

UNIVERSIDAD POLITÉCNICA DE YUCATÁN



Data engineering
3A

Data Preprocessing
Didier Gamboa

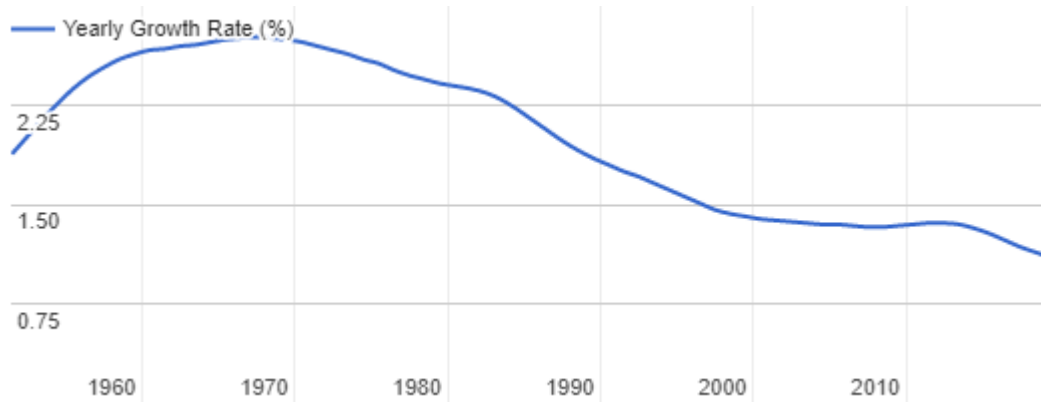
H3. Exploratory Data Analysis Report

-Contraceptive Method Choice-

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National Contraceptive Prevalence Survey (NICPS)

Indonesia, according to Worldometers elaboration of the latest United Nations data, is known for being the fourth most populous country in the world with a current population of approximately 271,446,935.



To promote new birth control policies and contraceptive use as well as provide new health and population information for the research community, the 1987 Demographic and Health Survey (DHS) was conducted in Indonesia, which was the first survey in its type to be made in the country.

The DHS was designed to reach the following objectives:

“- To provide data on the family planning and fertility behavior of the Indonesian population necessary for program organizers and policymakers in evaluating and enhancing the national family planning program, and

- To measure changes in fertility and contraceptive prevalence rates and at the same time study factors which affect the change, such as marriage patterns, urban/rural residence, education, breastfeeding habits, and availability of contraception.”

BPS Statistics Indonesia, 2014.

Its importance also lies in the fact that these kinds of datasets provides -international- useful information about health and population behaviors for policymakers and researchers around the world. It also helps us to make well-informed choices based on analysis for new policies and to identify target population sectors.

With this dataset we will be able to understand how the population behaves and what kind of socio-economic factors affects the use or non-use of contraceptive methods, for example, what kind of people use each type of contraceptive method? Or how does the religion/education/social media affect the contraceptives people choices?

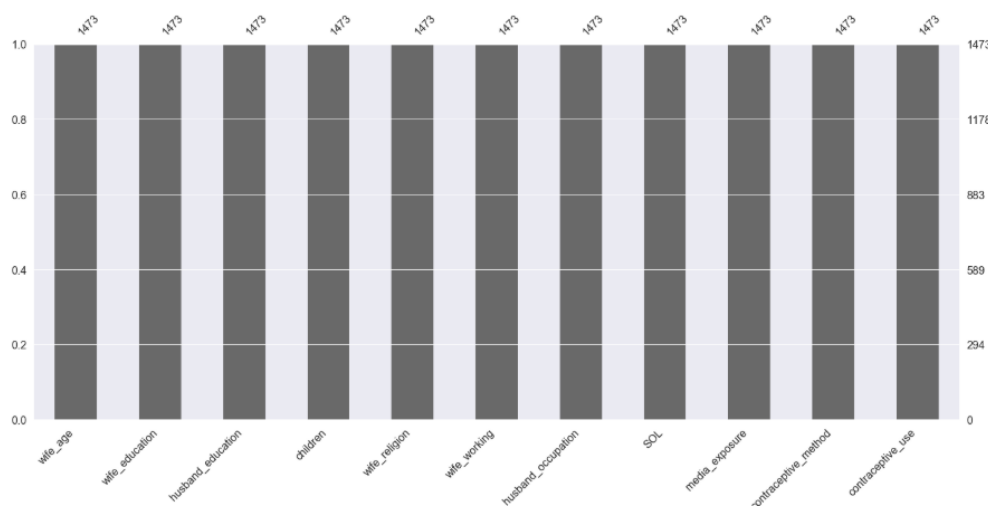
Dataset Description

An Indonesian 1987 Demographic and Health Survey with the following attributes:

Sample: 1473 Indonesian women.

