

Univerzita Karlova v Praze
Fakulta sociálních věd

Institut ekonomických studií

Bakalářská práce

2010

Jiří Pokorný

Univerzita Karlova v Praze

Fakulta sociálních věd

Institut ekonomických studií

BAKALÁŘSKÁ PRÁCE

**AIDS a polygamie v Sub-Saharské Africe
(AIDS and Polygamy in Sub-Saharan Africa)**

Vypracoval: Jiří Pokorný

Vedoucí: PhDr. Julie Chytilová PhD.

Akademický rok: 2009/2010

Prohlášení:

Prohlašuji, že jsem bakalářskou práci vypracoval samostatně a použil pouze uvedené prameny a literaturu.

V Praze dne

podpis studenta

Poděkování:

Děkuji PhDr. Julii Chytilové PhD. za inspiraci a komentáře.

ABSTRACT

Cílem této práce je přispět k pochopení vztahů mezi AIDS, mnohoženstvím a ekonomickou situací dané země či jednotlivce rozbořením a diskutováním určitých konkrétních otázek, a přidáním některých nových myšlenek k existujícím teoriím. První část je teoretická, z většiny věnovaná vlivu AIDS na ekonomiku. Druhá část je mikroekonomická statistická analýza, která se snaží najít, jaké jsou charakteristiky polygammích mužů a žen, a jaký je vztah mezi polygamií a AIDS. Ukazuje, že polygamní domácnosti jsou poměrně více bohaté a že motivací mužů k tomu mít více manželek je pravděpodobně touha po velkém množství dětí. Dále bylo zjištěno, že polygamie s sebou nese vyšší riziko nákazy AIDS, a to kvůli tomu, že polygamní muži jsou častěji nevěrní. Závěr je, že rodiny mající nejlepší vyhlídky jsou pravděpodobně ty s polygamním a věrným manželem. Takové rodiny budou bohaté a budou mít hodně dětí.

The objective of this work is to contribute to understanding the relationship between AIDS, polygamy and the economic performance of a country or of an individual by analyzing and discussing some particular questions, and by adding some new ideas to existing theories. The first part is theoretical, largely devoted to AIDS and its influence on the economy. The second part is a microeconomic statistical analysis, which tries to find what are the characteristics of polygamous men and women, and what is the relationship between polygamy and AIDS. It shows that polygamous households are relatively more wealthy and that the men's motivation to have more wives is probably wanting to have lots of children. Then it was found that polygamy brings higher risk of being infected by AIDS, because of polygamous husbands being more often unfaithful. The conclusion is that families having the best outlook are probably those with a polygamous and faithful husband. Such families will be wealthy and will have many children.

INTRODUCTION

- Field of interest -

The objective of this work is to contribute to understanding the relationship between AIDS, polygamy and the economic performance of a country by analyzing and discussing some particular questions, and by adding some new ideas to existing theories.

In the theoretical section (the first one), larger part is devoted to AIDS.

In the data analysis then (the second part), the work is focused on polygamy. It consists of three main questions:

Question 1

What are the characteristics of polygamous men (education, wealth, etc.), what is their motivation to have more wives?

Question 2

What are the characteristics of women who live in polygamous marriage (education, position in the family, number of children, etc.)?

Question 3

What is the relationship between polygamy – AIDS? Are the people in polygamous marriages less likely to be infected (because they have stable partners and are more faithful)?

For analyzing these questions, the data obtained from the University of Pennsylvania's Malawi Diffusion and Ideational Change Project (MDICP) and Kenya Diffusion and Ideational Change Project (KDICP) are used, and the results are interpreted in the theoretical background of AIDS and polygamy.

So this work is a theoretical (the first part) and microeconomic (the second part) statistical analysis, which is trying to contribute to understanding how AIDS, polygamy and economic situation influence each other.

The contribution of the work is putting together the main theoretical ideas from the field of interest, and from time to time extending them with my own thoughts, and then analyzing the MDICP and KDICP data, and interpreting the results.

- Structure of the paper -

INTRODUCTION

Presenting the field of interest of this work.

Structure of the paper.

Objective facts about Malawi and Kenya that are necessary to understand the situation.

AIDS AND POLYGAMY - THEORETICAL BACKGROUND

This part uses objective facts and various sources (scientific papers, web pages, videos,...), and is the most subjective part, because there are also my own ideas. It consists of:

Describing specifics of Sub-Saharan Africa and limitations of this essay.

Repeating the most important theories about AIDS and how it influences the country's development (Macro level), and the individuals (micro level), with an emphasis on the economy.

Describing polygamy and it's possible relations to the economy.

What was found about AIDS' connection to polygamy.

ANALYSIS OF THE DATA

The data and their problems are presented.

Includes the output of the analysis of the data (mostly in form of tables). It is objective in the sense that it is a statistical analysis, and subjective in the sense that I decided what are the most interesting results to be a part of the output.

Then there is an interpretation (subjective or objective) after each output, using the theoretical background (it usually tries to either back up or dispute the theoretical ideas).

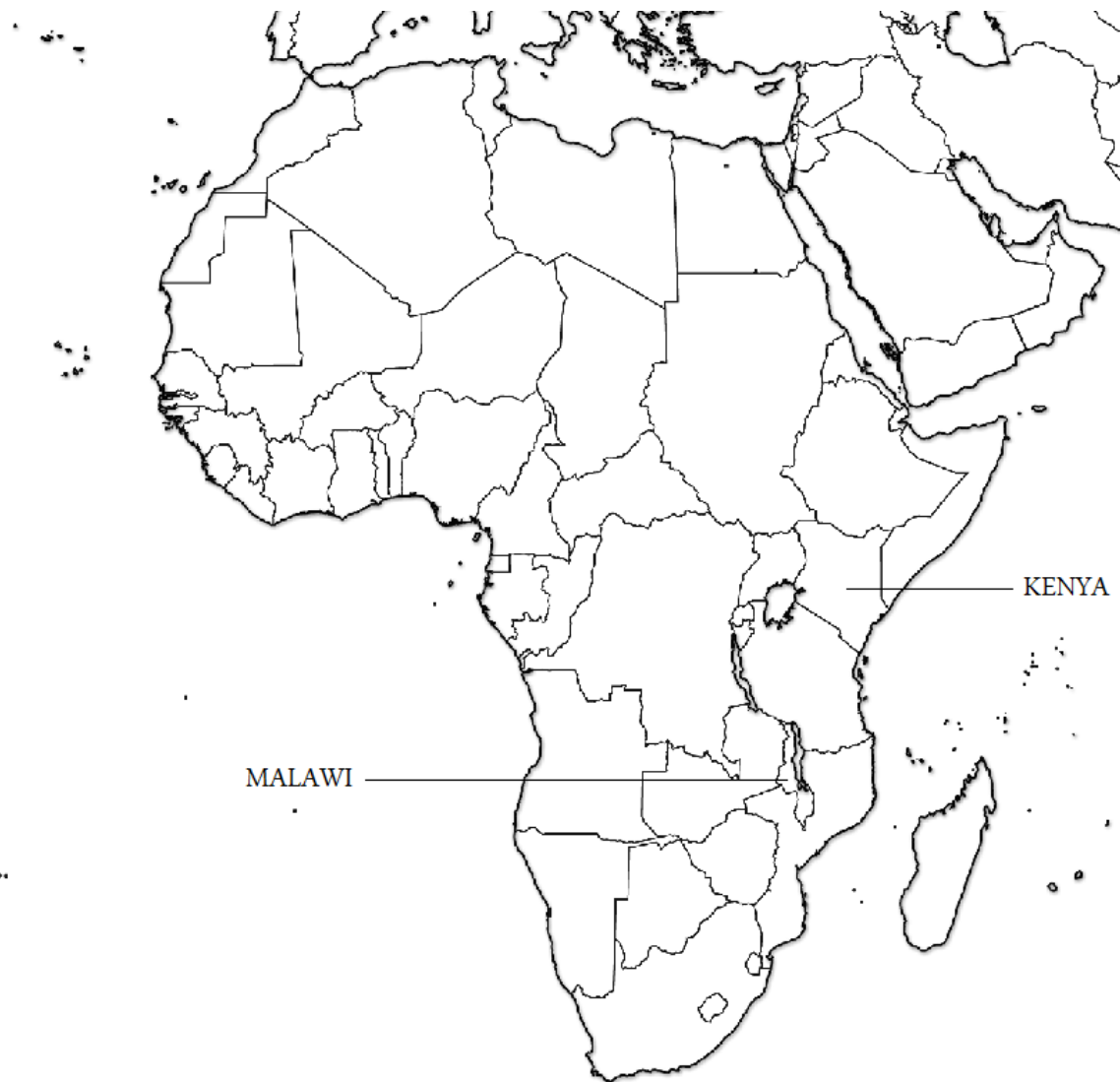
Part of the analysis are regression models concerning Questions 1&2 .

At the end there is a short summary.

- Geography -

With this paper, we will bring ourselves mentally to the Sub-Saharan Africa, particularly in Kenya, lying in the central-west with an access to Indian ocean, and Malawi, more to the south, about five times smaller, a landlocked country, separated from Kenya by the United republic of Tanzania.

Picture 1: Africa map





- Malawi -

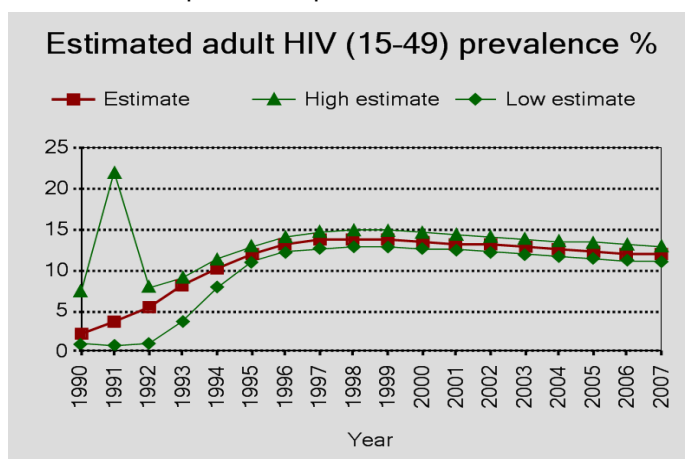
„...southern African country of exceptional beauty and great poverty. No war lays waste Malawi, nor is the land unusually crowded or infertile, but Malawians still have trouble finding enough to eat.“(Economist, Food for thought 2004).

GDP per capita: 837\$, ranking 156. in the world, (World Bank, 2008).

People living with less than 1.25\$ per day: 73.9% (UNDP, 2009).

There is a high prevalence of AIDS (Malawi, Epidemiological Country Profile on HIV and AIDS), and „Polygamy is prohibited by the Malawian Penal Code, yet is estimated to affect one-fifth of married women. The law on civil marriage is based on the former British legal system, in which marriage is monogamous, but the predominant form of marriage in Malawi is based on African customary law, which allows polygamy. Other forms of union exist in Malawi, based on Asian and African marriage laws that also permit polygamy.“(SIGI, gender equality and social institutions in Malawi)

Graph 1 - HIV prevalence in Malawi



Source: UNAIDS/WHO, 2008



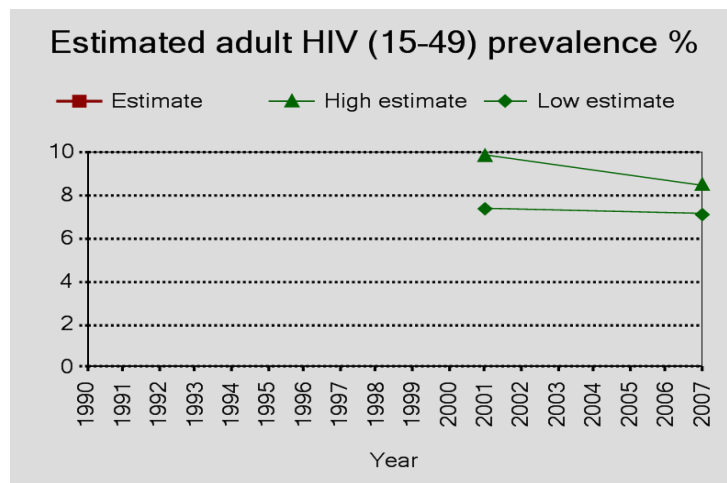
- Kenya -

GDP per capita: 1.590\$, ranking 136. in the world, (World Bank, 2008).

People living with less than 1.25\$ per day: 19.7% (UNDP, 2009).

