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# Aging and Death under a Dollar a Day

Abhijit V. Banerjee and Esther Duflo

He who is contented is rich.

—Lao Tzu, Chinese Taoist philosopher

I've been rich and I've been poor. Believe me, rich is better.

—Mae West, American actress

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## 7.1 Introduction

Despite the many assurances from many wise men that being rich is not all that it is made out to be, most economists remain firmly in Ms. West's camp. This is partly no doubt an item of faith not unrelated to what makes people want to be economists. But mostly it reflects the suspicion that, at least up to a point, what are usually called necessities of life are really necessary, and having to do without them cannot be pleasant.

To what extent are the poor deprived of the necessities of life? Obviously this turns on who we call the poor. One popular definition, which we adopt, is to focus on those who have a daily per capita expenditure of a dollar a day (at purchasing power parity [PPP]) or less. We call them the very (or extremely) poor to distinguish them from the merely poor, who live on less than two dollars a day. In a previous essay (Banerjee and Duflo 2007b), we used household surveys from thirteen countries and draw on existing research to look at what the poor can afford. From these it appears that even the extremely poor can afford to buy enough calories to keep going, though whether they always prioritize that over other things they could buy is not entirely clear. At least in some countries there seems to be evidence

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that the extremely poor are actually short on calories and other nutrients, relative to the standard norms for their country. In India, the poorest seem to live on less than 1,500 calories a day compared to a norm of over 2,000, and moreover, this number seems to be going down over time. Where there is more detailed health information, such as in a survey we carried out in the rural Udaipur district (Banerjee, Deaton, and Duflo 2004), it is also clear that the very poor betray signs of undernourishment: 65 percent of adult men and 40 percent of adult women have body mass indexes (BMIs) under 18.5, which is the standard cut-off for being underweight.

How do the very poor do in terms of other necessities? Most of them seem to have a place to stay and some minimal clothing—what else should we be looking for? Perhaps one way to answer that is to look at some of the things that the people immediately richer than them seem to have, that they may not. This is one of things that we did in Banerjee and Duflo (2007a): we used the same surveys to compare the poor with two groups of slightly richer people in the same countries. These are households whose daily per capita expenditures (DPCE) valued at purchasing power parity are between two and four dollars and those whose DPCE are between six and ten dollars. While clearly much better off than the very poor, and much better placed in the consumption distribution of their respective countries, these are still poor households by developed country standards: the poverty line in the United States for someone who lives in a family of five, for example, works out to be about \$13 per day.

Compared to the poor, the less poor spend more per visit to the doctor and more per child educated. They are more likely to send their children to school, more likely to see a doctor when they feel sick, and more inclined to see a private doctor rather than a public practitioner. They also have much greater access to water, sanitation, and public infrastructure: the fraction with tap water at home increases with DPCE in most countries (and in some countries by quite a large margin): from 12 percent (for the extremely poor) to 73 percent (for those with DPCE between six and ten dollars) in rural Ivory Coast, 2 percent to 63 percent in rural Tanzania, and 12 percent to 55 percent in Nicaragua. In urban areas, in seven countries out of the nine for which we have data, 70 percent or more of the households with DPCE between six and ten dollars have tap water, whereas the share is below 50 percent in all countries but one for the extremely poor. The same pattern holds for latrines (where the share of those who have latrines among the households with DPCE between six and ten dollars is above 80 percent in seven countries) and electricity (the share that has access to electricity in this group is above 90 percent in seven countries).

These differences obviously suggest a better quality of life for the less poor, though these surveys cannot tell us what, if anything, they are giving up in terms of connectedness in the community or the consumption of lei-

sure (for all it is worth, when asked in surveys, the non-poor always report more life satisfaction than the poor). Do we also see cruder, more tangible, differences between them, say in terms of differences in the risk of dying? And if so, by how much? It is known (see, e.g., Wagstaff 2002) that infant mortality is greater among the poor than among the richer households. Is the same true among adults? This is the set of questions that we set out to answer here.

## 7.2 Data Sources

We mainly used the Living Standard Measurement Surveys (LSMS) conducted by the World Bank and the “Family Life Surveys” conducted by the Rand Corporation, all of which are publicly available.<sup>1</sup> We have data for fifteen countries from these sources: Brazil, Bangladesh, Ivory Coast, Guatemala, India, Indonesia, Mexico, Nicaragua, Pakistan, Panama, Papua New Guinea, Peru, South Africa, Tanzania, and East Timor. In addition, we also use two surveys that we conducted in India with our collaborators. The first was carried out in 2002 and 2003 in 100 hamlets of Udaipur District, Rajasthan (Banerjee, Deaton, and Duflo 2004). Rural Udaipur is one of the poorer areas of India, with a large population of tribals (the term used in India to designate people who used to be so low in the Hindu caste hierarchy that they had no official place in it) and an unusually high level of female illiteracy (at the time of the 1991 census, only 5 percent of women were literate in rural Udaipur). Our second survey covered 2,000 households in “slums” (or informal neighborhoods) of Hyderabad, the capital of the state of Andhra Pradesh and one of the boomtowns of post-liberalization India (Banerjee, Duflo, and Glennerster 2006). We chose these countries and surveys because they provide detailed information on extremely poor households around the world, from Asia to Africa to Latin America, including information on what they consume, where they work, and how they save and borrow.

From each of these surveys we compute the consumption per capita in PPP terms, using the 1993 PPP as the benchmark.<sup>2</sup> We identify the extremely poor as those living in households where the consumption per capita is less than \$1.08 per person per day, as well as the merely “poor,” defined as those who live under \$2.16 a day using 1993 PPP as benchmark. In keeping with convention, we call these the one and two dollar poverty lines, respectively. For comparison, we then added two additional groups: those living between two and four dollars a day, and those living between six and ten dollars a day.

1. See Frankenberg and Karoly (1995); Frankenberg and Thomas (2000); Strauss et al. (2004).

2. The use of consumption, rather than income, is motivated by the better quality of the consumption data in these surveys (Deaton 2004).

### 7.3 Age Pyramids: Missing Old People?

One first approach (although we are going to see its limitations shortly) to get at the question of “excess” mortality is to look at the age distribution of the population: is the number of older people in the population unusually low?

Tables 7A.1 and 7A.2 in the appendix show the fraction of the sample that lives under one dollar a day, under two dollars a day, between two and four dollars a day, and between six and ten dollars a day, in different age groups.<sup>3</sup> Tables 7.1 and 7.2 show summary ratios: the fraction of young people (less than eighteen) in the population, and the ratio of those over fifty over all adults (twenty-one and over), broken down by gender and for the overall population.

The first striking (and well-known) fact is that the very poor form a remarkably young group. The ratio of the population under eighteen over the total population among the rural extremely poor range from 40 percent (Indonesia) to 60 percent (Panama). In urban areas it ranges from 34 percent (Indonesia again, in 2000) to 63 percent. This ratio falls substantially in all countries as people get slightly richer, although it remains high even then (it ranges between 35 percent and 42 percent for those with DPCE between six and ten dollars a day in rural areas, and 28 percent to 42 percent for the urban areas).

Part of the reason is, of course, that fertility is high among the poor, and as a result there are a lot of children. But there are also comparably few older people. The ratio of people age fifty and above to adults over twenty among the rural extremely poor ranges between 15 percent (in Papua New Guinea) to 34 percent (Indonesia, 1997). Compared to other indicators of how the poor live, it is actually strikingly similar across these countries, clustered around 20 percent for most of them. In the United States, the corresponding ratio was 38 percent in 2000 (2000 census). This in itself is, however, not sufficient to conclude that the poor die more in developing countries than people do in the United States, since the fertility rates are also higher in poorer countries. As a result, the number of younger people at any point in time is mechanically higher, compared to the number of older people in those countries, compared to in the United States. So these “missing old people” may just be people who were never born.

Is there an income gradient in the ratio of older people over the total number of adults within countries? In most countries, the ratio of old people over all adults is similar when we look at either the poor or the extremely poor. However, in nine countries out of fifteen, in the rural areas, there

3. In this and all that follows, the observations are weighted by the survey weights if appropriate (multiplied by household size when the data is first aggregated at the household level) so that these should be estimate of population means.

**Table 7.1**                      **Old and young in the population**

	Fraction of individuals aged less than 18				Fraction of individuals aged 51 or more			
	< \$1	< \$2	\$2-\$4	\$6-\$10	< \$1	< \$2	\$2-\$4	\$6-\$10
<b>Rural</b>								
Bangladesh	0.51	0.49	0.42	0.38	0.13	0.13	0.16	0.21
Brazil	0.61	0.54	0.39	0.31	0.06	0.1	0.19	0.19
East Timor	0.56	0.54	0.45	0.35	0.07	0.07	0.12	0.2
Ecuador	0.61	0.56	0.47	0.34	0.07	0.08	0.1	0.16
Guatemala	0.55	0.57	0.55	0.53	0.08	0.07	0.07	0.07
Indonesia00	0.4	0.41	0.37	0.3	0.13	0.13	0.13	0.14
Indonesia93	0.47	0.46	0.43	0.39	0.16	0.15	0.15	0.15
Indonesia97	0.44	0.43	0.4	0.34	0.18	0.18	0.17	0.17
Ivory Coast	0.44	0.46	0.47	0.42	0.1	0.08	0.06	0.04
Mexico	0.46	0.47	0.41	0.34	0.13	0.12	0.15	0.16
Nicaragua	0.58	0.55	0.47	0.32	0.07	0.08	0.12	0.21
Pakistan*	0.44	0.43	0.4	n.a.	0.09	0.1	0.12	n.a.
Panama	0.6	0.56	0.48	0.34	0.07	0.09	0.13	0.21
Papua New Guinea	0.52	0.51	0.47	0.42	0.06	0.06	0.08	0.08
Peru	0.55	0.53	0.43	n.a.	0.09	0.1	0.16	n.a.
South Africa	0.56	0.54	0.47	0.32	0.27	0.25	0.2	0.16
Tanzania	0.55	0.54	0.47	0.46	0.11	0.1	0.1	0.15
Udaipur	0.54	0.5	0.37	n.a.	0.08	0.1	0.18	n.a.
Vietnam9293	0.46	0.44	0.38	0.35	0.03	0.03	0.05	0.04
Vietnam9798	0.62	0.54	0.45	0.37	0.07	0.11	0.15	0.19
<b>Urban</b>								
Bangladesh	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Brazil	0.63	0.54	0.44	0.33	0.06	0.11	0.13	0.17
East Timor	0.57	0.53	0.47	0.4	0.07	0.07	0.07	0.04
Ecuador	0.57	0.53	0.42	0.37	0.13	0.14	0.16	0.18
Hyderabad	0.48	0.42	0.37	0.32	0.07	0.08	0.09	0.08
Indonesia00	0.34	0.36	0.32	0.25	0.18	0.13	0.13	0.15
Indonesia93	0.44	0.45	0.43	0.38	0.16	0.14	0.12	0.13
Indonesia97	0.44	0.4	0.38	0.34	0.17	0.17	0.16	0.13
Ivory Coast	0.44	0.45	0.45	0.42	0.09	0.1	0.1	0.09
Mexico	0.54	0.5	0.44	0.43	0.1	0.12	0.16	0.14
Nicaragua	0.57	0.54	0.47	0.35	0.09	0.09	0.1	0.13
Pakistan*	0.46	0.44	0.38	0.4	0.09	0.09	0.1	0.14
Panama	n.a.	0.59	0.49	0.38	n.a.	0.1	0.1	0.13
Papua New Guinea	0.6	0.49	0.45	0.45	0.05	0.06	0.07	0.03
Peru	0.57	0.55	0.43	0.35	0.05	0.08	0.12	0.15
South Africa	0.11	0.11	0.11	0.11	0.15	0.2	0.2	0.18
Tanzania	0.51	0.51	0.47	0.39	0.19	0.13	0.09	0.07
Udaipur	n.a.	n.a.	0.42	n.a.	n.a.	n.a.	0.22	n.a.
Vietnam9293	0.48	0.4	0.35	0.28	0.03	0.03	0.06	0.09
Vietnam9798	n.a.	0.45	0.41	0.3	n.a.	0.15	0.17	0.2

