



Occupational Radiation Exposure in Hong Kong (2011)

Radiation Monitoring Service
Radiation Health Unit
Department of Health, HKSAR

E-version available at
<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 2011. 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 2011, the RMS provided whole body type individual monitoring dosimeters to 9,085 named persons and 1,293 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* (11.44%), *industrial* (9.96%), *medical* (57.39%) and *others* (21.21%). 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 0.12 mSv, which indicated a slight increase from 0.11 mSv in 2010. Except the case of a single worker with a recorded dose of 102.67 mSv, all monitored persons had doses within the statutory limit of 20 mSv in a year. 83.6% 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. Six persons received an annual dose exceeding 6 mSv. Two of them, including the one mentioned above had received a whole body dose exceeding 10 mSv.

For individual job categories, the average annual doses for dental, industrial, medical and others were respectively 0.05, 0.22, 0.13 and 0.10 mSv.

Among the monitored persons, about 47.8% worked in the public sector (including staff in hospitals of Hospital Authority), the rest of about 52.2% worked in the private sector. By gender, 4,634 (51.0%) were male and 4,451 (49.0%) were female (Figure 5). The dose distribution by gender is at Table 5.

Extremity radiation monitoring

In 2011, the RMS also provided extremity (finger) dose monitoring service to 175 workers in Hong Kong. The average annual finger dose was about 4.72 mSv. Two workers received an annual finger dose exceeding 100 mSv and the highest dose recorded was 220.77 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 1.00, 2.29 and 11.50 mSv. By gender, 128 (73.1%) were male and 47 (26.9%) 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, 2011

