

CHAPTER 6

DISCUSSION, CONCLUSION, LIMITATION AND RECOMMENDATION

6.1. Discussions

Discussion has been developed regarding each dependent variable. Regression analysis on maternal mortality discussed alone due to its non significance.

6.1.1. Livestock per capita (LS)

The positive sign of the livestock variable in the crude birth rate is a not surprising. The arguments are:

- Since 1990 the crude birth rate has declined in Mongolia. It is partly explained by the economic hardships. As mentioned in chapter one the macroeconomic adjustments of transition have been paralleled by harder adjustments within many households. Liberalization, stabilization and privatization of the economy have created new gaps through which some households have fallen, at the same time when the old system of safety nets was withdrawn or undermined. As a result of these difficulties for most Mongolians, transition meant loss of employment and/or erosion of real income. Therefore, in that society small families are apparently preferred because of the costs of children.
- Decrease in crude birth rate can be partly explained by implementation of family planning policy. Due to implementation of family planning programme since 1980s, couples are able to manage number of children.

The government target for GDP growth is 3.5 per cent in 1997, and 5 per cent in 1998. If we assume that the proxy of GDP has the same growth at the province level, the health indicators would be changed as in the following table (Table 5.11.) when all else remains constant.

Table 6.1. Changes in health indicators according to the government target

	1997	1998
Life expectancy	0.31	0.45
Infant mortality rate	-3.6	-5.1
Underfive mortality rate	-0.035	-0.05
Crude birth rate	0.07	0.1
Crude death rate	-0.11	-0.15

6.1.2. Poverty (POV)

In the IMR and crude death rate regressions (equation 4.8; 4.12 and table 5.2; 5.6) the coefficients have the opposite sign and are also statistically not significant in both their current and one year lagged values. The correlation coefficients between the explanatory variables are not more than 0.35. Therefore, there is no problem of multicollinearity. May be poverty does not have direct impact on the IMR in the quite short run. The arguments are:

- Despite economic difficulties, the infant mortality rate has declined over the 1990s. Such a strong decline is due to high immunization coverage, and wide spread use of oral rehydration therapy for one of the cause of infant mortality (diarrhea) since the 1980s. (According to the Ministry of Health and Social Welfare data immunization coverage in 1996 was: 90.2% for BCG; 90.0% for DPT3; 90.0% for OPV3; 88% for measles; 92.8% for hepatitis B). Therefore, may be we should include more lagged values in order to estimate long run effect.
- Decline in fertility rate leads to decrease in infant mortality. As a result of economic difficulties and also successful implementation of family planning policy, the fertility and birth rates are declining over the last years. Therefore, infant mortality rate of “wanted” children should be lower than “unwanted” children.
- People are still reaping the benefits of good health and health care in the early stages of their life before the transition period. As a result of this, the crude death rate still remains at the same level as in the 1980s. Thus, poverty might have a more lagged effect on the crude birth rate.
- Finally, may be we need a variable which can reflect inequality in the income distribution.(If we compare figures 3.5 and 3.7 in chapter 3 , we can see that the provinces with more livestock per capita have high poverty.) This concept is mentioned by a number of researchers. For instance, Ravallion (1996) stated that persistently high inequality inhibits longer term progress in fighting poverty – when inequality is high, the gains to the poor from a given rate of growth will be lower, and there is some evidence that the expected rate of growth will also be lower.

6.1.3. Education (EDUC)

The results of the IMR and U5MR regressions imply that decreasing trend of basic education level does not have immediate impact on health in the short run.

The crude death rate still remained at the same level during the transition period in comparison with the 1980s due to its continuing benefit. Therefore, decrease in the basic education level does not result increase in crude death rate in the short run. The negative sign of the crude death rate regression /opposite of the expected sign/ can be explained this above mentioned reason. Also, may be more lagged values should be included in the model in order to estimate its long run effect.

The result of the crude birth rate regression shows that the crude birth rate increases by 0.21 for every 1 per cent decrease in basic education level. May be it is true, because the

educational system is directed toward fitting people into urban society. Higher educated people prefer to live in urban areas and tend to have fewer children. (For instance, in Mongolia, 25% per cent of the population live in the capital city. One more example is that school drop outs is higher in rural areas than the urban areas.). Therefore, may be as people's education level and urbanization increase their fertility decline.

6.1.4. Government expenditure on health (EXPEND)

This variable has the expected sign in the IMR and CBR regressions, but statistically are not significant.

Life expectancy and MMR regression's coefficients do not have expected sign, but also statistically not different from zero.

These results show that our hypothesis regarding the government expenditure on health is not valid. There are several possible reasons:

- Total government expenditure contains current and capital and also curative and preventive expenditures. All of this expenditure can not reflect the amount spent for equitable basic health services.
- Not only government expenditure but also expenditures on health related services such as sanitation, water supply influence health. Therefore, these expenditures should be taken together. May be we need to test another models with more lagged value.
- People are still reaping the benefits of good health and health care in the early stages of their life before the transition period. As a result of this, health status still remains at the same level as in the 1980s when per capita health expenditure declined sharply. Also health related inputs such as water supply, sanitation, vaccination and medical equipment have a long-term effect against adverse effects of economic downturn.
- May be private health expenditure is increased while government health expenditure decline. But our study have not include this variable due to non-availability of data.

