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Survival Among Individuals Diagnosed with Cancer in Mainland France 1989-2018

SUMMARY OF RESULTS: SOLID TUMOURS AND HAEMATOLOGICAL MALIGNANCIES

Collaborative partnership study between the French Network of Cancer Registries (Francim), the Biostatistics-Bioinformatics department of Hospices civils de Lyon (HCL), Santé publique France (the French national public health agency), and the French National Cancer Institute (INCa)

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List of Francim network cancer registries included in this study

General registries	Specialised registries
Registre des cancers du Bas-Rhin	Registre bourguignon des cancers digestifs
Registre général des tumeurs du Calvados	Registre des tumeurs digestives du Calvados
Registre des tumeurs du Doubs et du Territoire de Belfort	Registre finistérien des tumeurs digestives
Registre général des cancers de la Gironde	Registre des cancers du sein et des cancers gynécologiques de Côte-d'Or
Registre des cancers du Haut-Rhin	Registre des tumeurs primitives du système nerveux central de la Gironde
Registre des tumeurs de l'Hérault	Registre des cancers thyroïdiens Marne-Ardennes
Registre du cancer de l'Isère	Registre des hémopathies malignes de Basse-Normandie
Registre général des cancers de Lille et de sa Région	Registre des hémopathies malignes de Côte-d'Or
Registre général des cancers en Région Limousin	Registre des hémopathies malignes de la Gironde
Registre des tumeurs de Loire-Atlantique et de Vendée	Registre national des hémopathies malignes de l'enfant
Registre des cancers de la Manche	Registre national des tumeurs solides de l'enfant
Registre général des cancers de Poitou-Charentes	
Registre du cancer de la Somme	
Registre des cancers du Tarn	

INTRODUCTION

A key indicator for cancer observation and epidemiological surveillance, along with incidence, mortality, and prevalence, survival makes it possible to assess the overall improvement in cancer patients' prognosis, resulting both from therapeutic progress and initiatives implemented to diagnose cancers at earlier stages and to improve cancer care. Survival is an essential component for assessing the healthcare system as a whole and measuring the impact of public policies in respect of prevention, screening, and care.

This fourth survival study, conducted based on data from Mainland France cancer registries from the Francim network, is aligned with the objectives of the successive Cancer Plans [1] and the 2021-2030 ten-year anti-cancer strategy [2], particularly the axis on combatting cancers of poor prognosis. It is the result of the partnership between the French Network of Cancer Registries (Francim), the Biostatistics-Bioinformatics department of Hospices Civils de Lyon (HCL), Santé publique France (the French national public health agency), and the French National Cancer Institute (INCa).

This new study proposes updated 1-, 5- and 10-year post-cancer diagnosis survival estimates, along with trends in survival since 1989. For the first time, 20-year post-diagnosis survival estimates are presented along with estimates by anatomical or histological subsites.

This summary presents the key aspects of the methodology used and focuses on the main findings, also published in separate documents for each site[1]. It has been chosen to comment on the findings for solid tumours and haematological malignancies together — specific characteristics will emerge from the tables and figures presented in this summary.

MATERIALS AND METHODS

Materials

This study relates to the follow-up of individuals diagnosed with cancer between 1989 and 2015, aged 15 years or over at the time of diagnosis and living in one of the departments in Mainland France covered by a cancer registry (19 to 22 departments depending on the cancer studied)[3]. The vital status of the individuals included was updated on 30 June 2018 by the registries according to a standardised procedure.

The analyses related to 73 invasive cancer sites, defined as per the International Classification of Diseases for Oncology, 3rd edition (ICD-O-3), divided into 50 solid tumours (28 primary sites and 22 anatomical or histological subsites) and 23 haematological malignancies (including 6 subtypes). Given the wide disparity in survival between the different cancer sites, estimates for "all sites combined" were not produced in this study.

Organisation of results

The results are organised in three sections:

- section 1: 1- and 5-year net survival among individuals diagnosed between 2010 and 2015 (all registries, men and women together, and by sex where that sex represents more than 200 cases);
- section 2: 1-, 5- and 10-year net survival trends among individuals diagnosed between 1990 and 2015 (restriction to registries covering the entire 1990-2015 period, men and women together, only for sites representing more than 1,500 cases). This analysis was conducted for 41 solid tumours and 18 haematological malignancies. Some haematological malignancies have only been suitable for analysis since 1995 or 2003 (due to classification updates) and, in that case, their trends were studied over a shorter period;

[1] Survie des personnes atteintes de cancer en France métropolitaine (1989-2018) - Les données sur les cancers [Internet]. Institut national du cancer. Available at: https://www.e-cancer.fr/Expertises-et-publications/Les-donnees-sur-les-cancers/Survie-des-personnes-atteintes-de-cancer-en-France-metropolitaine
Cancers - Survie des personnes atteintes de cancer [Internet]. Santé publique France. Available at: https://www.santepubliquefrance.fr/maladies-et-traumatismes/cancers

- section 3: long-term net survival (20 years) among individuals diagnosed between 1989 and 2000 and under 75 years of age at the time of diagnosis (restriction to registries covering the entire 1989-2000 period, men and women together, number of survivors at 15 years of at least 100 cases per site for the sites described in section 2).

Indicators described

Observed survival is the proportion of people who are still alive at a given point in time after their diagnosis, all causes of death combined. This indicator does not differentiate between deaths caused by the cancer studied or not.
Net survival is the survival that would be observed if the only possible cause of death were cancer; it follows directly from the cumulative effect of the excess mortality rate over the follow-up period.
The **excess mortality rate** is the mortality rate at a specific point in time directly or indirectly caused by the cancer under study; it is estimated as the additional mortality rate among cancer patients, compared to the expected mortality rate among the general population.
The latter two key indicators provide insight on the **mortality caused by the cancer under study**. They are **the only indicators to allow comparisons between ages, sexes, years or localities**, as they are not affected by mortality linked to other causes. To ensure comparability between sexes, years or with other countries, **net survival has been age-standardised** (ICSS[2] standard).

Statistical methods

This study is based on an innovative approach to modelling the mortality rate at a specific point in time, based on the use of multidimensional penalised splines (*survPen* R package) [4]. Net survival is estimated based on the excess mortality rates obtained from models. These models, developed in the HCL Biostatistics-Bioinformatics department, make it possible to render potentially complex variations in net survival and in the excess mortality variable, according to age and/or year of diagnosis. They provide an accurate picture of survival variation over the years and insight as to whether this variation is identical, regardless of the age at the time of diagnosis.

RESULTS

As in the previous edition of this study, the different sites studied were categorised into three groups defined according to their 5-year standardised net survival (SNS) over the 2010-2015 period: positive prognosis (SNS >65%), intermediate prognosis (SNS between 33 and 65%), and negative prognosis (SNS <33%).

Section 1: 1- and 5-year survival among individuals diagnosed between 2010 and 2015

The results show great disparity in survival between the different sites. Standardised net survival (SNS which accounts for the effect of age by standardisation) at 5 years varies from 96% for thyroid cancers to 10% for pleural mesotheliomas (Tables 1 and 2).
Cancers with a negative prognosis represent, in terms of incidence, 32% of solid tumours in men and 19% in women, and 7% of haematological malignancies in men and 9% in women [5; 6]. Conversely, cancers with a positive prognosis represent 40% of solid tumours in men and 55% in women, and 45% of haematological malignancies in men and women.

