



# FANC registration of administered activity – Current situation

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Thibault Vanaudenhove, Dr. Ir.

[thibault.vanaudenhove@FANC.FGOV.BE](mailto:thibault.vanaudenhove@FANC.FGOV.BE)

Federal agency for Nuclear control (FANC)  
Health & Environment – Health Protection  
Inspector-Expert Dosimetry

# Registration of administered activity

- Why?

- Protocols and guidelines → how far are they followed?
- Distribution of administered activity in function of:
  - Procedure/examination
  - Type of radiopharmaceutical
  - Patient weight
- Diagnostic Reference Levels (DRL's)
  - Optimization process
  - National comparison
  - International comparison

(2014 : No BE DRL's for NM) ←



# Registration of administered activity

- How?

- 2010 Belgian survey (FANC, BelNuc & BHPA):

- On voluntary basis (66% of response)
    - Results: Mean activity, radiopharmaceutical used, frequency of examinations, type of equipment, etc.

- Since 1/1/2015, compulsory survey:

- FANC decree (see [www.jurion.fanc.fgov.be](http://www.jurion.fanc.fgov.be))
    - DRL's computed by the FANC + personalized FB to centers
    - 9 periods (one per procedure) of 3 months **or** 30 patients

→ see [www.fanc.fgov.be](http://www.fanc.fgov.be) > Définition de niveaux de référence diagnostiques en médecine nucléaire  
> Bepaling van diagnostische referentieniveaus in nucleaire geneeskunde

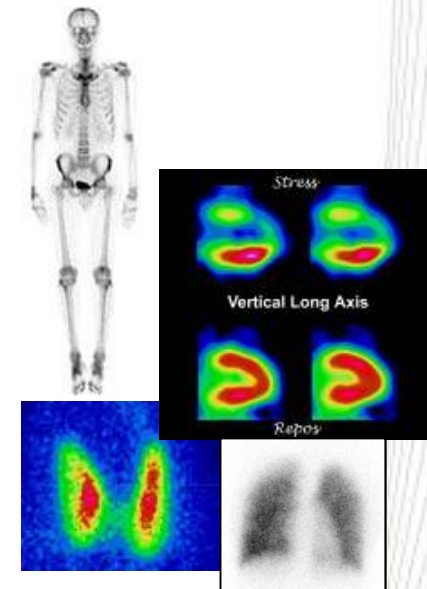
# Registration of administered activity

- Diagnostic Reference Levels (DRL's)
  - National comparison
    - "BE2010" = 2010 Belgian survey
    - "BelNuc" = Belgian Society of Nuclear Medicine
  - International comparison
    - "DDM2" = Dose DataMed II (European Commission)
    - "EANM" = European Association of Nuclear Medicine (EU)
    - "SNMMI" = Society of Nuclear Medicine and Molecular Imaging (US)

# Registration of administered activity

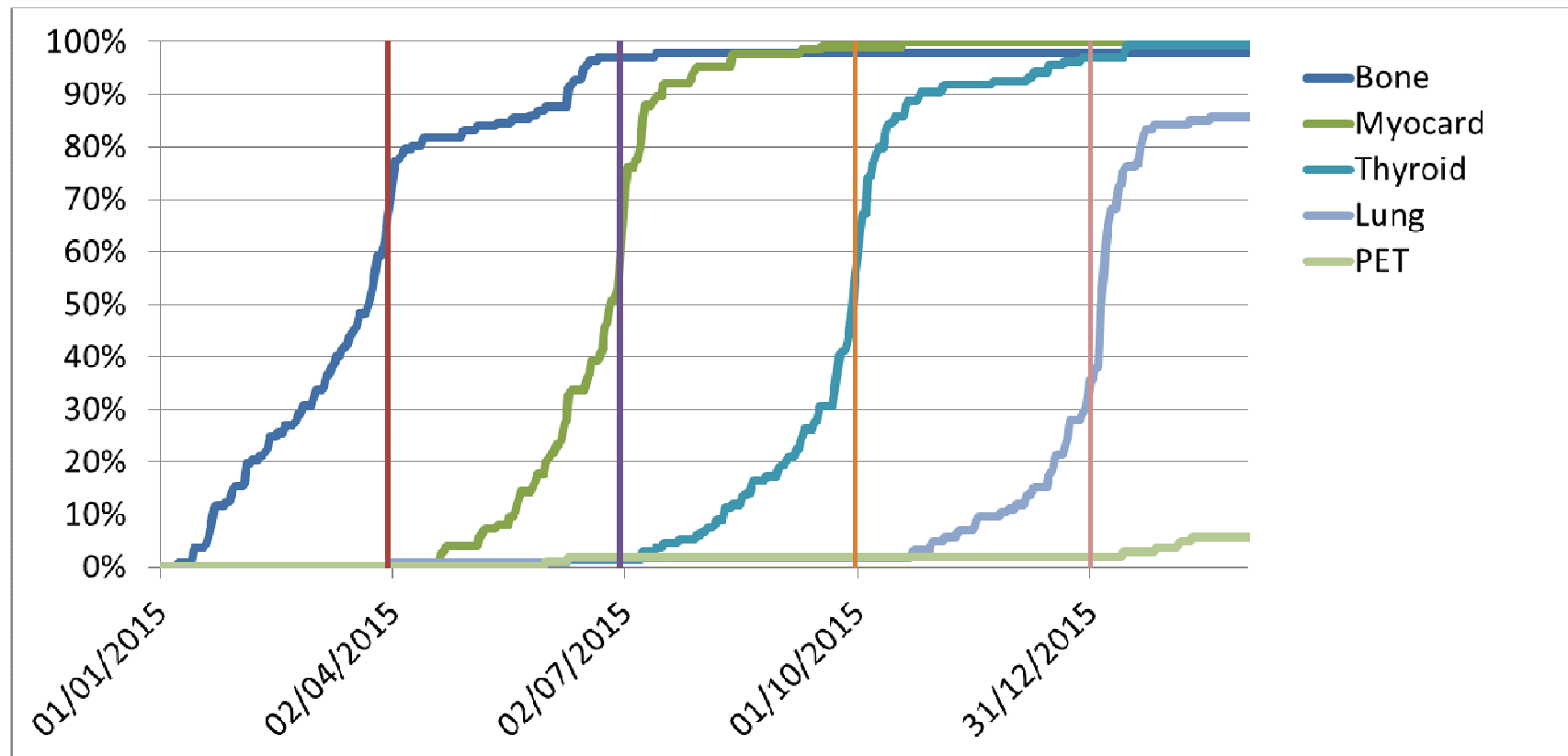
- List of periods and procedures:

1. 01/01-31/03/2015 : Bone imaging
2. 01/04-30/06/2015 : Myocardial perfusion
3. 01/07-30/09/2015 : Thyroid scintigraphy
4. 01/10-31/12/2015 : Lung perfusion
5. 01/01-31/03/2016 : Tumor imaging
6. 01/04-30/06/2016 : Pediatric (Bone, Renal, Gastro and PET)
7. 01/07-30/09/2016 : Cerebral blood flow
8. 01/10-31/12/2016 : Renography, renal cortical scintigraphy
9. 01/01-31/03/2017 : Gastro emptying



