Infant mortality rates and decentralisation in Uganda

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RESEARCH

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ABSTRACT

Background

Many countries in the developing world have embarked on the path of decentralisation over the last three decades to improve the provision of public goods such as healthcare services. It is hypothesised that devolving power to local governments would improve efficiency as well as equity and thereby health outcomes by bringing decision makers closer to the people, and by enhancing the participation of the community in the decision-making and implementation processes.

Aims

This paper aims to assess the impact of decentralisation on infant mortality rates in Uganda.

Methods

The intervention model was used to analyse national representative data from Uganda Demographic Health Surveys (1988/89, 1995, 2001, 2006).

Results

Results indicate that infant mortality rates deteriorated during the decentralisation period in three out of four regions in Uganda, but not overall when analysed for the whole country.

Conclusion

Decentralisation was supposed to lead to a decrease in infant mortality rates, however, the opposite effect was seen with rates increasing in individual regions. There is need for further detailed studies to understand why infant mortality rates increased during the period of decentralisation in Uganda.

What this study adds:

1. What is known about this subject?
While medical literature is extensive on the topic of infant mortality in Uganda, there are few studies investigating the impact of decentralisation on infant mortality in the country.

2. What new information is offered in this study?
Empirical results show that infant mortality rates increased during the decentralisation period in three out of four regions in Uganda.

3. What are the implications for research, policy, or practice?
Decentralisation was expected to reduce infant mortality; however, it has not proven to be the case in all instances. Further investigation is needed to determine why infant mortality rates increased during Uganda's decentralisation period. Other factors, not covered in this study, may be important in reducing infant mortality rates.

Background

Decentralisation has been advocated by healthcare reformists as a powerful means of improving the provision of public services such as health care.[1] It is hypothesised that devolving power to local governments would improve efficiency and equity, and consequently health outcomes, by bringing decision makers closer to the people and by enhancing the participation of the community in the decision-making and implementation processes.[2,3] Over the

last three decades, many countries in the developing world have embarked on the path of decentralisation.[4] Dillinger showed that out of 75 developing and transitional countries covered in a survey, 84 per cent had embarked on a certain type of decentralisation (deconcentration, delegation, and devolution) process.[4] Despite arguments in favour of decentralisation, there is little evidence that countries with decentralised systems have experienced improved health outcomes and sustainable development.[5] There is limited empirical evidence on the impact of decentralisation on improving delivery of healthcare services and health outcomes worldwide.[5,6]

This paper explores the impact of decentralisation on infant mortality rates in Uganda. The Government of Uganda officially implemented a decentralisation policy in 1997, when the central government devolved many functions and responsibilities, including the provision of primary health care, with the major objective of improving public service delivery.[7] Within the decentralisation framework, local governments have powers to implement their own development plans, but the plans must be based on the national and sector priorities. They implemented the decentralised programme that was previously handled by the central government as guided by the Local Government Act of 1997.[7]

The Millennium Development Goals aimed to reduce infant mortality by two-thirds between 1990 and 2015.[8] In Uganda's case, this goal implies a reduction from about 90 per thousand in 1990 to about 30 per thousand by 2015. However, until recently there were no satisfactory assessments of performance in primary healthcare sectors. Most evaluations on decentralisation of primary health care tend to focus on the congruency between intended and actual expenditures using expenditure trucking surveys. While tracking performance at this level is important, it is also necessary to evaluate programmes at a more fundamental level to find out whether decentralisation improves or worsens infant mortality rates. In an effort to fill the existing gap in medical literature, this paper explores the impact of decentralisation on infant mortality rates.

Method
The model
In the literature two common approaches are used to evaluate the impact of a policy change: intervention analysis, and differences-in-differences in differences approach (triple differences model).[9] An intervention analysis involves a test of the change in the mean of a variable as a result of a policy reform.[10] To analyse the

effects of decentralisation on infant mortality in Uganda, we adopted the intervention analysis because we are using national and regional datasets, and no such data exist for outcomes of public and private primary healthcare services that could be used in the triple differences model.

