



## **Occupational Radiation Exposure in Hong Kong (2017)**

Radiation Monitoring Service  
Radiation Health Unit  
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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 2017. 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 2017, the RMS provided whole body type individual monitoring dosimeters to 10,422 named persons and 1,320 unnamed users at 872 sites. The named persons could be grouped into 56 different job types in one of the following four job categories: *dental* (10.46%), *industrial* (9.24%), *medical* (62.94%) and *others* (17.36%). 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 0.11 mSv, which increased slightly from 0.10 mSv in 2016. All monitored persons had doses within the statutory limit of 20 mSv in a year. 84.8% 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. No person received a dose exceeding 6 mSv. The highest whole body dose recorded was 5.80 mSv.

For individual job categories, the average annual doses for dental, industrial, medical and others were respectively 0.04, 0.10, 0.12 and 0.12 mSv.

Among the monitored persons, about 49.9% worked in the public sector (including staff in hospitals of Hospital Authority), the rest of about 50.1% worked in the private sector. By gender, 5,051 (48.5%) were male and 5,371 (51.5%) were female (Figure 5). The dose distribution by gender is at Table 5.

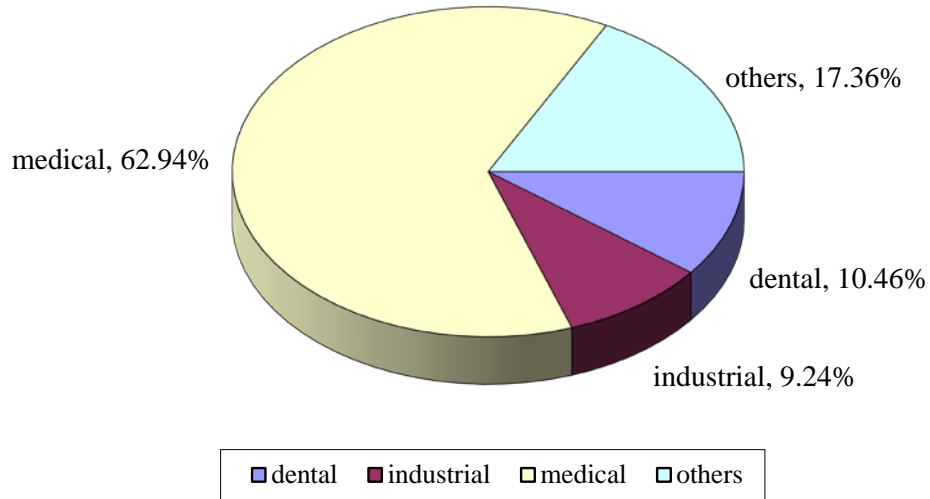
### **Extremity radiation monitoring**

In 2017, the RMS also provided extremity (finger) dose monitoring service to 305 workers at 55 sites in Hong Kong. The average annual finger dose was about 4.95 mSv. Four workers received annual finger doses exceeding 100 mSv and the highest dose recorded was 223.22 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 1.21, 1.33 and 12.40 mSv. By gender, 250 (82.0%) were male and 55 (18.0%) were female (Figure 6). The dose distribution by gender is at Table 6.

