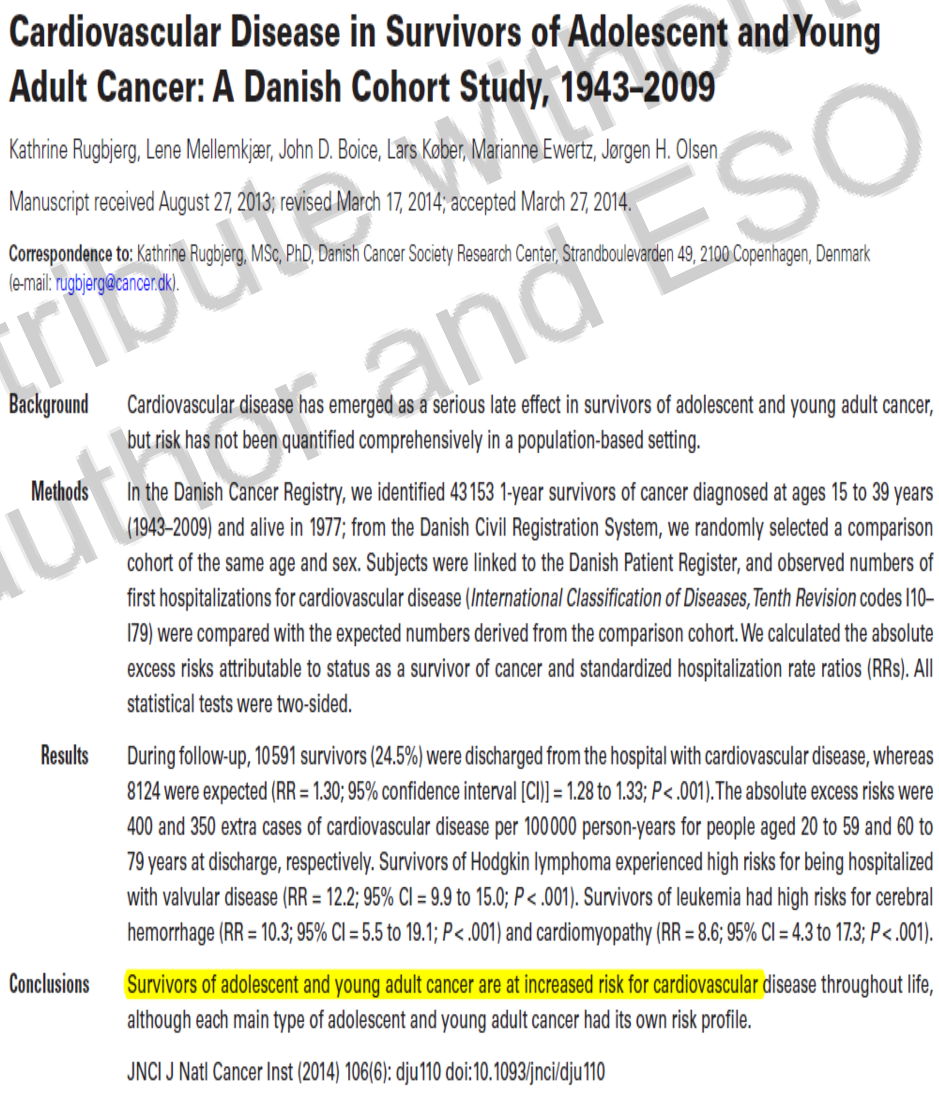

Cardiovascular Disease in Survivors of Adolescent and Young Adult Cancer: A Danish Cohort Study, 1943–2009

Kathrine Rugbjerg, Lene Mellemkjær, John D. Boice, Lars Køber, Marianne Ewertz, Jørgen H. Olsen

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Background Cardiovascular disease has emerged as a serious late effect in survivors of adolescent and young adult cancer, but risk has not been quantified comprehensively in a population-based setting.

