

The specific activity of Sr-90 in the extracted teeth of Semipalatinsk city residents is shown in the table 1.17. One kilogram of teeth contains 282 g of calcium; thus, the coefficient for calculation of the activity of Sr-90 in bone tissues from teeth is 0.5. Using these parameters, the average dose equivalent of the bone tissues of the Semipalatinsk region residents were calculated. It was established that if the concentration of Sr-90 in the bone tissues is 2 milliCurie, the average annual dose equivalent would be 30 cSv. The usual amount of calcium in the bone tissues of a standard man is 1000 g. So, the dose to bone tissues can be calculated as being 30 cSv per year if the concentration of Sr-90 in the bone tissues is $2 \cdot 10^6$ picocurie/skeleton 10^3 g (calcium/skeleton) and equal to $2 \cdot 10^3$ strontium units (Sr/u). Accordingly, 1 Sr/u can be a dose equivalent of 15 millirem per year. All of these calculations were used to gain the data shown in table 1.17. And, a decreasing tendency of median annual dose equivalent of the bone tissues (and, accordingly, of the bone marrows) was evident in the observed population after 1983.

The median annual external exposure doses were measured using the dosimeters IFKU and IKS in 16 populated areas of maximal radiation risk (Figure 1). The data for the period from 1981 to 1988 are shown in table 1.18. Exposure year doses after subtraction of the natural (background) radiation dose (the median figure for this zone is 0.12 roentgen per year) are shown. The results of direct measurements (table 1.19) show that the exposure doses from the fallout were not so high - 0.008-0.015 microroentgen per hour = 1051 milliroentgen per year.

Table 1. 18. Average dose equivalent of bone tissues of the population of Semipalatinsk city (based on analyse of samples from extracted teeth, millirem/year)

Years	Age groups (years)		
	5-13	14-20	>20
1983	114.0	111.0	76.5
1984	22.5	28.5	—
1985	19.5	18.0	16.5
1986	28.5	—	15.9
1987	24.0	24.0	20.3
1988	22.5	—	12.5

Table 1. 19. Exposure year doses of γ -ray irradiation in populated areas of control zone, after subtraction of background dose

Populated area	Dose of γ -ray irradiation (Roentgen) by year							
	1981	1982	1983	1984	1985	1986	1987	1988
1. Semiyarka	0.08	0.08	0.00	0.00	0.00	0.14	0.38	0.03
2. Grachi	0.05	0.05	0.00	0.27	0.00	0.07	0.25	0.02
3. Cheremushki	0.18	0.18	0.00	0.09	0.00	0.24	0.30	0.06
4. Mostik	0.11	0.11	0.00	0.00	0.00	0.22	0.34	0.03
5. Dolon	0.11	0.11	0.00	0.23	0.00	0.25	0.37	0.04
6. Belokamenka	0.08	0.08	0.00	0.07	0.00	0.10	0.15	0.05
7. Gluhovka	ND	ND	0.00	0.00	0.00	0.06	0.44	0.03
8. Beisen	ND	ND	ND	0.00	0.00	0.12	0.37	0.04
9. Sarapan	ND	ND	ND	0.05	0.00	0.21	0.37	0.03
10. Chinji	0.18	0.18	0.00	0.19	0.00	0.43	0.17	0.03
11. Gostinitsa	0.15	0.15	0.085	0.45	0.36	0.25	1.00	0.08
12. Sarjal	0.18	0.18	0.00	0.21	0.00	0.26	0.42	0.05
13. Jarik	ND	ND	0.00	ND	0.00	0.02	0.02	0.05
14. Bolshaya Vladimirovka	ND	ND	0.00	0.21	0.00	0.17	0.12	0.03