Cancer Survivorship: Cardiovascular Risks, Challenges and Opportunities

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Disclosures

Alexander R. Lyon

Speaker, advisory board or consultancy fees and/or research grants:

JNJ, Philips, Pfizer, Novartis, Servier, Astra Zeneca, Bristol Myers Squibb, GSK, Amgen, Takeda, Roche, Janssens-Cilag Ltd, Clinigen Group, Eli Lily, Eisai Ltd, Ferring Pharmaceuticals, Boehringer Ingelheim, Nordic Pharma, Aktiia, Akcea Therapeutics, Myocardial Solutions, iOWNA Health, Heartfelt Technologies Ltd, EpicLife and ARMA Biosciences.

Cancer and Cardiovascular Disease

ESC European Society of Cardiology
European Heart Journal (2022) 00, 1–133
https://doi.org/10.1093/eurheartj/ehac244

ESC GUIDELINES

2022 ESC Guidelines on cardio-oncology developed in collaboration with the European Hematology Association (EHA), the European Society for Therapeutic Radiology and Oncology (ESTRO) and the International Cardio-Oncology Society (IC-OS)

Developed by the task force on cardio-oncology of the European Society of Cardiology (ESC)

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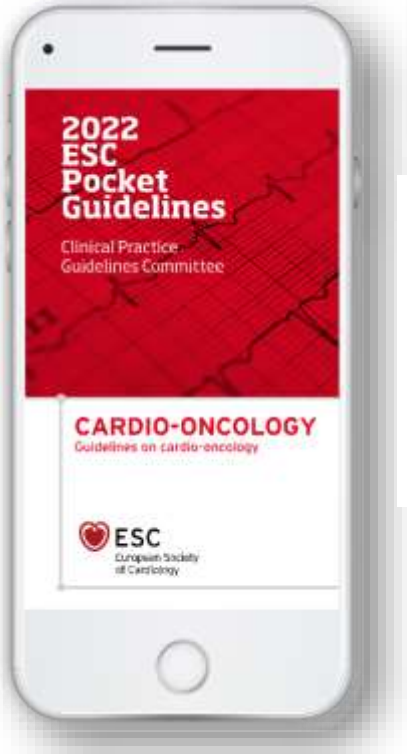
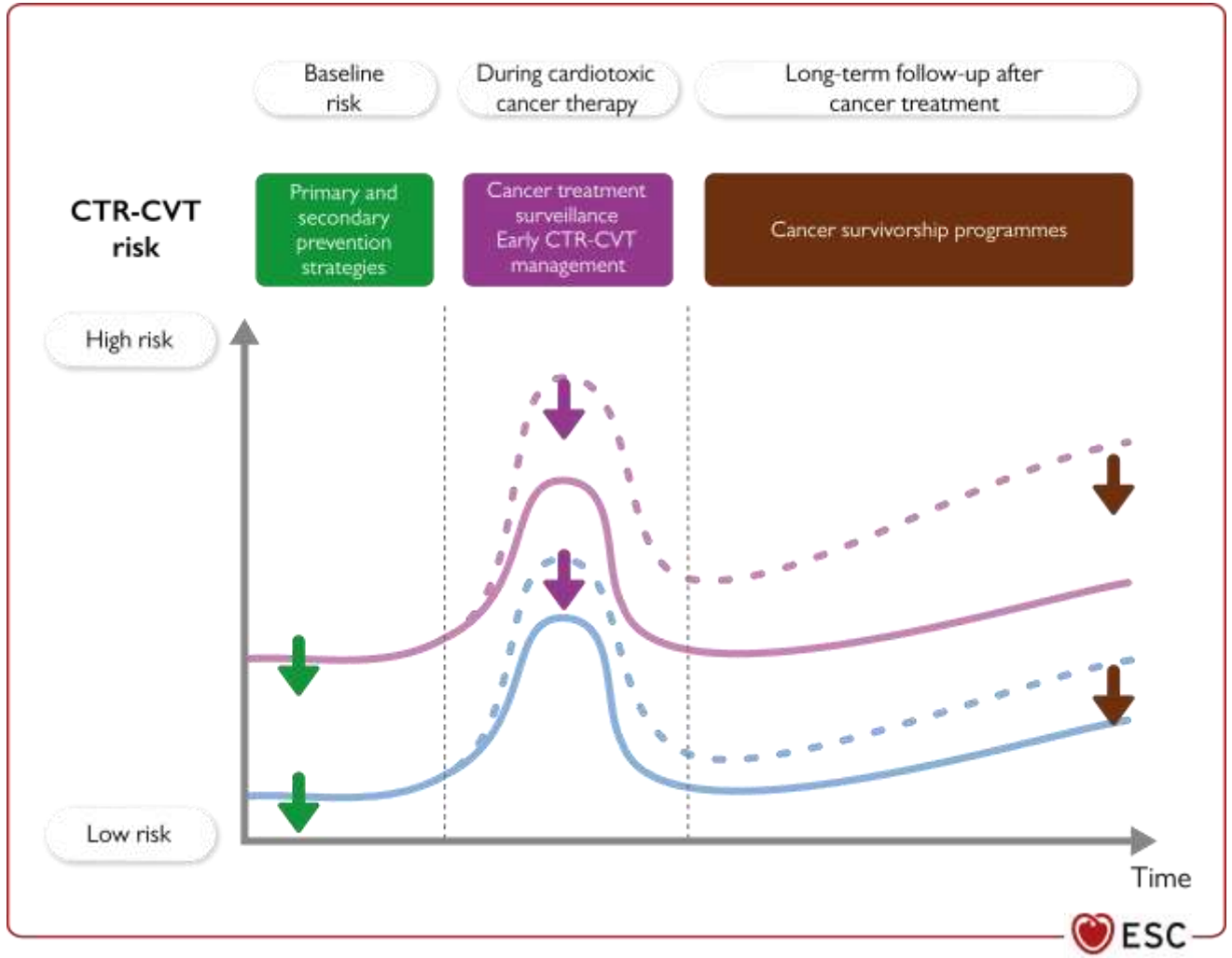


2022 ESC guidelines on Cardio-Oncology *European Heart Journal*, doi.org/10.1093/eurheartj/ehac244

Dynamics of cardiovascular toxicity risk in cancer patients during their cancer therapy and follow up



Lyon AR, Lopez-Fernandez T et al EHJ 2022 Nov 1;43(41):4229-4361

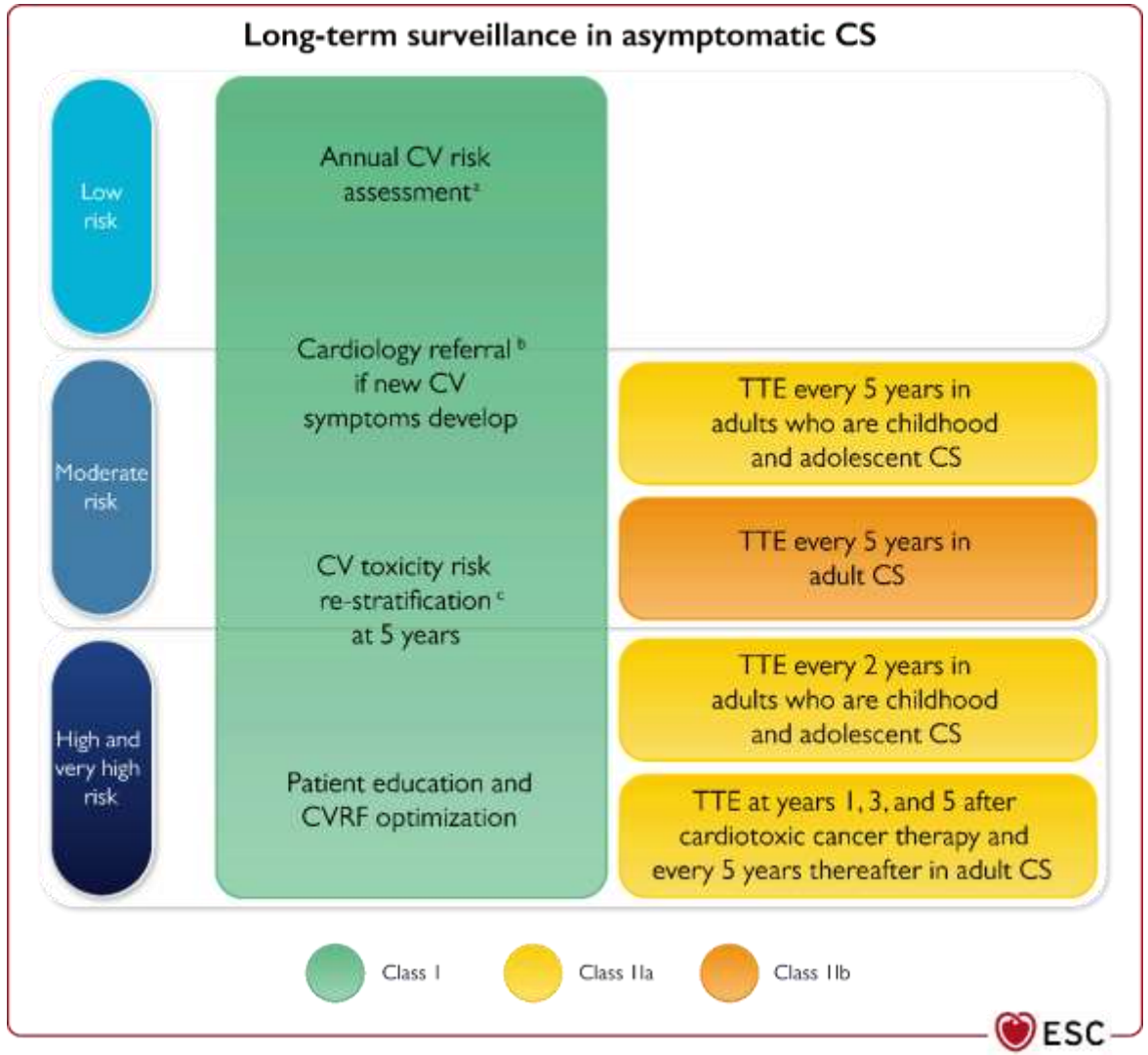
Long term surveillance in asymptomatic cancer survivors