The key issue in intervention analysis is the problem of unobservable. The problem of unobservable is concerned with unobserved variables that are correlated with the intervention(s) and with the measured effects. In that case, the measurement of the effects of the interventions may be biased. Since we are using average ratios of infant mortality rates at the regional levels, the problem of unobservable is minimised. The most common intervention model is:[9,10]

$$Y_{it} = \alpha_0 + \alpha_1 Y_{it} + \alpha_2 Z_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

Where i and t are region and time subscripts, Y is the dependent variable, and in our case, the infant mortality rate.

We have used infant mortality rates from the Uganda Demographic Household Surveys from four time periods as a measure of health status. Infant mortality has been considered as the most important indicator of health outcomes in a society.[2,3,12,13] It reflects infant health and pregnant women´s health, in addition to the state of health development within the society. Infant mortality is more reliably measured and is based on actual data unlike other measures of health outcomes such as life expectancy. It is also argued that the infant mortality rate is more sensitive to policy changes such as decentralisation than other health indicators like life expectancy and total death rate, and therefore is a better measure of health status. Since the data on infant mortality is only available during the periods 1988/89, 1995, 2001, and 2006, we generated values of this variable for the intermittent years by interpolation.

The independent variable according to model one included: the lagged values of dependent variable (Y_{t-1}) that controls for initial conditions, and the decentralisation variable (Z), which is our intervention variable that takes on the value of zero prior to intervention and unity after intervention. A decentralisation dummy variable was applied according to the period when all the districts were decentralised (1997). The value of Z is zero in the pre-intervention period, therefore, the intercept is α_0. However, in the post-intervention period, the intercept jumps to $\alpha_0 + \alpha_2$, thus the impact of the intervention is equal to the magnitude of α_2.

The statistical significance of α_2 was tested using a standard t-test, and then if α_2 was statistically different from zero, the direction of impact could be interpreted from the sign of α_2. For decentralisation to be seen as improving service delivery and sustainable development, α_2 should be positive and statistically significant. We investigate the hypothesis that shifts towards greater decentralisation would be accompanied by a reduction in infant mortality rates in Uganda.

Results

Descriptive results

Although there was a slight drop in average infant mortality rates (number of deaths of infants under one year old in a given year per 1,000 live births in the same year), the variation increased at the regional level (Table 1). The coefficient of variation for mortality rates increased from 0.099 to 0.19 for infant mortality for pre- and post-decentralisation periods, respectively, meaning that the variation in infant mortality increased among regions after decentralisation. The coefficient of variation is the standard deviation of a distribution divided by the mean of the distribution. It is a commonly used measure of variation. Immunisation rates worsened during the decentralisation period, although the variation among regions reduced.

Table 1: Regional level averages and coefficient of variation of immunisation and infant mortality rates (number of deaths of infants per 1,000 live births)

Indicator	Mean (1995)	Mean (2006)	Coefficient of variation (1995)	Coefficient of variation (2006)
Immunisation	46.9	45.78	0.32	0.05
Infant mortality	87.56	80.42	0.13	0.22

Source: UDHS (1988/89, 1995, 2001, 2006)[16]

Trend analysis shows a deterioration in the infant mortality rates in the Western, Central, and Northern regions, but an improvement trend in the Eastern region during the decentralisation period (Figure 1).

Regression results: At the national level, there was no significant association between decentralisation and infant mortality rate. At the regional level, there was positive association between infant mortality rates in the Western, Central, and Northern regions, and no association between the Eastern region and decentralisation (Table 2).

Figure 1: Trends in infant mortality rates
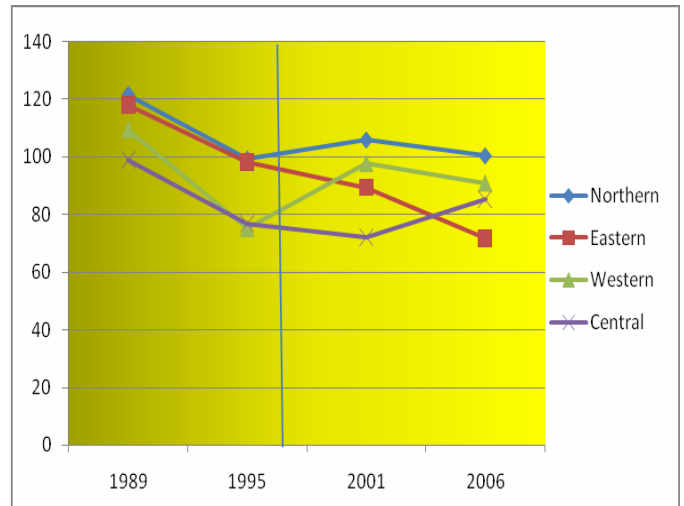
Source: UDHS (1988/89, 1995, 2001, 2006)[16]

