



## **Occupational Radiation Exposure in Hong Kong (2015)**

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 2015. 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 2015, the RMS provided whole body type individual monitoring dosimeters to 10,334 named persons and 1,388 unnamed users at 853 sites. The named persons could be grouped into 58 different job types in one of the following four job categories: *dental* (10.65%), *industrial* (8.99%), *medical* (61.63%) and *others* (18.73%). 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 0.13 mSv, which was the same as 0.13 mSv in 2014. All monitored persons had doses within the statutory limit of 20 mSv in a year. 81.6% 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. One person received a dose exceeding 6 mSv. The highest whole body dose recorded was 8.07 mSv.

For individual job categories, the average annual doses for dental, industrial, medical and others were respectively 0.04, 0.12, 0.14 and 0.12 mSv.

Among the monitored persons, about 50.3% worked in the public sector (including staff in hospitals of Hospital Authority), the rest of about 49.7% worked in the private sector. By gender, 4,997 (48.4%) were male and 5,337 (51.6%) were female (Figure 5). The dose distribution by gender is at Table 5.

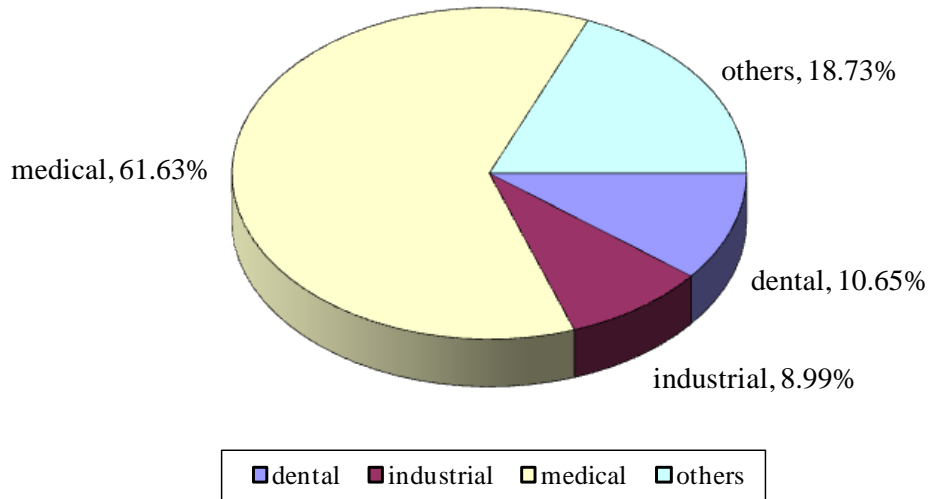
### **Extremity radiation monitoring**

In 2015, the RMS also provided extremity (finger) dose monitoring service to 259 workers at 46 sites in Hong Kong. The average annual finger dose was about 3.03 mSv. One worker received an annual finger dose exceeding 100 mSv and the dose recorded was 208.13 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 0.01, 0.22, 0.89 and 8.41 mSv. By gender, 205 (79.2%) were male and 54 (20.8%) were female (Figure 6). The dose distribution by gender is at Table 6.

