

Appendix Material for

“The Prices in the Crises: What We Are Learning from Twenty Years of
Health Insurance in Low- and Middle-Income Countries”

Jishnu Das and Quy-Toan Do

Appendix A: Figures

Figure A1 – panel A: The likelihood of having health insurance as a function of wealth

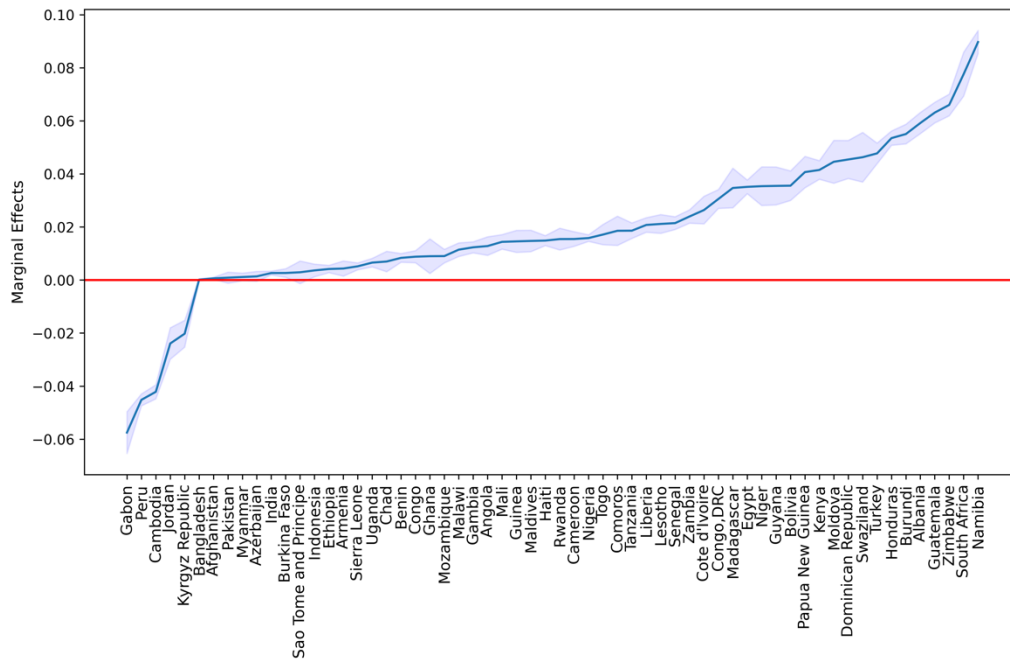
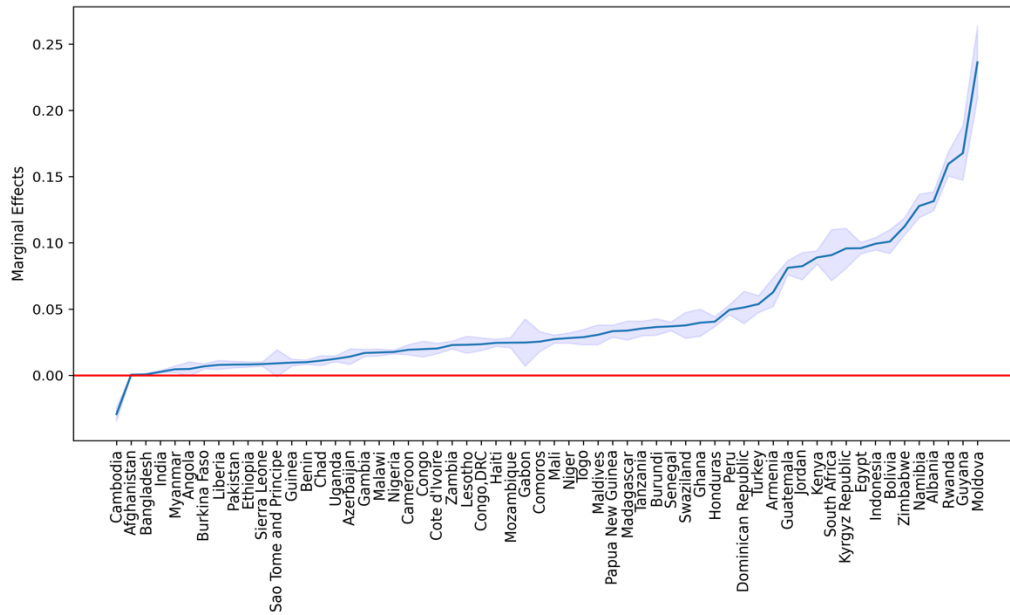