Missing values: 0

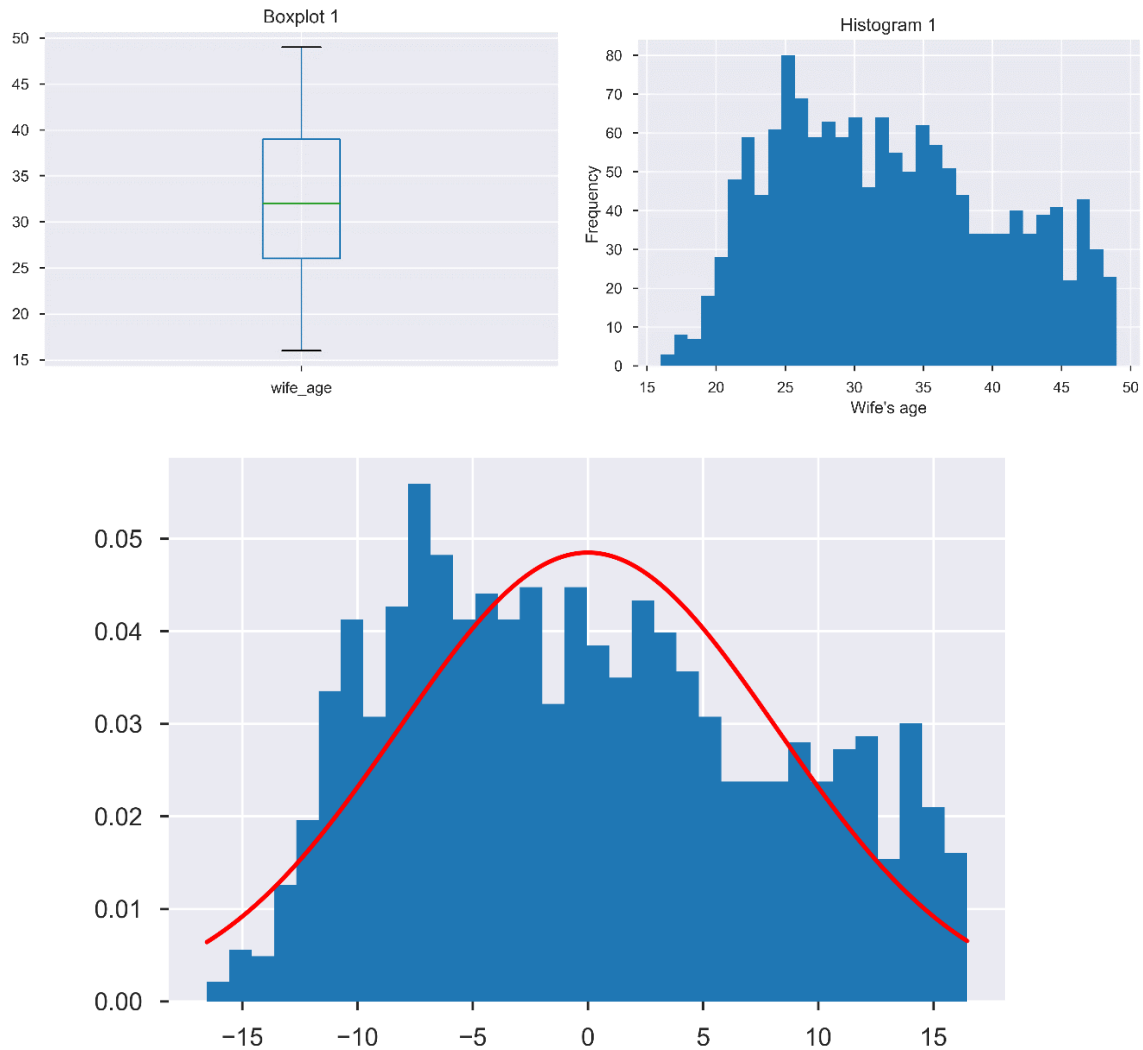
Variable	Type	Description
Wife's Age	Numerical	Age of the woman
Wife's Education	Categorical	Wife's Educational level reached 1=low, 2, 3, 4=high
Wife's Education	Categorical	Husband's Educational level reached 1=low, 2, 3, 4=high
Number of children ever born	Numerical	Total number of children that the woman has had
Wife's Religion	Binary	Religion practiced 0=Non-Islam 1=Islam
Wife Working	Binary	Is the woman currently working? 0=Yes 1=No
Husband's Occupation	Categorical	Code of husband's current occupation 1,2,3,4
Standard-of-Living Index	Categorical	Standard-of-Living Index of the woman 1 = low, 2, 3, 4 = high
Media Exposure	Categorical	Level of woman's media exposure 0=good 1=not good
Contraceptive Method Used	Class Attribute	1 = No use 2 = Long-term 3 = Short-term



