



Occupational Radiation Exposure in Hong Kong (2018)

Radiation Monitoring Service
Radiation Health Unit
Department of Health, HKSAR

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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 2018. The data were obtained from individual occupational monitoring using thermoluminescent dosimeters (TLD) provided by the Radiation Monitoring Service (RMS) of the Radiation Health Unit, Department of Health, the Government of the Hong Kong Special Administrative Region.

Whole body radiation monitoring

In 2018, the RMS provided whole body type individual monitoring dosimeters to 11,276 named persons and 1,355 unnamed users at 884 sites. The named persons could be grouped into 57 different job types in one of the following four job categories: *dental* (10.28%), *industrial* (8.57%), *medical* (64.22%) and *others* (16.93%). 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 slightly decreased from 0.11 mSv in 2017. All monitored persons had doses within the statutory limit of 20 mSv in a year. 88.5% 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. Three persons received doses exceeding 6 mSv. The highest whole body dose recorded was 7.19 mSv.

For individual job categories, the average annual doses for dental, industrial, medical and others were respectively 0.03, 0.10, 0.10 and 0.11 mSv.

Among the monitored persons, about 50.5% worked in the public sector (including staff in hospitals of Hospital Authority), the rest of about 49.5% worked in the private sector. By gender, 5,412 (48.0%) were male and 5,864 (52.0%) were female (Figure 5). The dose distribution by gender is at Table 5.

Extremity radiation monitoring

In 2018, the RMS also provided extremity (finger) dose monitoring service to 321 workers at 54 sites in Hong Kong. The average annual finger dose was about 6.43 mSv. Seven workers received annual finger doses exceeding 100 mSv and the highest dose recorded was 211.41 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 industrial, medical and others were respectively 1.30, 2.53 and 15.28 mSv. By gender, 259 (80.7%) were male and 62 (19.3%) 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, 2018