Figure A1 – panel B: The likelihood of having health insurance as a function of education



Notes: Source—Demographic and Health Surveys. For each country, we estimate a logistic regression with insurance coverage as the independent variable and household wealth and respondent education level as dependent variables. The marginal effects (and 95 percent confidence interval) are reported. Countries are ranked in increasing order of the estimated marginal effects. Details of the data and estimations are provided in Appendix B.

Appendix B: Data Sources and Replication Notes for DHS Analysis

Data sources

Since its first survey in 1984, Demographic and Health Surveys (DHS) have collected nationally-representative data on households with a focus on population, health, and nutrition. The target population of these surveys is women ages 15–49 and their children under 5 years old. Questions on health insurance were not added until 1989. DHS started implementing a standardized module in 2003 with question v481, which asks respondents about health insurance coverage.

In a majority of DHS surveys, eligible individuals include women of reproductive age (15–49) and men age 15–59, or in some cases 15–54. In some countries, only women are interviewed. Data from DHS surveys are produced in both raw and recode formats. A raw data file includes the data as they were collected, without any structural changes. These files are generally not distributed. A recode data file is generated from the raw data. All variables in the raw data file are represented in the recode data file in a standardized format, with the same structure across countries participating in each DHS phase. This standardization is meant to facilitate comparisons across surveys. The surveys are available for different units of analysis, such as households, individuals, or men. For the analysis in this paper, only the individual recode files pertaining to women respondents from the DHS website have been used.

According to the DHS website survey characteristic search, there are 161 surveys that have an insurance variable and 113 of these surveys are standard DHS surveys with data available to the public. We managed to clean and capture data with an insurance variable in 98 surveys. In 90 surveys, insurance was coded under a standard insurance variable (V481), and in 8 surveys, there was a nonstandard insurance variable, but the questions could be converted to retain comparability. For 16 surveys, the variable V481 only has missing entries (coded as “NA”) in the surveys. This is, for instance, the problem with Colombia and the Philippines. These can still be included by converting nonstandard insurance questions, but as of this draft these countries have been excluded.

Table B1 lists all DHS completed as of April 2022 and indicates those that have questions on health insurance as well as the percentage of respondents that say that they are covered by health insurance.

Table B1: Health insurance information in DHS

s.no	Country	Year	Insurance Var Women	Total Respondents (Weighted)	Insurance coverage (%)
1	Afghanistan	2015	Yes	29461	0.11
2	Albania	2008	Yes	7584	23.31
3	Albania	2017	Yes	15000	29.88
4	Angola	2015	Yes	14379	5.32
5	Armenia	2000	No		
6	Armenia	2005	No		

7	Armenia	2010	Yes	5922	0.76
8	Armenia	2015	Yes	6116	7.82
9	Azerbaijan	2006	Yes	8444	1.17
10	Bangladesh	1993	No		
11	Bangladesh	1996	No		
12	Bangladesh	2000	No		
13	Bangladesh	2004	No		
14	Bangladesh	2007	Yes		
15	Bangladesh	2011	Yes		
16	Bangladesh	2014	Yes		
17	Bangladesh	2017	Yes	20127	0.18
18	Benin	1996	No		
19	Benin	2001	No		
20	Benin	2006	Yes		
21	Benin	2011	Yes	16599	1.4
22	Benin	2017	Yes	15928	1.09
23	Bolivia	1989	No	7923	20.07
24	Bolivia	1993	No		
25	Bolivia	1998	No		
26	Bolivia	2003	No		
27	Bolivia	2008	Yes	16939	26.57
28	Brazil	1986	No		
29	Brazil	1991	No		
30	Brazil	1996	No		
31	Burkina Faso	1992	No		
32	Burkina Faso	1998	No		
33	Burkina Faso	2003	No		
34	Burkina Faso	2010	Yes	17087	0.51
35	Burundi	1987	No		
36	Burundi	2010	Yes	9389	13.63
37	Burundi	2016	Yes	17269	23.18
38	Cambodia	2000	No		
39	Cambodia	2005	Yes		
40	Cambodia	2010	Yes	18754	13.61
41	Cambodia	2014	Yes	17578	14.57
42	Cameroon	1991	No		
43	Cameroon	1998	No		
44	Cameroon	2004	No		