Exploratory Data Analysis Results

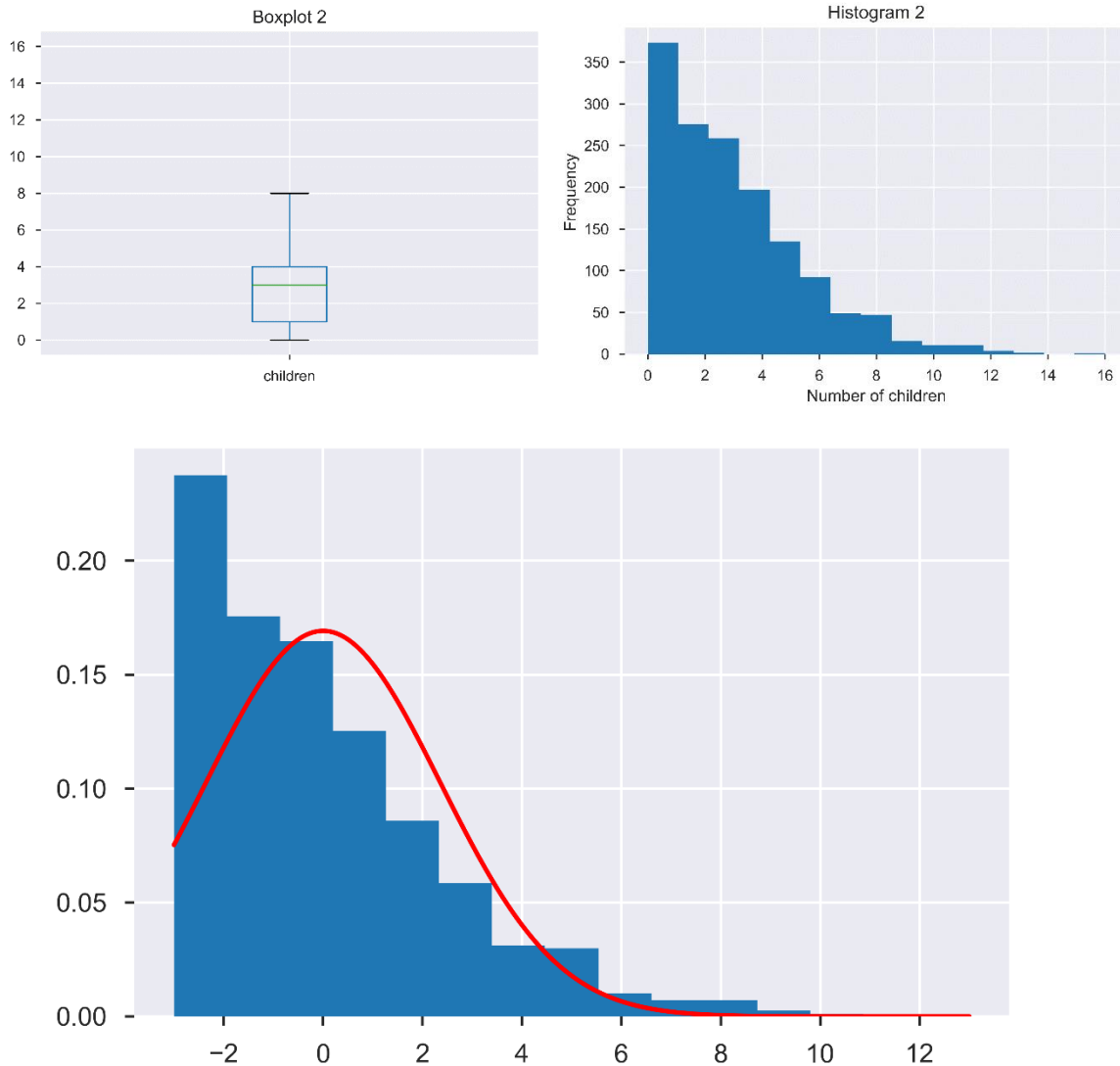
Wife's Age

1473 Indonesian women were sampled. The mid-range of age was 33 years old, with a standard deviation of 8.22 years. The youngest and oldest women of the data set have 16 and 49 years old respectively. The histogram below has a positive skewness of 0.25 -very close to zero- and it is platykurtic. Therefore, this sample is mainly represented by women in median-adult ages.



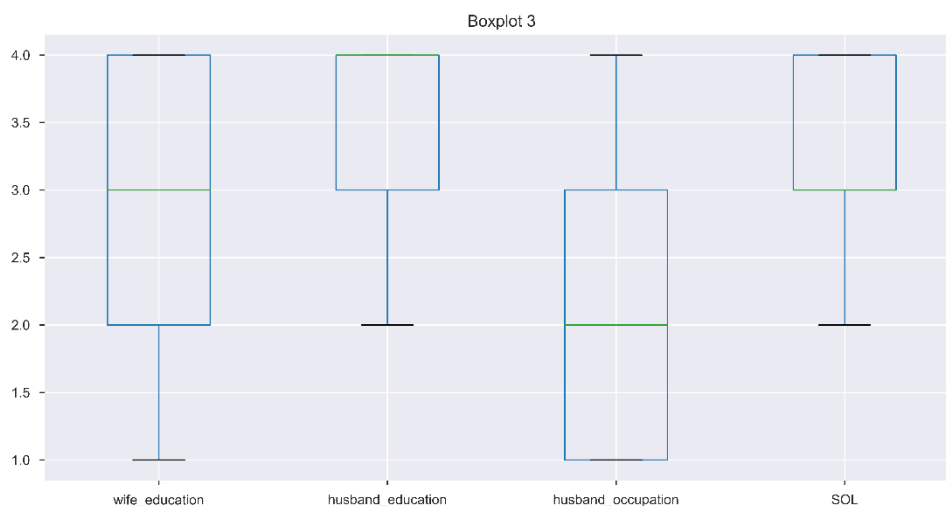
Number of children

75% of the sampled women has 4 or less children. Given the positive asymmetry of this histogram (skewness=1.09), the most representative quantity for the number of children in this case is the mode, which rounds around 0 and 2 children per wife.



Education and standard-of-living categories

Given the negative skewness nature of the boxplot 3, the general level of wife's education corresponds to an interval from 3 to 4, and for the men of 4, this means a medium-high average education reached for both genders (based on the mode).



For the husband's occupation category, the data description is not very useful, it only says that the occupations were divided by sectors, but there is not additional information about what sector is each number from 1 to 4.

