



Occupational Radiation Exposure in Hong Kong (2022)

Radiation Monitoring Service
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This is a report on the occupational external radiation dose data of persons who were employed in work involving radioactive substances or irradiating apparatus in Hong Kong in the year 2022. The data were obtained from individual occupational monitoring using thermoluminescent dosimeters (TLD) provided by the Radiation Monitoring Service (RMS) of the Radiation Health Division, Department of Health, the Government of the Hong Kong Special Administrative Region.

Whole body radiation monitoring

In 2022, the RMS provided whole body type individual monitoring dosimeters to 13,165 named persons and 1,031 unnamed users at 925 sites. The named persons could be grouped into 57 different job types in one of the following four job categories: *dental* (8.81%), *industrial* (7.15%), *medical* (65.23%) and *others* (18.82%). A summary of the annual dose distribution tabulated separately by job category and by job type is at Table 1 and 3 respectively.

The average annual dose of all the monitored persons was 0.09 mSv, which was slightly lower than the value in 2021. One person's dosimeter recorded a dose higher than the statutory limit of 20 mSv in a year. 86.2% of the monitored persons had annual doses 0.17 mSv or below, which was the level equivalent to one-tenth the pro rata monthly fraction derived from the annual statutory dose limit. Two persons' dosimeters recorded doses exceeding 6 mSv, the highest of which was 35.27 mSv.

For individual job categories, the average annual doses for dental, industrial, medical and others were respectively 0.05, 0.08, 0.10 and 0.09 mSv.

Among the monitored users, about 46.8% worked in the public sector (including staff in hospitals of Hospital Authority), the rest of about 53.2% worked in the private sector. By gender, 6,475 (49.2%) were male and 6,690 (50.8%) were female (Figure 5). The dose distribution by gender is at Table 5.

Extremity radiation monitoring

In 2022, the RMS also provided extremity (finger) dose monitoring service to 391 workers at 64 sites in Hong Kong. The average annual finger dose was about 5.01 mSv. Five workers received annual finger doses exceeding 100 mSv and the highest dose recorded was 216.20 mSv against the annual limit of 500 mSv prescribed by the Radiation Ordinance. A summary of the dose distribution tabulated separately by job category and by job type is at Table 2 and 4 respectively.

For individual job categories, the average annual extremity doses for dental, industrial, medical and others were respectively 0.00, 3.50, 5.62 and 3.90 mSv. By gender, 312 (79.8%) were male and 79 (20.2%) were female (Figure 6). The dose distribution by gender is at Table 6.

