

**Chronic exposure to cadmium
and health effects in inhabitants
of Kakehashi River Basin,
Ishikawa Prefecture, Japan**

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Main items in this lecture

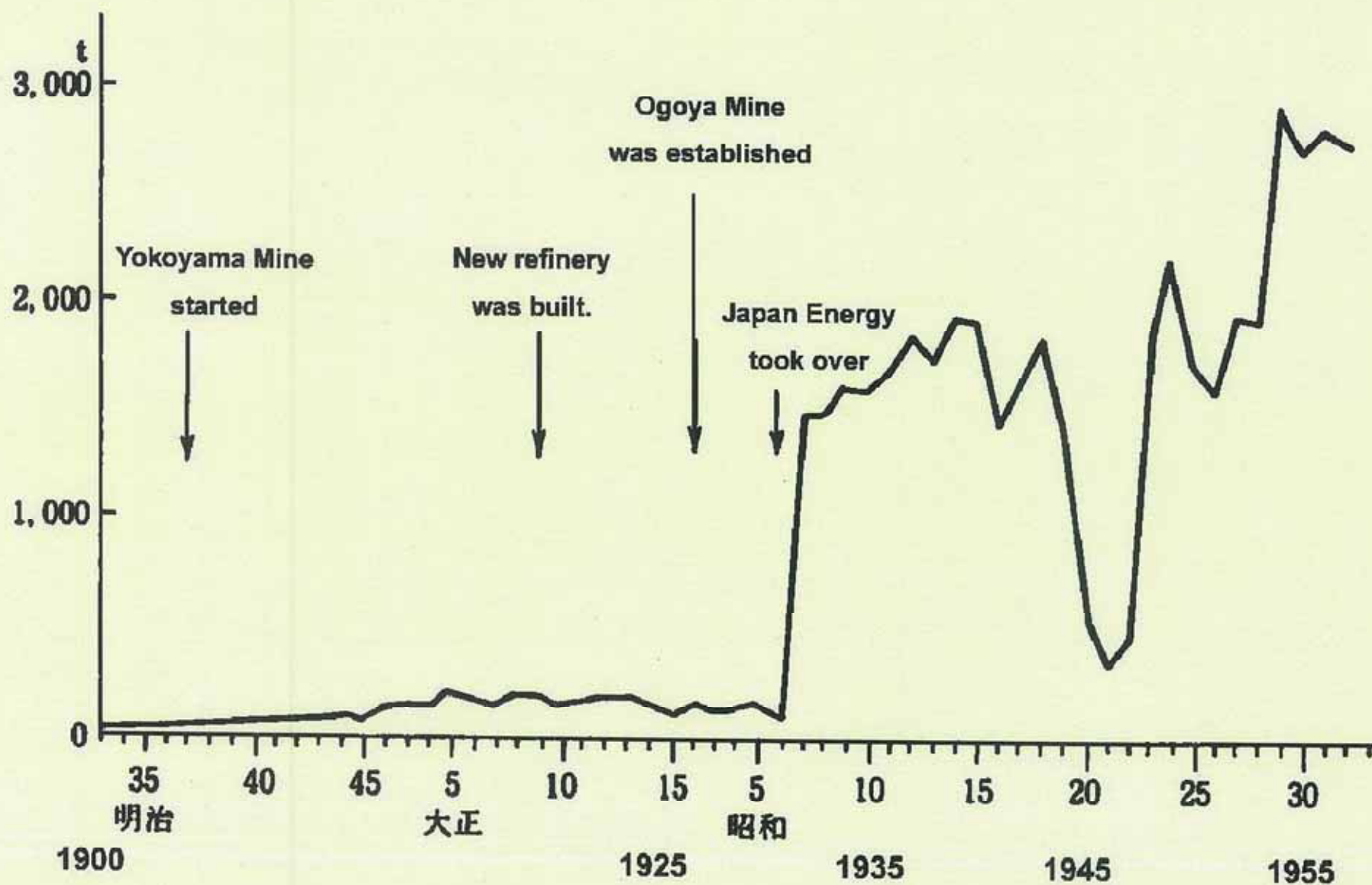
- I . Epidemiological study on renal dysfunction in inhabitants living in Kakehashi River Basin, Ishikawa Prefecture
- II . Cadmium induced renal effects
- III . Cadmium induced bone effects
- IV . Dose-response relationship between cadmium exposure and adverse health effects

