

Web Table 1 Transitional cell kidney and ureter cancer odds ratios after various exclusions by categories of highest five-year average arsenic intake ($\mu\text{g}/\text{day}$), Northern Chile, 2007-2010

Arsenic intake	No. Controls	No. Cases	OR^a	95% CI
Excluding proxy subjects				
<400	382	5	1.00	
400-1000	126	7	5.40	1.50, 19.5
>1000	76	11	12.2	3.97, 37.4
Excluding ureter cancers ^b				
<400	405	4	1.00	
400-1000	141	4	3.26	0.72, 14.6
>1000	94	7	9.16	2.50, 33.5
Excluding non-European descent				
<400	244	4	1.00	
400-1000	117	8	5.38	1.39, 20.8
>1000	84	10	8.88	2.55, 30.9

Abbreviations: CI, confidence interval; OR, odds ratio.

^aOdds ratios are adjusted for age, sex, smoking, SES, mining work, and body-mass index.

^bIncludes only transitional cell renal pelvis cancers.

Web Table 2. Previously Published Studies of Arsenic in Drinking Water and Kidney Cancer Stratified by High (median ≥ 100 $\mu\text{g/L}$) or Low (median < 100 $\mu\text{g/L}$) Arsenic Water Concentrations

Study	Location	Outcome ^a	Design	N	Exposure assessment	Exposure level ^b	Relative risk (95% CI)	Con-founders ^d	Water intake ^e	Notes
<i>High exposure studies (median arsenic water concentrations ≥ 100 $\mu\text{g/L}$)</i>										
Chen <i>et al.</i> , 1985 (females) (1)	Taiwan: BFD region	Mortality	Ecologic	62	Ecologic: BFD region compared to the rest of Taiwan	780 $\mu\text{g/L}$ (0-2500 $\mu\text{g/L}$)	11.19 (8.38-14.00)	Age, sex	No	Mortality for 1968-82 84 villages
Chen <i>et al.</i> , 1985 (males) (1)	Taiwan: BFD region	Mortality	Ecologic	42	Ecologic: BFD region compared to the rest of Taiwan	780 $\mu\text{g/L}$ (0-2500 $\mu\text{g/L}$)	7.72 (5.37-10.07)	Age, sex	No	Mortality for 1968-82 84 villages
Chen <i>et al.</i> , 1988a (males) (2)	Taiwan: BFD region	Mortality	Ecologic	--	Ecologic: median village concentration	<300 $\mu\text{g/L}$ 300-599 ≥ 600	4.9 11.9 19.6	Age, sex	No	CI's not provided Reference group: Taiwan Mortality for 1973-86
Chen <i>et al.</i> , 1988a (females) (2)	Taiwan: BFD region	Mortality	Ecologic	--	Ecologic: median village concentration	<300 $\mu\text{g/L}$ 300-590 ≥ 600	4.0 13.9 37.0	Age, sex	No	CI's not provided Reference group: Taiwan Mortality for 1973-86
Chen <i>et al.</i> , 1988b (3)	Taiwan: BFD region	Mortality	Cohort 1968-84	3	BFD diagnosis	BFD patients	19.53 ($p>0.05$)	Age, sex	No	Reference group: Taiwan No individual data on arsenic
Chiou <i>et al.</i> , 2001 (4)	Taiwan: northeast	Incidence	Cohort 1991-96	9	Cross-sectional: one measurement per subject; exposure before age 40 years not assessed; no data in 15% of subjects	117 $\mu\text{g/L}$ (0-3590 $\mu\text{g/L}$)	2.82 (1.29-5.36)	Age, sex	No	Limited follow-up period Reference group: Taiwan
Chen and Wang, 1990 (males) (5)	Taiwan: 314 precincts & townships	Mortality	Ecologic	--	Ecologic: township or precinct average	(0- ≥ 350 $\mu\text{g/L}$)	B=1.1 ($p<0.05$) (regression coefficient)	Age, sex, industrialization, urbanization	No	Regression coefficient is mortality/100,000 person-years for each 100 $\mu\text{g/L}$ increase in arsenic in well water. Mortality for 1972-83
Chen and Wang, 1990 (females) (5)	Taiwan: 314 precincts & townships	Mortality	Ecologic	--	Ecologic: township or precinct average	(0- ≥ 350 $\mu\text{g/L}$)	B=1.7 ($p<0.05$) (regression coefficient)	Age, sex, industrialization, urbanization	No	Regression coefficient is mortality/100,000 person-years for each 100 $\mu\text{g/L}$ increase in arsenic in well water. Mortality for 1972-83
Hopenhayn <i>et al.</i> , 1998 (males) (6)	Argentina: Cordoba	Mortality	Ecologic	53	Ecologic: counties, based on water measurements and arsenicism	178 $\mu\text{g/L}$	1.57 (1.17-2.05)	Age, sex	No	Mortality for 1986-91 Reference group: Argentina
Hopenhayn <i>et al.</i> , 1998 (females) (6)	Argentina: Cordoba	Mortality	Ecologic	27	Ecologic: counties, based on water measurements and arsenicism	178 $\mu\text{g/L}$	1.81 (1.19-2.64)	Age, sex	No	Mortality for 1986-91 Reference group: Argentina
Smith <i>et al.</i> , 1998 (males) (7)	Chile: Region II	Mortality	Ecologic	39	Ecologic: Region II compared to the rest of Chile	568 $\mu\text{g/L}$ (10-860 $\mu\text{g/L}$)	1.6 (1.1-2.1)	Age, sex	No	Same area as the current study Mortality for 1989-93 Reference group: Chile
Smith <i>et al.</i> , 1998 (females) (7)	Chile: Region II	Mortality	Ecologic	34	Ecologic: Region II compared to the rest of Chile	568 $\mu\text{g/L}$ (10-860 $\mu\text{g/L}$)	2.7 (1.9-3.8)	Age, sex	No	Same area as the current study Mortality for 1989-93 Reference group: Chile