45	Cameroon	2011	Yes	15426	1.64
46	Cameroon	2018	Yes	14677	2.17
47	Central African Republic	1994	No		
48	Chad	1996	No		
49	Chad	2004	No		
50	Chad	2014	Yes	17719	0.3
51	Colombia	1986	No		
52	Colombia	1990	No		
53	Colombia	1995	No		
54	Colombia	2000	No		
55	Colombia	2004	No		
56	Colombia	2009	Yes		
57	Colombia	2015	Yes		
58	Comoros	1996	No		
59	Comoros	2012	Yes	5329	5.4
60	Congo	2005	Yes		
61	Congo	2011	Yes	10819	2.01
62	Congo, Dem. Rep.	2007	Yes		
63	Congo, DRC	2013	Yes	18827	4.13
64	Côte d'Ivoire	1994	No		
65	Côte d'Ivoire	1998	No		
66	Côte d'Ivoire	2011	Yes	10060	2.82
67	Dominican Republic	1986	No		
68	Dominican Republic	1991	No		
69	Dominican Republic	1996	No		
70	Dominican Republic	1999	No		
71	Dominican Republic	2002	No		
72	Dominican Republic	2007	Yes		
73	Dominican Republic	2013	Yes	11079	56.5
74	Ecuador	1987	No		
75	Egypt	1988	No		
76	Egypt	1992	No		
77	Egypt	1995	No		
78	Egypt	2000	No		
79	Egypt	2003	No		
80	Egypt	2005	No	19474	11.78
81	Egypt	2008	Yes		
82	Egypt	2014	Yes	21762	9.88

83	Eswatini	2006	Yes	4987	5.31
84	Ethiopia	1992	No		
85	Ethiopia	1997	No		
86	Ethiopia	2010	Yes	16515	0.89
87	Ethiopia	2011	Yes		
88	Ethiopia	2016	Yes	15683	4.2
89	Gabon	2000	No		
90	Gabon	2012	Yes	8422	54.03
91	Gambia	2013	Yes	10233	2.13
92	Gambia	2019	Yes	11865	2.17
93	Ghana	1988	No		
94	Ghana	1993	No		
95	Ghana	1998	No		
96	Ghana	2003	No		
97	Ghana	2008	Yes	4916	41.7
98	Ghana	2014	Yes	9396	65.95
99	Guatemala	1987	No		
100	Guatemala	1995	No		
101	Guatemala	1998	No		
102	Guatemala	2014	Yes	25914	12.5
103	Guinea	1999	No		
104	Guinea	2005	No		
105	Guinea	2012	Yes		
106	Guinea	2018	Yes	10874	1.44
107	Guyana	2009	Yes	4996	16.33
108	Haiti	1994	No		
109	Haiti	2000	No		
110	Haiti	2005	Yes	10757	1.59
111	Haiti	2012	Yes	14287	2.93
112	Haiti	2016	Yes	15393	2.24
113	Honduras	2005	Yes	19948	8.19
114	Honduras	2011	Yes	22757	7.66
115	India	1992	No		
116	India	1998	No		
117	India	1999	No		
118	India	2000	No		
119	India	2005	Yes	124385	5.9
120	India	2015	Yes	699686	17.86