**I . Epidemiological study
on renal dysfunction
in inhabitants living
in Kakehashi River Basin,
Ishikawa Prefecture**

Cadmium polluted areas in Japan



Annual data on copper production at Ogoya Mine (by history of Nishio Village)



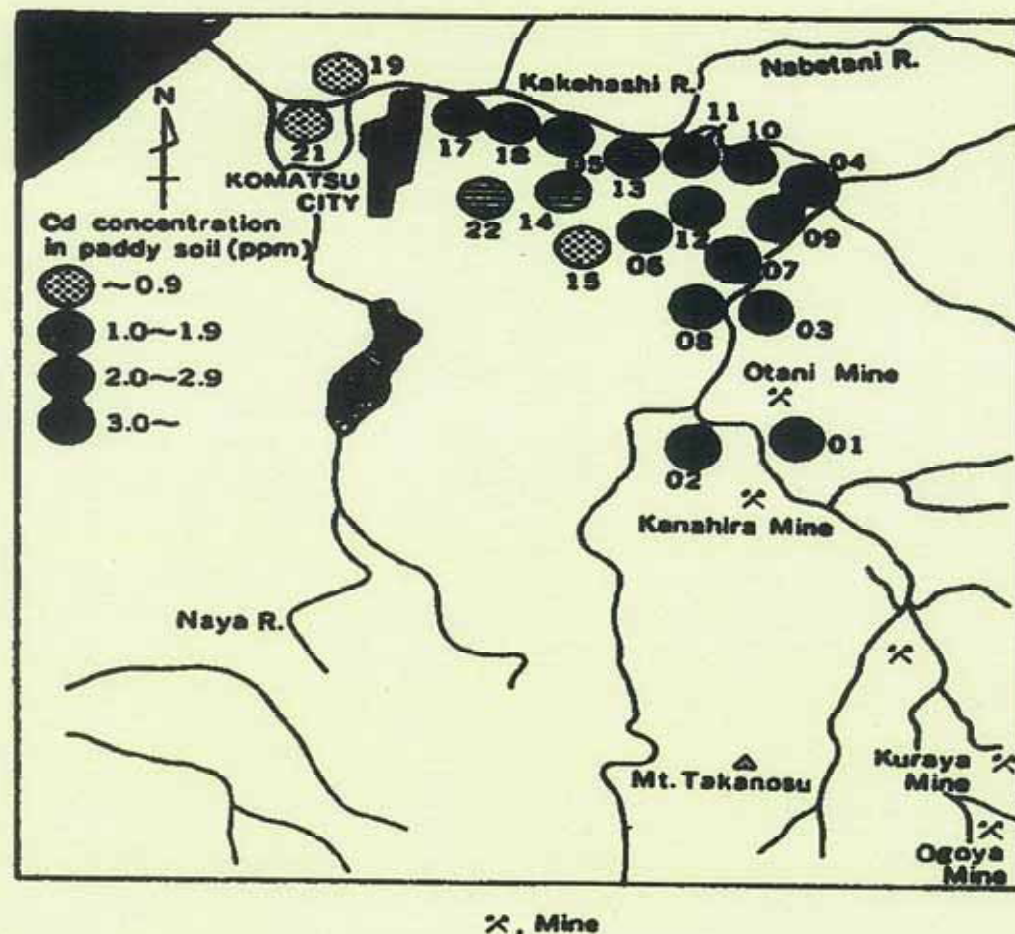


Fig. 6-25. Location of cadmium mines and concentrations of cadmium in paddy soil, Kakehashi River Basin. 1974 survey.

