

Macroeconomics and Health: An International Analysis of Government Health Expenditure and Health Outcomes

Emee Vida Estacio & David F Marks

Department of Psychology
City University, London

Abstract. Research on health inequalities, both between and within countries, shows strong pervasive gradients in many indicators of health. These have been related with a variety of factors, ranging from age, sex, and genetics to socio-economic variables such as income, culture and social structures. However, very little research has tackled its macroeconomic aspect - a very relevant sphere since it has the potential to influence many if not all other determinants of health. Neo-liberal economic policies claim that growth can be maximized if the market is allowed to act freely. However, its implications on social inequality, ill-health and quality of life are still debatable. This study aims to investigate the impact of neo-liberal economic policies on health outcomes. It focuses on its emphasis in reducing government expenditure, particularly on health care. The path analysis shows no direct relationship between public health expenditure and health outcomes. However, strong mediating relationships, particularly through increased wealth have been found. It is therefore recommended that governments invest more on health care as it is a key factor in both social and economic development.

Every human being has a right to health. The World Health Organisation (1946) defines health as -

‘a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (p.100).’

As suggested by Dahlgren and Whitehead (1991), health is determined by a number of inter-related variables ranging from innate factors (i.e. age, sex and genetics), to social and community influences, living and working conditions, and the general socio-economic and cultural conditions. The fundamental right to health however, is being challenged by the role of *power* – social, economic, and political – on the experience of health. Let us consider the following points:

- In 2004, there were 39.4 million people living with HIV. There are treatments available, but only 700,000 were receiving antiretrovirals (WHO, 2005).
- African countries spend half more on debt repayments than on health care (UNHDR, 2004).
- In 2001, there were 1.1 billion people living in extreme poverty (The World Bank Group, 2004a); a child dies from it every three seconds (Save the Children UK, 2005).

Whatever the socially prescribed rights might be, the quest for health is a struggle for those with less power (i.e. the poor and other marginalized individuals/groups). Research on health inequalities, both between and within countries, shows strong pervasive gradients in many indicators of health including morbidity and mortality:

Between countries

- More than 800 million people are chronically undernourished, killing over 5.2 million children in the developing world (WHO, 2003).
- Every year more than half a million women die from maternal complications. Most of the deaths occur in Asia, but the risk of dying is highest in the least developed countries in Africa. One in every 16 women is at risk, compared with one in 4,100 in industrialized countries (The World Bank Group, 2004b).
- There has been a decline in life expectancy in some parts of Africa in the last 10 years. A child born in Norway between 2000 and 2005 will have an average life expectancy of 78.9, whereas a child born in Sierra Leone can expect to live just 34.3 years (UNHDR, 2004).

Within countries

- In the UK, mortality tends to rise inversely with falling occupational rank for both sexes and all ages (Townsend & Davidson, 1982).
- In the USA, patients in lower socioeconomic status tend to have higher rates of late-stage cancer diagnosis and lower rates of cancer survival (Singh, Miller, & Edwards, 2004).
- In Canada and Australia, educational attainment is positively correlated with self-reported health status (Kennedy, 2003).
- In Goa, India, economic deprivation is a risk factor for the occurrence and chronicity of depression among mothers (Patel, Rodrigues, & DeSouza, 2002).

- In many countries, the poor tend to consume more tobacco and bear most of the tobacco-related economic and disease burden (WHO, 2004).

The voluminous literature on health inequalities provides a good foundation on the role of personal, community and social factors that affect individual and public health. However, very little research tackles its macroeconomic aspect - a very relevant sphere since it has the potential to influence many if not all other determinants of health.

As our world keeps on ‘shrinking’ with rapid globalization, it is essential for research to go beyond the traditional boundaries that separate disciplines and nation states. Current world trade and politics are set on a different playing field – the actors becoming more diverse, the stratification more complex, and the patterns of interaction very complicated (Hocking & Smith, 1995). The traditional notion of sovereignty within the state system is being questioned by the emergence of new centers of power. Policies that dictate international trade, finance, and government spending need to be investigated with a critical eye, using a sound theoretical base and a good methodological approach.