Risk categories for asymptomatic adults who are childhood and adolescent cancer survivors

Risk category	RT dose (Gy MHD)	Total cumulative doxorubicin dose (mg/m²)	Combination therapy	
			RT dose (Gy MHD)	Total cumulative doxorubicin dose (mg/m²)
Very high risk	>25	≥400	>15	≥100
High risk	>15 to 25	250–399	5–15	≥100
Moderate risk	5–15	100–249	<5	≥100
Low risk	<5	<100	-	

Risk categories for asymptomatic adult cancer survivors

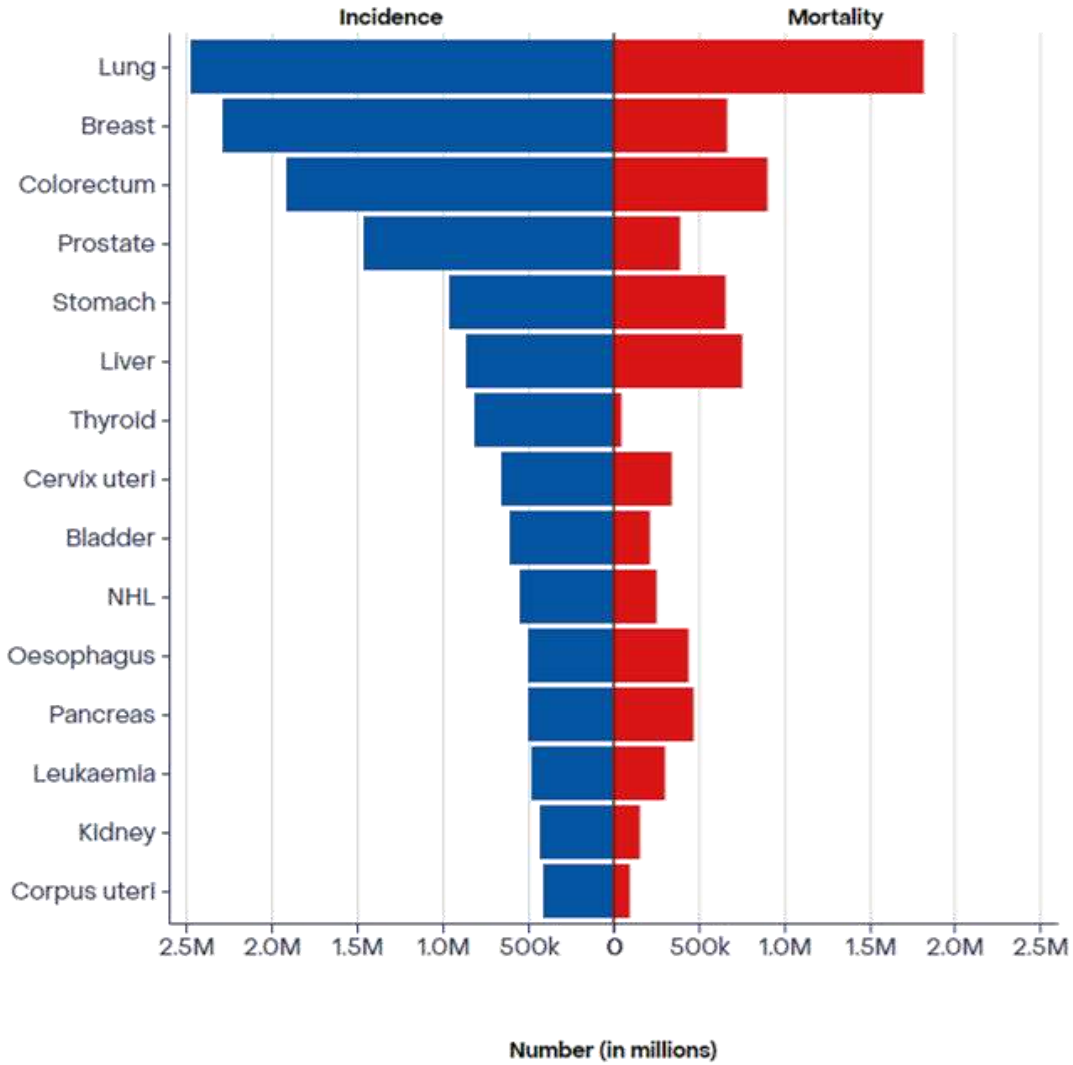
Risk category	Patient characteristics
Very high risk	• Very high baseline CV toxicity risk pre-treatment • Doxorubicin ≥400 mg/m² • RT >25 Gy MHD • RT >15 to 25 Gy MHD + doxorubicin ≥100 mg/m²
Early high risk (<5 years after therapy)	• High baseline CV toxicity risk • Symptomatic or asymptomatic moderate-to-severe CTRCD during treatment • Doxorubicin 250–399 mg/m² • High-risk HSCT
Late high risk	• RT >15 to 25 Gy MHD • RT 5–15 Gy MHD + doxorubicin ≥100 mg/m² • Poorly-controlled CVRF
Risk category	**Patient characteristics**
Moderate risk	• Moderate baseline CV toxicity risk • Doxorubicin 100–249 mg/m² • RT 5–15 Gy MHD • RT<5 Gy MHD + doxorubicin ≥100 mg/m²
Low risk	• Low baseline CV toxicity risk and normal end-of-therapy cardiac assessment • Mild CTRCD during therapy but recovered by the end of cancer therapy • RT <5 Gy MHD • Doxorubicin <100 mg/m²

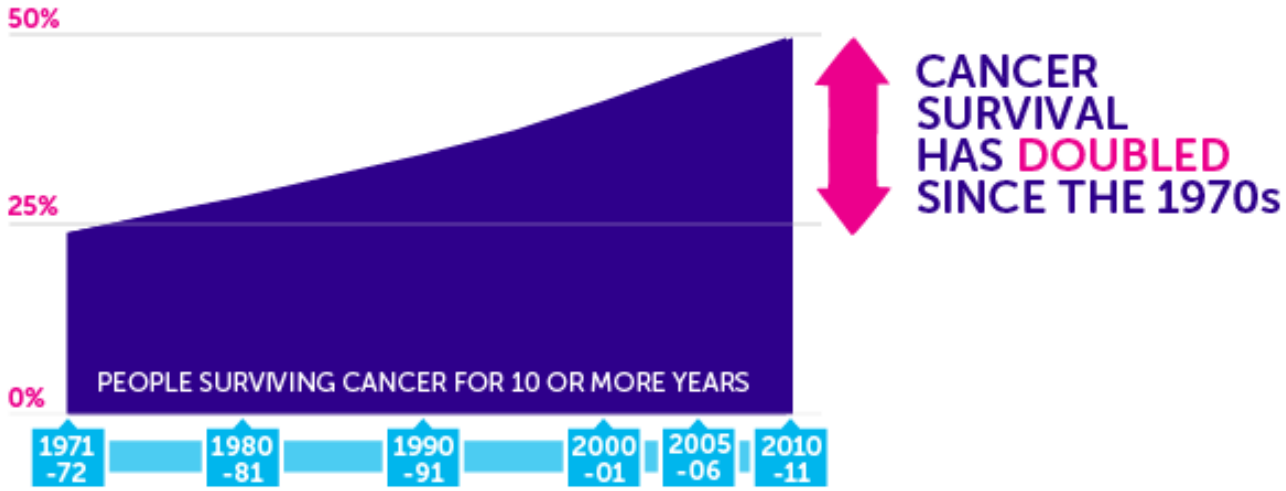


2022 ESC guidelines on Cardio-Oncology *European Heart Journal*, doi.org/10.1093/eurheartj/ehac244

The Cancer Epidemic: the magnitude of the problem

Incidence and mortality per Cancer





The Cancer Epidemic: the magnitude of the problem

How many cancer survivors are there in the world?