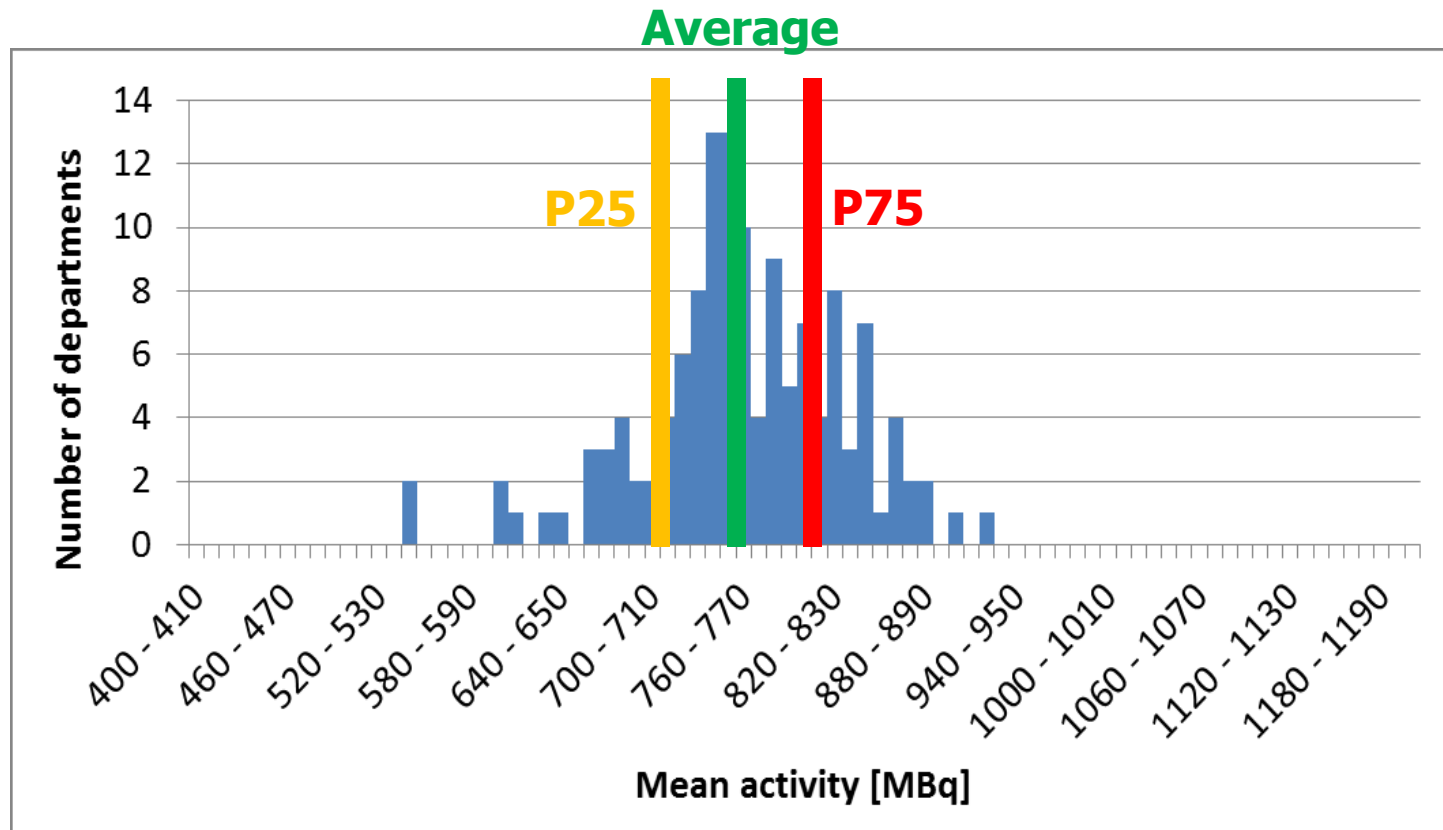
# Results

- Participation: **~100%**



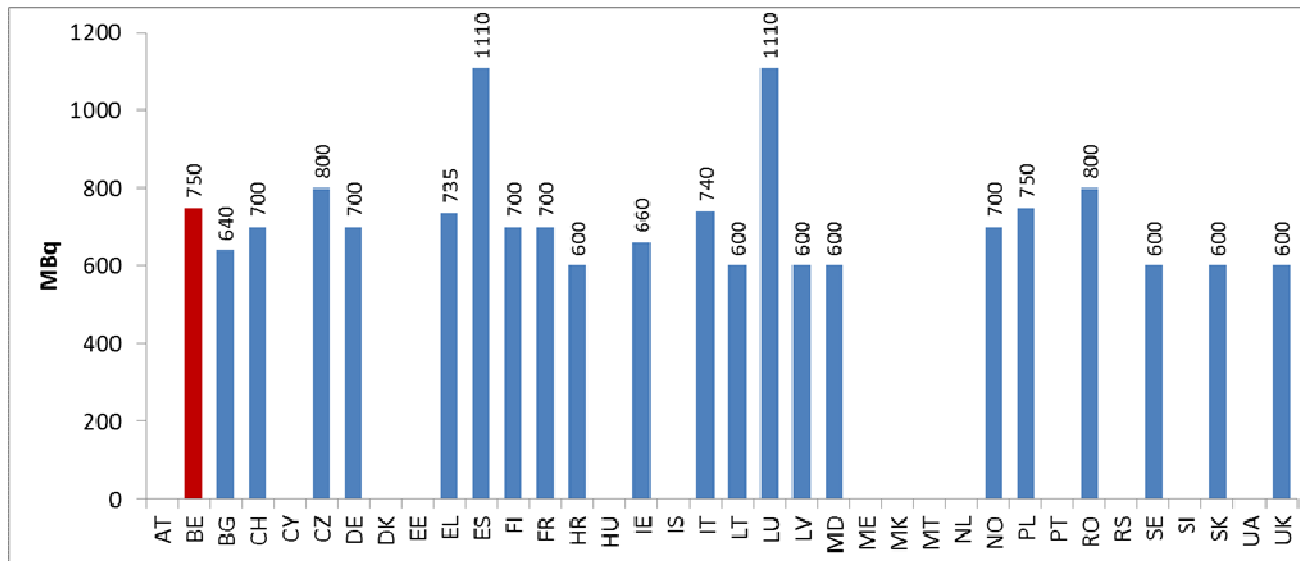
# Results – Bone imaging

- Activity distribution (only  $^{99m}\text{Tc}$  phosphates)



# Results – Bone imaging

- DRL (average):
  - For adults 70 kg : **750 MBq** (P25 = 710 MBq, P75 = 800 MBq)
    - < BE2010, SNMMI
    - = BelNuc
    - > DDM2, EANM

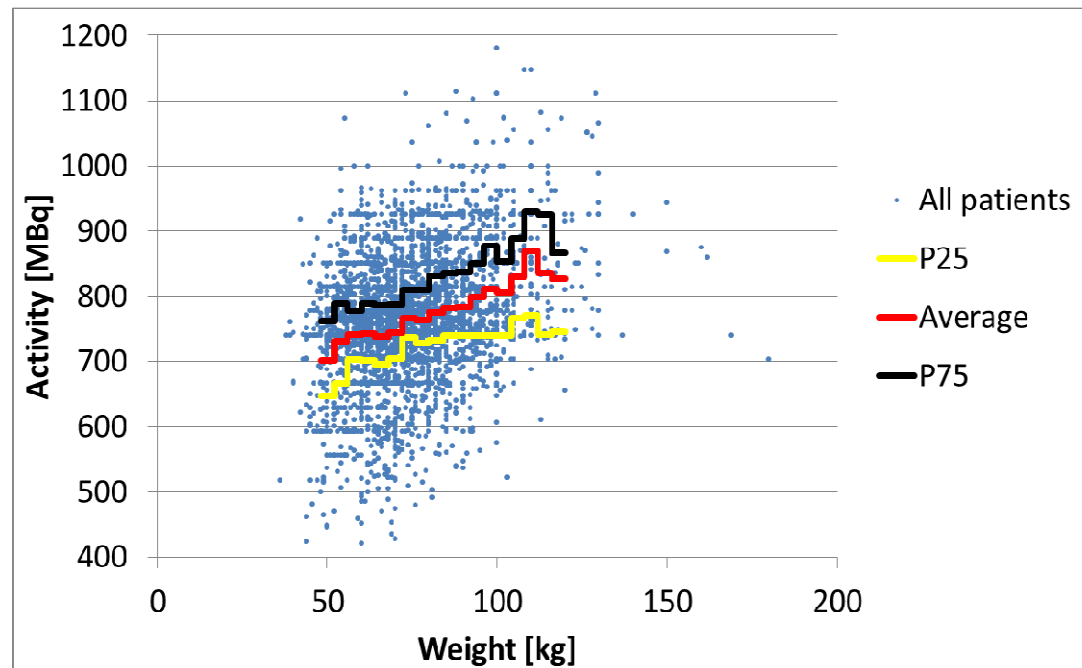


DDM2. (2010). *Study on European Population Doses from Medical Exposure - DDM2 Project Report Part 2: Diagnostic Reference Levels (DRLs) in Europe. Dose Datamed 2.*