**Table 7.2 Ratio elderly/prime age: Ratio of individuals over 51/all adults**

	All			Women			Men					
	<\$1	<\$2	\$2-\$4	\$6-\$10	<\$1	<\$2	\$2-\$4	\$6-\$10	<\$1	<\$2	\$2-\$4	\$6-\$10
Rural areas												
Bangladesh	0.27	0.27	0.3	0.36	0.25	0.25	0.29	0.36	0.29	0.28	0.31	0.37
Brazil	0.18	0.24	0.33	0.29	0.13	0.24	0.35	0.27	0.22	0.23	0.31	0.31
East Timor	0.19	0.19	0.24	0.31	0.16	0.16	0.26	0.34	0.23	0.21	0.23	0.28
Ecuador	0.19	0.19	0.2	0.26	0.17	0.19	0.21	0.26	0.2	0.18	0.19	0.25
Guatemala	0.2	0.19	0.18	0.19	0.18	0.17	0.16	0.16	0.23	0.21	0.2	0.22
Indonesia00	0.24	0.25	0.23	0.22	0.25	0.25	0.24	0.23	0.24	0.24	0.23	0.21
Indonesia93	0.33	0.29	0.28	0.27	0.32	0.29	0.28	0.28	0.33	0.29	0.27	0.25
Indonesia97	0.34	0.33	0.3	0.27	0.36	0.34	0.3	0.27	0.32	0.32	0.3	0.27
Ivory Coast	0.29	0.22	0.17	0.1	0.27	0.2	0.14	0.08	0.32	0.24	0.21	0.12
Mexico	0.26	0.23	0.24	0.23	0.29	0.22	0.23	0.23	0.22	0.23	0.25	0.23
Nicaragua	0.22	0.22	0.28	0.35	0.18	0.2	0.26	0.36	0.26	0.24	0.29	0.34
Pakistan*	0.24	0.25	0.28	0.23	0.24	0.26	0.28	0.28	0.24	0.25	0.28	0.18
Panama	0.2	0.25	0.29	0.35	0.15	0.23	0.27	0.35	0.26	0.28	0.3	0.34
Papua New Guinea	0.15	0.15	0.18	0.17	0.1	0.11	0.16	0.16	0.21	0.2	0.19	0.17
Peru	0.24	0.24	0.31	n.a.	0.23	0.23	0.31	n.a.	0.25	0.25	0.32	n.a.
South Africa	0.27	0.26	0.24	0.19	0.27	0.26	0.24	0.19	0.27	0.26	0.26	0.23
Tanzania	0.29	0.26	0.23	0.3	0.26	0.23	0.2	0.34	0.32	0.29	0.27	0.24
Udaipur	0.21	0.22	0.32	n.a.	0.22	0.23	0.34	n.a.	0.19	0.21	0.3	n.a.
Vietnam9293	0.13	0.13	0.2	0.17	0.13	0.11	0.18	0.22	0.13	0.15	0.23	0.11
Vietnam9798	0.2	0.25	0.29	0.34	0.25	0.27	0.32	0.34	0.14	0.21	0.27	0.34





are comparatively more old people among the slightly more well-off people (two to four dollars and six to ten dollars) than among the poorer people. For example, in Udaipur district (rural India) the ratio of old to adults increases from 22 percent among the poor to 34 percent among those living on between two and four dollars a day. Likewise in Peru, the ratio increases from 24 percent to 31 percent in the same categories (in both countries, we have too few people with DPCE between six and ten dollars to give meaningful statistics). We get similar numbers for Pakistan and Vietnam. In Nicaragua and Panama, respectively, it increases from 22 percent to 35 percent between the extremely poor and those living between six and ten dollars, and in Panama it increases from 25 percent to 35 percent in the same categories. In all those countries, the ratio of old to prime-age adults among the more well-off is almost similar to what it is in the United States, despite the fact that these people are still very poor by U.S. standards, and despite the much better public health environment in the United States.

In four other countries (Guatemala, Indonesia, Mexico, and Tanzania), the ratio does not change with income. In the remaining two—South Africa and Ivory Coast—it actually falls sharply (from 27 percent to 19 percent in rural South Africa, for example). One thing that is common across these six countries is that the ratio of people in the zero to eighteen age group compared to older people does not vary a lot between the extremely poor and those living between six and ten dollars a day. This difference ranges from 2 percent (South Africa and Guatemala) to 10 percent (Indonesia) in these six countries, whereas it ranges from 10 percent (Papua New Guinea) to 30 percent (Brazil) in the other countries. While the share of those less than eighteen today is a very imperfect proxy for the difference in fertility rates in the past, this suggests the possibility that a part of the reason why some countries have many more young adults compared to older adults among poorer people, is that the poorer people in those countries have relatively more children.

The fact that three of the countries where we see a distinct pattern are in Africa points to another general limitation of this exercise: we may be confusing the location decision of the older people with the fact that they may be alive or not. For example, in South Africa, older people may live with their grandchildren while the parents are away working. Unless they are receiving a pension (which is available after sixty for women and sixty-five for men), the per capita consumption of such households might be particularly low (since they have many children and no prime-age worker) compared to households without older people.

A different choice of location may in turn explain the pattern we found in the other countries: it is conceivable that older people choose to live with their richer children, which would make the ratio of older people to adults artificially low among the poorest.

Of course, since we find the ratios are similar among the extremely poor

and the poor, and they start to differ only when we look at various categories, this does not seem very likely, since it is not very likely that many old people have some children living under one dollar a day and others above two dollars. But since we have no data, this remains a possibility.

#### 7.4 A New Measure of Adult Mortality: Are Your Parents Alive?

Given that the age structure data turns out to be quite hard to interpret, it is fortunate that, for a subset of countries, there is a way to address this problem: in some of the household surveys (eleven countries in total), the household roster contains a question on whether each member's father and mother are alive. For these countries, we present in table 7.3 the fraction of those age thirty-five to fifty whose father and mother are alive. These fathers and mothers are likely to be above fifty (if they are alive), giving us a handle, albeit approximate, on how the entire population of those age fifty and above changes across the different income categories. Note that to the extent that richer people have children later, and that the children of richer people are rich as well, this will underestimate any difference in the age-adjusted mortality, since the parents of richer people between thirty-five and fifty will tend to be older.

In table 7.3, we show the data for urban and rural households together (although in some countries the data is available only for rural households). For women, there is a fairly clear pattern: in four countries (Udaipur, Pakistan, South Africa, and Bangladesh), the probability that the mother of the respondent is alive does not really change between the richest category for which we have data and the poorest one. In all the other countries, it goes up with DPCE, and the difference between the richest and the poorest category for which we have data ranges from 6 percentage points in Vietnam to 23 percentage points in East Timor.

In most of the last group of countries (countries where the probability of a person's mother being alive is higher in the richest group than in the poorest), the pattern is one of a monotonic increase. The probability that the respondents' mother is alive goes up as DPCE goes up, though in some countries we only see a sizable gap among the most well-off (e.g., Brazil), while in others the critical break seems to be in the two- and four-dollar range (e.g., Mexico), and yet in others there is a steady increase across all the groups (e.g., Indonesia in 1993).

For fathers, there is no clear picture: in seven surveys (but only five countries, since Indonesia appears three times), the probability of the father being alive increases between the richest and the poorest category. In four countries it declines. In two it is roughly constant.

The gender gap here might reflect differences in the nature of the health problems faced by men and women in their fifties and sixties. First, those men are older (since men have children older than women), and their

**Table 7.3 Out of the individuals age 31–50, fraction whose mother and father is alive**

	Fraction whose father is alive				Fraction whose mother is alive			
	< \$1	< \$2	\$2–\$4	\$6–\$10	< \$1	< \$2	\$2–\$4	\$6–\$10
<b>All</b>								
Bangladesh	0.25	0.23	0.19	n.a.	0.65	0.65	0.66	n.a.
Brazil	0.46	0.44	0.41	0.42	0.61	0.60	0.63	0.69
East Timor	0.09	0.17	0.23	0.30	0.29	0.29	0.33	0.51
Indonesia93	0.15	0.15	0.17	0.17	0.26	0.27	0.29	0.33
Indonesia97	0.31	0.33	0.33	0.36	0.55	0.56	0.59	0.65
Indonesia00	0.30	0.36	0.34	0.35	0.50	0.62	0.63	0.61
Ivory Coast	0.22	0.26	0.29	0.38	0.44	0.48	0.54	0.55
Mexico	0.50	0.51	0.52	0.58	0.67	0.68	0.75	0.75
Nicaragua	0.57	0.54	0.51	0.56	0.68	0.71	0.75	0.74
Pakistan	0.39	0.39	0.34	n.a.	0.54	0.55	0.54	n.a.
South Africa	0.32	0.30	0.30	0.37	0.61	0.60	0.60	0.60
Udaipur	0.46	0.44	0.37	n.a.	0.58	0.58	0.56	n.a.
Vietnam 92	0.41	0.39	0.41	n.a.	0.60	0.62	0.66	n.a.
<b>Rural</b>								
Bangladesh	0.25	0.23	0.19	n.a.	0.65	0.65	0.66	n.a.
Brazil	0.48	0.47	0.45	0.50	0.62	0.63	0.64	0.70
East Timor	0.08	0.15	0.18	0.25	0.27	0.28	0.26	0.35
Indonesia93	0.15	0.15	0.17	0.18	0.26	0.26	0.28	0.37
Indonesia97	0.30	0.33	0.34	0.34	0.53	0.55	0.58	0.65
Indonesia00	0.30	0.36	0.34	0.36	0.53	0.61	0.61	0.65
Ivory Coast	0.36	0.31	0.28	0.28	0.49	0.54	0.60	0.74
Mexico	0.55	0.48	0.50	0.60	0.57	0.67	0.77	0.74
Nicaragua	0.58	0.54	0.55	0.62	0.64	0.69	0.75	0.75
Pakistan	0.39	0.40	0.33	n.a.	0.53	0.55	0.54	n.a.
South Africa	0.31	0.29	0.32	0.33	0.61	0.60	0.63	0.66
Udaipur	0.46	0.44	0.37	n.a.	0.58	0.58	0.56	n.a.
Vietnam92	0.33	0.43	0.43	n.a.	0.33	0.55	0.70	n.a.
<b>Urban</b>								
Urban	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Brazil	0.39	0.40	0.39	0.42	0.57	0.56	0.63	0.69
East Timor	0.13	0.21	0.30	0.31	0.34	0.31	0.43	0.56
Indonesia93	0.15	0.14	0.17	0.16	0.28	0.30	0.31	0.32
Indonesia97	0.35	0.34	0.32	0.37	0.65	0.62	0.62	0.65
Indonesia00	0.31	0.34	0.33	0.35	0.44	0.64	0.66	0.60
Ivory Coast	0.21	0.25	0.30	0.44	0.43	0.48	0.52	0.44
Mexico	0.49	0.51	0.54	0.54	0.69	0.69	0.72	0.77
Nicaragua	0.55	0.54	0.49	0.55	0.82	0.73	0.76	0.74
Pakistan	0.40	0.39	0.36	n.a.	0.55	0.55	0.54	n.a.
South Africa	0.22	0.31	0.29	0.37	0.61	0.58	0.56	0.58
Vietnam92	0.41	0.39	0.40	n.a.	0.61	0.63	0.63	n.a.

*Notes:* The data for Bangladesh, Guatemala, and Udaipur covers only rural areas. Cells with fewer than 100 observations are eliminated.

mortality naturally catches up across the age group (since eventually everybody dies). Second, in these age groups, men often die of heart disease, lung cancer, diabetes, and high blood pressure, all of which may be related to their pattern of consumption, and therefore potentially be more of a risk for those who can afford to consume more. This is less true of women. Alternatively, it could be pointing to a reverse causation. Young adults whose father is alive may be younger and hence poorer, while since mothers tend to be younger and in any case have a higher life expectancy at forty, having a mother alive may not be a signal of her son's age. Following, we solve this problem by controlling for the respondent's age.