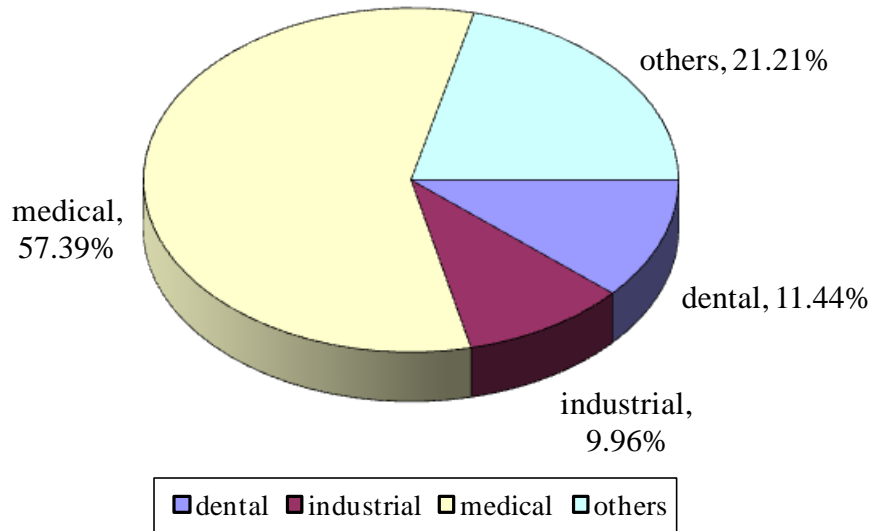


Figure 2
The Distribution of Finger Dosimeter Users by Job Categories, 2011

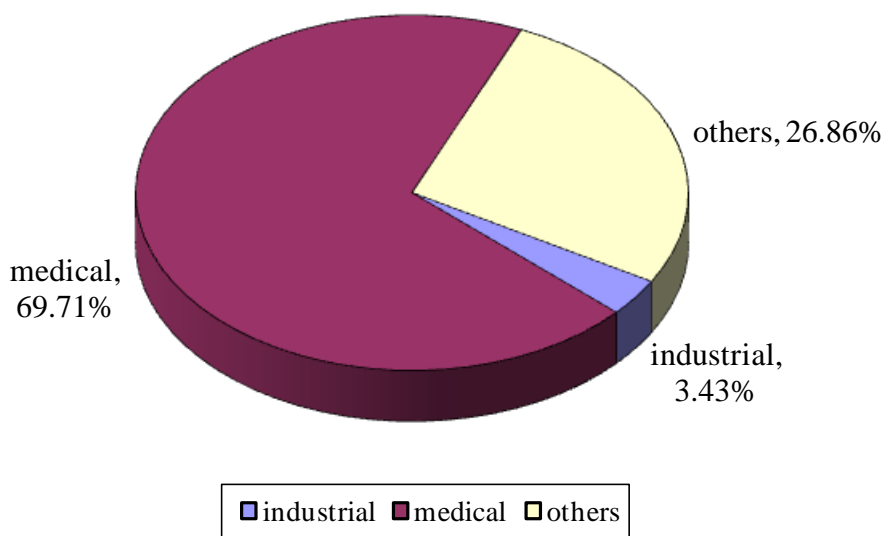


Figure 3
The Average Annual Occupational Whole Body Dose by Job Categories, 2011

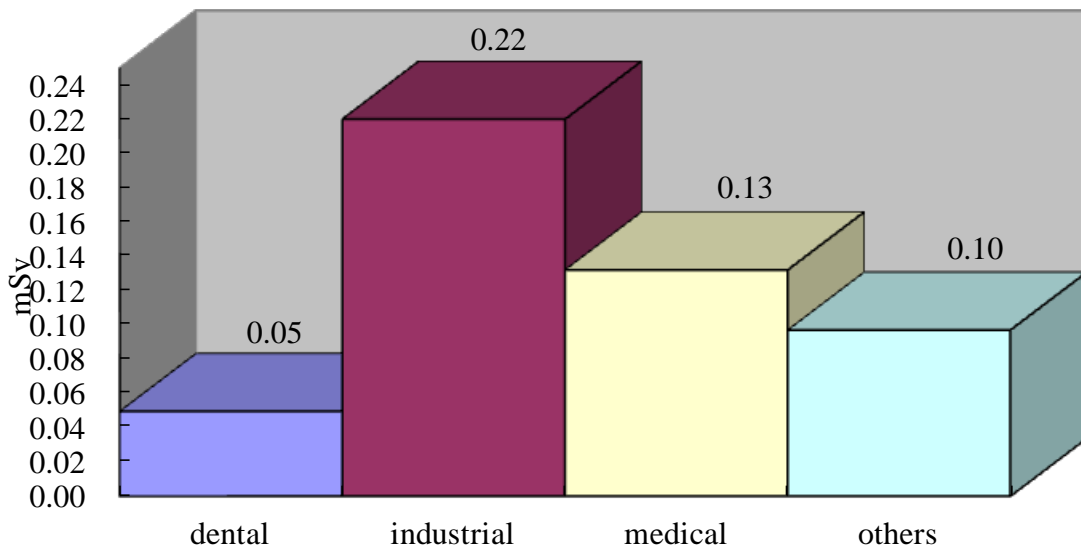


Figure 4
The Average Annual Occupational Finger Dose by Job Categories, 2011

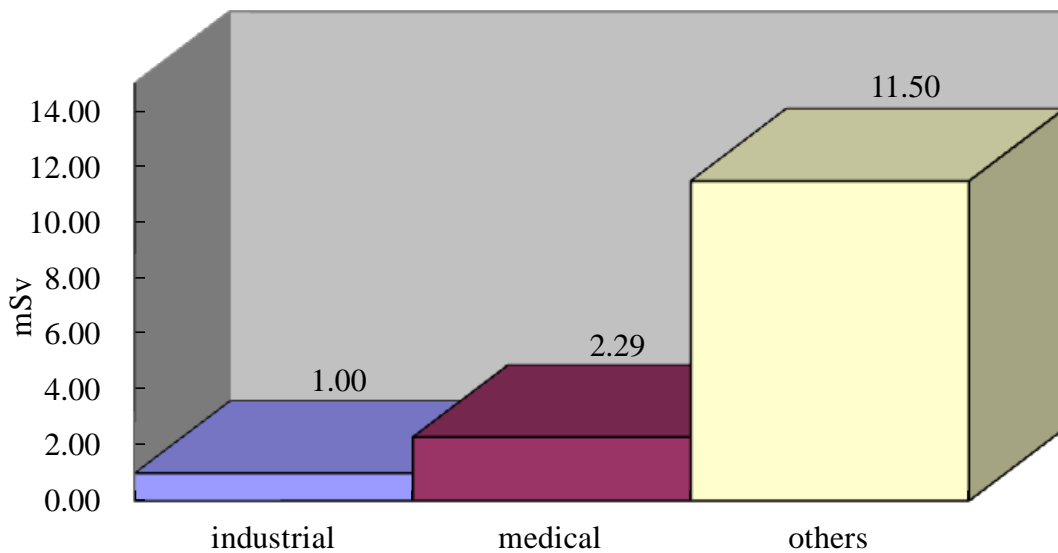


Figure 5
The Distribution of Whole Body Dosimeter Users by Gender, 2011

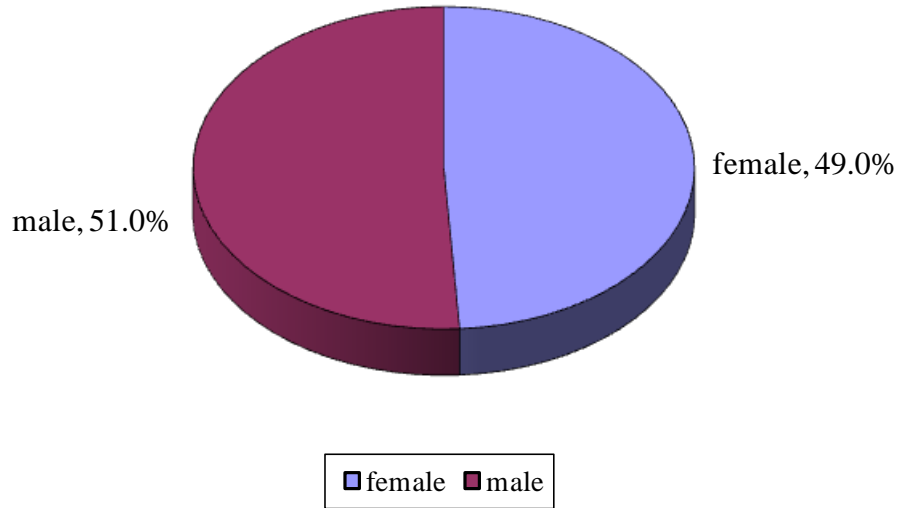


Figure 6
The Distribution of Finger Dosimeter Users by Gender, 2011

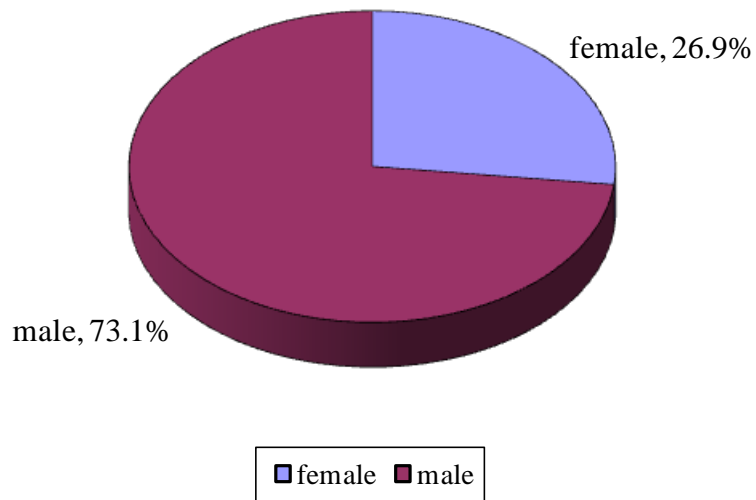


Table 1

**The Distribution of Whole Body Dose
by Job Categories, 2011**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$10 < x$
Dental	952	82	4	1	0	0	0
Industrial	753	127	15	8	1	0	1
Medical	4222	822	116	41	9	3	1
Others	1666	228	17	9	6	1	0
Total	7593	1259	152	59	16	4	2