Methods In the Danish Cancer Registry, we identified 43 153 1-year survivors of cancer diagnosed at ages 15 to 39 years (1943–2009) and alive in 1977; from the Danish Civil Registration System, we randomly selected a comparison cohort of the same age and sex. Subjects were linked to the Danish Patient Register, and observed numbers of first hospitalizations for cardiovascular disease (*International Classification of Diseases, Tenth Revision* codes I10–I79) were compared with the expected numbers derived from the comparison cohort. We calculated the absolute excess risks attributable to status as a survivor of cancer and standardized hospitalization rate ratios (RRs). All statistical tests were two-sided.

Results During follow-up, 10 591 survivors (24.5%) were discharged from the hospital with cardiovascular disease, whereas 8124 were expected (RR = 1.30; 95% confidence interval [CI]) = 1.28 to 1.33; $P < .001$). The absolute excess risks were 400 and 350 extra cases of cardiovascular disease per 100 000 person-years for people aged 20 to 59 and 60 to 79 years at discharge, respectively. Survivors of Hodgkin lymphoma experienced high risks for being hospitalized with valvular disease (RR = 12.2; 95% CI = 9.9 to 15.0; $P < .001$). Survivors of leukemia had high risks for cerebral hemorrhage (RR = 10.3; 95% CI = 5.5 to 19.1; $P < .001$) and cardiomyopathy (RR = 8.6; 95% CI = 4.3 to 17.3; $P < .001$).

Conclusions Survivors of adolescent and young adult cancer are at increased risk for cardiovascular disease throughout life, although each main type of adolescent and young adult cancer had its own risk profile.

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Risk of subsequent primary neoplasms in survivors of adolescent and young adult cancer (Teenage and Young Adult Cancer Survivor Study): a population-based, cohort study

Chloe J Bright, Raoul C Reulen, David L Winter, Daniel P Stark, Martin G McCabe, Angela B Edgar, Clare Frobisher, Michael M Hawkins

Summary

Background Few studies have investigated the risks of subsequent primary neoplasms after adolescent and young adult (AYA) cancer. We investigated the risks of specific subsequent primary neoplasms after each of 16 types of AYA cancer.

Methods The Teenage and Young Adult Cancer Survivor Study is a population-based cohort of 200 945 survivors of cancer diagnosed when aged 15–39 years in England and Wales from Jan 1, 1971, to Dec 31, 2006. The cohort was established using cancer registrations from the Office for National Statistics and the Welsh Cancer registry. Follow-up was from 5-year survival until the first occurrence of death, emigration, or study end date (Dec 31, 2012). In this analysis, we focus on the risk of specific subsequent primary neoplasms after 16 types of AYA cancer: breast; cervical; testicular; Hodgkin lymphoma (female); Hodgkin lymphoma (male); melanoma; CNS (intracranial); colorectal; non-Hodgkin lymphoma; thyroid; soft-tissue sarcoma; ovarian; bladder; other female genital; leukaemia; and head and neck cancer. We report absolute excess risks (AERs; per 10 000 person-years) and cumulative incidence of specific types of subsequent primary neoplasm after each type of AYA cancer.

Findings During the 2 631 326 person-years of follow-up (median follow-up 16·8 years, IQR 10·5–25·2), 12 321 subsequent primary neoplasms were diagnosed in 11 565 survivors, most frequently among survivors of breast cancer, cervical cancer, testicular cancer, and Hodgkin lymphoma. AERs of any subsequent primary neoplasms were 19·5 per 10 000 person-years (95% CI 17·4–21·5) in survivors of breast cancer, 10·2 (8·0–12·4) in survivors of cervical cancer, 18·9 (16·6–21·1) in survivors of testicular cancer, 55·7 (50·4–61·1) in female survivors of Hodgkin lymphoma, and 29·9 (26·3–33·6) in male survivors of Hodgkin lymphoma. The cumulative incidence of all subsequent primary neoplasms 35 years after diagnosis was 11·9% (95% CI 11·3–12·6) in survivors of breast cancer, 15·8% (14·8–16·7) in survivors of cervical cancer, 20·2% (18·9–21·5) in survivors of testicular cancer, 26·6% (24·7–28·6) in female survivors of Hodgkin lymphoma, and 16·5% (15·2–18·0) in male survivors of Hodgkin lymphoma. In patients who had survived at least 30 years from diagnosis of cervical cancer, testicular cancer, Hodgkin lymphoma in women, breast cancer, and Hodgkin lymphoma in men, we identified a small number of specific subsequent primary neoplasms that account for 82%, 61%, 58%, 45%, and 41% of the total excess number of neoplasms, respectively. Lung cancer accounted for a notable proportion of the excess number of neoplasms across all AYA groups investigated.

