



Occupational Radiation Exposure in Hong Kong (2012)

Radiation Monitoring Service
Radiation Health Unit
Department of Health, HKSAR

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<http://www.info.gov.hk/dh-rhu>

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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 2012. The data were obtained from 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 2012, the RMS provided whole body type individual monitoring dosimeters to 9,608 named persons and 1,318 unnamed users at 844 sites. The named persons could be grouped into 59 different job types in one of the following four job categories: *dental* (11.03%), *industrial* (8.96%), *medical* (59.62%) and *others* (20.39%). 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 indicated a slight increase from 0.12 mSv in 2011. All monitored persons had doses within the statutory limit of 20 mSv in a year. 84.5% 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. Except one case of a worker with a recorded dose of 15.5 mSv, all the others had doses below 6 mSv.

For individual job categories, the average annual doses for dental, industrial, medical and others were respectively 0.03, 0.11, 0.13 and 0.09 mSv.

Among the monitored persons, about 47.2% worked in the public sector (including staff in hospitals of Hospital Authority), the rest of about 52.8% worked in the private sector. By gender, 4,831 (50.3%) were male and 4,777 (49.7%) were female (Figure 5). The dose distribution by gender is at Table 5.

Extremity radiation monitoring

In 2012, the RMS also provided extremity (finger) dose monitoring service to 191 workers in Hong Kong. The average annual finger dose was about 3.68 mSv. Two workers received an annual finger dose exceeding 100 mSv and the highest dose recorded was 187 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 0.14, 1.16 and 10.37 mSv. By gender, 142 (74.3%) were male and 49 (25.7%) 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, 2012