Neo-liberalism and Health

Neo-liberal economic policies claim that growth can be maximized if the market is allowed to act freely. Its goal is to ensure economic stability through deregulation, privatization, and the liberalization of trade. It advocates less government intervention and public spending, particularly on education, health care and social welfare.

These policies have been adopted by many Third World countries in response to the Debt Crisis in the 1980s. These were more commonly known then as ‘structural adjustment programmes’ (SAPs). These are a set of economic reform policies designed by major international financial institutions (IFIs) such as the World Bank and the IMF to ensure sustained economic growth among its debtor countries by boosting foreign investment (through ‘free trade’) and by reducing government deficits (through cuts in spending).

However, the impact of SAPs on social inequality, ill-health and quality of life has raised concerns among social activists. These policies have been linked with environmental degradation, abuse and exploitation, and worsening health outcomes among the poorest of the poor (see Kim, Millen, Irwin, & Gersham, 2000). It has been argued that such policies worsen inequalities in health by taking away the social ‘safety nets’ needed by the most vulnerable members of society. SAPs heavy reliance on market forces and its faith on the ‘trickle down’ effect towards social and economic development remain debatable.

This study aims to investigate the impact of neo-liberal economic policies on health outcomes. It focuses on its emphasis in reducing government expenditure, particularly on health care. It examines both its direct and indirect effects on health through wealth, growth, equality, literacy, and health resource.

Method

Data source. Data were obtained from the United Nations Human Development Report (UNHDR, 2004). It provides statistics on a variety of human development indicators from a collection of international data resources. This year, a total of 193 countries were entered in the database. All countries with available data necessary in this study were included in the analysis. The data extracted were as follows:

- Public expenditure on health as % of GDP (1990)
- Wealth – real GDP per capita, PPP\$ (1997)
- Growth – GDP per capita annual growth rate (1990-2002)
- Equality – share of income or consumption of poorest 10% (year varies)
- Literacy – adult literacy rate, % ages 15 and above (1997)
- Health resource – physicians per 100,000 people (1990-2003)
- Health outcomes – under-five mortality per 1,000 live births (2002)

Data were copied and pasted to SPSS (version 12.0) for analysis. These were then transformed into log scores to make it more normally distributed.

Path Analysis. A model linking all the above variables was designed and agreed by the authors prior to the analysis. This model was then tested statistically using path analysis.

Path analysis involves a series of multiple regressions to examine a theory of assumed causal order among a set of variables. Here, the analysis runs as ‘X causes Y and Y causes Z’ (Klem, 1995, in Grimm & Yarnold, 1995). In a path model, a variable can be both dependent and independent at the same time. To avoid confusion, two kinds of variables are classified in this model: *endogenous* (any variable dependent on one or more other variables in the model) and *exogenous* (variables independent of the other variables in the model).

Path coefficients were derived by running regression analyses for each endogenous variable. In this study, six multiple regressions were run, using the following as dependent variables: 1) under-five mortality; 2) wealth; 3) growth; 4) equality; 5) literacy; and 6) physicians. The pre-determined model identified the independent variables for each regression analysis. The dependent variable was health outcomes as measured by Under-five Mortality per 1,000 Live Births (2002).

Initially, this process was followed to test the model using all countries in the dataset. Afterwards, to explore the generality of the findings, countries were split into two groups - ‘high-income economies’ were categorized as those above (or equal) the median for the overall GDP per capita; and ‘low-income economies’ were collectively classified as those below the median. Data were re-analysed in the same manner.