Source: Ishikawa Prefecture 1975C

1 Kanahira	8 Hanasaka	15 Yoshitake
2 Kaneno	9 Nakaumi	17 Sono
3 Gokoji	10 Arakida	18 Kamikomatsu
4 Karumi	11 Sasaki	19 Shimomaki
5 Shirae	12 Yawata	21 Tsurugashima
6 Wakasugi	13 Urushi	22 Oki
7 Shorenji	14 Uchikoshi	

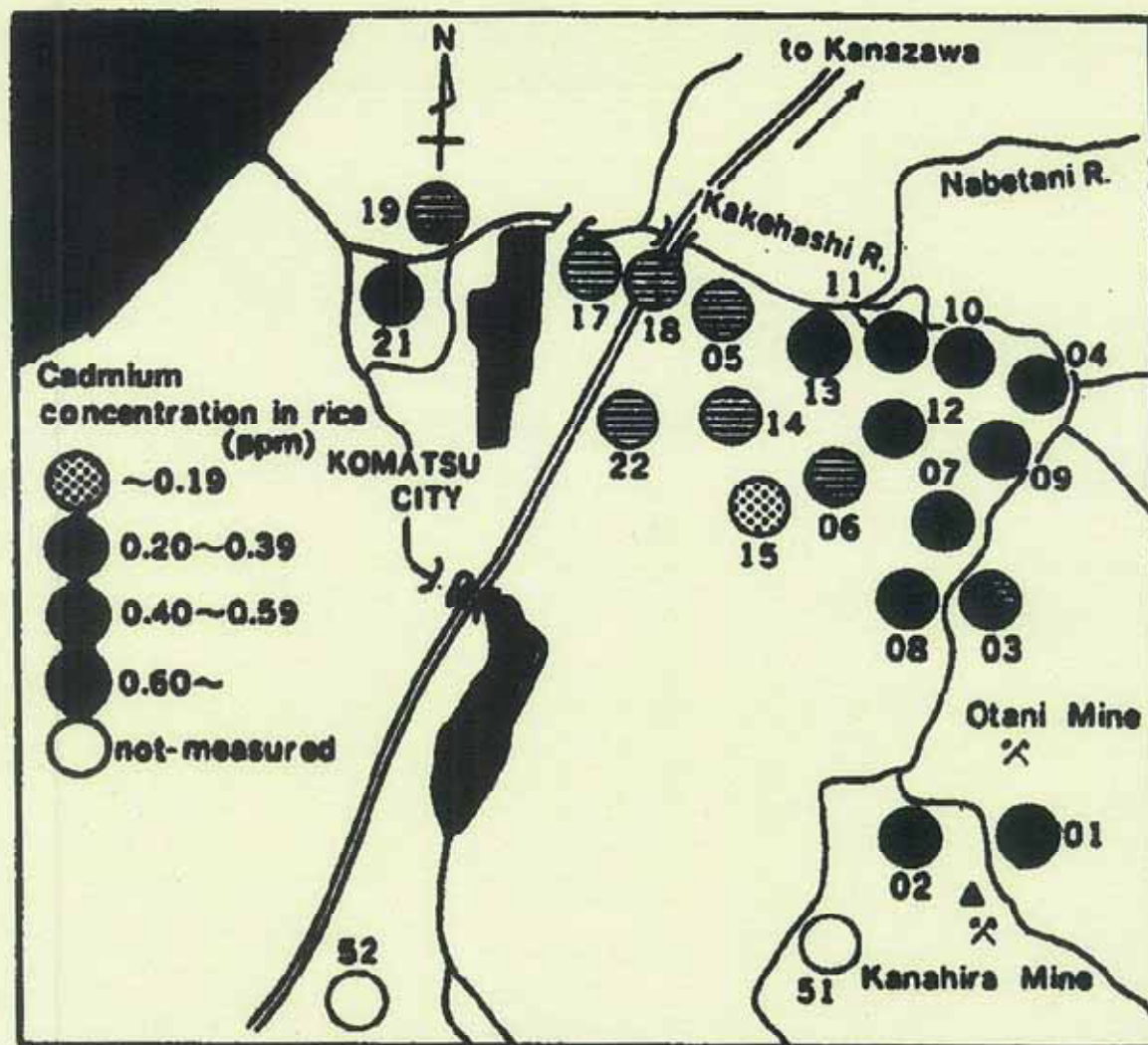


Fig. 6-27. Cadmium concentrations in rice grown in 1974 in the Kakehashi River Basin.

