# Events of parents of children with cancer.

We have 887 responses for 509 children. For 378 children, we have a response for both parents. For 25 children, we have a response for the father only, and for 106 children we have a response for the mother only.

This appears to be related to whether the parents are in a relationship.

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| **Current marital status** | **Both responses** | **One response** | **Total** |
| Married or de-facto | 348 (92%) | 62 (47%) | 410 |
| Otherwise | 30 (8%) | 69 (53%) | 99 |
|  | 378 (100%) | 131 (100%) | 509 |

Number of children, by marital status of parents and their response. Where the parents are married, we are more likely to have both responses. This is also the case within the cases and control groups.

Disregarding the difference between cases and control for the moment, we see a difference in the response between fathers and mothers in these five questions:

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| **Question** | **Fathers (403)** | **Mothers (484)** | **p-values**  **(couples; singles)** |
| Serious illness or injury in close relative | 65 (16%) | 106 (24%) | 0.015; 0.796 |
| Death in a more distant relative | 108 (27%) | 172 (38%) | 0.002;0.651 |
| Serious problem with close friend, neighbour | 44 (11%) | 99 (21%) | <0.001;0.015 |
| Unemployment for more than one month | 59 (15%) | 36 (7%) | <0.001;0.112 |
| Problems with police or court appearance | 17 (4%) | 10 (2%) | 0.010; 0.681 |

Questions with different response between fathers and mothers.

Data was analysed separately for the couples and the singles groups. The difference between mothers and fathers is statistically significant only in the group where we have both responses, except for the 3rd question (which is significant in both groups). This is based on Fisher’s exact test for the singles, and on McNemar’s test for the couples.

We see that the mothers are more unfortunate in their friends and relatives, while men are more troubled by unemployment or the police. I don’t immediately see a reason why this might be so about the mothers. Perhaps they keep closer track of their relationships, or have more close friends.

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| **Question** | **CONTROLS** | **CASES** |
| Serious illness or injury in close relative | 0.265 ;1 | 0.031; 0.518 |
| Death in a more distant relative | <0.001;0.717 | 0.626; 1 |
| Serious problem with close friend, neighbour | 0.012; 0.054 | 0.016; 0.269 |
| Unemployment for more than one month | 0.004; 1 | 0.004; 0.033 |
| Problems with police or court appearance | 0.077; 1 | 0.114; 0.488 |
| Change of job, including quitting | 1 ; 0.271 | 0.010; 0.364 |

P-values for comparisons between fathers and mothers within the 2 groups. An extra question appears: There is a significant difference between fathers and mothers in the case group for the change of job question.

# Cases vs controls

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|  | **# Children** | **Response father only** | **Response mother only** | **Both responses** |
| **Cases** | 231 | 13 | 53 | 165 |
| **Controls** | 278 | 12 | 53 | 213 |
| **All** | 509 | 25 | 106 | 378 |

Total number of responses (surveys) by parent and case/control

Let’s look at the total number of events, by parent and case vs. control

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| --- | --- | --- | --- | --- | --- | --- |
| **# boxes ticked** | **Total** |  | **Cases** |  | **Controls** |  |
|  | **father** | **Mother** | **Father** | **Mother** | **Father** | **Mother** |
| 0 | 0 (0%) | 1 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (0%) |
| 1 | 220 (55%) | 237(49%) | 87 (49%) | 100 (46%) | 133 (59%) | 137 (52%) |
| 2 | 82 (20%) | 105 (22%) | 38 (21%) | 47 (22%) | 44 (20%) | 58 (22%) |
| 3 | 53 (13%) | 66 (14%) | 26 (15%) | 26 (12%) | 27 (12%) | 40 15%) |
| 4 | 21 (5%) | 33 (7%) | 15 (8%) | 21 (10%) | 6 (3%) | 12 (5%) |
| 5 | 15 (4%) | 23 (5%) | 6 (3%) | 14 (6%) | 9 (4%) | 9 (3%) |
| 6 | 8 (2%) | 9 (2%) | 4 (2%) | 5 (2%) | 4 (2%) | 4 (2%) |
| 7 | 1 (0%) | 5 (1%) | 0 (0%) | 2 (1%) | 1 (0%) | 3 (1%) |
| 8 | 1 (0%) | 4 ( 1%) | 0 (0%) | 3 (0%) | 1 (0%) | 1 (0%) |
| 9 | 2 (0%) | 1 (0%) | 2 (1%) | 0 (0%) | 0 (0%) | 1 (0%) |
| **Total** (100%) | **403** | **484** | **178** | **218** | **225** | **266** |

Number of events experienced by father/mother and by case/control. Nothing stands out, and there appear to be no difference between fathers and mothers, or between cases and controls.