Looking at urban and rural dwellers separately (the interpretation of which is complicated, since the urban dwellers may be migrants whose parents were themselves rural dwellers), we reach similar conclusions: in rural areas in Pakistan, Udaipur, and Bangladesh the probability of an individual's mother being alive is roughly constant between the poorest and those with DPCE between two and four dollars (we do not have richer people in the surveys in rural areas in those countries). It increases across category everywhere else, and the difference usually lies between 10 and 20 percentage points. For example, in Brazil the proportion of rural dwellers whose mother is alive increases from 63 percent to 72 percent across those two categories. In Indonesia it increases from 52 percent to 65 percent. In Mexico it increases from 57 percent to 74 percent, and so forth.

For fathers, once again, there is no obvious pattern: the probability of the father being alive is greater among the richer households in seven surveys (and five countries), roughly constant in two, and decreasing in four countries.

And finally, for urban dwellers, in Nicaragua and South Africa the probability of the mother being alive declines somewhat as we go toward richer households; it is roughly constant in three surveys, and increases in six. For men, we have a clearer pattern than for the rural areas: the probability decreases only in Pakistan. Elsewhere it is either roughly constant (Indonesia in 1993, Nicaragua and Vietnam) or increasing (everywhere else).

Another way to look at this data is to perform simple descriptive regressions. We present in tables 7.4 and 7.5 the results of logit regressions where a dummy indicating whether a respondent's mother (or father) is alive is regressed on the respondent's age and age squared, as well as country dummies and indication of the economic welfare of the household. We present country-by-country regressions in table 7.4 and, to save space, we focus on the pooled rural and urban data and one specification: economic welfare is regressed on the log of total monthly per capita expenditure expressed in 1993 PPP dollars. This table confirms the pattern revealed by the descriptive statistics for mothers, and gives somewhat stronger results for men: there is an insignificant, sometime mildly negative, relationship between the probability that a respondents' mother and father are alive in Udaipur, Pakistan,

**Table 7.4** Logit regressions: Coefficient of  $\ln(\text{total expenditure per capita})$ 

	Mother alive (1)	Father alive (2)
Bangladesh	-0.004 (0.041)	-0.010 (0.053)
Brazil	0.207 (0.051)	0.152 (0.049)
East Timor	0.176 (0.103)	0.592 (0.117)
Indonesia93	0.018 (0.024)	0.040 (0.028)
Indonesia97	0.097 (0.041)	0.117 (0.043)
Indonesia00	0.069 (0.040)	0.060 (0.040)
Ivory Coast	0.108 (0.083)	0.236 (0.090)
Mexico	0.127 (0.049)	0.119 (0.045)
Nicaragua	0.217 (0.070)	0.163 (0.069)
Pakistan	0.070 (0.058)	-0.090 (0.060)
South Africa	0.204 (0.031)	0.308 (0.032)
Udaipur	0.095 (0.131)	-0.326 (0.135)

*Note:* Regressions control for age of respondent, age squared, and rural dummy.

and Bangladesh (except for a significant *negative* relationship between the probability that the father is alive and monthly per capita expenditure in Udaipur). Elsewhere, the coefficients are positive, and in most cases significant at least at the 10 percent level (except in the first wave of the Indonesian Family Life Survey [IFLS] for both mothers and fathers, for mothers in Ivory Coast, and for fathers in Indonesia, 2000).

Finally, to summarize all the patterns in this section, we present in table 7.5 regression using data from all the countries pooled together (all the regressions control for a set of country dummies).<sup>4</sup> In panel A, death is regressed on the logarithm of monthly capita expenditure (expressed in 1993 PPP dollars), and the consumption categories in panel B. In panel B, we exclude the “below 2” dollars a day category, so that the coefficients should all be read in relation to those between one and two dollars a day. Overall, we do see a strong association between  $\log(\text{monthly per capita expenditure})$  and the probability that one’s mother is alive, with similar coefficients in rural and urban areas. For fathers, the relationship is also strong overall,

4. As well as the IFLS wave for Indonesia.

**Table 7.5** Logit regression: Pooling countries

	Mother alive (1)	Father alive (2)
<i>Panel A</i>		
1. All		
ln(expenditure pc)	0.12 (.016)	0.10 (.016)
2. Rural		
ln(expenditure pc)	0.08 (.024)	0.04 (.026)
3. Urban		
ln(expenditure pc)	0.15 (.022)	0.19 (.023)
<i>Panel B</i>		
1. All		
Below 1	-0.08 (.053)	-0.06 (.055)
2 to 4	0.11 (.041)	0.00 (.043)
6 to 10	0.24 (.057)	0.18 (.059)
2. Rural		
Below 1	-0.08 (.053)	-0.05 (.054)
2 to 4	0.11 (.041)	-0.01 (.043)
6 to 10	0.36 (.098)	0.14 (.097)
3. Urban		
Below 1	-0.08 (.053)	-0.06 (.054)
2 to 4	0.11 (.041)	0.00 (.043)
6 to 10	0.18 (.061)	0.18 (.063)

*Notes:* All countries are pooled. Expenditure per capita expressed in 1993 PPP dollars. All observations are weighted using country weights, such that weights sum to 1 for each country. Regressions control for age of respondent, age squared, and when relevant, rural dummy. In panel B, only individuals living in households with dpce between 0 and 4 or between 6 and 10 are included. The excluded category is "below \$2."

but insignificant in rural areas. Even in rural areas, however, those with DPCE between six and ten dollars are more likely to have their father alive, relative to the poor.

This data, which does not suffer from the obvious problems of fertility differential and endogenous locations, suggests that, conditional on reaching adulthood, the poor are significantly less likely to reach old age than the less poor.

This obviously does not rule out the possibility that the dearth of older

people in poorer households is also partly driven by the decision of which child to live with. Table 7.3 looks at this question directly: we ask whether poorer or richer adults are likely to have their parents live with them, conditional, obviously, on the parents being alive. The answer to this question, interestingly, turns out to vary quite a lot across countries. In the rural areas of six countries out of twelve, mothers are more likely to live with their grown-up children among households with DPCE between two and four dollars. In one country (Pakistan), the ratio is more or less constant. Within countries, the effect of income is not monotonous: out of the seven countries where children who are between two and four dollars a day are more likely to have their mother living with them than the poor, in all but one of the ones for which we have data for the six to ten dollars a day group, the share is lower for that last group than for the two to four dollar group. The pattern for men is somewhat different: there are in fact two cases (Bangladesh and East Timor) where the probability of coresidence decreases in income for men while increasing for women.

Note that out of the six countries where the ratio of old to young among adults was lower among the rich than among the poor, we have information for five on whether parents are alive and where they live. Out of these five countries, four (Mexico, Indonesia, South Africa, and Ivory Coast) are also countries where richer children were less likely to live with their mother than the extremely poor. This suggests that the choice of residence among the old people might have explained at least a part of why there seem to be “missing” older people in poorer households.

To our knowledge, there is very little evidence on adult mortality by income groups in developing countries. For the reasons previously discussed, age pyramids cannot be used to generate such evidence, and it is rare to have data on mortality and on poverty status in the same data sets. This quick panorama based on whether parents are alive seems to establish that in many countries, at least among women, the poor have higher adult mortality than the non-poor (of course it does not tell us anything about the key question of causality—do the poor die or are the dying poor?)

The best way to establish whether the poor really die more than the non-poor, however, is to use a panel data set to measure the mortality of those identified as poor over the next few years. It is not possible for most of our countries, but there are three where the necessary panel data is available: Udaipur (India), Indonesia (IFLS), and Vietnam.

### **7.5 Age-Specific Mortality Rates: Indonesia-Vietnam-India**

The Indonesian Family Life Survey is a panel, of which three waves have already been completed: the first one was fielded in 1993, the second in 1997, and the last one in 2000. For all waves, a lot of effort went into tracking down most of the respondent households (Frankenberg, Thomas, and Smith 2003). When a household was reinterviewed in the second or third phase, the

entire household roster was carefully updated: the interviewers worked with a preprinted list of household members, and asked for each member whether he or she still lived in the household and whether he or she is still alive. In addition, we know if all the members of a given household died.

The Vietnam living standard measurement survey is a two-wave panel, fielded in 1992 and 1993 and 1997 and 1998. As in the Indonesian family life survey, the 1992 and 1993 household roster was updated for all households that were part of the panel in 1997 and 1998, with information for each member of whether they died in the intervening period.

Finally, the Udaipur survey will eventually also be a five-year panel, allowing us to carry out the same exercise, but the endline survey has not been collected yet. Two data sources are available for now: first, a comprehensive update of the household roster was completed after one year. Second, each household is interviewed once a month to monitor health status and health seeking behavior, and if anyone died, this is also indicated in this survey. This survey has been going on for two years (in this version, we only use the one year out mortality).

For all three surveys, we adopted the same method: we determine poverty status in the first wave of the survey; then we compute the probability to have died by the next survey, in different age groups, and notably among the older members.

Table 7.6 presents the results for Indonesia: in all age groups, there is very little difference in death rates between the poor and the extremely poor, but the non-poor are less likely to die than the poor and the extremely poor. This is true both five years out and ten years out, and in both rural and urban areas. In rural areas, depending on the age group and whether we look at five to ten years out, the extremely poor are 1.4 to 5 times more likely to die than those who live between six and ten dollars a day.

In terms of percentage points (and even in terms of ratio of percentages, for the rural areas at least) the largest difference between the poor and the non-poor is seen for the five-years out death rates of those age fifty and over in rural areas. Overall, 15.3 percent of those who were fifty and above in 1993 have died by 1997 among the extremely poor. The number is very similar among all the poor (15.8 percent) but much lower among those who were living between six and ten dollars a day (7 percent). The difference is particularly striking in rural areas (15 percent versus 3 percent) and still large in urban areas (18 percent versus 11 percent).

By 2000, the ratios are much less skewed (22 percent versus 17 percent in the overall population), suggesting that, among the richer households, many of the people who did not die by 1997 have died in the meantime. This is as we might have expected. Clearly by 2050, for example, the ratio would be 100 percent in all income groups.

The patterns are strikingly similar in Vietnam (table 7.7). There again, the percentage who died decline with economic welfare in all age groups, and this decline is particularly steep among the older age group, in the rural areas.



