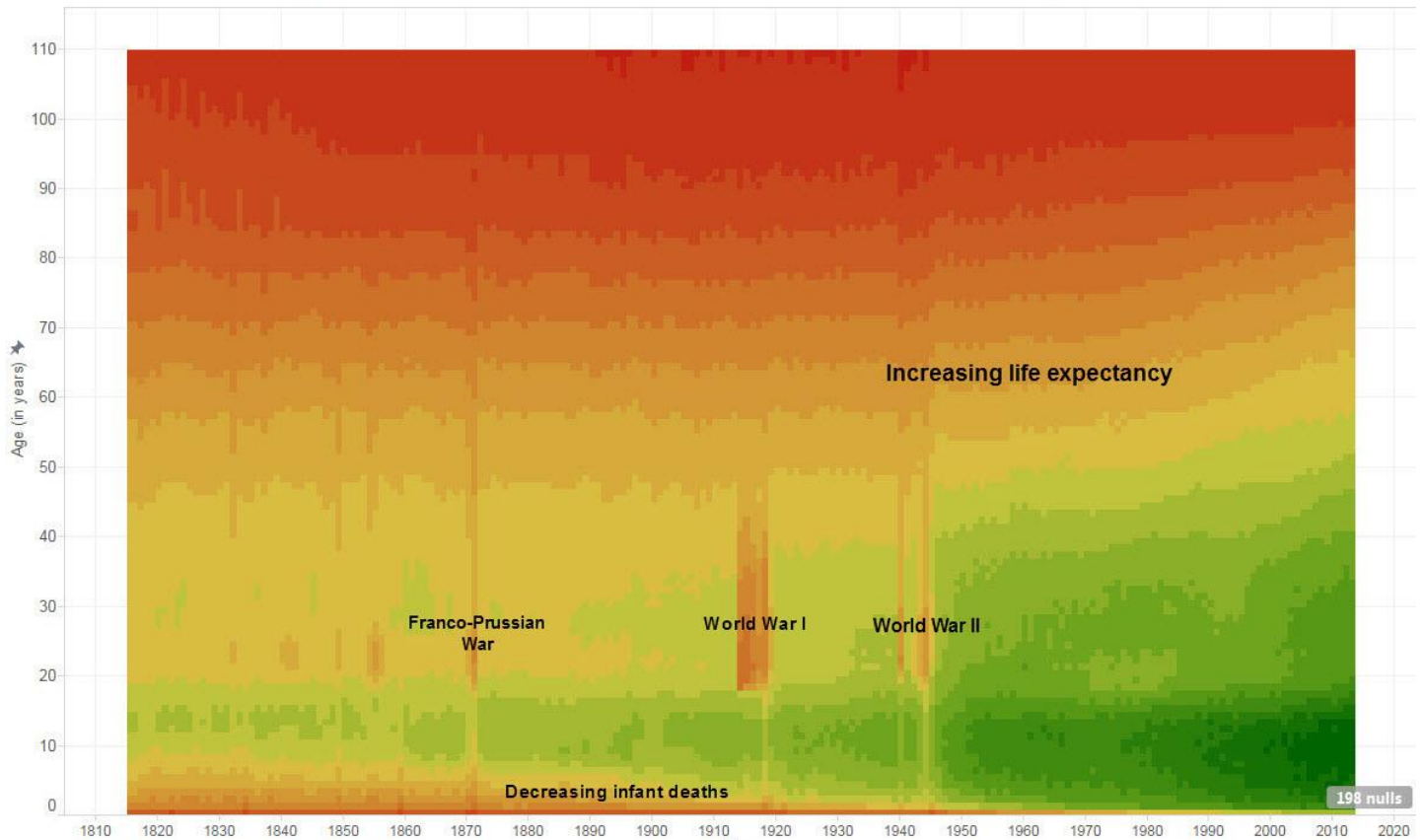


Homework #3

CS 5890, Fall 2015

Probability of male deaths in France from 1815 to 2014



The above graph known as **Lexis Map** shows the distribution of probabilities of male deaths in France from year 1815 to 2014, with historical events such as Franco-Prussian War, World War I & II.