6.1.5. Results of maternal mortality regression

The MMR regression (equation 4.10 and table 5.4.) is discussed separately, below. Because, it is not statistically significant. We can not blame multicollinearity between number of livestock and public health expenditure; between number of livestock and poverty for this result, as the correlation coefficients are 0.32 and 0.30 respectively. There are can be several doubts regarding the validity of the explanatory variables in the model.

- Number of livestock can be negatively related to the maternal mortality. It means that as number of livestock head increase, the maternal mortality might decrease all else being equal. Maternal mortality rates in rural areas twice as high as in urban areas. It partly can be explained by the overwork of the rural women during

pregnancy. In herdsmen households women have the main responsibility to milk the animals and to produce milk products. Therefore, as the number of livestock increase they are more busy and do not have time even to go to the medical facility. Also closing of maternity homes necessitates rural women to stay at home until delivery.

An indirect effect of the economic transition on maternal health is diminished quality of medical care. According to the MOHSW survey 86 per cent of those who died were high-risk mothers who had not been managed appropriately. It is clear if we look at the predominant causes of maternal death. (postpartum hemorrhage – 32%, toxemia-21%, medical complications-21%, sepsis-16%, rupture of uterus-10%) But government expenditure on health variables can not reflect the change in quality of care which is caused by reduced expenditure. Also it does not reflect the government expenditure that is spent on basic health services. Thus, total government expenditure may not be a valid indicator. One of the main reason of reduced accessibility of available medical care and delayed transportation of rural women to referral level health facility is a shortage of fuel and vehicles. As a result of this, rural women can not receive a medical care in time. It means that maternal mortality rates is highly sensitive indicator for health system performance, reflecting quality of outreach and ambulatory antenatal care as well as first referral and secondary care capacity.

Overall vulnerability and risk of rural women due to marginal literacy and poverty (According to the MOHSW data 50% and 74% respectively, of the 51 rural women whose deaths were investigated.)

6.1.6. The effect of health status on economic growth

The coefficients associated with infant mortality has negative sign and is statistically significant at the 10 per cent level. If we compare the sign of the coefficient with the trend of infant mortality, this result does not indicate the statistical relationship between per capita livestock head and infant mortality. It means that infant mortality does not have direct impact on the economic growth in the short run. Also, infant mortality indicator includes both neonatal and post-natal deaths. Neonatal deaths (within 28 days of birth) are usually related to the congenital anomalies, prematurity, and complications of delivery. Post-natal deaths (after 28 days, but within one year) are frequently result of infectious diseases or accidents. Therefore, it is may not valid indicator..

The results of the determinants maternal mortality, underfive mortality and death rate show that these indicators do not have relationship with the economic growth in the short run. Also, for instance, crude death rate indicator is not age and sex specific, and all of these indicators do not reflect economic burden of diseases.

6.2. Conclusion

This study has presented the interrelationship between economic indicators and health status using multiple regression analysis at the province level in the case of Mongolia. For over six decades, from its independence to the late 1980s, Mongolia followed the Soviet model of centrally planned command economy. After political reforms in early 1990, an elected coalition government embarked on a program of economic transformation from a socialist to a market economy. Since this period, Mongolia has faced severe economic difficulties. Compounding these economic hardships, the governments actual expenditures for health, education and social services have been cut back severely over the past 7 years. The system of safety nets has deteriorated. Most of the health indicators declined dramatically during this period. But how do these economic hardships affect on health? What is happening in trends of health status? These are questions that we tried to answer. Exploring and understanding these determinants is crucial for further policy making and economic development.

In order to investigate the interaction between economic indicators and health status, we developed a model including 4 explanatory variables such as economic growth, poverty incidence, education and government expenditure on health. Livestock head per capita has been used as a proxy of GDP per capita. Education is represented by percentage of 8-years secondary school graduates in the total population. Life expectancy, infant, underfive and maternal mortality rates, crude birth and death rates are selected as health status indicators according to the data availability. Also, we developed a model which has included all health indicators as an explanatory variables in order to determine the effect of health status on economic growth.

Loglinear specification of multiple regression analysis was chosen as an analytical tool. Also one year lagged value of dependent and independent variables have been included in the model in order to estimate the long run elasticity of and adjustment rates. Time series data between 1991-1996 at the province level have pooled. The total number of observation was 132. The results of regression analysis have shown that our model can be accepted.

In the all regression models, the coefficients associated with livestock per capita had the expected sign and statistically significant at the 1 per cent level except the maternal mortality regression. These results indicate that the overall level of economic resources remains important for the determination of health status. Our conclusion from this result is that the overall economic decline does not have an immediate impact on health status.

The regression results show that education has a significant impact on health status. The current value of coefficients associated with education implies that its effect on health status was negative. When the lagged values are taken into account the signs are changed into positive and net impacts are positive. Thus, our conclusion is health status deteriorates in the long run due to decline in basic education level.