Figure 1

The Distribution of Whole Body Dosimeter Users by Job Categories, 2022

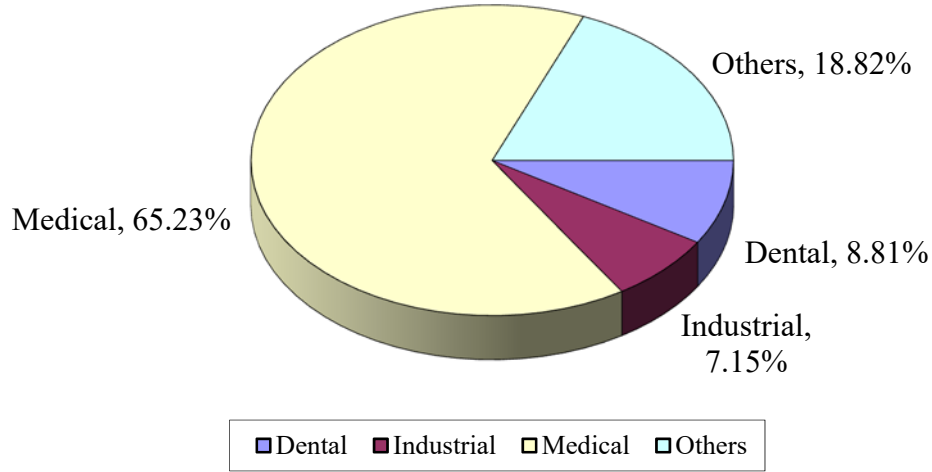


Figure 2

The Distribution of Finger Dosimeter Users by Job Categories, 2022

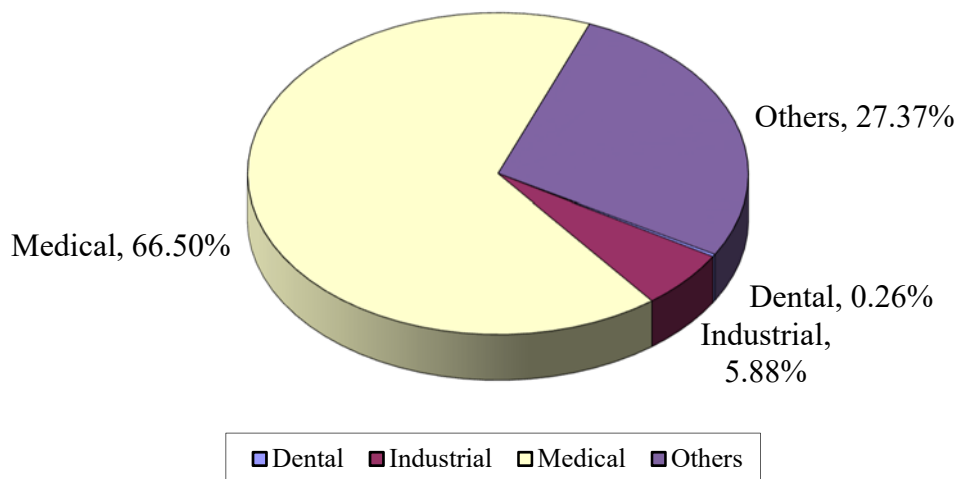


Figure 3

The Average Annual Occupational Whole Body Dose by Job Categories, 2022

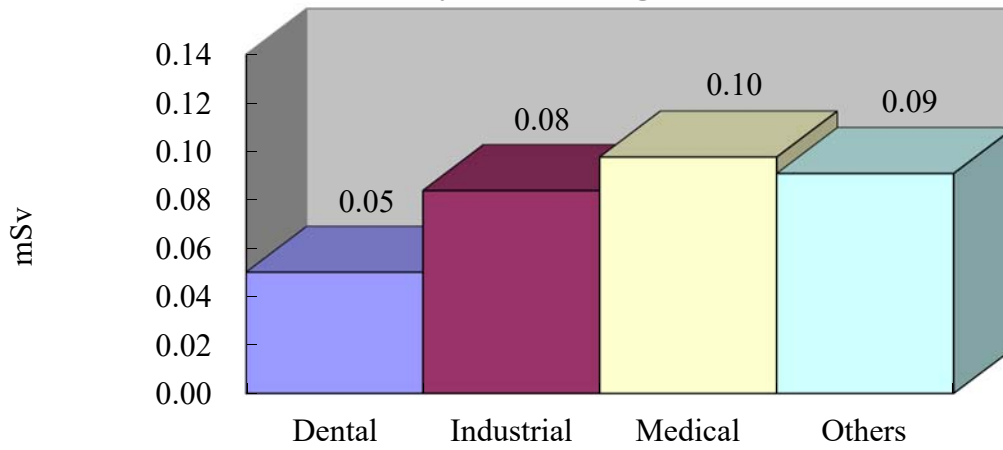


Figure 4

The Average Annual Occupational Finger Dose by Job Categories, 2022

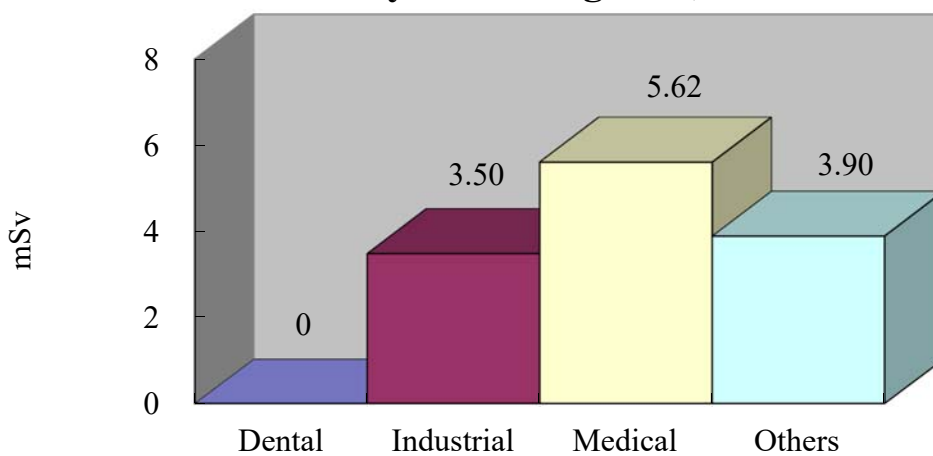


Figure 5

The Distribution of Whole Body Dosimeter Users by Gender, 2022

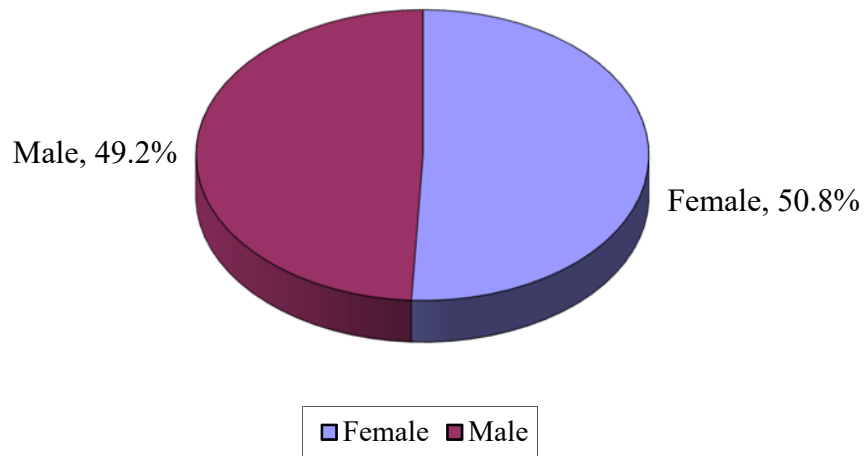


Figure 6

The Distribution of Finger Dosimeter Users by Gender, 2022

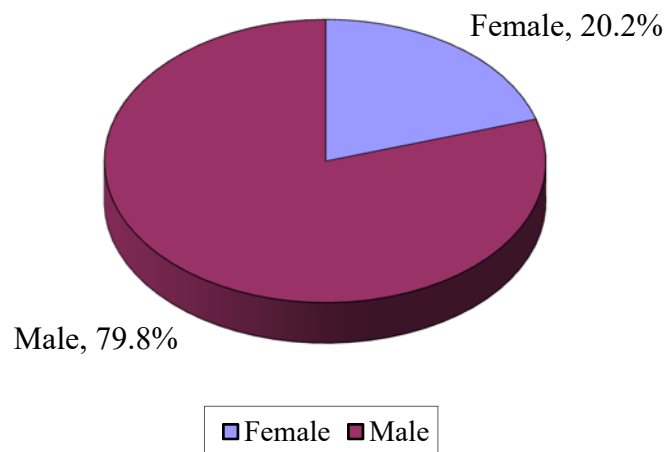


Table 1

**The Distribution of Whole Body Dose
by Job Categories, 2022**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Dental	1062	95	3	0	0	0	0
Industrial	784	144	11	2	0	0	0
Medical	7324	1070	120	61	11	1	0
Others	2179	262	21	12	2	0	1