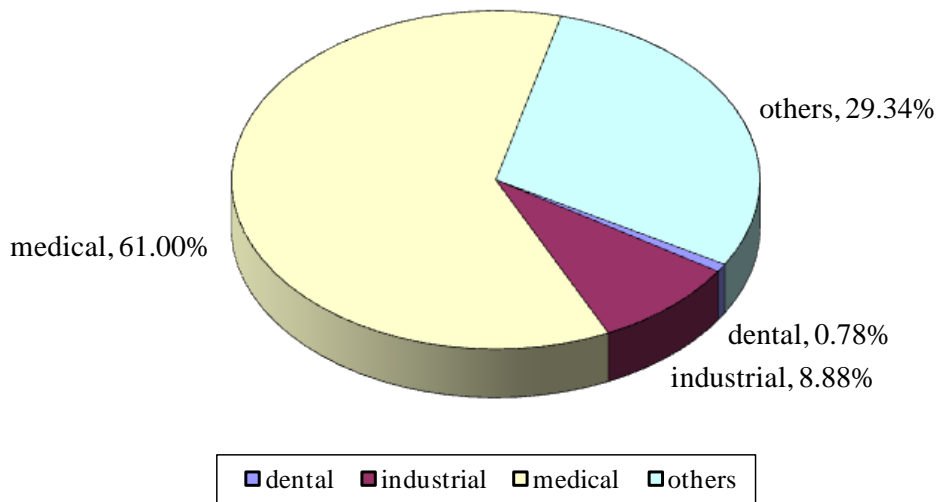
**Figure 1**

**The Distribution of Whole Body Dosimeter Users by Job Categories, 2015**



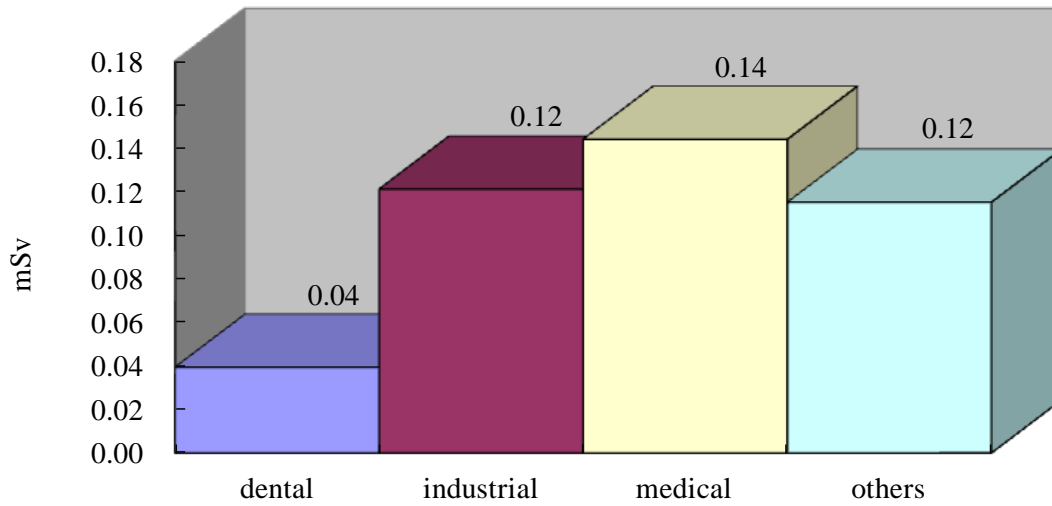
**Figure 2**

**The Distribution of Finger Dosimeter Users by Job Categories, 2015**



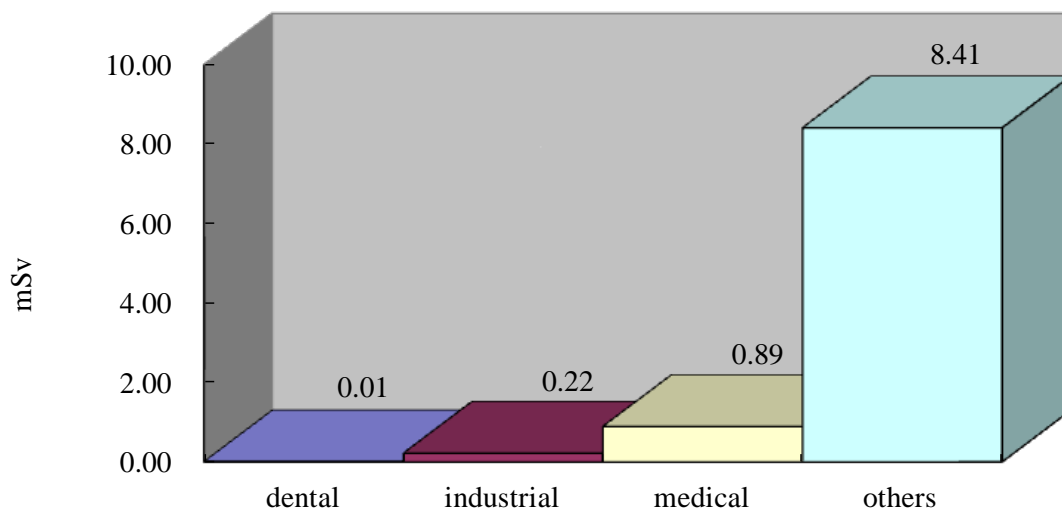
**Figure 3**

**The Average Annual Occupational Whole Body Dose by Job Categories, 2015**



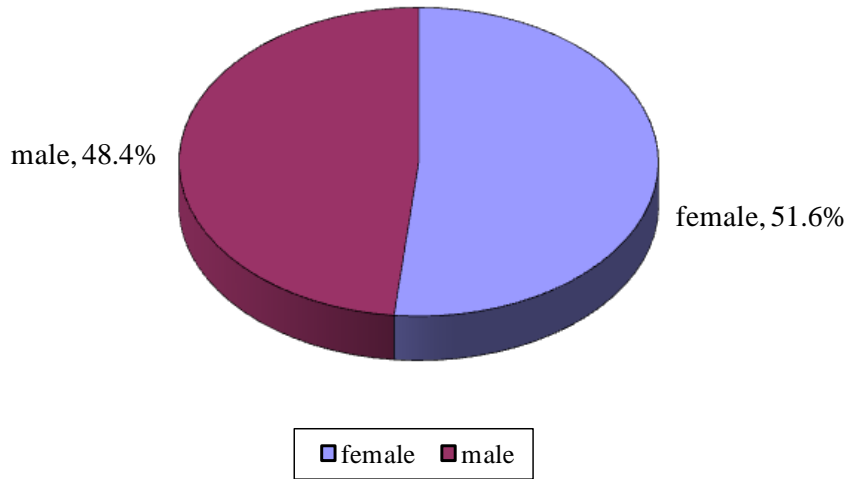
**Figure 4**

**The Average Annual Occupational Finger Dose by Job Categories, 2015**



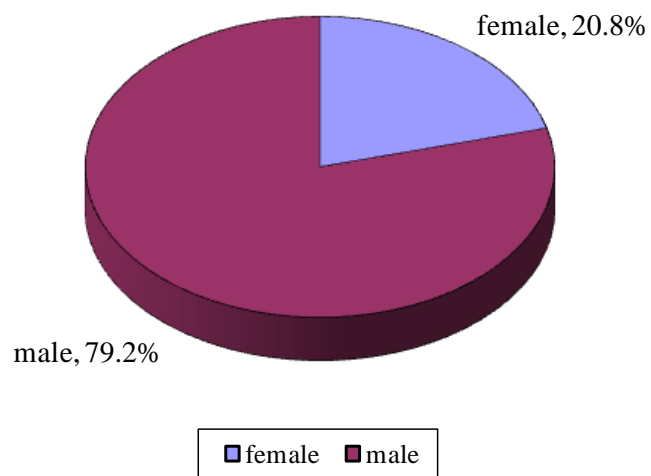
**Figure 5**

**The Distribution of Whole Body Dosimeter Users by Gender, 2015**



**Figure 6**

**The Distribution of Finger Dosimeter Users by Gender, 2015**



**Table 1**

**The Distribution of Whole Body Dose  
by Job Categories, 2015**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Dental	1031	66	3	0	0	0	0
Industrial	742	157	24	6	0	0	0
Medical	5027	1060	207	66	9	0	0
Others	1632	255	33	7	8	1	0