European Data

- 4-4.5 million new cancer cases per annum
- 12 million cancer patients in Europe
- 12-20 million cancer survivors
  = 1 in 37-62 of European population

US Data

- 2 million new cancer patients per annum
- 18.6 million cancer survivors
  = 1 in 18 US population*

Global data

Prevalence

- US population is 4.2% of world population
- Current world population 8.1 billion
- Extrapolated 420+ million cancer survivors worldwide

Incidence

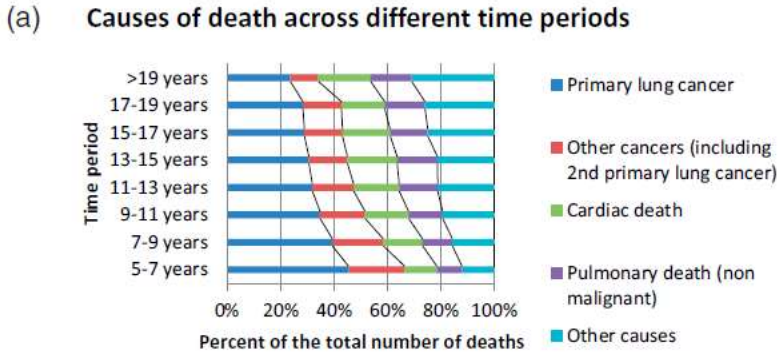
- 20+ million new cancer cases per annum (WHO)
- Overall 50% 10 year mortality
- Therefore every 10 years there are 100 million new cancer survivors

*Survival Information from the National Cancer Institute and Centers for Disease Control and Prevention
http://www.cdc.gov/cancer/dcpc/data/

What is the leading cause of death in Cancer Survivors?

Cause of death in Lung Cancer Patients after 5 years from Lung Cancer Diagnosis – US SEER Database Study

Cohort of 78,701 Lung Cancer patients 5+ years after diagnosis and first t



Overall 6.8% CV Mortality

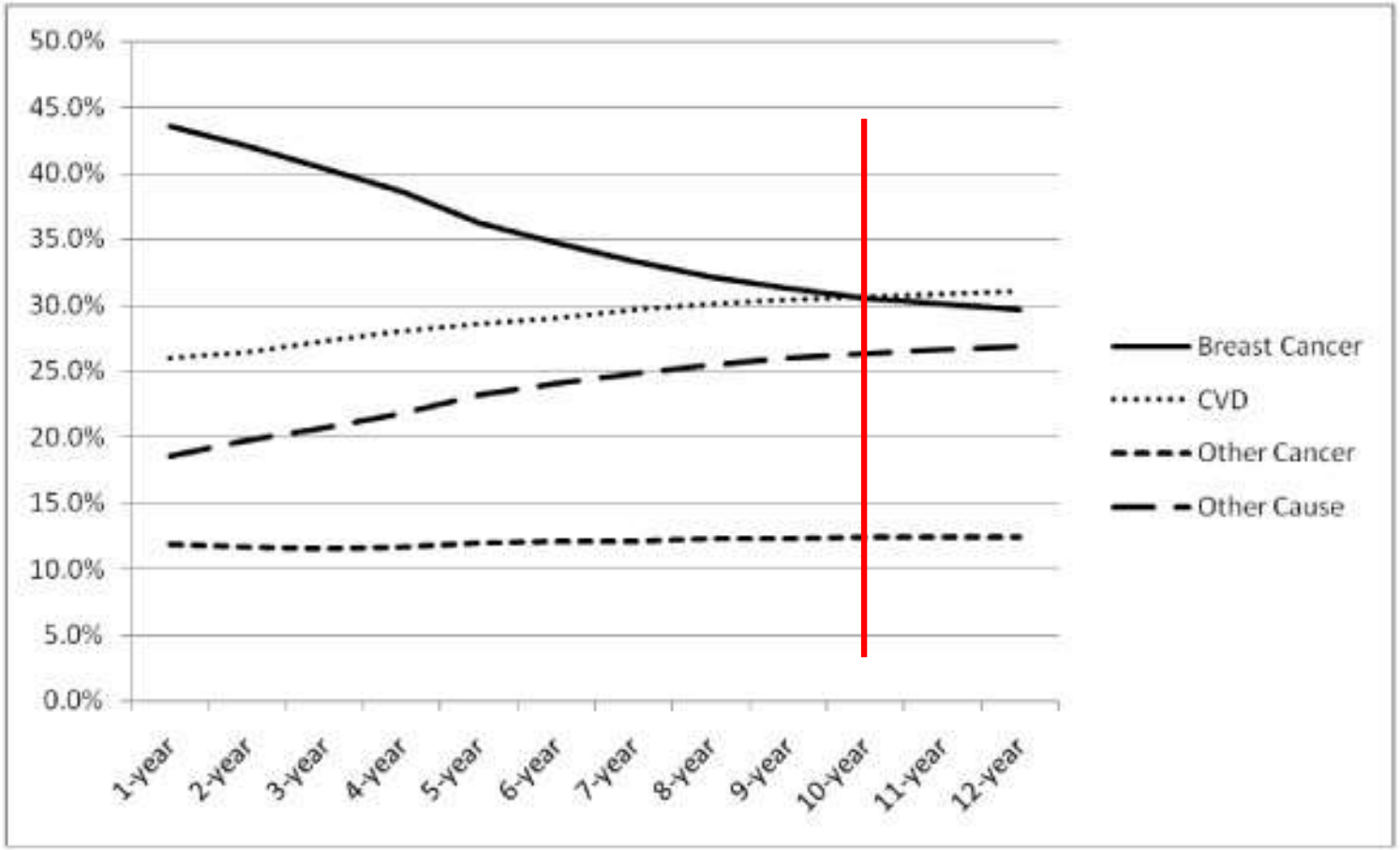
Figure 1. Causes of death according to time from diagnosis of long-term (>5 years) lung cancer survivors: (a) the whole cohort; (b) patients younger than 70 years; (c) patients older than 70 years.

O Abdel-Rahman Current Medical Research and Opinion 2017 33 1343-48

Breast Cancer Survivors

Proportional distribution of cumulative leading causes of death by time since breast cancer diagnosis.