Source: Ishikawa Prefecture 1975C

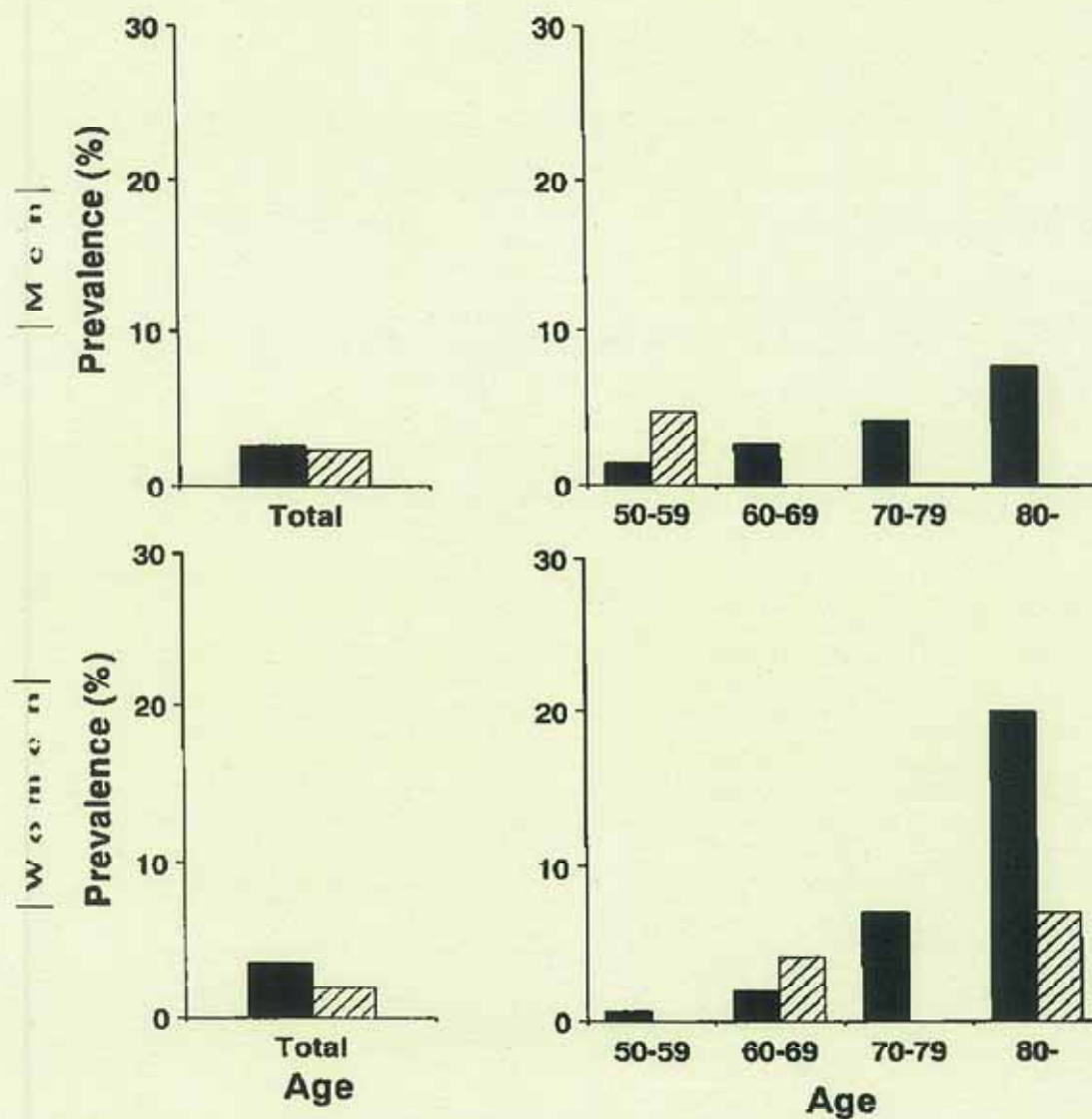
Note: Numbers correspond to key on Fig. 6-25.

51 Hasadani, 52 Futatsumashi

Table 1 Age and sex distribution of population studied.