Results

World. The analysis shows no significant direct relationship between health expenditure and under-five mortality with a β coefficient of -.086 (see Figure 1). However, significant indirect links were found with 91.3% of controlled variance overall ($R=.955$; $R^2=.913$; $df=86$): *wealth* was the best predictor of under-five mortality ($\beta=-.614$; $p<.001$), followed by *equality* ($\beta =-.200$; $p<.001$), *physicians* ($\beta=-.160$; $p=.007$), *literacy* ($\beta=-.136$; $p=.013$), and *growth* ($\beta=-.109$; $p=.002$).

Health expenditure was positively associated with *wealth* ($\beta=.487$; $p<.001$), which in turn was related to *literacy* ($\beta=.608$; $p<.001$) and number of *physicians* ($\beta=.451$; $p<.001$).

High-income economies. Similarly for high-income economies, although no significant direct relationship was found between health expenditure and under-five mortality (see Figure 2), indirect links were apparent. The pathways were through the direct relationships between *wealth* ($\beta=-.414$; $p<.001$), *equality* ($\beta=-.298$; $p<.001$), and *literacy* ($\beta=-.234$; $p=.003$) with under-five mortality ($R=.929$; $R^2=.864$; $df=53$).

Health expenditure was found to be directly associated with *wealth* ($\beta=.404$; $p<.001$), which in turn was positively associated with *equality* ($\beta=.308$; $p=.046$) and *literacy* ($\beta=.382$; $p=.011$).

Low-income economies. This trend also appears among low-income economies (see Figure 3). There was no significant direct relationship between health expenditure and health outcomes. However, increases in the number of *physicians* ($\beta=-.388$; $p=.010$),

wealth ($\beta=-.327$; $p=.036$), *growth* ($\beta=-.299$; $p=.006$), and *literacy* ($\beta=-.293$; $p=.033$), were found to be directly related with decreased under-five mortality ($R=.873$; $R^2=.762$; $df=32$).

Health expenditure was found to be directly associated with increased *wealth* ($\beta=.292$; $p=.015$), which in turn was related with more *physicians* ($\beta=.596$; $p=.001$) and higher *literacy* ($\beta=.526$; $p=.001$).

Discussion

As shown in this analysis, health expenditure and health outcomes are not directly associated. The relationship is mediated by many other different factors such as wealth, growth, equality, literacy, and the number of physicians in a population. For example, health expenditure is positively related to wealth, which in turn is associated with better health outcomes.

These findings support the argument presented by the World Health Organisation's Commission on Macroeconomics and Health (2001) that investment in health is essential in promoting social and economic development. The Commission claimed that increased investment in health by 1 percent of the GNP by 2007 compared with current levels (plus further assistance of 0.1 percent of donor countries' GNP) could lead to around 8 million lives saved, mainly in low-income economies by 2010. The economic benefits of this increased investment relative to its costs are significantly greater as this will translate into approximately 330 million disability-adjusted life years (DALYs) saved which would be worth around US\$ 360 billion in direct and indirect economic gains by 2015-2020, and possibly more.

From these analyses, it can be induced that public investment in health expenditure is strongly associated with both the health and wealth of the population. Health expenditure is related to increased income, which is then associated with better resources for the other pre-requisites for health, especially literacy and the availability of physicians.

In high-income economies, increased health expenditure is also directly related to improvements in income equality by increasing the wealth of the poorest 10% of the population. Income equality is associated with lower rates of under-five mortality, which confirms previous research on the *relative income hypothesis* among rich countries (e.g. Wilkinson, 1996). This hypothesis assumes that more egalitarian societies tend to have better health outcomes than those with a more unequal distribution of wealth among the rich and the poor.

However, this trend on income equality and health was not reflected among low-income economies. Not only was income equality not significantly related to better health outcomes (probably since absolute wealth was more essential in these countries), but higher health investment was associated with increased income inequality.

This could possibly be related to poor health sector management and unequal access to health services among low-income countries. It is likely that health expenditure is not being spent on health interventions to reach the most vulnerable, and that the services are benefiting the better-off disproportionately more than the poor. These countries should enable health investment of reach those with greatest need and access to health services should be widened so that all members of society can benefit in equal proportions.