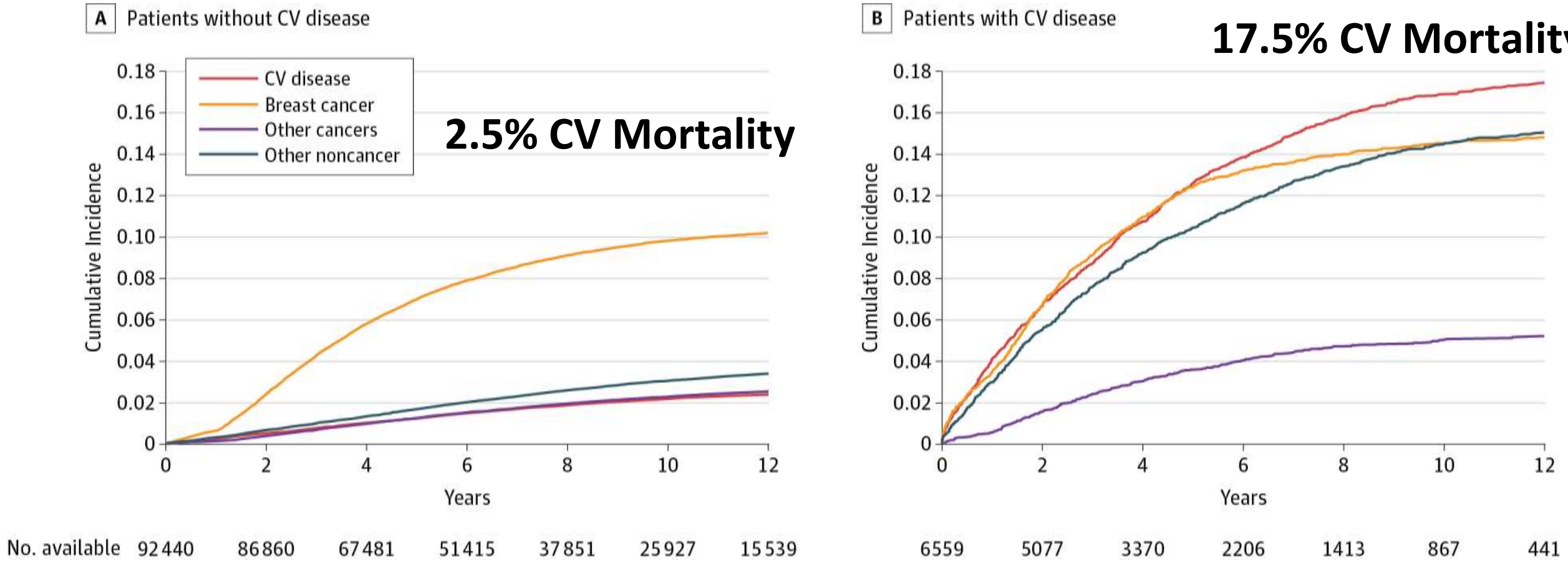
US SEER database : 63,566 patients



Patnaik et al Breast Cancer Res. 2011; 13(3): R64

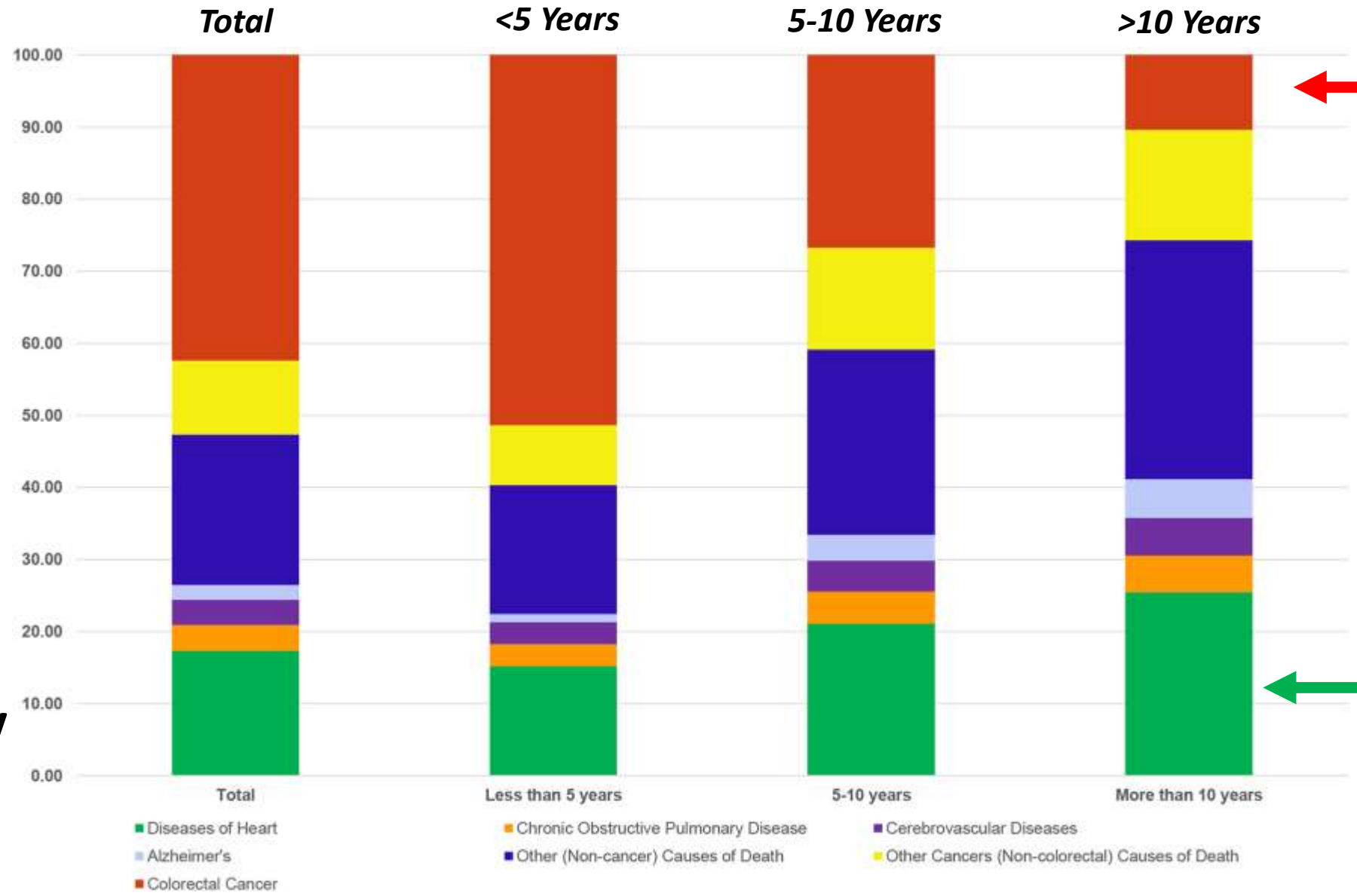
A Population-Based Study of Cardiovascular Mortality Following Early-Stage Breast Cancer

Cumulative Incidence of Cause-Specific Death Based on History of Cardiovascular (CV) Disease Before Breast Cancer Diagnosis



Abdel-Qadir H et al JAMA Cardiol. 2017;2(1):88-93

Causes of Death Following Nonmetastatic Colorectal Cancer Diagnosis in the U.S.



Colorectal Cancer

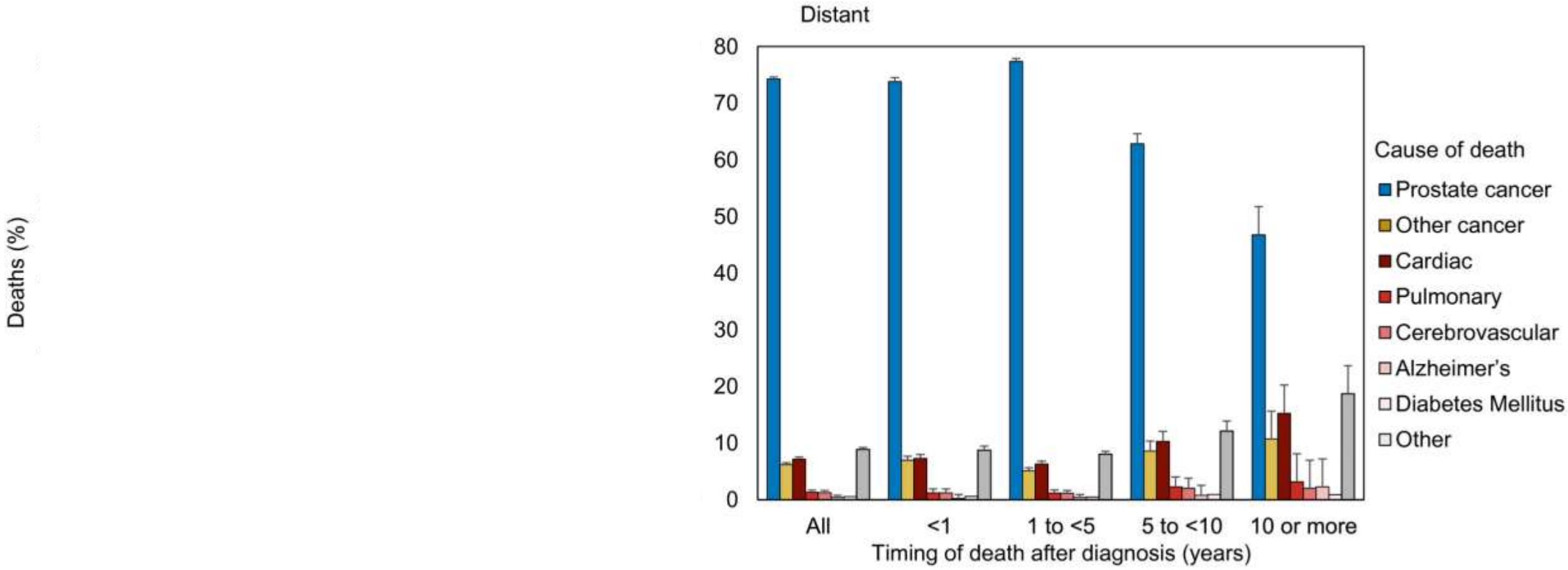
Cardiovascular

18% CV Mortality

Afifi et al The Oncologist 2021 Volume: 26, Issue: 9, Pages: 733-739

Causes of death during Prostate Cancer Survivorship

A contemporary US population–based analysis



Weiner et al Cancer 2021 *127 (16)* Pages: 2895-2904

Paediatric and Young Adult Cancer Survivors

Paediatric Oncology Survivorship agenda

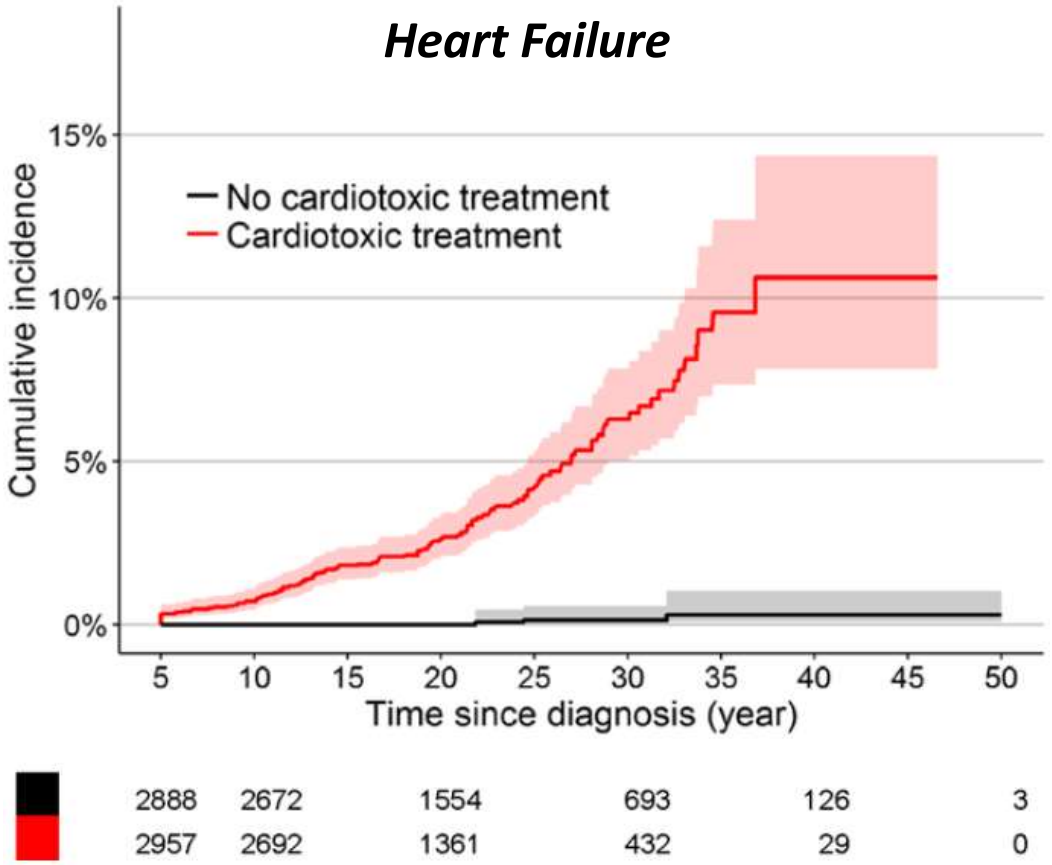
- 79% of childhood cancer survivors will be alive five years after diagnosis
- ~75% will be alive 10 years after diagnosis
- In 2020 there were an estimated 500,000 survivors of childhood cancer in the USA