Info about the dataset:

- From plotting the graph, I have used dataset from mortality.org/hmd/FRATNP/STATS/mltper_1x1.txt, The dataset contains following information:

Year	Age	mx	qx	ax	lx	dx	Lx	Tx	ex
1816	0	0.22293	0.19396	0.33	100000	19396	87005	3903261	39.03
1816	1	0.04667	0.04561	0.50	80604	3676	78766	3816256	47.35
1816	2	0.03431	0.03373	0.50	76928	2595	75631	3737490	48.58
1816	3	0.02315	0.02289	0.50	74333	1701	73483	3661859	49.26
1816	4	0.01607	0.01595	0.50	72632	1158	72053	3588377	49.40
1816	5	0.01364	0.01354	0.50	71474	968	70990	3516324	49.20
1816	6	0.01163	0.01157	0.50	70506	815	70098	3445334	48.87
1816	7	0.00991	0.00986	0.50	69690	687	69347	3375236	48.43
1816	8	0.00838	0.00834	0.50	69003	576	68715	3305889	47.91
1816	9	0.00710	0.00708	0.50	68427	484	68185	3237174	47.31
1816	10	0.00601	0.00599	0.50	67943	407	67739	3168988	46.64
1816	11	0.00521	0.00519	0.50	67536	351	67360	3101249	45.92
1816	12	0.00465	0.00464	0.50	67185	311	67029	3033889	45.16
1816	13	0.00443	0.00442	0.50	66874	295	66726	2966859	44.37
1816	14	0.00455	0.00454	0.50	66578	302	66427	2900133	43.56
1816	15	0.00496	0.00495	0.50	66276	328	66112	2833706	42.76

- The dataset contains account of all the male deaths from years 1816 to 2014. It contains various columns like $m(x)$: Central death rate between ages x and $x+n$ (where $n=1, 4, 5$, or ∞ (open age interval)), $d(x)$: Number of deaths between ages x and $x+n$, $e(x)$: Life expectancy at exact age x (in years), etc.
- We are particularly interested in Year, Age and **$q(x)$: Probability of death between ages x and $x+n$.**

Analysis of the Lexis Map:

- On observing the graph, we can see few red spots in the years 1860, 1914-1918 and 1939-1945. These are the period when Franco-Prussian war, WW-I and WW-II took place. And during this time the probability of male deaths was quite high because most of the males HAD TO join the army and fight in the war.
 - In the lower part of the graph we can see that the red portion is constantly falling down, indicating that the infant mortality rate has gradually and constantly decreased over the years. This could be due to the improvement of health and social condition in France over the years?
 - Also the rise of yellow and green portions after World War II indicates that the life expectancy of males have continued to increase.
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- ❖ **What Am I trying to communicate?** In the graph I am trying to show the probability of deaths of French men between 1815-2014 years using the time graph known as Lexis Map. I am showing the deaths using palette of colors ranging from red to yellow to green, where red indicates high probability and green indicates low probability. In particular I want to show the abnormality in probability of deaths during the time of war, decrease of infant mortality rate and increase in life expectancy.
 - ❖ **Why particular visualization type?** The Lexis Map is usually used to represent events (such as births or deaths) that occur to individuals belonging to different cohorts. And in my visualization is am showing the probability of deaths of people in a span of time, which meets the criteria of Lexis Map. This is reason I have chosen to use Lexis Map as the visualization type.
 - ❖ **What motivated your choice of size, color, and scale?** For the vertical “Age”, I have used the scale of in the intervals of 10s, which is obvious choice because a man can normally live between 0-100 years. And choosing the scale of 10s seems practical. For horizontal “Years”, I have used scale of 10 years, because it easily covers the entire 1815-2014 years in one graph. And for showing the probability of deaths, I have used palette of colors starting from Red to Green. Red indicating high probability of death and Green indicating low probability of death. This is an obvious choice because red in kind of ‘Sad or Dangerous’ color, whereas green is ‘Happy’ color. So, it will be easy for a commoner to infer the graph based on the mood of colors.
 - ❖ **Any downsides to your viz?** The visualization does not give actual number of the death probability, but it only give the sense if it, like if the probability is either on the higher or lower side.

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