**Table 7.6**                      **Death rate by age and category, IFLS panel**

	All	Rural	Urban
A. Dead by 1997, order than 50 in 1993			
Less than 1 dollar a day	0.154	0.148	0.184
Less than 2 dollars a day	0.158	0.155	0.170
2 to 4 dollars a day	0.135	0.126	0.155
6 to 10 dollars a day	0.073	0.029	0.117
B. Dead by 2000, order than 50 in 1993			
Less than 1 dollar a day	0.222	0.210	0.284
Less than 2 dollars a day	0.229	0.216	0.279
2 to 4 dollars a day	0.222	0.215	0.239
6 to 10 dollars a day	0.178	0.146	0.209
C. Dead by 1997, order than 45 in 1993			
Less than 1 dollar a day	0.137	0.129	0.183
Less than 2 dollars a day	0.141	0.136	0.164
2 to 4 dollars a day	0.119	0.114	0.131
6 to 10 dollars a day	0.069	0.030	0.106
D. Dead by 2000, order than 45 in 1993			
Less than 1 dollar a day	0.204	0.192	0.269
Less than 2 dollars a day	0.208	0.193	0.266
2 to 4 dollars a day	0.196	0.192	0.205
6 to 10 dollars a day	0.153	0.125	0.180
E. Dead by 1997, aged between 15 and 45 in 1993			
Less than 1 dollar a day	0.021	0.023	0.012
Less than 2 dollars a day	0.037	0.033	0.052
2 to 4 dollars a day	0.009	0.007	0.011
6 to 10 dollars a day	0.010	0.009	0.012
F. Dead by 2000, aged between 15 and 45 in 1993			
Less than 1 dollar a day	0.053	0.056	0.038
Less than 2 dollars a day	0.060	0.053	0.082
2 to 4 dollars a day	0.013	0.012	0.015
6 to 10 dollars a day	0.014	0.011	0.017
G. Dead by 1997, aged between 5 and 15 in 1993			
Less than 1 dollar a day	0.014	0.017	0.018
Less than 2 dollars a day	0.030	0.029	0.037
2 to 4 dollars a day	0.003	0.004	0.002
6 to 10 dollars a day	0.011	0.010	0.011
H. Dead by 2000, aged between 5 and 15 in 1993			
Less than 1 dollar a day	0.044	0.046	0.034
Less than 2 dollars a day	0.050	0.045	0.067
2 to 4 dollars a day	0.009	0.011	0.006
6 to 10 dollars a day	0.013	0.010	0.016
I. Dead by 1997, aged less than 5 in 1993			
Less than 1 dollar a day	0.027	0.031	0.000
Less than 2 dollars a day	0.038	0.040	0.032
2 to 4 dollars a day	0.008	0.005	0.011
6 to 10 dollars a day	0.010	0.018	0.000
J. Dead by 2000, aged less than 5 in 1993			
Less than 1 dollar a day	0.046	0.048	0.030
Less than 2 dollars a day	0.055	0.054	0.057
2 to 4 dollars a day	0.013	0.011	0.018
6 to 10 dollars a day	0.012	0.018	0.006

*Note:* Data is from the IFLS panel. Each cell is the fraction of people found in 1993 who have died by the indicated year.

**Table 7.7** Death rates by age and consumption category, VLSS panel

	All	Rural	Urban
A. Dead by 1997, order than 50 in 1993			
Less than 1 dollar a day	0.145	0.149	
Less than 2 dollars a day	0.131	0.131	0.132
2 to 4 dollars a day	0.111	0.115	0.100
6 to 10 dollars a day	0.098	0.053	0.108
B. Dead by 1997, order than 45 in 1993			
Less than 1 dollar a day	0.120	0.124	
Less than 2 dollars a day	0.112	0.112	0.110
2 to 4 dollars a day	0.096	0.098	0.090
6 to 10 dollars a day	0.080	0.040	0.090
C. Dead by 1997, aged between 15 and 45 in 1993			
Less than 1 dollar a day	0.010	0.010	
Less than 2 dollars a day	0.010	0.010	0.007
2 to 4 dollars a day	0.008	0.006	0.014
6 to 10 dollars a day	0.000	0.000	0.000
D. Dead by 1997, aged between 5 and 15 in 1993			
Less than 1 dollar a day	0.007	0.008	
Less than 2 dollars a day	0.006	0.006	0.000
2 to 4 dollars a day	0.004	0.003	0.005
6 to 10 dollars a day	0.000	0.000	0.000
E. Dead by 1997, aged less than 5 in 1993			
Less than 1 dollar a day	0.015	0.012	n.a.
Less than 2 dollars a day	0.012	0.012	0.014
2 to 4 dollars a day	0.007	0.005	0.011
6 to 10 dollars a day	0.000	0.000	0.000

*Notes:* Data is from the Vietnam Living Standard Survey (VLSS). Each cell is the fraction of people found in 1992 who have died by 1997.

Overall, 14.4 percent of those age fifty and above who lived in extremely poor households in 1992 and 1993 have died by 1997 and 1998, versus 9.8 percent among those who were living in households with DPCE between six and ten dollars. In rural areas, the probabilities are, respectively, 15 percent and 5 percent. These numbers are very close to the Indonesian numbers, and suggest that those numbers are unlikely to be just due to chance: above fifty, it seems the rural extremely poor are at least three times more likely to die than the less poor.

It should be noted that those ratios indicate high mortality rates among the old, compared to the United States: For example, in the Health and Retirement Study (HRS), 6 percent of the sample aged between fifty and fifty-nine in the first wave had died by 1998 (in six years).<sup>5</sup>

5. It should be noted that the HRS 1992 sample is younger, since only individuals ages fifty to fifty-nine were sampled. The unweighted average age in the HRS 1992 sample is 55.26, versus 62.6 among all those age fifty-five or above in the Vietnamese survey.

**Table 7.8** **Udaipur**

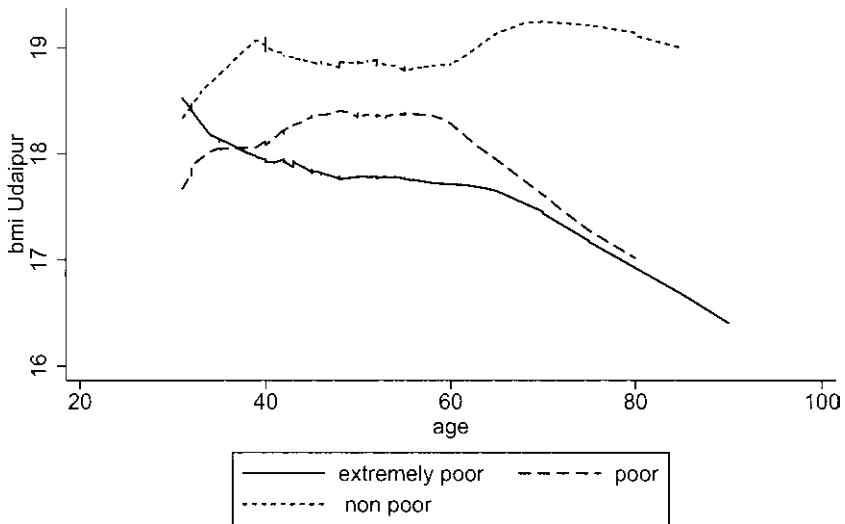
	Mortality one year out	Mortality two years out
A. Aged 50 or more at baseline		
Less than 1 dollar a day	0.053	0.0659
Less than 2 dollars a day	0.0462	0.0489
More than 2 dollars a day	0.0349	0.0535
B. Aged 46 or more at baseline		
Less than 1 dollar a day	0.0488	0.0521
Less than 2 dollars a day	0.0406	0.0405
More than 2 dollars a day	0.0321	0.045
C. Aged 16 to 45 at baseline		
Less than 1 dollar a day	0.0099	0.0098
Less than 2 dollars a day	0.0058	0.0057
More than 2 dollars a day	0	0.0184
D. Aged 6 to 15 at baseline		
Less than 1 dollar a day	0.0014	0.0066
Less than 2 dollars a day	0.0046	0.0087
More than 2 dollars a day	0.0159	0
E. Aged less than 5 at baseline		
Less than 1 dollar a day	0.0354	0.0273
Less than 2 dollars a day	0.0228	0.0279
More than 2 dollars a day	0	0

*Note:* Data is from the Udaipur survey.

The results we have for Udaipur are not directly comparable to the results for Vietnam and Indonesia for two reasons: the mortality is only after one year, and there are almost no households in the sample with consumption per capita between six and ten dollars a day. Given the number of observations in each group, and for more clarity, we present the results for three groups: the extremely poor, those with DPCE between one and two dollars, and those with DPCE above two dollars.

Despite these differences, the patterns we find in Udaipur are entirely consistent with those for Indonesia and Vietnam. Here again, in all age groups, the mortality is higher for the extremely poor than for the poor and the non-poor. And once again, the largest difference in percentage point are found among the older people. The probability of dying within a year is 5.8 percent for the extremely poor, 4.6 percent for the poor, and 3.4 percent for those with DPCE above two dollars.

In all three countries, death rates are thus higher for the poor at all consumption levels, and in particular for the old. This higher mortality among the old is particularly striking given that the poor tend to die more at every age, and therefore the surviving old poor might be selected to be particularly healthy. One possible interpretation is that the difference in lifestyle in this group, albeit incremental, does generate these differences in mortality rates. Another possibility (and possibly both coexist) is that poor health is disabling, and responsible for maintaining those households in poverty.



**Fig. 7.1 Udaipur: Relationship between BMI and age, by expenditure categories, females**

## 7.6 Aging, Health, and Poverty in India and Indonesia

To shed more light on these rather concerning statistics about death, we now examine the correlation of age and health status among the poor and the less poor in two of the surveys where we conducted the mortality analysis, where we also have detailed health data: Udaipur and Indonesia.

For the two countries, we simply plot nonparametric regressions of a number of health and mental health indicators on age separately by gender and by income groups: in Udaipur we plot these graphs for the extremely poor (less than a dollar a day), the poor (one to two dollars a day) and the non-poor (more than two dollars a day). In Indonesia, we plot these graphs for the extremely poor, the poor, those with DPCE between two and four dollars and those with DPCE between six and ten dollars. Note that this cross-sectional correlation may underestimate the deterioration of health with age (relative to a panel where people would be compared over time), since the weakest people presumably disappear from the sample as they age. Given the differential mortality we have described among the poor and non-poor, this implies that there is a stronger negative bias among the poor than the non-poor, and therefore, everything else equal, we will tend to underestimate any differences in the slope of health with respect to age between the groups.

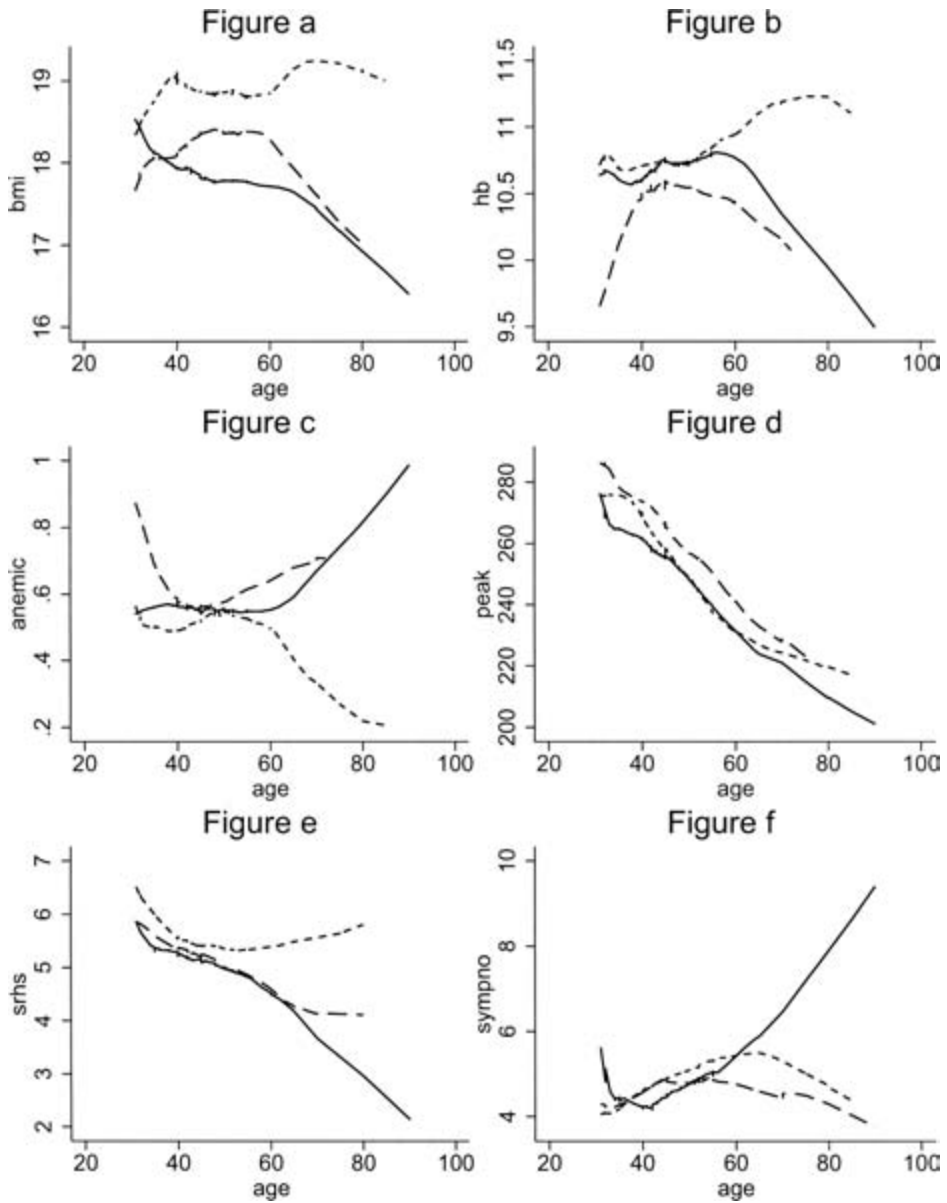
The indicators we look at are body mass index, hemoglobin (Hb) levels, and anemia (defined as less Hb below 12 g/dl for women and 13g/dl for men), lung capacity (measured as the maximum of three peak flow meters reading), self-reported health status, number of activities of daily living that the

person carries out with difficulty or not at all (excluding eating, dressing, and going to the bathroom), and self-reported well-being (which is available only in Udaipur). In addition we have signs of depression, measured differently in both surveys. In Udaipur it is defined as the answer to the question, “In the last twelve months, was there a period of at least one month where you felt worried, tense or anxious?” In Indonesia it is the number of symptoms over the last four weeks from among the following: having difficulty sleeping, being bothered by things, feeling lonely, being sad, being anxious, having difficulty concentrating, and finding everything an effort.