Kenya is not as poor as Malawi, but the phenomenon of AIDS is there, too,(Kenya, Epidemiological Country Profile on HIV and AIDS) and „*Polygamy is forbidden in statutory marriages, but allowed in Muslim and customary marriages (SIGI, gender equality and social institutions in Kenya, statutory=legal)*“.

Graph 2 - HIV prevalence in Kenya



Source: UNAIDS/WHO, 2008

AIDS AND POLYGAMY - THEORETICAL BACKGROUND

- Why looking into Africa? -

From the listed numbers, it makes sense to study the phenomenons of AIDS and polygamy in these two countries, because the ratios are so high. There is an obvious connection with natality, mortality and life expectancy, and these are macroeconomic parameters that influence the whole country's performance. Of course, on a micro-level, for individual villages and for families, they are important even more.

How is Africa different?

First, let's have a look at what the people do: In Kenya, 75% of working people are working in agriculture, whereas in Malawi, it is 90% (CIA – The World Factbook, estimate from 2003). These numbers, together with the low level of GDP per capita and poverty level, show how the countries are underdeveloped and how differently the people there live compared to the developed ones.

This also means (apart from other reasons) that the situation about AIDS and polygamy there is uncomparable to the situation in developed countries, and therefore, it is hard to get an insight into what is really going on. Actually, the main source of knowledge for someone who has never tried living in Sub-Saharan Africa are numbers and statistics, which are usable for any place in the world. Numbers are objective and because there in Kenya and Malawi they achieved relatively extreme levels, we say that something unusual happens.

The questions „Why it happens? and What to do with it?“ are, however, more complicated, because to get an answer, we need something more than just numbers, not only because they cannot describe everything, but also because The Malawians and The Kenyans themselves don't use them as much as it is in developed world, which means that trying to gain insight into their way of life is even more difficult for us.

For example: in a developed country, a high risk of being infected would lead to spread of the information through the media and people change their behavior accordingly so that the situation would probably start to change automatically. However, in SSA, the media are not so advanced and people just may not be able to understand the statistical message properly. So the main reason behind these extreme numbers, which we see as a problem of SSA, might be that most Sub.S.Africans, not having the „glasses of statistics“, don't see any problem at all.

Therefore, the ambition of this paper is not to answer the question „Why there is AIDS and polygamy in Sub-Saharan Africa?“ fully (it is not for a single paper), but to answer some less general questions like „What makes the people in Malawi to live in polygamous unions?“, using world-wide-applicable methods of statistics. Hopefully, these partial answers will help to answer the more general questions such as the one stated above.

- AIDS -

This part answers the question „Why should an economist be interested in AIDS?“.

It will introduce some main AIDS-economy relations with the help of scientific findings that were already made until now, and some new ideas about this.

Why repeating the theory again?

The problem of impact of AIDS on a country's economy has been studied extensively and many times, and even a much broader study than this paper would not contain every important aspect, but, in spite of that, I will list some of the main ideas here, so that the results of the analysis can be put in this context more easily.

The impacts on the economy on micro-level and on macro-level are, of course, usually tied together. Whereas the micro-level impacts proceed over a short period of time and have an effect on an individual's life, the macro-level impacts are connected with the whole country's longer-term performance, and may not be felt by individuals.

Here it is important to say that when I talk about micro-level in this study, it means mostly the inhabitants of rural parts of Kenya and Malawi, because there the data were collected, and they also make the majority of both countries (Kenya 61%, Malawi 84%, United Nations Secretariat, 2003).

For understanding the AIDS implications on the economy, it would be necessary to compare the weights of each of the ideas and also examine some relationships between them (for example whether the expenditures for medical expenses are more painful than the loss of labor), but for our analysis it is enough to make a list of the most important ones.

micro level

- *„Loss of income of the patient.*
- *Household expenditures for medical expenses.*
- *Other members of the household, usually daughters and wives, may miss school or work (which also means less productive firms sector) less in order to care for the sick person.*
- *Death results in: a permanent loss of income, from less labor on the farm or from lower remittances; funeral and mourning costs; and the removal of children from school in order to save on educational expenses and increase household labor, resulting in a severe loss of future earning potential.“*

(Stover; Bollinger, 1999)

- A video record of a conversation with Malawian woman shows that there is also the problem of trust in the economy, and actually reveals the information of how it really is with AIDS and polygamy in the country: *„...Because I am HIV positive, my husband abandoned me and the children. My relatives and the villagers began to treat me as if I were already dying. many laughed at me and sang a song, calling me a 'Virus Woman'. I am angry at my husband. He won't get a test, and I am sure he infected me. He had taken many other wives, and I believe one of those women was infected. Now I have our three children, and no support. I can't turn to prostitution for money because I have the children to look after. So I do my best to get some money from my tomato stand. But when people learned that I was positive, and word spread throughout the village, my customers stopped coming to buy my tomatoes....“*

(Choices Video, 2007)

For now, from this speech, I conclude that AIDS distorts trust in a community, and depreciates one's work even before AIDS brings him or her to death, and thus also motivates infected people to keep their status as a secret, which has obvious consequences on the spread of the infection. But besides that, more ideas of what was said should be kept in mind for further analysis.

- Another study says that: *„We find that the main impact of HIV/AIDS-related mortality and morbidity at the household level is to induce diversification of income sources, with women reallocating their time from workintensive (typically farming) to cash generating tasks. As men's time allocation is unresponsive to the same shocks, overall agricultural output might fall as a consequence of HIV/AIDS-relates morbidity and mortality.“*

(Anglewicz; Bignami,... 2005)

Switching to the less workintensive tasks surely means that the total macroeconomic production decreases and we may expect that also the level of living then goes down, but on the other hand, if we look on AIDS as on a some kind of „invisible hand of the market“, it may not mean that this switching is undesirable, since it forces people to behave differently, leaving traditional agricultural and other activities, and can finally lead to development of the economy.

Macro level

- *The loss of young adults in their most productive years will affect overall economic output.*
- *If AIDS is more prevalent among the economic elite, then the impact may be much larger than the absolute number of AIDS deaths indicates.*
- *If the disease is treated using expensive methods, then the direct costs of AIDS include expenditures for medical care and drugs.*
- *Indirect costs include lost time due to illness and recruitment and training costs to replace workers.*

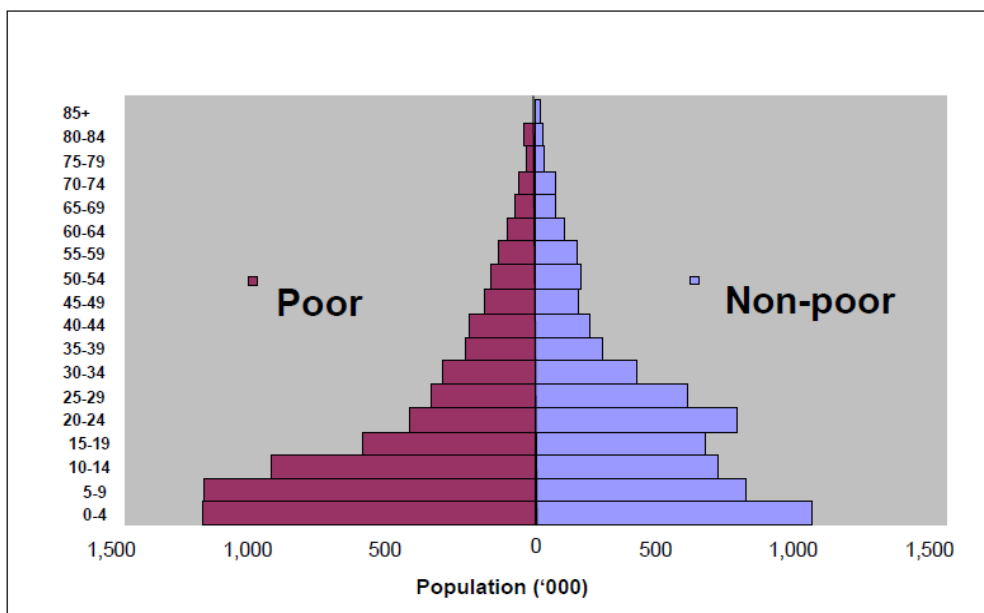
(Stover; Bollinger, 1999)

- Another important idea: *HIV/AIDS unlike most of other diseases does not strike groups with lowest immunity such as the youth and the elderly, but strikes people in the most productive age. ... With the death of the parent while the children are young, the possibility to raise them properly and educate them are greatly reduced. ... Moreover, increased premature mortality leads to lower incentive to invest in to children's education, as in the presence of the epidemics child might well die soon after finishing school.*

(Hozik, 2008)

The next diagram of Malawi population shows somehow opposite situation to the one in for example The Czech republic – it is not the high ratio of retired population to be given social transfers (as in the CZ), but extremely high ratio of children, who cannot be maintained by working population, and so they cannot be well educated (one might think that putting these two groups and their problems together is pareto efficient, but the practical realisation of it would be rather complicated: if it is possible, then there are still very high transaction costs). In fact, children often fall into the working class themselves, since staying alive is preferable to be educated. If we looked at the same diagram for Kenya, we would see that it is about the same, only the ratio of poor population is lower. It is important to keep this picture of the countries' population in mind while doing any analysis or making any conclusions about people's behavior in the case of AIDS and polygamy.

Graph 3 – Population pyramid of malawi



source: Malawi integrated household survey 2004-2005

As we can also see from the diagram, the life expectancy is relatively low, which can prevent people from investing into human capital, because there is a high risk that the human capital will be destroyed (as it was stated above). This is a motivation for an analysis of what the people who live longer are like – for example, if these are educated, then the investment into education might be more attractive.

- As far as the factors of production are concerned: there are no significant effects on Land and Capital, whilst there are on Labor and Human capital, where the effects on human capital were already discussed. The effect on labor is however not so clear, because on the one side, AIDS decreases the population (directly or by preventing part of population to have unprotected sex), but on the other side, it might motivate people to have even more children (so that at least some of them survive), and to have them even more early (so that they have children before they can die), which increases the population growth, by contrast. Then it is also unclear, how the population growth influences the GDP per capita growth, where, particularly in SSA, AIDS can be even „beneficial“, preventing from the „disguised unemployment“ (or, from a more general point of view, overpopulation), and increasing the GDP per capita (as the basic Harrod-Domar growth model shows).

The word „beneficial“ applies only for the country's macroeconomical long-term development. Of course, if we asked any African, he would not see it as beneficial. Personally, I think about it more as „a sacrifice to future generations“.

Quantitative evidence

Now, to provide some quantitative evidence of the AIDS implications on a country's economy, there is this very explanatory citation:

- *„For South Africa, for example, the available projections of the impact of HIV/AIDS on GDP per capita range from –8 percent to +9 percent by 2010. This paper, in contrast, evaluates South Africa's welfare loss associated with increased mortality at around 80 percent of GDP.“*

(Crafts; Haacker, 2004, note: the results for Zambia, which is just by Malawi, are almost the same)

Not only it is explanatory in the way that (if the projections associated with increased mortality are true) the effect can be tremendous, but also points at huge differences between available evaluations.

Last but not least, billions of dollars spent by certain world organizations to change the situation about AIDS make the problem international, affecting almost every country's finance.

Historical perspective

For interpreting the data-analysis more properly, some historical perspective is also useful.

- The history tells us that, in development, Sub-Saharan Africa is behind the developed countries by many years, or, one can say, hundreds of years. Analogically, if a firm would enter a market on such a level, where the others were years before, it would have no chance to survive. However, united nations are not a usual market, and behave differently, actually, they are doing just the opposite – helping these poor countries to survive. Whether it makes sense or not, is a question overreaching the spectrum of this work, but, anyway, it means that Sub-S.A. hadn't got the chance to grow-up in the way the Europe did, and is like a baby, who is receiving huge amounts of money, but at the same time needing some help in growing-up, for example in the form of coordination of how the money will be spent, or teachers of economics etc.

What historically led Sub-S.A. to the contemporaneous situation is summarized for example in the paper *Opomíjená heterogenita lidí aneb Proč Afrika dlouhodobě neroste (Neglected heterogeneity of people or Why is Africa not growing in the long-term)* (Bauer; Chytilová, 2006),

which also says that the causes presented until now are not sufficient, and proposes „*taking the specificity of Sub-Saharan Africans' behavior more seriously*“ (which applies for the helping coordinators, too). In fact, this is exactly what this essay is also supposed to do.

- SSA's backwardness is not only in economic development - Even though AIDS appeared as far as in the twentieth century, genealogists say that: „*The absence of CCR5-D32 deletion allele, which is almost absent in SSA, decreases the probability of AIDS infection by 70%. The average frequency in Europe is estimated to be 10%.*“ (which is because of historical plagues such as The Black Death etc.: Duncan; Scott; Duncan, 2005).