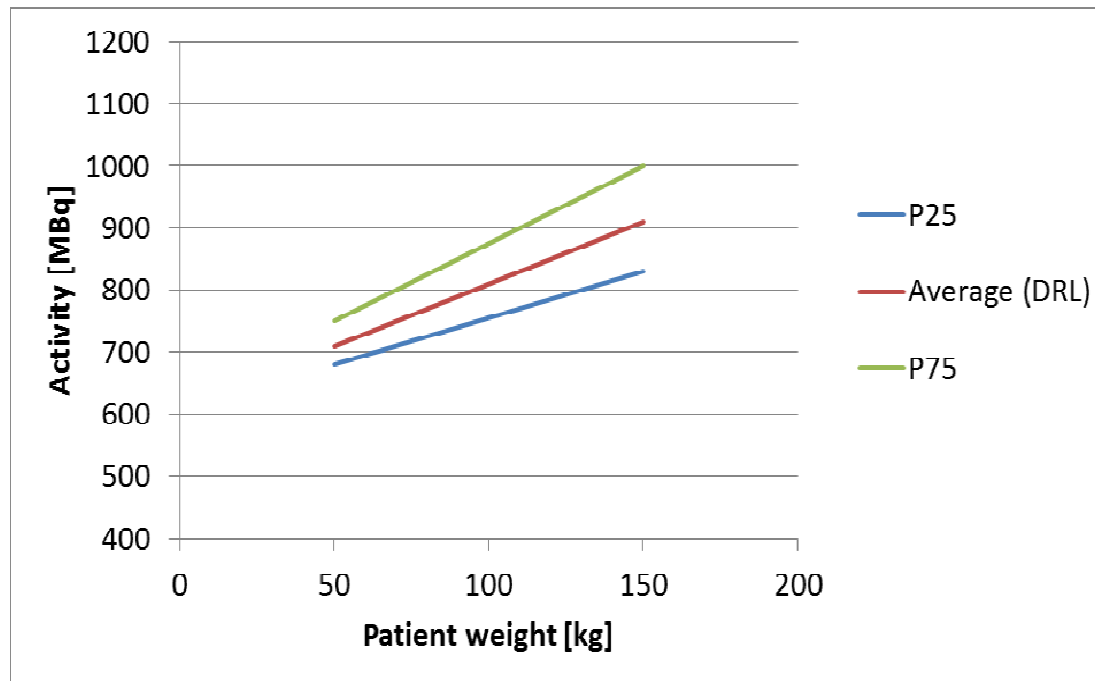
# Results – Bone imaging

- DRL (average):
  - For adults 70 kg : **750 MBq** (P25 = 710 MBq, P75 = 800 MBq)
  - For adults xxx kg :



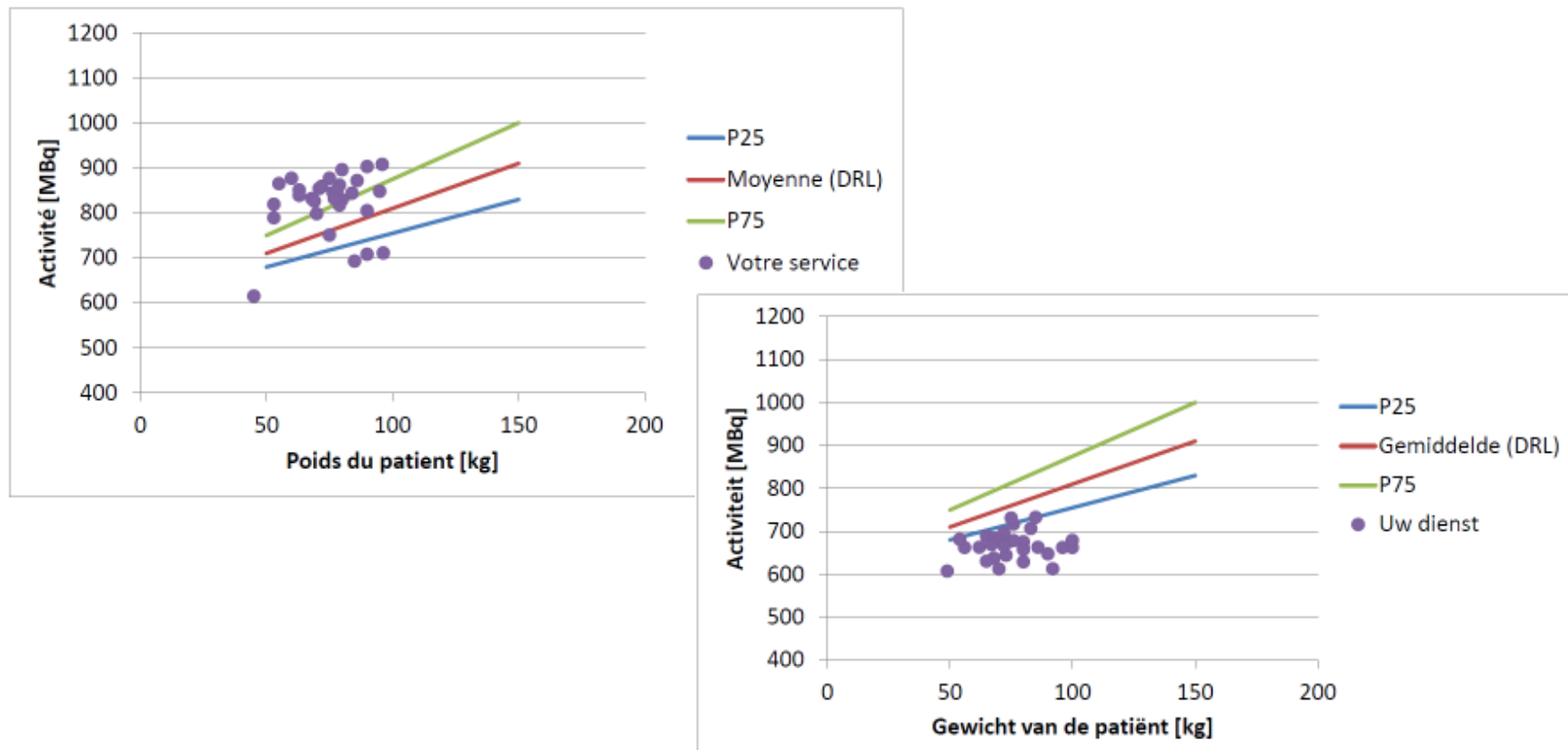
# Results – Bone imaging

- DRL (average):
  - For adults 70 kg : **750 MBq** (P25 = 710 MBq, P75 = 800 MBq)
  - For adults *xxx* kg :