[2] ICSS: International Cancer Survival Standard

TABLE 1. **5-year standardised net survival (SNS) and confidence interval (95% CI) among individuals diagnosed between 2010 and 2015, according to sex, Mainland France. Solid tumours**

Site	5-year SNS (%) and 95% CI					
	All sexes		Men		Women	
Positive prognosis (SNS >65%)						
Represent 40% of incident cancers in men and 55% in women						
Thyroid	**96**	[95; 97]	**93**	[91; 94]	**97**	[96; 97]
Prostate	**93**	[93; 93]	**93**	[93; 93]	-	
Cutaneous melanoma	**93**	[92; 93]	**91**	[90; 92]	**94**	[93; 95]
Testis	**93**	[91; 95]	**93**	[91; 95]	-	
Breast	**88**	[88; 89]	-		**88**	[88; 89]
Corpus uteri	**74**	[73; 75]	-		**74**	[73; 75]
Uveal melanoma	**74**	[69; 78]	**74**	[67; 80]	**74**	[67; 80]
Kidney	**70**	[69; 70]	**69**	[68; 70]	**71**	[69; 72]
Penis	**68**	[63; 73]	**68**	[63; 73]	-	
Intermediate prognosis (SNS between 33 and 65%)						
Represent 28% of incident cancers in men and 26%[b] in women						
Colon and rectum	**63**	[63; 64]	**62**	[61; 62]	**65**	[64; 66]
Cervix uteri	**63**	[61; 64]	-		**63**	[61; 64]
Vulva	**62**	[58; 65]	-		**62**	[58; 65]
Sarcoma	**61**	[59; 62]	**62**	[60; 65]	**60**	[58; 62]
Larynx	**59**	[57; 61]	**59**	[57; 61]	**61**	[56; 66]
Small intestine	**57**	[55; 59]	**55**	[51; 58]	**59**	[56; 63]
Bladder	**54**	[52; 55]	**55**	[53; 56]	**49**	[47; 52]
Nasal cavity[a]	**54**	[50; 58]	**56**	[51; 60]	**51**	[45; 58]
Lip-mouth-pharynx	**45**	[44; 46]	**41**	[40; 42]	**56**	[54; 58]
Vagina	**45**	[38; 52]	-		**45**	[38; 52]
Ovary	**43**	[42; 44]	-		**43**	[42; 44]
Negative prognosis (SNS <33%)						
Represent 32% of incident cancers in men and 19%[b] in women						
Stomach	**30**	[29; 31]	**27**	[26; 29]	**35**[b]	[33; 37]
Central nervous system	**26**	[24; 27]	**23**	[22; 25]	**28**	[26; 30]
Gallbladder and bile ducts	**22**	[21; 24]	**22**	[20; 25]	**22**	[20; 25]
Lung	**20**	[19; 20]	**18**	[17; 18]	**24**	[23; 25]
Liver	**18**	[17; 19]	**18**	[17; 19]	**19**	[17; 21]
Oesophagus	**17**	[16; 18]	**16**	[15; 17]	**20**	[18; 22]
Pancreas	**11**	[11; 12]	**10**	[9; 11]	**13**	[12; 14]
Pleural mesothelioma	**10**	[7; 13]	**10**	[7; 13]	**10**	[5; 18]

[a] Nasal cavity, sinuses, middle and inner ear.

[b] The stomach is the only site to have a different prognosis in men (negative prognosis) and women (intermediate prognosis); for the calculation of the percentage of incident cancer cases according to prognosis, the stomach is therefore counted under intermediate prognosis for women.

Survival gap >5 percentage points in favour of women, Survival gap >5 percentage points in favour of men

TABLE 2. **5-year standardised net survival (SNS) and confidence interval (95% CI) among individuals diagnosed between 2010 and 2015, according to sex, Mainland France. Haematological malignancies**

Site	5-year SNS (%) and 95% CI					
	All sexes		Men		Women	
Positive prognosis (SNS >65%) Represent 45% of incident cancers in men and in women						
Hairy cell leukaemia	**95**	[91; 97]	**94**	[90; 97]	**NA**	
Polycythaemia vera (CMS)	**93**	[90; 95]	**93**	[89; 96]	**93**	[89; 95]
Essential thrombocythaemia (CMS)	**91**	[89; 93]	**88**	[85; 91]	**93**	[90; 95]
Chronic lymphocytic leukaemia (CLL)/ Small lymphocytic lymphoma	**89**	[88; 90]	**87**	[85; 88]	**90**	[89; 92]
Marginal zone lymphoma	**88**	[86; 90]	**86**	[83; 89]	**90**	[87; 92]
Hodgkin lymphoma	**87**	[86; 88]	**85**	[83; 87]	**89**	[87; 91]
Follicular lymphoma	**86**	[85; 88]	**86**	[83; 88]	**87**	[85; 89]
Chronic myelogenous leukaemia (CML)	**85**	[82; 88]	**84**	[79; 89]	**86**	[81; 89]
NK/T-cell lymphoma	**85**	[81; 88]	**86**	[81; 90]	**85**	[78; 90]
Lymphoplasmocytic lymphoma/ Waldenström macroglobulinaemia	**82**	[80; 85]	**81**	[78; 84]	**85**	[82; 88]
Burkitt lymphoma	**68**	[61; 74]	**NA**		**NA**	
Intermediate prognosis (SNS between 33 and 65%) Represent 48% of incident cancers in men and 46%[a] in women						
Mantle cell lymphoma	**63**	[59; 66]	**61**	[57; 65]	**66**[a]	[60; 72]
Diffuse large B-cell lymphoma	**61**	[60; 62]	**60**	[58; 62]	**62**	[60; 64]
Multiple myeloma and plasmocytoma	**60**	[59; 61]	**59**	[57; 61]	**62**	[60; 64]
Lymphoblastic leukaemia/lymphoma (B, T or NOS)	**54**	[50; 58]	**53**	[48; 57]	**55**	[49; 61]
Myelodysplastic syndrome	**51**	[49; 53]	**46**	[44; 49]	**56**	[53; 59]
Primary myelofibrosis (CMS)	**46**	[41; 51]	**44**	[38; 49]	**NA**	
Chronic myelomonocytic leukaemia and MDS-MPN	**45**	[41; 48]	**41**	[37; 46]	**51**	[45; 56]
Non-cutaneous T/NK lymphoma	**43**	[40; 46]	**40**	[36; 44]	**48**	[43; 52]
Negative prognosis (SNS <33%) Represent 7% of incident cancers in men and 9% in women						
Acute myeloid leukaemia (AML)	**27**	[25; 28]	**25**	[23; 27]	**28**	[26; 30]

[a] Mantle cell lymphoma is the only haematological malignancy to have a different prognosis in men (intermediate prognosis) and women (positive prognosis); for the calculation of the percentage of incident cancer cases according to prognosis, mantle cell lymphoma is therefore counted under positive prognosis for women.
NA: non-analysable
CMS: chronic myeloproliferative syndrome
NOS: not otherwise specified
MDS-MPN: myelodysplastic syndrome/myeloproliferative neoplasm
Survival gap >5 percentage points in favour of women

Cancers with a positive prognosis (5-year SNS >65%)

Prostate and ***breast*** cancers, which are the most frequent cancer sites in men and women respectively [5; 6], have a positive prognosis with SNS values at 1 year of 97-98% and at 5 years of 88% for ***breast*** cancer and 93% for ***prostate*** cancer.
The other solid tumours with a positive prognosis include ***thyroid*** cancers (5-year SNS of 96%), ***cutaneous melanomas*** (93%), cancers of the ***testis*** (93%), ***uveal melanomas*** (74%), cancers of the ***corpus uteri*** (74%), ***kidney*** (70%) and ***penis*** (68%).
All haematological malignancies with a positive prognosis have a 5-year standardised net survival greater than 80%, apart from ***Burkitt lymphoma*** (68%).

Cancers with an intermediate prognosis (5-year SNS between 33 and 65%)

Colorectal cancers, which are the 3rd most frequent cancers in men and the second in women [5; 6] have a 5-year standardised net survival of 63%. Colon cancers have a slightly higher survival rate than that of cancers of the ***rectum*** (5-year SNS of 64 and 62% respectively).
Among cancers of the ***lip-mouth-pharynx*** category which have an intermediate survival prognosis overall (5-year SNS of 45%), considerable disparity is observed with ***lip*** cancers having the most positive prognosis (89%) and cancers of the ***hypopharynx*** the most negative (26%).
Most cancers of the female genital organs have an intermediate 5-year standardised net survival between 63% for ***cervix uteri*** cancer, and 43% for ***ovary*** (only cancers of the ***corpus uteri*** have a positive prognosis at 5 years with an SNS of 74%).

Cancers with a negative prognosis (5-year SNS <33%)

Pleural mesotheliomas and cancers of the ***pancreas*** have the worst prognosis with a 5-year SNS of 10% and 11% respectively. They are followed by cancers of the ***oesophagus*** (5-year SNS of 17%), ***liver*** (18%), ***lung*** (20%), ***gallbladder and bile ducts*** (22%), ***central nervous system*** (CNS*)* (26%), ***acute myeloid leukaemia*** (AML) (27%) *and* ***stomach*** cancers (30%).
Some of these cancers with a negative prognosis are among the most frequent cancers, such as ***lung*** cancers, the 2nd male cancer and 3rd female cancer in terms of incidence in France in 2018 [5; 6]. ***Small cell lung carcinomas*** have the most negative prognosis among lung cancers with a 5-year SNS of 7%. ***Squamous cell carcinomas*** and ***adenocarcinomas*** have a slightly better prognosis (21% and 23% respectively).
Among cancers of the oesophagus, ***adenocarcinomas*** have a slightly better prognosis (20%) than that of ***squamous cell carcinomas*** (16%).
Stomach cancers have a negative prognosis in men with a 5-year SNS of 27%, but an intermediate prognosis in women (35%).