This may not be such an important fact (what is more, there are still discussions about this topic), but it is here to show, how deep the roots of the AIDS phenomenon (and therefore of the economic backwardness) may be.

- Polygamy -

Of course, polygamy, compared to AIDS, has much smaller economic impacts, and initially, it is part of this essay only because of its possible relationship with AIDS, but as we are already discussing it, some direct economic impacts will be discussed there, too.

What is it?

- Firstly, it is important to distinguish between concurrent partnerships (which we will understand under the word „polygamy“) and serial monogamy: *„While several studies find the total lifetime number of sexual partners no greater in sub-Saharan Africa than in the West, “concurrent partnerships” (in contrast to “serial monogamy”) seem to be more common in Africa, and in the context of AIDS, particularly dangerous.“*

(Swidler; Watkins, 2006)

- Secondly, polygamy in SSA is the same as polygyny, since the occurrence of polyandry (one women, two or more men) is very rare in there.

Direct economic effect?

Is there any change in the economy because of polygamous unions (in addition to the indirect effect through AIDS which will be introduced later), even though negligible?

- Allowing polygamous unions is, on the other hand, more like a free market – people do what they really prefer, and men are motivated to higher performance, because of the possibility to have more wives (whereas in orthodoxly monogamous culture they would slow down

after achieving the first one), and because of the threat of being without a wife (which I believe is a threat for the majority of SSA people). Of course, those, who were successful, probably got rid of the poverty and then there are two possibilities: if they prevented themselves from AIDS, they passed the ability to the next generation, and if they did not, they passed that inability much less. The conclusion is that polygamy, surprisingly with some help from AIDS, speeds up the development of the country's economy (here we can add the idea from the AIDS theoretical part about increasing GDP per cap.).

What SSA needs now is development, and stopping AIDS and prohibiting polygamy at any cost might be contraproductive under these circumstances. It is certainly not possible to just stand by and watch Africans dying, because it is not in the nature of humans, but unpremeditated anti-AIDS politics goes somehow against the long-term development (if the circumstances hold).

- Secondly, from the page of African Holocaust, an idea, which describes probably the strongest economic rationale of polygamous unions, is proposed by Esther Stanford, an African-focused lawyer, who says that „*more women in the family means more children and more workforce in the family, making it more productive*“. It makes sense in SSA, where there is no economic system like in developed countries, but a system based largely on families as economic institutions.

Motivation?

- One of the motivations has just been mentioned – increasing the size of family.
- Apart from the survey that the KDICP data were collected from, several semi-structured interviews were also made there in Kenya. The next citation is quite explanatory for the question of motivation (by a woman with polygamous husband):

„M: Men! Men, even when a woman gives birth until they burst, they don't care. All he wants is children. They say this carries forward his name.“

So the motivation for men is quite clear. They want to „produce“ as much children as possible, which cannot be attained without a kind of „human capital“ in form of wives. It is known (and see also the population pyramid and related text) that the desire for children in Africa is enormous. But is the desire the same for women?

- Regarding Esther Stanford, some semi-structured interviews and the interview from the Choices video, women in SSA are hard-working to sustain their children, while men are not so aware of the fact, that they might not be able to provide the children enough subvention, and sometimes even leave the wife.

Therefore, the motivation for women to be in a polygamous union, can be the formality of the husband and wife relationship, which somehow (legally or else) puts bigger responsibility on the husband to take care of the children.

However, E.S. says that this formal relationship is by far not that important as the informal relationship between the two, and we should not put on it such a big weight.

- Connection between AIDS and polygamy -

- x While AIDS is influencing the economy directly, as it was explained above, the effect of polygamy can also be quite direct somehow, but mostly, it is blamed for accelerating the spread of AIDS and thus indirectly negatively influencing the economy. However, there is this study, which partially disagrees with the statement: *„We review the relationship between polygyny and HIV and identify a positive individual-level correlation, and a negative ecological correlation.“*

How the individual-level positive correlation arises?

„...women whose previous husband(s) died should be disproportionately found in marriages with a polygynous husband. ... we find that men in polygynous marriages have more extramarital sex than men in monogamous unions.“

(Reniers; Tfailly, 2008, note: they used the same MDICP data)

What about the negative ecological correlation?

„... Using the evidence at hand, it is not possible to explain the difference in individual and aggregate level correlations between polygyny and HIV. ...

... Unobserved factors are a likely candidate, but a more intriguing hypothesis is one that implies a strong selection of HIV positive individuals into polygynous households.“

(the same mechanism causes the individual-level positive correlation).

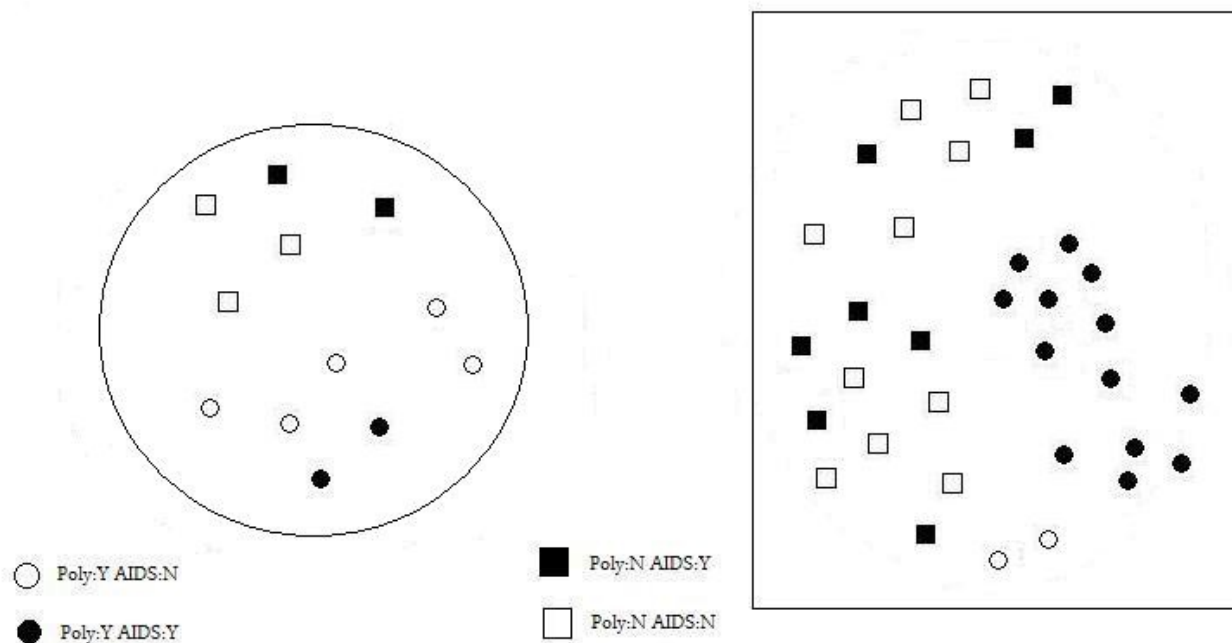
(Reniers; Tfaily, 2008)

Why is the individual-level correlation opposite to the ecological one, is further explained by the fact that: „*The prevalence and intensity of polygyny are negatively associated. Thus, any drop in the prevalence of polygyny in Africa may be accompanied by a rise in the number of wives per polygynist.*“

(Timaeus; Reynar, 1998)

- x The fact of negative ecological correlation at the same time with positive individual-level correlation is explained on the subsequent picture:

Picture 2: Negative ecological correlation x positive individual-level correlation



The picture illustrates that even though polygamy is positively correlated with AIDS:

($15/22 = \text{black circles}/\text{total circles} > \text{black quads}/\text{total quads} = 10/23$)

The correlation between the areas-as-a-whole's level of AIDS (total black/total):

- LEFT: 12/36 (lower level)
- RIGHT: 21/33

And the areas-as-a-whole's level of polygamy (total circles/total):

- ➔ LEFT: 21/36 (higher level)
- ➔ RIGHT: 15/33

Is negative, because the left area is more polygamous, and in the meanwhile is less infected.

Specially, we shall look at the high concentration of black circles, representing infected polygamists, in the right area. This is a graphical illustration of the two explanations of the negative ecological correlation stated above, while individual-level correlation being positive:

We can imagine these people as for example two polygamous households with many wives (5 and 6 resp.). If there is one AIDS positive husband at the beginning, then the infection spreads through his family, and if one of his wives is unfaithful at the same time (we remember the woman saying that she think that her husband infected her and then left her – so the wife we will consider here might recognize her being infected only after she is unfaithful, which increases the probability of spread of the infection), she infects the husband of the other polygamous family, who then (again not knowing about it) spreads it through his own family.

Both of the factors (prevalence and intensity negatively associated + strong selection of AIDS positive into polygamous households) play important role in creating such a high concentration of infected polygamists.

- × This part will be extended mainly by results of the analysis of question 3.

ANALYSIS OF THE DATA

- About the data -

MDICP

The data came from questionnaires, which consist of about 200 questions concerning respondent's sexual and family life.

The cluster sampling strategy was used, where clusters were defined as villages.

„The MDICP is conducted in three distinctive districts of Malawi, one in each of the three regions of the country....

The sampling strategy was not designed to be representative of the national population of rural Malawi. ...However: A comparison of the characteristics of the 1998 MDICP sample with those of the rural population surveyed in the 2000 Malawi Demographic and Health Survey indicates that, at the baseline, the MDICP sample was representative of the national rural population. ... The target sample was 500 ever married women in each district, plus their husbands.“

(Watkins, Zulu, Kohler, Behrman, 2003)

(S.B.+A.V. Van Assche, 2007)

The districts differ (intentionally) in terms of family behavioral, where there is patrilocality and, on the other side, matrilocality (residing near father's resp. mother's parents), and in terms of religion, which there is predominantly Muslim, Protestant and Catholic. They are located in different regions of Malawi.

I will use the MDICP-2 data (the second wave), carried out in 2001, on a sample of 1571 women and 1097 men, randomly selected from randomly selected villages of the three districts.

KDICP

The data were collected similarly to those of MDICP. The questions are generally on the same subjects, but not exactly the same.

„All rounds of the KDICP were carried out in four sites in Nyanza Province, in south-west Kenya ... The four sublocations were chosen according to a 2x2 research design that maximized variation according to two characteristics: the spatial extension of social networks and the presence of a Community Based Distribution (CBD) program. The sublocations were chosen to be as similar as possible in every other characteristic....

(Watkins, Zulu, Kohler, Behrman, 2003)

I will use the KDICP-3 data (the third round, from the year 2000).

Similarly as in the MDICP case, the sample was not designed to be representative of the whole rural population, but it again resembles the Kenya Demographic and Health Survey, which was, and also the women respondents were again ever-married women, and the majority of men respondents were their husbands (about 80%).

Problems of the data

One of the main problems with the data are the inconsistencies in reporting. For example, for the MDICP project:

There were discrepancies in reports for about 10% of the couples on household items and about 30% on the family planning and AIDS questions.

(Watkins, Zulu, Kohler, Behrman, 2003)

The authors think that this may be caused by the attempts of respondents to increase their own wealth by giving biased answers, as they think that the survey was conducted to some kind of development efforts, for example by donating some chosen respondents. Thus, the authors conclude, men overestimate their wealth, thinking they will be rewarded as good providers, and women underestimate it *„to present themselves as needy.“*

Some bias can also appear from the self-interested behaviour of the conductors of the survey, which is possible due to the principal-agent problem (however, we don't know how much big, and where exactly this problem is located).

Another thing is that both men and women probably underestimate their extramarital sex indispensably. The authors are not able to tell how big is that discrepancy, and only advice analytics to be particularly cautious about data concerning extramarital sex.

For someone who would like answers for our questions on some general level as for example for the whole Kenya or Malawi or even for SSA or the whole Africa, the problem to be solved is deducing from parts into whole, because the data were sampled only in some particular districts, and in other places the people might behave significantly different. So while reading the results of this work, it must be kept in mind that they are answered locally, i.e. For the particular districts of Kenya and Malawi, and the deduction on more areas is not a part of this work. From mentioned comparisons with KDHS and MDHS, we have at least some empirical proof, that the deduction is possible, but it is too complicated to be incorporated in this paper.

While analyzing the data, one must be prepared that sometimes they just don't make sense. When I was going through the responses of those who answered „No“ the question whether they attended school, I percieve in the next column that almost twenty out of sixty-six said that in school they spent two, three or more years, respectively. Cleaning all such errors would take unimaginally lot of time, and it may happen that there will be almost none observation left. In this particular case, it is not even sure, if the respondent realizes what he is asked for only after the second question, or if he was for example signed in school for some amount of years, but he didn't attended it.