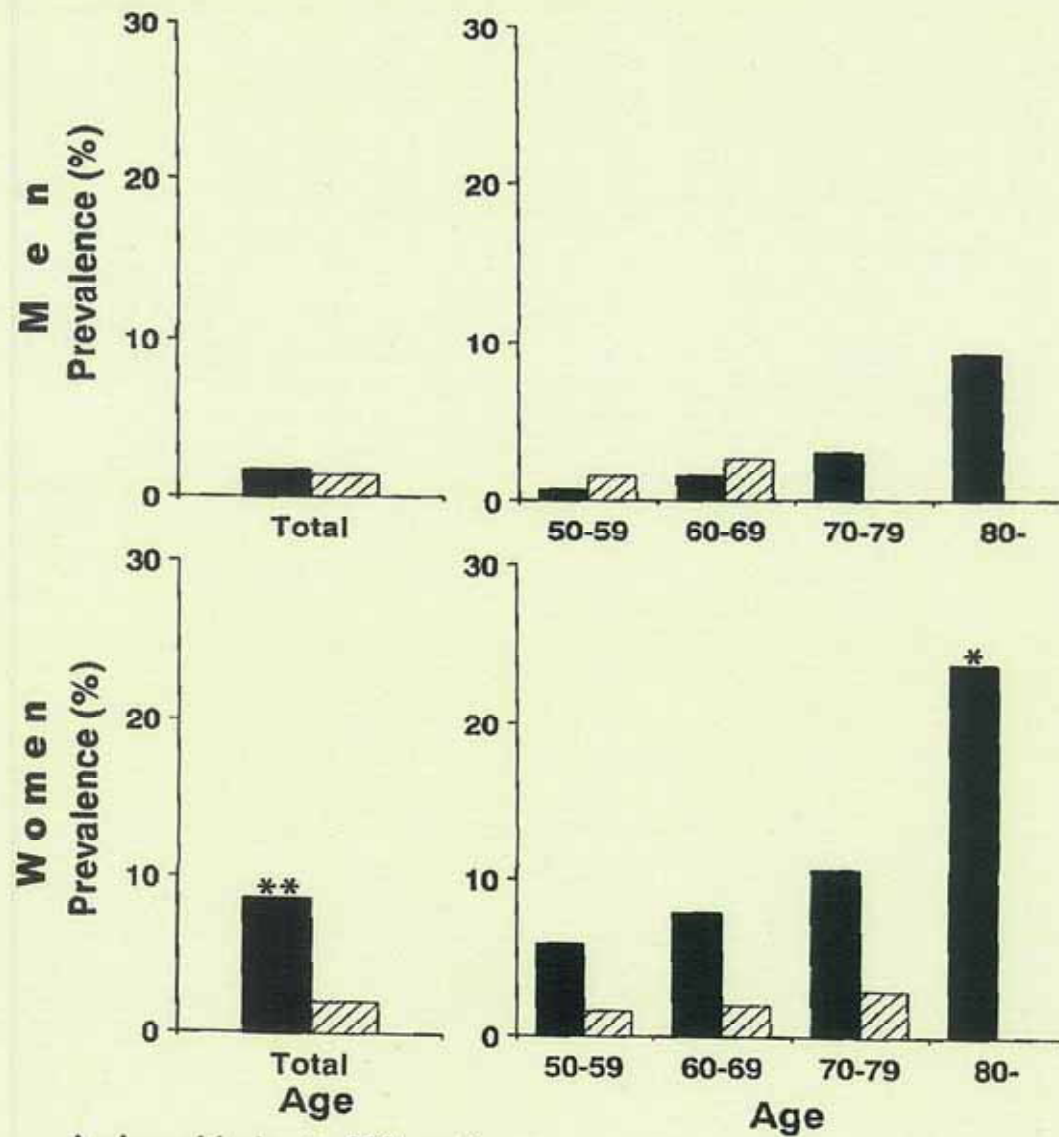
Age	<u>Cd-exposed subjects</u>			<u>Nonexposed control subjects</u>		
	Men	Women	Men and women	Men	Women	Men and women
50 — 59	600	713	1313	62	64	126
60 — 69	494	591	1085	38	49	87
70 — 79	265	340	605	26	34	60
80 —	65	110	175	7	14	21
Total	1424	1754	3178	133	161	294

Prevalence of Glucosuria with Proteinuria



Glucosuria ≥ 20 mg/dl, Proteinuria ≥ 5 mg/dl
 ■ ; Cd-exposed subjects, ▨ ; Nonexposed subjects

