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# **Barriers to procreational intentions among cancer survivors 2 years after diagnosis: a French national cross-sectional survey**

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## **Abstract**

### **Objectives**

**To determine the rates of parenthood projects among two-year cancer survivors with a preserved fertility, and to identify factors associated with parenthood project, opposing cancer-related factors to socio-demographic factors usually associated with parenting in healthy individuals.**

### **Methods**

**Among 6,957 adult cancer patients randomly selected in the Long Duration Disease File of the French National Health Insurance Fund between September and October 2002, still alive and not hospitalised two years after diagnosis, 4,270 responded to this cross-sectional questionnaire study of whom 969 reported having preserved fertility.**

### **Results**

**Among women aged 20–44 (n=175) and men aged 20–70 (n=784), 26.3% and 6.1% respectively planned to have a child or another child. Such plans were more frequently reported by in younger patients but were also reported by the oldest ones (until 70 years old for men).**

**33.5% of the 257 male and female survivors, aged 20–45, had parenthood project. After adjustment for age, previous children, and gender, only high education level (adjusted odds ratio: 3.1, 95% confidence interval 1.3 to 7.8) and stability or increase of financial resources (2.4, 1.0 to 5.7) were independently associated with parenthood project. Cancer stage at diagnosis and evolution did not modify this project.**

### **Conclusions**

**Two years after cancer diagnosis when fertility has been preserved, motives against parenthood project tend to be similar among cancer survivors and in the general population. Survivors who reported a reduction in financial resources were less likely to have a parenthood project. Targeted support is needed to help them to face financial consequences of the disease.**

**MESH Keywords** Adult ; Age Distribution ; Aged ; Cross-Sectional Studies ; European Continental Ancestry Group ; Female ; Fertility ; physiology ; France ; Humans ; Intention ; Male ; Middle Aged ; Neoplasms ; psychology ; Questionnaires ; Reproductive Behavior ; Risk Factors ; Sex Distribution ; Socioeconomic Factors ; Survivors ; psychology ; statistics & numerical data ; Young Adult

**Author Keywords** cancer ; oncology ; cancer survivors ; parenthood ; procreational intentions ; socio-economic status ; national survey

## **INTRODUCTION**

With the increased frequency of delayed childbearing in developed countries, many adult cancer survivors may not have completed their family at the time of cancer occurrence. Previous studies on psychosocial consequences of a cancer occurring before or during reproduction years, have shown that parenthood is a main concern among young survivors [1]. Parenthood after cancer is not exceptional, but, according to a recent survey, it is reduced by about 25% for first births and 36% for higher-order births compared with the general population [2]. Of course, fertility is frequently impaired by cancer itself and/or its treatment [3], but infertility related to cancer treatment may not be the only barrier to parenthood after cancer. Cancer survivors may fear that pregnancy will result in cancer recurrence, that the child will not be healthy, or that they will not live long enough to see their child grow up [4–6]. Financial difficulties, cancer family

history or fear of the responsibility may also affect child desire [1]. On the contrary, cancer experience may improve skills and pleasure of parenting, help to regain health and femininity, and decrease death anxiety [7]. Surveys among survivors suggested that the wish to have a child is generally not influenced by cancer occurrence [1] and could even increase among childless survivors [4]. However, previous research has mainly focused on parenthood rates of cancer survivors [2, 8–10] or in motivation for parenthood after breast cancer [1]. Less is known about parenthood projects in other cancer sites [4, 5] and, to our knowledge, there is no survey on child project in a fertile representative population of cancer survivors.

The first aim of this study was to determine the rates of parenthood projects among men and women with a preserved fertility two years after a cancer diagnosis in a national representative sample of French cancer survivors. The second aim was to identify factors associated with parenthood project, opposing cancer-related factors to socio-demographic factors usually associated with parenting in healthy individuals.

## METHODS

### Study population

In 2004, a French national cross-sectional survey was initiated to investigate living conditions of adult cancer patients two years after cancer diagnosis [11]. Patients were randomly selected in the Long Duration Disease File of the National Health Insurance Fund. Eligible patients were all those included in this file between September and October 2002 for a diagnosis of biopsy-proven primary cancer, aged over 18 years at diagnosis, still alive two years after diagnosis, not hospitalised at the time of the survey and with a valid address. Of the 6,957 eligible cancer patients, 4,270 agreed to participate (response rate: 64.1%).