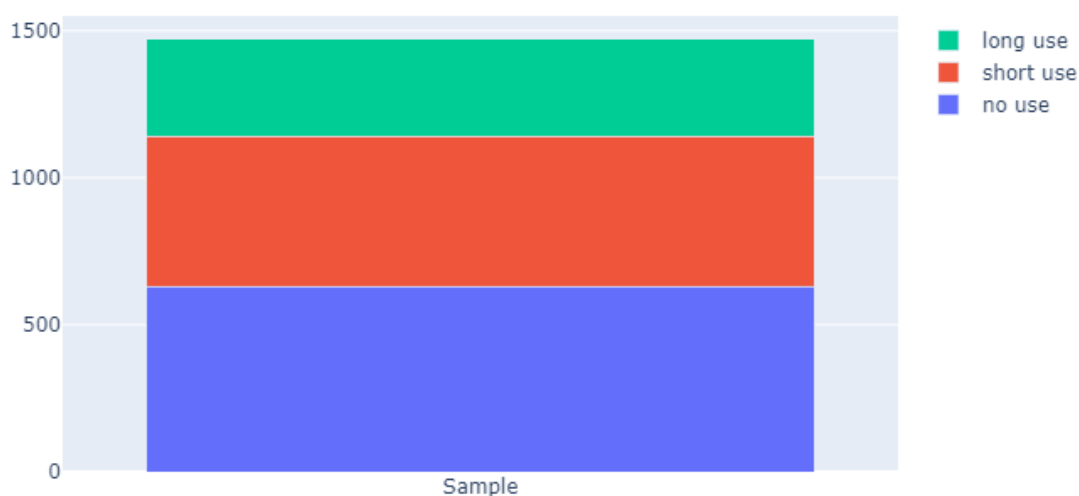
For the Standard-of-Living index of the women, we had a mean of 3.13 and a mode of 4, that means a medium-high quality of life. The half of the sampled women are below that category.

From these instances, we can conclude then that this data is represented by median adult women in a medium-high standard of education and life in Indonesia.

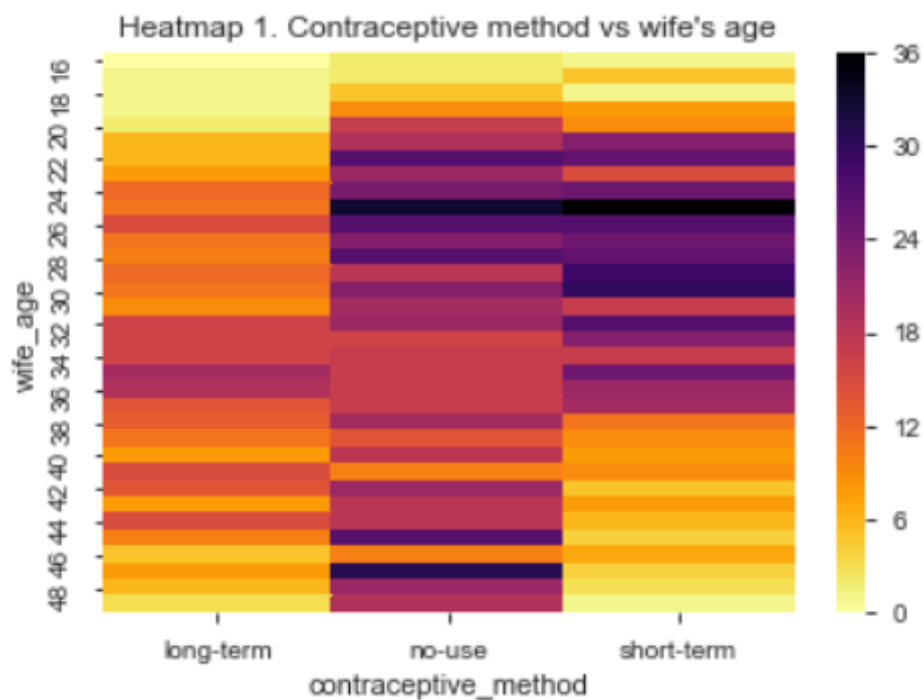
Contraceptive methods choice

From the total sample, 42.7% of the women do not use any contraceptive method, 34.70% use a short-term method and 22.60% use a long-term method.

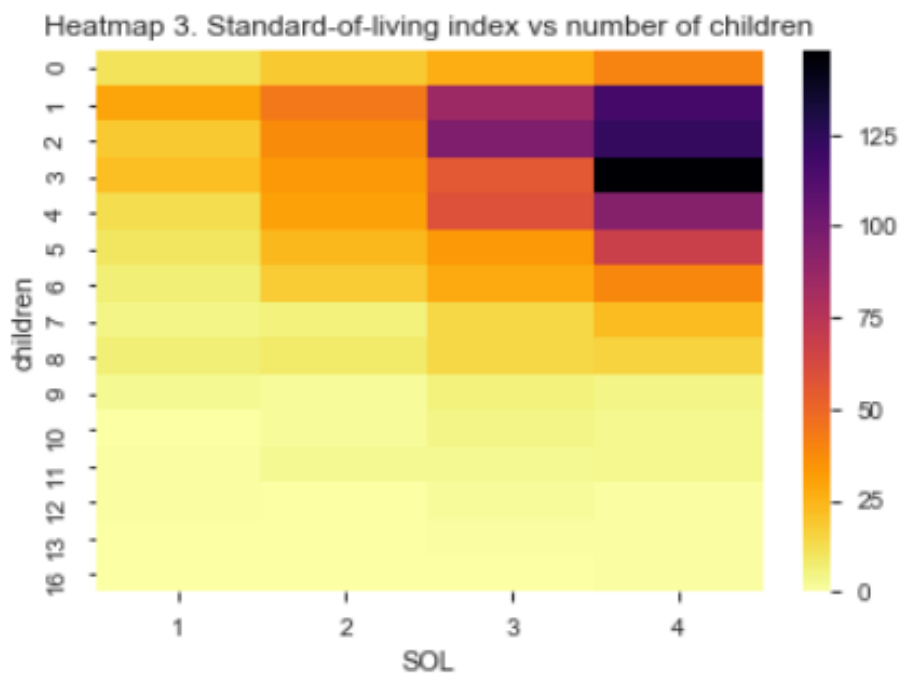
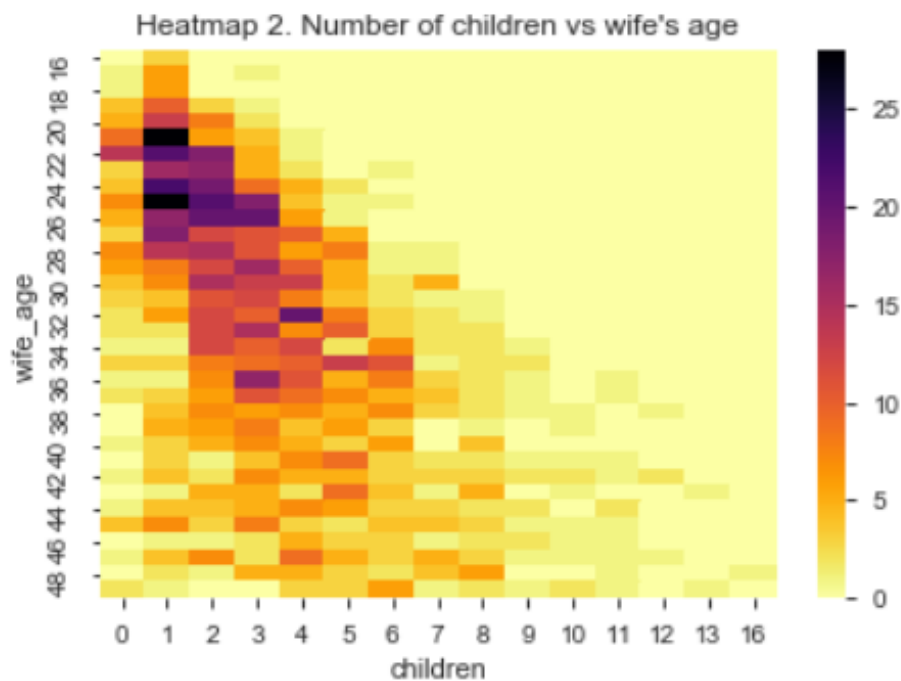
Stacked bar 1. Contraceptive method used