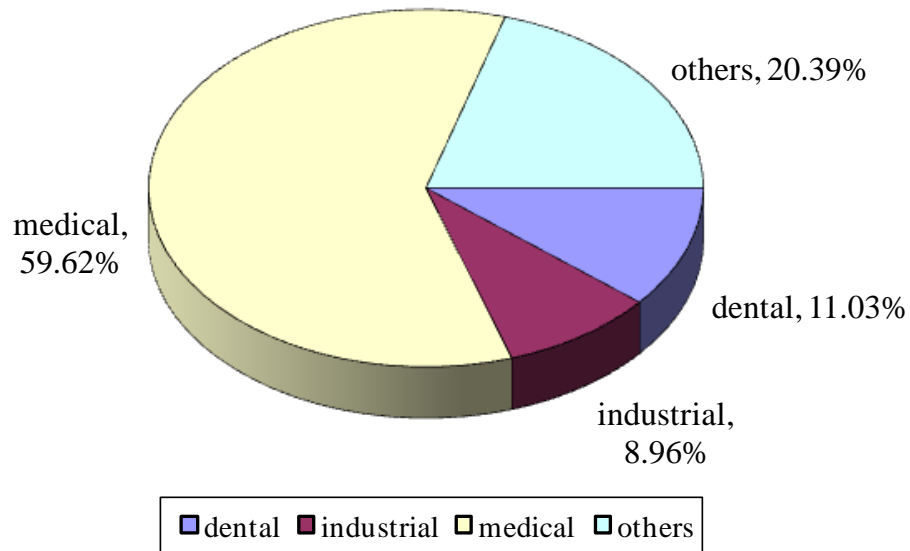


Figure 2
The Distribution of Finger Dosimeter Users by Job Categories, 2012

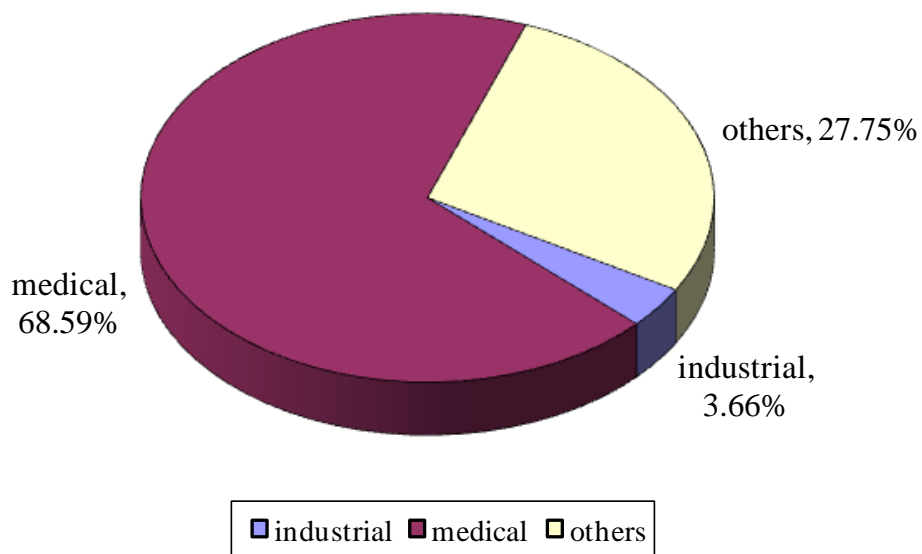


Figure 3
The Average Annual Occupational Whole Body Dose by Job Categories, 2012

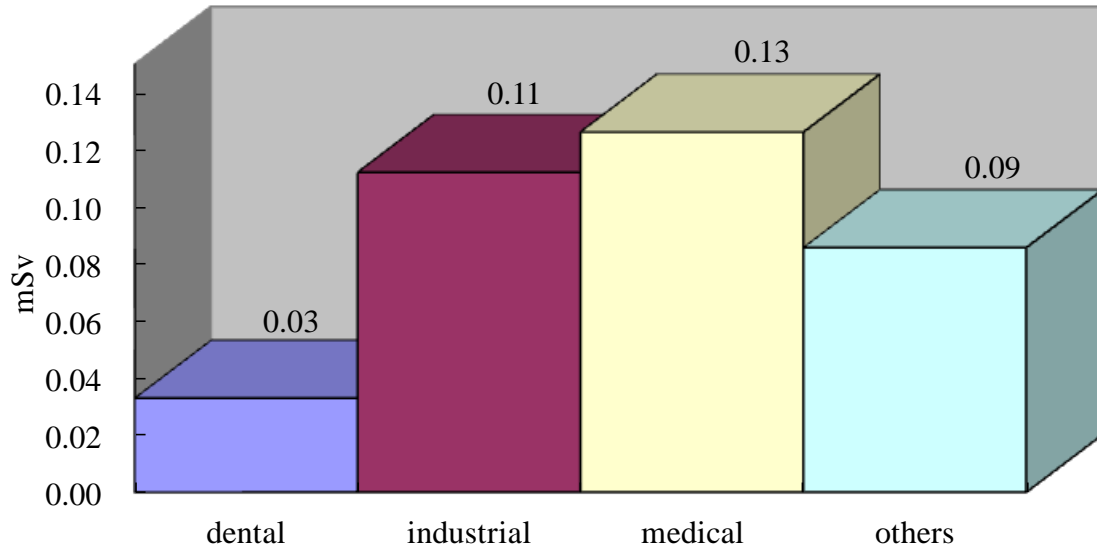


Figure 4
The Average Annual Occupational Whole Body Dose by Job Categories, 2012

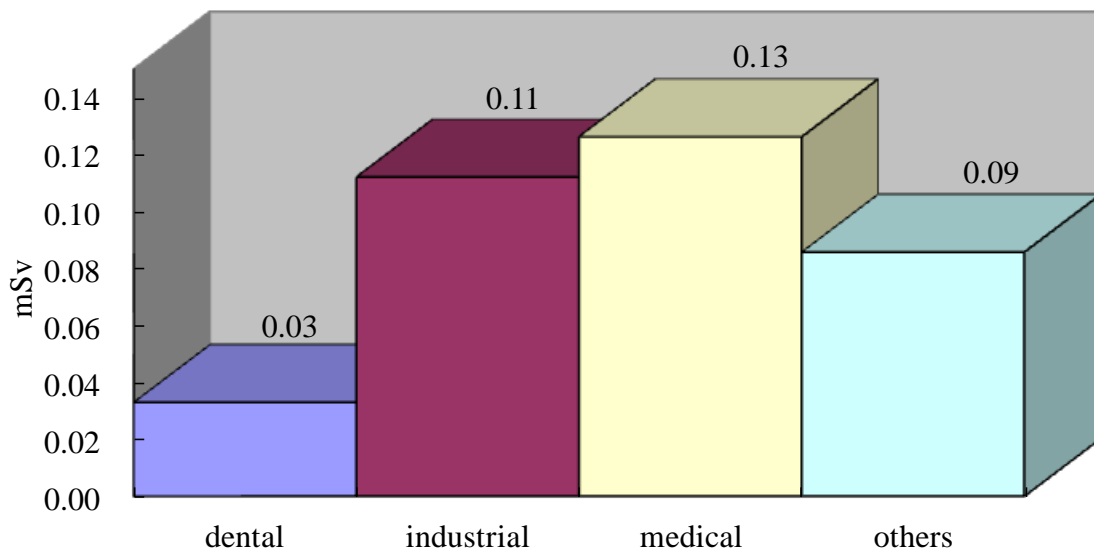


Figure 5
The Distribution of Whole Body Dosimeter Users by Gender, 2012

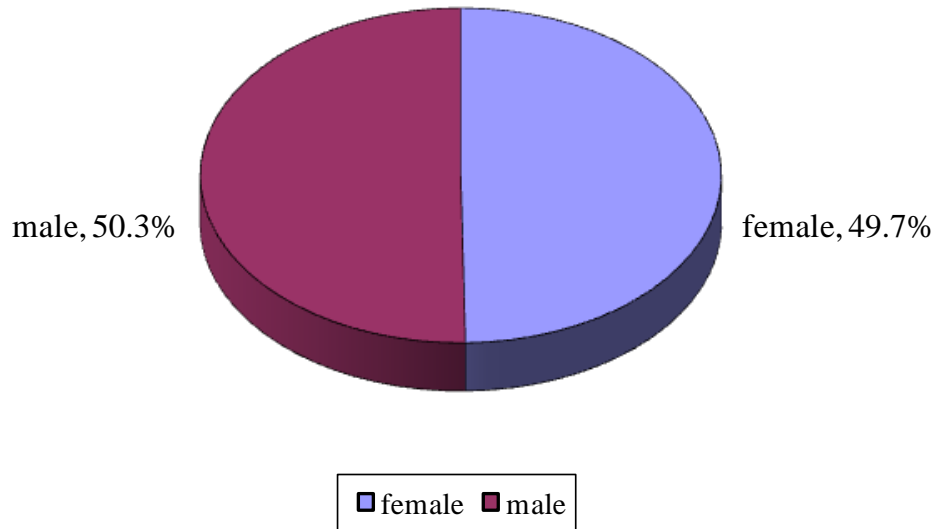


Figure 6
The Distribution of Finger Dosimeter Users by Gender, 2012

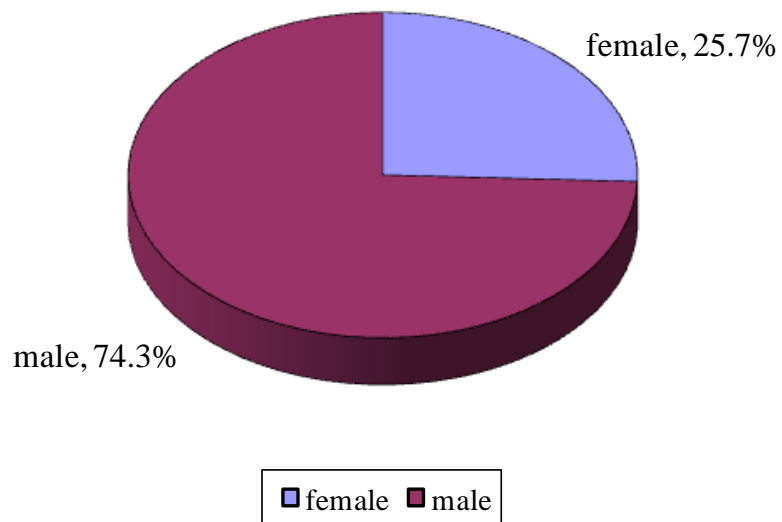


Table 1

**The Distribution of Whole Body Dose
by Job Categories, 2012**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$10 < x$
Dental	1000	59	1	0	0	0	0
Industrial	685	158	13	4	1	0	0
Medical	4703	858	101	49	16	0	1
Others	1726	201	20	6	6	0	0
Total	8114	1276	135	59	23	0	1