Therefore, I will work with the data as they were collected, and if the respondent says that he attended school, I will assume that he or she attended school.

In the questionnaire, there was a question for an interwiever, whether he thinks the respondent answered truthfully, and it was „yes“ in about 17% of cases. We can expect that this was particularly in private sensitive questions such as those about infidelity (it was said that respondents underestimate this).

- Results of the analysis -

In this part, there will be presented results of the empirical analysis which are interesting and seem to be answering one of our questions. For some cases, they will be interpreted on and compared with the theoretical background explained in the first part of the paper.

Results, that will be chosen, are those that I considered as most appropriate. Usually they are the strongest relationships (correlations etc.) found in the data, and if there is missing some theoretically expected result, then it most likely does not hold for the data, or might have been omitted by me.

Before moving to the particular questions, I must say, that I didn't find any intraclass correlation, meaning that in the following, we will not take into account that the whole population was sampled in tens of different villages, but treat them as one sample.

Question 1 - What are the characteristics of polygamous men (education, wealth, etc.), what is their motivation to have more wives?

The vast majority of polygamous men (more or less 4/5) said to have 2 wives in Malawi, while in Kenya the number of polygamist's wives is unknown (but as we know that the sample consists of 925 women and 672 of men are their husbands, and the ratio of polygamous husbands is 27%, we can assume that most polygamists probably have two wives also in Kenya), so in the analysis, we will simplify it and distinguish only monogamous (1 wife) and polygamous (2 or more wives) unions.

Then, the proportion of polygamists in our sample will look as follows:

Men	Kenya	27.17%
	Malawi	13.41%
Women	Kenya	38.39%
	Malawi	29.30%
Kenya and Malawi (sample) – Rate of polygamy		

The higher rate for women is probably due to sampling strategy – every time a polygamous household is sampled, two or more women are interviewed and only one man, thus the ratio of women increases more, whereas if a monogamous household is sampled, the ratio still remains higher for women.

Education

Let's first look at the education of polygamous men. Whereas for Malawi, no significant direct relationship between education and polygamy was learned from the data, for Kenya, there seems to be relatively more powerful relationship:

been to school	Monogamous	Polygamous
No	137(84%)	27(16%)
Yes	681(87%)	100(13%)
Fisher independence test	P-value=0.210	
Goodman and Kruskal's gamma	-0.14	
Cramér's V	-0.04	
Malawi men – Polygamy and education		

attended school	Monogamous	Polygamous
No	35 (58%)	25 (42%)
Yes	492(74%)	171(26%)
Fisher independence test	P-v.=0.014**	
Goodman and Kruskal's gamma	-0.35	
Cramér's V	-0.10	
Kenya men – Polygamy and school attendance		

Note:

Where the P-value (P-v., from the Fisher's exact test of independence, or in case of large tables from the Pearson's test of independence) here tells us to reject the hypothesis of independence, and the Goodman's and Kruskal's gamma measures the power of the relationship, from -1 as 100% negative to +1 as 100% positive. It has higher range of values than correlation (which there is -0.0985) and is recommended to use for the type of data that I work with, so I have chosen it as the most precise indicator.

The Cramér's V is a test of power of dependency, based on the chi-squared statistic, ranging from 0 (no dependency) to 1 (high dependency). It is more convenient when we want to compare more wide range of associations, because it adjusts to size of the sample and to size of the table. The minus sign is added if the variables are known to be ordinal and negatively associated.

* the null hypothesis rejected on 10% significance level

** the null hypothesis rejected on 5% significance level

*** the null hypothesis rejected on 1% significance level

This may mean lots of things. There are for example these two completely different argumentations:

1) Educated people might know better that polygamy is in developed world seen as something unacceptable, and they would like to advance towards developed world.

2) Polygamous husbands might had „something more time-worthy to do“ rather than attending an African school (every Czech former student can wonder about this idea with his or her own experience from a Czech school, that are surely more advanced than those of Africa), and thus they can afford a bigger family.

If the 2) is right, then it is also a sign of different economic value of human capital in form of school knowledge in Africa and in developed world. Whereas in developed countries, people without education have often low wages, in Africa, the higher education may not be a way to more wealth. However, the data only tell us, that 42% out of 60 non-educated husbands in some part of Kenya are polygamous, which is a small information to make any big conclusions from. We will examine this question further on.

Wealth

Table 4

has plough	Monogamous	Polygamous
Yes	121(25%)	99(46%)
Fisher's independence test	P-v.=0.000***	
Goodman and Kruskal's gamma	0.42	
Cramér's V	0.20	
Kenya men – Polygamy and wealth (plough)		

Table 5

has lantern	Monogamous	Polygamous
Yes	308(65%)	173(80%)
Fisher's independence test	P-v.=0.000***	
Goodman and Kruskal's gamma	0.38	
Cramér's V	0.16	
Kenya men – Polygamy and wealth (lantern)		

Table 6

has fishing net	Monogamous	Polygamous
Yes	48(10%)	47(22%)
Fisher's independence test	P-v.=0.000***	
Goodman and Kruskal's gamma	0.42	
Cramér's V	0.16	
Kenya men – Polygamy and wealth (fishing net)		

Table 7

has boat	Monogamous	Polygamous
Yes	27(6%)	31(14%)
Fisher's independence test	P-v.=0.000***	
Goodman and Kruskal's gamma	0.47	
Cramér's V	0.14	
Kenya men – Polygamy and wealth (boat)		

These tables show that polygamous husbands are relatively more wealthy, as far as these possessions are concerned. However, here we shall remember that husbands are overestimating their wealth, which may apply for their wives, too, and then everything will be explained – polygamous men are wealthy as much as everyone, but this information was lost in the process of filling the questionnaire, because of the overestimation (Some of the men are overestimating more than others – their wealth as well as the number of wives).

The fact that having fishing net is correlated with having boat, and that almost all owners of a boat lives in the same one of the districts does not influence the conclusion made.

Table 8

	owns bed with mattress	# of pigs owns	earnings	# ate chicken/fish last week
values of gamma	0.31	0.32	0.20	0.25
Malawi men – Polygamy and wealth (relationship between polygamy and wealth indicators)				

Adding some information from the Malawi, which show some not very strong but at least some positive relationships between polygamy and wealth (only the relation between # of pigs and # of wives is exceptionally strong, having gamma of 0.49), I conclude that polygamous men are probably those, who can afford it because of they are wealthy, and they probably didn't attain the wealth while sitting at school.

This is one possible explanation, but the causality can be the opposite as well:

Because of being polygamous, there is more workforce in the family, and therefore also more wealth. What I believe, is that it goes on both sides – when a husband decides to take a second wife, it is logical that his total wealth (here we consider the total weath of the family) increases (and if we take into account only the husband's own wealth, then at least his possessions surely increase by what his new wife brings into to household – we also see, that they have higher coefficients).

Whether the decision is caused by a husband wanting to increase family's wealth, or as a consequence of having sufficient wealth to adopt a new woman, we can't know empirically, but intuitively it can again go both directions.

We will return to this in Question 2, where mainly women are discussed.

Languages

These findings are about languages that the respondents know in Malawi.

Table 9

speaks Chichewa	Monogamous	Polygamous
Yes	322(41%)	72(58%)
Fisher's independence test	P-v.=0.001***	
Goodman and Kruskal's gamma	0.32	
Cramér's V	0.11	
Malawi men – Polygamy and language (Chichewa)		

Table 10

speaks Senga	Monogamous	Polygamous
Yes	89(12%)	4(3%)
Fisher's independence test	P-v.=0.005***	
Goodman and Kruskal's gamma	-0.57	
Cramér's V	-0.09	
Malawi men – Polygamy and language (Senga)		

Languages are always a part of culture, so these tables confirm that polygamy might to some extent be a legacy.

Those, who speak Senga, are rarely polygamous.

This can be either because it is a part of their culture (while those, who speak Chichewa, are more likely to be polygamous for the same reason), or because of the logic that people who speak the same language are living together for example in an area where there is higher level of wealth (it will be checked by regression, where these influences (wealth and language) are considered both at a time and thus we can decide which of them is the more important one. If we look now on the language-wealth relation, we see that it is really not negligible – correlations vary from -0.12 (Yao) to +0.19 (English) in Malawi. However, since neither Yao or English speaking were found to be significantly more or less polygamous than the others, we may expect that the cultural effect (a cultural habit of polygamy) there is.

What is interesting, Chichewas are a matrilineal culture, which means that families are formed around mother. If this exists at the same time with polygamy, it means that polygamous men are actually gathering more families together, building something like a family-based monopoly. It makes sense that husbands are motivated to have more wives, because it multiplies the human power of the family, and thus also the economic power, since in Africa, families are much more important as economic institutions than elsewhere. If there were one woman with multiple husbands, it clearly wouldn't work under such matrilineal system.

We can see this result, hand in hand with what was mentioned in the theoretical part about families as economic institutions, to be the evidence of polygamy being actually the motor of economic development.

Religion

Various cultures in Malawi (religions) have various numbers of polygamists:

religion	Monogamous	Polygamous
Catholic	171(21%)	9(7%)
Protestant	175(21%)	10(8%)
Moslem	165(20%)	44(35%)
Revivalist	34(4%)	1(1%)
Other	256(31%)	54(43%)
Pearson independence test		P-v.=0.000***
Cramér's V		0.22
Malawi men – Polygamy and religion		

This is in accord with the fact, that Moslems are „officially“ allowed to have up to four wives, while among Christians it is more often seen as moral to have only one wife (it is not forbidden, but neither it is formally allowed as for the Moslems).

Also the „Other“ row has high percentage in the Polygamists column, where the „Others“ are formed mainly by African religions (from about one half) and several kinds of Christianity.

Among Kenya respondents, there is majority of Catholics and Protestants and not so many Moslems, and the differences are smaller than for Malawi:

religion	Monogamous	Polygamous
Catholic	104(23%)	31(19%)
Protestant	302(68%)	119(72%)
Other	38(9%)	15(9%)
Pearson independence test		0.47
Cramér's V		0.05
Kenya men – Polygamy and religion		

Question 2 - What are the characteristics of women who live in polygamous marriage (education, position in the family, number of children, etc.)?

Education

	Kenya		Malawi	
attended school	Monogamous	Polygamous	Monogamous	Polygamous
Yes	566(85%)	337(79%)	648(65%)	295(72%)
Fisher's independence test	P-v.=0.005***		Fisher's independence test	P-v.=0.018**
Goodman and Kruskal's gamma	-0.22		Goodman and Kruskal's gamma	0.15
Cramér's V	-0.09		Cramér's V	0.06
Kenya women – Polygamy and education			Malawi women – Polygamy and education	

Kenya - The relationship for women there is the same as it was for men (quite less strong) – educated women are slightly less frequently in polygamous households. From such a weak relationship there can't be made any conclusion, perhaps only that educated women are more aware of that being in polygamous union is seen as inferior, and that a women, especially the second one, would hard seek a new husband, if she divorced her polygamous husband (divorced woman from either monogamous or polygamous unions have usually lower chance to marry again).

However this idea might hold or not without the result for Malawi, the result for Malawi goes the opposite:

Malawi – The relationship is even smaller, but in contrary to Kenya, it is positive. The only thing that I am able to conclude from these two tables, is that education probably doesn't have any significant influence on whether a woman will live with a polygamous husband or not (generally, it does not, however, for Kenya itself, or for Malawi itself, the gamma test returns -0.22, resp. 0.15).

Wealth

has metal roof	Monogamous	Polygamous
Yes	207(37%)	168(47%)
Fisher's independence test	P-v.=0.002***	
Goodman and Kruskal's gamma	0.22	
Cramér's V	0.11	
Kenya women – Polygamy and wealth		

has plough	Monogamous	Polygamous
Yes	134(24%)	133(37%)
Fisher's independence test	P-v.=0.000***	
Goodman and Kruskal's gamma	0.32	
Cramér's V	0.15	
Kenya women – Polygamy and wealth		

As it might have been expected, the polygamy-wealth relationship for women in Kenya is similar to the men's, just because the ownership of plough or metal roof counts for the whole family, and so this result only confirms what was already found.