Differences in survival according to sex

For almost all cancer sites, the 5-year SNS was greater in women than in men (this difference was sometimes non-significant) (Tables 1 and 2). The greatest difference is observed for cancers of the ***lip-mouth-pharynx*** category (15 more percentage points in women), ***myelodysplastic syndromes*** (10 points), ***chronic myelomonocytic leukaemia*** (10 points), ***stomach*** cancers (8 points), and ***lung*** cancers (6 points). The difference between men and women can have at least two explanations: 1) earlier diagnosis in women who have greater awareness of prevention and screening, 2) a difference in exposure to risk factors resulting in a different breakdown of anatomical subsites or histological cancer types. The survival gap between men and women for cancers of the ***lip-mouth-pharynx*** category can be explained for the most part by a greater proportion of cancers associated with alcohol/tobacco exposure (having a worse prognosis) among men, and also by a greater frequency of cancers associated with *human papillomavirus* (HPV) (having a better prognosis) among women. Lower survival among women is only observed for cancers of the ***bladder*** (5-year SNS of 55% in men and 49% in women) and for ***nasal cavity-sinus-ear cancers*** (5-year SNS of 56% in men and 51% in women).

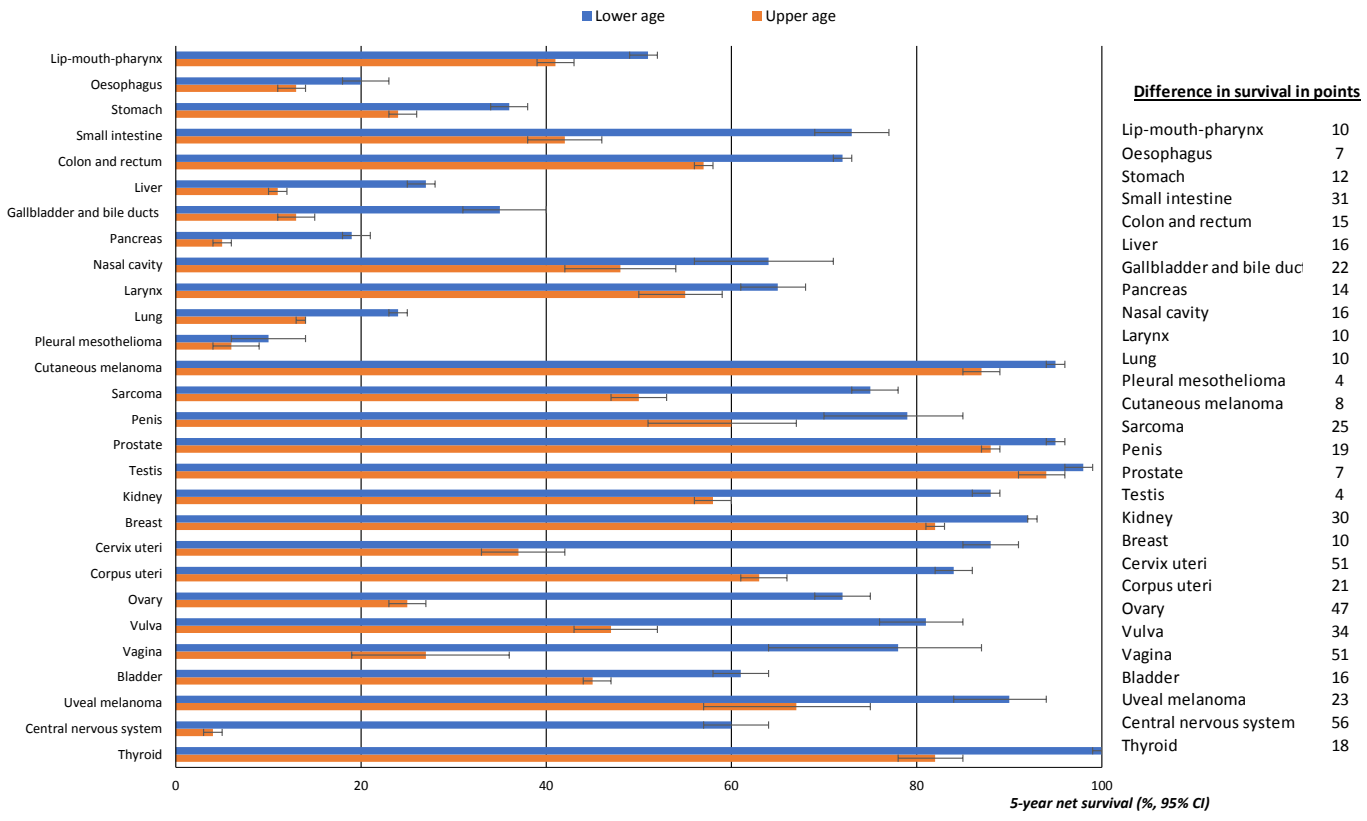
Differences in survival according to age at time of diagnosis

For all sites (solid tumours and haematological malignancies), the greater the age at the time of diagnosis, the lower the survival (Figures 1 and 2). However, the differences appear to be more pronounced for haematological malignancies. The greatest difference (63 points) is observed for ***acute myeloid leukaemia*** with a 5-year NS of 69% among the youngest individuals *versus* 6% among the oldest.

One of the reasons might be that older people may be diagnosed at a more advanced stage (lack of awareness of clinical signs, lack of screening, individual vulnerability, etc.). Moreover, the presence of comorbidities may prevent access to curative treatments or give rise to post-treatment complications in these individuals.

Differences in net survival according to age are also observed according to the histological tumour type. This applies to low-grade ***glial tumours*** (CNS tumours), which have a better prognosis, observed more in young people (30-50 years), whereas ***glioblastomas,*** which are more aggressive, occur more frequently from 50 years of age. For cancers of the ***ovary***, young women are more likely to present with germ cell tumours which have a better prognosis than carcinomas which are more frequent in older women. ***Breast*** and ***prostate*** cancers are sites for which the younger population have a slightly worse survival than the middle-aged population, due to the high frequency of more aggressive tumours.

FIGURE 1. **5-year net survival (% and 95% CI) among individuals diagnosed between 2010 and 2015, for lower and upper ages at time of diagnosis, Mainland France. Solid tumours.**