In Udaipur (Udaipur figures, figures 7.2 and 7.3), for most indicators health seems to deteriorate more strongly with age among the poor than the non-poor. Starting with women, BMI, for example, decreases with age for the poorer categories, while it does not among the non-poor. Anemia rises much more steeply with age among the extremely poor than among the poor and it does not increase with age for the non-poor. The same pattern can also be seen for self-reported health status, number of symptoms of acute morbidity, self-reported well-being, and symptoms of depression over the last year. The only variables that do not follow this pattern are the activities of daily living (ADL) limitations, the peak flow meter reading, and the time spent in squatting and getting up for five times (as well as the inability or refusal to do it). Interestingly, the patterns for males are similar for all the objective measures, and different for the self-reported measures (self-reported health status, number of symptoms, symptoms of depressions). The responses to this last set of questions do not always indicate a deterioration with age, and when they do, the slopes are similar for the extremely poor, the poor and the non-poor. The only exception is self-reported well-being, which actually is positively correlated with age for the sixty and eighty age group for the two richer categories, and negatively for the poorest. It could be because men, and in particular older men, are more reluctant to complain. Alternatively, given the Indian context, it is quite likely that older women are substantially less well treated than older men, which could increase both their likelihood of being depressed and their vulnerability to various ailments.

On the whole, in Udaipur, a simple story can be told: as they get older, the poor get comparably weaker and weaker, and they are also more likely to die. Again, it could be that they were always frail (which is why they were poor), and so support age less well, or it could be that poverty accelerates age’s damage on the body.

The same analysis for Indonesia does not reveal a similar pattern for all the objective variables, where the slopes are very similar for the poor and non-poor. Hemoglobin levels, if anything, are positively correlated with age among the poor, and negatively among the non-poor. But here again, we find that women’s self-reported health status, depression symptoms, and number of health complaints over the last months all worsen more with age



**Fig. 7.2** Udaipur: Health indicators and age, females

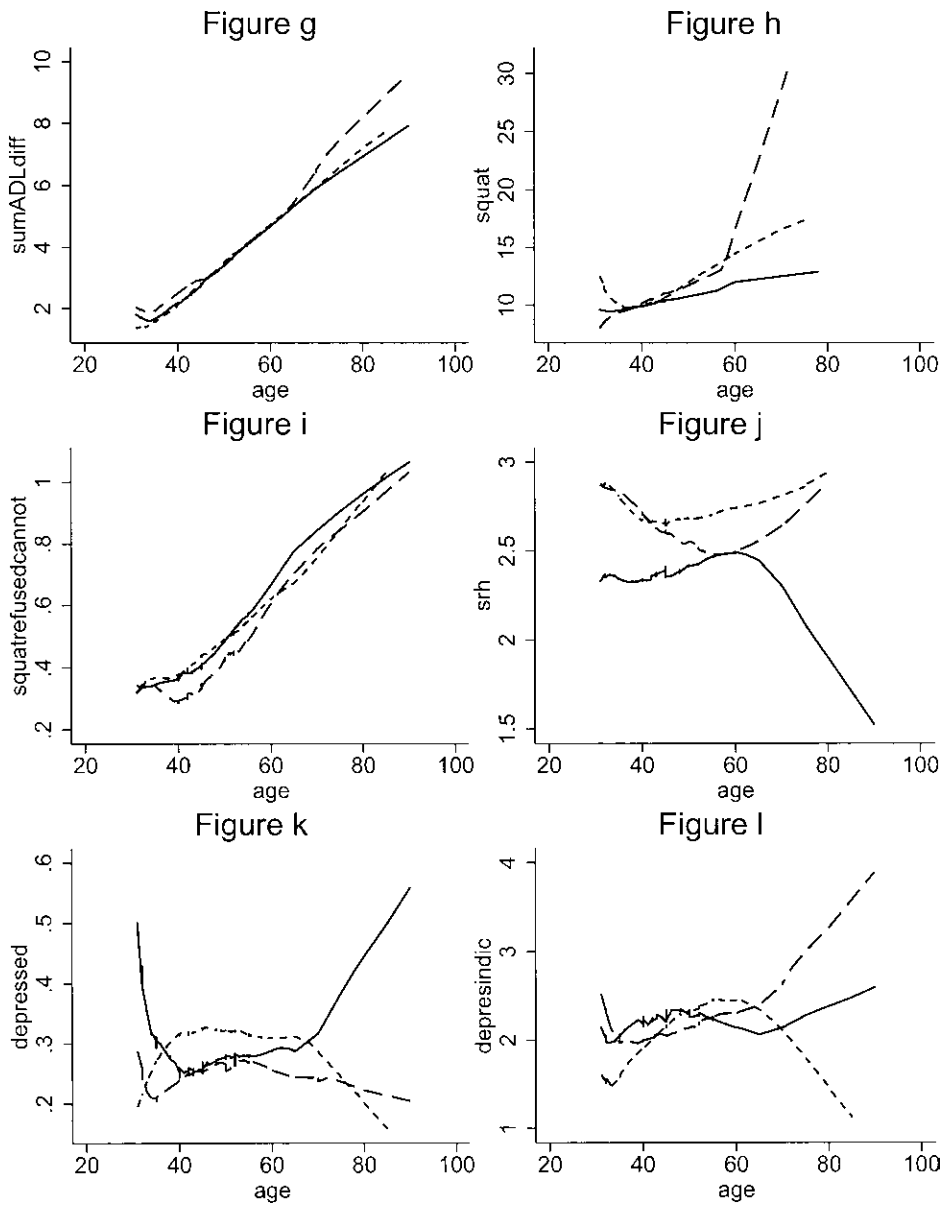
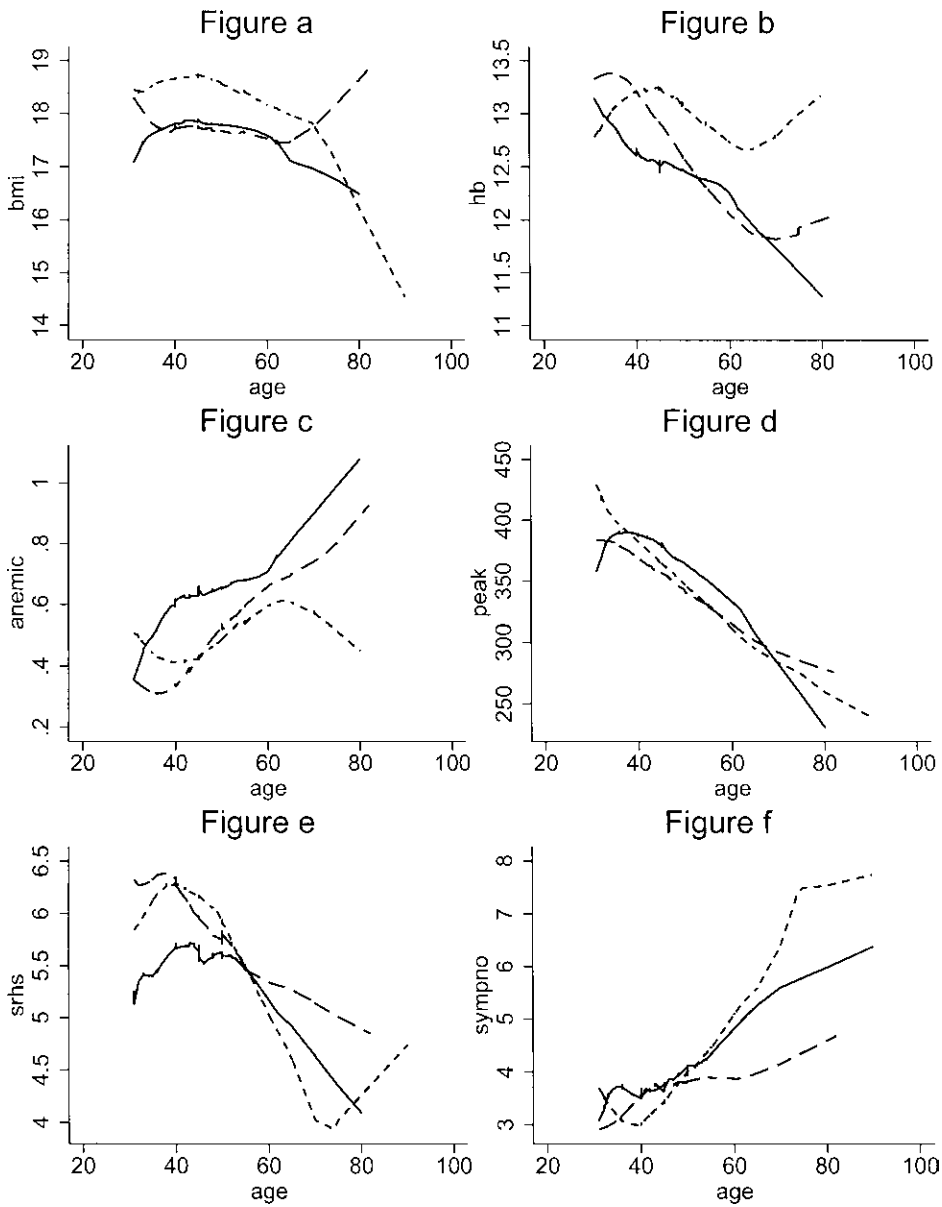


Fig. 7.2 (cont.)