Moreover, in addition to metal roof and plough in Kenya, in Malawi, polygamous families relatively more often own some land, and were able to visit Mzuzu (the capital of Malawi's Northern region):

Owns no land	Monogamous	Polygamous
	193(19%)	45(11%)
Malawi women – Polygamy and wealth		

been to Mzuzu	Monogamous	Polygamous
Yes	214(22%)	140(34%)
Fisher's independence test	P-v.=0.000***	
Goodman and Kruskal's gamma	0.30	
Cramér's V	0.13	
Malawi women – Polygamy and wealth		

The relation between polygamy and for example amount of money the wife earns for a year or for a month would be more explaining, but it is very small, if some. The independency is refused on the 5% significance level, but it is not on the very low 1% s.l., so there is only a slight chance for the dependency. The numbers don't show any big relation between a woman's (as an individual) wealth and her likelihood to be with a polygamous husband.

Since the positive relation holds for Kenya as well as for Malawi households (but probably not for women as individuals), we may expect that it probably holds generally.

Desire for children

We already spoke about the men's desire for children, whereof the empirical equivalent (in Malawi) is the following:

# of children given birth to x polygamy		
	Monogamous	Polygamous
Mean # children	4.88	5.25
Pearson independence test		P-v.=0.000***
Goodman and Kruskal's gamma		0.09
Cramér's V		0.19
t-test of equiv. of population means		P-v.=0.0287**
Mann-Whitney U test		P-v.=0.0125**
Malawi women – Polygamy and children		

Note:

Because the assumption of normal distribution of number of children in monogamous, resp. polygamous households does not hold (rejected by both Shapiro-Wilk and Skewness-Kurtosis tests on the 1% level of significance), the student's t-test for testing the difference of sample means does not work very well. For this reason, we use the Mann-Whitney test for testing if the two samples are from equally distributed populations.

The Goodman's and Kruskal's gamma is computed not for means, but for the original table with numbers of children.

We can see that there are more 0's than some numbers unveiling dependency, but nevertheless, it is enough information to say that the relation is more positive than negative.

The equality of distributions of populations (monogamous and polygamous) from which the samples were obtained is rejected (primarily by the M.-W. U test), and now we can say that women of polygamous unions have statistically more children.

Thus, if we take into account that in each polygamous union are at least two women, the number of children is at least twice as much as in monogamous union according to this analysis, and so the analysis confirms that one of the reasons, why husbands want more wives, is (or to be more careful – might be) to have more children.

However unconvincable the table may be, the same relation for men in Malawi has gamma 0.49 , and in Kenya it is 0.67 (in this case, correlation = 0.53), so there is no doubt.

There is the desired number of children for women and men in Malawi, also being higher for polygamous men (for women much less higher):

Table 19

Desired # of children x polygamy		
	Monogamous	Polygamous
Mean # children	5.23	7.02
Pearson independence test	P-v.=0.000***	
Goodman and Kruskal's gamma	0.30	
Cramér's V	0.34	
t-test of diff. of population means	P-v.=0.0000***	
Mann-Whitney U test	P-v.=0.0000***	
Malawi men – Polygamy and children		

Table 20

Desired # children x polygamy		
	Monogamous	Polygamous
Mean # children	4.89	5.24
Pearson independence test	P-value=0.178	
Goodman and Kruskal's gamma	0.12	
Cramér's V	0.12	
t-test of equiv. of population means	P-v.=0.0051***	
Mann-Whitney U test	P-v.=0.0064***	
Malawi women – Polygamy and children		

Note: The normality assumption of distributions of numbers of desired children is again violated (as it is in the next cases considering # of children, too), so we look primarily (in the next cases, too) on the Mann-Whitney U test.

We see that the desired number of children is 7 for polygamists, while each polygamist's woman gave birth to 5 children. At first sight, it seems that the actual number is higher than the husbands would like it to be, but because of the high mortality, the number of children changes:

Table 21

# of children alive x polygamy		
	Monogamous	Polygamous
Mean # children	3.65	4.02
Pearson independence test	P-v.=0.008***	
Goodman and Kruskal's gamma	0.11	
Cramér's V	0.14	
t-test of equiv. of population means	P-v.=0.0041***	
Mann-Whitney U test	P-v.=0.0041***	
Malawi women – Polygamy and children		

Table 22

# of children given birth to x polygamy		
	Monogamous	Polygamous
Mean # children	4.88	5.25
Pearson independence test	P-v.=0.000***	
Goodman and Kruskal's gamma	0.09	
Cramér's V	0.19	
t-test of equiv. of population means	P-v.=0.0287**	
Mann-Whitney U test	P-v.=0.0125**	
Malawi women – Polygamy and children		

Having recalled the fact that the number of children a polygamist have is twice the number of children that were born by one of his wife, we compute that a monogamist (man) have more or less 2 children less than he would like to, while a polygamist (man) have one children more then he would like to.

Returning back to what we began about the polygamy-wealth relationship in Question 1, we can now enlighten to which direction the causality goes more:

Because we know that a polygamist has more than twice as much children, we might think, at a first glance, that the polygamist has to be more wealthy to support his amount of children (the ratio adults/children is lower), and so the sequence wealthy->polygamous would be more likely.

However, there again goes the opposite causality, because if we assume that children are working, then the husband's wealth increases, where especially the possession of non-rivalrous goods is worthy to raise when there are more users (such as lantern, metal roof, etc.). In the end, we might have enlightened the problem, but only to see another factor, that can work in both directions.

Remembering the population pyramid of Malawi, where there are so many children, we can clarify it by this table:

Table 23		
using FP method	Monogamous	Polygamous
Yes	328(55%)	143(55%)
Fisher's independence test	P-value=1.000	
Goodman and Kruskal's gamma	-0.003	
Cramér's V	-0.001	
Malawi women – Polygamy and family planning		

We see that both types of unions care equally about how many children they would have, as far as family planning is concerned. This means that women in both unions are equally aware of the number of children, which however might not always hold for men:

Only 9 of 44 husbands (in Malawi) did nothing when they realized that the woman used family planning secretly, while 11 made her stop, while others asked her to leave, quarreled with her, beat her etc.

So we see that women sometimes have motivation to use FP secretly, and if the husband, whose desire for children is probably higher than wife's, realizes it, it might be a problem.

However, the most important information of the table is the fact, that only 55% of all women are planning the family (explaining why the bottom of the population pyramid looks like this) .

For comparison, there are the desired numbers and the actual numbers for men of Kenya:

Table 24

Ideal # of children x polygamy	Monogamous	Polygamous
Mean # children	5.68	10.3
Pearson independence test	P-v.=0.000***	
Goodman and Kruskal's gamma	0.67	
Cramér's V	0.57	
t-test of equiv. of population means	P-v.=0.0000***	
Mann-Whitney U test	P-v.=0.0000***	
Kenya men – Polygamy and children		

Table 25

# of own children x polygamy	Monogamous	Polygamous
Mean # children	3.8	6.85
Pearson independence test	P-v.=0.000***	
Goodman and Kruskal's gamma	0.48	
Cramér's V	0.42	
t-test of equiv. of population means	P-v.=0.0000***	
Mann-Whitney U test	P-v.=0.0000***	
Kenya men – Polygamy and children		

The difference between polygamist's and monogamist's desired # of children here is even larger than in Malawi.

As well as in Malawi, the desired # of children is lower than actual for monogamists, but in this case, even the polygamists want even more children than they actually have (if we assume that children that a husband get by marrying a second women are also treated as his own).

Let's summarize the desire and actual number in the following tables:

Table 26	Desired #	Born #	Actual #	Born–Actual(Dead)#	Desired–Born #	Desired–Actual #
Poly-men	7.02	9.15	7.02	2.13	-2.13	0.00
Poly-women	5.24	5.25	4.02	1.23	-0.02	1.21
Mono-men	5.23	5.54	4.16	1.38	-0.31	1.07
Mono-women	4.89	4.88	3.65	1.23	0.01	1.24
All men	5.46	5.98	4.51	1.47	-0.52	0.95
All women	5.00	5.00	3.75	1.25	0.00	1.25
Means of desired # and born # and actual # of children in Malawi						

Table 27	Ideal #	Born #	Living with #	Born–Liv. with(Dead)#	Ideal–Born #	Ideal–Liv. with #
Poly-men	10.31	12.38	6.85	5.53	-2.07	3.46
Poly-women	5.37	5.47	3.61	1.86	-0.10	1.76
Mono-men	5.68	5.65	3.80	1.84	0.03	1.87
Mono-women	5.52	5.30	3.74	1.56	0.22	1.78
Total men	6.97	7.71	4.77	2.94	-0.75	2.19
Total women	5.47	5.37	3.70	1.68	0.09	1.77
Means of desired # and born # and actual # of children in Kenya						

Note:

There is Ideal instead of Desired etc. because the questionnaires have not exactly the same questions.

It must be said that when asking men how many children they want, they often do not answer an exact number. The answer which is remarked as „UP TO GOD“ , had 8% of men in Malawi and

30% of men in Kenya. For women it was 8% in Malawi and 17% in Kenya.

This confirms that women are more careful about the family planning, and there are more numbers that confirm this in the table:

The fact that women born exactly the same number of children that they are desiring for (especially in Malawi) is remarkable, but because of the high mortality, they actually have less children than they want.

This somehow justifies the men's behavior as far as children are concerned, because men, in every case desiring more children than women, help to lower the gap between Desired and Actual.

One might notice that the numbers of men and women sometimes do not cohere even though they should. For example total # of children the men are living with is higher than total # of children the women are living with. This can be explained in the two following ways:

- 1) Wives that live in polygamous unions count only their own children and not the children of the other wife, whereas men always count all their children, which causes the discrepancy.
- 2) As was mentioned before, men probably overestimate their wealth and maybe also the # of children. There we have several numbers that underwrite this idea: apart from those just discussed, the number of children born in monogamous unions is higher for men as well. As the first effect here is not present, the overestimating effect probably works.

The mortality ratio being high (always above 1) differences between Desired-Born and Desired-Actual differs, too. While the first one is usually close to 0, the second one is higher.

If the Desired # is that the respondents really want, then the vast majority of them must be quite unhappy. However, the high Desired number can also mean that they are already presuming the mortality ratio and answer the number that they want to Born, rather than to Live with.

If this is true, then it speaks about quite a good ability of incorporating the mortality ratio into family planning.

Comparing Kenya with Malawi, there is a relatively huge difference between desired # of children. Especially the Kenyan polygamists wanting more than 10 children are remarkable.

Languages

Table 28

speaks Basuba	Monogamous	Polygamous
Yes	51(8%)	59(14%)
Fisher's independence test	P-v.=0.001***	
Goodman and Kruskal's gamma	0.32	
Cramér's V	0.10	
Kenya women – Polygamy and language		

Table 29

speaks Senga	Monogamous	Polygamous
Yes	96(10%)	15(4%)
Fisher independence test	P-v.=0.000***	
Goodman and Kruskal's gamma	-0.48	
Cramér's V	-0.10	
Malawi women – Polygamy and language		

The right table only confirms, what was already found for men – The Sengas are rarely polygamous.

The left table then again points at differences in polygamy among various languages, but here it probably really is the (mentioned in the part for men) indirect relation through wealth:

Cramér's V of „Speak Basuba-Wealth“ relationship is -0.75 (Basubas are relatively unwealthy).

However, what's the problem here: the linkage goes the opposite direction than we would expect from what was found about Wealth-Polygamy relation – Basubas are unwealthy but at the same time they are polygamous.

The conclusion is that in the case of Basubas (Here we have results for women. For men it is similar) the cultural effect is even stronger, because it overweights the wealth effect which goes counter to it.

Religion

Finally, the cultural differences express themselves in a woman's religion, too.

Table 30

religion	Monogamous	Polygamous
Catholic	192(79%)	50(21%)
Protestant	248(80%)	61(20%)
Moslem	220(67%)	106(33%)
Revivalist	39(85%)	7(15%)
Pearson independence test	P-v.=0.000***	
Cramér's V	0.20	
Malawi women – Polygamy and religion		

Again, the disparity between Moslems and Christians is obvious.

Table 31

religion	Monogamous	Polygamous
Catholic	135(70%)	57(30%)
Protestant	389(59%)	274(41%)
Other	43(57%)	32(43%)
Pearson independence test		P-v.=0.012**
Cramér's V		0.10

Kenya women – Polygamy and religion

In Kenya, it is similar as in Question 1 (vast majority of Christians), but there is quite remarkable difference between Catholic women (30% percent of them have polygamous husbands) and Protestant women (41% have polygamous husbands).

Regressions for Q1 & Q2

Malawi data

Men

Using the Probit model, we will always make sure that the sample size is sufficiently large, and the cells of tables of variables are not too small.

For example in the case of wealth and languages that we are to test now, there are only 4 polygamists who speak Senga, which might cause the regression model to give unprecise results.