Short-term contraceptives are used by young-adult women in an interval from 20 to 34 years old approximately, while long-term methods are most often used by medium-adult women. The non-use is dispersed among all ages.



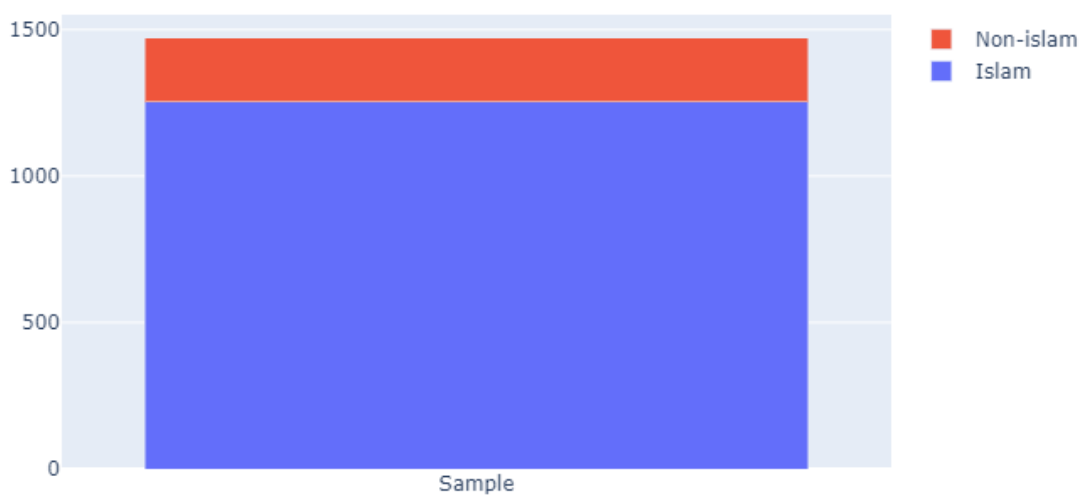
The difference of contraceptive choice between young and medium adult women is mostly given to the desire of having children. Generally, when a woman reaches certain age or number of children (heatmap 2) she decides to stop having more children -hence prefers a long-term method- mostly by socioeconomical reasons (heatmap 3).



Religion

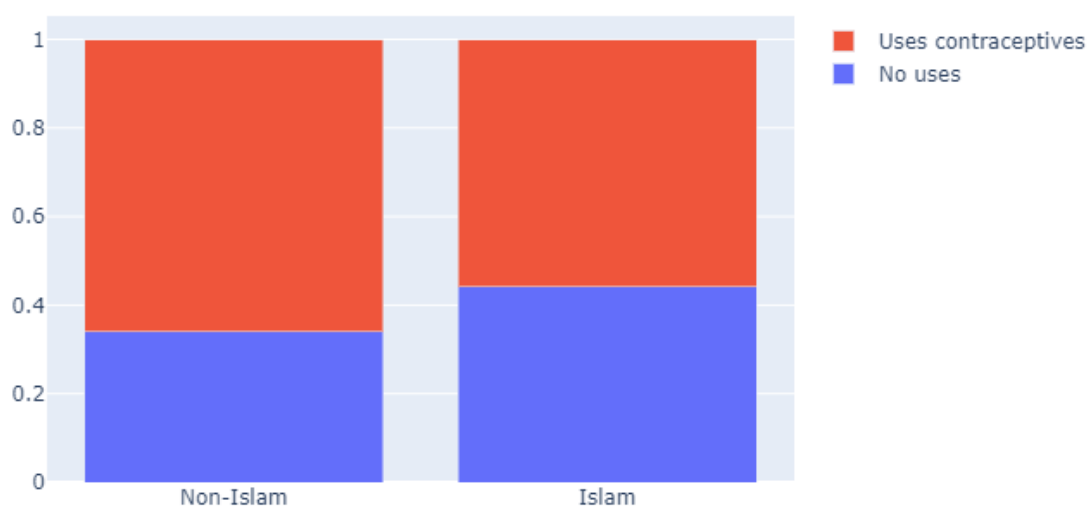
85% of the sampled women have Islam as religion while the other 15% do not.

