

TRACKING OF PATIENTS DOSES

Telemedicína 2018, Brno

DUŠAN ŠALÁT

Úradný vestník Európskej únie



Slovenské vydanie

Právne predpisy

Obsah

II Nelegislatívne akty

SMERNICE

- ★ **Smernica Rady 2013/59/Euratom z 5. decembra 2013, ktorou sa stanovujú základné bezpečnostné normy ochrany pred nebezpečenstvami vznikajúcimi v dôsledku ionizujúceho žiarenia, a ktorou sa zrušujú smernice 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom a 2003/122/Euratom**..... 1

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L 13

KAPITOLA X

ZÁVEREČNÉ USTANOVENIA

Článok 106

Transpozícia

1. Členské štáty uvedú do účinnosti zákony, iné právne predpisy a správne opatrenia potrebné na dosiahnutie súladu s touto smernicou do 6. február 2018.

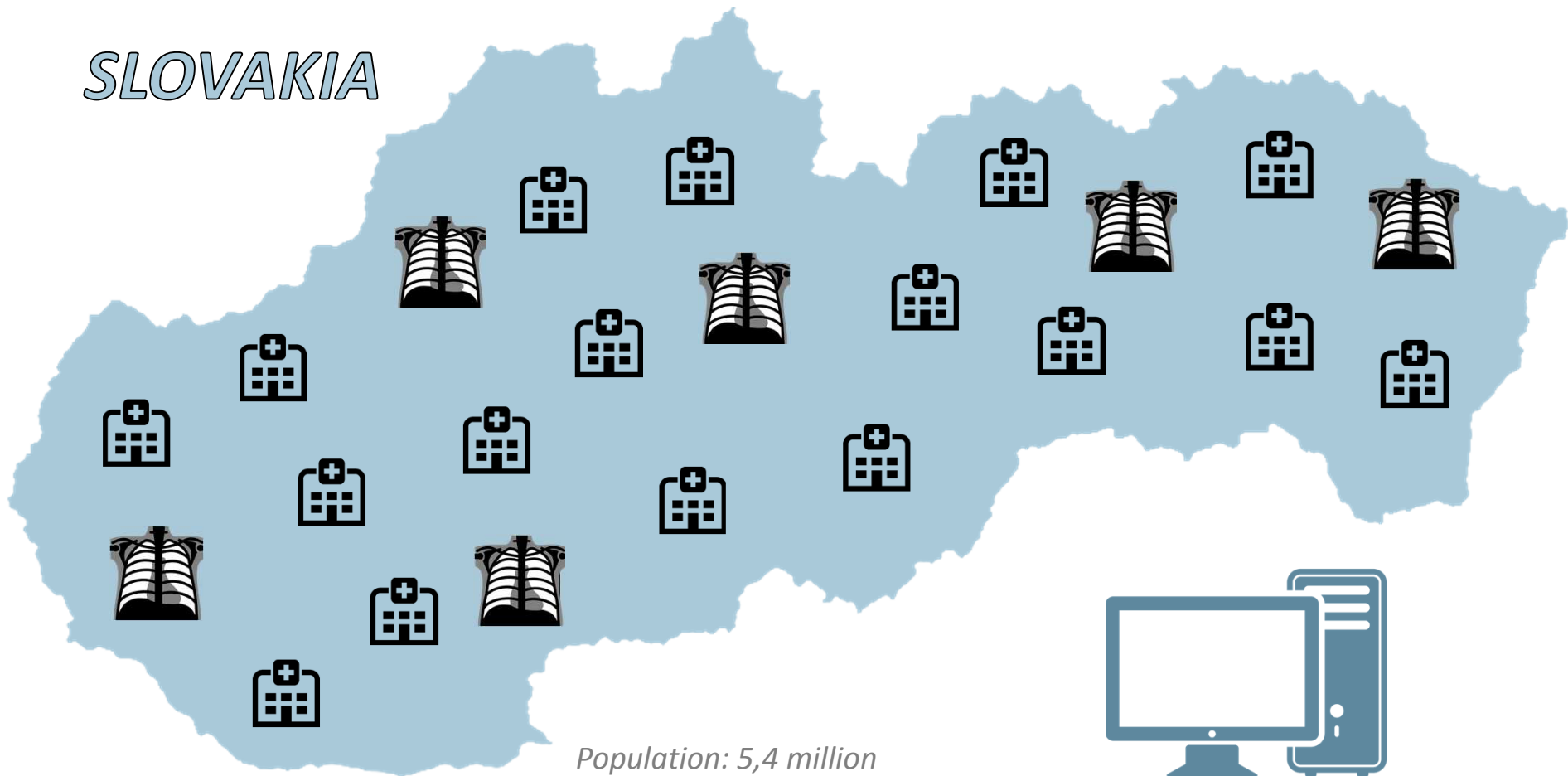


Úradný vestník

Európskej únie

(28) V lekárskej oblasti viedol významný technologický a vedecký pokrok k výraznému zvýšeniu ožiarenia pacientov. Z tohto hľadiska by sa v tejto smernici