So let's return first to the polygamy-wealth-language relationship for men:

Table 32

Regressors	Marginal effect	Std.error	Significance
owns bed with m.	0.0530	0.0267	0.037**
# pigs owns	0.0086	0.0052	0.094*
# ate chicken/fish	0.0157	0.0059	0.009***
speaks Chichewa	0.0488	0.0243	0.042**
# of observations			893
Log-likelihood			-345.48
Mc Fadden's Pseudo R-squared			0.04

Malawi men – Probit regression: Probability of being polygamist

Note:

The Marginal effect says how much the probability changes with additional marginal unit of regressor. It is measured from mean values of the non-dummy regressors, and for the dummy regressors it says how much the probability changes if the dummy variable is true.

As we were not sure in Question 1 whether the language effect is indirect through wealth, or direct, here we see that if we take only these four variables that were listed as significant for husband being polygamous or not, the language effect remains significant. A husband who can't speak Chichewa will have to eat three chicken/fish more a week to have the same probability of being polygamous as a husband who can.

A regression model with other possible explanatory variables of polygamy for both men and women:

Probit regression		Table 33				
Variable	Men			Women		
	Marginal effect	Std.Err.	Sig.	Marginal effect	Std.Err.	Sig.
Owens bed with mattress	0.061	0.033	**0.047	-0.042	0.040	0.296
# of pigs owns	0.012	0.005	**0.013	-0.003	0.008	0.679
# eat chicken/fish last week	0.004	0.006	0.485	-0.003	0.008	0.713
Speaks Chichewa	-0.040	0.032	0.216	0.018	0.039	0.636
is Moslem	0.187	0.072	***0.002	0.156	0.055	***0.003
Ever been to school	0.002	0.036	0.966	0.042	0.039	0.289
Speaks Yao	-0.088	0.025	**0.016	-0.051	0.056	0.376
Speaks English	-0.005	0.029	0.861	0.040	0.068	0.548
Ever been to Mzuzu	0.091	0.035	***0.005	0.179	0.047	***0.000
Ever been to Zomba	0.013	0.035	0.711	-0.055	0.046	0.251
Ever been to Blantyre	0.007	0.033	0.820	0.039	0.049	0.412
Ever been to Lilongwe	-0.021	0.027	0.437	0.060	0.035	*0.080
Owens paraffin glass lamp	-0.009	0.027	0.744	-0.004	0.036	0.920
Has pit latrine	0.016	0.034	0.643	-0.124	0.040	***0.002
Owens bicycle	0.033	0.025	0.205	-0.014	0.034	0.669
# cattle owns	-0.002	0.003	0.423	0.009	0.006	0.165
# of goats owns	0.004	0.004	0.234	0.009	0.005	*0.085
# of chickens/ducks owns	0.001	0.001	0.403	0.002	0.002	0.371
Amount earned last week	-0.0000004	0.000002	0.807	0.0000164	0.00001	*0.097
How much land does R. Own	-0.0001437	0.001	0.870	-0.003	0.001	***0.000
Household looks wealthy	0.020	0.016	0.228	0.045	0.022	**0.045
# of observations	790			963		
Log-likelihood	-281.333			-548.367		
Mc Fadden's Pseudo R-sq	0.09			0.073		
Malawi men and women – regression: Probability of being in a polygamous household						

Note:

Earnings measured in Malawian Kwacha. Approximately, 141 Kwacha = 1 US dollar.

Land measured in acres.

In this regression model, there are generally variables concerning respondent's wealth and education.

Most of the variables are insignificant, even the „#ate chicken/fish” and „speaks Chichewa“, that were significant in the previous small model. This change can be caused by some link between each of these two variables with some of those that were added, most likely with some of those that are significant.

The variables significant on the 5% level for men are:

„is Moslem“, „Speaks Yao“ and „Ever been to Mzuzu“.

Going back to contingency tables, we will find the reasons of the two initially significant variables not being significant any more:

- 1) „#ate chicken/fish” is positively correlated with moslems – Moslems eat lot of chicken/fish.
- 2) Those who speak Chichewa rarely speak Yao, and often been to Mzuzu.

So these three new significant variables replaced those two initial.

The other insignificant variables for men are:

Ever been to school – education probably don't have big effect on poly/mono husband, or is borned by some of the significant variables.

Speak English, Ever been to Zomba, Ever been to Blantyre, Ever been to Lilongwe.

Owns paraffin glass lamp - might be borned by „owns bed with mattress.

Has pit latrine - might be borned by „owns bed with mattress.

Owns bicycle – 0.205 – relatively more significant, 3% margin is not much but still relatively high.

cattle owns – might be borned by „# of pigs owns“.

goat owns - might be borned by „# of pigs owns“.

chicken/ducks owns - might be borned by „# of pigs owns“.

How much money did R. Earn last week – might differ across various occupations.

How much land does R. own – we would expect this to be significant positive.

How wealthy the household is according to interviewer – 0,228 – relatively significant with 2% margin.

As neither Zomba, Blantyre or Lilongwe is significant, we may ask: Why Mzuzu is?

The reason can be that it is because of the fact that Mzuzu belongs to the Northern Region, which is an agricultural region.

On the other hand, at the beginning of the analysis, no big differences were found among regions.

If we keep only the significant variables in the model for men, the result is as follows:

Probit regression reduced		Table 34 Men		
Variable	Marginal effect	Std.Err.	Sig.	
Owens bed with mattress	0.046	0.028	*0.083	
# of pigs owns	0.011	0.005	**0.022	
is Moslem	0.149	0.041	***0.000	
Speaks Yao	-0.070	0.025	**0.027	
Ever been to Mzuzu	0.066	0.026	***0.008	
# of goats owns	0.005	0.003	*0.083	
Household looks wealthy	0.027	0.014	*0.066	
# of observations	872			
Log-likelihood	-308.752			
Mc Fadden's Pseudo R-sq	0.077			
Malawi men – regression: Prob. Of being in a polygamous household				

There are those variables that were significant in the previous model plus two more:

„# goat owns“ and „How wealthy the household is according to interviewer“.

I interpret this result as confirming the polygamy-wealth positive link.

Women

Being Moslem and being to Mzuzu are significant for women as well, which is understandable.

Instead of # of pigs there is # of goats, which makes little difference as far as wealth is concerned. It may be just because the regression fits more on # goats in this case, while ownership of both are positively correlated, the # of pigs brings information that is already included in # of goats.

Quite significant is being to Lilongwe, which means that being to some larger city indicates polygamy for two out of four cities significantly, while for the rest two the p-value is also relatively low, so that Mzuzu is probably not indicating polygamy only because it is a center of one particular (agricultural) region.

Instead of mattress the pit latrine is significant for women.

The last three variables which describe wealth from three different points of view other than possessions, unambiguously speak about wealth accompanying polygamy.

If we then keep only the significant variables in the model for women, the result is as follows:

Probit regression reduced		Table 35		
Variable	Marginal effect	Std.Err.	Men	
				Sig.
is Moslem	0.120	0.045		***0.005
Ever been to Mzuzu	0.204	0.039		***0.000
Ever been to Lilongwe	0.056	0.033		*0.084
Has pit latrine	-0.120	0.040		***0.002
# of goats owns	0.011	0.005		**0.032
Amount earned last week	0.0000170	0.0000095		*0.071
How much land does R. Own	-0.00261	0.0006094		***0.000
Household looks wealthy	0.045	0.020		**0.023
# of observations	974			
Log-likelihood	-558.014			
Mc Fadden's Pseudo R-sq	0.0658			
Malawi women – regression: P. Of being in a polygamous household				

So we see that the significant variables are the same, with the exception of # goat (from one star to two stars) they have also the same level of significance, and of course the Pseudo R-sq. slightly decreased, however with model being much smaller (in the best sense) .

Finally, it is a good remark to say that since the variables chosen for this model are almost all about wealth, it would be a surprise if none of those twelve variables was significant.

Even if the wealth was not behind it, because of the majority of variables being about wealth there would be a good chance that some of them were significant, just by chance, or because they are correlated with some explaining variable, which however we don't know, or which wasn't or can't be measured.

Nevertheless, it is most likely that the relationship there is and it surely positive.

Kenya data

The relationships were probed extensively enough, so, to not recapitulate the same phrases again, regressions on data from Kenya will be presented only shortly.

Probit regression	Table 36					
	Men			Women		
Variable	Marginal effect	Std.Err.	Sig.	Marginal effect	Std.Err.	Sig.
Been to school	-0.090	0.085	0.263	-0.056	0.049	0.243
Speaks Kiswahili	0.061	0.043	0.166	-0.062	0.036	*0.082
Speaks Basuba	0.190	0.063	***0.002	0.189	0.060	***0.002
Speaks English	-0.103	0.044	**0.02	-0.064	0.043	0.142
Has metal/wooden ben	-0.102	0.116	0.351	-0.014	0.075	0.853
Has radio	0.048	0.047	0.317	-0.060	0.040	0.134
Has bicycle	0.025	0.049	0.616	0.056	0.041	0.175
Has sofa set	0.092	0.052	*0.07	0.059	0.045	0.186
Has metal roof	0.028	0.045	0.528	0.093	0.039	**0.015
Has lantern	0.039	0.048	0.428	-0.044	0.040	0.276
Has plough	0.137	0.055	**0.01	0.166	0.043	***0.000
Has fishing net	0.271	0.109	***0.009	0.129	0.072	*0.070
Has boat	-0.569	0.079	0.495	0.115	0.093	0.207
Has pit latrine	0.085	0.045	*0.061	-0.033	0.038	0.379
Earns a mthl. Salary (Yes/No)	-0.055	0.052	0.314	-0.048	0.085	0.580
Sells from the shamba	-0.014	0.041	0.736	-0.010	0.036	0.779
Works for someone else	-0.137	0.041	***0.001	0.009	0.044	0.835
Sells fish	-0.062	0.073	0.421	0.032	0.047	0.496
Sells beer or changa	-0.168	0.084	0.162	-0.113	0.110	0.345
Does bussiness	-0.032	0.043	0.467	-0.013	0.036	0.720
Income generating group	-0.032	0.074	0.671	-0.073	0.080	0.376
Credit merry go round	0.030	0.063	0.625	0.005	0.041	0.908
# of cattle owns	0.009	0.005	*0.084	0.008	0.005	0.146
# of goats owns	-0.003	0.005	0.523	-0.004	0.004	0.396
# of sheep owns	0.001	0.010	0.922	0.014	0.009	0.137
# of chickens owns	0.003	0.001	*0.068	-0.001	0.002	0.676
# of observations	593			883		
Log-likelihood	-304.9252			-547.077		
Mc Fadden's Pseudo R-sq	0.1418			0.0697		
Kenya men and women – regression: Probability of being in a polygamous household						

Languages are again important variables – Basuba and Kiswahili positively and English negatively (in the correlation sense).

Relatively strong determinants are the possession of plough and fishing net, as we have seen already on the contingency tables. The possession of fishing net is then an indicator of wealth, and besides that also of living in the area with lot of fishermen (Wakula South).

Putting these two together, it is a mark of polygamists living probably in fishermen's area (Wakula South or Owich).

We've already seen positive margin of bred animals as well, and negative margin of schooling was discussed, too (here with quite low p-values 0.263 and 0.243).

What is new for men respondents, is variable „Works for someone else“ with -0.137 margin and high significance, meaning that polygamists are probably more often self-employed.

Lastly, the approximately twice as high ratio as the other models have speaks for better explaining ability of the model, but at the same time is higher because of lower number of observations and in the model for Kenya dataset there are five more variables than in the model for Malawi dataset.

Question 3 - What is the relationship between polygamy – AIDS? Are the people in polygamous marriages less likely to be infected (because they have stable partners and are more faithful)?

Firstly, we will look in Malawi.

Because only a few respondents (less than 2%) answered that they have AIDS at the moment, the direct comparison between infected and uninfected is not possible.

Therefore, I will use the two following ways how to evaluate it: indirectly, and from the opinion of the respondent.

1) From the opinion of the respondent

The respondents are asked, what do they think is the chance that they are infected at the moment.

The responses are No/Low/Medium/High/Don't know.

Table 37		
AIDS chance	Monogamous	Polygamous
No	403(49%)	56(45%)
Low	171(21%)	21(17%)
Medium	60(7%)	11(9%)
High	104(13%)	22(18%)
Don't know	77(9%)	14(11%)
Cramér's V		0.06
Pearson independence test		P-value=0.412
Malawi men – Polygamy and AIDS		

Table 38		
AIDS chance	Monogamous	Polygamous
No	451(46%)	184(46%)
Low	205(21%)	78(20%)
Medium	67(7%)	25(6%)
High	125(13%)	69(17%)
Don't know	125(13%)	41(10%)
Cramér's V		0.07
Pearson independence test		P-value=0.200
Malawi women – Polygamy and AIDS		

As far as these tables are concerned, the polygamous and monogamous respondents perceive their chances of having AIDS almost equally. The polygamists (and their wives) slightly more think that the chance is high than the monogamists (and their wives).