One limitation of these analyses is that the samples for high- and low-income economies were rather small due to many missing data. The most reliable analysis is the one carried out for the world as a whole which had a sample size varying between 86 and 147 for different paths within the model.

In terms of causality, it is a truism that correlation is not causation, and the path analyses presented here are essentially based on correlational methods. Health expenditure and wealth are strongly associated but which is chicken and which is egg is a contentious issue. There is as good an argument in favour of health being a condition for health as there is for the converse.

Conclusion

The neo-liberal assumption that less government spending, particularly on health care, is a key factor to development should be re-thought. As shown in this study, health investment is essential in improving both the health and wealth of societies. When used efficiently, its social and economic benefits significantly outweigh its costs through improvements in income and the fulfillment of the other pre-requisites for health. It is therefore recommended that governments invest more on health care that will benefit all sectors of society.

References

- Dahlgren, G. & Whitehead, M. (1991). *Policies and strategies to promote social equity in health: Background document to WHO - strategy paper for Europe*. Stockholm: Institute for Futures Studies.
- Kennedy, S. (2003). *The relationship between education and health in Australia and Canada*. SEDAP Research Paper No.93
- Kim, J.Y., Millen, J.V., Irwin, A. & Gershman, J. (2000). *Dying for Growth: Global inequality and the health of the poor*. Monroe: Common Courage Press.
- Klem, L. (1995) Path analysis in L.G. Grimm & P.R. Yarnold (eds.) *Reading and Understanding Multivariate Statistics*. Washington: APA. Pp.65-98.
- Patel, V., Rodrigues, M. & DeSouza, N. (2002). Gender, poverty, and postnatal depression: A study of mothers in Goa, India. *American Journal of Psychiatry*, 159, 43-47.
- Save the Children UK (2005). *Election 2005 - Call to candidates*. Accessed online (21 April 2005):
<http://www.savethechildren.org.uk>
- Singh, G.K., Miller, B.A., Hankey, B.F. & Edwards, B.K. (2004). Persistent area socioeconomic disparities in US incidence of cervical cancer, mortality, stage and survival, 1975-2000. *Cancer*, 101(5), 1051-7.
- The World Bank Group (2004a). *Dramatic Decline In Global Poverty, But Progress Uneven*. Accessed online (21 April 2005):
<http://web.worldbank.org>
- The World Bank Group (2004b). *Millennium Development Goals: Improve Maternal Health*. Accessed online (21 April 2005):
http://www.developmentgoals.org/Maternal_Health.htm
- Townsend, P. and Davidson, N. (1982). *The Health Divide: Inequalities in Health in the 1980's*. London: Penguin

United Nations Human Development Report (2004). *Cultural Liberty in Today's Diverse World*. Accessed online (21 April 2005):
<http://hdr.undp.org/reports/global/2004>

Wilkinson, R. (1996). *Unhealthy societies: The afflictions of inequality*. London: Routledge.

World Health Organisation (1946). *Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference*. New York, 19-22 June, 1946.

World Health Organisation (2003). *What do we mean by malnutrition?* Accessed online (21 April 2005):
<http://www.who.int/nutrition2.htm>

World Health Organisation (2004). *Tobacco and poverty: A vicious circle*. Geneva: WHO.

World Health Organisation (2005). *"3 by 5" Progress report, December 2004*. Accessed online (21 April 2005):
<http://www.who.int/3by5/progressreport05/en>

World Health Organisation Commission on Macroeconomics and Health (2001). *Macroeconomics and Health: Investing in Health for Economic Development*. Geneva: WHO.