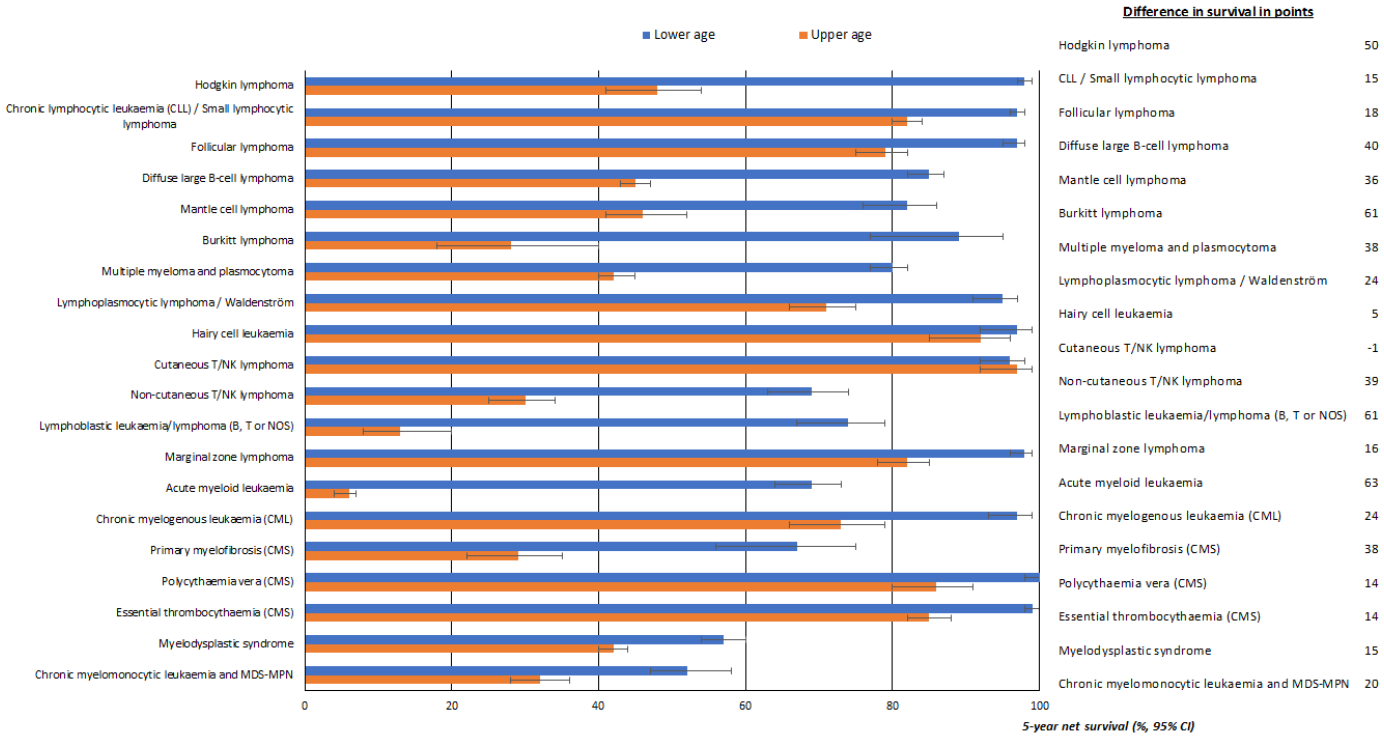


Both ages shown correspond to percentiles of the age distribution in respect of each site: Lower age = 5th percentile; Upper age = 95th percentile (or at 80 years if 95th percentile >80 years)

Nasal cavity: Nasal cavity, sinuses, middle and inner ear

CNS: central nervous system

FIGURE 2. **5-year net survival (% and 95%CI) among individuals diagnosed between 2010 and 2015, for lower and upper ages at time of diagnosis, Mainland France. Haematological malignancies.**



Both ages shown correspond to percentiles of the age distribution in respect of each site: Lower age = 5th percentile; Upper age = 95th percentile (or at 80 years if 95th percentile >80 years)
CMS: chronic myeloproliferative syndrome
MDS-MPN: myelodysplastic syndrome/myeloproliferative neoplasm

Other factors of variation

Other factors not taken into account in this study may influence survival, e.g. clinical factors such as the stage at time of diagnosis, or individual factors such as socioeconomic status.
For all solid tumours and lymphocytic haematological malignancies, the prognosis is closely dependent on the stage at time of diagnosis. As such, all of the sites for which organised or individual screening is available (***breast***, ***colon and rectum, cervix uteri, prostate***) are among the cancers with a positive prognosis. Conversely, some cancers, which are often non-symptomatic or have non-specific symptoms at disease onset, are mostly diagnosed at advanced stages (***lung, liver, oesophagus, pancreas, ovary***), which mainly explains their negative prognoses.

Dynamics of excess mortality rate after diagnosis

The dynamics of the excess mortality rate show that, in the majority of cases, the risk of death is high in the year following diagnosis and tends to subsequently decrease over the follow-up period. Furthermore, the risk of dying immediately after diagnosis increases with age and is greatest in the elderly for all sites. As mentioned above, this phenomenon is probably linked to the existence of comorbidities, more advanced stages at the time of diagnosis, suboptimal care, and more frequent treatment complications in those over 70 or 80 years of age. For some sites, regardless of age, the risk of death for those who are still alive 3 or 5 years post-diagnosis remains high (***pancreas, liver, oesophagus, CNS, ovary, lung, LMP***), whereas it tends towards zero after 10 years for ***breast*** and particularly ***prostate*** cancer.

Section 2: Trends in 1-, 5- and 10-year net survival among individuals diagnosed between 1990 and 2015

The net survival trend analysis over the entire study period shows an improvement in 5-year net survival for a majority of solid tumours (35 out of 41 sites) and haematological malignancies (10 out of 18 subtypes) (Tables 3 and 4). These somewhat positive survival trends reflect the progress achieved in the healthcare system both in terms of detecting cancers, and also in terms of their therapeutic management. There are nonetheless contrasts in this gain depending on the sites and according to the age at the time of diagnosis. Finally, artefacts may be involved, such as overdiagnosis and a diagnostic lead time bias for cancers covered by an existing screening programme.

Improvement in 5-year net survival over the study period

Improvement regardless of age at time of diagnosis

The most spectacular gains in 5-year standardised net survival between the start of the study period and 2015 are observed for two haematological malignancies: ***chronic myeloid leukaemia (CML)*** with +40 percentage points between 1990 and 2015, meaning that the prognosis is now positive, and ***diffuse large B-cell lymphomas (DLBCL)*** with +24 points between 1995 and 2015, and for ***prostate*** cancers with +21 points between 1990 and 2015 (Tables 3 and 4). These sizable improvements observed for ***CML*** and ***DLBCL*** are particularly associated with increased access to and use of effective new treatments associated with improved toxicity control. For prostate cancers, overdiagnosis and lead time bias are likely factors.

Progress in patient care has also resulted in an improvement of over 10 percentage points in 5-year SNS observed regardless of age for ***non-cutaneous T-cell lymphomas*** (+ 18 points), ***sarcomas*** (+ 17 points), ***chronic lymphocytic leukaemia*** (+ 16 points) and ***Waldenström macroglobulinaemias*** (+ 16 points), cancers of the ***small intestine*** (+ 14 points), ***kidney*** (+ 13 points) and ***adenocarcinomas*** and ***squamous cell lung carcinomas*** (+ 11 points).

For most sites, these improvements in survival were progressive between 1990 and 2015. Nevertheless, for cancers of the ***prostate***, ***breast***, ***ovary***, ***colon-rectum***, ***kidney*** and ***thyroid***, the gains are observed primarily before 2005. Conversely, survival increased after 2000 for cancers of the ***central nervous system*** and after 2005 for ***lung*** cancers and ***acute myeloid leukaemia (AML)***.

The benefits observed at 5 years are maintained overall up to 10 years of follow-up.

The gain in survival observed for ***prostate*** cancers partially reflects the impact of individual screening which allows cases to be detected earlier and thus leads to an increase in the proportion of low-grade cancers, thus improving overall survival. These results are also observed for cancers covered by an organised screening programme such as ***colorectal cancers*** (+ 12 points for 5-year SNS) and, to a lesser extent, ***breast*** cancers (+ 9 points).

However, the survival gain over the entire period is probably linked with a combination of earlier diagnoses and substantial therapeutic improvements. The survival gain, more pronounced before the general rollout of the organised breast cancer screening programme throughout French territory, can probably be explained by improved care. For the most recent period, the impact of organised screening alone is difficult to differentiate. Indeed, *in situ* tumours, detected in screening and having a very positive prognosis, are excluded from our analyses. Furthermore, as stated above, it is not possible to quantify some of the effects of screening here, such as the contribution of overdiagnosis or lead time bias.

While a decrease in excess mortality from the first year is observed for some sites with a noteworthy gain in SNS at 1 year, these gains lessen after the first year post-diagnosis to ultimately result in a slightly improved 5-year SNS. This situation is primarily observed for several cancers with a negative prognosis, cancers of the ***liver***, ***pancreas*** and ***pleural mesotheliomas*** as well as cancers of the ***stomach*** and ***oesophageal adenocarcinomas***. This phenomenon reflects the effects of current treatments that help delay death, but do not result in full remission.

Improvement among younger patients

A sizable improvement in 5-year net survival between the start of the study period and 2015 is primarily observed among those diagnosed at a relatively young age for ***AML*** (+ 32 points at 30 years of age at time of diagnosis), ***multiple myelomas and plasmocytomas*** (+ 26 points at 50 years of age), cancers of the ***lip-mouth-pharynx*** category (+ 21 points at 50 years of age) and ***sarcomas*** (+ 20 points at 30 years of age) (Tables 3 and 4). Progress in diagnostic tools with the development of cytogenetic and molecular biology techniques have helped adapt therapeutic treatments according to the patient's genomic profile at the time of diagnosis, along with the development of targeted therapies such as proteasome inhibitors for myelomas, or FLT-3 inhibitors for ***AML*** thus improving patient survival. Improvement in surgical treatments combined with radiotherapy and/or adjuvant or neoadjuvant chemotherapy can also mostly explain the survival gains for ***sarcomas***. Besides therapeutic improvements, the gains observed for cancers of the ***lip-mouth-pharynx*** category may also reflect the increase in the proportion of ***oropharyngeal*** tumours in the ***lip-mouth-pharynx*** category since 1990, these tumours having the best prognosis among this category of sites [5].