Total	11349	1571	155	75	13	1	1

Remark: x represents the dose values in mSv

Table 2

**The Distribution of Finger Dose
by Job Categories, 2022**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Dental	1	0	0	0	0	0
Industrial	19	2	2	0	0	0
Medical	214	21	21	3	1	0
Others	95	4	7	1	0	0
Total	329	27	30	4	1	0

Remark: x represents the dose values in mSv

Table 3**The Distribution of Whole Body Dose
by Job Types, 2022**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Administrator	10	2	0	0	0	0	0
Artisan	28	6	0	0	0	0	0
Chemist	12	5	0	0	0	0	0
Clerk	28	2	1	0	0	0	0
Consultant (Medical)	17	2	2	0	0	0	0
Delivery	1	2	0	0	0	0	0
Dental Assistant	418	25	3	0	0	0	0
Dental Hygienist	26	2	0	0	0	0	0
Dental Therapist	180	32	0	0	0	0	0
Dentist	438	36	0	0	0	0	0
Department Manager	1	1	0	0	0	0	0
Driver	15	14	2	0	0	0	0
Engineer	204	41	3	0	0	0	0
Experimental Officer	1	0	0	0	0	0	0
Fire Safety Worker	3	2	0	0	0	0	0
Laboratory Attendant	21	6	1	1	0	0	0
Lecturer	10	1	0	0	0	0	0

