Death Won't Wait.
Cancer Deaths Around Birthdays and Religious Holidays

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Abstract

When it comes to certain long lasting and fatal illnesses, there is a widespread ›folk belief‹ in the hypothesis that persons are able to delay their own death for a brief period of time: A lot of people can tell anecdotes about relatives or close friends that died from such an illness, e. g. cancer, only a few days after their birthday or important religious holidays, simply because they intensely wanted to live to see that specific event. Results both supporting and opposing this hypothesis of an ›intentionally delayed death‹ can be found in the recent literature, with many of the findings based on rather small and/or rather specific samples. In our research project we analysed more than four million cases of people who died from malignant neoplasms (cancer)—a cause of death being prototypical for the ›type of dying‹ meeting the above requirements. In this data we found no evidence supporting the hypothesis: neither for the population in general nor for specific religious, regional, or other sub-groups. In the present paper, the core results of the research project are presented alongside some methodological remarks. In a forthcoming paper by the authors, a more in-depth discussion of the methodology and the results will be given.

Introduction

The ›intentionally delayed death‹ hypothesis states that at least some people suffering from long lasting, terminal illnesses are able to delay their own death for a brief period of time. The common phrase ›a brief period‹ is, of course, rather vague; we take it to mean ›a couple of days‹. The hypothesis is, at first glance, perfectly plausible. Moreover, from anecdotes and sometimes even from personal experience, we know of cases that count as clear examples for the hypothesis. So—why shouldn't it be true? As some wise person once said: »The plural of ›anecdote‹ is not ›data‹.« And with the help of official statistics we are in the lucky position to have large amounts of high quality data at hand that can be used to test the ›intentionally delayed death‹ hypothesis.

Maybe the most famous scientific proponent of this ›postponement of death‹ thesis is David P. Phillips. A whole number of papers by him (with different co-authors; see the references section for some examples) can be found in which natural death cases are examined that suggest the truth of the above hypothesis—not for the population in general but for specific sub-groups and specific events. In the temporal distribution of death cases in these sub-groups a pattern, called ›dip-peak-effect‹ can be observed: Around specific dates of special relevance for the people in question (e. g., birthdays and religious holidays), there are less death cases in the days before and more cases in the days after the event to be found. One conclusion drawn is that the ›intentionally delayed death‹ hypothesis is in fact true. Nonetheless, some results of Phillips et al.'s papers are far from being intuitively plausible. Another critical factor is that the sizes of their samples are often rather small.

Young/Hade (2004) set out to check on these studies' conclusions. Their study has at least two important benefits over the previous ones: (1) Young/Hade base their conclusion on a much larger (*n*=309 221) sample. (2) Furthermore, this sample consists only of death cases with malignant neoplasms—cancer—as leading reason of death. This seems to be the best choice for testing the hypothesis. In this data set, they are unable to reproduce the dip-peak effect for any sub-group on three different events (Christmas, Thanksgiving, the individual's birthday). They conclude that the ›intentionally delayed death‹ hypothesis is false.

Our goal, too, is to test the hypothesis; whilst our methods are roughly similar to the ones used by Young/Hade, we use a nearly 14 times larger sample and a different—in our eyes more appropriate—placement of the event in the time window examined.[1] Furthermore, we adapt Young/Hade's choice of sub-groups and events for the German cultural background.

Methods

Our sample consists of *n*=4 248 875 death cases with with malignant neoplasms as leading reason of death. Source of the data is the German causes of death statistics from between 1992 and 2011.[2] 2 219 606 persons (52.2 %) are males, 2 029 269 (47.8 %) females. The median age is 72 years (Q1: 63 years, Q3: 81 years). 2 330 667 (54.9 %) persons were married at the time of their death, 1 816 898 (45.1 %) were either single, divorced or widowed. 3 175 479 persons (74.7 %) are Christians of either Roman-Catholic or Protestant confession. Data on the ethnical background and nationality of the persons deceased is not available.

In accordance with previous studies we analyse all death cases that occurred in a time frame of 14 days centred on the special events. To reduce the risk of erroneous assumptions, we also carried out some of the tests with larger (28 and 20 days) and a smaller (six days) time frames. The results made no difference to the general outcome, so we stuck with the established 14 days.

