

MEDICAL EXPOSURE IN ROMANIA

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INTRODUCTION

Medical exposure and in particular diagnostic radiology represents in Romania the largest manmade source of public exposure (about 14,200 man Sv/y).

METHODOLOGY

The annual frequencies of 32 different types of X-ray examination by age and sex distribution were estimated from radiological registers of 45 medical units (25 hospitals and 20 ambulatory care units) from 20 districts. As representative for country they were selected on the reported annual workload of their X-ray departments.

The sample of X-ray exams consisted of all radiological examinations carried out in a specified week (2nd) of the middle month of each quarter in 1990 in every medical center taking part in this survey.

The details recorded included age and sex of patients, type of examinations as well as technical factors such as the number of films or the fluoroscopic screening time.

Sample's data (213,675 patients representing 2.86 % from the annual total) were extended to the annual number of X-ray exposures reported to the Ministry of Health by local district Health Statistic Departments [1].

The grand annual total for all types of medical and dental X-ray examination was 7,471,235. This corresponded to 495 exams per thousand head of population [2].

The size of population concret by the medical services was 15,084,146 people. The population of Romania in 1990 was 23,2 million [3]. Local population details such as age and sex distribution (1990) were taken from local Offices of Population Censuses.

In order to assess the tendency of medical exposure in Romania, present results were compared with those obtained in the earlier surveys (1970, 1980) [4].

RESULTS

The annual numbers of diagnostic X-ray examinations decreased between 1970 and 1990, as shown in Table 1, from 1010 exams per thousand inhabitants in 1970, to 495 exams in 1990. Romania, like other few countries of health-care level I, showed downward trend [2]. The calculated annually decrease rate for the last ten years was 2.2 per cent. This tendency was manifestly in all age groups as the following data show (Table 2). Also, these data indicate the 16-30 years old as the most frequently examined.

Although particular examinations such as fluoroscopy or mass miniature chest radiography were dropping between 1980-1990, as showed previously, they still have a frequent utilisation. For example, comparing the frequency of fluoroscopic examinations it

was evident that 63 - 74 per cent of all 1990's fluoroscopic examinations were performed for chest (lung, heart) (Table 3).

Table 1. The annual average numbers of radiological examinations per thousand population in Romania (1970-1990)

Type of examination	1970		1980		1990	
	number	%	number	%	number	%
Fluoroscopy	320	31.68	264	42.17	178	35.95
Radiography	240	23.77	150	23.96	182	36.77
Photofluorography	450	44.55	212	33.87	135	27.28
TOTAL	1010	100	626	100	495	100

Table 2. The average ratio of total number of X-ray exams by age group (1990/1980)

Age group(years)	0 - 15	16 - 30	over 30
Ratio 1990/1980	0.48	0.52	0.46

Table 3. The frequency of fluoroscopic examinations between 1980 and 1990

Examination	Age group (years)							
	0 - 15		16 - 30		31 - 45		over 45	
	I*	II**	I	II	I	II	I	II
Chest	87.4	73.3	75.7	70.7	69.4	64.4	68.2	63.4
G.I. tract	12.5	26.6	24.2	29.2	30.5	35.6	31.8	36.5
Stomach, duoden	9.1	15.7	19.1	25.0	24.2	29.1	24.6	28.9
Small+large intestine	3.4	10.9	5.1	4.2	6.3	6.5	7.3	7.6

*) = 1980 **) = 1990

The values of table 3 point out that the children under 15 , are the population group where this X-ray procedure has been most frequently carried out.

In the last survey (1990) also digestive examinations were more common in older patients, the children had an unexpected high frequency of bowel examinations (10.9 per cent).

Detailed quantitative data on the frequencies of different types of X-ray examinations conducted in 1990 are given in Table 4.

As table data show, the thorax is the most irradiated anatomical region, either by fluoroscopic or by mass miniature chest radiography; their cumulated annual frequencies ranged between 37.9 (for 0-15 years old) and 65.9 (for 16-30 years old) from all X-ray examination carried out in a specified age group [5]. Digestive barium examinations increase with age, males having a small higher frequency than females (4.71 v 4.45).

Table 4. The frequency of the radiological examination by age and sex (1990)

Type of examination	Age group (years)				Sex	
	0-15	16-30	31-45	over45	M	F
FLUOROSCOPY (total)	35.92	23.16	33.94	45.14		
Lung	26.52	16.18	21.88	28.70	9.54	8.30
G.I. tract :						
- Ba swallow	1.03	1.41	2.27	2.75	0.84	0.78
- Ba meal	4.61	4.57	7.59	10.26	2.90	2.67
- Ba enema	3.76	1.00	2.20	3.43	0.97	1.00
RADIOGRAPHY (total)	64.08	76.84	66.06	54.86		
Lung - PA	12.53	2.63	3.68	4.24	2.60	1.99
-tomography	0.35	0.53	1.10	1.27	0.59	0.28
-photofluorography	11.60	49.72	26.53	13.27	19.43	15.89
Spine(+lombo-sacral joint)	1.51	2.48	5.45	6.32	2.42	2.50
Skull, facial bones (+dental)	9.82	9.38	10.54	8.54	4.92	4.85
Arm, hand, leg, foot	18.98	6.79	9.49	10.07	5.44	3.83
Pelvis	3.51	0.49	0.82	1.11	0.56	0.58
Abdomen: - plane	1.53	0.71	1.44	1.65	0.68	0.60
- colecistography	0.05	0.44	0.99	1.27	0.28	0.50
- urography	0.65	0.56	1.22	1.58	0.76	0.83
-hysterosalpingo-graphy	-	0.37	0.31	0.09	-	0.21
Angiography	0.92	0.60	1.33	1.75	0.20	0.15
Mammography	0.01	0.30	0.59	0.35	-	0.34
Others	2.62	1.84	2.57	3.35	1.21	1.32
TOTAL	100	100	100	100	53.38	46.62

Some specific X-ray examinations as computed tomography have had a very low annual frequency and were reported as "others exams". Mammography was used only for diagnostic, not in screening programmes.

It is possible that spectrum of medical exposure in Romania will be changed for the next years due to extensive use of ultrasounds, after 1990.

So, it will be interesting to compare this last "clasic-radiological picture" with that of the end of century.

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