Stacked bar 2. Wife's religion



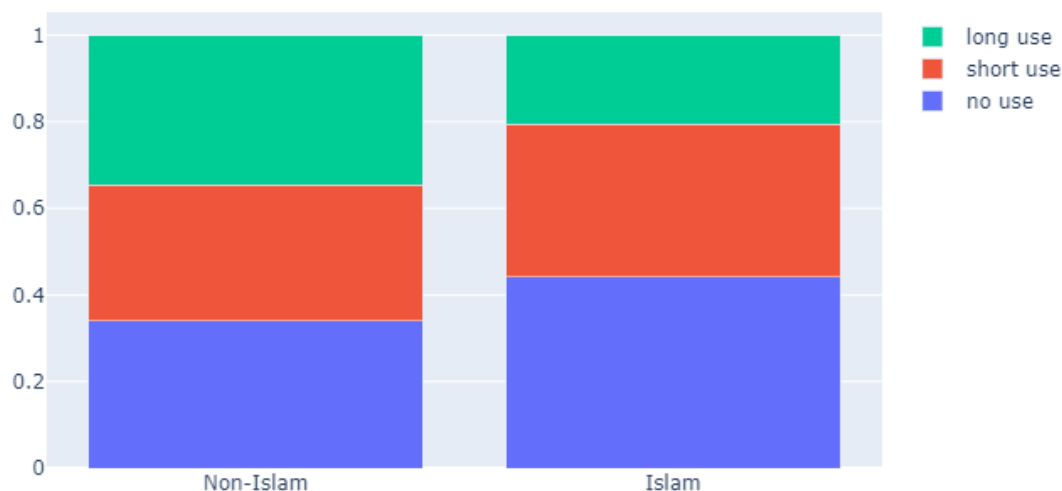
Although Muslims are encouraged to have children, contraceptive methods are not prohibited. That is the reason of why the difference between the contraceptive use in Islam and Non-Islam women is not such that bigger as someone could expect.

Stacked bar 3. Wife religion influence on contraceptive use



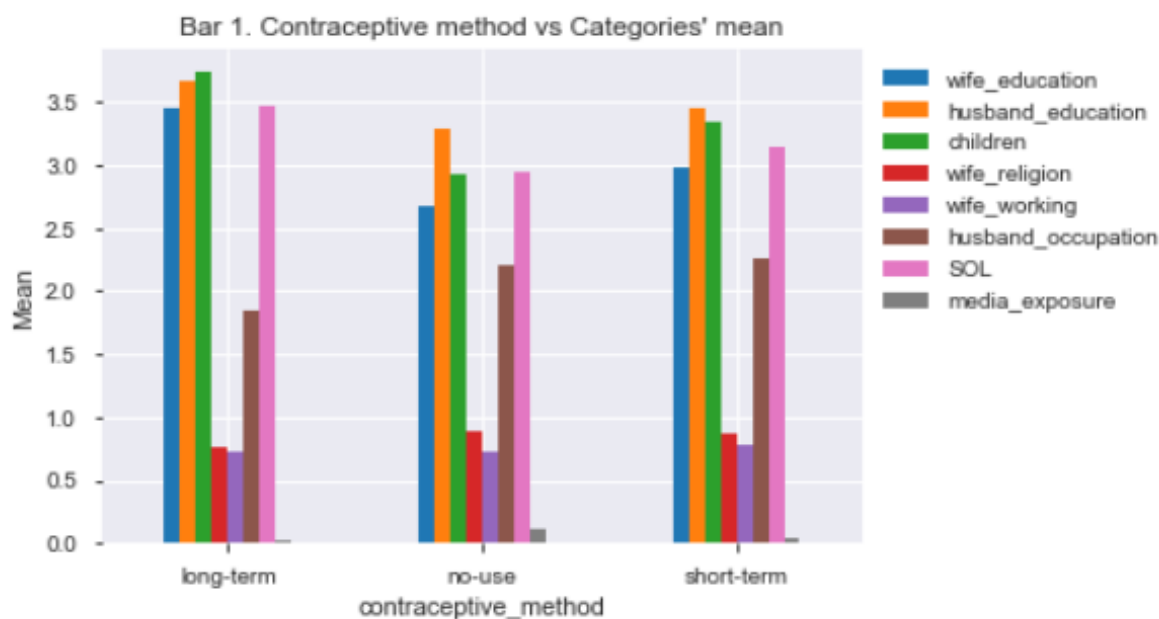
We can see that in Non-Islam women, the predominant contraceptive is the long-term, meanwhile in Islam women, the predominant is the short one.