In the theoretical part there was said that one study found positive correlation between the two factors. Our results are not very convincing in this.

They rather tell us (compared with the positive correlation which was found by Reniers and Tfaily) that either the respondents have wrong opinion about it (because the polygamists are in reality more often infected, they underestimate the chance), or it is just a statistical problem resulting from a small sample size.

On the other hand, there are at least these few percents turning the scale to the positive correlation.

Moreover, the tables say something anyway: if not about how it really is, then at least about motivation – the motivation to being a polyg. union is probably not to decrease the chance of getting AIDS.

Let's confirm this idea by the following results:

Table 39		
Low chance of AIDS because having sex only with wife/wives		
	Monogamous	Polygamous
Yes	561(70%)	86(70%)
Goodman and Kruskal's gamma		0.02
Fisher's independence test	P-value=0.916	
Cramér's V		0.01
Malawi men – Polygamy and AIDS		

Table 40		
Low chance of AIDS because having sex only with husband		
	Monogamous	Polygamous
Yes	685(70%)	283(71%)
Goodman and Kruskal's gamma		0.01
Fisher independence test	P-value=0.897	
Cramér's V		0.00
Malawi women – Polygamy and AIDS		

According to this, the type of union does not influence how the respondent evaluates the importance of intra-family sex on preventing the infection, neither it looks like that among these more than 2000 respondents the AIDS positive women are more often chosen into polygamous unions, as it was presented in the theory.

2) Indirectly

This approach is assuming the positive dependency between infidelity and chance of getting AIDS, which is intuitively correct, but the data do not give us an empirical approbation (too low number of respondents who said that they have AIDS).

Moreover, we must take into account the problems which were mentioned about underestimation of infidelity – particularly the questions of AIDS and infidelity are very sensitive and respondents have understandable reasons to keep their status as a secret in the face of interviewers, which is however not justified when in the face of husband and/or wife: not only that infidelity itself increases the chance of getting AIDS, but not telling husband about it makes it even worse (it was already discussed in the theoretical part).

Table 41

Think H unfaithful	Monogamous	Polygamous
Yes, know	142(14%)	112(27%)
Suspect	66(7%)	45(11%)
Can't know	200(20%)	76(18%)
Probably not	517(52%)	159(39%)
Don't know	66(7%)	20(5%)
Pearson independence test	P-v.=0.000***	
Cramér's V	0.18	
Malawi women – Polygamy infidelity and AIDS		

What the wives think about husband being or not being unfaithful should not be that underestimated, but relatively more accurate (under the assumption that husbands are not always telling the truth).

27% of poly-wives know husband having been unfaithful (with a women outside the union), against 14% of mono-wives.

The data do not allow us to find out anything about the ecological correlation, but the individual-level correlation there probably is, which is derived from the statistical fact, that polygamous husbands want even more sexual partners in addition to their wives.

Let's compare what wives think about husbands with husbands' own responses:

Table 42

Unfaithful	Monogamous	Polygamous
Yes	144(18%)	14(11%)
Fisher's independence test	P-v.=0.094*	
Goodman and Kruskal's gamma	-0.26	
Cramér's V	-0.06	
Malawi men – Polygamy infidelity and AIDS		

While monogamist's responses are more or less in accord with what the wives think, polygamists are certainly underestimating their infidelity – just the number of those, who their wives know to be unfaithful, is higher than what the husbands are confessing. This is a signal for us that we shouldn't give this table much attention.

In Kenya:

Table 43		
Think H. Unfaithful	Monogamous	Polygamous
Yes	76(13%)	65(18%)
Suspect	87(15%)	50(14%)
Can't know	142(25%)	93(26%)
Probably not	261(46%)	147(41%)
Fisher's independence test		0.19
Cramér's V		0.07
Kenya women – Polygamy infidelity and AIDS		

The confessions of infidelity are not available from Kenya (they probably wouldn't be of much cost anyway), but the wives' opinions about husbands we have above.

The polygamists are again more unfaithful, but not that much as in Malawi.

Now we shall look at women's confessions in Malawi and opinions of men in Malawi and Kenya:

Table 44		
Unfaithful	Monogamous	Polygamous
Yes	16(2%)	8(2%)
Fisher's independence test		P-v.=0.655
Goodman and Kruskal's gamma		0.09
Cramér's V		0.01
Malawi women – Polygamy infidelity and AIDS		

Table 45		
Wife Unfaithful	Monogamous	Polygamous
Yes, know	15(2%)	5(4%)
Suspect	16(2%)	5(4%)
Can't know	84(10%)	16(13%)
Probably not	652(80%)	93(74%)
Don't know	49(6%)	7(5%)
Fisher's independence test		0.20
Cramér's V		0.08
Malawi men – Polygamy infidelity and AIDS		

Table 46		
Wife Unfaithful	Monogamous	Polygamous
Yes	14(3%)	8(4%)
Suspect	15(3%)	10(5%)
Can't know	115(24%)	68(31%)
Probably not	327(70%)	130(60%)
Fisher's independence test		0.11
Cramér's V		0.09
Kenya men – Polygamy infidelity and AIDS		

The figures like 2%, 3% etc. speak clearly: Wives, according to both themselves and their husbands, are almost always faithful. However, we don't have an information about men's and women's recognizing ability that his or her partner has been unfaithful.

Assuming that the recognizing ability is quite the same for both, the polygamous unions are more AIDS-risky only because of men, as far as infidelity is concerned. Of course, there is also the factor, mentioned in theor. backgr., of selection of women whose husband died into polygamous unions (is not empirically confirmed by our results, but in the paper by Reniers and Tfamily it was).

Hence, combining these results with what was found in Questions 1 & 2, the families having the best outlook are probably those with a polygamous and faithful husband who has undivorced and faithful wives, where the husband being faithful is probably the hardest thing that has to be achieved. Such families will be healthy and have lots of children.

- Summary -

Since there are the problems of the data, such as for example overestimated wealth and underestimated infidelity, the results must be perceived with some uncertainty.

I found that education of the respondent is not a significant determining factor of polygamy, and if it is, then for men the dependency is probably negative (in the sense of negative correlation).

The dependence between polygamy and wealth is quite high positive for men and households, while there is probably no relationship for women in Kenya and none in Malawi as well. There is only one empirical evidence for that the relationship for Malawi women is positive.

Then I found that polygamous men are more likely to be self-employed.

What is questionable is whether the polygamy is due to wealth, or if the wealth is due to polygamy (because women and children are working).

Concerning cultural effects, polygamists relatively more often speak Chichewa and/or Basuba, while usually don't speak Senga/Yao.

Then, the ratio of polygamists is higher among Moslems than among Christians.

For the men's motivation of having more wives I found that polygamous men are wanting much more children. For women, this does not hold.

Lastly, I found that polygamous unions mean higher risk of infection because of polygamous husband being more often unfaithful than the monogamous. Therefore, combining this with what was found about wealth, the families having the best outlook are probably those with a polygamous and faithful husband who has undivorced and faithful wives, where the husband being faithful is probably the hardest thing that has to be achieved. Such families will be wealthy and have lots of children.

ACRONYMS

- ◆ AIDS – *Acquired Immune Deficiency Syndrome*
- ◆ UNDP – *United Nations Development Programme*
- ◆ MDICP – *Malawi Diffusion and Ideational Change Project*
- ◆ KDICP – *Kenya Diffusion and Ideational Change Project*
- ◆ SSA – *Sub-Saharan Africa*

SOURCES

Note:

some sources, such as the Choices video, which are not of a widely respected institution, or they are not scientific papers, are not treated as facts, but only as an inspiration for me, as the author of this work, or for better explanation of some problem (they are marked with the star*).

Linkages have the form : *Author (Institution): Name, Year of publication, URL, The date when the document was downloaded from the URL*, if everything available.

- The Economist: Food for thought, 2004
- (World Bank, 2008).
- (UNDP, 2009).
- Malawi, Epidemiological Country Profile on HIV and AIDS,
http://apps.who.int/globalatlas/predefinedReports/EFS2008/short/EFSCountryProfiles2008_MW.pdf , 22.2.2010
- Social Institutions and Gender Index (SIGI): gender equality and social institutions in Malawi,
<http://genderindex.org/country/malawi> , 22.2.2010
- Kenya, Epidemiological Country Profile on HIV and AIDS,
http://apps.who.int/globalatlas/predefinedReports/EFS2008/short/EFSCountryProfiles2008_KE.pdf , 22.2.2010

- Social Institutions and Gender Index (SIGI): gender equality and social institutions in Kenya,
<http://genderindex.org/country/kenya> , 22.2.2010
- *Nedvěd, Radek (Lidové noviny): „Svět Afriku nespasí, musí se spasit sama“ ,
27.8.2005*
- National Statistical Office of Malawi: Malawi integrated household survey 2004-2005,
http://www.nso.malawi.net/data_on_line/economics/ihs/IHS2/IHS2_Report.pdf ,
25.2.2010
- Central Intelligence Agency – The World Factbook: Kenya ,
<https://www.cia.gov/library/publications/the-world-factbook/geos/ke.html> , 25.2.2010
- Central Intelligence Agency – The World Factbook: Malawi ,
<https://www.cia.gov/library/publications/the-world-factbook/geos/mi.html> , 25.2.2010
- Population Studies Center of the University of Pennsylvania: Social Networks Project, KDICP and MDICP, 1994-2010, <http://www.malawi.pop.upenn.edu/> , 27.2.2010,
„From this website it is possible to access the quantitative and qualitative data collected by each project; to access information about the relevant principal investigators and other affiliated parties; and to download papers and related documentation produced as part of the projects.“
- Stover, John; Bollinger, Lori (The POLICY Project): The Economic Impact of AIDS, 1999, http://pdf.dec.org/pdf_docs/Pnacm899.pdf , 27.2.2010
- Hozík, Tomáš (IES FSV UK): Impact of HIV/AIDS on human capital accumulation in Sub-Saharan Africa, 2008,
<http://ies.fsv.cuni.cz/default/file/download/id/8805>, 27.2.2010

- Swidler, Ann; Watkins, Susan Cotts (California Center for Population Research): Ties of Dependence: AIDS and Transactional Sex in Rural Malawi, 2006,
<http://escholarship.org/uc/item/7t14c4h0> , 27.2.2010
- U.S. Census Bureau, International Data Base: Kenya population pyramid, 2008,
http://www.us-passport-service-guide.com/imagefiles/kenya_population_pyramid_2008.png , 27.2.2010
- *Choices Video (Leitner Center for International Law and Justice ,
www.choicesvideo.net), The Female Face of Aids: Crisis in Malawi Video, 2007,
<http://www.youtube.com/watch?v=2vO3Hcg743I> , 28.2.2010*
- United Nations Secretariat: World Urbanization Prospects: The 2003 Revision, Data Tables and Highlights,
http://www.nationmaster.com/graph/peo_per_liv_in_urb_are-people-percentage-living-urban-areas , 28.2.2010
- CRAFTS, NICHOLAS; HAACKER, MARKUS (International Monetary Fund): The macroeconomics of HIV/AIDS, chapter 6, 2004,
<http://www.imf.org/external/pubs/ft/AIDS/eng/chapter6.pdf> , 28.2.2010
- Bauer, Michal; Chytilová, Julie (Institute of Economic Studies, Charles University of Prague): *Opomíjená heterogenita lidí aneb Proč Afrika dlouhodobě neroste* (*Neglected heterogeneity of people or Why is Africa not growing in the long-term*) , 2006
- Duncan, C.J.; Scott; Duncan, S.R. (Correspondence to: Professor C J Duncan School of Biological Sciences, University of Liverpool): Reappraisal of the historical selective pressures for the CCR5-D32 mutation., 2005,
<http://jmg.bmj.com/content/42/3/205.abstract> , 28.2.2010

- Reniers, Georges; Tfaily, Rania (Demographic Research Journal, Volume 19): Polygyny and HIV in Malawi, 2008
- Timaeus, Ian M.; Reynar, Angela (Population Studies Journal, Volume 52): Polygynists and Their Wives in Sub-Saharan Africa: An Analysis of Five Demographic and Health Surveys , 1998
- Simona Bignami-Van Assche,Ari Van Assche (Annual Meeting of the Population Association of America, March 30, 2007): Poverty as a risk factor for HIV/AIDS: Evidence from a panel study in rural Malawi (extended abstract), 2007
- Susan C. Watkins, Eliya M. Zulu, Hans-Peter Kohler, Jere R. Behrman(Demographic Research Journal, Special Collection 1): Introduction to: Social Interactions and HIV/AIDS in Rural Africa, 2003,
<http://www.demographic-research.org/special/1/1/S1-1.pdf>, 24.4.2010
- *African Holocaust: POLYGAMY (Polygyny) IN AFRICA
http://www.africanholocaust.net/news_ah/africanmarriageritual.html, 3.5.2010*
- UCLA: Academic Technology Services, Statistical Consulting Group. :Stata Data Analysis Examples, Probit Regression ,
<http://www.ats.ucla.edu/stat/stata/dae/probit.htm> , 17.5.2010

THESIS



Akademický rok 2008/2009

TEZE BAKALÁŘSKÉ PRÁCE

Student:	Jiří Pokorný
Obor:	Ekonomie
Konzultant:	PhDr. Julie Chytilová PhD.