A smaller, but significant, improvement is also observed among younger patients with a 5-year net survival gain of over 10 percentage points for cancers of the ***liver*** (+ 18 points), ***gallbladder and bile ducts*** (+ 15 points), ***pancreas*** (+ 11 points), ***oesophagus*** (+ 11 points), and ***breast*** (+ 10 points).

In spite of a doubling of 10-year survival for cancers of the ***oesophagus*** and ***pancreas***, and even a tripling for cancers of the ***liver***, their prognosis remains bleak.

Improvement among older patients

For some sites, older patients at the time of diagnosis have seen a substantial improvement in survival. This is particularly the case with 80-year-old patients diagnosed with ***follicular lymphomas*** (+ 38 points for 5-year NS), ***thyroid*** cancer (+ 31 points) or ***soft tissue sarcomas*** (+ 21 points). For these cancers, the prognosis of younger patients was already positive at the start of the study period, which may explain a more pronounced increase in net survival among older patients, thus reducing the survival gap between ages. Net survival at 5 years also improved in favour of older patients for ***cutaneous melanomas*** (+ 19 points), ***Hodgkin lymphomas*** (+ 17 points), ***mantle cell lymphomas*** (+ 13 points), and cancers of the ***larynx*** (+ 11 points). It should also be noted that, in 2015, the prognosis of 70-year-old women with ***breast*** cancer became similar to that of younger women. These results would seem to be linked with better initial disease management for older patients with access to effective and less toxic treatments, along with better patient monitoring, particularly with the implementation of a specific oncogeriatric strategy. However, in the case of both cancers of the ***ovary*** and ***breast***, the 5-year prognosis is most positive for intermediate age groups.

As a general rule, apart from certain sites such as the ***cervix uteri***, ***AML*** and ***essential thrombocythaemias***, the survival gap between younger and older patients reduced further between 2005 and 2015.

Cancers with no improvement in 5-year net survival over the study period

For some cancer sites, survival did not improve over the study period. This applies to cancers of the ***testis***, ***marginal zone lymphomas***, ***cutaneous T-cell lymphomas***, ***polycythaemia vera***, *which already had a positive prognosis and have retained this prognosis*. ***Myelodysplastic syndromes*** and ***chronic myelomonocytic leukaemia,*** in the absence of improvement, have retained a negative prognosis. In spite of a significant improvement in 1-year SNS of 21 points between 1990 and 2015, the 5-year SNS of ***glioblastomas*** has not improved.

A statistically significant decrease in 5-year SNS between the start of the study period and 2015 is observed for three sites. This applies to ***bladder*** cancers diagnosed at 30 years of age (- 14 points), among women aged 60 years or over with a ***cervix uteri*** cancer diagnosis (- 12 points), and among 80 year old older patients with an ***essential thrombocythaemia*** diagnosis (- 11 points). For the ***bladder***, this reduction observed is probably artefactual, compared with the decrease observed in the incidence of this site over the same study period, probably linked with changes in tumour classification over the years of diagnosis [5]. Indeed, since the 1990s, histological classification rules have enabled a more restrictive definition of invasive bladder tumours, which has led to the exclusion of some tumours from registries and an increase in the proportion of tumours of poorer prognosis among the incident cases recorded, particularly among the younger population.

For ***cervix uteri*** cancer, the screening rollout has helped lower the incidence of invasive cancers by detecting tumours at a precancerous or early stage, which are curable, and thus improve the chances of recovery. For the older population, screening would appear to have a paradoxical effect on survival, through selection bias: in fact, due to the reduction in the number of invasive cancers diagnosed, the proportion of cancers diagnosed at advanced stages or of aggressive cancers, with a poor prognosis, would appear to increase over time.

There has also been a change in the profile of patients diagnosed with ***essential thrombocythaemias***, due to changes in diagnostic criteria (JAK2, MPL and CALR) thereby increasing their incidence (primarily among women between 2003 and 2010) [6] which may have impacted the prognosis of these patients particularly among the older population.

TABLE 3. **5-year standardised net survival (SNS) and net survival (NS) according to age at time of diagnosis and confidence interval (95CI) among individuals diagnosed between the start of the study period and 2015, Mainland France. Solid tumours**

	5-year SNS according to year of diagnosis, % [95CI]			Difference in SNS at 5 years, % points [95CI]		Age Range[1]	Difference in NS at 5 years, % points [95CI]			
	1990	2005	2015	1990 versus 2015	2005 versus 2015		1990 versus 2015		2005 versus 2015	
							Lower age	Upper age	Lower age	Upper age
Lip-mouth-pharynx	36 [34; 37]	40 [39; 41]	48 [46; 50]	12 [9; 15]	7 [5; 10]	[50-80]	21 [17; 26]	6 [0; 12]	13 [9; 17]	6 [2; 11]
Mouth cavity	37 [35; 39]	45 [43; 46]	50 [48; 53]	13 [9; 17]	5 [3; 7]	[50-80]	17 [12; 22]	12 [4; 19]	7 [5; 9]	5 [2; 8]
Oropharynx	31 [29; 33]	38 [36; 40]	49 [46; 52]	18 [14; 22]	11 [7; 14]	[50-80]	18 [14; 22]	17 [13; 21]	11 [7; 14]	11 [7; 14]
Hypopharynx	22 [20; 24]	24 [23; 26]	27 [24; 30]	5 [1; 8]	3 [0; 5]	[50-80]	5 [1; 9]	4 [1; 7]	3 [0; 6]	2 [0; 5]
Oesophagus	9 [8; 9]	14 [13; 15]	18 [17; 20]	10 [8; 11]	4 [4; 5]	[50-80]	11 [9; 13]	8 [6; 9]	5 [4; 6]	4 [3; 4]
Adenocarcinoma	14 [10; 18]	17 [15; 19]	24 [20; 28]	10 [4; 16]	7 [3; 12]	[50-80]	16 [6; 26]	5 [-1; 11]	10 [4; 17]	5 [1; 9]
Squamous cell carcinoma	8 [7; 9]	14 [13; 15]	15 [13; 17]	7 [5; 9]	2 [0; 4]	[50-80]	8 [6; 11]	6 [4; 7]	2 [0; 5]	2 [0; 3]
Stomach	25 [24; 27]	28 [27; 29]	31 [29; 33]	6 [3; 8]	3 [1; 6]	[50-80]	4 [-1; 10]	7 [3; 11]	1 [-4; 6]	6 [2; 9]
Small intestine	43 [37; 48]	52 [49; 55]	57 [51; 62]	14 [6; 22]	5 [-2; 12]	[50-80]	12 [5; 20]	16 [7; 25]	4 [-2; 10]	6 [-2; 14]
Colon and rectum	53 [52; 54]	62 [61; 62]	65 [64; 66]	12 [11; 13]	3 [2; 5]	[50-80]	15 [12; 17]	10 [8; 13]	3 [1; 5]	5 [3; 7]
Colon	54 [52; 55]	62 [61; 63]	65 [64; 66]	11 [10; 13]	3 [2; 4]	[50-80]	14 [11; 17]	10 [7; 13]	3 [1; 5]	5 [2; 7]
Rectum	51 [50; 53]	60 [59; 61]	65 [64; 66]	14 [12; 15]	5 [4; 5]	[50-80]	17 [13; 20]	7 [3; 10]	6 [5; 7]	3 [1; 4]
Anus	53 [48; 59]	65 [62; 68]	65 [61; 70]	12 [5; 19]	0 [-5; 5]	[50-80]	18 [9; 28]	7 [-3; 18]	3 [-2; 7]	-2 [-10; 5]
Liver	6 [5; 7]	15 [14; 16]	18 [16; 20]	12 [10; 14]	3 [1; 5]	[50-80]	18 [13; 23]	7 [4; 10]	2 [-3; 7]	3 [0; 6]
Gallbladder and bile ducts	16 [14; 18]	20 [19; 21]	22 [20; 25]	6 [3; 10]	2 [0; 4]	[50-80]	15 [8; 22]	0 [-3; 3]	6 [2; 9]	0 [-2; 1]
Pancreas	6 [5; 7]	9 [8; 9]	12 [11; 13]	7 [5; 8]	3 [2; 5]	[50-80]	11 [7; 15]	3 [1; 5]	5 [2; 9]	2 [1; 4]
Larynx	51 [49; 53]	57 [56; 59]	61 [59; 64]	10 [7; 14]	4 [3; 5]	[50-80]	9 [6; 13]	11 [7; 15]	4 [2; 5]	4 [3; 6]
Lung	12 [11; 13]	16 [15; 16]	22 [21; 23]	11 [9; 12]	7 [6; 8]	[50-80]	9 [7; 11]	10 [9; 11]	6 [5; 7]	6 [5; 7]
Adenocarcinoma	14 [12; 15]	17 [17; 18]	25 [23; 26]	11 [9; 13]	7 [5; 9]	[50-80]	7 [3; 10]	13 [10; 15]	5 [3; 7]	8 [6; 10]
Squamous cell carcinoma	13 [13; 14]	19 [18; 20]	25 [23; 26]	11 [9; 13]	5 [4; 7]	[50-80]	6 [3; 10]	14 [11; 16]	3 [1; 5]	7 [5; 9]
Small cell lung carcinoma	4 [4; 5]	6 [6; 7]	7 [7; 8]	3 [2; 4]	1 [1; 2]	[50-80]	4 [3; 6]	2 [1; 3]	2 [1; 3]	1 [0; 1]
Pleural mesothelioma	4 [2; 7]	7 [6; 9]	10 [7; 14]	6 [1; 11]	3 [0; 5]	[60-80]	7 [-1; 15]	5 [0; 11]	3 [-1; 8]	3 [-1; 7]
Cutaneous melanoma	82 [80; 84]	91 [90; 92]	93 [92; 95]	11 [9; 14]	2 [0; 4]	[30-80]	6 [5; 8]	19 [15; 24]	1 [0; 2]	4 [1; 7]
Sarcoma	46 [43; 50]	59 [57; 60]	63 [60; 66]	17 [12; 21]	5 [1; 8]	[30-80]	20 [14; 25]	16 [9; 22]	6 [3; 8]	4 [0; 9]
Soft tissue sarcoma	47 [42; 52]	55 [52; 57]	66 [61; 70]	19 [12; 26]	11 [5; 17]	[30-80]	14 [9; 19]	21 [14; 29]	8 [4; 12]	13 [6; 20]
Prostate	71 [69; 73]	94 [93; 94]	92 [90; 93]	21 [18; 23]	-2 [-3; 0]	[50-80]	30 [21; 38]	22 [17; 27]	-1 [-6; 3]	-1 [-5; 3]
Testis	91 [87; 93]	93 [91; 95]	94 [91; 96]	3 [0; 7]	1 [0; 2]	[20-60]	3 [0; 6]	3 [-1; 7]	1 [0; 2]	1 [0; 2]
Non-seminomatous and mixed germ cell tumour	91 [84; 95]	91 [84; 95]	91 [84; 95]	0 [0; 0]	0 [0; 0]	[20-50]	0 [0; 0]	0 [0; 0]	0 [0; 0]	0 [0; 0]