Remark: x represents the dose values in mSv

Table 2

**The Distribution of Finger Dose
by Job Categories, 2012**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$500 < x$
Industrial	7	0	0	0	0	0
Medical	105	21	5	0	0	0
Others	37	7	7	2	0	0
Total	149	28	12	2	0	0

Remark: x represents the dose values in mSv

Table 3**The Distribution of Whole Body Dose
by Job Types, 2012**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$10 < x$
Artisan	83	20	1	0	0	0	0
Administrator	18	5	0	0	0	0	0
Chemist	26	5	1	0	2	0	0
Clerk	51	5	2	0	0	0	0
Consultant (Medical)	34	6	2	0	0	0	0
Delivery	3	0	2	0	0	0	0
Dentist	401	20	0	0	0	0	0
Dental Assistant	359	14	1	0	0	0	0
Dental Hygienist	15	1	0	0	0	0	0
Dental Therapist	225	24	0	0	0	0	0
Department Manager	4	1	0	0	0	0	0
Driver	21	1	0	0	0	0	0
Engineer	158	29	3	2	0	0	0
Experimental Officer	2	0	0	0	0	0	0
Fire Safety Worker	7	5	0	0	0	0	0
Laboratory Attendant	49	10	3	2	0	0	0
Lecturer	38	0	0	0	0	0	0

