

THE MATTHEW EFFECT IN ADULT MORTALITY DECLINE BY CAUSE AROUND THE WORLD

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Introduction

During the demographic transition populations experience a period in which significant reductions in mortality take place. After extraordinary gains in the reduction of mortality these tend to be moderate and later on modest. Some authors (Wang, 2002) consider that mortality reductions cannot be indefinite. This suggests the idea that there are limits that cannot be passed. This would mean that for each age there is a lower limit for the age specific mortality rate (ASMR). This idea was in vogue in the decade of 1970, and remained in the formulas for projecting mortality for each age group using an asymptotic function considering the lower rate of mortality observed.

In fact it is not known if such limits exist. However, mortality rates are still declining. In general it can be said that mortality rates descend more in developing than in developed countries, because in the later there have already taken place important reductions. Nevertheless it is not clear if relative reductions are greater in one group of countries or in the other. This may be caused by two facts that did not seem feasible some decades ago but nowadays occur:

1. That mortality would continue experiencing important relative reductions, at least at certain ages and by some causes.
2. A stagnation in the reductions of mortality in developing countries, again for some age groups and by certain causes.

This paper investigates whether the Matthew Effect occurs or not for mortality decline at certain ages and due to some specific causes, with the implication of widening the existing gap between developed and developing countries.

The Matthew Effect is a phenomenon in which inequalities increase. It was initially labeled by Merton (1968) making reference to a biblical phrase: “*Unto every one that hath shall be given, and he shall have abundance; but from him that hath not shall be taken away even that which he hath*” (Matthew 25:29).

To evaluate this hypothesis we take the experience of a set of selected countries from different regions of the world and for different ages and causes, applying the Spearman's correlation coefficient test to verify

empirically if the Matthew Effect occurs or not.

Data

In order to apply the Spearman's correlation test we use data from Demographic Yearbook of several years. Particularly, this publication of the Population Division of the United Nations, dedicates every year a special topic. This data come from census information and the vital statistics. We selected a sample of 14 countries around the world (see list of countries on table 1). We would have liked to include some African countries, however such information was not available. We consider trends in mortality from around 1970 to around 1980, depending on the available data (see years on table 1).

Initially we wanted to take mortality rates for people aged 60 and over. Unfortunately we appreciated certain inconsistencies in the data probably due to effects of the age structure of the populations analysed. To overcome this situation we use mortality rates for the age group 60-64. Since male mortality is at higher levels we decided to work only with this sex. Table 1 shows male ASMR 60-64 for the 14 countries selected. Some inconsistencies can be observed in mortality levels according to the degree of development: contrary to expected, mortality rates of some developing countries are lower than those of some developed countries. A possible explanation for this is the different quality of the information across countries.

Results

The first step we took consisted on ranking the countries according to their mortality rates in 1970. Then we compared with the rates in 1980. In order to test the Matthew Effect hypothesis we calculated relative differences (RD) between the rates in these two moments in time, namely:

$$\text{Relative Differences} = \frac{(\text{Rate70} - \text{Rate80})}{\text{Rate 70}} \times 100$$

We also ranked these relative differences. We expected to find some correlation between the ranks of the mortality rates in 1970 and the ranks of the RD, since countries with higher mortality should experience lower reductions. Graphically it cannot be observed a strong correlation (see figure1).

Finally we applied the Spearman test. As we know this test works with ranks of the variables involved. The results confirm the faint relationship between the ranks. This means that the Matthew Effect does no exist in the set of countries included in this paper.

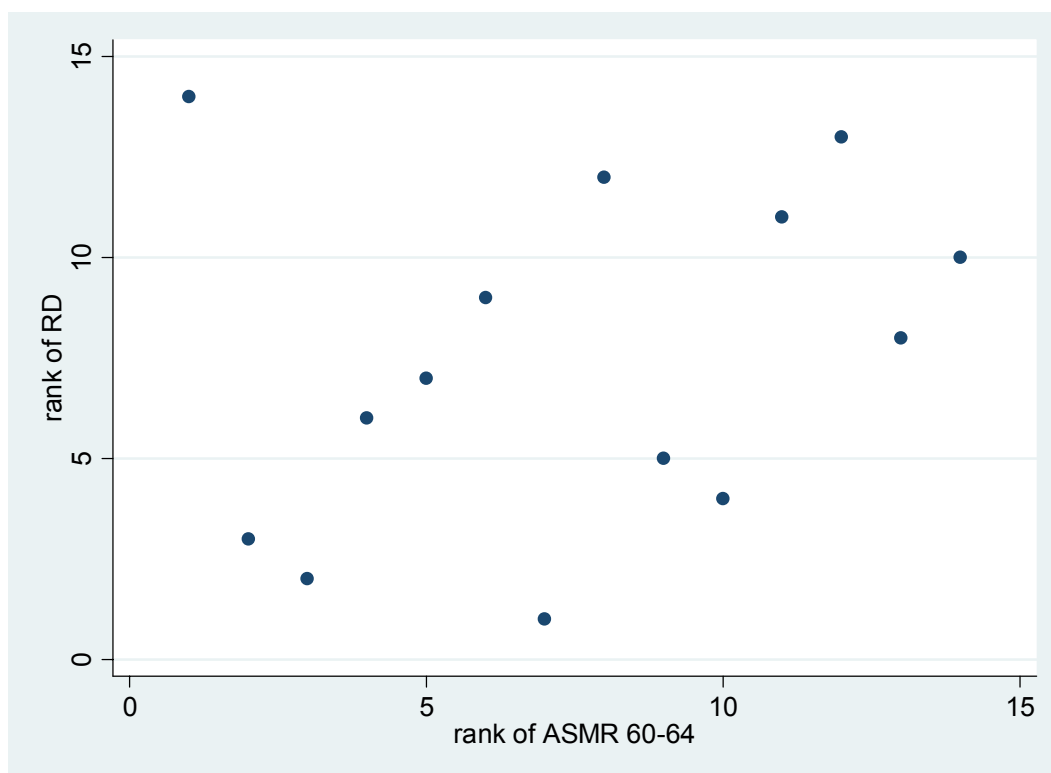
Table 1. ASMR 1970, 1980 and RD

Countries	ASMR		Differences		
	1970	1980	absolute	relative	
Guatemala	2414.7 (10)	1941.2	473.5	19.61	(4)
México	2444.3 (11)	2148.6	295.7	12.10	(11)
Panama	1906.7 (3)	1417.4	489.3	25.66	(2)
Colombia	2115.6 (5)	1811.3	304.3	14.38	(7)
Perú	1807.5 (2)	1359.9	447.6	24.76	(3)
Venezuela	2660.8 (13)	2283.9	376.9	14.16	(8)
Japan	2181.0 (7)	1501.2	679.8	31.17	(1)
France	2383.8 (9)	1975.0	408.8	17.15	(5)
Ireland	2655.1 (12)	2448.4	206.7	7.79	(13)
Italy	2337.9 (8)	2144.2	193.7	8.29	(12)
Spain	2023.6 (4)	1731.2	292.4	14.45	(6)
Sweden	1774.4 (1)	1788.3	-13.9	-0.78	(14)
Switzerland	2117.9 (6)	1831.3	286.6	13.53	(9)
United Kingdom	2708.9 (14)	2362.5	346.4	12.79	(10)

* Ranks in parenthesis.

Sources: United Nations, *Demographic Yearbook*, several years,

Figure 1. Rank of RD vs Rank of ASMR₆₀₋₆₄



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