mala zdôrazňovať potreba odôvodnenia lekárskeho ožiarenia vrátane ožiarenia a symptomatických osôb a mali by sa posilniť požiadavky týkajúce sa informácií poskytovaných pacientom, zaznamenávania a uvádzania dávok v liečebných postupoch, používania diagnostických referenčných úrovní a dostupnosti zariadení s indikáciou dávok. Je potrebné poznamenať, že podľa Svetovej zdravotníckej organizácie pojem zdravie zahŕňa fyzickú, duševnú a sociálnu pohodu jednotlivca, a nielen absenciu choroby či nevládnosti.

SLOVAKIA



Population: 5,4 million

Number of X-ray examination: 5,4 million (2016)



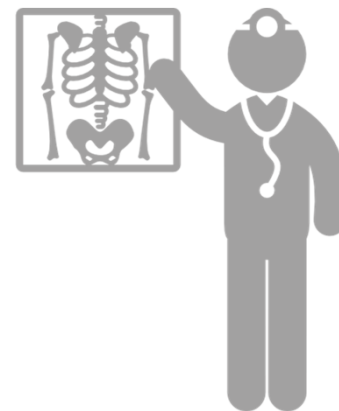
Radiographer



Medical physicist



Patient



Physician

PHYSICIAN

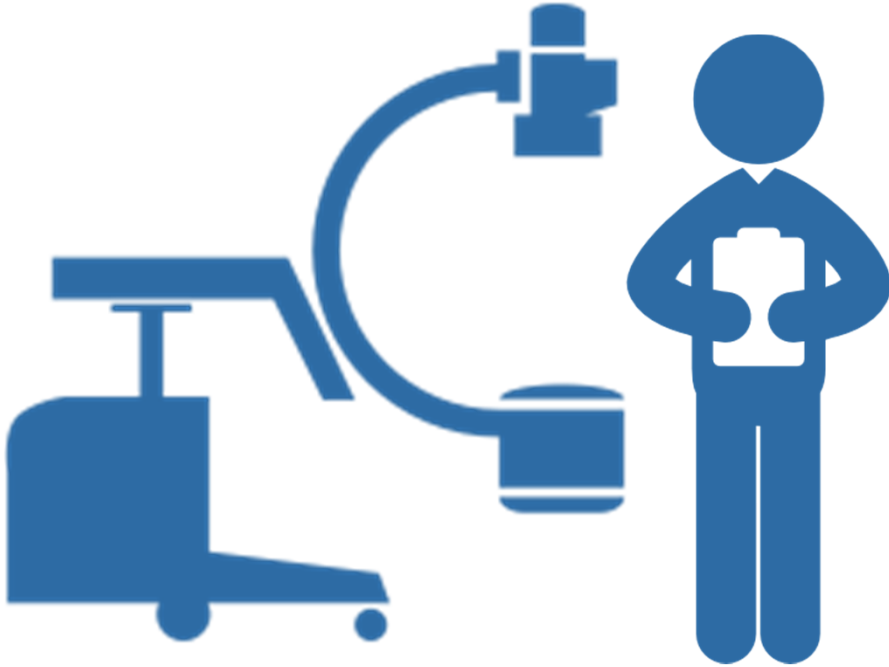
The role: Justification



- History of all X-ray examinations from all X-ray departments
- Effective doses from the X-ray examinations
- Total effective dose from all X-ray examinations
- Radiation risk from all X-ray examinations