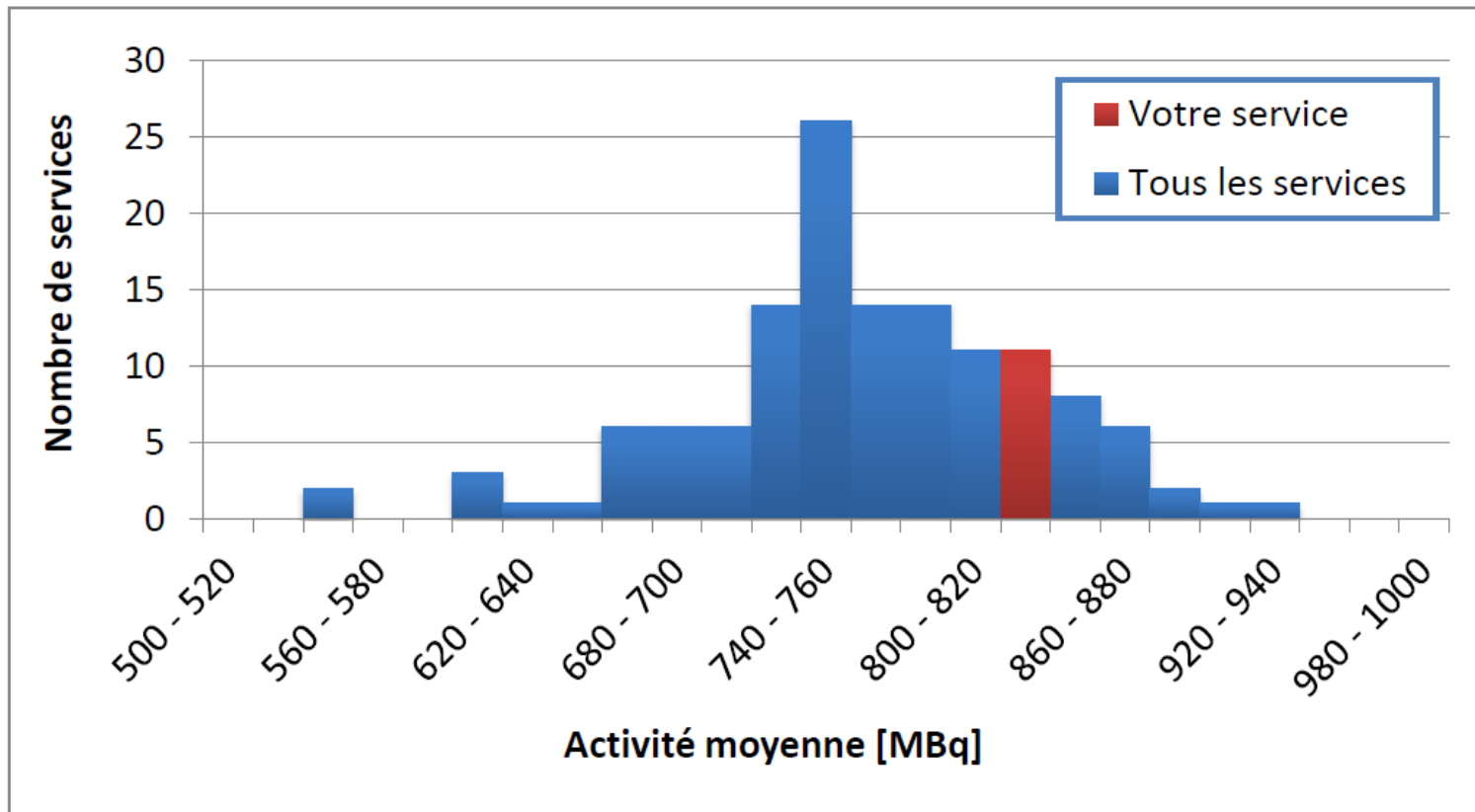
# Results – Bone imaging

- Personalized feed-back per department:



# Results – Bone imaging

- Personalized feed-back per department:



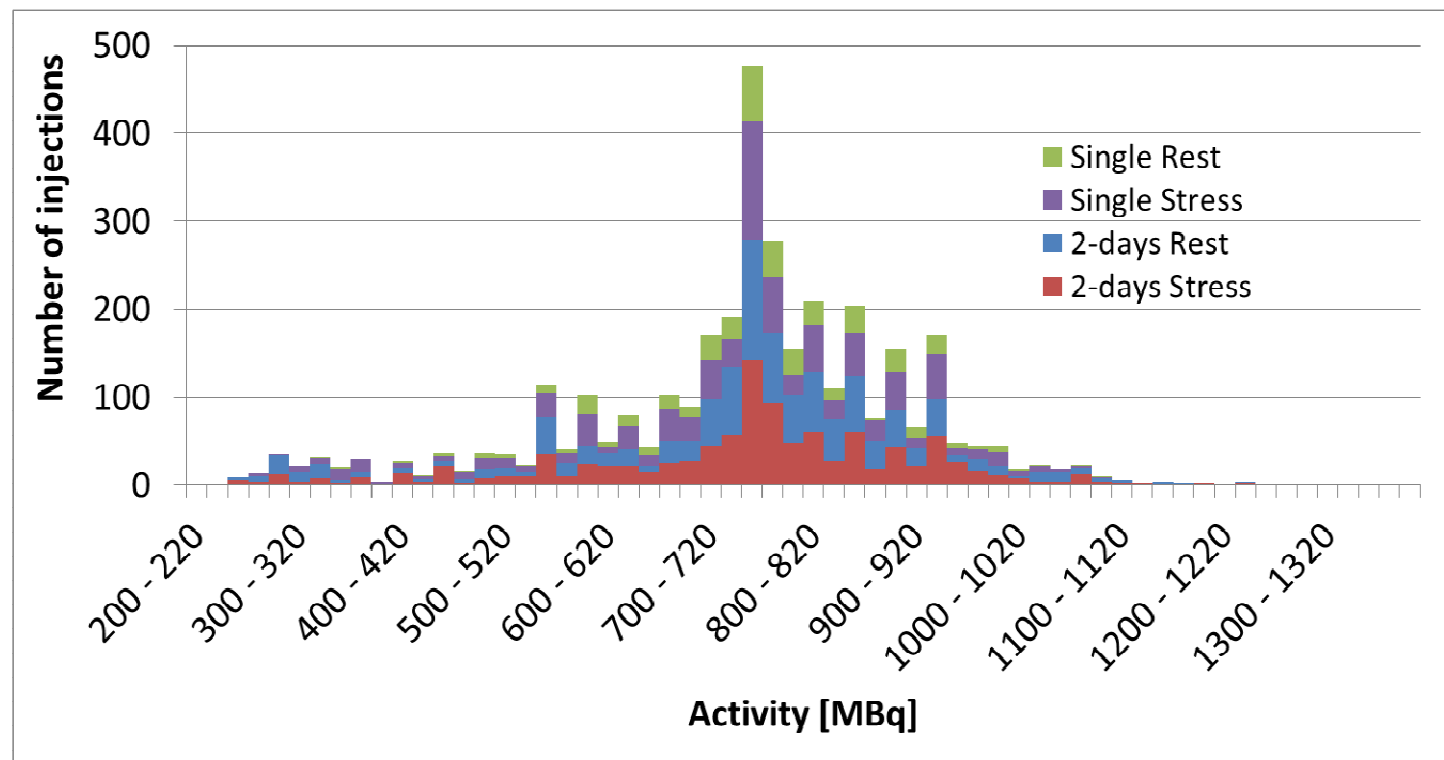
# Results – Myocardial perfusion

- Protocols :
  - single injection
  - 2 injections on 2 days
  - 2 injections on 1 day
- Radiopharmaceuticals :
  - $^{99m}\text{Tc}$  (Tetrophosmine, MIBI)
  - $^{201}\text{TlCl}_2$