TABLE 3 – Continued.

	5-year SNS according to year of diagnosis, % [95CI]			Difference in SNS at 5 years, % points [95CI]		Age Range[1]	Difference in NS at 5 years, % points [95CI]			
	1990	2005	2015	1990 versus 2015	2005 versus 2015		1990 versus 2015		2005 versus 2015	
							Lower age	Upper age	Lower age	Upper age
Seminomatous germ cell tumour	93 [86; 96]	96 [93; 97]	97 [93; 98]	4 [-1; 9]	1 [0; 2]	[30-60]	1 [0; 3]	5 [-2; 12]	0 [0; 1]	1 [0; 3]
Breast	79 [78; 80]	88 [87; 88]	89 [88; 90]	9 [8; 11]	1 [0; 2]	[40-80]	10 [8; 11]	6 [3; 9]	2 [1; 2]	-1 [-2; 1]
Cervix uteri	66 [64; 67]	64 [63; 65]	62 [60; 64]	-3 [-7; 0]	-2 [-3; 0]	[30-80]	8 [3; 13]	-12 [-21; -4]	3 [1; 4]	-5 [-8; -2]
Corpus uteri	70 [68; 72]	74 [73; 75]	76 [75; 78]	6 [4; 9]	2 [1; 3]	[50-80]	4 [3; 6]	9 [6; 12]	1 [1; 2]	3 [2; 5]
Ovary	33 [32; 35]	42 [41; 43]	47 [45; 48]	14 [11; 16]	5 [4; 6]	[40-80]	9 [3; 15]	8 [3; 13]	3 [1; 5]	3 [1; 5]
Epithelial tumour	33 [31; 35]	41 [40; 43]	46 [44; 48]	13 [10; 16]	5 [4; 6]	[40-80]	5 [-2; 12]	8 [3; 14]	2 [-1; 4]	3 [1; 5]
Kidney	57 [54; 59]	68 [67; 69]	70 [68; 72]	13 [10; 16]	2 [-1; 4]	[40-80]	16 [11; 20]	10 [6; 15]	3 [2; 5]	0 [-3; 4]
Renal parenchyma	56 [54; 59]	71 [70; 72]	73 [71; 75]	17 [14; 20]	2 [0; 5]	[40-80]	16 [11; 21]	16 [11; 22]	3 [1; 5]	1 [-2; 5]
Bladder	58 [56; 59]	55 [54; 56]	53 [51; 55]	-5 [-7; -2]	-2 [-3; 0]	[50-80]	-14 [-20; -9]	-2 [-6; 2]	-6 [-9; -3]	-1 [-2; 1]
Central nervous system	22 [20; 24]	23 [22; 25]	26 [23; 29]	4 [1; 8]	3 [-1; 6]	[30-80]	6 [-3; 15]	1 [-3; 4]	4 [-4; 11]	1 [-1; 4]
Glioblastoma	4 [2; 7]	5 [4; 6]	7 [4; 9]	2 [-1; 6]	2 [0; 4]	[40-80]	1 [-5; 8]	2 [0; 3]	2 [-2; 6]	1 [0; 3]
Thyroid	82 [80; 85]	93 [92; 94]	96 [95; 97]	14 [11; 17]	3 [2; 4]	[30-80]	1 [0; 1]	40 [30; 51]	0 [0; 0]	12 [9; 16]
Papillary cancer	91 [87; 94]	99 [98; 99]	100 [99; 100]	8 [5; 12]	1 [1; 1]	[30-80]	0 [0; 1]	31 [17; 44]	0 [0; 0]	3 [2; 5]

[1]Both ages shown correspond to percentiles of the age distribution in respect of each site: Lower age = 5th percentile; Upper age = 95th percentile (or at 80 years if 95th percentile >80 years)

SNS: standardised net survival

NS: net survival

95CI: 95% confidence interval

Key: Difference in survival, period start versus 2015 or 2005 versus 2015 (% points)

	≥ +20
	≥ +10 and < +20
	> 0 and < +10
	non-significant change
	< 0 and ≥ -10
	< -10 and ≥-20

TABLE 4. **5-year standardised net survival (SNS) and net survival (NS) according to age at time of diagnosis and confidence interval (95CI) among individuals diagnosed between the start of the study period and 2015, Mainland France. Haematological malignancies**