RADIOGRAPHER

The role: Optimisation



- History of all X-ray examinations
- Diagnostic Reference Levels

MEDICAL PHYSICIST

The role: QA / QC



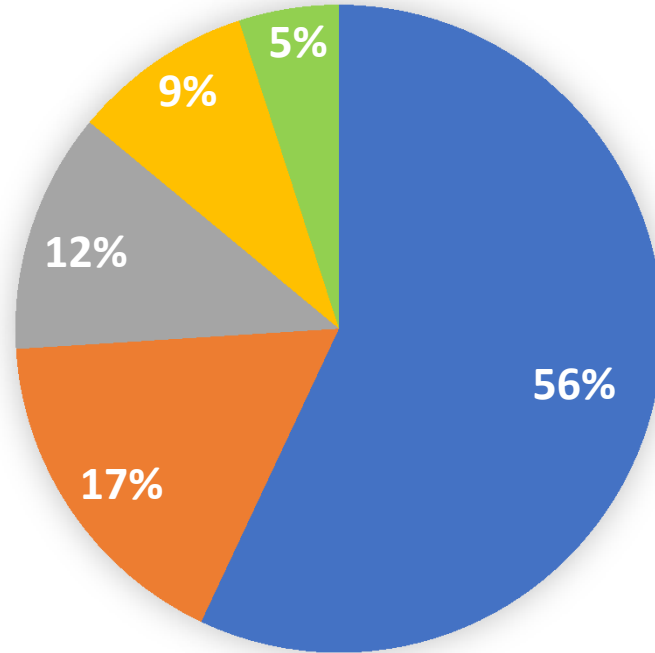
- Organ dose for pregnant patients
- Diagnostic Reference Levels