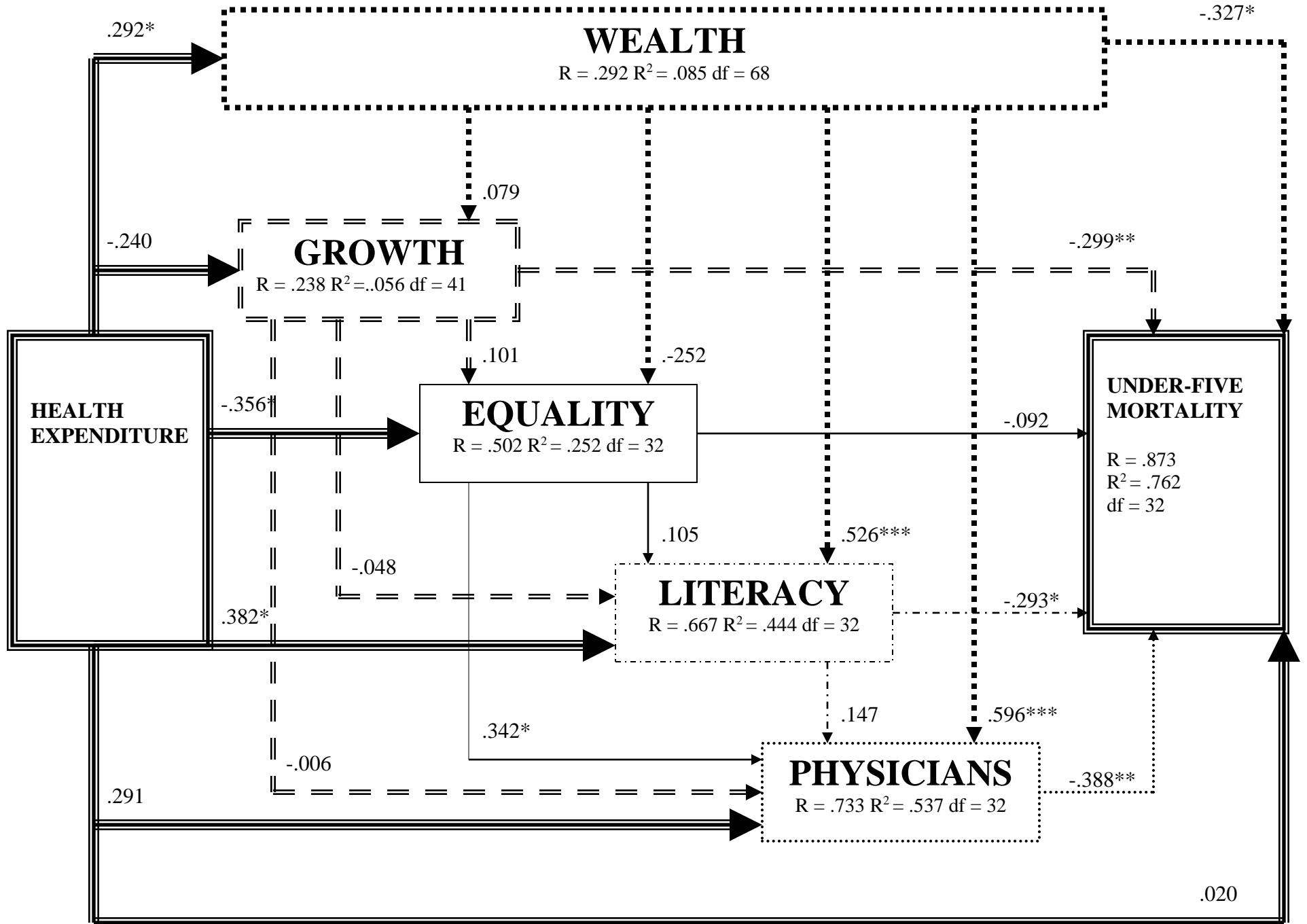


Figure 3. A Model on Health Expenditure and Under-five Mortality (Low-income economies)