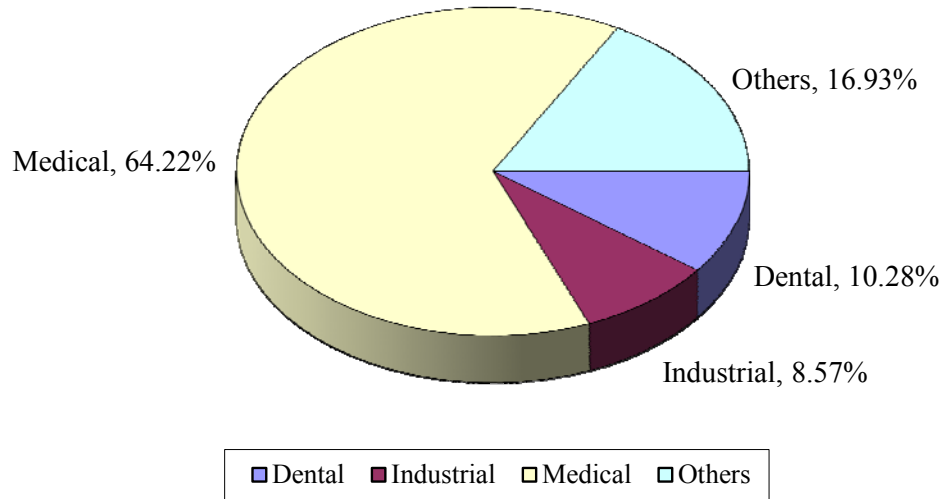


Figure 2

The Distribution of Finger Dosimeter Users by Job Categories, 2018

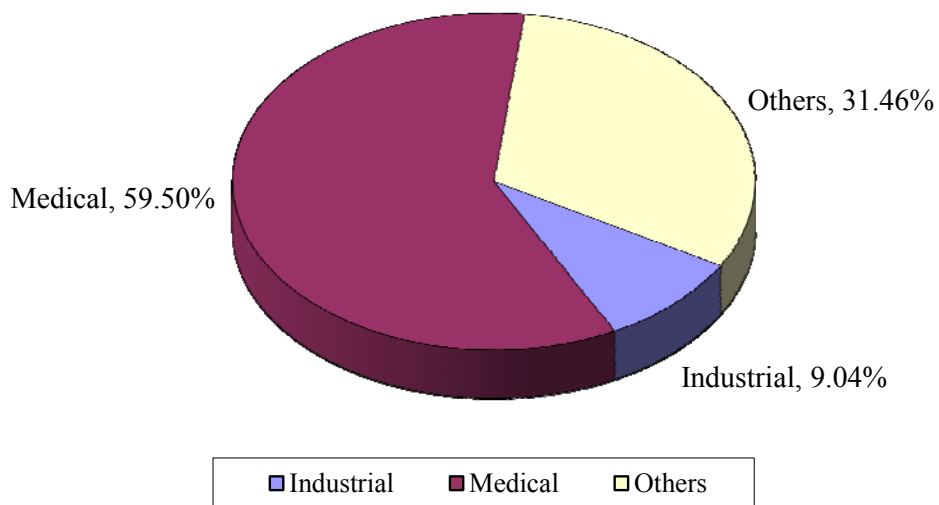


Figure 3

The Average Annual Occupational Whole Body Dose by Job Categories, 2018

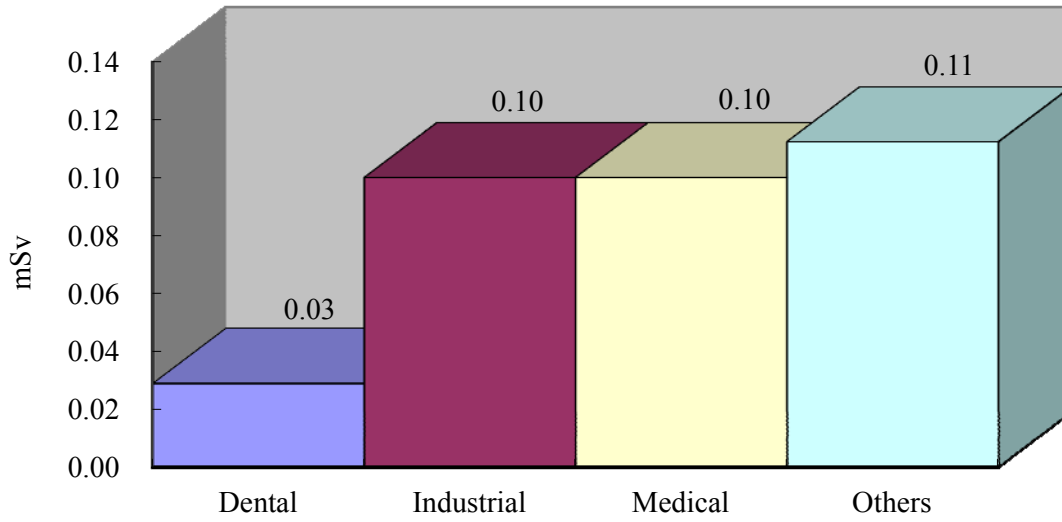


Figure 4

The Average Annual Occupational Finger Dose by Job Categories, 2018

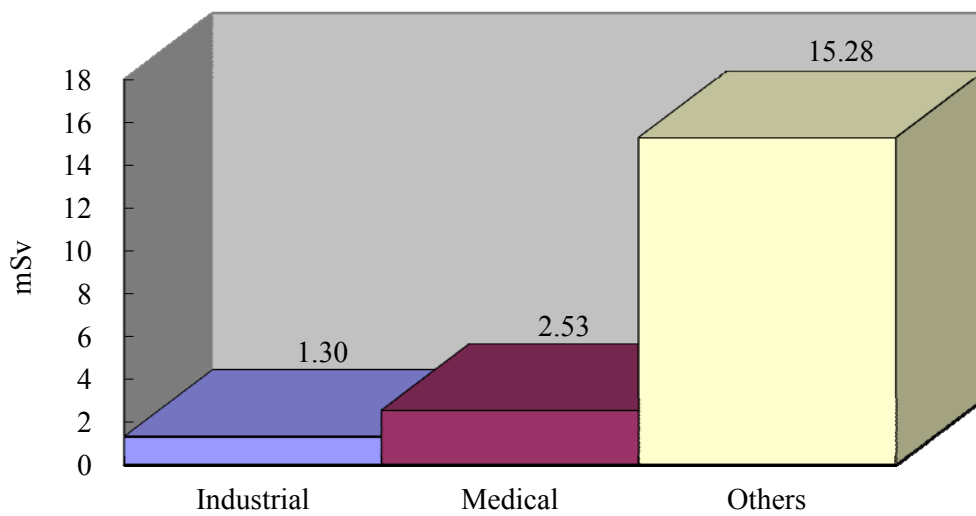


Figure 5

The Distribution of Whole Body Dosimeter Users by Gender, 2018

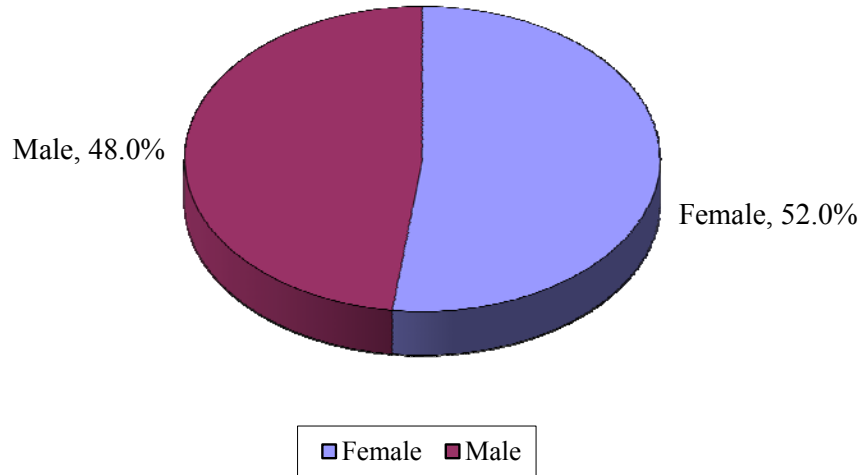


Figure 6

The Distribution of Finger Dosimeter Users by Gender, 2018

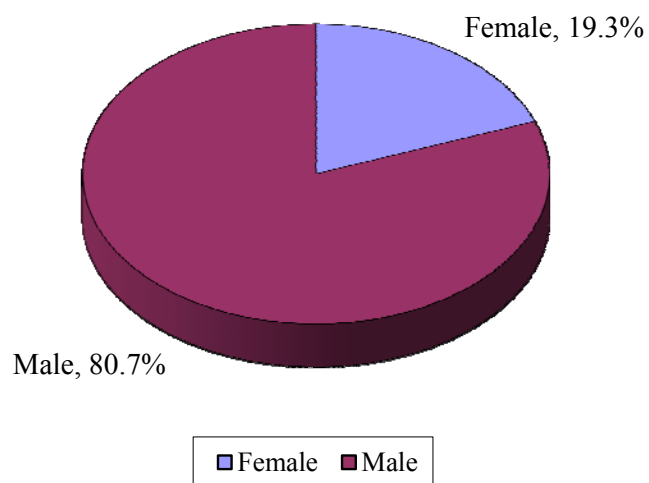


Table 1

**The Distribution of Whole Body Dose
by Job Categories, 2018**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Dental	1108	52	0	0	0	0	0
Industrial	829	109	17	9	1	1	0
Medical	6351	730	88	55	17	0	0
Others	1690	172	21	11	13	2	0
Total	9978	1063	126	75	31	3	0

Remark: x represents the dose values in mSv

Table 2

**The Distribution of Finger Dose
by Job Categories, 2018**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Industrial	23	5	1	0	0	0
Medical	146	37	7	1	0	0
Others	72	12	11	5	1	0
Total	241	54	19	6	1	0

Remark: x represents the dose values in mSv

Table 3
**The Distribution of Whole Body Dose
 by Job Types, 2018**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Administrator	11	2	0	0	0	0	0
Artisan	52	6	0	0	0	0	0
Chemist	18	11	1	2	4	1	0
Clerk	47	1	1	0	0	0	0
Consultant (Medical)	22	5	0	0	0	0	0
Delivery	1	0	1	0	0	0	0
Dental Assistant	415	18	0	0	0	0	0
Dental Hygienist	25	1	0	0	0	0	0
Dental Therapist	227	11	0	0	0	0	0
Dentist	441	22	0	0	0	0	0
Department Manager	0	2	0	0	0	0	0
Driver	18	4	1	0	0	0	0
Engineer	195	25	6	5	1	1	0
Experimental Officer	2	0	0	0	0	0	0
Fire Safety Worker	3	2	0	0	0	0	0
Laboratory Attendant	27	5	0	2	0	0	0
Lecturer	21	0	0	0	0	0	0