PATIENT



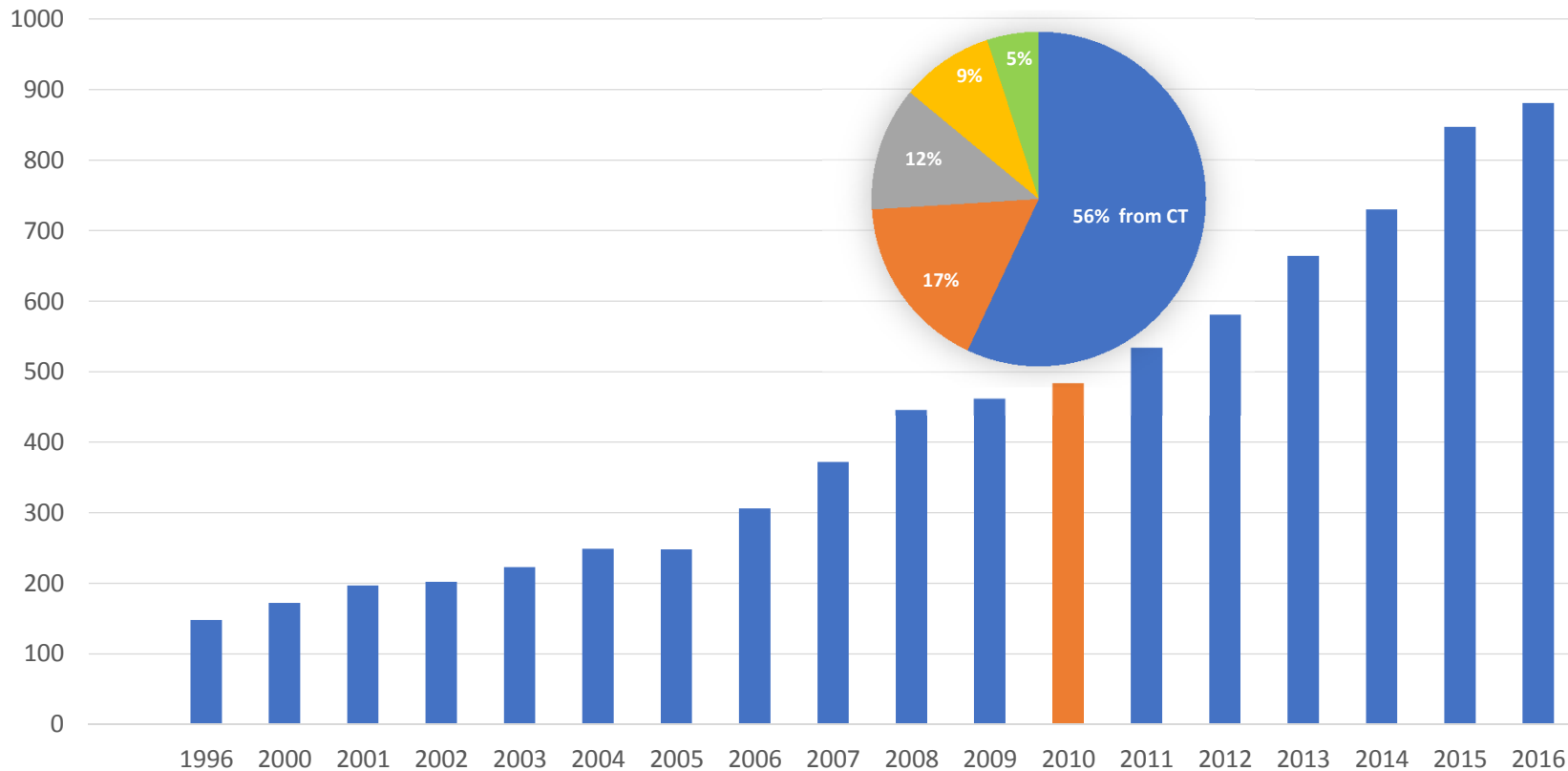
- History of all the patient X-ray examinations
- Radiation risk from X-ray examinations

DISTRIBUTION OF COLLECTIVE EFFECTIVE DOSES (DDM2 in 2010)



■ CT ■ Plain radiography ■ Fluoroscopy ■ IR ■ NM

Number of CT examinations in Slovakia (in thousands)



We Are Giving Ourselves Cancer

By RITA F. REDBERG and REBECCA SMITH-BINDMAN JAN. 30, 2014



Ben Jones

DESPITE great strides in prevention and treatment, [cancer](#) rates remain stubbornly high and may soon surpass heart disease as the leading cause of death in the United States. Increasingly, we and many other experts believe that an important culprit may be our own medical practices: We are silently irradiating ourselves to death.

The use of medical imaging with high-dose radiation — CT scans in particular — has soared in the last 20 years. Our resulting exposure to medical radiation

Neither doctors nor patients want to return to the days before CT scans. But we need to find ways to use them without killing people in the process.

radiation doses of CT scans (a series of [X-ray](#) images from multiple angles) are 100 to 1,000 times higher than conventional X-rays.

Of course, early diagnosis thanks to medical imaging can be lifesaving. But there is distressingly little evidence of



Donald P. Frush, MD
Chair,
Imaging Gently Alliance

Children's Hospitals Cut Down On CT Scans To Prevent Cancer

A new study shows a major drop in uses of the risky procedure.