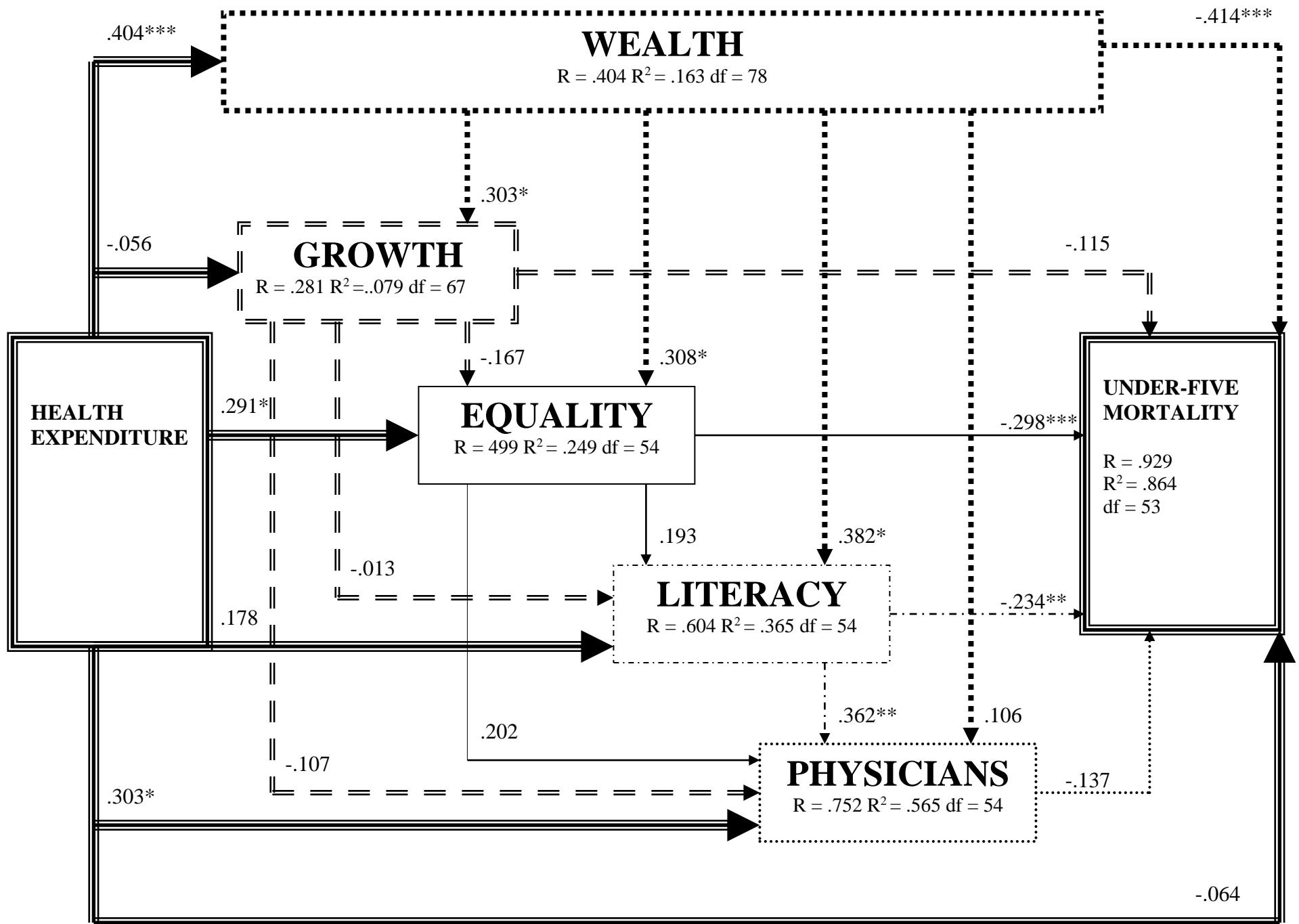


Figure 2. A Model on Health Expenditure and Under-five Mortality (High-income economies)

