

eAppendix

The field teams of the AsMat survey interviewed all eligible individuals (n=166,934) regarding their water consumption history, source of water used, with information on the location and year when starting to use that water source. Individual arsenic exposure was calculated for each year since 1970 or from the year of birth if born later, based on individual water consumption histories and arsenic concentration data on all currently functioning tube-wells. For those using surface water, we set arsenic concentration at zero. Due to lack of reliable tracking information of people's residence before 1970, we considered water consumption histories since 1970. Before 1970, however, there were very few tube-wells installed in Bangladesh and most of the people used surface water that has very low concentration of arsenic ². We have extracted current location (household number and *bari* number) of 166,934 individuals for each year separately from 1970 to 1990, if living in Matlab area. Average household exposure for each year was calculated based on current population present in that specific household in that specific year. Similarly, average *bari* (compound) level exposure was calculated for 21 years separately.

After selecting the cohort with individuals who were 15 years old or more on 1 January 1991 and living in Matlab, we have created a database including all eligible population. Individuals' current location (household and *bari* number) were extracted from HDSS database for each year separately since 1970 or year of birth up-to end of 1990. The corresponding exposure was determined for each year. We used the household exposure as a proxy for an individual's exposure for each year from 1970 (or from birth if later) to the year 1990. If household level exposure was unavailable, we used *bari* level exposure.

eTable 1. Mean median and inter-quartile range of arsenic in drinking water in Matlab population by age, gender, education, and asset score. Average arsenic concentrations were calculated from 1970 (or birth, if born later) up to the end of 1990.

Variables	Mean	Median	Inter quartile range
Age categories			
15-29	132.8	107.4	47.6-188.0
30-44	129.7	103.4	45.1-183.3
45-59	129.4	102.9	43.5-184.9
60-74	129.9	104.5	44.8-184.1
>75	128.0	99.0	43.1-180.8
Gender			
Men	130.1	103.4	44.4-184.8
Women	132.0	106.8	47.3-186.6
Education			
No	130.1	104.9	44.5-186.5
Primary	131.9	105.9	47.4-185.2
Secondary	134.4	107.1	49.4-187.0
Higher	125.9	97.3	41.9-179.1
Household asset score			
1 (poor)	117.1	93.5	18.5-176.6
2	132.5	108.6	46.6-189.8
3	129.9	102.8	47.3-183.7
4	132.3	104.8	50.6-182.9
5 (rich)	138.7	112.6	52.3-193.9
Total	131.1	105.1	46.0-185.6

eTable 2. Distribution of major causes of non-accidental deaths^a for adults (age 15 years and above) by sex.

Causes of death and age (years)	Sex				Total	
	Male		Female			
	No	(%)	No	(%)	No	(%)
<i>Cancer</i>						
15-29	23	(6.1)	24	(11.4)	47	(8.0)
30-44	69	(18.2)	45	(21.4)	114	(19.4)
45-59	148	(39.1)	91	(43.3)	239	(40.6)
60-74	125	(33.0)	47	(22.4)	172	(29.2)
75 +	14	(3.7)	3	(1.4)	17	(2.9)
Total	379	(100.0)	210	(100.0)	589	(100.0)
<i>Cardiovascular disease</i>						
15-29	7	(1.1)	8	(1.4)	15	(1.2)
30-44	44	(6.8)	34	(6.0)	78	(6.4)
45-59	217	(33.5)	168	(29.8)	385	(31.8)
60-74	281	(43.4)	272	(48.2)	553	(45.7)
75 +	98	(15.1)	82	(14.5)	180	(14.9)
Total	647	(100.0)	564	(100.0)	1211	(100.0)
<i>Diarrhea</i>						
15-29	12	(3.2)	14	(4.1)	26	(3.6)
30-44	20	(5.4)	15	(4.4)	35	(4.9)
45-59	76	(20.4)	75	(21.9)	151	(21.1)
60-74	168	(45.0)	156	(45.5)	324	(45.3)
75 +	97	(26.0)	83	(24.2)	180	(25.1)
Total	373	(100.0)	343	(100.0)	716	(100.0)
<i>Other Infections^b</i>						
15-29	29	(3.0)	57	(10.0)	86	(5.6)
30-44	83	(8.5)	73	(12.8)	156	(10.1)
45-59	336	(34.5)	169	(29.6)	505	(32.7)
60-74	414	(42.5)	222	(38.9)	636	(41.2)
75 +	112	(11.5)	49	(8.6)	161	(10.4)
Total	974	(100.0)	570	(100.0)	1544	(100.0)
<i>All Others</i>						
15-29	113	(4.3)	179	(7.7)	292	(5.9)
30-44	213	(8.1)	165	(7.1)	378	(7.6)
45-59	660	(25.0)	486	(21.0)	1146	(23.1)
60-74	1093	(41.4)	973	(42.0)	2066	(41.7)
75 +	561	(21.2)	512	(22.1)	1073	(21.7)
Total	2640	(100.0)	2315	(100.0)	4955	(100.0)