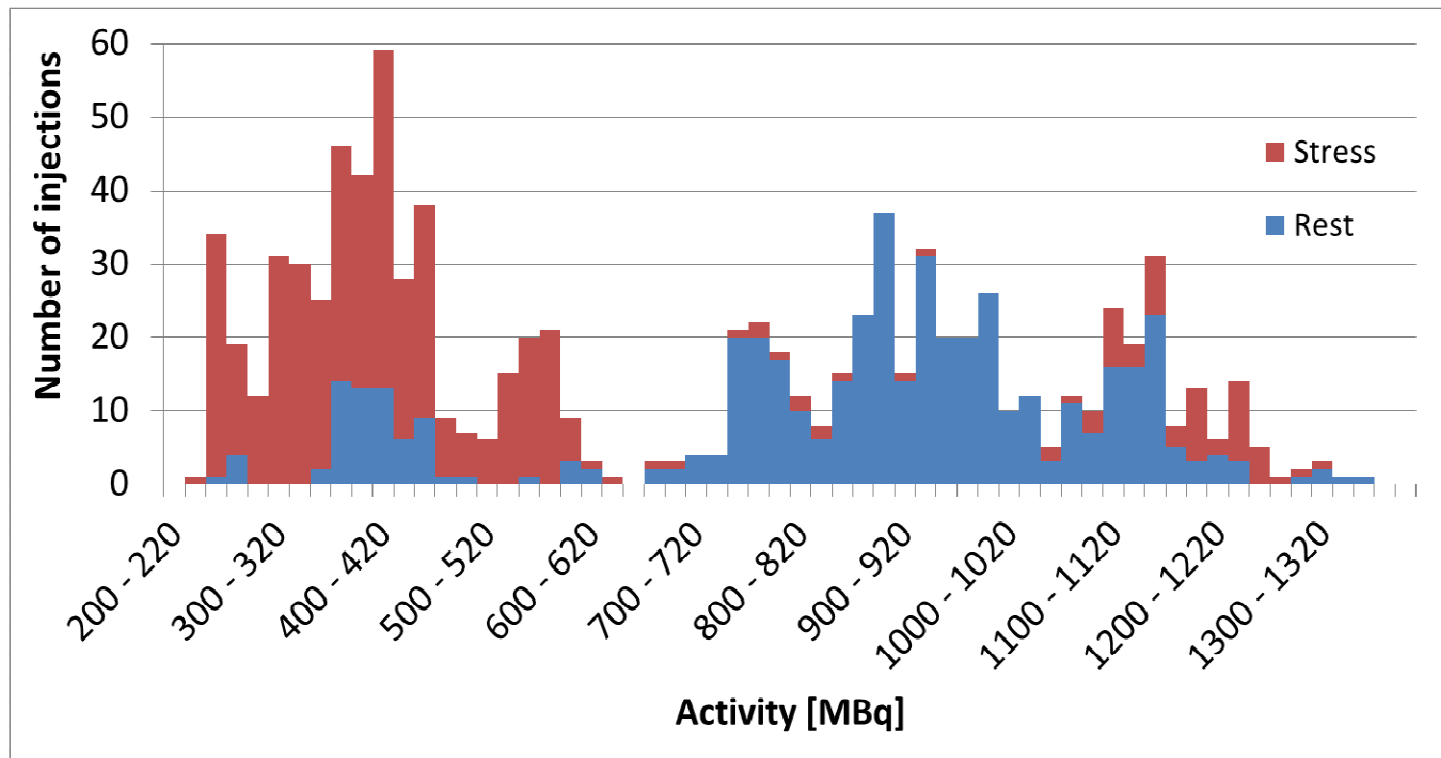
# Results – Myocardial perfusion

- $^{99m}\text{Tc}$  : single injection + protocols on 2 days



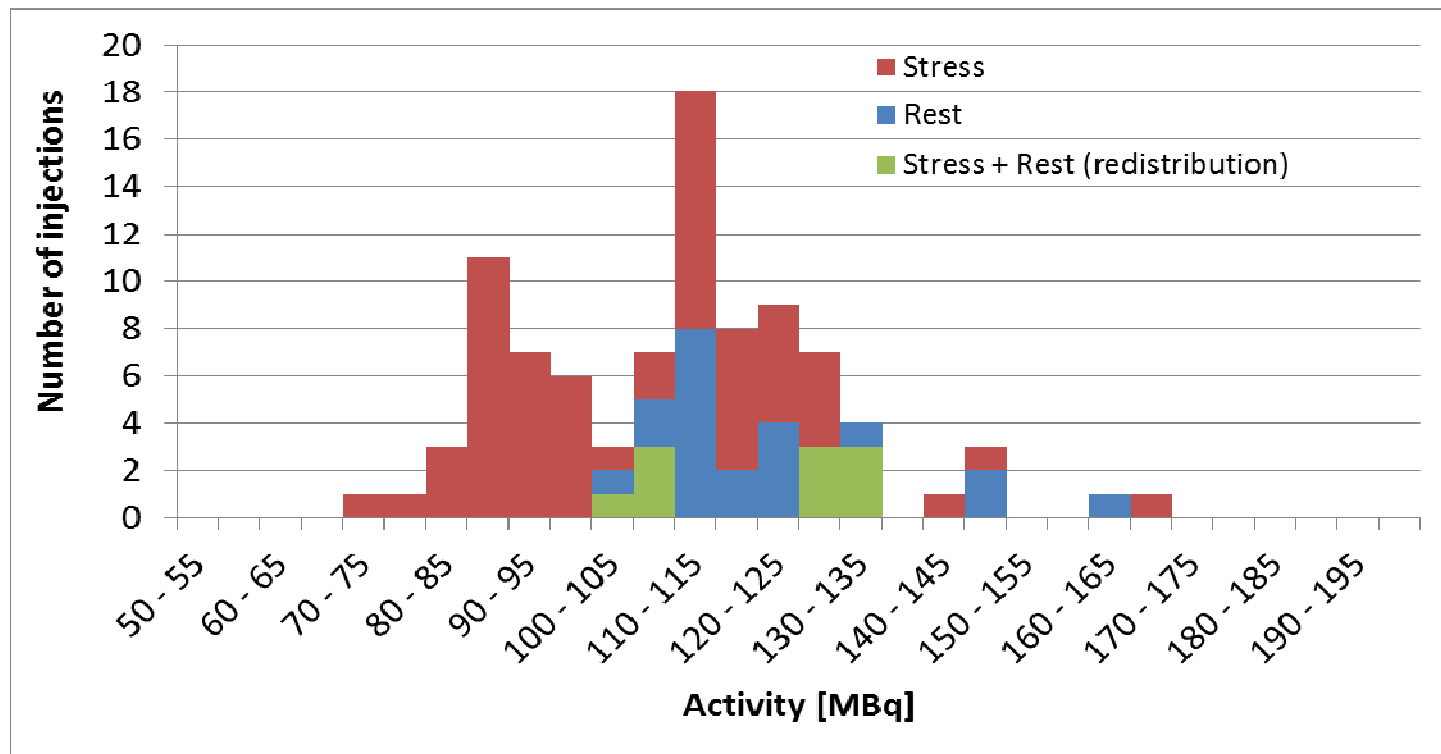
# Results – Myocardial perfusion

- $^{99m}\text{Tc}$  : protocols on 1 day



# Results – Myocardial perfusion

- $^{201}\text{TlCl}_2$  : single injection



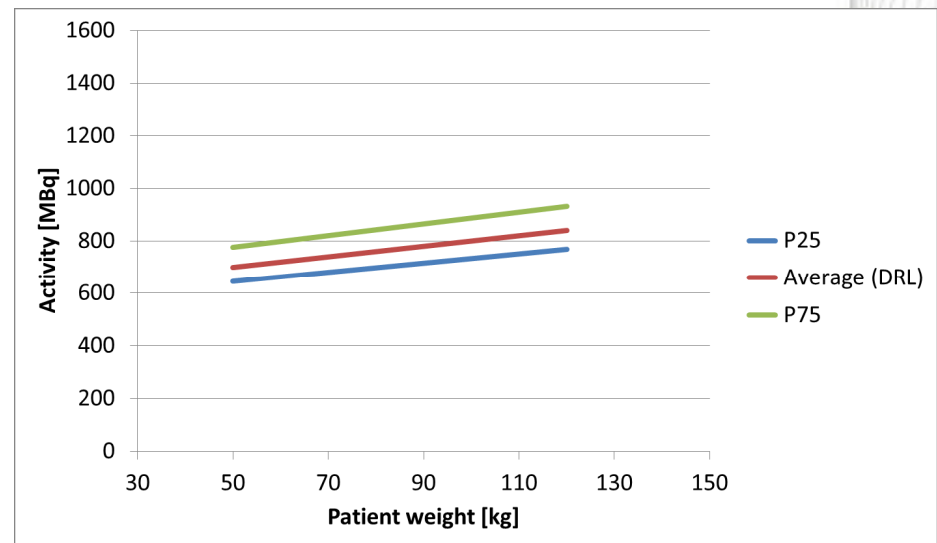
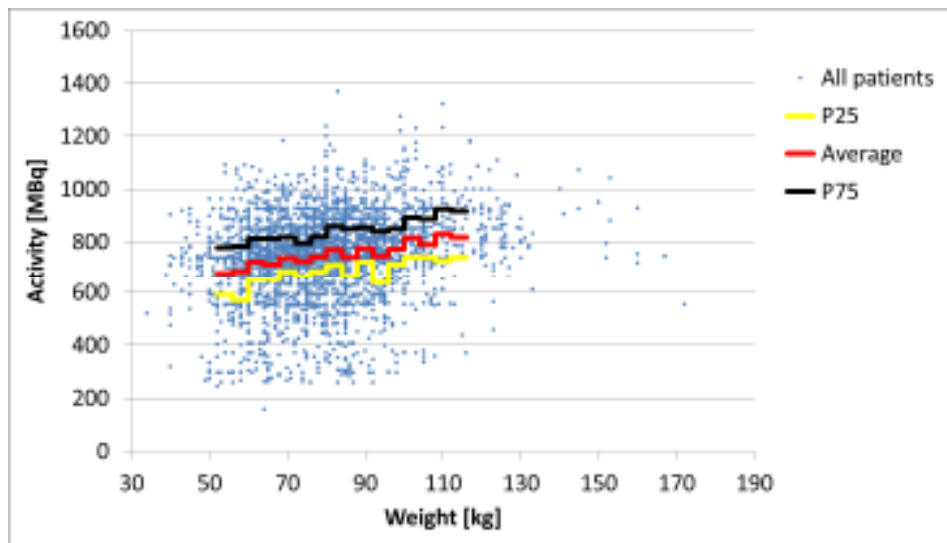


# Results – Myocardial perfusion

- DRL (average):
  - For adults 70 kg :
    - $^{99m}\text{Tc}$  single/2 days : **740 MBq** (P25 = 680 MBq, P75 = 820 MBq)  
< BE2010, FR, DDM2, BELNUC, SNMMI