Joe Satran
Staff Writer, The Huffington Post

Posted: 09/03/2015 07:31 PM EDT



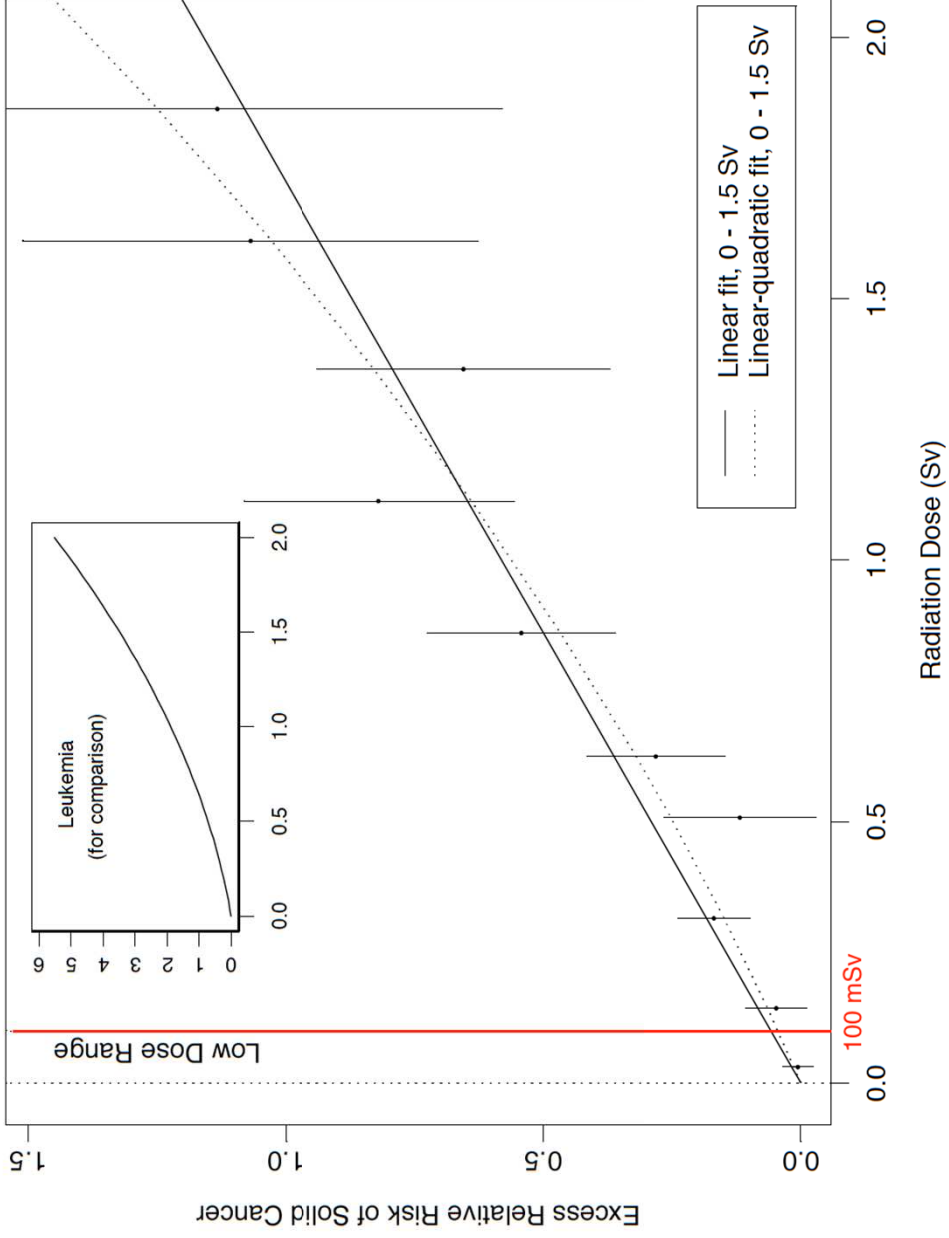
CREDIT: ABILEE STRAIN/ASSOCIATED PRESS
Children's hospitals have cut down on the number of CT scans performed in recent years.

When your children are sick, it's hard not to want doctors to do everything in their power to cure them. But when it comes to CT scans, less is often more.

That's because CT scanners -- which use X-rays to produce richly detailed images of almost any part of the body -- deliver far higher doses of dangerous ionizing radiation than any other



Radiology MD:
“As many as 1 in 300 children who get a CT scan of the abdomen, chest or spine will eventually develop a tumor as a result of the radiation...”