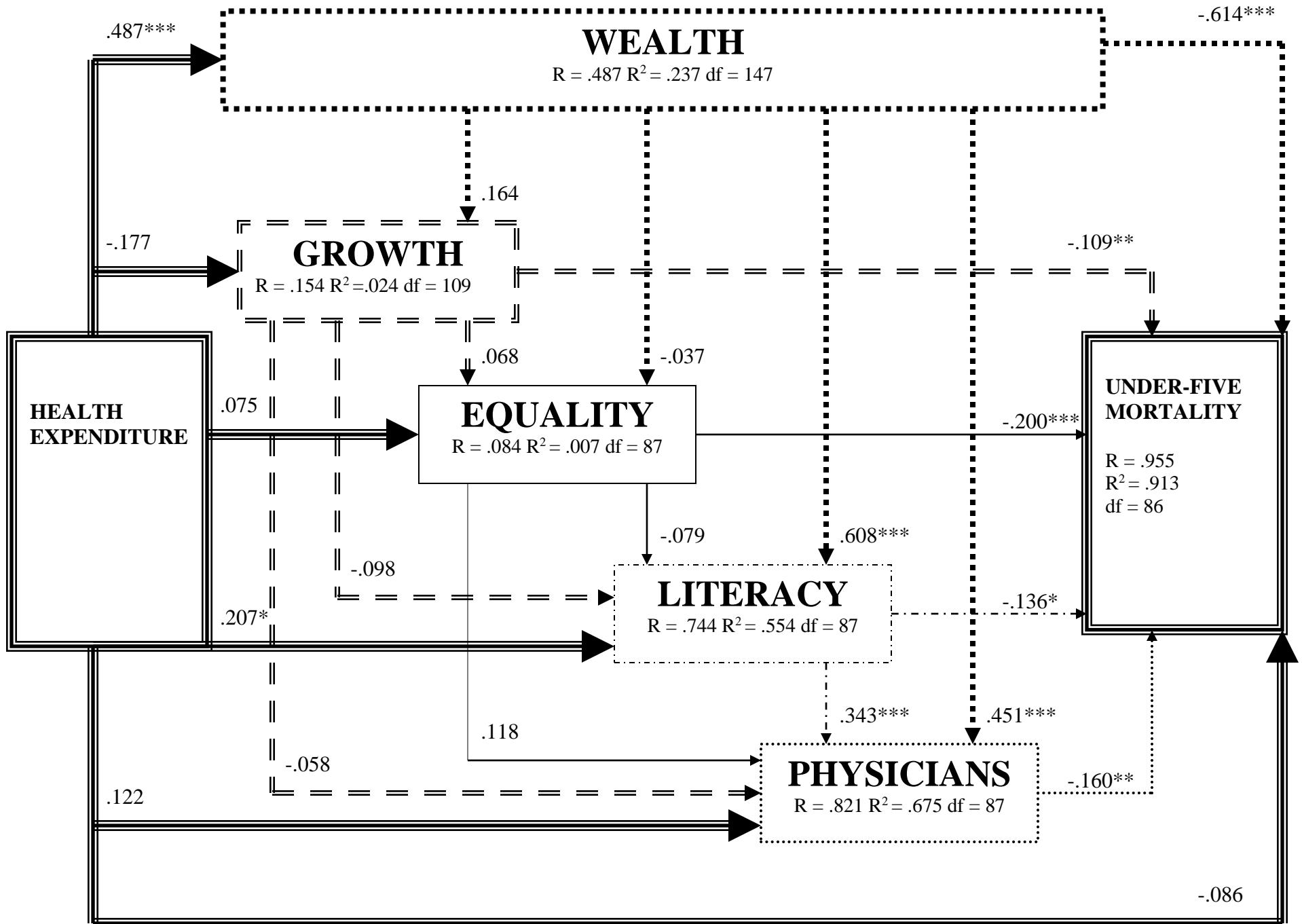


Figure 1. A Model on Health Expenditure and Under-five Mortality

$p \leq .001^{***} p \leq .01^{**} p \leq .05^{*}$