    - $^{99m}\text{Tc}$  1 day : **380/980 MBq** (P25 = 320/870 MBq, P75 = 430/1100 MBq)  
< BE2010 ; > FR, DDM2, BELNUC ; = EANM, SNMMI
    - $^{201}\text{TlCl}_2$  single : **110 MBq** (P25 = 90 MBq, P75 = 120 MBq)  
> BE2010 ; = FR, DDM2, BELNUC, EANM, SNMMI

# Results – Myocardial perfusion

- DRL (average):
  - For adults 70 kg
  - For adults *xxx* kg :
    - e.g.  $^{99m}\text{Tc}$  single/2 days :



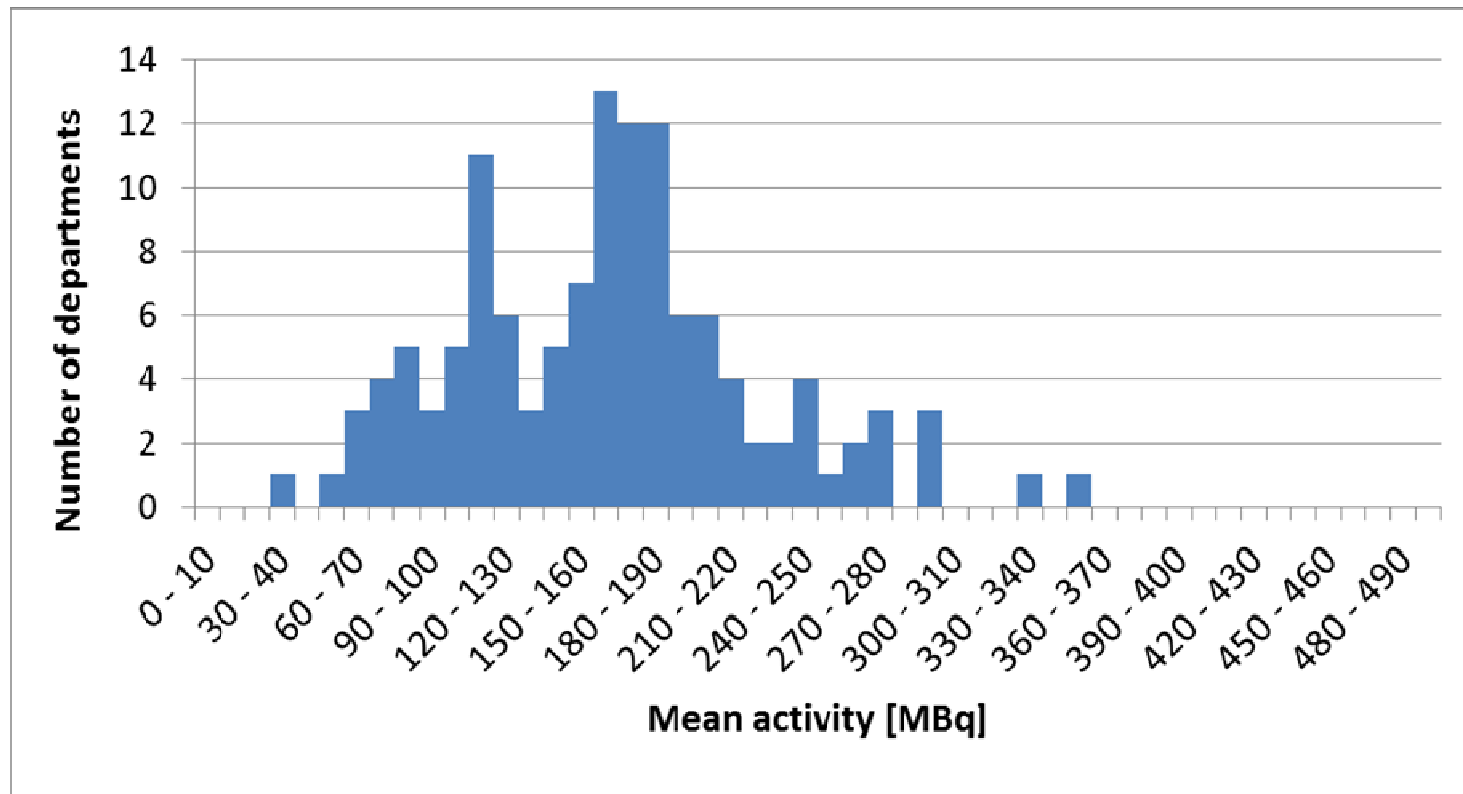
# Results – Thyroid

- Modalities :
  - planar
  - SPECT
  - functional test (= uptake)
- Radiopharmaceuticals :
  - $^{99m}\text{Tc}$  pertechnetate
  - $^{123}\text{I}$  NaI