What is the right safety metric?

Goal



CTDI, DLP

ESAK, DAP

mSv

Device
Radiation
Output

Dose
Outputs

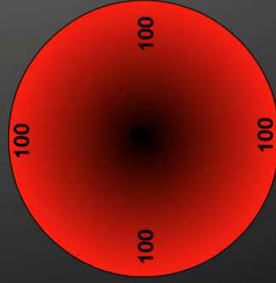
Size-based
Dose
Outputs

Effective
Dose

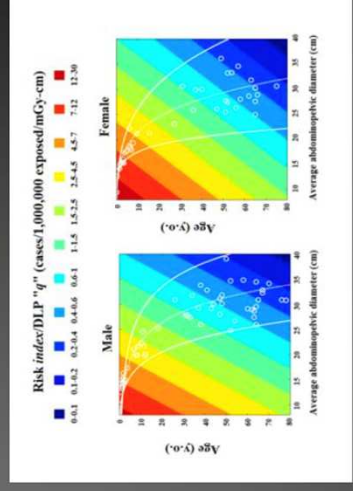
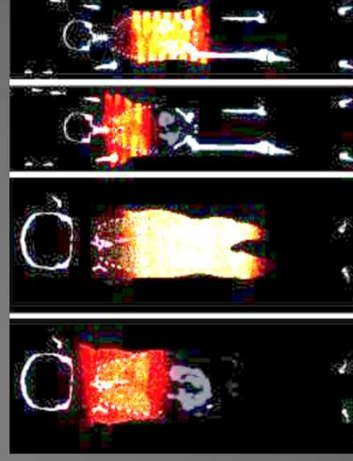
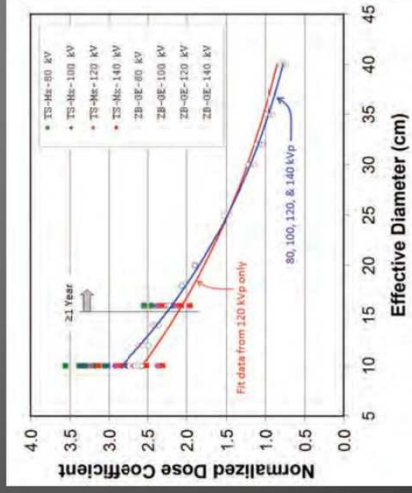
Patient
Organ Dose
Estimates

Patient
Risk
Estimates

Patient
Risk




Head \varnothing 16cm
Body \varnothing 32 cm



(a) Categories of exposures to people

According to UNSCEAR (2008), five main categories of people were exposed to radiation from Chernobyl. These numbers have changed considerably from earlier reports, especially the large increase in the numbers of clean-up workers.

1. About 530,000 **clean-up workers** (formerly called 'liquidators') sent into the Chernobyl exclusion zone for decontamination work, sarcophagus construction, and other clean-up operations between 1986 and 1989. Their average dose was ~ 100 mSv. 
2. About 115,000 **evacuees** who were evacuated within two weeks of the accident and 16,000 more before the autumn of 1986. Their average dose was ~ 33 mSv.
3. About 6.4 million **residents of contaminated areas** in Belarus, Ukraine and Russia. Their average dose was ~ 10 mSv.
4. About 100 million people who lived in in Belarus, Ukraine and Russia whose average dose was about 1.3 mSv.
5. Approximately 500 million **living in the rest of Europe** whose average dose was about 0.3 mSv.