- 15 fold risk of developing Heart Failure
- 7 fold risk of premature mortality from CV causes
- 60% survivors exposed to Anthracycline Chemotherapy and/or chest DXT

Survival Information from the National Cancer Institute and Centers for Disease Control and Prevention 2013
http://www.cdc.gov/cancer/dcpc/data/

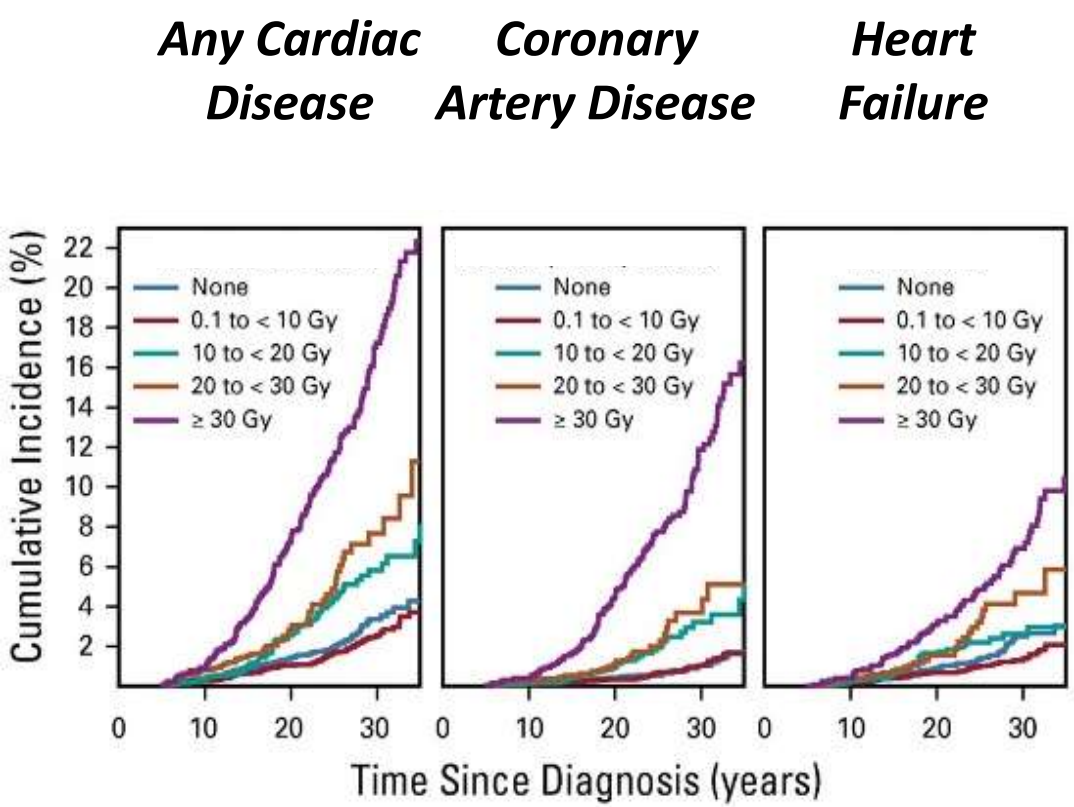
Risk and temporal changes of late cardiac side effects in childhood cancer survivors

Cardiotoxic chemotherapy



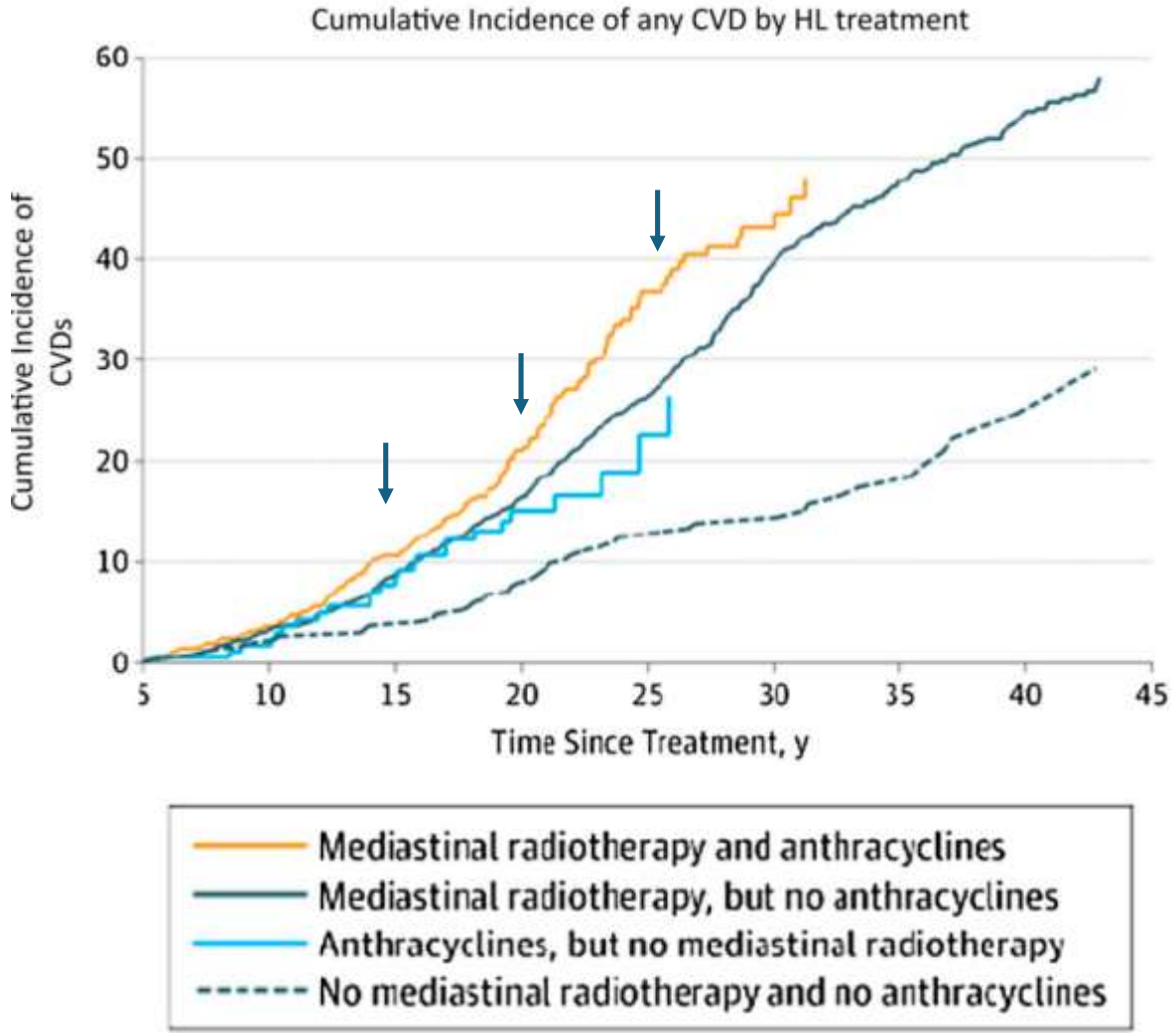
Feijen EAM et al. JAHA 2019

Radiation therapy



Bates JE et al. J Clin Oncol. 2019;37:1090-1101

High incidence of Cardiovascular Disease in Hodgkin Lymphoma survivors treated with radiotherapy



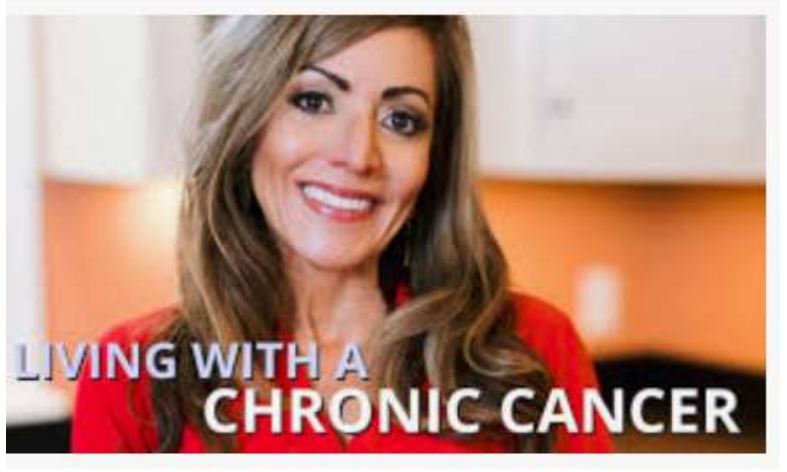
van Nimwegen FA et al. JAMA Intern Med. 2015;175(6):1007-1017.