There are at least two events that can be regarded as ›special‹ for the vast majority of the population: One of those is Christmas, celebrated on the evening of the 24th and both the 25th and 26th of December. A very large part of the non-christian population of Germany celebrates Christmas as well, albeit as a more social than religious event. Since the date is fixed, we took the number of death cases from the week leading up to and including the 24th of December and those from the week beginning with the 25th of December.

The other event is a bit more complex—the individual birthday of the deceased persons. Here, we took the number of persons that died in the seven days leading up to but not including their own birthday and contrasted this to the number of persons that died in the seven days after their own birthday.[3]

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[1] For reasons of comparability, we calculated the values for the method used by Young/ Hade as well. Those will be presented alongside our values in the forthcoming paper.

[2] People born or deceased on a 29th of February were excluded from the sample.

[3] In previous studies, the (first) day of the events was regarded as being part of week one; we are of the opinion that, e. g., a person dying on their birthday has indeed lived to see that event.

For both events (and for at least some of the sub-groups), for the hypothesis to be true, the number of death cases in the first week should be significantly lower than the number of death cases in the second week—this would be the dip-peak effect mentioned above. Technically, to test the hypothesis, two conditions had to be fulfilled: (1) The total number of deaths in week two had to exceed those of week one and (2) the difference between the number of deaths in the two weeks had to be significant.

We calculated a dip-peak index against the assumption that the number of deaths in week one and week two are equal, so the deaths in week one would amount to 50 % of the total deaths in the period. The dip-peak index is the sum of the decrease in deaths in week one and the increase in deaths in week two. The significance of the result was evaluated by an exact binomial test with a 95 % confidence interval. So a dip-peak effect would obtain for a specific sub-group and event if and only if the corresponding dip-peak index would be both (1) positive and (2) significant.

Results

As regards the birthdays, our results are on a line with those of Young/Hade: Neither for the sample in general nor for the sub-groups a significant dip-peak effect could be found. The death cases were equally distributed over week one and week two.

Table 1: Deaths from malignant neoplasms in a fortnight around birthdays and Christmas in Germany, 1992–2011

Event	Sub-group		Total deaths in both weeks	Deaths in week one	Percentage of deaths in week one	Dip-peak index (bold means significant)
Birthday (first day of week two)	total		162936	81285	49,9 %	0,22 %
	sex	male	85367	42525	49,8 %	0,37 %
		female	77569	38760	50,0 %	0,06 %
	religion	Christians	121611	60703	49,9 %	0,17 %
		others	41325	20582	49,8 %	0,39 %
	martial status	married	89444	44566	49,8 %	0,35 %
		single, divorced, widowed	73429	36698	50,0 %	0,04 %
	age	< 72	73699	36613	49,7 %	0,64 %
		>= 72	87610	43694	49,9 %	0,25 %
Christmas (week two starts on Dec. 25th)	total		165599	83564	50,5 %	**-0,92 %**
	sex	male	86761	43756	50,4 %	**-0,87 %**
		female	78838	39808	50,5 %	**-0,99 %**
	religion	Christians	123237	62116	50,4 %	**-0,81 %**
		others	42362	21448	50,6 %	**-1,26 %**
	martial status	married	90326	45627	50,5 %	**-1,03 %**
		single, divorced, widowed	75237	37923	50,4 %	**-0,81 %**
	age	< 72	77091	38734	50,2 %	-0,49 %
		>= 72	88508	44830	50,7 %	**-1,30 %**

Remarks: ›Christians‹ only includes the Roman-Catholic and Protestant confession; an explanation of the dip-peak index is given in the text

When it comes to Christmas, however, the dip-peak index is significant—albeit small—in nearly all of the sub-groups. Since the index is negative, the most accurate description of the phenomenon would be ›peak-dip effect‹—significantly

more deaths are to be found in week one than in week two. We suspect this not to be a consequence of some ›intentionally rushed death‹ but of external reasons. We will discuss these findings in detail in our forthcoming paper.

Another result of our tests is that sex, religion, martial status and age have hardly any influence on the dip-peak index.

Conclusion

In accordance with Young/Hade we conclude that there is no such phenomenon as an intentionally postponed death—at least not for an amount of time that should be measured in at least days. The ›intentionally delayed death‹ hypothesis and the corresponding folk belief is, albeit very widely spread, simply false.

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