	Period start	5-year SNS according to year of diagnosis, % [95CI]			Difference in SNS at 5 years, % points [95CI]		Age Range[1]	Difference in NS at 5 years, % points [95CI]			
		Period start	2005	2015	period start versus 2015	2005 versus 2015		period start versus 2015		2005 versus 2015	
								Lower age	Upper age	Lower age	Upper age
Hodgkin lymphoma	1990	82 [78; 84]	84 [82; 85]	88 [85; 90]	6 [2; 10]	4 [1; 7]	[20-80]	2 [1; 4]	17 [4; 30]	1 [0; 2]	13 [2; 24]
Non-Hodgkin lymphoma (NHL)											
CLL/Small lymphocytic lymphoma	1990	75 [72; 78]	85 [83; 86]	91 [88; 92]	16 [12; 19]	6 [3; 8]	[50-80]	17 [13; 22]	17 [10; 23]	4 [3; 5]	8 [4; 12]
Follicular lymphoma	1995	64 [60; 68]	80 [78; 81]	89 [87; 91]	25 [20; 30]	10 [8; 11]	[40-80]	7 [5; 10]	38 [30; 45]	3 [2; 3]	15 [13; 18]
Diffuse large B-cell lymphoma	1995	39 [35; 42]	56 [55; 58]	63 [60; 66]	24 [20; 29]	7 [3; 10]	[40-80]	29 [22; 36]	21 [15; 28]	8 [6; 10]	5 [1; 10]
Mantle cell lymphoma	2005	-	54 [50; 58]	64 [59; 68]	-	10 [3; 16]	[50-80]	-	-	6 [2; 11]	13 [4; 21]
Marginal zone lymphoma	2005	-	86 [84; 89]	90 [87; 92]	-	4 [0; 7]	[40-80]	-	-	1 [0; 2]	6 [0; 12]
Multiple myeloma and plasmocytoma	1995	42 [39; 45]	51 [50; 53]	63 [61; 66]	22 [18; 25]	12 [9; 15]	[50-80]	26 [21; 32]	16 [11; 22]	12 [10; 15]	11 [7; 15]
LPL/Waldenström M.	1995	70 [65; 74]	80 [78; 82]	86 [83; 88]	16 [10; 22]	6 [4; 8]	[50-80]	16 [8; 25]	15 [4; 26]	4 [3; 5]	7 [2; 12]
NK/T cell lymphoma (NKTL)	2005	-	60 [57; 63]	64 [61; 68]	-	4 [0; 9]	[30-80]	-	-	2 [0; 4]	5 [-1; 11]
Cutaneous T-cell lymphoma	2005	-	86 [83; 88]	86 [83; 88]	-	0 [0; 0]	[30-80]	-	-	0 [0; 0]	0 [0; 0]
Non-cutaneous T-cell lymphoma	2005	-	32 [29; 36]	50 [45; 54]	18 [12; 24]	18 [12; 24]	[40-80]	-	-	14 [9; 19]	18 [12; 25]
Acute myeloid leukaemia	1990	14 [12; 16]	20 [19; 22]	29 [26; 32]	15 [12; 19]	8 [5; 11]	[30-80]	32 [23; 41]	5 [2; 7]	14 [10; 17]	3 [1; 5]
Chronic myeloproliferative syndrome (CMS)											
Chronic myelogenous leukaemia (CML)	1990	47 [39; 53]	78 [74; 82]	86 [77; 92]	40 [30; 50]	8 [-1; 17]	[30-80]	42 [29; 55]	42 [25; 59]	5 [2; 7]	11 [-5; 26]
CMS other than CML	2005	-	86 [85; 87]	86 [85; 87]	-	0 [0; 0]	[40-80]	-	-	0 [0; 0]	0 [0; 0]
Polycythaemia vera	2005	-	92 [89; 94]	95 [92; 97]	-	3 [0; 7]	[40-80]	-	-	0 [0; 1]	6 [-1; 12]
Essential thrombocythaemia	2005	-	95 [93; 97]	89 [85; 92]	-	-6 [-11; -2]	[40-80]	-	-	-1 [-1; 0]	-11 [-19; -3]
Myelodysplastic syndrome	2005	-	49 [47; 51]	52 [50; 54]	-	3 [0; 6]	[60-80]	-	-	3 [0; 6]	3 [0; 6]
Chronic myelomonocytic leukaemia and MDS-MPN	2005	-	42 [38; 46]	43 [39; 48]	-	1 [-5; 8]	[60-80]	-	-	1 [-5; 8]	1 [-5; 8]

[1]Both ages shown correspond to percentiles of the age distribution in respect of each site:
Lower age = 5th percentile; Upper age = 95th percentile (or at 80 years if 95th percentile >80 years)
SNS: standardised net survival NS: net survival
95CI: 95% confidence interval CLL: Chronic lymphocytic leukaemia
LPL/Waldenström M.: Lymphoplasmocytic lymphoma/Waldenström macroglobulinaemia
MDS-MPN: myelodysplastic syndrome/myeloproliferative neoplasm

Key: Difference in survival, period start versus 2015 or 2005 versus 2015 (% points)

	≥ +20
	≥ +10 and < +20
	> 0 and < +10
	non-significant change
	< 0 and ≥ -10
	< -10 and ≥-20

Section 3: Long-term (20-year) net survival among individuals diagnosed between 1989 and 2000 and under 75 years of age at time of diagnosis

In this section, the 5- and 20-year net survival is shown for the extreme ends of the age range at the time of diagnosis in Tables 5 and 6[3].

Cancers with over 50% 20-year net survival for the extreme ends of the age range

Among the cancers with a positive prognosis 5 years post-diagnosis, some continue to have a very good prognosis at 20 years regardless of the age at the time of diagnosis, with a relatively stable net survival, such as for cancers of the ***testis*** (20-year net survival > 90% regardless of age), ***cutaneous melanomas*** (> 80%) and ***breast*** cancers (> 63%).
Further sites continue to have a good prognosis after 20 years of follow-up, except for the older population whose net survival continues to decline between 5 and 20 years of follow-up. This applies to cancers of the ***thyroid*** and ***corpus uteri*** (20-year net survival > 90% and close to 80% respectively, except for individuals 70 years of age at the time of diagnosis).
The situation is reversed for ***prostate*** cancers with a lower 20-year net survival for the younger population, diagnosed at 50 years of age (20-year net survival of 57% *vs* > 65% for the older population, diagnosed at 70 years of age).

TABLE 5. **5- and 20-year net survival (NS) and 95% confidence interval (95%CI) among individuals diagnosed between 1989 and 2000, and under 75 years of age at the time of diagnosis, Mainland France. Solid tumours**

	Age Range[1]	Lower age		Upper age	
		NS5 % and 95%CI	NS20 % and 95%CI	NS5 % and 95%CI	NS20 % and 95%CI
Lip-mouth-pharynx	[50-70]	51 [49; 52]	12 [11; 14]	44 [43; 46]	10 [8; 11]
Mouth cavity	[50-70]	56 [53; 58]	15 [13; 17]	48 [45; 50]	11 [8; 14]
Oropharynx	[50-70]	47 [44; 49]	10 [8; 11]	41 [38; 43]	4 [2; 6]
Hypopharynx	[50-70]	34 [30; 37]	6 [5; 8]	26 [23; 29]	4 [2; 6]
Oesophagus	[50-70]	20 [18; 23]	4 [3; 5]	18 [16; 20]	3 [2; 4]
Squamous cell carcinoma	[50-70]	20 [17; 22]	3 [2; 4]	17 [15; 18]	2 [1; 4]
Stomach	[50-70]	36 [34; 38]	24 [22; 26]	32 [31; 34]	16 [14; 19]
Small intestine	[50-70]	73 [69; 77]	38 [32; 44]	58 [55; 61]	25 [18; 32]
Colon and rectum	[50-70]	72 [71; 73]	52 [51; 53]	65 [64; 66]	46 [44; 47]
Colon	[50-70]	72 [71; 73]	54 [52; 55]	65 [64; 65]	48 [47; 50]
Rectum	[50-70]	71 [69; 72]	50 [48; 52]	65 [63; 66]	42 [39; 44]
Anus	[50-70]	75 [72; 78]	49 [42; 56]	70 [66; 73]	45 [36; 54]
Liver	[50-70]	27 [25; 28]	7 [6; 9]	17 [16; 18]	1 [1; 2]
Gallbladder and bile ducts	[50-70]	35 [31; 40]	17 [13; 22]	20 [18; 22]	10 [7; 13]
Pancreas	[50-70]	19 [18; 21]	6 [5; 8]	9 [9; 10]	2 [1; 3]
Larynx	[50-70]	65 [61; 68]	27 [24; 30]	61 [58; 63]	22 [18; 26]
Lung	[50-70]	24 [23; 25]	8 [7; 9]	22 [21; 22]	3 [3; 4]
Adenocarcinoma	[50-70]	25 [24; 26]	9 [7; 10]	25 [24; 26]	3 [2; 4]
Squamous cell carcinoma	[50-70]	22 [19; 24]	8 [7; 9]	24 [23; 26]	3 [2; 4]
Cutaneous melanoma	[30-70]	95 [94; 96]	86 [84; 88]	92 [91; 93]	79 [76; 82]
Sarcoma	[30-70]	75 [73; 78]	56 [53; 59]	61 [59; 63]	33 [27; 38]

[3]Particular attention should be paid regarding interpretation. Survival at the extreme ends of the age range cannot provide a general idea of the 20-year survival for the site in question, which depends on the age distribution at the time of diagnosis for each site.