Changing world of cancer and medicine

New Cancer Survivor Populations

Cancer as a Chronic Disease

Chronic Myeloid Leukaemia
Chronic Lymphocytic Leukaemia
Multiple Myeloma



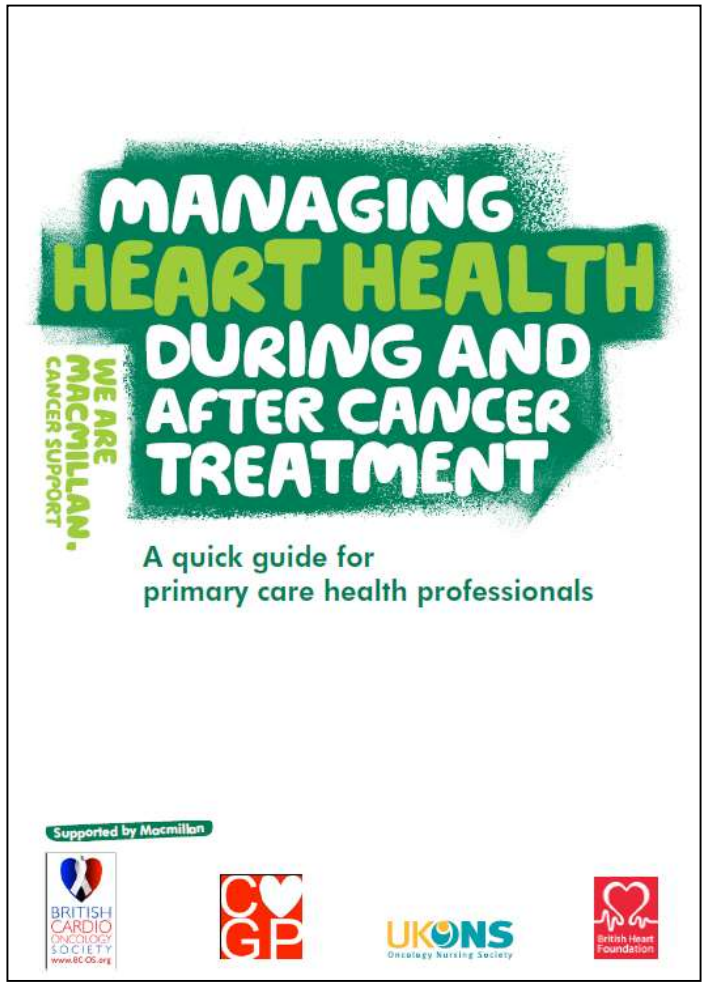
Locally Advanced Prostate Cancer
Metastatic HER2+ Breast Cancer
EGFR-mutant Lung Cancer
ALK-mutant Lung Cancer

Opportunities

- Cardiovascular phenotyping of different survivor cohorts
  - Recruitment from last Oncology Clinic appointment e.g. 5 year F/U
  - Survivor network groups and charities
  - Example: CARD-IO Study
- Chronic Cancer Cohorts
  - Example: Primary Care – Prostate Cancer and CV risk assessment
- Prospective studies
  - Recruitment at baseline
  - Serial surveillance during cancer treatment
  - Long term assessment after cancer treatment
    - High risk cohorts
    - Everyone
  - Example: COMPASS Network

Engaging with Primary Care

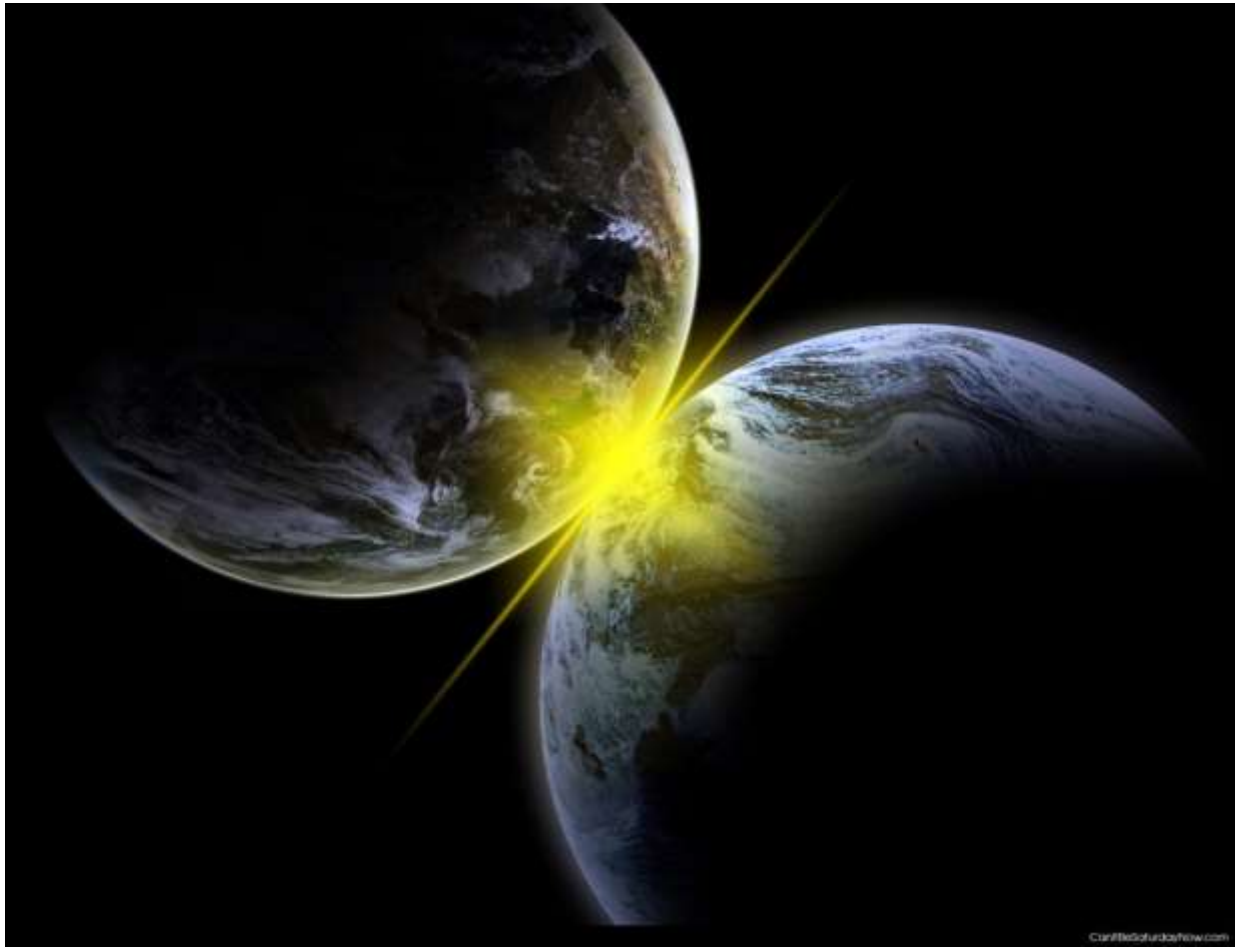
This is where the cancer survivors are!



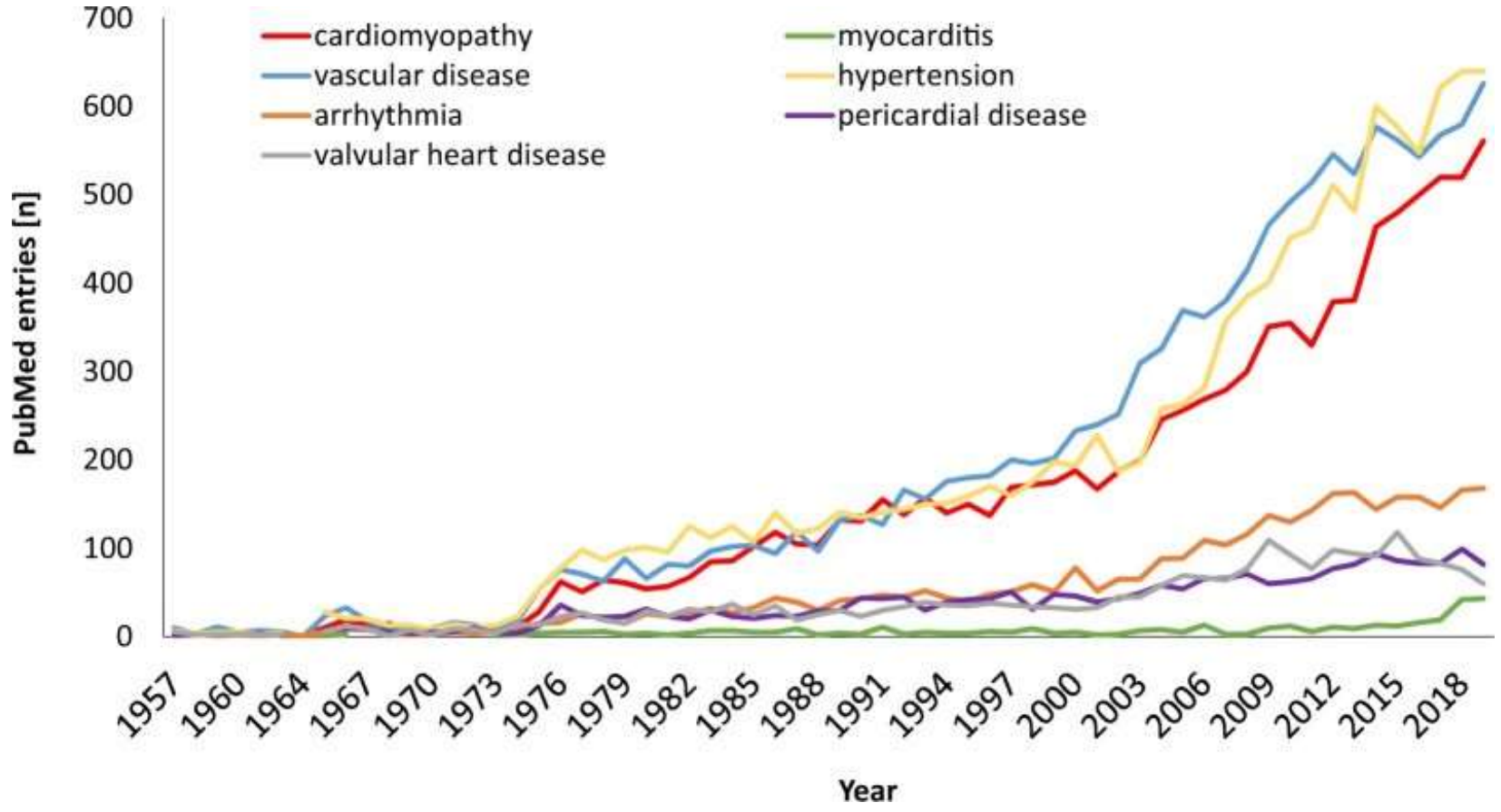
https://be.macmillan.org.uk/be/p-22855-managing-heart-health-during-and-after-cancer-treatment-guide.aspx