### Data collection

Telephone interviews were conducted with consenting patients between November 2004 and January 2005 to collect sociodemographic data, data on disease history, and health status at the time of the interview. For ethical concerns, the question about the potential parenthood project ("Do you plan to have a child or more children?") was asked only to patients who reported having a preserved fertility [12]. Medical characteristics (cancer localisation, stage and evolution) were collected by advisory physicians of the National Health Insurance Fund. Coping with cancer was assessed using the 'Mental Adjustment to Cancer scale' (MAC), a 21-item self-report questionnaire measuring three possible responses to cancer: fighting spirit, helpless/hopelessness, and anxious preoccupation [13]. Health-related quality of life was assessed using the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36) [14].

### Patients

For the purpose of the analyses on reproductive issues, an upper age limit was fixed at 44 years for women and 70 years for men. The study sample included 969 two-year cancer survivors who reported having preserved fertility: 178 of 282 women (63.1%) and 791 of 1,137 men (69.6%) included [12].

### Statistical analyses

Because parenthood theme concerned different age classes in males and females, description of parenthood projects rates among age groups were first stratified according to gender.

Secondly, as plan to have a(nother) child among older men was a rare event, factors associated with such plan were only assessed in 20–44 years old men and women together. Main socio-demographic factors (age, previous children, and gender) were first entered in a multiple logistic regression model. Then, the contribution of factors associated with cancer was assessed using adjusted odds ratios.

## RESULTS

### Parenthood project according to gender

Among the 969 fertile two-year cancer survivors with preserved fertility, 959 (99%) responded to the question about parenthood project. Of the 175 fertile women less than 45 years old, 46 (26.3%) planned to have a child or more children. This project was more frequent in younger women (71.1% of women 20–34 years old vs. 18.5% of 35–39 years old vs. 5.3% of 40–44 years old;  $p < 0.001$ ), but is still present in the oldest women (until 43 years old). Of the 784 fertile men less than 71 years old, 48 (6.1%) planned to have a child or another child. Such plan decreased with age (77.8% of men 20–34 years old vs. 45.5% of 35–39 years old vs. 8.3% of 40–44 years old vs. 2.9% of 45–49 years old vs. 0.9% of >49 years old;  $p < 0.001$ ) but remained in some of the oldest survivors (until 70 years old).

### Factors associated with parenthood project among 20–44 years old survivors (men and women together) (Table)

Eighty-six (33.5%) of the 257 fertile survivors aged 20–44 years (average age = 36.7 +/- 5.8) had a parenthood project. This project was more frequent in male, youngest and childless patients.

After adjustment for age, previous children, and gender, only a lower education level and a reduction of financial resources were independently associated with lack of parenthood project. Mostly, this reduction of financial resources was reported by survivors as directly related to cancer occurrence (78.7%). Moreover, a stable couple relationship, a fighting spirit and a low feeling of hopelessness/helplessness were marginally associated with parenthood project. No relation was found (not reported) between parenthood project and current employment status ( $p = 0.14$ ), family financial resources ( $p = 0.24$ ), and negative sexual consequences of cancer ( $p = 0.33$ ).

Parenthood project was independent of cancer site, cancer prognosis index, and report of troublesome sequelae, but also (not reported) of cancer stage at diagnosis (localised, regional, distant tumour;  $p = 0.92$ ), treatment (surgery, radiotherapy, chemotherapy, hormonotherapy;  $p = 0.26$ ;  $p = 0.52$ ;  $p = 0.59$ ;  $p = 0.14$ , respectively), and disease evolution 2 years later (remission, stability, relapse;  $p = 0.94$ ). Moreover, survivors who stated that their family members had an increased risk of cancer occurrence had also similar rates of children project (not reported;  $p = 0.12$ ).

## DISCUSSION

The desire for children among cancer survivors is still poorly documented. Among survivors having preserved fertility, parenthood project is frequent and influenced by a reduction of financial resources.

In our survey, one third of the 20–44 years French fertile cancer survivors, 2 years after a cancer diagnosis, had a parenthood project. Schover et al [4] in a small sample of American cancer survivors and Heard et al [15] in a representative sample of French HIV-infected patients reported similar rates of parenthood project. As expected, parenthood project was more frequent in younger cancer survivors. However, our survey showed that child project remained in oldest survivors, suggesting that detailed information about infertility risk related to cancer treatment should be provided to all treated patients, irrespective of their age [12]. The great persistence of parenthood project in fertile survivors suggests that the important reduction of parenthood probability in cancer survivors compared with the general population [2, 9, 10] is mainly related to fertility impairment. Moreover, in premenopausal women, despite preserved fertility and a strong child desire, long-term hormonal therapies may lead to delay pregnancies for years, until parenthood became impossible. For example, premenopausal women with localised breast cancer should be informed that early conception, six months after completing their treatment would not reduce survival [16]. More generally, a greater attention should be given to the preservation of fertility in patients with cancer. New methods of fertility preservation and treatment modifications can help to preserve fertility without compromising cancer care [17].

