

Are Wealthier Adults More at Risk of Premature Death in Ouagadougou, Burkina Faso?

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Introduction

Until recently, Sub-Saharan African cities did not held interest for health researchers and program designers, because, on average, urban areas boast better socio-economic and health indicators than rural ones on average (Brockhoff and Brennan 1998). In Burkina Faso, according to the 2006 census, life expectancy at birth is 67 in the Center Region (which roughly corresponds to the capital city of Ouagadougou), and only 57 in the country as a whole (Baya et al. 2009). But despite the concentration of wealth in urban areas, poor African city dwellers may be worse off than average rural residents. They tend to live in slums, with recent studies showing that people living in informal urban settlements can experience worse health conditions than rural residents because of high population density and lack of public services (APHRC 2002, Magadi et al. 2003, Hacker and Ryan 2003). In Ouagadougou, informal urban settlements encircle the city almost entirely and house an estimated 30% of the city's population (Boyer and Delaunay 2009).

In the context of rapid urbanization of the continent, the Institut Supérieur des Sciences de la Population at the University of Ouagadougou launched the Ouagadougou Health and Demographic Surveillance System (Ouaga HDSS) in 2008. The research platform aims to provide a greater understanding of the health and development challenges facing urban populations in West Africa, and ultimately, to provide African policy makers and program designers the information they need to create interventions and systems adapted to the urban context.

Preliminary results from the Ouaga HDSS show that Ouagadougou today seems to face a double burden of disease. In the neighborhoods surveyed, the most common cause of death for children under age five is still infectious disease, while for adults 15-59, the most frequent causes of deaths AIDS, cardiovascular disease and accidents (Duthé and Soura 2011). Almost everywhere in the world, and at most times throughout history, wealthier individuals have been advantaged in terms of health (Victoria et al. 2003, Gwatkin et al. 2007, Marmot 2007). While this (almost) universal rule is likely to hold for children (infectious diseases certainly affect the poorest urban children disproportionately), the adverse health events that affect adults (HIV, cardiovascular disease and accidents) may indeed more heavily concern the most affluent in Ouagadougou. Indeed, wealthier individuals are more likely to engage in risky practices associated with economic development (for example drive with a motorcycle instead of a bicycle). In a population that has just entered the epidemiological transition, a generalized lack of prevention may characterize these new areas of behaviors (for example, people seldom wear helmets when driving motorcycles). Moreover, there may be a lack of affordable medical care for these illnesses, which are only now starting to pose a significant health burden. In such a context, wealthier adults may take greater health risks and end up in worse health, despite their greater ability to afford medical care.

Preliminary analyses of Ouaga HDSS data showed that the wealthier adults seem indeed to be at a net health disadvantage in Ouagadougou (Rossier et al. 2011). Although they seek health care more

often when they are ill, they have a higher prevalence of HIV and of risk-factors for cardiovascular disease (like being overweight), compared to poorer adults. The higher mortality in the formal neighborhood is thus likely to be due to a composition effect. Since the adults in the formal neighborhoods seem to show the same determinants of health when all else is controlled for as adults in informal neighborhoods, it is probably the higher concentration of wealth in these neighborhoods that explains the excess mortality observed among adults there.

This finding is particularly interesting in that it would constitute an exception to once the biggest observed constants in public health: those of socioeconomic health disparities. Until recently, most African countries faced only the single burden of infectious disease, and constructed their health systems primarily to address this challenge. Their populations have benefited from prevention techniques for infectious diseases (like bed net campaigns for malaria and national vaccination campaigns) and have gained access to treatments (through generic medicines, etc.). However, the same is not true for chronic diseases and accidents, and prevention against AIDS is still a challenge. When prevention is lacking, exposure will be the first determinant of mortality rates, which may explain why richer adults are more prone to premature death in Ouagadougou.

Data and methods

Mortality data from the Ouagadougou Health and Demographic Surveillance System

The Ouaga HDSS follows five neighborhoods at the northern periphery of the city, areas which corresponds to 55 census tracks (2006 census). Each census track is inhabited by, on average 1400 residents. After an initial census (Round 0) in 2008-2009 of the Ouaga HDSS neighborhoods (including the name, sex, age, ethnic group, and marital status of each individual), an exhaustive list of dwellings and their residents has been updated approximately every ten months. A brief life history, including migration, marital and reproductive history, is collected for each new resident. At each new passage, field agents collect information on demographic events that have taken place since the last passage (new arrivals, departures, births, deaths, changes in marital status, etc.) Each death is followed by a verbal autopsy which is then diagnosed by a team of eight local doctors. Every two passages, field agents collect information on the living standard of each household (household goods and characteristics of the home), and the characteristics of residents (education level, economic activities, etc.) A complete description of the Ouaga HDSS can be found in Rossier et al. 2012.

In this analysis, we will use the mortality data for adults 15 to 59 collected through the first three passages and cover a period from October 2008 through March 2012. Analyses of data from Round 0 to Round 2 shows that the mortality rate for adults between 15 and 59 is 2.3 per 1000 in the Ouaga HDSS neighborhoods. At the country level, the mortality rate for the same age group is 3.7 per 1000 (Baya et al. 2009), which is 1.6 times higher. The mortality rates measured for adults in the ODSS are plausible because the mortality rate for the Centre region (which roughly corresponds to Ouagadougou) is about two times less than national rates.

Methods

Our dependent variable is the probability of dying while under surveillance (Round 0 to Round 3) between age 15 to 59. For the second dependent variable, data are left censored if adults arrived

after the beginning of surveillance, and are right censored when adults exit the areas or die. Independent variables are time-varying. We use Cox regressions to model the effects of varying independent variables on the risk of dying. The independent variables are: age, sex, educational level, ethnicity, place of birth, duration since arrival in Ouagadougou, poverty level (a proxy constructed using the data on household goods Rossier et al. 2011), type of neighborhood (formal or not) and the distance to the closest health center.

In order to explain the greater probability of dying of wealthier adults aged 15 to 59 in Ouagadougou, we will elaborate on the main causes of death observed in the Ouaga HDSS for this age group (AIDS, cardiovascular diseases, accidents) and we will elaborate on the social disparities in the risk factors associated to these causes of deaths (occurrence of road accidents, obesity and hypertension, and engaging in unprotected non marital sexual relations): available evidence in the Ouaga HDSS and in DHS data show that richer individuals are more exposed to these new urban health risks (see Rossier et al. 2011).

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