Cancer and Cardiovascular disease

Two Medical Worlds Collide

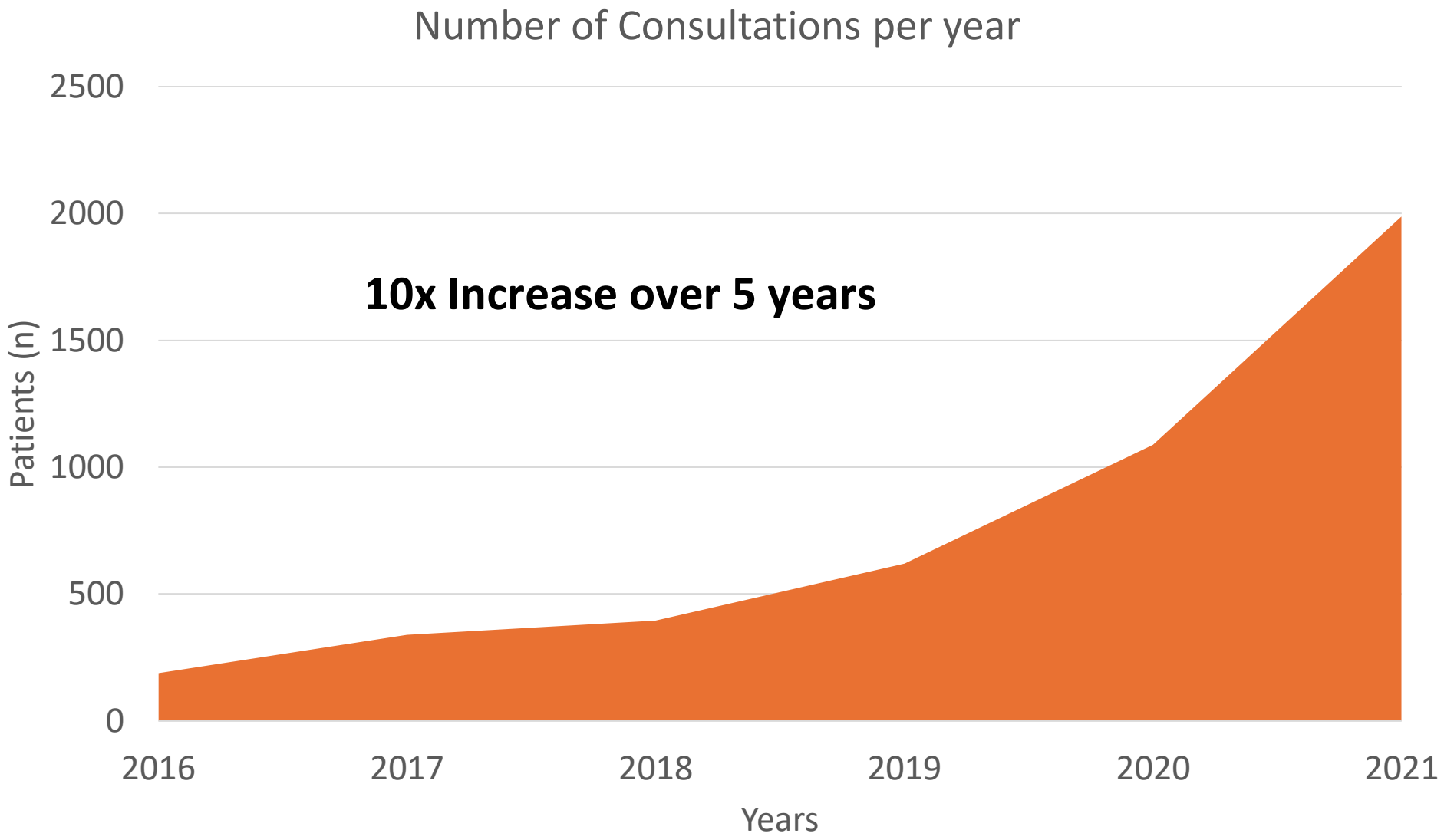


The scope of the problem – PubMed entries



Eur Heart J, Volume 43, Issue 4, 21 January 2022, Pages 280–299

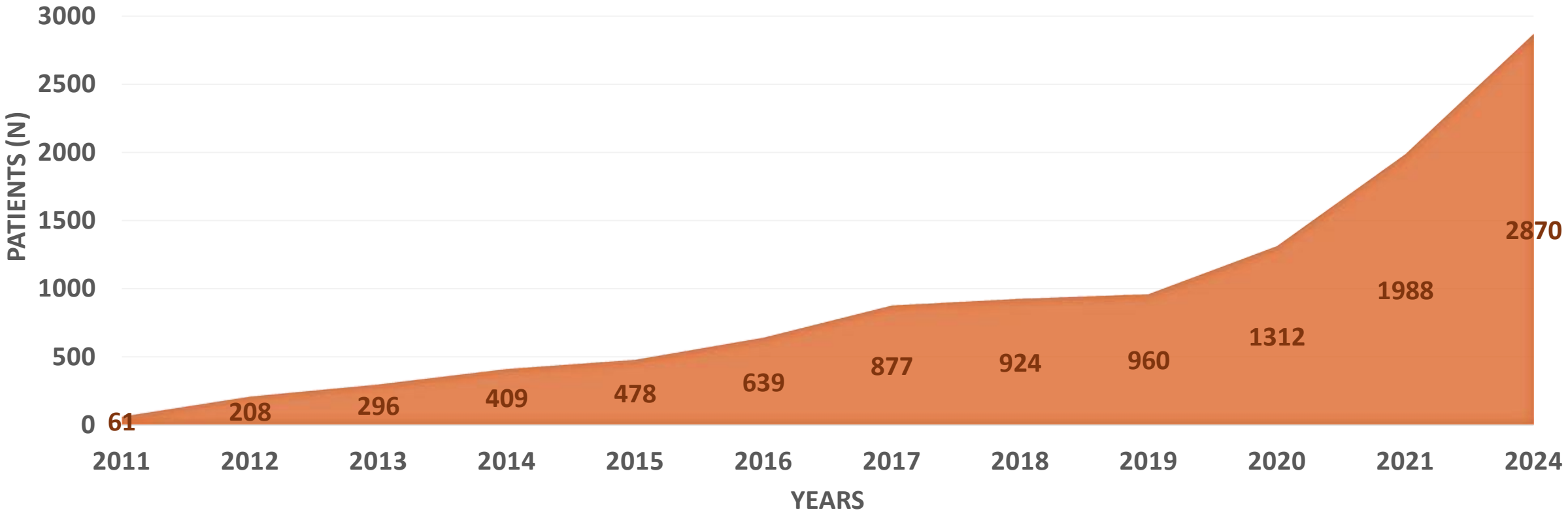
Evolution & Growth of Cardio-Oncology
Royal Brompton Hospital Cardio-Oncology Service