The main predictors of parenthood projects were age, gender and previous children, as already described in parenthood rates [2, 8, 18]. However, if post cancer reproduction rate is known to be strongly associated with the type, extent and treatment of the malignancy [8], none of the variables measuring objective or perceived health status were associated with parenthood project in our survey. Such a low impact of clinical conditions on child desire is consistent with results of previous surveys carried out in HIV patients [15] or in breast cancer women [1]. The only major negative impact of cancer on child project is indirect, through income reduction. This argument against parenthood is not specific to cancer. Financial restraints are common arguments against parenthood in the general population [19, 20].

If in our results, couple relationship was not associated with parenthood project, youngest adult cancer survivors with parenthood projects that have not started to live in couple may experience difficulties to get married or enter a union such as childhood cancer patients [21] and have their child project compromised by lack of partner. Future studies with larger sample of young adult cancer survivors may answer this question.

Our study has a few limitations. First, fertility assessment was based on patients' self report. However, for the evaluation of parenthood project, self-perception of fertility could be as relevant as real fertility. Second, our sample included only a few survivors of cancer sites like leukaemia, lymphoma or testicular cancer. The subrepresentation of these cancer sites is not related to a selection bias but is directly related to consequences of cancer treatment on fertility. So our sample is representative of French fertile cancer survivors 2 years after diagnosis.

Finally, our results show that cancer characteristics do not deeply affect parenthood project in fertile survivors, and that, 2 years after a cancer diagnosis, motives against parenthood project tend to be similar among cancer survivors and in the general population. Of course, more efforts should be done to improve fertility preservation before cancer treatment, but once 'patients' have become 'survivors', targeted support is also needed to help them to face financial consequences of the disease.

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**Table**

Factors associated with parenthood project in French adult cancer survivors.

	Parenthood project				Adjusted OR <sup>*</sup>	(95%CI)	Adjusted P value
	No		Yes				
	n	%	n	%			
<b>Gender</b>							
Male	42	51.2	40	48.8	2.3	(1.0 to 5.2)	0.039
Female	129	73.7	46	26.3	1		
<b>Age</b>							<0.001
20–34	21	25.9	60	74.1	25.3	(9.0 to 71.3)	<0.001
35–39	56	73.7	20	26.3	6.0	(2.1 to 17.4)	0.001
40–44	94	94.0	6	6.0	1		
<b>Previous child</b>							<0.001
0	21	30.9	47	69.1	12.9	(5.1 to 32.3)	<0.001
1	27	50.9	26	49.1	8.1	(3.2 to 20.4)	<0.001
2 and more	123	90.4	13	9.6	1		
<b>Education</b>							0.048
< high school	81	77.1	24	22.9	1		
high school graduate	40	64.5	22	35.5	1.5	(0.5 to 3.9)	0.451
> high school	50	55.6	40	44.4	3.1	(1.3 to 7.8)	0.015
<b>Financial resources</b>							
Stable/increased	117	64.6	64	35.4	2.4	(1.0 to 5.7)	0.050
Reduced	54	72.0	21	28.0	1		
<b>Couple relationship</b>							0.306
No	22	48.9	23	51.1	1		
Stable	116	72.5	44	27.5	3.0	(0.9 to 10.1)	0.083
Deteriorated/separation	28	70.0	12	30.0	2.9	(0.6 to 13.3)	0.163
New	5	41.7	7	58.3	4.2	(0.6 to 26.8)	0.134
<b>Cancer site</b>							0.324
Breast	63	87.5	9	12.5	0.6	(0.2 to 2.2)	0.440
Thyroid	26	54.2	22	45.8	2.4	(0.8 to 7.8)	0.130
Melanoma	15	62.5	9	37.5	1.8	(0.4 to 8.0)	0.422
Testicular	8	40.0	12	60.0	1.4	(0.3 to 7.0)	0.679
Lymphoma	9	42.9	12	57.1	2.6	(0.6 to 11.1)	0.190
Leukaemia	8	57.1	6	42.9	1.3	(0.2 to 7.1)	0.768
Other <sup>**</sup>	42	72.4	16	27.6	1		
<b>Troublesome sequelae</b>							
Yes	26	83.9	5	16.1	0.4	(0.1 to 1.6)	0.199
No	143	63.8	81	36.2	1		