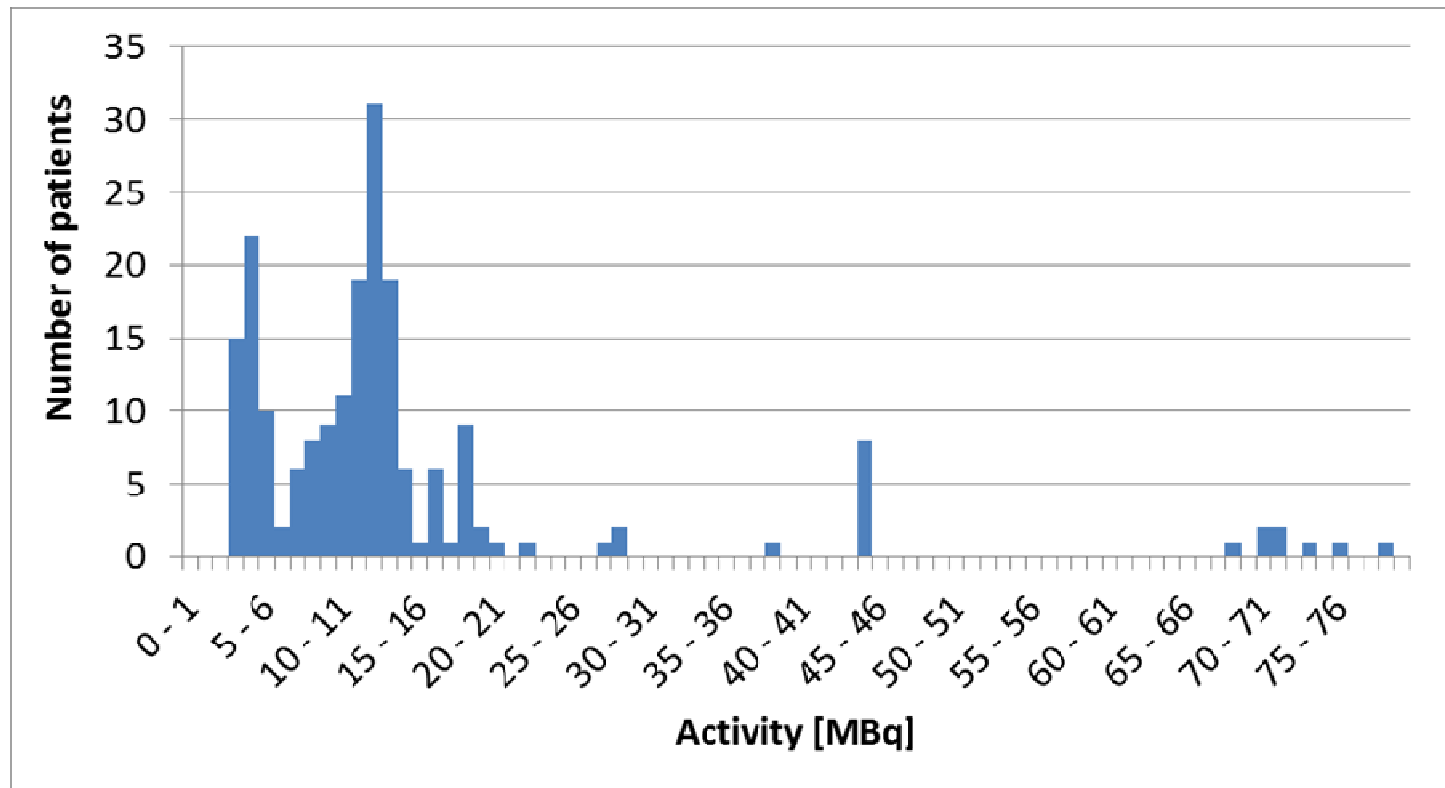
# Results – Thyroid

- $^{99m}\text{Tc}$



# Results – Thyroid

- $^{123}\text{I}$

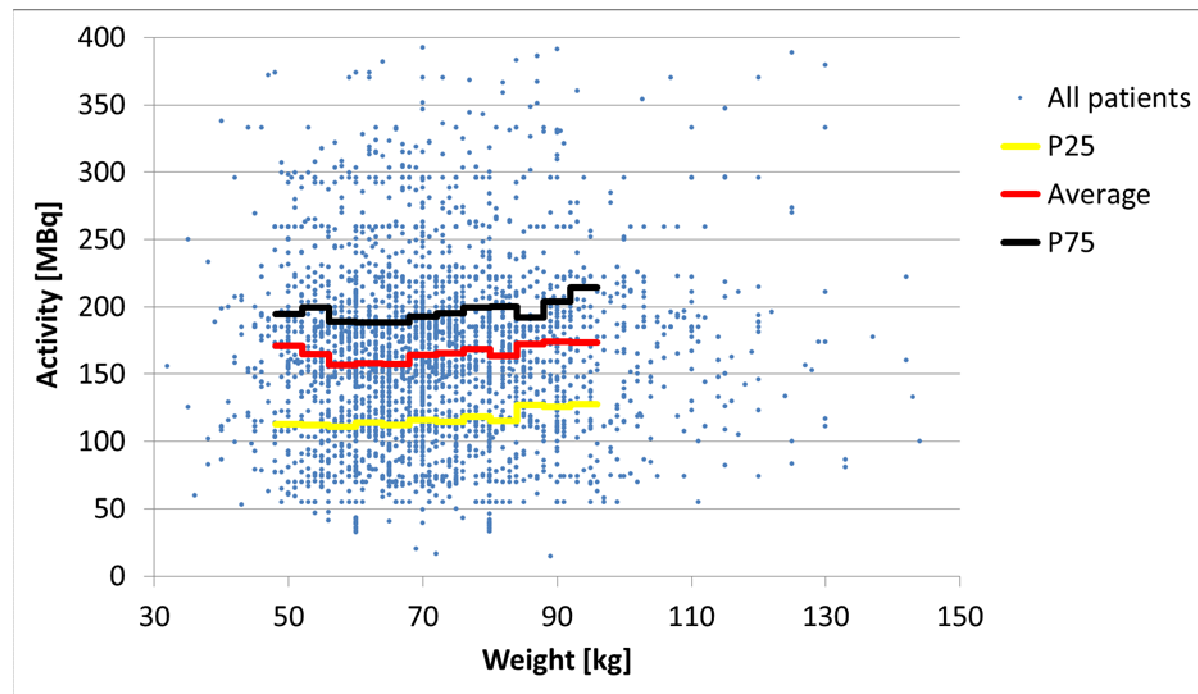


# Results – Thyroid

- DRL (average):
  - For all departments :
    - $^{99m}\text{Tc}$  pertechnetate: **165 MBq** (P25 = 120 MBq, P75 = 200 MBq)
      - > BE2010, FR, DDM2, BELNUC ; = ACR, SNMMI  
(max 200 MBq)
    - $^{123}\text{I}$  NaI: **12 MBq** (but some extreme values !)
      - < BE2010, DDM2, BELNUC ; = FR, ACR, SNMMI