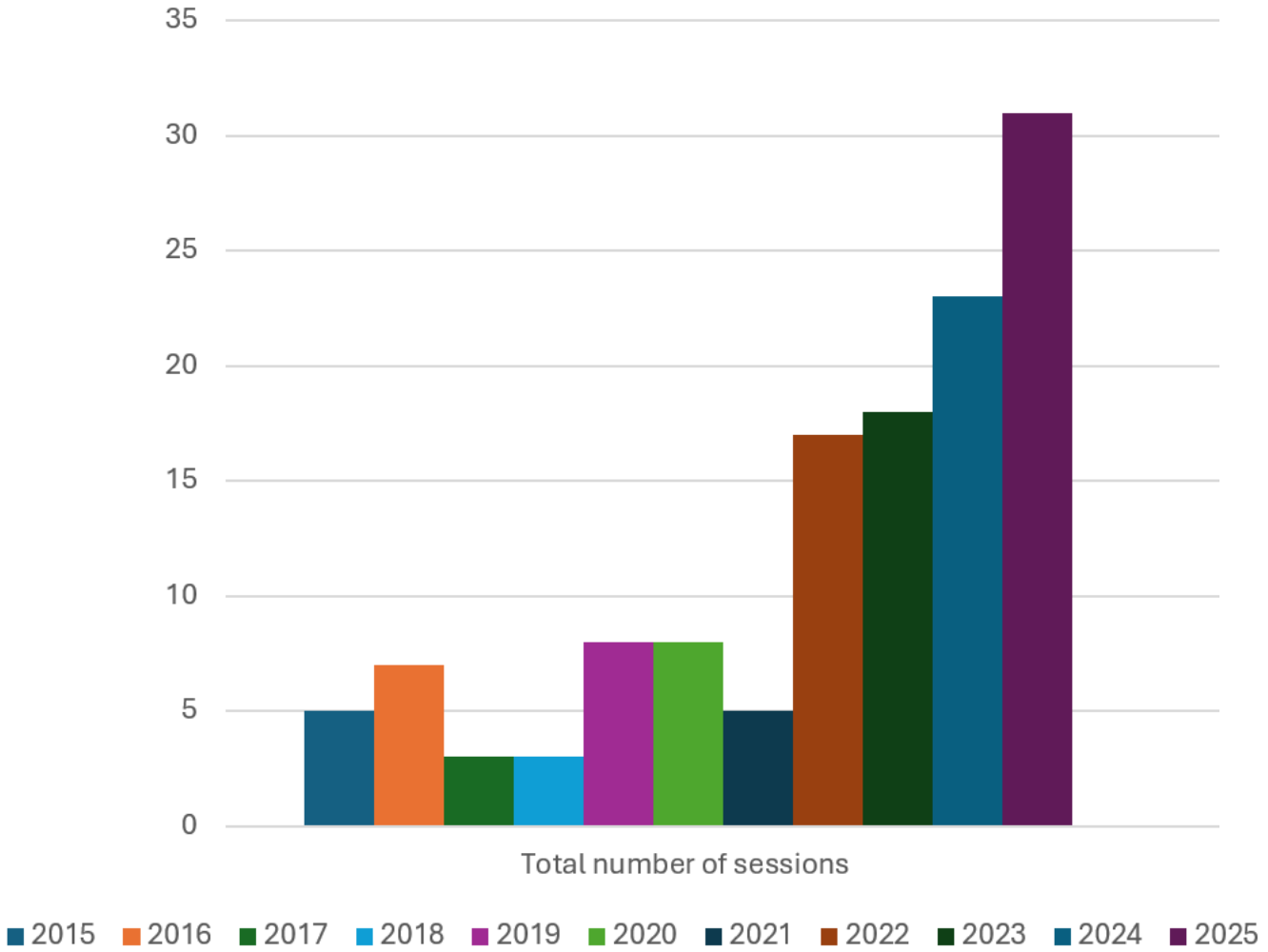
Andres et al J Am Coll Cardiol CardioOnc. Feb 06, 2024.

Royal Brompton Hospital Cardio-Oncology Service

Latest Audit Data
Number of consultations 2011-2024
100% increase from 2016-2021 and again 2021-2024



Total Number of Cardio-Oncology Sessions in ESC Summer Congresses 2015-2025



ESC CARDIO ONCOLOGY 2025

The annual conference of the ESC Council of Cardio-Oncology

The 1st launch went over our expectations!

Registration

2025 objective was 620 total participants;

- Attendance **exceeded expectations** with **over 880 participants from 77 countries**
  - **Overall, 75% European**
  - **4 countries from outside EU in the Top 20** including strong interest from **Philippines and the US.**
  - **Excellent local support of the Italian Community**

2025 Delegate Breakdown
Top 16 Countries

Rank	Country	Onsite
1	Italy*	97
2	Romania	70
3	Spain	61
4	United Kingdom of Great Britain and Northern Ireland	53
5	Philippines	47
6	Netherlands (The)	46
7	United States of America	38
8	Germany	31
9	Greece	24
10	Australia	23
11	France	22
12	Belgium	19
13	Albania	16
14	Canada	16
15	Poland	16
16	Bulgaria	15

Scientific contributions

- **31 scientific sessions & 27 abstract based sessions**
- 398 abstracts submitted
- 196 clinical cases submitted
- **96 Faculty** from **26** countries

Industry support

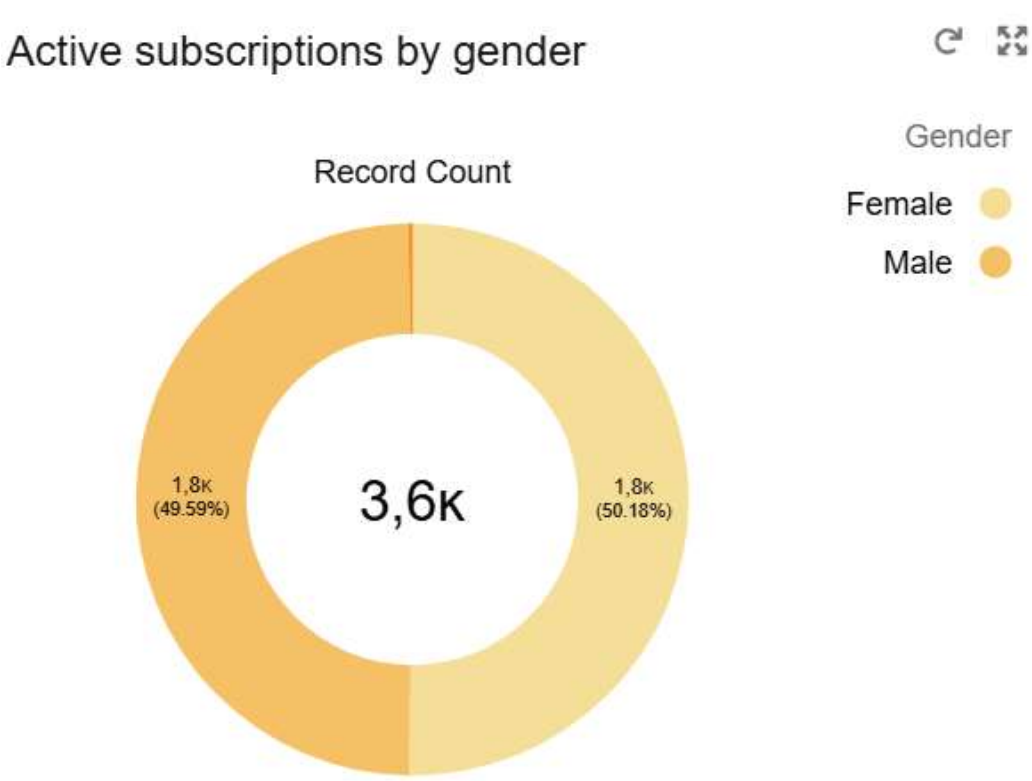
- **45m² of exhibition** (with 5 exhibitors for this 1st edition)
- **5 sponsored sessions** (4 Satellite Symposia + 1 Tutorials by the day)

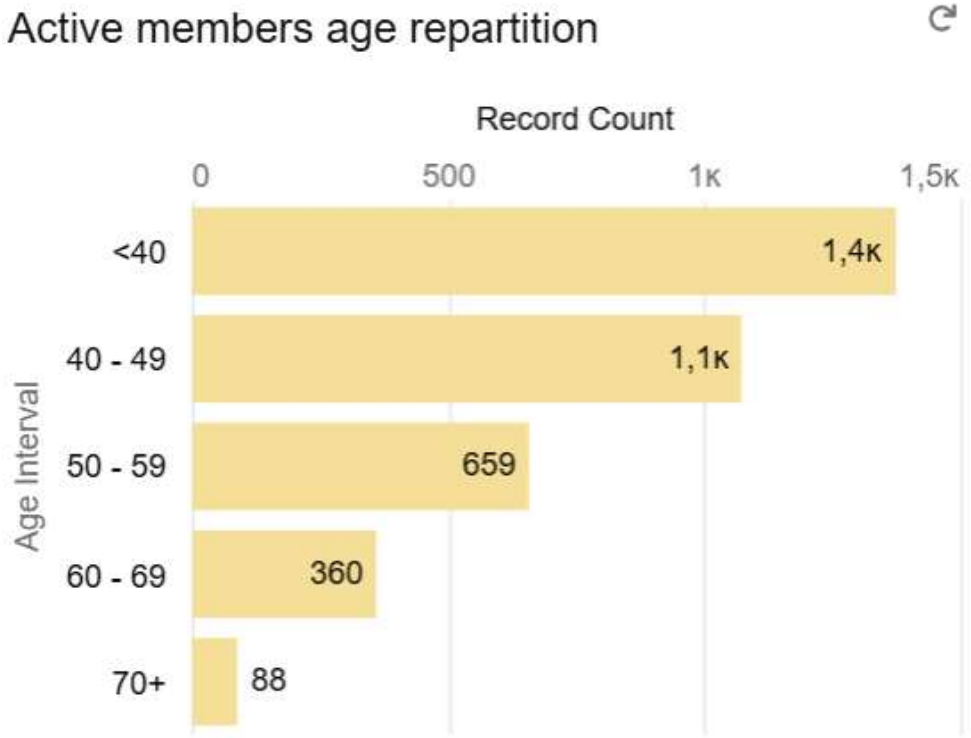
ESC Cardio-Oncology Conference 2026

https://www.escardio.org/Congresses-Events/Cardio-Oncology

ESC Council Cardio-Oncology

ESC Council of Cardio-Oncology Membership





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Thank you