Hello! Here is the assignment to be answered in teams. Please send us a PDF/Word document/RMarkdown with your answers and your code (please write so that we can understand it). You have until the 18th February to send it back.

Question 1

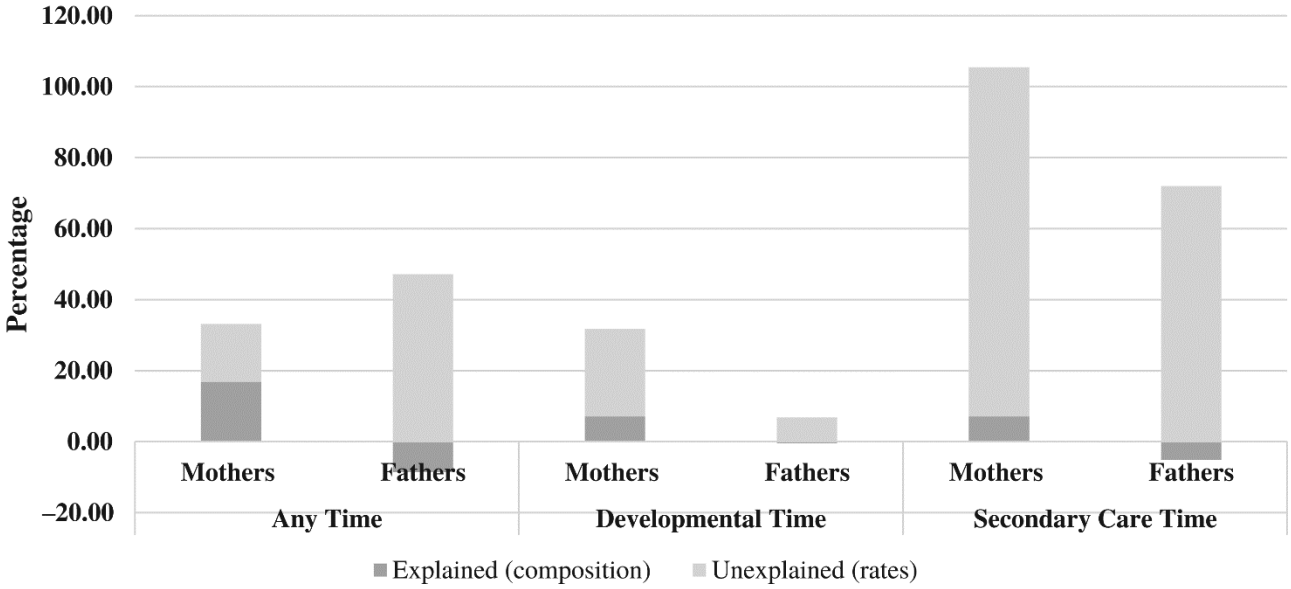
We would like to know whether the same causes drove changes in life expectancy and lifespan variation between 2000 and 2015. Use the HMD's cause-of-death series (short list) to answer the following questions about two countries that were assigned to your group.

- How did life expectancy and lifespan variation change?
- Which were the causes that drove changes in life expectancy? Which were the causes that drove lifespan variation changes?
- Were they the same across the two countries? Do this cause/these causes explain the difference in life expectancy between these two countries in 2015?
- Did the cause(s) that drove changes in life expectancy between 2000 and 2015 affect all ages equally? What about the cause(s) that drove changes in lifespan variation?

Question 2

Between 2019 and 2020, the time that parents spend with children increased. This was due to the fact that children were staying at home and parents had to take care of them, but also due to the fact that some parents lost their job and parents that work less have more time to spend with children. Augustine and Prickett (2022) tried to understand how much of the increase was due to behavioural changes and how much of the increase was due to changes in employment status. Mothers and fathers were divided among working full-time, part-time, not employed and looking for work, not employed and not looking for work (for ease, let's divide them between more time-consuming and less time-consuming employment). What method do you think they used? Would you have used another one? If so, which one and why?

Below, you can find a figure with some results and a table with values (let's assume these are accurate), decomposing the change in time spent with children by mothers and fathers between 2019 and 2020 in the USA. Time spent with children is divided between "Developmental time" (time spent in developmental tasks, such as homework), "Secondary care time" (care time while doing other primary tasks, e.g. caring for a child while cooking) and "Any time" (the total time spent with children). Below the figure, there is a short text interpreting it, which contains some mistakes (some concern details, others parts of the interpretation). Can you find and correct them? Please explain your reasoning for each.



	Any time		Developmental time		Secondary care time	
	Mothers	*Fathers*	*Mothers*	*Fathers*	*Mothers*	*Fathers*
Explained	18%	-5%	5%	5%	100%	75%
Unexplained	17%	45%	30%	0%	5%	-5%

In 2020, mothers and fathers spent on average more time with children compared to 2019. For mothers, this time increased by 35%, for fathers by more than 40%. For mothers, this increase was due in comparable parts to changes in the population composition (e.g. increase in the proportion of mothers in less time-consuming employment) and in behavioural changes. For fathers, behavioural changes explained the total of the increase, while compositional changes contributed towards a decline in time spent with children of 5%. This suggests that a greater number of mothers shifted to less time-consuming employment, while fathers on average did not change employment status.

When considering developmental and secondary care time, the time spent by mothers increased more than the time spent by fathers. The time spent by mothers in developmental activities increased by 30% and the time spent in secondary care more than doubled. In both cases, this increase was largely due to changes in employment status and only in small part to behavioural changes. The time spent by fathers in developmental activities only increased by 5% and the time spent in secondary care increased by 70%. Here again, the increase was completely driven by behavioural changes, while compositional changes contributed slightly negatively to the time spent in secondary care. This means that if in 2020 fathers had had the same employment status composition as in 2019, they would have spent 75% more time in secondary care than they actually did.

In summary, both mothers and fathers increased the time spent with children between 2019 and 2020, and fathers more so than mothers. Because results show that in 2020 mothers spent more time in developmental activities and secondary care compared to fathers, this suggests fathers spent more time with children than mothers in other areas (e.g. recreational activities). For both mothers and fathers, increases were mostly explained by behavioural changes. For mothers, compositional changes contributed positively to the change in time spent with children, suggesting that mothers were more likely to be in less time-consuming employment in 2019 compared to 2020. In contrast,

compositional changes for fathers contributed negatively to time spent with children, suggesting that fathers became more likely to be in more time-consuming employment.