Our study finding evidenced that as educational level increases, the health status of the population will improve in response to the change in lifestyle. Change in life style requires a quite long time, therefore health status deteriorates slowly than economic and basic educational level decline.

In Mongolia poverty has increased during the transition period, both in numbers of people and in the proportion of the total population, Therefore, we expected that its impact on health status would be negative. But this was supported only in the regressions of life expectancy and underfive mortality. It suggests that poverty does not have direct impact on the health status such as infant and maternal mortality, crude birth and death rates in the short run . May be more lagged values are needed. If data is available, we can use the model including an inequality indicator such as Gini coefficient in order to reflect impact of poverty.

We did not obtain however, the result that total government expenditure on health has a statistical significant impact on health status. It suggests that the total government expenditure on health is not an appropriate variable, because, it does not reflect the expenditures that have direct impact on health services such as recurrent expenditure.

Looking at the results according to the dependent variables:

1. From the life expectancy regression we concluded that per capita livestock head, poverty and education have significant impact on life expectancy.
2. Infant mortality is associated with per capita livestock head and education.
3. In the USMR regression all explanatory variables particularly government expenditure on health and poverty have strong impact.
4. Also all explanatory variables except public health expenditure have significant influence on crude birth rate.
5. In the crude death rate regression, it depends on the per capita livestock head, education and public expenditure on health.
6. MMR regression is not significant. Its R^2 is very small and F-statistic is not statistically different from zero. Increase in maternal mortality during the transition period might be more related to the shortage of drugs and diminished quality of care.

From these results we can say that underfive mortality rate is the most sensitive indicator of health status for the economic transition changes.

These results are supported by the findings from the regression on the economic growth (per capita livestock head). Underfive mortality, life expectancy and crude birth rates have effect on the with per capita livestock head variable at the statistically significant level.

In summary, our conclusions regarding the independent variables are:

1. Overall economic decline does not have an immediate impact on health status.
2. Health status deteriorates in the long run due to decline in basic education level.

3. Poverty does not have direct impact on the most health indicators such as infant and maternal mortality, crude birth and death rates in the short run. However, we should include the variable which can reflect inequality in order to determine impact of poverty.
4. Total government expenditure on health is not an appropriate variable, because, it does not reflect the expenditures that have direct impact on health services such as recurrent expenditure.

Finally, among the most important findings from this study is the support for the concept that economic growth and education are very important in the determination of health status indicators. However, economic downturns do not necessarily cause in immediate reduction in health status achieved, because human lifestyle due to achievements in education and also other health related inputs such as water supply, sanitation, vaccination and medical equipment have a long-term effect against adverse effects of economic hardships. Therefore, the interaction between health indicators and economic development is not instantaneous and quite complex as well.

6.3. Limitations of the study

Non-availability of data was main limitation of this study. Number of livestock per capita used as a proxy of GDP per capita, may be it is not good indicator at the province level, because in some provinces livestock is not main source of income. Also, number of eight-years secondary school graduates calculated as a percentage of total population. Therefore, it can creates difficulties for the reliability of regression analysis result.

However, we can improve this study further by utilizing larger data set and modifying explanatory variables. For instance, we can interested to see whether similar econometric results are obtained when government's commitment to health measured differently. Also, we can measure poverty by using inequality indicator such as Gini coefficient. For the education variable, gross-enrollment rate, enrollment and completion rates are more reliable indicators.

6.4. Recommendation

Purpose of this section is to help policy makers at the provincial level improve the health status of population during the economic transition period.

According to our conclusion, policies at the provincial level should be directed to keep the continuity of benefits under the pre-transition period by maintaining basic education level achieved, supporting disadvantaged groups, and improving quality of health care at the given input level. However, our policy recommendation is limited as a result of non-availability of data. If we have data such as GDP per capita at the province level, income and poverty distribution within the provinces, and secondary school completion rate, our recommendation will be more reliable.

Policy recommendations:

- Allocate resources to provide school children with accommodation from rural herdsmen households in order to decrease school dropouts.
- Mobilize local resources and motivate community participation and NGOs in order to focus on disadvantaged groups and provide their children with accommodation and food during the schooling period.
- Reconstruction of maternity homes at the sum level in order to improve accessibility of pregnant women to medical care.
- Allocate resources for strengthening of health staff performance through regular further education, better equipment, transport, communication and payment.
- Allocate more resources on preventive health care such as immunization and antinatal care, health education programs rather than curative services, because improving preventive services for women and their babies is an effective way to improve overall health and avoid unnecessary medical expenditure.
- Enhance health education programme, because it is essential to reduce risk factors that affect on healthy lifestyle negatively. Main policies to reduce these risk factors at the provincial level is public education programs to inform population about diet specially, the benefits of reduced consumption of alcohol, and of increased consumption of fruit and vegetables, exercise and the risk of smoking and other dangerous behavior. Legislation on tobacco, alcohol and unhealthy food advertising and selling in the local area in order to reduce these risk factors.