Garant studijního programu Vám dle zákona č. 111/1998 Sb. o vysokých školách a Studijního a zkušebního řádu UK v Praze určuje následující bakalářskou práci

Předpokládaný název BP:

Infidelity, polygamy and AIDS

Charakteristika tématu, současný stav poznání, případné zvláštní metody zpracování tématu:

Témata nevěry, mnohoženství a AIDS spolu úzce souvisí. Týkají se přímo či nepřímo každého člověka a netřeba je nějak více charakterizovat. Pohled na ně se v různých kulturách liší, přičemž tato práce se zaměří na africké rozvojové země, kde jsou tato témata obzvlášť významná a kde mají přímý vliv na ekonomiku dané země. Ze zdrojů dat je možné pomocí statistických metod získat odpovědi na vybrané otázky ohledně zvoleného tématu, což bude hlavním cílem práce. Zdroji dat se myslí především výpovědi jednotlivců a fakta o prostředí, kde žijí, z čehož lze vyvodit obecné závěry o vztazích mezi AIDS, nevěrou, mnohoženstvím a charakteristikou lidí a prostředí, ve kterém žijí. Příkladnou otázkou je třeba to, jestli s mnohoženstvím roste riziko nákazy AIDS, nebo zda je tomu naopak, případně proč a za jakých dalších podmínek. Odpovědi na vybrané otázky by měly vysvětlit některé nejasnosti ohledně chování lidí v afrických zemích a pomoci k pochopení lidského chování v oblasti mezilidských vztahů, rodiny a AIDS.

Struktura BP:

Struktura B.P. bude přibližně následující:

- 1) Motivace, úvod k vybraným otázkám.
- 2) Shrnutí a srovnání dosavadních poznatků na dané téma.
- 3) Charakteristika dat, se kterými se bude pracovat, a metodologické poznámky.
- 4) Zpracování dat.
- 5) Analýza a vyhodnocení výsledků, komentáře k výsledkům.
- 6) Srovnání s výsledky jiných prací a s odbornou literaturou.
- 7) Shrnutí nejzajímavějších poznatků a závěr.

Seznam základních pramenů a odborné literatury:

- ◦ UNAIDS. 1999. Sexual Behavioral Change for HIV: Where Have Theories Taken Us? Geneva: United Nations.
- ◦ Kohler, Hans-Peter, Jere R. Behrman, and Susan Cotts Watkins. 2007. "Social Networks and HIV/AIDS Risk Perceptions." *Demography* 44(1):1-33.
- ◦ Fertility and social interaction: an economic perspective / Hans-Peter Kohler. - 1st ed.
- ◦ Swidler, Ann and Susan C. Watkins. 2006. "Ties of Dependence: AIDS and Transactional Sex in Rural Malawi." Working Paper.
- ◦ Clark, Shelley. 2003. "Suspicion, Infidelity and HIV among Married Couples in Malawi."
- ◦ Kaler, Amy. 2003. "My Girlfriends Could Fill A Yanu-Yanu Bus': Rural Malawian Men's Claims About Their Own Serostatus," *Demographic Research* S1(11): 349-372.
- ◦ Kaler, Amy. 2001. "'Many Divorces and Many Spinsters': Perceptions of Marriage as a Degenerate Institution in Southern Malawi in the 1940s and 1990s,"
- ◦ Reniers, Georges. 2003. "Divorce and Remarriage in Rural Malawi," *Demographic Research* S1(6): 175-206.
- ◦ <http://www.malawi.pop.upenn.edu/Level%202/level2.html>
- ◦ Welfare implications of HIV/AIDS, Crafts, Nicholas F. R., Haacker, Markus, Washington, DC [US] : International Monetary Fund, 2003
- ◦ The Africa multi-country AIDS program 2000-2006: results of the World Bank's response to a development crisis / Marelize Gorgens-Albino ... [et al.], Gorgens-Albino, Marelize, Washington, DC [US] : International Bank for Reconstruction and Development/The World Bank, 2007
- ◦ The macroeconomics of HIV/AIDS / edited by Markus Haacker, Washington, DC [US] : International Monetary Fund, 2004
- ◦ An assessment of the impact of HIV/AIDS on economic growth: the case of Kenya, Were, Maureen
- Nafula, Nancy N., Munich, DE : Institute for Economic Research, 2003
- ◦ Education and HIV/AIDS: a window of hope, Washington, DC [US] : International Bank for Reconstruction and Development/The World Bank, 2002

Datum zadání:	
Termín odevzdání:	

Podpisy konzultanta a studenta:

V Praze dne

Contents

Univerzita Karlova v Praze.....	1
Institut ekonomických studií.....	1
Bakalářská práce.....	1
Abstract.....	5
Introduction.....	6
- Field of interest -.....	6
- Structure of the paper -.....	8
- Geography -.....	9
- Malawi -.....	10
- Kenya -.....	11
AIDS and polygamy - theoretical background.....	12
- Why looking into Africa? -.....	12
How is Africa different?.....	12
- AIDS -.....	13
Why repeating the theory again?.....	13
micro level.....	14
Macro level.....	15
Quantitative evidence.....	17
Historical perspective.....	18
- Polygamy -.....	19
What is it?.....	19
Direct economic effect?.....	19
Motivation?.....	20
- Connection between AIDS and polygamy -.....	21
Analysis of the data.....	25
- About the data -.....	25
MDICP.....	25
KDICP.....	26
Problems of the data.....	26
- Results of the analysis -.....	28
Question 1 - What are the characteristics of polygamous men (education, wealth, etc.), what is their motivation to have more wives?.....	28
Question 2 - What are the characteristics of women who live in polygamous marriage (education, position in the family, number of children, etc.)?.....	33
Regressions for Q1 & Q2.....	41
Malawi data.....	41
Kenya data.....	46
Question 3 - What is the relationship between polygamy – AIDS? Are the people in polygamous marriages less likely to be infected (because they have stable partners and are more faithful)?.....	47
- Summary -.....	52
Acronyms.....	53
Sources.....	54
Thesis.....	58
Attachments - „Table of tables“ and Simplified list of sources in alphabetical order.	

„Table of tables“ for better orientation

No.	Subject of the table	Dataset	Cramér's V	Page
1	Rate of polygamy	All		28
2	Been to school x polygamy	Malawi men	-0.04	29
3	Attended school x polygamy	Kenya men	-0.10	29
4	Has plough x polygamy	Kenya men	0.20	30
5	Has lantern x polygamy	Kenya men	0.16	30
6	Has fishing net x polygamy	Kenya men	0.16	30
7	Has boat x polygamy	Kenya men	0.14	30
8	Wealth and polygamy	Malawi men		31
9	Speaks Chichewa x polygamy	Malawi men	0.11	31
10	Speaks Senga x polygamy	Malawi men	-0.09	31
11	Religion x polygamy	Malawi men	0.22	32
12	Religion x polygamy	Kenya men	0.05	33
13	Attended school x polygamy	K. & M. women	-0.09/0.06	33
14	Has metal roof x polygamy	Kenya women	0.11	34
15	Has plough x polygamy	Kenya women	0.15	34
16	Owens no land x polygamy	Malawi women		34
17	Been to Mzuzu x polygamy	Malawi women	0.13	34
18	# children given birth to x polygamy	Malawi women	0.19	35
19	Desired # children x polygamy	Malawi men	0.34	36
20	Desired # children x polygamy	Malawi women	0.12	36
21	# children alive x polygamy	Malawi women	0.14	36
22	# children given birth to x polygamy	Malawi women	0.19	36
23	Using family planning x polygamy	Malawi women	0.00	37
24	Ideal # of children x polygamy	Kenya men	0.57	38
25	# of own children x polygamy	Kenya men	0.42	38
26	Means of des., born, act. # of children	Malawi all		38
27	Means of des., born, act. # of children	Kenya all		38
28	Speaks Basuba x polygamy	Kenya women	0.10	40
29	Speaks Senga x polygamy	Malawi women	-0.10	40
30	Religion x polygamy	Malawi women	0.20	40
31	Religion x polygamy	Kenya women	0.10	41
32	Regression – prob. of poly-household	Malawi men		41
33	Regression – prob. of poly-household	Malawi all		42
34	Regression – prob. of poly-household	Malawi men		44
35	Regression – prob. of poly-household	Malawi women		45
36	Regression – prob. of poly-household	Kenya all		46
37	AIDS chance x polygamy	Malawi men	0.06	47
38	AIDS chance x polygamy	Malawi women	0.07	47
39	AIDS chance x polygamy	Malawi men	0.01	48
40	AIDS chance x polygamy	Malawi women	0.00	48
41	Think husband unfaithful x polygamy	Malawi women	0.18	49
42	Unfaithful x polygamy	Malawi men	-0.06	49
43	Think husband unfaithful x polygamy	Kenya women	0.07	50
44	Unfaithful x polygamy	Malawi women	0.01	50
45	Wife unfaithful	Malawi men	0.08	50
46	Wife unfaithful	Kenya men	0.09	50

Simplified list of sources in alphabetical order

	Page
African Holocaust: POLYGAMY (Polygyny) IN AFRICA	20
¹ Anglewicz; Bignami, ... : The Socioeconomic Impact of AIDS	15
Bauer, Michal; Chytilová, Julie: Neglected heterogeneity of people or Why is Africa not growing in the long-term	18
Central Intelligence Agency – The World Factbook: Kenya	12
Central Intelligence Agency – The World Factbook: Malawi	12
Choices Video, The Female Face of Aids: Crisis in Malawi Video	14
CRAFTS, NICHOLAS; HAACKER, MARKUS: The macroeconomics of HIV/AIDS	17
Duncan, C.J.; Scott; Duncan, S.R.: Reappraisal of the historical selective pressures for the CCR5-D32 mutation	18
Hozík, Tomáš: Impact of HIV/AIDS on human capital accumulation in Sub-Saharan Africa	16
Kenya, Epidemiological Country Profile on HIV and AIDS	11
Malawi, Epidemiological Country profile on HIV/AIDS	10
National Statistical Office of Malawi: Malawi integrated household survey 2004-2005	16
Nedvěd, Radek: „Svět Afriku nespasí, musí se spasit sama“	
Population Studies Center of the University of Pennsylvania: Social Networks Project, KDICP and MDICP	
Reniers, Georges; Třaily, Rania: Polygyny and HIV in Malawi	21,22
Social Institutions and Gender Index (SIGI): GENDER EQUALITY AND SOCIAL INSTITUTIONS IN Kenya	11
Social Institutions and Gender Index (SIGI): GENDER EQUALITY AND SOCIAL INSTITUTIONS IN Malawi	10
Stover, John; Bollinger, Lori: The Economic Impact of AIDS	14,15
Swidler, Ann; Watkins, Susan Cotts: Ties of Dependence: AIDS and Transactional Sex in Rural Malawi	19
The Economist: Food for thought	10
Timaeus, Ian M.; Reynar, Angela: Polygynists and Their Wives in Sub-Saharan Africa	22
UCLA: Academic Technology Services, Statistical Consulting Group.:Stata Data Analysis Examples, Probit Regr.	
UNAIDS/WHO	10,11
UNDP	10,11
United Nations Secretariat: World Urbanization Prospects: The 2003 Revision, Data Tables and Highlights	14
U.S. Census Bureau, International Data Base: Kenya population pyramid	16
Van Assche, Van Assche:Poverty as a risk factor for HIV/AIDS: Evidence from a panel study in rural Malawi	25
Watkins, Zulu, Kohler, Behrman: Introduction to: Social Interactions and HIV/AIDS in Rural Africa	25,26
World Bank	10,11
¹ Omitted in „Sources“	