121	Indonesia	1987	No		
122	Indonesia	1991	No		
123	Indonesia	1994	No		
124	Indonesia	1997	No		
125	Indonesia	2002	No		
126	Indonesia	2007	Yes		
127	Indonesia	2012	Yes	45607	40.71
128	Indonesia	2017	Yes	49627	61.36
129	Jordan	1990	No		
130	Jordan	1997	No		
131	Jordan	2002	No		
132	Jordan	2007	Yes		
133	Jordan	2009	Yes		
134	Jordan	2012	Yes		
135	Jordan	2017	Yes	14689	70.32
136	Kazakhstan	1995	No		
137	Kazakhstan	1999	No		
138	Kenya	1988	No		
139	Kenya	1993	No		
140	Kenya	1998	No		
141	Kenya	2003	No		
142	Kenya	2008	Yes	8444	7.15
143	Kenya	2014	Yes	31079	7.21
144	Kyrgyz Republic	1997	No		
145	Kyrgyz Republic	2012	Yes	8208	88.28
146	Lesotho	2004	No		
147	Lesotho	2009	Yes	7624	8.74
148	Lesotho	2014	Yes	6621	1.65
149	Liberia	1986	No		
150	Liberia	2006	Yes		
151	Liberia	2013	Yes	9239	3.58
152	Liberia	2019	Yes	8065	3.69
153	Madagascar	1992	No		
154	Madagascar	1997	No		
155	Madagascar	2003	No		
156	Madagascar	2008	Yes	17375	1.88
157	Malawi	1992	No		
158	Malawi	2000	No		

159	Malawi	2004	No		
160	Malawi	2010	Yes		
161	Malawi	2015	Yes	24562	1.37
162	Maldives	2009	Yes		
163	Maldives	2016	Yes	7699	4.86
164	Mali	1987	No		
165	Mali	1995	No		
166	Mali	2001	No		
167	Mali	2006	Yes		
168	Mali	2012	Yes	10424	2.51
169	Mali	2018	Yes	10519	4.76
170	Mexico	1987	No		
171	Moldova	2005	No	7439	54.91
172	Morocco	1987	No		
173	Morocco	1992	No		
174	Morocco	2003	No		
175	Mozambique	1997	No		
176	Mozambique	2003	No		
177	Mozambique	2011	Yes	13745	3.08
178	Mozambique	2015	Yes	7749	2.97
179	Myanmar	2015	Yes	12885	0.96
180	Namibia	1992	No		
181	Namibia	2000	No		
182	Namibia	2006	Yes	9804	15.77
183	Namibia	2013	Yes	9176	17.73
184	Nepal	1995	No		
185	Nepal	2000	No		
186	Nepal	2005	Yes		
187	Nepal	2010	Yes		
188	Nepal	2016	Yes		
189	Nicaragua	1997	No		
190	Nicaragua	2001	No		
191	Niger	1992	No		
192	Niger	1998	No		
193	Niger	2006	Yes		
194	Niger	2012	Yes	11160	3.58
195	Nigeria	1990	No		
196	Nigeria	2003	No		

197	Nigeria	2008	Yes	33385	1.79
198	Nigeria	2013	Yes	38948	2.11
199	Nigeria	2018	Yes	41821	2.67
200	Pakistan	1990	No		
201	Pakistan	2006	Yes		
202	Pakistan	2012	Yes		
203	Pakistan	2017	Yes	12364	2.57
204	Papua New Guinea	2016	Yes	15198	3.93
205	Paraguay	1990	No		
206	Peru	1986	No		
207	Peru	1991	No		
208	Peru	1996	No		
209	Peru	2000	No		
210	Peru	2003	Yes	81104	26.57
211	Peru	2009	Yes	24212	52.94
212	Peru	2010	Yes	22947	59.93
213	Peru	2011	Yes	22517	62.17
214	Peru	2012	Yes	23887	58.05
215	Philippines	1993	No		
216	Philippines	1998	No		
217	Philippines	2003	No		
218	Philippines	2008	Yes		
219	Philippines	2013	Yes		
220	Philippines	2017	Yes		
221	Rwanda	1992	No		
222	Rwanda	2000	No		
223	Rwanda	2005	No	11321	41.04
224	Rwanda	2007	Yes		
225	Rwanda	2010	Yes		
226	Rwanda	2014	Yes		
227	Rwanda	2019	Yes	14634	83.22
228	Sao Tome and Principe	2008	Yes	2615	1.8
229	Senegal	1986	No		
230	Senegal	1992	No		
231	Senegal	1997	No		
232	Senegal	2005	No		
233	Senegal	2010	Yes	15688	5.11
234	Senegal	2012	Yes		