Table 2: OLS regression results

	North	East	West	Central
Constant	12.869 (1.83)*	2.603 (0.37)	20.639 (2.9)***	−2.065 (−0.32)
Lagged infant mortality rates	0.856 (13.52)***	0.949 (14.40)***	0.735 (9.51)***	0.986 (13.4)***
Decentrali-sation dummy	1.984 (2.51)**	−0.873 (−0.49)	4.639 (3.45)***	4.071 (3.4)***

Dependent variable is the infant mortality rate.

***, **, and * indicate statistical significance at 1 per cent, 5 per cent, and 10 per cent, respectively. Values in italics are the t-statistics.

Discussion

The national representative data that was used in this study was obtained from Uganda Demographic Health Surveys (1988/89, 1995, 2001, 2006). Comparing all four UDHS surveys offers the advantage of a very large sample (more than 60,000 births). As Mosley and Chen[16] noted, infant mortality is a rare and statistically noisy event, so it is essential that any analysis of its determinants be based on a large sample.

The descriptive and regression results show that infant mortality rates deteriorated during the decentralisation period in three out of four regions in Uganda. Immunisation rates have been shown in the literature to be strongly associated with infant mortality rates. Moller argues that the lack of progress on infant and child mortality in Uganda has been due a decline in vaccinations, especially in the late 1990s with the share of fully immunised children falling from 47 per cent in 1995 to 37 per cent in 2000. [17] This

decline in vaccinations has been attributed to lack of political support for vaccinations at all levels and a decline in popular support for the national immunisation programme.

These results are also consistent with the results obtained by Habibi et al. who studied panel data of Argentinean provinces over the period 1970–1994, and found that decentralisation had a negative and significant association with infant mortality rates.[14] In contrast, in another study Habibi et al.[19] found that more fiscal decentralised provinces in China have lower infant mortality rates. Prieto and Saez, in a study of 15 European countries using panel data from 1990 to 2003, found that decentralisation has positive effects on infant mortality rates.[18]

According to Uganda's Assistant Commissioner for Reproductive Health, the positive association between decentralisation and infant mortality rates in Western Uganda is a result of poor nutrition levels in the Western region with Bushenyi and Mbarara among those on the list.[15] Low immunisation levels in the area are also leading to high child mortality rates.[15] High rates of home deliveries by pregnant women in some parts of Western Uganda also account for high infant mortality rates.[15] The Director of Clinical and Community Services attributes the high rates of infant and child mortality rates in Western Uganda to the fact that most donors for some time thought the West was well covered and hence would not fund any health projects in that region. Because of this neglect, the Western region is now behind on most of the health indicators in the country.[15]

According to the Assistant Commissioner for Reproductive Health, infant mortality rates in Northern Uganda remain high because of the war effects.[15] The high rates of infant mortality in Central Uganda may be a result of low immunisation levels in that region. The outcomes of decentralisation may depend on the existing institutional arrangements in a country, which may also depend on social, institutional, economic, and geographical factors that may influence the delivery of public services, including health services that have a strong bearing on infant mortality.

One important limitation of the data used in this study is that they are available at the regional level and only at the time of the survey, not retrospectively to periods prior to 1988. However, the fact that infant mortality rates show little trend over time diminishes this concern. Nevertheless, there is clearly the possibility of measurement error, and

thus of attenuation bias, for these estimates. There is need for further detailed study to understand why infant mortality rates deteriorated in individual regions following decentralisation in Uganda.

Conclusion

This article aimed to assess the impact of decentralisation on infant mortality rates in Uganda, with results indicating that infant mortality rates deteriorated during the decentralisation period in three out of four regions in Uganda. Further and ongoing analysis is required to continue monitoring the infant mortality rate in Uganda and to determine precisely how individual factors are contributing to the high infant mortality rate across regions of this country.

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