Stacked bar 4. Wife religion influence on contraceptive method



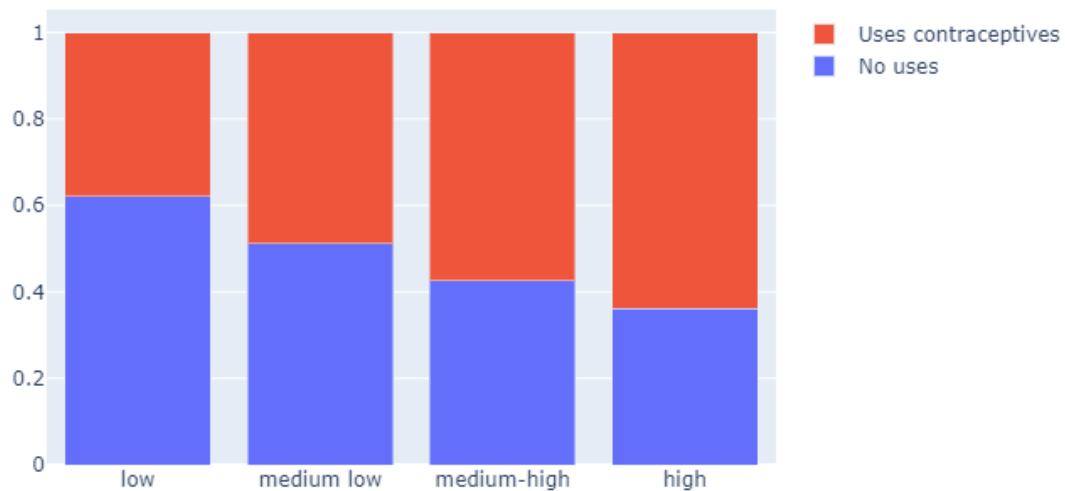
Contraceptive methods and its relationship with socioeconomic status

In the following graphic, we can see the mean tendencies grouped by contraceptive method used. We can notice then that for the women who do not use any contraceptive method, the mean values of education and standard of living are lower than those who do use some method in a short or long term. This may be related to a low preventive sexual culture that is usually obtained with a good level of education and media exposure.



The assumption of before, can be better confirmed with these new charts, which show the wife's socioeconomic level influence on contraceptive method use. We can see then that from a medium-high to a higher socioeconomic level, the use of contraceptives ratio rules over the non-use. As SOL is highly associated with educational level, the social and economic status carries a higher culture of sexual prevention.

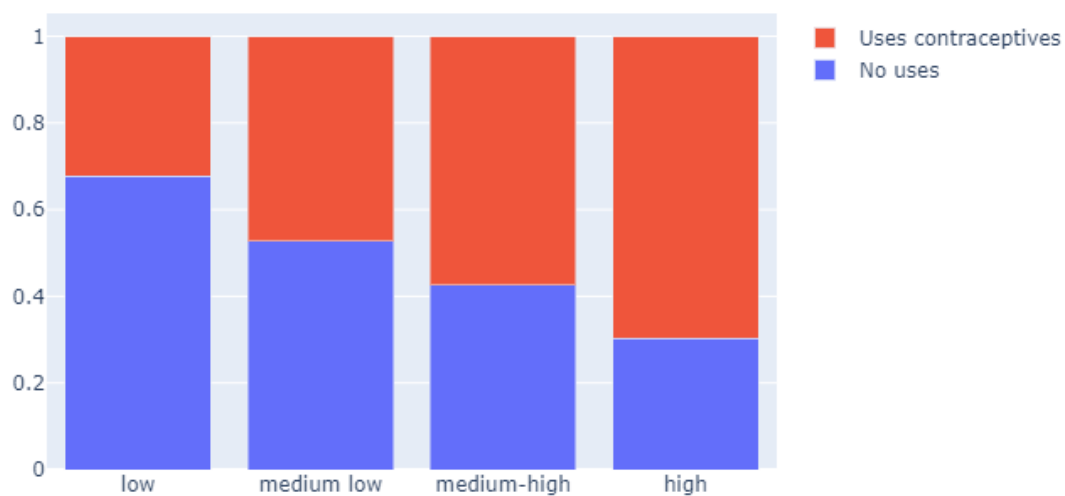
Stacked bar 5. Standard-of-living influence on contraceptive use



Education

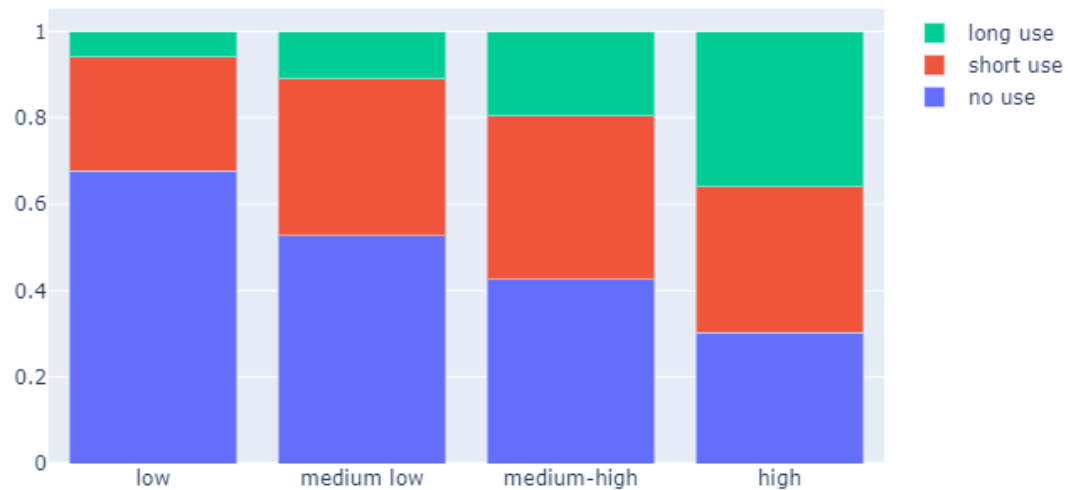
Women's educational level has a high influence on the contraceptive use given that school programs usually promote a sex education culture as part of its interdisciplinarity.