235	Senegal	2012	Yes		
236	Senegal	2014	Yes		
237	Senegal	2015	Yes		
238	Senegal	2015	Yes		
239	Senegal	2016	Yes	8865	5.7
240	Senegal	2017	Yes		
241	Senegal	2018	Yes		
242	Senegal	2019	Yes		
243	Sierra Leone	2008	Yes	7374	2.12
244	Sierra Leone	2013	Yes	16658	1.2
245	Sierra Leone	2019	Yes	15574	3.47
246	South Africa	1998	No		
247	South Africa	2016	Yes	8514	6.31
248	Sri Lanka	1987	No		
249	Sudan	1989	No		
250	Tajikistan	2012	Yes		
251	Tajikistan	2017	Yes		
252	Tanzania	1991	No		
253	Tanzania	1996	No		
254	Tanzania	1999	No		
255	Tanzania	2004	No		
256	Tanzania	2009	Yes	10139	4.9
257	Tanzania	2015	Yes	13266	8.13
258	Thailand	1987	No		
259	Timor-Leste	2009	Yes		
260	Timor-Leste	2016	Yes		
261	Togo	1988	No		
262	Togo	1998	No		
263	Togo	2013	Yes	9480	4.55
264	Trinidad and Tobago	1987	No		
265	Tunisia	1988	No		
266	Türkiye	1993	No		
267	Türkiye	1998	No	8576	56.23
268	Türkiye	2003	No	8075	66.34
269	Türkiye	2008	Yes	7405	83.55
270	Türkiye	2013	Yes	9746	88.58
271	Uganda	1988	No		
272	Uganda	1995	No		

273	Uganda	2000	No		
274	Uganda	2006	Yes		
275	Uganda	2011	Yes	8674	1.61
276	Uganda	2016	Yes	18506	1.29
277	Ukraine	2007	Yes		
278	Uzbekistan	1996	No		
279	Vietnam	1997	No		
280	Vietnam	2002	No		
281	Yemen	1991	No		
282	Yemen	2013	Yes	25434	1.77
283	Zambia	1992	No		
284	Zambia	1996	No		
285	Zambia	2001	No		
286	Zambia	2007	Yes	7146	7.16
287	Zambia	2013	Yes	16411	2.54
288	Zambia	2018	Yes	13683	1.86
289	Zimbabwe	1988	No		
290	Zimbabwe	1994	No		
291	Zimbabwe	1999	No		
292	Zimbabwe	2005	Yes	8907	8.77
293	Zimbabwe	2010	Yes	9171	6.6
294	Zimbabwe	2015	Yes	9955	12.21

Notes to Appendix Figure 1

Appendix Figure 1 uses logistic regressions, one for each country, to report the correlation between insurance coverage and wealth and education. Marginal effects are reported. The wealth variable used is v190 and the education variable is v106, which measures the highest education level of the respondent. Both are coded in the datasets. For each country, we use the latest available DHS and run a logistic regression of the respondent's insurance coverage on her education and household wealth.

Definition of Wealth Variable (v190): The wealth index is a composite measure of a household's cumulative living standard. The wealth index is calculated using easy-to-collect data on a household's ownership of selected assets, such as televisions and bicycles; materials used for housing construction; and types of water access and sanitation facilities. Generated with a statistical procedure known as principal components analysis, the wealth index places individual households on a continuous scale of relative wealth. DHS separates all interviewed households into five wealth quintiles to compare the influence of wealth on various population, health, and nutrition indicators. The wealth index is presented in the DHS Final Reports and survey datasets as a background characteristic.

Definition of education variable (v106): Records the highest education level attended. This is a standardized variable providing level of education in the following categories: No education, Primary, Secondary, and Higher. In some countries the educational system does not fit naturally within this scheme and a different categorization was used for the Final Report. In this case, this variable is constructed as accurately as possible from the country's own scheme and the variable used for the Final Report is included as a country-specific variable.

Table B2 displays the regression results.