Prevalence of Aminoaciduria

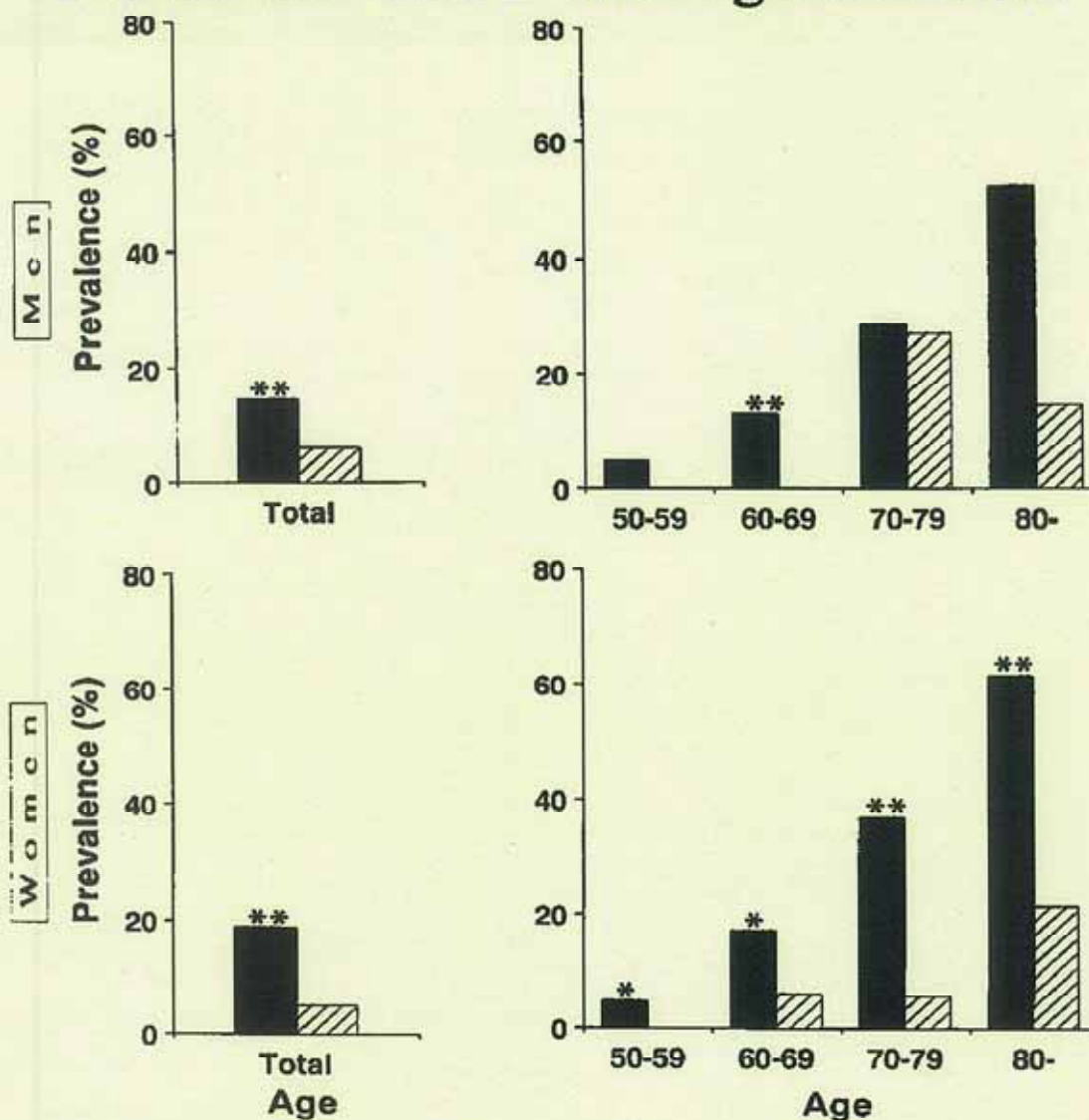


Aminoaciduria ≥ 300 mg/g cr

■ ; Cd-exposed subjects, ▨ ; Nonexposed subjects

* ; $P \leq 0.05$, ** ; $P \leq 0.01$

Prevalence of B₂-Microglobulinuria

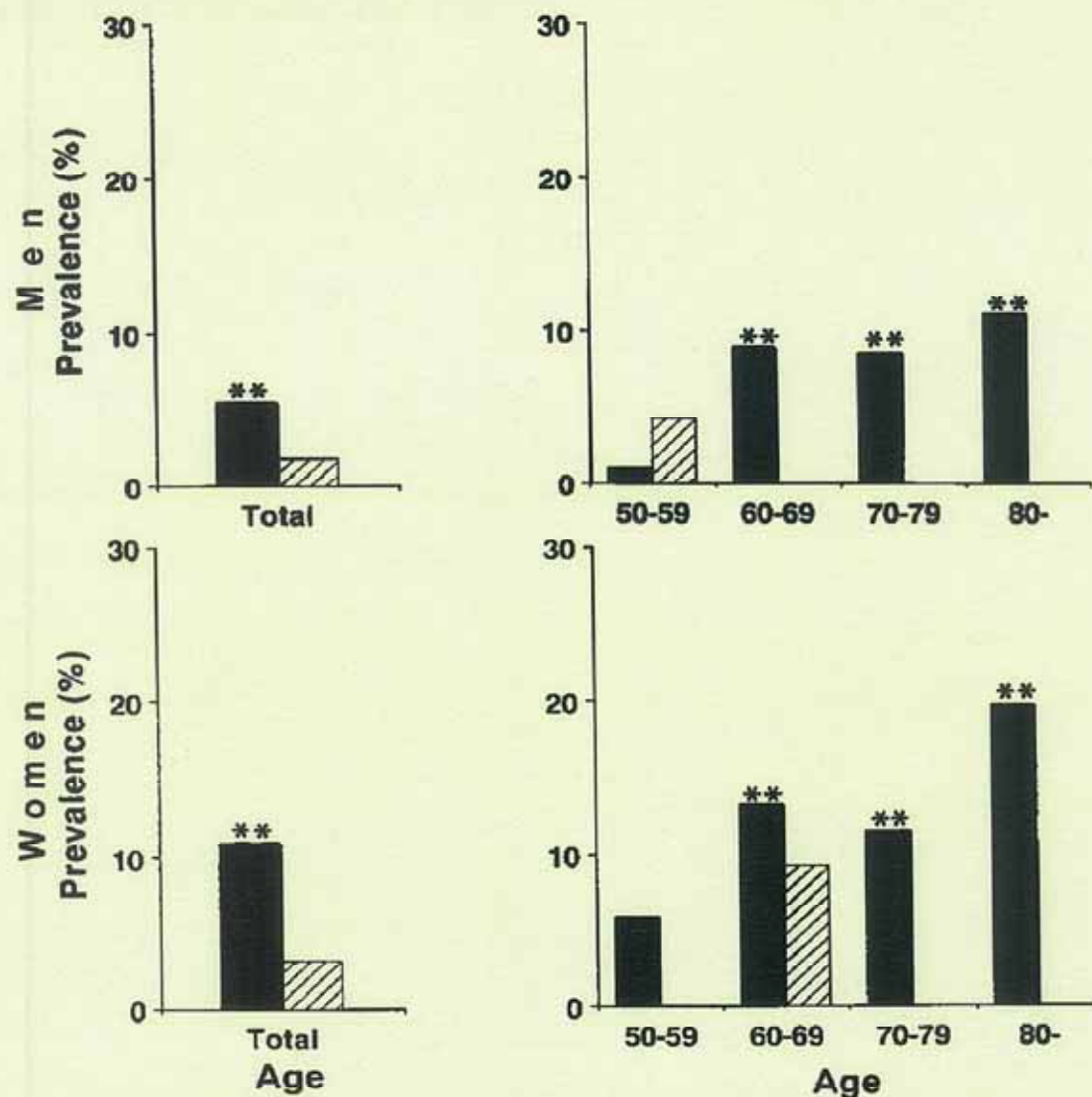