Study	Location	Out-come ^a	Design	N	Exposure assessment	Exposure level ^b	Relative risk (95% CI)	Con-founders ^d	Water intake ^e	Notes
Tsai <i>et al.</i> , 1999 (males) (8)	Taiwan: BFD region	Mortality	Ecologic	94	Ecologic: BFD villages compared to the rest of the county	780 µg/L	6.76 (5.46-8.27)	Age, sex	No	Mortality for 1971-94 Reference group: nearby counties
Tsai <i>et al.</i> , 1999 (females) (8)	Taiwan: BFD region	Mortality	Ecologic	128	Ecologic: BFD villages compared to the rest of the county	780 µg/L	8.89 (7.42-10.57)	Age, sex	No	Mortality for 1971-94 Reference group: nearby counties
Wu <i>et al.</i> , 1989 (males) (9)	Taiwan: BFD region	Mortality	Ecologic	26	Ecologic: median village concentration	<300 µg/L 300-599 ≥600	1.00 (Ref) 2.24 (1.12-4.01) 3.00 (1.10-6.53)	Age, sex	No	RRs and CIs estimated using age adjusted rates and Byars approximation. Mortality for 1973-86 42 villages
Wu <i>et al.</i> , 1989 (females) (9)	Taiwan: BFD region	Mortality	Ecologic	33	Ecologic: median village concentration	<300 µg/L 300-599 ≥600	1.00 (Ref) 5.68 (3.02-9.71) 16.95 (9.68-27.53)	Age, sex	No	RRs and CIs estimated using age adjusted rates and Byars approximation. Mortality for 1973-86 42 villages
Yang <i>et al.</i> , 2004 (males) (10)	Taiwan: BFD region	Mortality	Ecologic	135	Ecologic: BFD region compared to the rest of Taiwan	<10-780 µg/L	6.87 (5.76-8.13)	Age, sex	No	Arsenic levels decreased over time. CIs estimated using Byars approximation.
Yang <i>et al.</i> , 2004 (females) (10)	Taiwan: BFD region	Mortality	Ecologic	173	Ecologic: BFD region compared to the rest of Taiwan	<10-780 µg/L	9.82 (8.41-11.40)	Age, sex	No	Arsenic levels decreased over time. CIs estimated using Byars approximation.
Yuan <i>et al.</i> , 2010 (males) (11)	Chile: Region II	Mortality	Ecologic	39	Ecologic: Region II compared to unexposed Region V	569 µg/L (10-860 µg/L)	3.37 (2.21-5.11)	Age, sex	No	For 1981-85, SMRs were lower for other 5-year periods. Same area as the current study
Yuan <i>et al.</i> , 2010 (females) (11)	Chile: Region II	Mortality	Ecologic	49	Ecologic: Region II compared to unexposed Region V	569 µg/L (10-860 µg/L)	4.37 (2.98-6.41)	Age, sex	No	For 1991-95, SMRs were lower for other 5-year periods Same area as the current study
Low exposure studies (arsenic water concentrations < 100 µg/L)										
Baastrop <i>et al.</i> , 2008 (12)	Denmark	Incidence	Cohort 1970-2003	53	Only exposures after age 41 years used in main analysis; ecologic data in some subjects	0.7 µg/L (0-25.3 µg/L)	0.89 (0.65-1.22)	Age, sex, smoking, education, BMI, occupation	No	Narrow range of mostly low exposures. RRs are per µg/L in time weighted average exposure
Han <i>et al.</i> , 2009 (13)	US: Idaho	Incidence	Ecologic	1864	Ecologic: county averages	2 µg/L (0-43 µg/L)	B=0.03 (p=0.724) (regression coefficient)	Age, sex, population density, smoking, BMI, white (ecologic)	No	Narrow range of mostly low exposures. Regression coefficient are per µg/L arsenic Ecologic data on confounders
Hinwood <i>et al.</i> , 1999 (14)	Australia	Incidence	Ecologic	134	Ecologic: assessment is unclear	(0->200 µg/L)	< 1.2	Age, sex	No	Results in Figure only: no dose-response relationship.
Kurtio <i>et al.</i> , 1999	Finland	Incidence	Case-control	49	Limited individual: arsenic only measured in wells used from 1967-80.	<0.2 µg/day 0.2-1.0 ≥1.0	1.00 0.55 (0.25-1.21) 0.94 (0.39-2.27)	Age, sex, smoking, BMI	Yes	Narrow range of mostly low exposures