**The Distribution of Whole Body Dose
by Job Types, 2022 (Continued)**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Luminous Watch Assembly Worker	4	1	0	0	0	0	0
Mechanic	22	4	1	0	0	0	0
Medical Officer	1446	284	19	3	1	1	0
Medical Officer (Therapeutic)	38	5	2	0	0	0	0
Medical Technologist	42	6	1	0	0	0	0
Nurse	2288	241	12	4	0	0	0
Nurse (Veterinary)	92	8	7	0	0	0	0
Operator	180	25	0	0	0	0	0
Pharmacist	18	7	1	1	0	0	0
Physicist (Health)	15	5	0	0	0	0	0
Physicist (Medical)	88	24	7	0	0	0	0
Physiotherapist	4	1	0	0	0	0	0
Police	0	9	0	0	0	0	1
Quality Assurance	15	3	0	0	0	0	0
Radiochemist	8	6	4	7	1	0	0
Radiographer (Diagnostic)	1621	248	49	37	7	0	0
Radiographer (Industrial)	42	13	0	1	0	0	0

**The Distribution of Whole Body Dose
by Job Types, 2022 (Continued)**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Radiographer (Therapeutic)	198	45	2	1	0	0	0
Radiologist	140	35	2	2	0	0	0
Research Assistant	155	17	0	0	0	0	0
Safety Officer	6	5	0	0	0	0	0
Scientific Assistant	8	0	0	0	0	0	0
Scientific Officer	13	0	0	0	0	0	0
Security Officer	1	0	0	0	0	0	0
Speech Therapist	75	5	0	0	0	0	0
Store Keeper	2	3	0	0	0	0	0
Student	139	7	1	0	0	0	0
Teaching Assistant	2	0	0	0	0	0	0
Technical Officer	105	12	1	0	0	0	0
Technician (Electrical)	160	31	5	0	0	0	0
Technician (Laboratory)	199	44	1	0	1	0	0
Technician (X-rays)	40	2	1	1	0	0	0
Trainee	16	1	0	1	0	0	0
Vet	207	13	0	0	0	0	0

**The Distribution of Whole Body Dose
by Job Types, 2022 (Continued)**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Vet Assistant	165	15	1	0	0	0	0
Ward Attendant	812	121	10	5	2	0	0
Workman	36	10	0	0	0	0	0
X-ray Assistant	24	1	0	0	0	0	0
X-ray Crystallographer	1	0	0	0	0	0	0
No Job Code	1509	135	16	11	1	0	0
Total	11349	1571	155	75	13	1	1

Remark: x represents the dose values in mSv

Table 4**The Distribution of Finger Dose
by Job Types, 2022**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Dentist	1	0	0	0	0	0
Engineer	14	2	0	0	0	0
Laboratory Attendant	2	0	1	0	0	0
Lecturer	1	0	0	0	0	0
Medical Officer	70	0	0	0	0	0
Medical Officer (Therapeutic)	13	0	0	0	0	0
Medical Technologist	1	0	0	0	0	0
Operator	2	0	0	0	0	0
Pharmacist	2	4	5	0	0	0
Physicist (Health)	0	1	0	0	0	0
Physicist (Medical)	18	0	0	0	0	0
Radiochemist	12	1	9	2	1	0
Radiographer (Diagnostic)	82	16	7	0	0	0
Radiographer (Therapeutic)	2	0	0	0	0	0
Radiologist	9	0	0	1	0	0
Research Assistant	7	0	0	0	0	0
Scientific Officer	0	1	2	0	0	0

**The Distribution of Finger Dose
by Job Types, 2022 (Continued)**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Speech Therapist	2	0	0	0	0	0
Store Keeper	4	0	0	0	0	0
Student	2	0	0	0	0	0
Technical Officer	0	0	1	0	0	0
Technician (Electrical)	1	0	0	0	0	0
Technician (Laboratory)	3	1	2	0	0	0
Vet	1	0	0	0	0	0
Ward Attendant	2	0	0	0	0	0
No Job Code	78	1	3	1	0	0
Total	329	27	30	4	1	0

Remark: x represents the dose values in mSv

Table 5

**The Distribution of Whole Body Dose
by Gender, 2022**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Male	5477	848	88	50	10	1	1
Female	5872	723	67	25	3	0	0
Total	11349	1571	155	75	13	1	1

Remark: x represents the dose values in mSv

Table 6

**The Distribution of Finger Dose
by Gender, 2022**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Male	261	22	24	4	1	0
Female	68	5	6	0	0	0
Total	329	27	30	4	1	0

Remark: x represents the dose values in mSv