**Fig. 7.3 Udaipur: Health indicators and age, males**



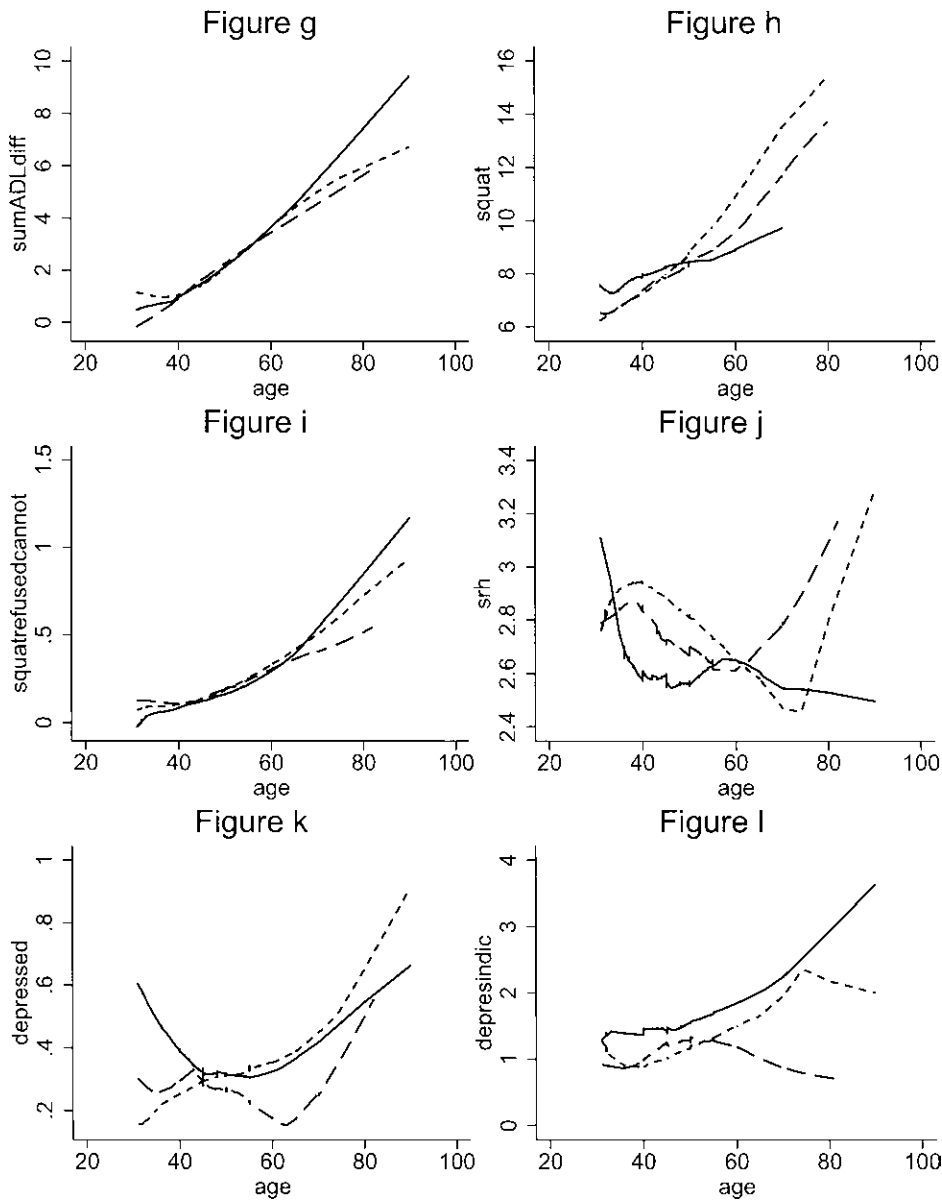
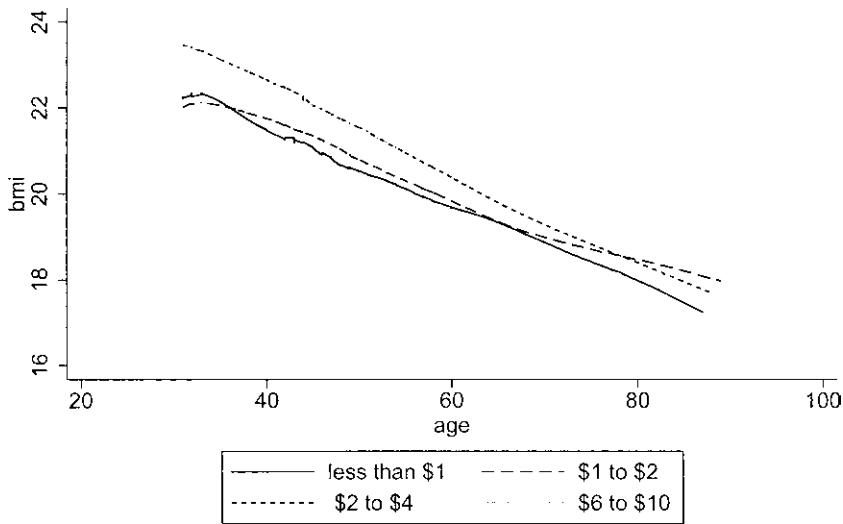


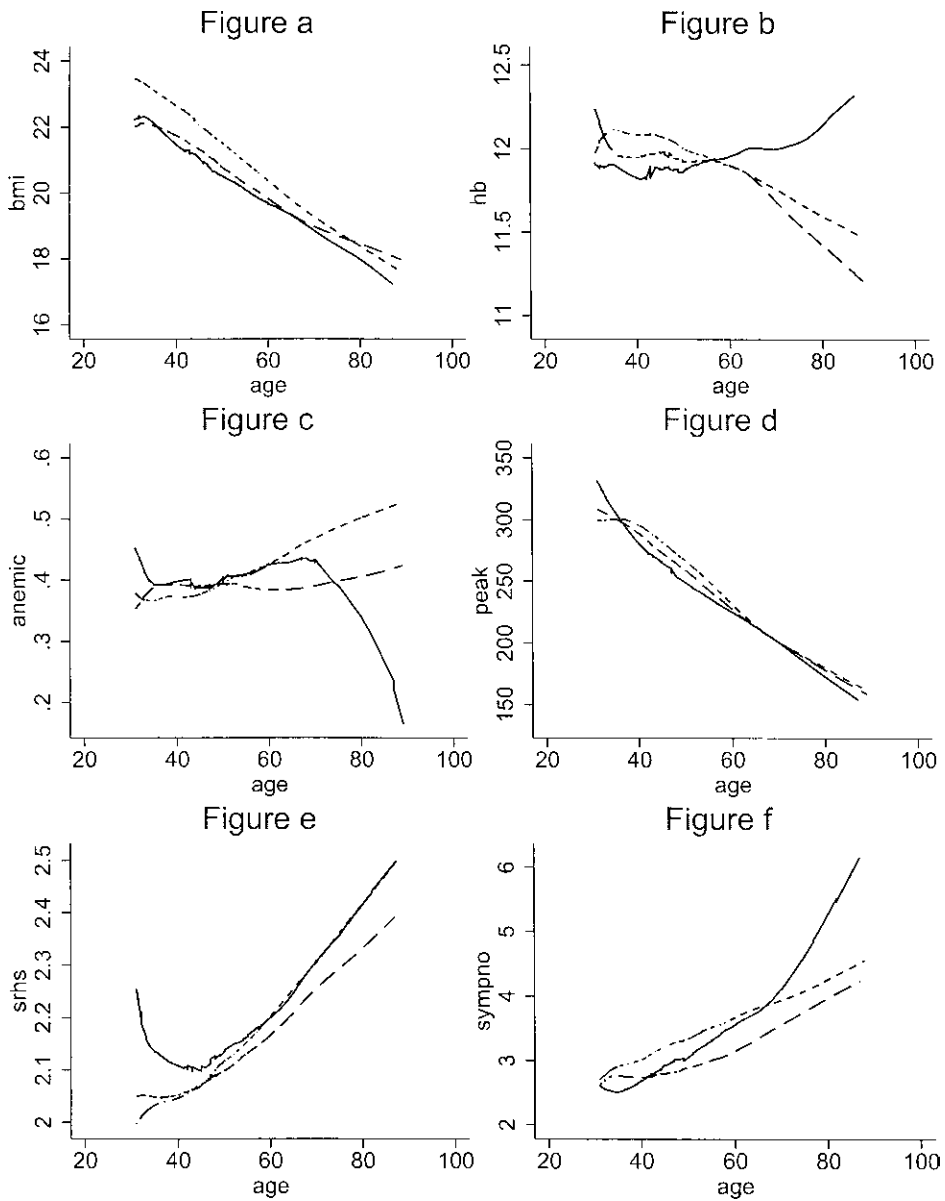
Fig. 7.3 (cont.)



**Fig. 7.4 Rural Indonesia: Relationship between BMI and age, by expenditure categories, females**

for the poor than for the non-poor (note that in this data, a higher value for self-reported health status variables indicate *worse* health, not better). And once again, this is not true for men.

Unlike Udaipur, there seems to be some tension between the health indicators and the actual mortality in rural Indonesia. One can offer different conjectures for this phenomenon. If one is prepared to take the subjective indicators seriously, one possible explanation is that the “objective” indicators we have here (anemia, BMI, lung capacity, time to squat, and ADLs) are indicative of chronic conditions that are often incurable, at least for older people. However, because of their better access to sanitation and good health care, the rich are less likely to be susceptible to acute conditions (hence the differential age slopes for the number of symptoms they report), and also perhaps less likely to die from them, in part because they are more likely to be treated (for example, an untreated cold for an older person may turn into a pneumonia and kill them, while a younger person would recover from it). Another possibility, if one thinks that the “subjective” measures reveal more about the psychology of the respondent than about their real health status, is that the older poor people become comparatively unhappier with age (the IFLS do not seem to have self-reported happiness indexes, but they do have depression indicators for the past month and the old poor women are much more likely to have those symptoms (see figure 7.5, panel i), which is also why they report more symptoms and worse self-reported health status. If this is true, they may then be less likely to effectively fight illnesses, which, in turn, make him or her more likely to die.



