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# Teenage Mothers

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Bertelsmann Udacity Challenge Course

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# Teenage Mothers

**Introduction:** If we want to congratulate someone for having a baby, we often say “What a bundle of joy!” A lot of new mothers describe being as mother as one of the most beautiful aspects of their lives. Just look at all the cute baby pictures shared by their mothers on social media! However, in many parts of the world, there are lots of girls who couldn't experience this joy as they give birth when they are still an adolescent, which is defined as “the period of life when a child develops into an adult” by Merriam-Webster.

These adolescent mothers are under a lot of environment, physical and emotional risks; poverty, malnutrition, poor education, pregnancy complications, emotional problems, drug and alcohol use are several factors that should be considered. As for babies, being born and raised by parents who are still themselves children brings a lot of cognitive, physical and emotional problems. (2)

According to an UNFPA report, worldwide, there are approximately 16 million girls between the ages of 15 and 19 become pregnant every year (3). In this analysis, we explore this problem and some factors and analyze the findings. The data used is obtained from Worldbank databases (1). The ideas given in this report is of authors only.

**Research Problem:** Is there any relationship between the adolescent fertility rate, total public spending on education or adolescent marriage rate?

# Exploratory Data Analysis

In this analysis, we looked at the 10-year period between 2007 and 2016. Here, `avg_fertility` denotes average of the adolescent fertility rate, which is given by the number of births per 1,000 women between ages 15-19; `fertility_change` denotes the change between the years 2007 and 2016 and `avg_pubedu` denotes total public spending on education (% of GDP).

According to the data

- World average fertility rate is 46.44.
- Worldwide, there is a decline (on average 3.24) in the number of births from 2007 to 2016.
- There are 85 countries in the world who fell above the world rate.
- There are 106 countries in the world who fell below the world rate.
- According to the table given, it is clear that the `avg_fertility` rate for the countries in the low income group is about 5 times more than those in the high income group.

	<code>avg_fertility</code>	<code>fertility_change</code>	<code>avg_pubedu</code>
<b>Income level</b>			
<b>Low income</b>	102.882740	-16.329235	3.791002
<b>Lower middle income</b>	51.735349	-10.706602	4.108279
<b>Middle income</b>	42.237851	-3.300235	4.161216
<b>Upper middle income</b>	29.108296	2.322915	4.224565
<b>High income</b>	19.336421	-7.447014	5.070535

# Exploratory Data Analysis

Next, we classify the `avg_fertility` variable according to the following criteria: If `avg_fertility` is less than 50, it is classified as low, if it is between 50 and 100, as mid-low, if it is between 100 and 150, as mid and if it is above 150, as high level. According to this table

- On average, there is a drop in the number of the adolescent mothers in every class, with high class having the largest change. Unfortunately, the number of adolescent mothers is still very high, being as much as 8 times more than that of low class.
- Notice that the average percentage spend on education in the high class is more than the mid class.

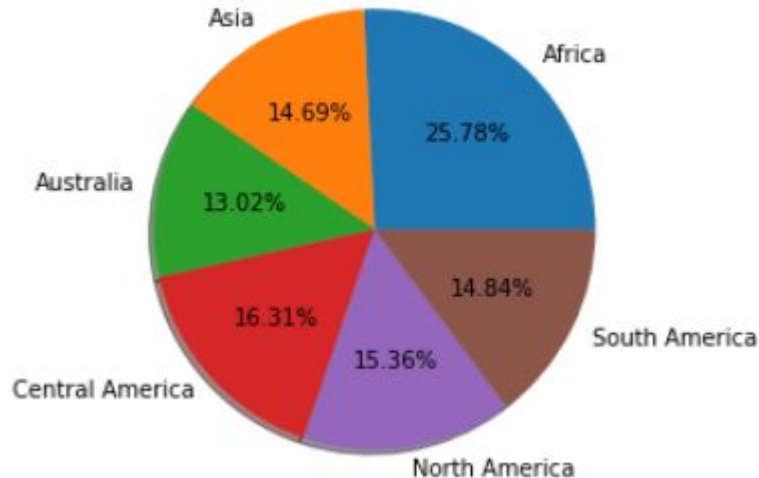
	<code>avg_fertility</code>	<code>fertility_change</code>	<code>avg_pubedu</code>	<code>avg_marriage</code>
<code>fertility_class</code>				
<code>low</code>	21.936622	-5.746668	5.106174	12.637500
<code>mid-low</code>	72.603026	-13.194964	4.816812	27.438889
<code>mid</code>	120.614710	-18.812676	3.380626	39.418333
<code>high</code>	175.330767	-23.282800	4.066473	52.161111

- Note that, `avg_marriage` (the variable showing the average of percentage of of women who were first married by age 18) variable is about 52% in the high class. This might be the cause of the high number of adolescent mother in countries in the high fertility class.

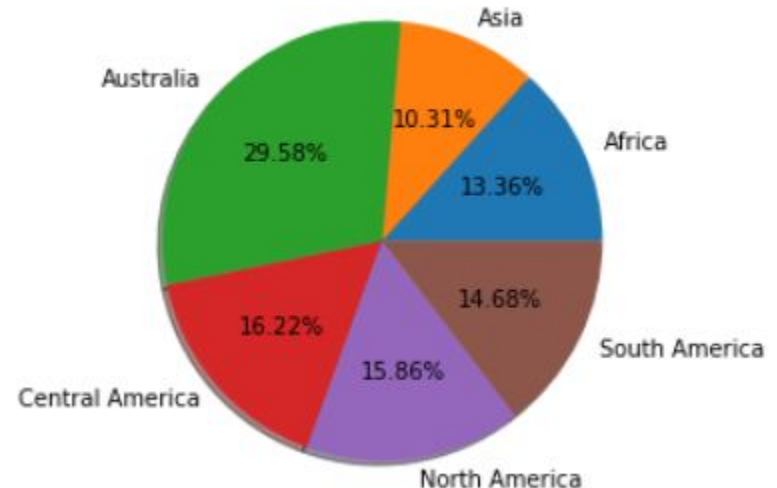
# Exploratory Data Analysis

Let's focus on the countries with average fertility rate above the world average. The following pie charts show that most of the countries are in Africa, followed by Central America. However, Africa has the second lowest average total public spending on education(% GDP) following Asian countries.

Average Fertility Rate with respect to continents



Public spending on education, total (% of GDP)



# References

(1) Datasets:

(1a) Adolescent fertility rate (births per 1,000 women ages 15-19), Public spending on education, total (% of GDP),

<http://databank.worldbank.org/data/source/health-nutrition-and-population-statistics>

(1b) Women who were first married by age 18 (% of women ages 20-24), <http://databank.worldbank.org/data/source/gender-statistics>

(2) Hechtman L., Teenage mothers and their children: risks and problems: a review, Can J Psychiatry 1989 Aug;34(6):569-75.

(3) UNFPA, Girlhood, not Motherhood: Preventing Adolescent Pregnancy, 2015.

[https://www.unfpa.org/sites/default/files/pub-pdf/Girlhood\\_not\\_motherhood\\_final\\_web.pdf](https://www.unfpa.org/sites/default/files/pub-pdf/Girlhood_not_motherhood_final_web.pdf)

(4) WHO Adolescent: Health risks and solutions,

<http://www.who.int/en/news-room/fact-sheets/detail/adolescents-health-risks-and-solutions>