Interpretation Our finding that a small number of specific subsequent primary neoplasms account for a large percentage of the total excess number of neoplasms in long-term survivors of cervical, breast, and testicular cancer, and Hodgkin lymphoma provides an evidence base to inform priorities for clinical long-term follow-up. The prominence of lung cancer after each of these AYA cancers indicates the need for further work aimed at preventing and reducing the burden of this cancer in future survivors of AYA cancer.

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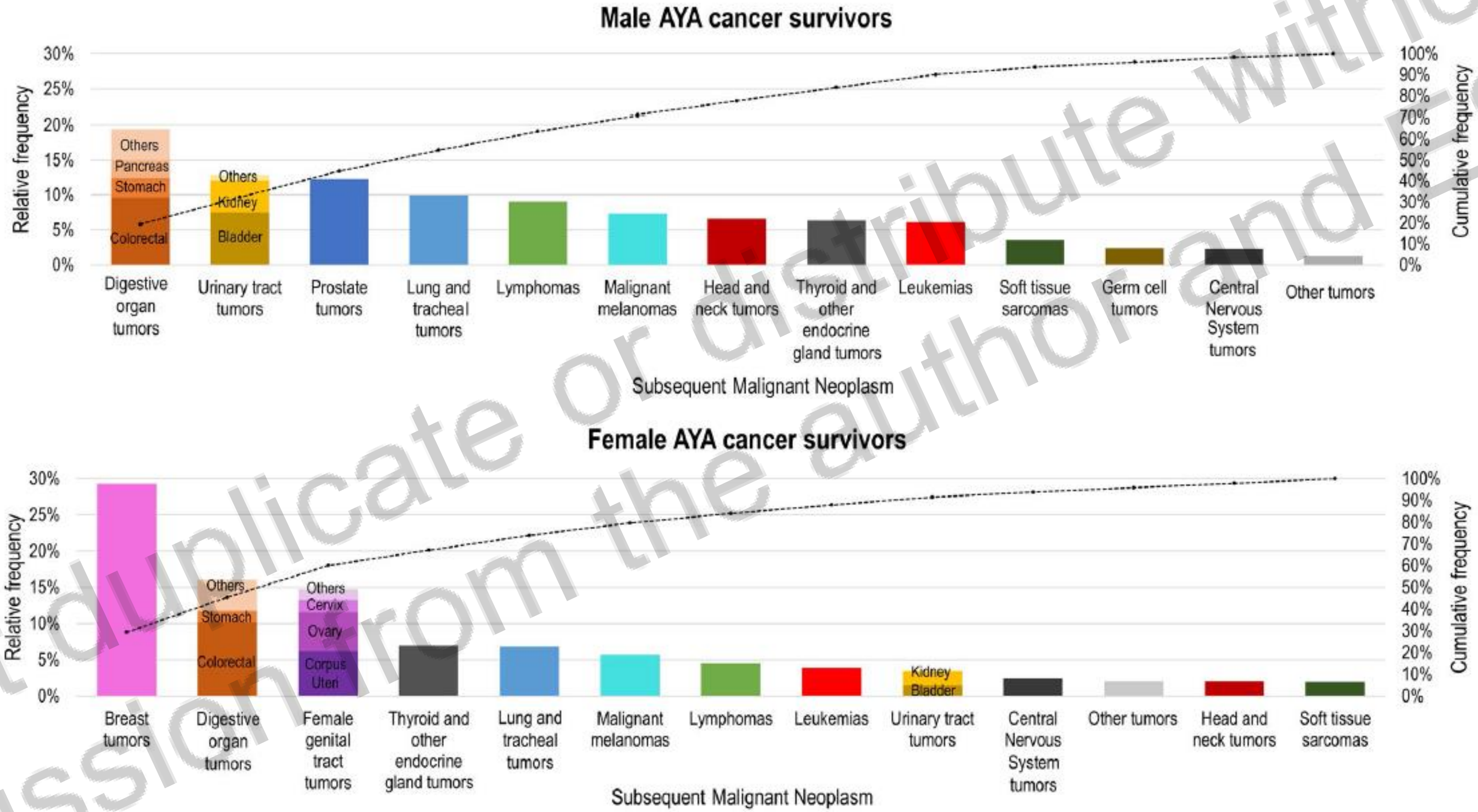