	Age Range[1]	Lower age		Upper age	
		NS5 % and 95%CI	NS20 % and 95%CI	NS5 % and 95%CI	NS20 % and 95%CI
Soft tissue sarcoma	[30-70]	74 [70; 78]	55 [50; 61]	60 [57; 63]	37 [29; 45]
Breast	[40-70]	92 [92; 93]	66 [65; 67]	92 [91; 92]	63 [61; 65]
Cervix uteri	[30-70]	88 [85; 91]	81 [77; 84]	51 [47; 54]	42 [36; 48]
Corpus uteri	[50-70]	84 [82; 86]	78 [75; 80]	76 [74; 77]	56 [52; 60]
Ovary	[40-70]	72 [69; 75]	57 [53; 60]	40 [38; 42]	20 [17; 23]
Epithelial tumour	[40-70]	68 [64; 72]	53 [50; 57]	40 [37; 42]	20 [17; 23]
Prostate	[50-70]	95 [94; 96]	57 [52; 62]	98 [98; 98]	66 [63; 68]
Testis	[20-60]	98 [96; 99]	93 [90; 96]	94 [91; 96]	90 [73; 97]
Non-seminomatous and mixed germ cell tumour	[20-50]	97 [95; 98]	93 [89; 96]	88 [83; 92]	91 [75; 97]
Seminomatous germ cell tumour	[30-60]	100 [98; 100]	97 [94; 99]	97 [94; 99]	90 [74; 96]
Kidney	[40-70]	88 [86; 89]	66 [63; 69]	71 [69; 72]	39 [35; 42]
Renal parenchyma	[40-70]	88 [87; 90]	66 [63; 70]	75 [74; 76]	39 [35; 43]
Bladder	[50-70]	61 [58; 64]	54 [51; 57]	57 [55; 58]	35 [31; 38]
Central nervous system	[30-70]	60 [57; 64]	27 [24; 31]	8 [7; 9]	2 [1; 3]
Thyroid	[30-70]	100 [99; 100]	99 [98; 99]	97 [96; 98]	68 [60; 74]
Papillary cancer	[30-70]	100 [99; 100]	99 [98; 100]	100 [98; 100]	85 [76; 90]

[1] Both ages shown correspond to percentiles of the age distribution in respect of each site: Lower age = 5th percentile; Upper age = 95th percentile (or at 80 years if 95th percentile > 80 years)

TABLE 6. **5- and 20-year net survival (NS) and 95% confidence interval (95%CI) among individuals diagnosed between 1989 and 2000, and under 75 years of age at the time of diagnosis, Mainland France. Haematological malignancies**

	Age Range[1]	Lower age		Upper age	
		NS5 % and 95%CI	NS20 % and 95%CI	NS5 % and 95%CI	NS20 % and 95%CI
Hodgkin lymphoma	[20-70]	98 [97; 99]	91 [89; 94]	71 [67; 75]	22 [13; 32]
Non-Hodgkin lymphoma					
Chronic lymphocytic leukaemia (CLL)/Small lymphocytic lymphoma	[50-70]	97 [96; 98]	55 [51; 59]	90 [89; 92]	36 [31; 41]
Acute myeloid leukaemia	[30-70]	69 [64; 73]	43 [37; 48]	20 [18; 22]	6 [4; 9]
Chronic myeloproliferative syndrome					
Chronic myelogenous leukaemia (CML)	[30-70]	97 [93; 99]	51 [42; 60]	89 [85; 92]	9 [4; 16]

[1] Both ages shown correspond to percentiles of the age distribution in respect of each site: Lower age = 5th percentile; Upper age = 95th percentile (or at 80 years if 95th percentile > 80 years)

Cancers with between 30% and 50% 20-year net survival for at least one of the extreme ends of the age range

These cancers include haematological malignancies with a positive prognosis at 5 years, losing according to age, between 10 and 25 survival points over the 15 years post-diagnosis: ***chronic lymphocytic leukaemia (CLL)/small lymphocytic lymphomas*** (20-year net survival between 36% and 55% according to age) and ***Hodgkin lymphomas*** (between 22% and 91%).

For ***kidney*** cancers which had a positive prognosis at 5 years, the 20-year net survival is 66% for the younger population, and 39% for the older population.

Among cancers with an intermediate prognosis at 5 years, cancers of the ***colon-rectum*** are those for which the net survival changes the least between 5 and 20 years of follow-up (decrease of 10 points in 15 years), with a 20-year net survival of over 52%.

Cancers for which the net survival loses between 10 and 20 points in 15 years of follow-up, varying to a greater or lesser degree according to age (***bladder*** and ***sarcoma***), resulting in 20-year net survival between 25% and 38% according to age for the ***small intestine*** and a higher survival: between 35% and 56% according to age, for ***sarcomas*** and the ***bladder***.
For cancers of the ***ovary*** and ***cervix uteri***, at 20 years of follow-up, the same age-related net survival gap as at 5 years is observed, ranging from 57% (women aged 40 years) to 20% (women aged 70 years) for cancers of the **ovary**, and from 81% (30 years) to 42% (70 years) for cancers of the ***cervix uteri***.
The survival for ***AML,*** which has a negative prognosis at 5 years, continues to decrease, -26 percentage points between 5 and 20 years of follow-up among those aged 30 years at the time of diagnosis (20-year NS of 43%) and - 14 percentage points for those aged 70 years at the time of diagnosis (20-year NS of 6%).

Cancers with under 30% 20-year net survival for the extreme ends of the age range

These cancers include ***ENT cancers***, which have an intermediate prognosis at 5 years, losing between 25 and 30 net survival points in 15 years of follow-up: the ***lip-mouth-pharynx*** category (20-year net survival of around 10%) and the ***larynx*** (between 20% and 30% according to age).
This category also includes all cancers which already had a negative prognosis at 5 years: cancers of the ***oesophagus*** (20-year net survival <5%), ***liver*** (<10%), ***pancreas*** (<10%), ***lung*** (<10%), ***gallbladder and bile ducts*** (<20%), ***stomach*** (<25%), and ***invasive CNS cancers*** for which the prognosis is more variable according to age (between 2% and 27%).

CONCLUSION

For the first time, thanks to new analytical methods, survival data according to age, and their trends, are now available for Mainland France for histological or anatomical subsites, in addition to the main cancer sites usually described. Furthermore, the follow-up period from French population registries now allows us to present long-term survival data for up to 20 years post-diagnosis. These results will soon be supplemented by a survival study in French overseas departments and regions (DROM), and by an analysis of survival according to stage.
Although most sites have a positive prognosis or intermediate prognosis, some continue to have a negative prognosis with very low standardised net survival rates, under 33% at 5 years. This applies particularly to cancers associated with alcohol and tobacco (oesophagus, liver, lung), both in men and women. Also, despite an improvement in survival over the study period for these sites, their prognosis remains negative. Efforts undertaken for their prevention and early detection should be continued. Combatting cancers with poor prognosis represents one of the axes of the 2021-2030 ten-year anti-cancer strategy [2].
This new study shows an improvement in survival for the large majority of cancer sites studied. This improvement is appreciable for all cancers which have benefited from diagnostic or therapeutic progress in recent years. The improvement in survival associated with screening is more difficult to identify in this study, due to the non-inclusion of *in situ* tumours diagnosed during screening in this study, and due to potential overdiagnosis and lead time bias which are both difficult to quantify.
Although, as a whole, net survival remains considerably lower among those who are older at the time of diagnosis compared to those diagnosed at a younger age, which is partially explained by diagnoses at a more advanced stage or by the presence of comorbidities (which can prevent curative treatments or cause post-treatment complications), significant improvements in survival for a large number of sites are observed among this population. These improvements show that superior oncogeriatric care is now available, and it can be predicted that the years to come will show even greater changes in survival among the older population. This may be a medium- and long-term result of one of the aims of the third 2014-2019 Cancer Plan which was to improve care through more systematic referral for geriatric assessment and with the implementation of oncogeriatric multidisciplinary reviews [1].

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