Dievča

95 kg 165 cm (obézna)

Diagnóza :

K 8581

Nekrotizujúca pankreatitída s dietnou chybou

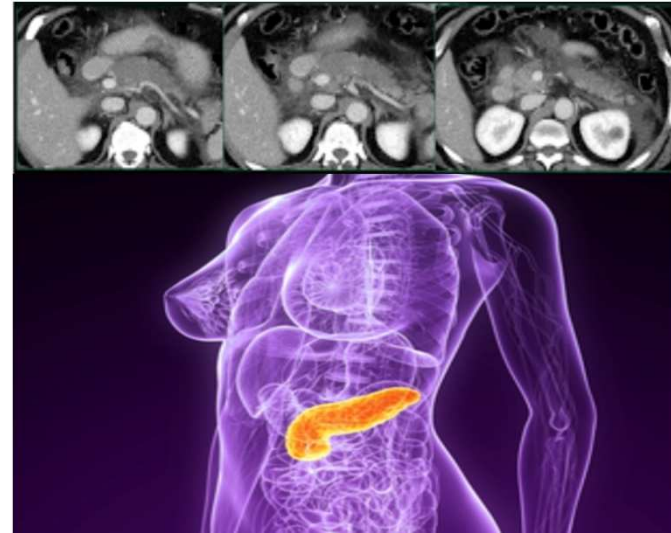
prvé CT vyšetrenie ako 12 ročná (r.2007 : 5 mSv)

6.5.2014 – 10.4.2015 (obdobie expozícií – 1 rok)

26 CT skenov + 5 x skiagrafia

celková efektívna dávka : **300 mSv**

(limit pre pracovníka 20 mSv/rok)



Dieťa < 1 rok

6 kg 70 cm

Diagnóza :

C 71.4 Tumor mozočka

Q 03.9 Obštrukčný hydrocefalus

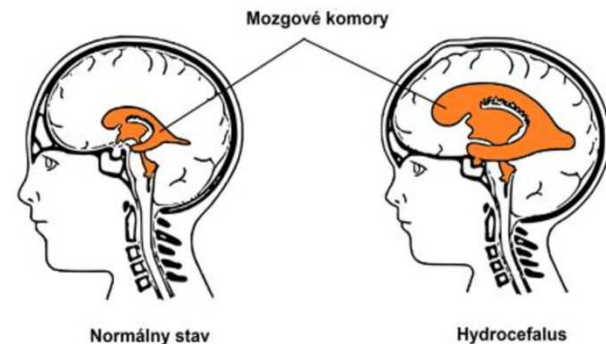
14 x CT hlavy (6M)

13 x skiagrafia

Efektívna dávka : 13 mSv

Ekvivalentná dávka na oči : **350 mSv / 6M**

(ročný limit pre pracovníka na oči 20 mSv/rok)



bezdomovec (40 r)

Diagnóza :