Stacked bar 6. Wife education influence on contraceptive use



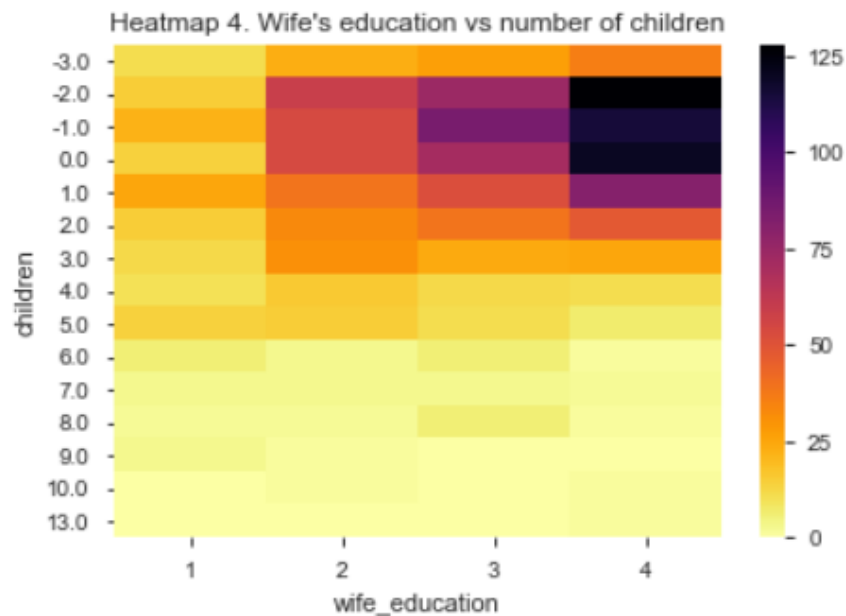
As well as long-term methods are most often used by the most educated women. In the first three educational levels, the non-use ratio is bigger than the other two, while in a high level of education, long-term method is the category which dominates over the others.

Stacked bar 7. Wife education influence on contraceptive method



Wife's education influence on number of children

Another interesting fact related to the wife's education, is the number of children per woman. Let's look.

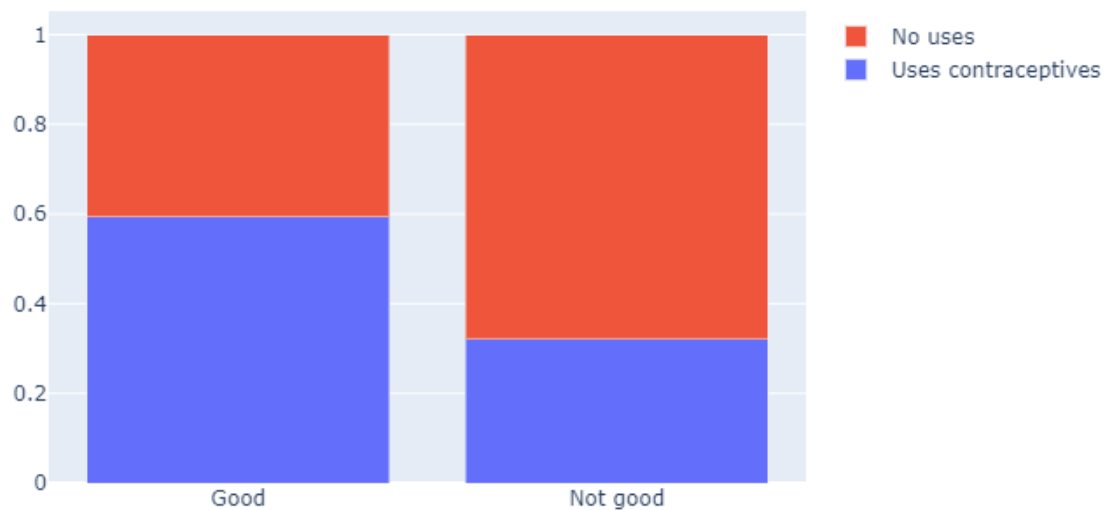


As you can see, the most educated is the woman, the least children she has. This can be related, as seen in heatmaps 1 and 2, with a higher socioeconomic status and hence to a most remarked social awareness about the number of children.

Media Exposure influence on contraceptive use

Another curious assumption is the fact that a lower media exposure is related with a lower use of contraceptive methods. The reason why I think this is given is because women who do not have a high media exposure are excluded from advertisements made by contraceptive companies as well as from educational information. In the same way because they do not have very marked the concept of modern woman who uses contraceptives that has been implanted by the media.

Stacked bar 8. Media exposure influence on contraceptive use



Conclusion

The socioeconomic status as well as media exposure have influence on the contraceptive method use, hence on the sex education of women.

We found out that Indonesian women who did not reach a medium-higher educational level either a good media exposure, are the most likely to do not use any contraceptive method and therefore they have more children.

The difference of contraceptive choice between young and medium adult women is mostly given to the desire of having children. Generally, young adult women prefer using short term methods, if they use, to control how many children they want, and when they reach 34-36 years old or 4 -5 children, then they decide to start using long-term contraceptives by its social awareness and familiar planification.

Needless to mention educational institutions, media exposure like internet or T.V. are the most common ways to learn about sex education and prevention. Through these resources, women can resolve doubts about their sexuality without shame or embarrassment, as well as they can kept up to date.

Media also plays an important role in the concept of the modern woman in East, promoting the use of contraceptive methods to seek public health care and population control.

Self and social awareness about contraception, provided by educative institutions and social media, is also a must of the Indonesian govern.

The lack of these resources is a problem that the Indonesian government must solve, so a good proposal would be to implement more sex education programs in schools at all levels in order to reach the most in danger sectors.

Another useful propose could be to implement in local T.V. programs a sex education channel for those women who didn't work or spend most of their time in house. So, they can be informed despite their educational attainment.

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