Risk of suicide after cancer diagnosis in England: a population-based study

22 May 2024

Katherine Thackray (née Henson), Rachael Brock, James Charnock, Bethany Wickramasinghe, Olivia Will, Alexandra Pitman

JAMA Psychiatry | Original Investigation

Risk of Suicide After Cancer Diagnosis in England

Katherine E. Henson, MSc, DPhil; Rachael Brock, MB, BChir; James Charnock, MSCi;
Bethany Wickramasinghe, BSc; Olivia Will, MBChB, PhD, FRCS;
Alexandra Pitman, MSc(Econ), MBBS, MRCPsych, PhD

IMPORTANCE A diagnosis of cancer carries a substantial risk of psychological distress. There has not yet been a national population-based study in England of the risk of suicide after cancer diagnosis.

OBJECTIVES To quantify suicide risk in patients with cancers in England and identify risk factors that may assist in needs-based psychological assessment.

DESIGN, SETTING, AND PARTICIPANTS Population-based study using data from the National Cancer Registration and Analysis Service in England linked to death certification data of 4 722 099 individuals (22 million person-years at risk). Patients (aged 18-99 years) with cancer diagnosed from January 1, 1995, to December 31, 2015, with follow-up until August 31, 2017, were included.

EXPOSURES Diagnosis of malignant tumors, excluding nonmelanoma skin cancer.

MAIN OUTCOMES AND MEASURES All deaths in patients that received a verdict of suicide or an open verdict at the inquest. Standardized mortality ratios (SMRs) and absolute excess risks (AERs) were calculated.

RESULTS Of the 4 722 099 patients with cancer, 50.3% were men and 49.7% were women. A total of 3 509 392 patients in the cohort (74.3%) were aged 60 years or older when the diagnosis was made. A total of 2491 patients (1719 men and 772 women) with cancer died by suicide, representing 0.08% of all deaths during the follow-up period. The overall SMR for

Introduction

- Substantial risk of psychological distress with a cancer diagnosis

- No population-based study yet in England

- National Cancer Registration and Analysis Service (NCRAS) offered access to data covering all patients diagnosed with cancer in England

- BUT: no linkage to psychiatric records so unable to adjust for pre-existing psychiatric disorders or other potential confounders, such as alcohol or drug misuse diagnosis

- Aim:
   Examine the variation in suicide risk among individuals diagnosed with cancer in England

Materials and Methods

- Cancer registration linked to Office for National Statistics (ONS) mortality data

- Individuals diagnosed with malignant cancer (excluding non melanoma skin cancer) during 1995-2015, aged 18-99

- Follow-up to 31st August 2017

- **Outcome:** All deaths that received a verdict of suicide or an open verdict at the inquest

- Comparison with population-based expected deaths:
  - Standardised mortality ratios (SMR)
  - Absolute excess risks (AER)

Models

- Time to event data

- Entry: date of cancer diagnosis

- Exit/Censorship: date of death, date when lost to follow-up, or August 31, 2017.

- Poisson regression models

- Standardised Mortality Ratios (SMRs) and absolute excess risks (AERs) calculated using univariate models

- Relative risks and relative excess risks calculated using multivariate models
  - Adjusted for: sex, cancer type, deprivation, ethnicity, age at cancer diagnosis, year of diagnosis, and follow-up period (or attained age)

- 2-sided significance threshold set at $p < 0.05$

Subgroups

- Sex

- Years since cancer diagnosis:
  - 0-7 months
  - 6-11 months
  - 12-23 months
  - 24-35 months
  - 3-4 years
  - 5-9 years
  - >= 10 years

- Age at death (attained age)

- Stage at diagnosis:
  - Stage 1-4
 - Unknown

Methodological Considerations

- Cause of death coding and death certificate parts

- Granularity of subgroups for follow-up period

- Subset analyses, e.g. by year of diagnosis
  - Stage at diagnosis subset analysis was reported in the paper