Study	Location	Out-come ^a	Design	N	Exposure assessment	Exposure level ^b	Relative risk (95% CI)	Con-founders ^d	Water intake ^e	Notes
Lewis <i>et al.</i> , 1999 (males) (15)	US: Utah	Mortality	Cohort 1945-96	9	Ecologic: median community arsenic concentrations	<1000 µg/L-yrs 1000-4999 ≥5000	2.51 1.13 1.43	Age, sex	No	Median arsenic concentrations in the exposed communities ranged from 14-166 µg/L. CIs not given.
Lewis <i>et al.</i> , 1999 (females) (15)	US: Utah	Mortality	Cohort 1945-96	4	Ecologic: median community arsenic concentrations	<1000 µg/L-yrs 1000-4999 ≥5000	2.36 1.32 1.13	Age, sex	No	Median arsenic concentrations in the exposed communities ranged from 14-166 µg/L. CIs not given.
Meliker <i>et al.</i> , 2007 (males) (16)	US: Michigan	Mortality	Ecologic	325	Ecologic: exposed counties compared to Michigan	7.58 µg/L (3.50-11.98)	1.06 (0.91-1.22)	Age, sex	No	Narrow range of mostly low exposures.
Meliker <i>et al.</i> , 2007 (females) (16)	US: Michigan	Mortality	Ecologic	194	Ecologic: exposed counties compared to Michigan	7.58 µg/L (3.50-11.98)	1.00 (0.82-1.20)	Age, sex	No	Narrow range of mostly low exposures.

Abbreviations: B, regression coefficient; BFD, blackfoot disease; CI, confidence interval; Ref, reference group; RR, relative risk; SMR, standardized mortality ratio.

^a Kidney cancer mortality or incidence.

^b Mean or median arsenic concentration in water (range).

^c Mean or median arsenic concentration in water in the highest exposure group < 100 µg/L (“low”) or ≥ 100 µg/L (“high”).

^d Potential confounding variables assessed, either by stratification or statistical adjustment.

^e Information on water consumption intakes rates collected.

References for Web Table 2

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