Total	8432	1538	267	79	17	1	0

Remark: x represents the dose values in mSv

**Table 2**

**The Distribution of Finger Dose  
by Job Categories, 2015**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Dental	2	0	0	0	0	0
Industrial	22	1	0	0	0	0
Medical	134	20	4	0	0	0
Others	53	13	9	0	1	0
Total	211	34	13	0	1	0

Remark: x represents the dose values in mSv

**Table 3****The Distribution of Whole Body Dose  
by Job Types, 2015**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Administrator	15	3	0	0	0	0	0
Artisan	59	15	0	0	0	0	0
Chemist	22	7	3	1	3	0	0
Clerk	55	9	1	0	0	0	0
Consultant (Medical)	28	4	4	1	0	0	0
Delivery	4	3	0	0	0	0	0
Dental Assistant	403	12	2	0	0	0	0
Dental Hygienist	14	4	0	0	0	0	0
Dental Therapist	213	19	0	0	0	0	0
Dentist	401	31	1	0	0	0	0
Department Manager	2	1	0	0	0	0	0
Driver	19	5	0	0	0	0	0
Engineer	185	26	8	2	0	0	0
Experimental Officer	2	0	0	0	0	0	0
Fire Safety Worker	4	4	0	0	0	0	0
Laboratory Attendant	24	5	1	2	0	0	0
Lecturer	29	0	0	0	0	0	0