The cohort

- 2,491 suicides among 4,722,099 individuals
0.08% of deaths

☐ Male   ◼ Female

Suicide	69%	31%
All deaths	54%	46%
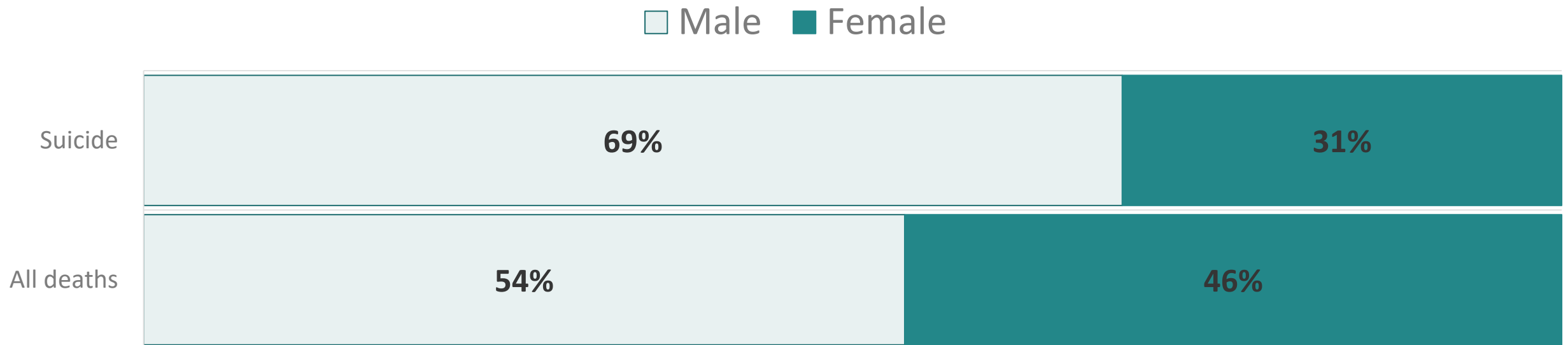
Variation in risk of suicide by cancer type
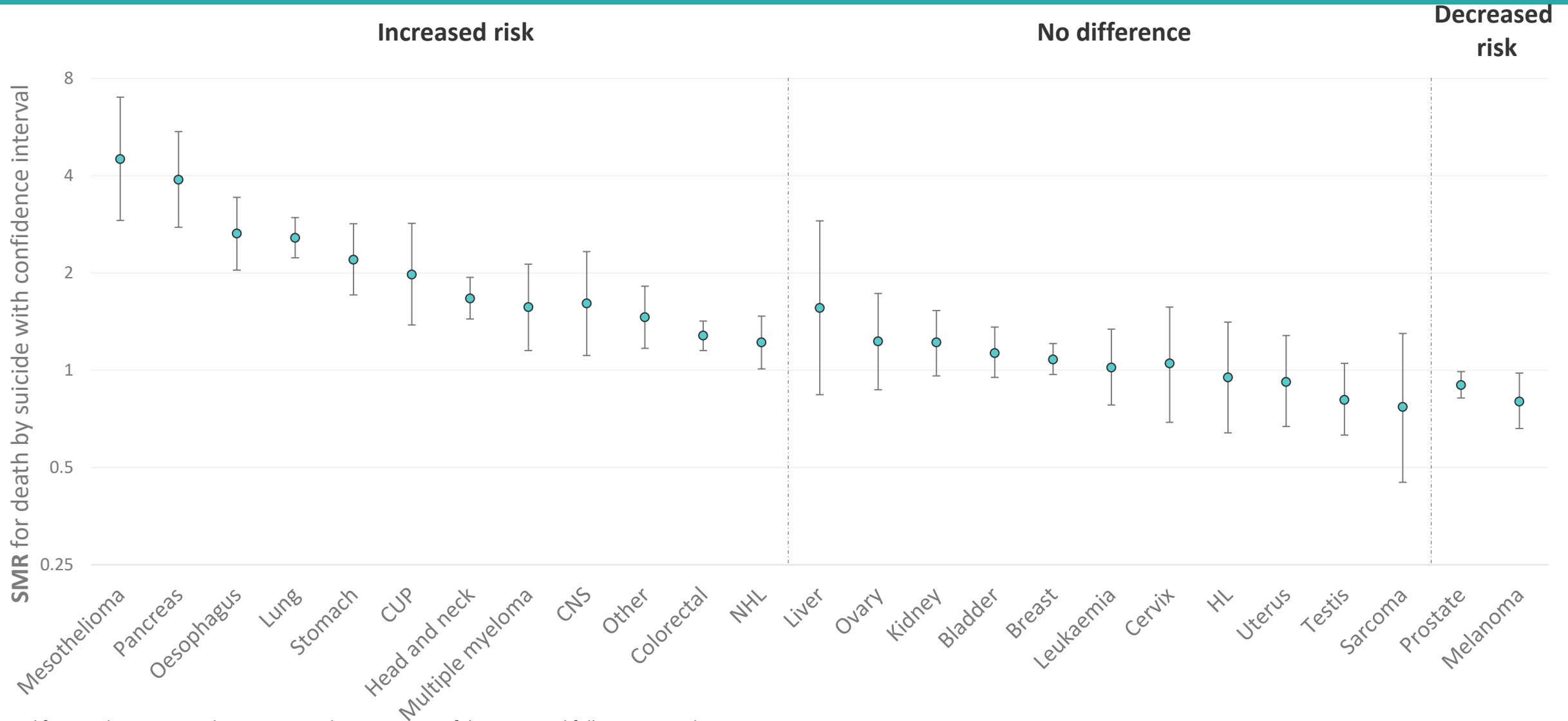
Adjusted for sex, deprivation, ethnicity, age at diagnosis, year of diagnosis and follow-up period

Conclusions

- Elevated risk of suicide in patients with certain cancers represent potentially preventable deaths

- First six months following a diagnosis is a critical period

- Limitation: death certificate coding of suicide

- Sources of bias could be addressed in sensitivity analyses:
  - eg using stricter definition of suicide if there are concerns about death certificate coding of suicide
  - eg combining tumour types where there is uncertainty over precise tumour site

This work uses data that has been provided by patients and collected by the NHS as part of their care and support. The data are collated, maintained and quality assured by the National Disease Registration Service, which is part of NHS England.