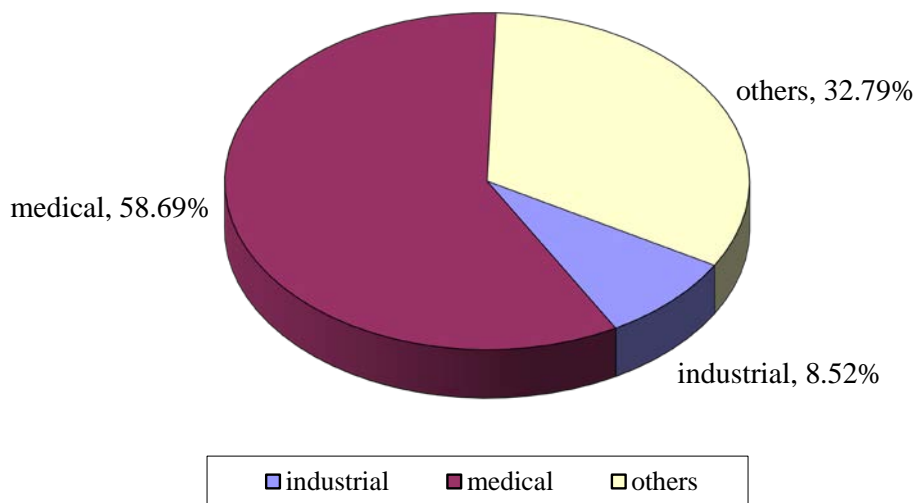
**Figure 1**

**The Distribution of Whole Body Dosimeter Users by Job Categories, 2017**



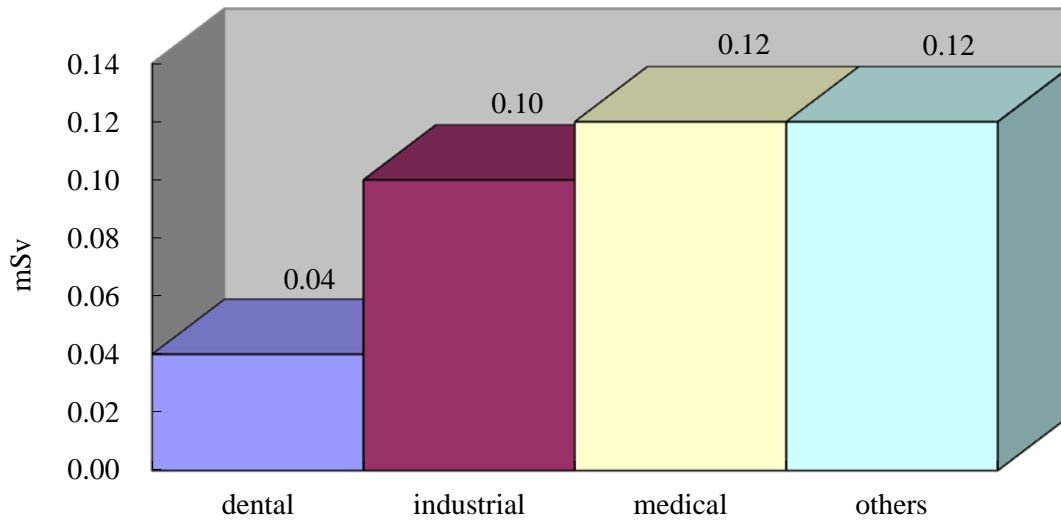
**Figure 2**

**The Distribution of Finger Dosimeter Users by Job Categories, 2017**



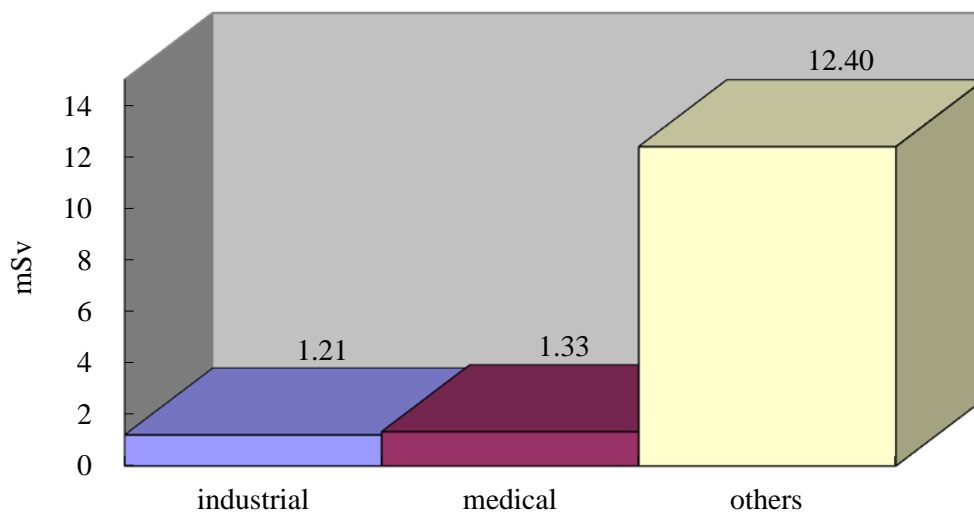
**Figure 3**

**The Average Annual Occupational Whole Body Dose by Job Categories, 2017**



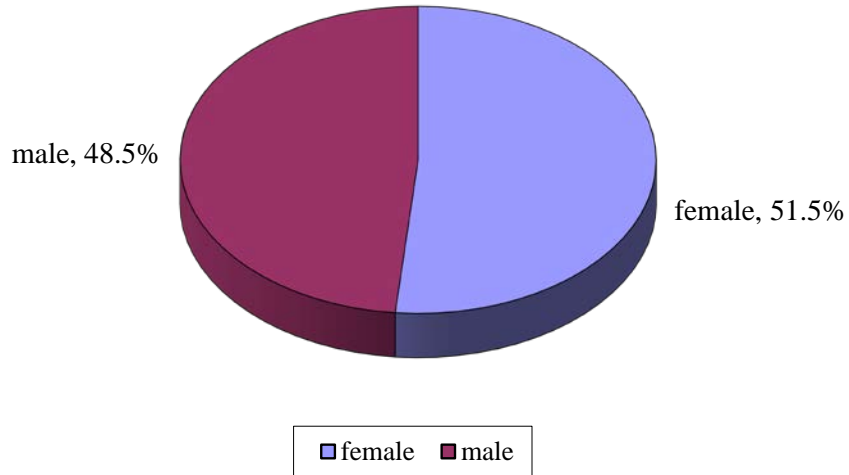
**Figure 4**

**The Average Annual Occupational Finger Dose by Job Categories, 2017**



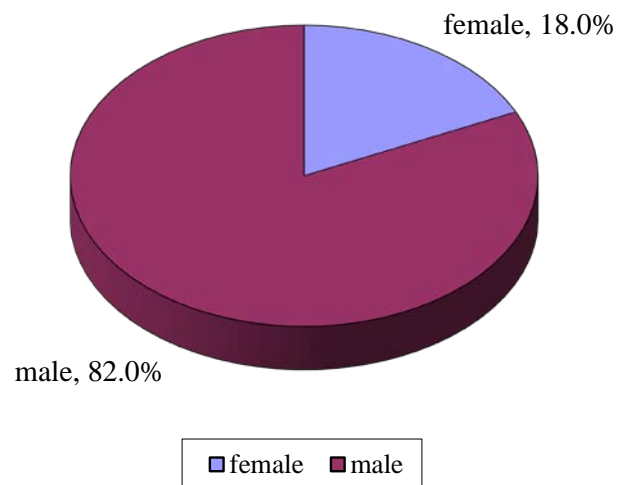
**Figure 5**

**The Distribution of Whole Body Dosimeter Users by Gender, 2017**



**Figure 6**

**The Distribution of Finger Dosimeter Users by Gender, 2017**



**Table 1**

**The Distribution of Whole Body Dose  
by Job Categories, 2017**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Dental	1009	78	3	0	0	0	0
Industrial	812	127	19	4	1	0	0
Medical	5481	880	129	59	11	0	0
Others	1534	233	20	11	11	0	0