^a Exclude deaths caused by intentional and non-intentional violence and accidentals

^b Chronic bronchitis, pulmonary tuberculosis, pneumonia/acute lower respiratory infection, viral hepatitis, infection of skin and subcutaneous tissue, rabies, tetanus, septicemia, meningitis, and malaria.

eTable 3. Average arsenic exposure ($\mu\text{g/L}$) and risk of having arsenic-related excess deaths (cancer, cardiovascular, all infection and non-accidental death) for female and male gender respectively. Proportional hazard model adjusted for potential confounders. Exposure categories characterised by arsenic exposure levels and gender. One analysis for each group of causes of death.

Cause of death and average arsenic exposure ($\mu\text{g/L}$)	Female		Male	
	No. deaths	HR ¹ (95% CI)	No. deaths	HR ¹ (95% CI)
Cancer				
<10	24	1.0	31	1.0
10-49	24	0.89 (0.52-1.67)	47	1.29 (0.81-2.05)
50-149	83	1.21 (0.99-2.68)	146	1.61 (1.08-2.40)
150-299	62	1.40 (1.34-4.32)	119	2.03 (1.35-3.06)
300+	17	1.17 (0.62-2.23)	36	1.85 (1.13-3.02)
Cardiovascular disease deaths				
<10	64	1.0	83	1.0
10-49	63	0.86 (0.60-1.23)	105	1.17 (0.87-1.57)
50-149	219	1.23 (0.92-1.64)	244	1.11 (0.85-1.44)
150-299	168	1.42 (1.05-1.91)	150	1.08 (0.82-1.43)
300+	50	1.34 (0.92-1.97)	65	1.41 (1.01-1.97)
All infections deaths				
<10	107	1.0	179	1.0
10-49	113	1.10 (0.84-1.45)	170	1.10 (0.88-1.36)
50-149	343	1.34 (1.07-1.69)	501	1.26 (1.05-1.51)
150-299	270	1.61 (1.27-2.04)	358	1.44 (1.19-1.74)
300+	80	1.47 (1.09-1.98)	139	1.66 (1.32-2.09)
All nonaccidental deaths				
<10	461	1.0	634	1.0
10-49	558	1.18 (1.04-1.33)	719	1.13 (1.02-1.27)
50-149	1562	1.34 (1.20-1.49)	1887	1.20 (1.09-1.31)
150-299	1090	1.43 (1.28-1.61)	1327	1.30 (1.18-1.43)
300+	331	1.36 (1.17-1.57)	446	1.34 (1.19-1.51)

¹ Hazard Ratios were adjusted for asset score, education, and age

Arsenic exposure ($\mu\text{g/L}$)

Among cancer deaths women = 210 and men = 379.

Among cardiovascular disease deaths women = 564 and men = 647.

Among all infection deaths women = 913 and men = 1,347.

Among all nonaccidental deaths women = 4002 and men = 5,013.

Among all survivors women = 54,802 and men = 52,086.