Remark: x represents the dose values in mSv

Table 2

**The Distribution of Finger Dose
by Job Categories, 2011**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$500 < x$
Industrial	4	2	0	0	0	0
Medical	88	32	1	1	0	0
Others	30	9	7	0	1	0
Total	122	43	8	1	1	0

Remark: x represents the dose values in mSv

Table 3**The Distribution of Whole Body Dose
by Job Types, 2011**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$10 < x$
Artisan	98	15	0	1	0	0	1
Administrator	16	5	0	0	0	0	0
Chemist	16	7	0	0	1	0	0
Clerk	46	3	2	0	0	0	0
Consultant (Medical)	36	6	3	0	0	0	0
Delivery	4	0	2	0	0	0	0
Dentist	392	23	1	1	0	0	0
Dental Assistant	344	13	2	0	0	0	0
Dental Hygienist	13	1	0	0	0	0	0
Dental Therapist	203	45	1	0	0	0	0
Department Manager	3	2	0	0	0	0	0
Driver	20	4	0	0	0	0	0
Engineer	154	18	4	3	1	0	0
Experimental Officer	3	0	0	0	0	0	0
Fire Safety Worker	6	6	0	0	0	0	0
Laboratory Attendant	55	8	2	3	0	0	0
Lecturer	45	1	0	0	0	0	0