B₂-Microglobulinuria ≥ 1000 $\mu\text{g/g cr}$

■ ; Cd-exposed subjects, ▨ ; Nonexposed subjects

* ; $P \leq 0.05$, ** ; $P \leq 0.01$

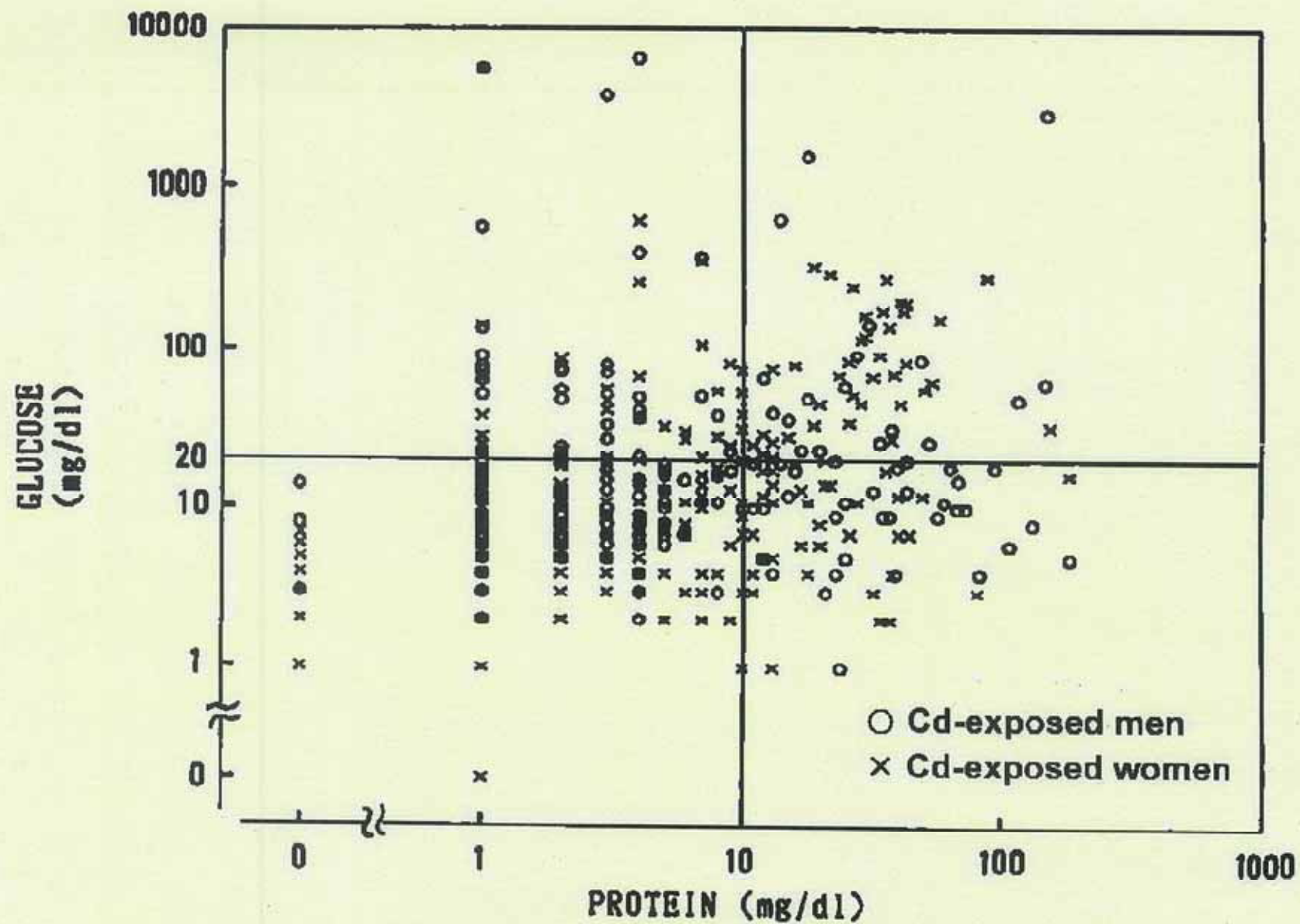
Prevalence of Metallothioneinuria



Metallothioneinuria ; Men ≥ 645 ug/g cr , Women ≥ 738 ug/g cr

■ ; Cd-exposed subjects, ▨ ; Nonexposed subjects

* ; $P \leq 0.05$, ** ; $P \leq 0.01$



Urinary findings of glucose and protein in cadmium – exposed inhabitants with β_2 – microglobulin concentration over 1,000 $\mu\text{g} / \text{g cr}$