**Fig. 7.5 Rural Indonesia: Health indicators and age, females**

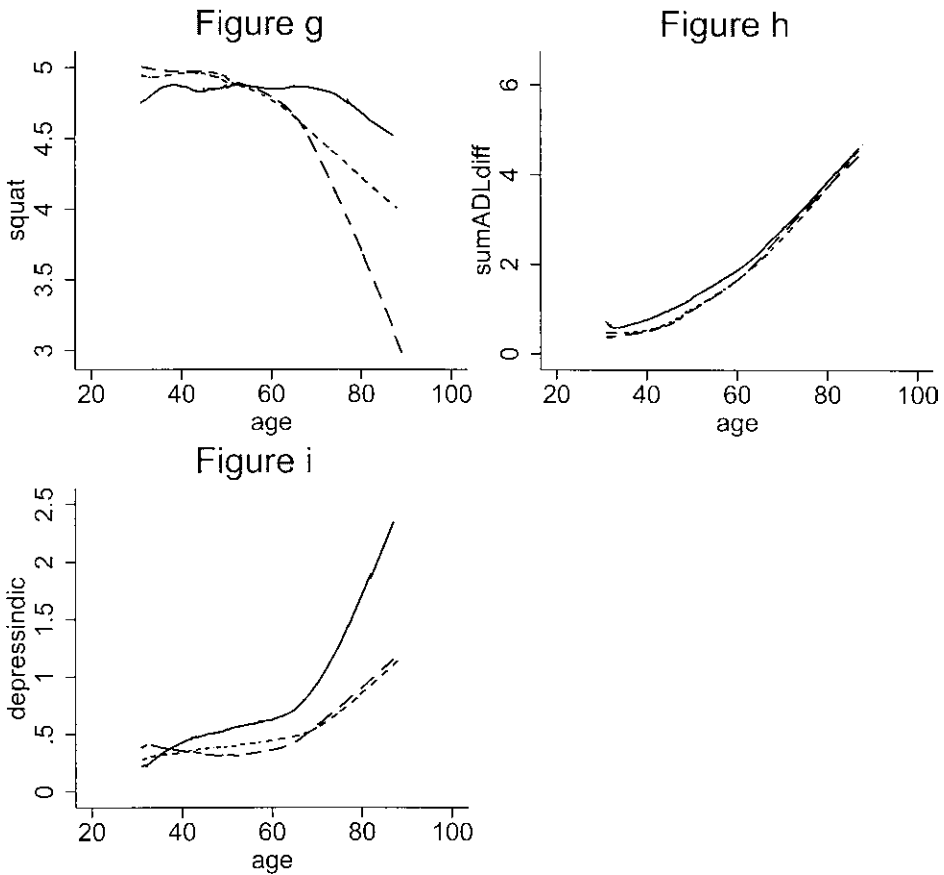
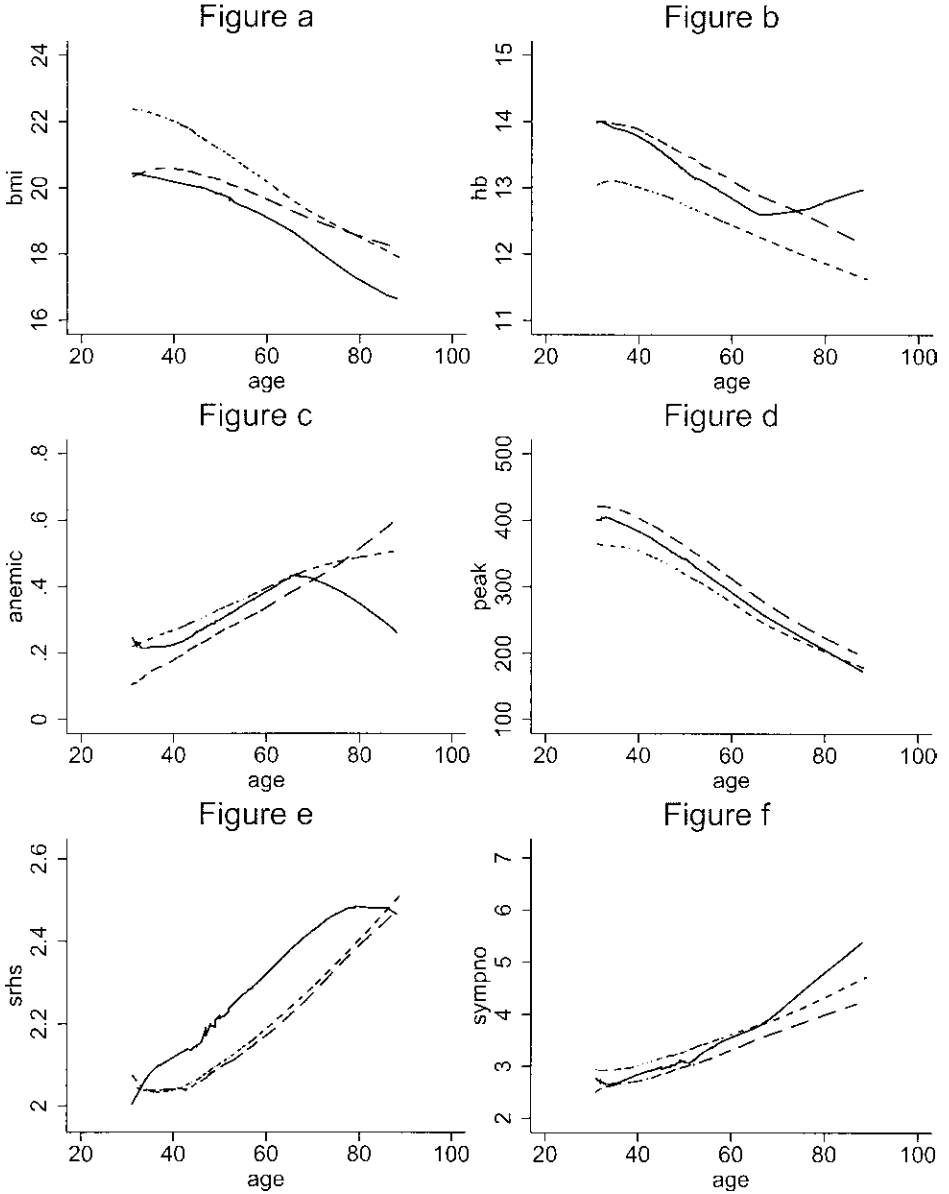


Fig. 7.5 (cont.)

### 7.7 Discussion and Interpretation

This chapter brings together various pieces of evidence that all point in the same direction: the poor, and particularly the extremely poor, have a lower chance of survival than those who are somewhat more well-off. We have not tried to disentangle the direction of the causality: these adults could be poor because they are in poor health, which would then in turn explain why they are more likely to die. Or alternatively, being poor could make them more likely to die. And of course, both directions of causality may be true at the same time. It is worth pointing out, however, that most old people in developing countries live with other, younger, adults: in Vietnam, for example, this is true of 80 percent of the older adults. And if we restrict the sample to



**Fig. 7.6 Rural Indonesia: Health indicators and age, males**

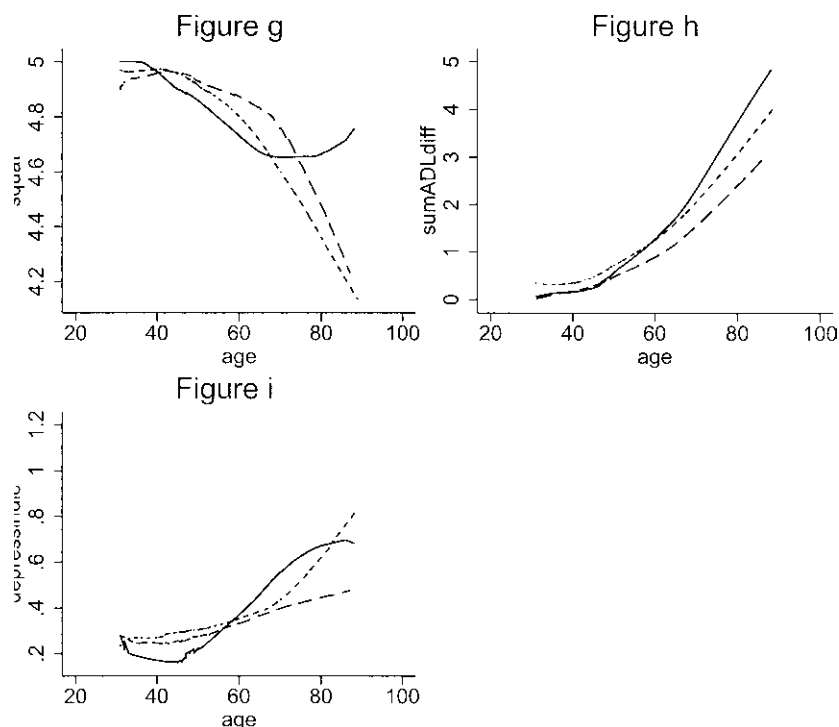


Fig. 7.6 (cont.)

only those people who do live with a younger adult, we find the same excess mortality rate among the poorer old people than in the entire sample.

This weakens the case for a direct link going only from the health of the old people to the poverty status of the household. This point is further strengthened by the fact that when we look at older women in households where there are prime-age adults, we continue to find the same pattern (in Vietnam, for example, for women above fifty who live with prime-age adults, the five-year mortality rate goes from 12 percent among the poor to 7.7 percent among those with DPCE between six and ten dollars). Since older women in households with prime-age adults are very unlikely to be engaged in any market work, it is unlikely that it is because they are unhealthy that the household is poor. To the extent poor health is in part inherited, it could, of course, be the case that unhealthy old people live with unhealthy younger adults, and this is the reason why the household is poor.

On balance, we are tempted to interpret the evidence accumulated in this chapter as revealing, at least in part, that poverty does kill.

# Appendix

Table 7/A.1 Share of women in different age group in the population, by consumption category

	Girls age 0–12					Girls age 13–18					Women age 20–50					Women age 51 and above					
	<\$1	<\$2	\$2–\$4	\$6–\$10	>\$10	<\$1	<\$2	\$2–\$4	\$6–\$10	>\$10	<\$1	<\$2	\$2–\$4	\$6–\$10	>\$10	<\$1	<\$2	\$2–\$4	\$6–\$10	>\$10	
Rural																					
Bangladesh	0.19	0.18	0.14	0.1	0.06	0.06	0.06	0.06	0.08	0.18	0.19	0.2	0.17	0.06	0.06	0.06	0.08	0.09	0.09	0.09	
Brazil	0.22	0.18	0.13	0.09	0.07	0.07	0.06	0.08	0.08	0.15	0.16	0.19	0.24	0.02	0.05	0.1	0.09	0.09	0.09	0.09	
East Timor	0.22	0.2	0.17	0.23	0.06	0.06	0.04	0	0	0.16	0.17	0.18	0.24	0.03	0.03	0.06	0.12	0.12	0.12	0.12	
Ecuador	0.14	0.19	0.16	0.11	0.03	0.07	0.07	0.06	0.06	0.16	0.17	0.21	0.25	0.03	0.04	0.05	0.09	0.09	0.09	0.09	
Guatemala	0.22	0.23	0.21	0.19	0.07	0.06	0.07	0.09	0.09	0.16	0.16	0.17	0.19	0.03	0.03	0.03	0.04	0.04	0.04	0.04	
Hyderabad	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Indonesia00	0.13	0.13	0.12	0.08	0.08	0.07	0.07	0.08	0.08	0.19	0.2	0.2	0.23	0.06	0.07	0.06	0.07	0.07	0.07	0.07	
Indonesia93	0.17	0.17	0.15	0.11	0.06	0.06	0.07	0.06	0.06	0.18	0.19	0.21	0.23	0.09	0.08	0.08	0.09	0.09	0.09	0.09	
Indonesia97	0.16	0.14	0.12	0.12	0.07	0.07	0.08	0.06	0.06	0.18	0.19	0.2	0.23	0.1	0.1	0.09	0.09	0.09	0.09	0.09	
Ivory Coast	0.1	0.09	0.1	0.08	0.06	0.08	0.09	0.11	0.11	0.16	0.16	0.16	0.17	0.06	0.04	0.03	0.01	0.01	0.01	0.01	
Mexico	0.15	0.17	0.13	0.12	0.08	0.06	0.08	0.05	0.05	0.17	0.21	0.24	0.3	0.07	0.06	0.07	0.09	0.09	0.09	0.09	
Nicaragua	0.2	0.19	0.16	0.1	0.07	0.07	0.07	0.08	0.08	0.14	0.14	0.16	0.19	0.03	0.04	0.06	0.1	0.1	0.1	0.1	
Pakistan*	0.09	0.09	0.08	n.a.	0.06	0.06	0.08	n.a.	n.a.	0.13	0.14	0.15	n.a.	0.04	0.05	0.06	n.a.	n.a.	n.a.	n.a.	
Panama	0.2	0.2	0.16	0.11	0.08	0.06	0.06	0.05	0.05	0.15	0.14	0.15	0.19	0.03	0.04	0.06	0.1	0.1	0.1	0.1	
Papua New Guinea	0.2	0.18	0.14	0.12	0.08	0.07	0.07	0.06	0.06	0.18	0.18	0.19	0.2	0.02	0.02	0.04	0.04	0.04	0.04	0.04	
Peru	0.23	0.21	0.14	n.a.	0.06	0.07	0.06	n.a.	n.a.	0.15	0.15	0.18	n.a.	0.04	0.05	0.08	n.a.	n.a.	n.a.	n.a.	
South Africa	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.18	0.19	0.23	0.25	0.08	0.08	0.09	0.08	0.08	0.08	0.08	
Tanzania	0.2	0.2	0.17	0.2	0.07	0.07	0.08	0.07	0.07	0.15	0.16	0.18	0.19	0.05	0.05	0.04	0.1	0.1	0.1	0.1	
Udaipur	0.21	0.19	0.12	n.a.	0.06	0.06	0.08	n.a.	n.a.	0.15	0.16	0.17	n.a.	0.04	0.05	0.09	n.a.	n.a.	n.a.	n.a.	
Vietnam9293	0.19	0.17	0.13	0.12	0.04	0.05	0.06	0.04	0.04	0.08	0.1	0.09	0.09	0.01	0.01	0.02	0.02	0.02	0.02	0.02	
Vietnam9798	0.26	0.2	0.14	0.08	0.08	0.08	0.08	0.09	0.09	0.14	0.17	0.19	0.19	0.05	0.06	0.09	0.09	0.09	0.09	0.09	