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| --- | --- | --- | --- | --- | --- | --- |
| **# boxes ticked** | **Total** |  | **Cases** |  | **Controls** |  |
|  | **father** | **Mother** | **Father** | **Mother** | **Father** | **Mother** |
| **0,1,2** | **302 (75%)** | **343 (71%)** | **125 (70%)** | **147 (67%)** | **177 (79%)** | **196 (74%)** |
| **3-9** | **101 (25%)** | **141 (29%)** | **53 (30%)** | **71 (33%)** | **48 (21%)** | **70 (26%)** |
| **Total** (100%) | **403** | **484** | **178** | **218** | **225** | **266** |

The same information, but collapsed into two groups;

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| --- | --- | --- | --- |
| **# boxes ticked** | **Cases (396)** | **Controls (391)** | **All (887)** |
| Mean | 2.2 | 1.9 | 2.0 |
| Sd | 1.6 | 1.4 | 1.5 |

The cases have experienced, on average, a slightly higher number of events than the controls (2.2 vs 1.9)

I have fitted a binomial linear mixed model, with the number of events as the response variable, and the following predictors (deprivation level (1 through to 4), mother/father, case/control). I have added a random intercept for each child, to take into account the lack of independence between parents of the same child.

I found that –adjusted for deprivation level- the confidence interval for the odds ratio of the *case* variable is [1.01-1.28]. This is just shy of the value-1, so only just statistically significant at the 5% level.

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| --- | --- | --- | --- |
| **Variable** | **Estimate**  **Odds ratio** | **95% CI** | **p-value** |
| Dep2 | 1.14 | 1.00-1.31 | 0.05 |
| Dep3 | 1.18 | 0.94-1.48 | 0.15 |
| Dep4 | 1.89 | 1.58-2.26 | <0.001 |
| Case | 1.14 | 1.01-1.28 | 0.03 |
| Mother | 1.05 | 0.95-1.17 | 0.32 |

Results from logistic regression on the total number of events per parent: Parents with a highest deprivation level are almost twice as likely to report an event. Parents with a child with cancer have a slightly larger likelihood of reporting an event than parents of healthy children. There was no evidence of a difference between fathers and mothers

On average, someone in Dep4 would have a probability of experiencing an event of 0.17, compared to 0.10 for someone in DEP1 (95% CI [0.15-0.91] vs [0.09-0.10]

Someone with a child with cancer would have a probability –on average- of experiencing an event of 0.11 (vs 0.10 for the controls).

I have also fitted the same model on the responses to the individual questions. This shows a significant difference between deprivation level 4 and the other levels, for questions 4,8,10,11,12 (Death in a more distant relative; Unemployment for more than one month; Major financial crisis; Problems with police..; Change of job…;

I found no significant differences between cases and controls for individual questions.

# Summary of results

The overall score appears to be associated with the highest deprivation level. This is also the case for some of the individual questions (death in a more distant relative; unemployment for more than one month; major financial crisis; problems with police; change of job). The probability of answering a question in the positive is estimated to be 17% for someone in DEP4, vs 10% for someone in DEP1 (95% Ci [0.15-0.19] vs [0.9-0.10]. This is not surprising, because –obviously- someone in the lowest deprivation scale would be more likely to have a financial crisis, be unemployed, or change jobs.

I have found no evidence of a difference in the overall score, between fathers and mothers.

Having a child with cancer appears to have a statistically significant effect on the total number of reported events. However the effect is very modest: The probability of a positive answer is 0.11 vs. 0.10 (95% CI [0.09-0.11] vs [0.11-0.12]). The mean number of events for cases is 2.2, and for controls it is 1.9.

# References

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