**The Distribution of Whole Body Dose
by Job Types, 2018 (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	5	2	0	0	0	0	0
Mechanic	30	2	1	0	0	0	0
Medical Officer	1350	191	16	3	3	0	0
Medical Officer (Therapeutic)	49	6	0	0	0	0	0
Medical Technologist	33	6	0	0	1	0	0
Nurse	2014	169	8	3	2	0	0
Nurse (Veterinary)	54	3	0	1	0	0	0
Operator	214	6	1	0	0	0	0
Pharmacist	11	4	7	0	0	0	0
Physicist (Health)	9	5	1	0	0	0	0
Physicist (Medical)	72	19	2	0	0	0	0
Physiotherapist	2	0	0	0	0	0	0
Police	4	5	0	0	0	0	0
Quality Assurance	31	5	2	0	0	0	0
Radiobiologist	1	0	0	0	0	0	0
Radiographer (Diagnostic)	1515	157	35	43	9	0	0
Radiographer (Industrial)	40	23	1	0	0	0	0

**The Distribution of Whole Body Dose
by Job Types, 2018 (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)	124	21	2	0	0	0	0
Radiologist	164	20	4	0	0	0	0
Research Assistant	193	10	1	1	0	0	0
Safety Officer	10	0	1	0	0	0	0
Scientific Assistant	6	0	0	0	0	0	0
Scientific Officer	15	1	0	0	0	0	0
Security Officer	1	0	0	0	0	0	0
Speech Therapist	69	1	0	0	0	0	0
Store Keeper	2	0	0	0	0	0	0
Student	154	6	0	0	0	0	0
Teaching Assistant	2	0	0	0	0	0	0
Technical Officer	125	12	3	1	0	0	0
Technician (Electrical)	107	21	3	1	0	0	0
Technician (Laboratory)	274	33	0	1	1	0	0
Technician (X-rays)	45	5	0	0	0	0	0
Trainee	17	3	0	0	0	0	0
Vet	170	9	2	1	1	0	0

**The Distribution of Whole Body Dose
by Job Types, 2018 (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	107	10	2	1	1	0	0
Ward Attendant	516	99	10	3	0	0	0
Workman	48	11	0	0	0	0	0
X-ray Assistant	33	3	0	0	0	0	0
X-ray Crystallographer	2	0	0	0	0	0	0
No Job Code	835	80	14	7	8	1	0
Total	9978	1063	126	75	31	3	0

Remark: x represents the dose values in mSv

Table 4**The Distribution of Finger Dose
by Job Types, 2018**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Chemist	3	4	7	2	1	0
Engineer	19	4	0	0	0	0
Laboratory Attendant	2	0	0	0	0	0
Lecturer	1	0	0	0	0	0
Medical Officer	62	1	0	0	0	0
Medical Officer (Therapeutic)	14	0	0	0	0	0
Medical Technologist	0	1	0	0	0	0
Pharmacist	3	3	1	1	0	0
Physicist (Medical)	8	1	0	0	0	0
Quality Assurance	0	0	1	0	0	0
Radiographer (Diagnostic)	47	31	6	0	0	0
Radiologist	6	0	0	0	0	0
Research Assistant	3	3	0	0	0	0
Scientific Officer	0	0	1	0	0	0
Speech Therapist	4	0	0	0	0	0
Store Keeper	1	0	0	0	0	0
Student	1	0	0	0	0	0

**The Distribution of Finger Dose
by Job Types, 2018 (Continued)**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Technical Officer	0	1	0	0	0	0
Technician (Electrical)	2	0	0	0	0	0
Technician (Laboratory)	9	0	1	1	0	0
Ward Attendant	2	0	0	0	0	0
Workman	1	0	0	0	0	0
No Job Code	53	5	2	2	0	0
Total	241	54	19	6	1	0

Remark: x represents the dose values in mSv

Table 5

**The Distribution of Whole Body Dose
by Gender, 2018**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Male	4659	607	76	47	21	2	0
Female	5319	456	50	28	10	1	0
Total	9978	1063	126	75	31	3	0

Remark: x represents the dose values in mSv

Table 6

**The Distribution of Finger Dose
by Gender, 2018**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Male	193	43	16	6	1	0
Female	48	11	3	0	0	0
Total	241	54	19	6	1	0

Remark: x represents the dose values in mSv