**The Distribution of Whole Body Dose
by Job Types, 2011 (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	10	0	0	0	0	0	0
Mechanic	37	6	1	0	0	0	0
Medical Officer	904	200	28	8	4	0	1
Medical Officer (Therapeutic)	60	5	5	0	0	0	0
Medical Technologist	34	7	0	0	0	0	0
Nurse	1282	267	17	4	0	0	0
Nurse (Veterinary)	20	7	1	1	0	0	0
Operator	131	6	0	0	0	0	0
Pharmacist	6	1	1	0	1	0	0
Physicist (Health)	8	3	1	0	0	0	0
Physicist (Medical)	42	14	6	1	0	0	0
Physiotherapist	6	0	0	0	0	0	0
Police	31	1	0	0	0	0	0
Quality Assurance	63	16	1	0	0	0	0
Radiobiologist	5	0	0	0	0	0	0
Radiographer (Diagnostic)	1106	148	37	27	4	2	0

**The Distribution of Whole Body Dose
by Job Types, 2011 (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)	26	20	2	1	0	0	0
Radiographer (Therapeutic)	109	23	6	0	0	0	0
Radiologist	76	15	1	0	0	0	0
Research Assistant	236	17	1	0	0	0	0
Safety Officer	8	0	0	0	0	0	0
Scientific Assistant	13	0	0	0	0	0	0
Scientific Officer	19	2	0	1	0	0	0
Security Officer	1	0	0	0	0	0	0
Speech Therapist	42	6	0	0	0	0	0
Store Keeper	4	1	0	0	0	0	0
Student	270	16	0	0	0	0	0
Teaching Assistant	3	0	0	0	0	0	0
Technician (Electrical)	100	25	4	0	0	0	0
Technician (Laboratory)	336	59	2	3	1	1	0
Technician (X-rays)	87	5	3	0	0	0	0
Technical Officer	72	7	1	0	0	0	0
Trainee	13	4	0	0	0	0	0

**The Distribution of Whole Body Dose
by Job Types, 2011 (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	104	28	2	0	0	1	0
Vet Assistant	70	25	1	0	0	0	0
Ward Attendant	196	59	5	0	0	0	0
Ward Manager	2	0	0	0	0	0	0
Workman	83	26	1	0	1	0	0
X-ray Assistant	32	4	0	0	0	0	0
X-ray Crystallographer	1	0	0	0	0	0	0
No Job Code	490	79	8	5	3	0	0
Total	7593	1259	152	59	16	4	2

Remark: x represents the dose values in mSv

Table 4**The Distribution of Finger Dose
by Job Types, 2011**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$500 < x$
Chemist	2	1	3	0	1	0
Engineer	1	1	0	0	0	0
Laboratory Attendant	2	1	0	0	0	0
Lecturer	1	0	0	0	0	0
Medical Officer	26	2	0	0	0	0
Medical Officer (Therapeutic)	20	0	0	0	0	0
Medical Technologist	0	1	0	0	0	0
Pharmacist	0	1	0	1	0	0
Physicist (Medical)	3	0	0	0	0	0
Radiobiologist	1	0	0	0	0	0
Radiographer (Diagnostic)	34	27	1	0	0	0
Radiographer (Therapeutic)	1	0	0	0	0	0
Radiologist	1	1	0	0	0	0
Research Assistant	1	0	0	0	0	0
Scientific Officer	0	2	0	0	0	0
Speech Therapist	1	0	0	0	0	0
Student	2	0	0	0	0	0

**The Distribution of Finger Dose
by Job Types, 2011 (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	4	0	0	0
Technical Officer	1	0	0	0	0	0
Ward Attendant	1	0	0	0	0	0
No Job Code	15	5	0	0	0	0
Total	122	43	8	1	1	0

Remark: x represents the dose values in mSv

Table 5

**The Distribution of Whole Body Dose
by Gender, 2011**

	$x \leq 0.17$	$0.17 < x \leq 0.75$	$0.75 < x \leq 1.5$	$1.5 < x \leq 3.0$	$3.0 < x \leq 6.0$	$6.0 < x \leq 10$	$10 < x$
Male	3838	651	96	33	12	2	2
Female	3755	608	56	26	4	2	0
Total	7593	1259	152	59	16	4	2

Remark: x represents the dose values in mSv

Table 6

**The Distribution of Finger Dose
by Gender, 2011**

	$x \leq 1$	$1 < x \leq 10$	$10 < x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$500 < x$
Male	88	30	8	1	1	0
Female	34	13	0	0	0	0
Total	122	43	8	1	1	0

Remark: x represents the dose values in mSv