Figure 2. Contributions (relative frequencies) of second malignant neoplasm types to the 25-year cumulative incidence by sex. AYA indicates adolescent and young adult.

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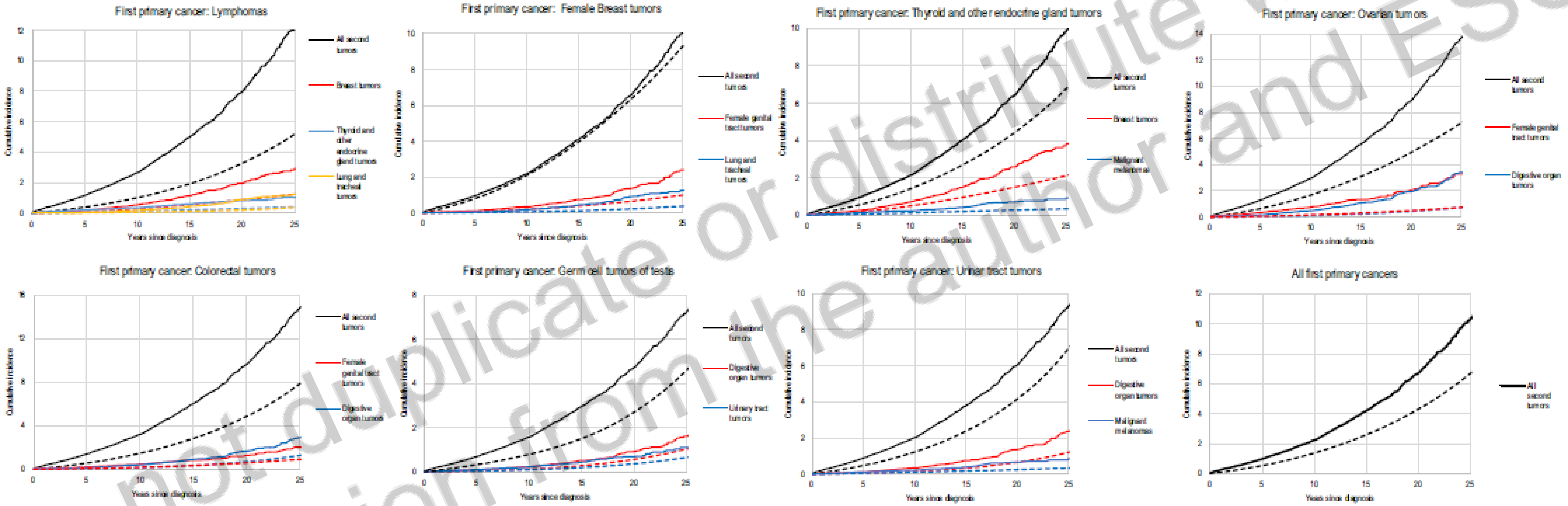

Figure 1. Observed cumulative incidences (solid lines) and expected cumulative incidences (dashed lines) of all subsequent malignant neoplasms and specific subsequent malignant neoplasms in survivors of adolescent and young adult cancer for first primary cancers overall and by specific primary cancer.

Thank you very much for your attention