Table B2: Logistic regression marginal effects

(1)	(2)	(3)
Country	Wealth	Education
Afghanistan	0.001 (0.000)	0.000 (0.000)
Albania	0.059 (0.002)	0.132 (0.004)
Angola	0.013 (0.002)	0.005 (0.003)
Armenia	0.004 (0.001)	0.063 (0.006)
Azerbaijan	0.001 (0.001)	0.014 (0.003)
Bangladesh	0.000 (0.000)	0.001 (0.000)
Benin	0.008 (0.001)	0.01 (0.001)
Bolivia	0.036 (0.003)	0.101 (0.005)

Burkina Faso	0.003 (0.001)	0.007 (0.001)
Burundi	0.055 (0.002)	0.036 (0.003)
Cambodia	-0.042 (0.001)	-0.029 (0.003)
Cameroon	0.015 (0.001)	0.019 (0.002)
Chad	0.007 (0.002)	0.011 (0.002)
Comoros	0.019 (0.003)	0.025 (0.004)
Congo	0.009 (0.001)	0.020 (0.003)
Congo, DRC	0.031 (0.002)	0.023 (0.002)
Côte d'Ivoire	0.026 (0.003)	0.020 (0.002)
Dominican Republic	0.045 (0.004)	0.051 (0.006)
Egypt	0.035 (0.001)	0.096 (0.002)
Ethiopia	0.004 (0.001)	0.008 (0.001)
Gabon	-0.058 (0.004)	0.025 (0.009)
Gambia	0.012 (0.001)	0.017 (0.001)
Ghana	0.009 (0.003)	0.040 (0.005)
Guatemala	0.063 (0.002)	0.081 (0.003)
Guinea	0.015 (0.002)	0.010 (0.001)
Guyana	0.035 (0.004)	0.168 (0.01)
Haiti	0.015 (0.001)	0.025 (0.001)
Honduras	0.053 (0.001)	0.041 (0.002)
India	0.003 (0.000)	0.003 (0.001)

Indonesia	0.004 (0.001)	0.099 (0.002)
Jordan	-0.024 (0.003)	0.082 (0.005)
Kenya	0.041 (0.002)	0.089 (0.003)
Kyrgyz Republic	-0.020 (0.003)	0.096 (0.008)
Lesotho	0.021 (0.002)	0.023 (0.003)
Liberia	0.021 (0.001)	0.008 (0.001)
Madagascar	0.035 (0.004)	0.034 (0.004)
Malawi	0.011 (0.001)	0.017 (0.001)
Maldives	0.015 (0.002)	0.031 (0.004)
Mali	0.014 (0.001)	0.027 (0.002)
Moldova	0.045 (0.004)	0.236 (0.014)
Mozambique	0.009 (0.001)	0.025 (0.002)
Myanmar	0.001 (0.001)	0.005 (0.001)
Namibia	0.090 (0.002)	0.128 (0.005)
Niger	0.035 (0.004)	0.028 (0.002)
Nigeria	0.016 (0.001)	0.018 (0.001)
Pakistan	0.001 (0.001)	0.008 (0.001)
Papua New Guinea	0.041 (0.003)	0.033 (0.002)
Peru	-0.045 (0.001)	0.049 (0.002)
Rwanda	0.016 (0.002)	0.159 (0.005)
Sao Tome and Principe	0.003 (0.002)	0.009 (0.005)

Senegal	0.021 (0.001)	0.037 (0.002)
Sierra Leone	0.005 (0.001)	0.009 (0.001)
South Africa	0.078 (0.004)	0.091 (0.01)
Eswatini	0.046 (0.005)	0.038 (0.005)
Tanzania	0.019 (0.001)	0.035 (0.003)
Togo	0.017 (0.002)	0.029 (0.003)
Türkiye	0.048 (0.002)	0.054 (0.003)
Uganda	0.007 (0.001)	0.012 (0.001)
Zambia	0.024 (0.001)	0.023 (0.002)
Zimbabwe	0.066 (0.002)	0.112 (0.003)
<i>Note: Standard errors in parentheses.</i>		

Appendix C: Data Sources for Figures 1, 2 and 3

Sources for Figure 1

Das, Jishnu, Abhijit Chowdhury, Reshmaan Hussam, and Abhijit Banerjee. 2016. "The impact of training informal health care providers in India: A randomized controlled trial." *Science* 354, no. 6308: aaf7384.

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