Total	8836	1318	171	74	23	0	0

Remark: x represents the dose values in mSv

**Table 2**

**The Distribution of Finger Dose  
by Job Categories, 2017**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Industrial	20	5	1	0	0	0
Medical	148	26	5	0	0	0
Others	71	15	10	2	2	0
Total	239	46	16	2	2	0

Remark: x represents the dose values in mSv

**Table 3****The Distribution of Whole Body Dose  
by Job Types, 2017**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Administrator	12	3	0	0	0	0	0
Artisan	55	6	0	0	0	0	0
Chemist	23	7	1	1	5	0	0
Clerk	48	4	1	0	0	0	0
Consultant (Medical)	22	7	1	0	0	0	0
Delivery	1	0	1	0	0	0	0
Dental Assistant	382	25	0	0	0	0	0
Dental Hygienist	18	2	1	0	0	0	0
Dental Therapist	210	19	0	0	0	0	0
Dentist	399	32	2	0	0	0	0
Department Manager	1	1	0	0	0	0	0
Driver	12	5	0	1	0	0	0
Engineer	188	28	3	2	1	0	0
Experimental Officer	2	0	0	0	0	0	0
Fire Safety Worker	6	1	0	0	0	0	0
Laboratory Attendant	16	5	1	1	0	0	0
Lecturer	23	0	0	0	0	0	0