Urban	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Bangladesh	0.27	0.19	0.15	0.11	0.07	0.07	0.07	0.06	0.16	0.17	0.19	0.23	0.04	0.06	0.07	n.a.	n.a.	n.a.	
Brazil	0.17	0.18	0.16	0.14	0.06	0.08	0.07	0.05	0.16	0.16	0.18	0.22	0.04	0.03	0.03	0.02	0.02	0.08	
East Timor	0.2	0.18	0.14	0.11	0.06	0.07	0.07	0.07	0.14	0.15	0.18	0.21	0.06	0.07	0.08	0.08	0.08	0.08	
Ecuador	0.17	0.14	0.1	0.09	0.07	0.07	0.07	0.05	0.19	0.21	0.23	0.21	0.03	0.04	0.04	0.04	0.04	0.04	
Hyderabad	0.11	0.12	0.1	0.07	0.05	0.06	0.06	0.05	0.18	0.21	0.24	0.27	0.08	0.07	0.07	0.07	0.07	0.07	
Indonesia00	0.15	0.15	0.14	0.1	0.06	0.07	0.07	0.1	0.19	0.19	0.21	0.23	0.1	0.08	0.07	0.06	0.06	0.06	
Indonesia93	0.1	0.12	0.11	0.09	0.08	0.08	0.07	0.08	0.18	0.19	0.22	0.24	0.1	0.1	0.09	0.07	0.07	0.07	
Indonesia97	0.09	0.09	0.1	0.08	0.06	0.06	0.07	0.06	0.17	0.17	0.16	0.21	0.05	0.05	0.05	0.04	0.04	0.04	
Ivory Coast	0.19	0.18	0.14	0.14	0.09	0.08	0.07	0.08	0.17	0.19	0.24	0.27	0.05	0.06	0.07	0.08	0.08	0.08	
Mexico	0.21	0.2	0.15	0.1	0.07	0.07	0.08	0.07	0.15	0.16	0.19	0.24	0.05	0.05	0.06	0.08	0.08	0.08	
Nicaragua	0.11	0.1	0.07	0.07	0.07	0.07	0.08	0.08	0.14	0.14	0.17	0.16	0.04	0.04	0.04	0.06	0.06	0.06	
Pakistan*	n.a.	0.23	0.18	0.13	n.a.	0.06	0.07	0.06	n.a.	0.17	0.17	0.22	n.a.	0.03	0.05	0.07	0.07	0.07	
Panama	0.22	0.2	0.15	0.16	0.11	0.07	0.07	0.04	0.14	0.17	0.21	0.18	0.01	0.02	0.03	0.01	0.01	0.01	
Papua New Guinea	0.21	0.18	0.14	0.1	0.08	0.08	0.08	0.08	0.17	0.17	0.21	0.24	0.01	0.04	0.06	0.08	0.08	0.08	
Peru	0.03	0.03	0.03	0.03	0.01	0.02	0.02	0.02	0.19	0.2	0.23	0.25	0.09	0.07	0.07	0.06	0.06	0.06	
South Africa	0.17	0.18	0.16	0.14	0.08	0.07	0.08	0.07	0.14	0.16	0.19	0.22	0.1	0.06	0.04	0.03	0.03	0.03	
Tanzania	n.a.	n.a.	0.11	n.a.	n.a.	0.11	0.11	n.a.	n.a.	n.a.	0.14	n.a.	n.a.	n.a.	0.11	n.a.	n.a.	n.a.	
Udaipur	0.14	0.15	0.12	0.09	0.05	0.06	0.06	0.04	0.1	0.11	0.13	0.19	0.01	0.01	0.03	0.05	0.05	0.05	
Vietnam9293	n.a.	0.14	0.13	0.08	n.a.	0.05	0.08	0.07	n.a.	0.18	0.21	0.25	n.a.	0.08	0.1	0.11	0.11	0.11	
Vietnam9798	n.a.	0.14	0.13	0.08	n.a.	0.05	0.08	0.07	n.a.	0.18	0.21	0.25	n.a.	0.08	0.1	0.11	0.11	0.11	



**Table 7/A.2** Share of men in different age group in the population, by consumption category

	Boys age 0-12					Boys age 13-18					Men age 20-50					Men age 51 and above					
	<\$1	<\$2	\$2-\$4	\$6-\$10	>\$10	<\$1	<\$2	\$2-\$4	\$6-\$10	>\$10	<\$1	<\$2	\$2-\$4	\$6-\$10	>\$10	<\$1	<\$2	\$2-\$4	\$6-\$10	>\$10	
Rural																					
Bangladesh	0.18	0.17	0.15	0.07	0.07	0.07	0.08	0.08	0.13	0.13	0.16	0.16	0.18	0.21	0.06	0.06	0.08	0.12			
Brazil	0.23	0.2	0.13	0.1	0.09	0.09	0.08	0.07	0.05	0.05	0.14	0.16	0.2	0.23	0.04	0.05	0.09	0.11			
East Timor	0.21	0.22	0.18	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.14	0.15	0.18	0.21	0.04	0.04	0.05	0.08			
Ecuador	0.34	0.22	0.17	0.12	0.1	0.07	0.07	0.06	0.06	0.14	0.16	0.19	0.22	0.04	0.04	0.05	0.07				
Guatemala	0.21	0.22	0.21	0.2	0.05	0.06	0.06	0.06	0.06	0.14	0.14	0.14	0.14	0.13	0.04	0.04	0.04	0.04			
Hyderabad	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.			
Indonesia00	0.13	0.14	0.12	0.09	0.06	0.06	0.06	0.06	0.05	0.2	0.2	0.23	0.27	0.27	0.06	0.06	0.07	0.07			
Indonesia93	0.18	0.17	0.15	0.13	0.06	0.06	0.06	0.07	0.09	0.16	0.17	0.18	0.19	0.19	0.08	0.07	0.07	0.07			
Indonesia97	0.16	0.15	0.12	0.09	0.06	0.07	0.08	0.08	0.06	0.16	0.17	0.19	0.22	0.22	0.08	0.08	0.08	0.08			
Ivory Coast	0.21	0.21	0.19	0.15	0.07	0.08	0.09	0.09	0.08	0.09	0.11	0.14	0.18	0.18	0.04	0.04	0.04	0.03			
Mexico	0.14	0.16	0.14	0.11	0.09	0.08	0.08	0.06	0.05	0.19	0.19	0.22	0.25	0.25	0.05	0.06	0.07	0.07			
Nicaragua	0.21	0.2	0.16	0.07	0.1	0.09	0.08	0.08	0.07	0.12	0.14	0.16	0.2	0.2	0.04	0.05	0.07	0.1			
Pakistan*	0.22	0.21	0.17	0.14	0.07	0.07	0.07	0.07	0.06	0.14	0.15	0.17	0.19	0.19	0.05	0.05	0.07	0.04			
Panama	0.23	0.22	0.18	0.12	0.09	0.08	0.08	0.08	0.06	0.12	0.14	0.17	0.21	0.21	0.04	0.05	0.07	0.11			
Papua New Guinea	0.17	0.19	0.19	0.16	0.07	0.07	0.07	0.08	0.09	0.15	0.16	0.18	0.21	0.21	0.04	0.04	0.04	0.04			
Peru	0.21	0.2	0.15	n.a.	0.05	0.06	0.06	0.07	n.a.	0.14	0.15	0.17	n.a.	n.a.	0.05	0.05	0.08	n.a.			
South Africa	0.04	0.04	0.04	0.03	0.01	0.02	0.02	0.02	0.02	0.14	0.15	0.2	0.37	0.37	0.06	0.06	0.06	0.07			
Tanzania	0.21	0.21	0.16	0.09	0.07	0.07	0.07	0.07	0.09	0.12	0.13	0.16	0.16	0.16	0.05	0.05	0.06	0.05			
Udaipur	0.22	0.2	0.12	n.a.	0.05	0.06	0.06	0.06	n.a.	0.16	0.17	0.2	n.a.	n.a.	0.04	0.05	0.09	n.a.			
Vietnam9293	0.18	0.18	0.13	0.18	0.04	0.05	0.06	0.06	0.01	0.08	0.1	0.09	0.1	0.1	0.01	0.02	0.03	0.01			
Vietnam9798	0.2	0.2	0.15	0.11	0.08	0.07	0.08	0.08	0.09	0.15	0.16	0.17	0.18	0.18	0.02	0.04	0.06	0.06			



Table 7A.3 Out of the individuals age 31 to 50 whose mother is alive

	Fraction whose father lives in household				Fraction whose mother lives in household			
	< \$1	< \$2	\$2–\$4	\$6–\$10	< \$1	< \$2	\$2–\$4	\$6–\$10
<b>Rural</b>								
Bangladesh	0.14	0.11	0.11	0.09	0.20	0.22	0.25	0.15
Brazil	0.02	0.06	0.15	0.10	0.03	0.09	0.17	0.14
East Timor	0.27	0.08	0.19	0.00	0.11	0.14	0.27	0.29
Indonesia93	0.04	0.04	0.02	0.00	0.11	0.09	0.06	0.05
Indonesia97	0.21	0.12	0.07	0.02	0.24	0.19	0.15	0.14
Indonesia00	0.14	0.14	0.11	0.03	0.25	0.19	0.20	0.13
Ivory Coast	0.31	0.12	0.08	0.00	0.35	0.13	0.10	0.00
Mexico	0.30	0.21	0.14	0.10	0.32	0.21	0.14	0.14
Nicaragua	0.12	0.12	0.13	0.14	0.12	0.13	0.14	0.16
Pakistan	0.27	0.26	0.29	n.a.	0.26	0.27	0.26	n.a.
South Africa	0.39	0.32	0.23	0.10	0.57	0.50	0.36	0.18
Udaipur	0.09	0.11	0.15	n.a.	0.09	0.13	0.16	n.a.
Vietnam92	n.a.	0.16	0.21	0.14	n.a.	0.27	0.25	0.22
<b>Urban</b>								
Brazil	0.13	0.21	0.13	0.07	0.01	0.20	0.16	0.15
East Timor	0.14	0.11	0.15	0.04	0.16	0.12	0.17	0.02
Indonesia93	0.05	0.04	0.03	0.04	0.19	0.15	0.07	0.04
Indonesia97	0.33	0.20	0.12	0.03	0.28	0.30	0.20	0.15
Indonesia00	0.26	0.20	0.11	0.10	0.54	0.29	0.22	0.20
Ivory Coast	0.32	0.16	0.09	0.00	0.34	0.24	0.10	0.00
Mexico	0.17	0.17	0.18	0.07	0.18	0.18	0.15	0.11
Nicaragua	0.17	0.11	0.09	0.07	0.20	0.22	0.21	0.16
Pakistan	0.25	0.25	0.22	0.38	0.23	0.23	0.20	0.30
South Africa	0.39	0.34	0.25	0.10	0.68	0.54	0.34	0.12
Vietnam92	0.18	0.11	0.09	0.00	0.21	0.17	0.14	0.22

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## Comment      Amitabh Chandra and Heidi Williams

The World Bank estimated that in 2001, 1.1 billion individuals lived under a dollar a day, and over 2.7 billion (approximately half of the world's population) lived on less than two dollars a day. The prevalence of extreme poverty as measured by the fraction of the world's population who live under a dollar a day has been falling, but the toll, as measured by population counts, has been steadily increasing (Bourguignon and Morrisson 2002). Sala-i-Martin (2006) documents that the decline in prevalence is driven largely by improvements in South Asia and East Asia; the past two decades have not seen improvements in Sub-Saharan Africa, the Middle East, Latin America, or Eastern Europe. These sobering facts provoke several sets of immediate and interrelated questions. What causes extreme poverty? What are the effects of living in such poverty? And what policies, microeconomic and macroeconomic, successfully lift people out of these conditions?

In this insightful chapter, Banerjee and Duflo document new facts that illuminate our understanding of the second question. Their analysis uses data from a number of low-income countries (including two new data sets collected by the authors and their colleagues) to study the association between poverty and what is arguably the single most important determinant of welfare: health (in particular, adult mortality). We say most important because even marginal improvement in health, when monetized into dollars using quality-adjusted life years (QALYs) and a societal measure of the willingness to pay for life, will generally dominate improvements in incomes and other measures of well-being. The new facts that emerge from their chapter build on the authors' own previous work (Banerjee and Duflo 2007)

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