S009,F100,W190

neurčený pád,
akútna intoxikácia,
poranenia hlavy

69 CT skenov od r 2014

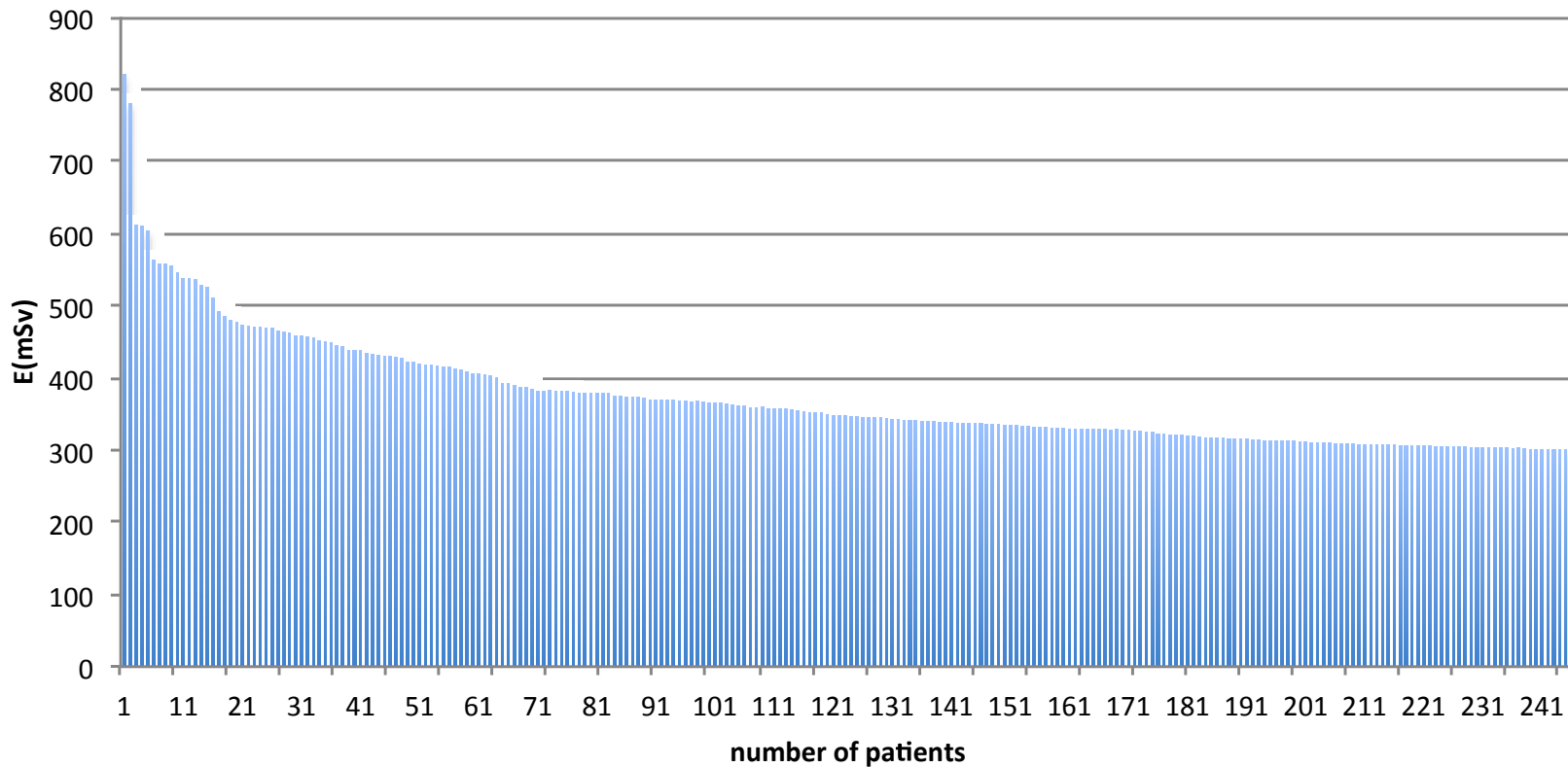
celková efektívna dávka : **800 mSv**

(limit pre pracovníka 20 mSv/rok)

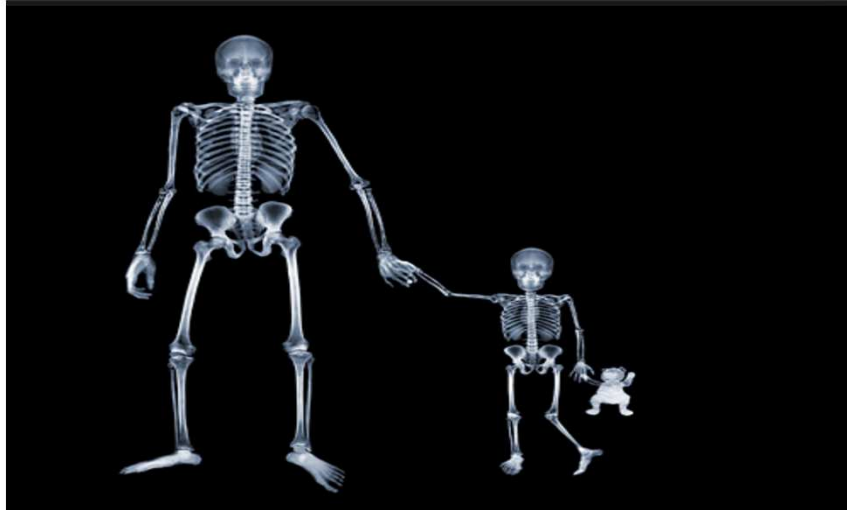


alkohol...epilepsia...

Effective doses from X ray examination in SR



Ďakujem za pozornosť



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