**The Distribution of Whole Body Dose  
by Job Types, 2015 (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	8	1	0	0	0	0	0
Mechanic	29	5	1	1	0	0	0
Medical Officer	1006	264	58	6	3	0	0
Medical Officer (Therapeutic)	55	6	4	1	0	0	0
Medical Technologist	27	4	0	0	0	0	0
Nurse	1574	320	34	3	1	0	0
Nurse (Veterinary)	47	6	0	1	0	0	0
Operator	216	22	0	0	0	0	0
Pharmacist	5	2	5	0	0	0	0
Physicist (Health)	10	6	0	0	0	0	0
Physicist (Medical)	57	16	10	1	0	0	0
Physiotherapist	3	1	0	0	0	0	0
Police	5	4	0	0	0	0	0
Quality Assurance	43	11	3	0	0	0	0
Radiobiologist	3	0	0	0	0	0	0
Radiographer (Diagnostic)	1212	243	46	46	5	0	0
Radiographer (Industrial)	34	26	2	0	0	0	0



**The Distribution of Whole Body Dose  
by Job Types, 2015 (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)	104	18	11	0	0	0	0
Radiologist	114	28	3	1	0	0	0
Research Assistant	185	24	1	0	0	0	0
Safety Officer	9	1	0	0	0	0	0
Scientific Assistant	5	0	0	0	0	0	0
Scientific Officer	14	1	0	1	0	0	0
Security Officer	1	0	0	0	0	0	0
Speech Therapist	64	11	0	0	0	0	0
Store Keeper	3	1	0	0	0	0	0
Student	199	14	0	0	1	0	0
Teaching Assistant	2	0	0	0	0	0	0
Technical Officer	75	16	1	0	0	0	0
Technician (Electrical)	65	26	8	1	0	0	0
Technician (Laboratory)	261	61	4	0	1	1	0
Technician (X-rays)	46	11	2	1	0	0	0
Trainee	18	3	1	0	0	0	0
Vet	171	11	5	2	0	0	0

**The Distribution of Whole Body Dose  
by Job Types, 2015 (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	108	14	1	1	0	0	0
Ward Attendant	373	99	23	2	0	0	0
Ward Manager	1	0	0	0	0	0	0
Workman	57	17	4	1	0	0	0
X-ray Assistant	27	1	1	0	0	0	0
X-ray Crystallographer	3	0	0	0	0	0	0
No Job Code	714	96	19	4	3	0	0
Total	8432	1538	267	79	17	1	0

Remark: x represents the dose values in mSv

**Table 4****The Distribution of Finger Dose  
by Job Types, 2015**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Chemist	2	3	5	0	1	0
Consultant (Medical)	1	0	0	0	0	0
Dental Assistant	1	0	0	0	0	0
Dentist	1	0	0	0	0	0
Engineer	18	1	0	0	0	0
Laboratory Attendant	2	0	0	0	0	0
Lecturer	1	0	0	0	0	0
Medical Officer	56	0	0	0	0	0
Medical Officer (Therapeutic)	18	0	0	0	0	0
Medical Technologist	1	0	0	0	0	0
Operator	1	0	0	0	0	0
Pharmacist	1	1	1	0	0	0
Physicist (Medical)	6	1	0	0	0	0
Radiographer (Diagnostic)	41	17	3	0	0	0
Radiographer (Therapeutic)	1	0	0	0	0	0
Radiologist	5	0	0	0	0	0
Research Assistant	1	1	0	0	0	0

**The Distribution of Finger Dose  
by Job Types, 2015 (Continued)**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Scientific Officer	1	0	1	0	0	0
Speech Therapist	2	0	0	0	0	0
Student	1	0	0	0	0	0
Technical Officer	1	0	0	0	0	0
Technician (Laboratory)	10	2	1	0	0	0
Ward Attendant	2	1	0	0	0	0
Workman	1	0	0	0	0	0
No Job Code	36	7	2	0	0	0
Total	211	34	13	0	1	0

Remark: x represents the dose values in mSv

**Table 5**

**The Distribution of Whole Body Dose  
by Gender, 2015**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$x > 10$
Male	3969	804	161	49	13	1	0
Female	4463	734	106	30	4	0	0
Total	8432	1538	267	79	17	1	0

Remark: x represents the dose values in mSv

**Table 6**

**The Distribution of Finger Dose  
by Gender, 2015**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$x > 500$
Male	166	26	12	0	1	0
Female	45	8	1	0	0	0
Total	211	34	13	0	1	0

Remark: x represents the dose values in mSv