**The Distribution of Whole Body Dose
by Job Types, 2012 (Continued)**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$10 < x$
Lightning Conductor Worker	1	0	0	0	0	0	0
Luminous Watch Assembly Worker	9	0	0	0	0	0	0
Mechanic	38	7	1	0	0	0	0
Medical Officer	1023	224	22	7	5	0	1
Medical Officer (Therapeutic)	65	8	4	0	0	0	0
Medical Technologist	39	3	0	0	0	0	0
Nurse	1433	254	12	2	2	0	0
Nurse (Veterinary)	22	8	0	0	0	0	0
Operator	106	5	0	0	0	0	0
Pharmacist	5	4	1	0	0	0	0
Physicist (Health)	10	3	1	0	0	0	0
Physicist (Medical)	49	10	8	1	0	0	0
Physiotherapist	3	2	0	0	0	0	0
Police	30	2	0	0	0	0	0
Quality Assurance	61	16	1	0	1	0	0
Radiobiologist	4	0	0	0	0	0	0
Radiographer (Diagnostic)	1172	168	35	33	8	0	0

**The Distribution of Whole Body Dose
by Job Types, 2012 (Continued)**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$10 < x$
Radiographer (Industrial)	20	29	1	0	0	0	0
Radiographer (Therapeutic)	112	27	5	1	0	0	0
Radiologist	85	13	0	0	0	0	0
Research Assistant	222	17	0	1	0	0	0
Safety Officer	8	1	0	0	0	0	0
Scientific Assistant	13	0	0	0	0	0	0
Scientific Officer	18	2	0	1	0	0	0
Security Officer	1	0	0	0	0	0	0
Speech Therapist	53	6	0	0	0	0	0
Store Keeper	3	1	0	0	0	0	0
Student	242	11	0	0	0	0	0
Teaching Assistant	5	0	0	0	0	0	0
Technician (Electrical)	83	27	3	0	0	0	0
Technician (Laboratory)	317	57	3	0	2	1	0
Technician (X-rays)	87	9	3	0	0	0	0
Technical Officer	70	10	0	0	0	0	0
Trainee	18	4	0	0	0	0	0

**The Distribution of Whole Body Dose
by Job Types, 2012 (Continued)**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$10 < x$
Vet	129	29	2	2	0	0	0
Vet Assistant	88	26	0	0	0	0	0
Ward Attendant	258	57	7	3	1	0	0
Ward Manager	2	0	0	0	0	0	0
Workman	96	16	2	0	0	0	0
X-ray Assistant	36	3	0	0	0	0	0
X-ray Crystallographer	1	0	0	0	0	0	0
No Job Code	583	71	9	4	2	0	0
Total	8114	1276	135	59	23	4	1

Remark: x represents the dose values in mSv

Table 4

**The Distribution of Finger Dose
by Job Types, 2012**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$500 < x$
Chemist	4	0	3	2	0	0
Consultant (Medical)	1	0	0	0	0	0
Engineer	3	0	0	0	0	0
Laboratory Attendant	3	0	0	0	0	0
Lecturer	1	0	0	0	0	0
Medical Officer	32	0	0	0	0	0
Medical Officer (Therapeutic)	19	0	0	0	0	0
Medical Technologist	1	0	0	0	0	0
Pharmacist	1	1	1	0	0	0
Physicist (Medical)	4	0	0	0	0	0
Radiographer (Diagnostic)	39	20	4	0	0	0
Radiographer (Therapeutic)	2	0	0	0	0	0
Radiologist	3	0	0	0	0	0
Research Assistant	1	0	0	0	0	0
Scientific Officer	1	1	0	0	0	0
Speech Therapist	1	0	0	0	0	0
Student	1	0	0	0	0	0

**The Distribution of Finger Dose
by Job Types, 2012 (Continued)**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$500 < x$
Technician (Laboratory)	9	1	2	0	0	0
Technical Officer	1	0	0	0	0	0
Ward Attendant	2	0	0	0	0	0
No Job Code	20	5	2	0	0	0
Total	149	28	12	2	0	0

Remark: x represents the dose values in mSv

Table 5

**The Distribution of Whole Body Dose
by Gender, 2012**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$10 < x$
Male	4020	674	84	36	16	0	1
Female	4094	602	51	23	7	0	0
Total	8114	1276	135	59	23	0	1

Remark: x represents the dose values in mSv

Table 6

**The Distribution of Finger Dose
by Gender, 2012**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$500 < x$
Male	110	18	12	2	0	0
Female	39	10	0	0	0	0
Total	149	28	12	2	0	0

Remark: x represents the dose values in mSv