**The Distribution of Whole Body Dose  
by Job Types, 2017 (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	6	1	0	0	0	0	0
Mechanic	30	1	2	0	0	0	0
Medical Officer	1126	230	39	9	0	0	0
Medical Officer (Therapeutic)	50	6	2	0	0	0	0
Medical Technologist	30	4	0	0	0	0	0
Nurse	1773	231	13	6	1	0	0
Nurse (Veterinary)	44	4	0	1	0	0	0
Operator	249	19	0	0	0	0	0
Pharmacist	17	4	3	1	0	0	0
Physicist (Health)	7	9	0	0	0	0	0
Physicist (Medical)	65	18	5	1	0	0	0
Physiotherapist	3	0	0	0	0	0	0
Police	3	6	0	0	0	0	0
Quality Assurance	32	7	3	0	0	0	0
Radiographer (Diagnostic)	1365	194	41	29	9	0	0
Radiographer (Industrial)	41	24	0	0	0	0	0
Radiographer (Therapeutic)	105	23	2	1	0	0	0



**The Distribution of Whole Body Dose  
by Job Types, 2017 (Continued)**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Radiologist	137	29	2	1	0	0	0
Research Assistant	190	27	0	1	0	0	0
Safety Officer	8	2	0	0	0	0	0
Scientific Assistant	4	0	0	0	0	0	0
Scientific Officer	13	2	0	0	0	0	0
Security Officer	1	0	0	0	0	0	0
Speech Therapist	64	2	0	0	0	0	0
Store Keeper	2	0	0	0	0	0	0
Student	153	13	0	0	0	0	0
Teaching Assistant	2	0	0	0	0	0	0
Technical Officer	104	14	4	1	0	0	0
Technician (Electrical)	85	21	6	0	0	0	0
Technician (Laboratory)	231	50	1	1	2	0	0
Technician (X-rays)	44	3	4	0	0	0	0
Trainee	17	2	1	0	0	0	0
Vet	136	16	0	2	1	0	0
Vet Assistant	76	14	2	3	0	0	0

**The Distribution of Whole Body Dose  
by Job Types, 2017 (Continued)**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Ward Attendant	398	90	14	5	0	0	0
Workman	52	15	0	0	0	0	0
X-ray Assistant	25	4	1	0	0	0	0
X-ray Crystallographer	3	0	0	0	0	0	0
No Job Code	727	88	15	7	4	0	0
Total	8836	1318	171	74	23	0	0

Remark: x represents the dose values in mSv

**Table 4****The Distribution of Finger Dose  
by Job Types, 2017**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Chemist	7	2	4	2	2	0
Engineer	17	4	0	0	0	0
Laboratory Attendant	2	0	0	0	0	0
Lecturer	1	0	0	0	0	0
Medical Officer	63	0	0	0	0	0
Medical Officer (Therapeutic)	14	0	0	0	0	0
Medical Technologist	1	0	0	0	0	0
Operator	1	0	0	0	0	0
Pharmacist	3	3	1	0	0	0
Physicist (Medical)	7	2	0	0	0	0
Quality Assurance	0	0	1	0	0	0
Radiographer (Diagnostic)	50	20	4	0	0	0
Radiologist	5	0	0	0	0	0
Research Assistant	4	3	0	0	0	0
Scientific Officer	0	0	1	0	0	0
Speech Therapist	3	0	0	0	0	0
Store Keeper	1	0	0	0	0	0

**The Distribution of Finger Dose  
by Job Types, 2017 (Continued)**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Student	1	0	0	0	0	0
Technical Officer	0	1	0	0	0	0
Technician (Laboratory)	7	1	2	0	0	0
Ward Attendant	2	1	0	0	0	0
Workman	1	0	0	0	0	0
No Job Code	49	9	3	0	0	0
Total	239	46	16	2	2	0

Remark: x represents the dose values in mSv

**Table 5**

**The Distribution of Whole Body Dose  
by Gender, 2017**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Male	4159	728	103	45	16	0	0
Female	4677	590	68	29	7	0	0
Total	8836	1318	171	74	23	0	0

Remark: x represents the dose values in mSv

**Table 6**

**The Distribution of Finger Dose  
by Gender, 2017**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Male	192	40	14	2	2	0
Female	47	6	2	0	0	0
Total	239	46	16	2	2	0

Remark: x represents the dose values in mSv