# Results – Thyroid

- DRL (average):
  - For all departments
  - For adults  $\geq 70$  kg : not recommended by the good practice



# Preliminary results – Lung perfusion

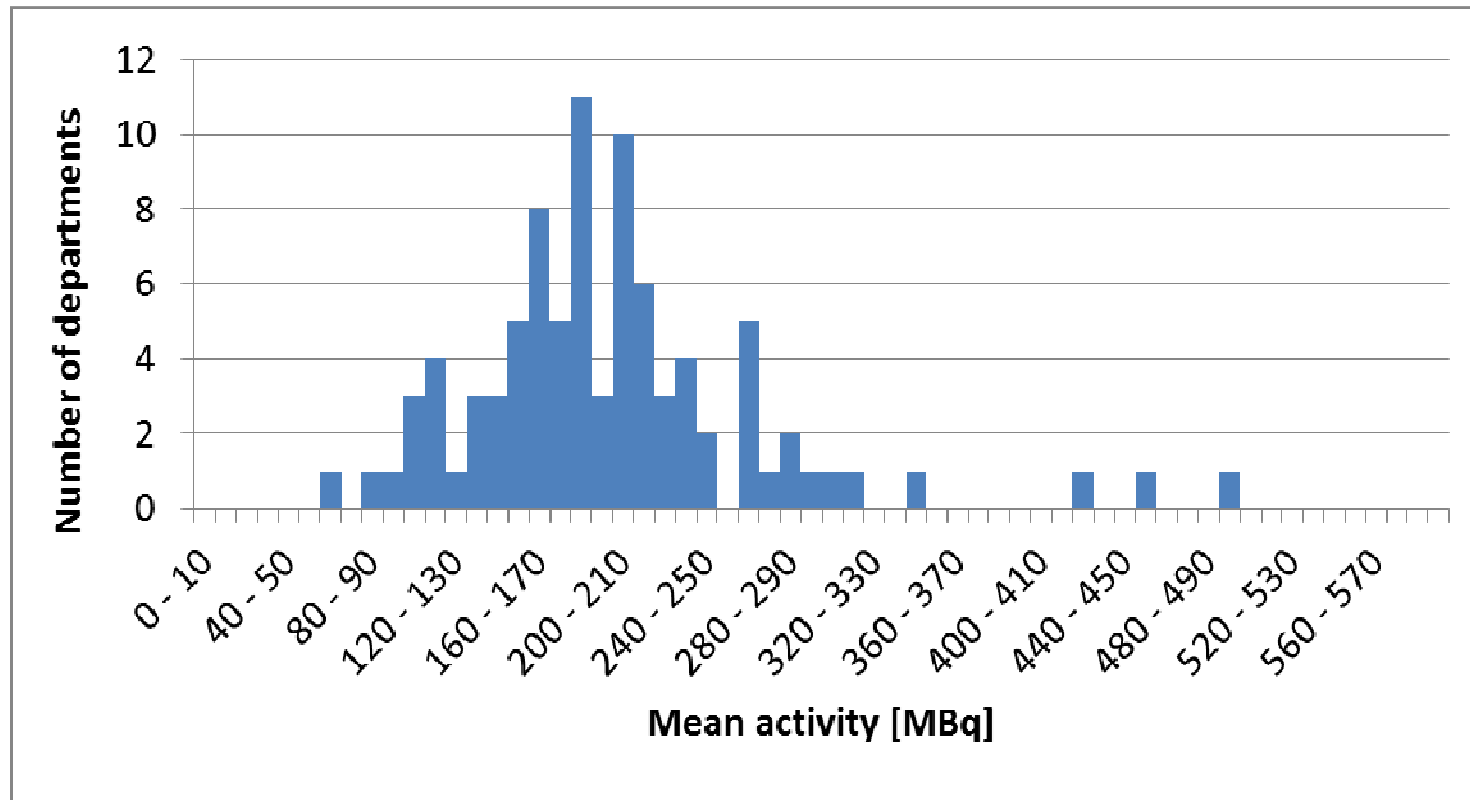
- Participation : **86%**
- Modalities :
  - planar
  - SPECT
- Radiopharmaceutical :
  - $^{99m}\text{Tc}$  MAA





# Preliminary results – Lung perfusion

- $^{99m}\text{Tc}$  MAA

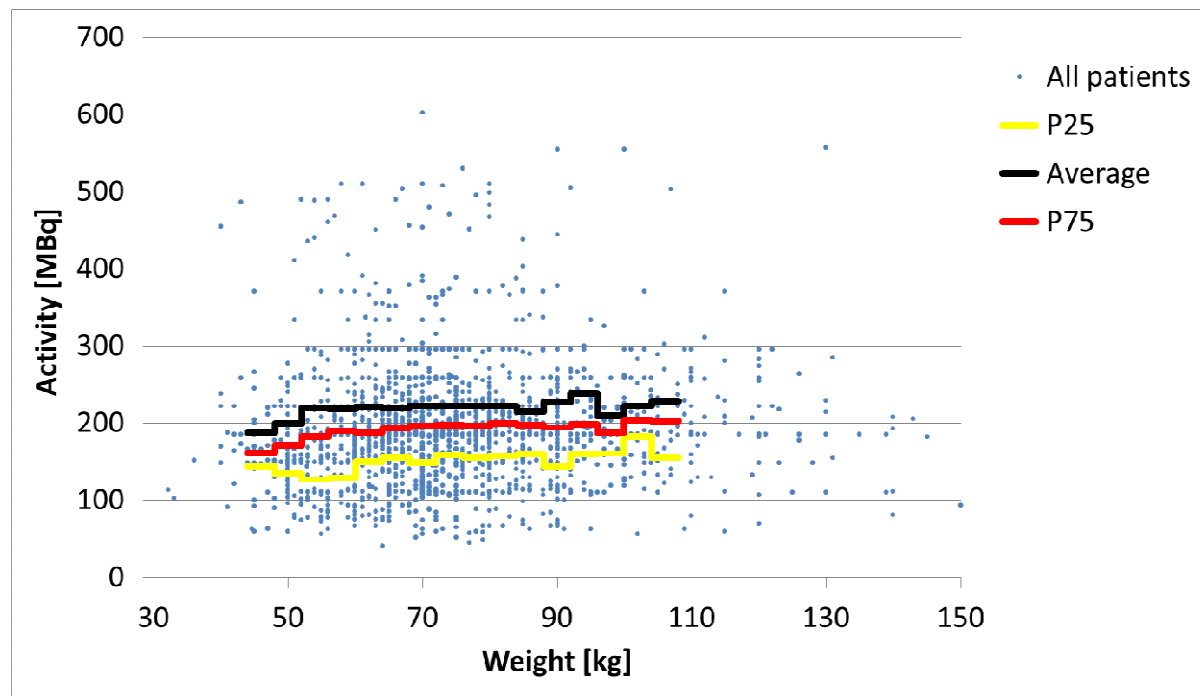


# Preliminary results – Lung perfusion

- Preliminary DRL (average):
  - For all departments : **200 MBq** (P25 = 160 MBq, P75 = 225 MBq)  
< FR ; > BE2010, DDM2, BELNUC, EANM, SNMMI  
(max 220 MBq)

# Preliminary results – Lung perfusion

- Preliminary DRL (average):
  - For all departments
  - For patients  $xxx$  kg : not recommended by the good practice



# Summary

- Good participation!
- **DRL's** in terms of average activities (+ function of weight)
  - Bone :  $^{99m}\text{Tc}$  : **ok**
  - Myocardperfusion :
    - $^{99m}\text{Tc}$  single/2-days : **"nice !"**
    - $^{99m}\text{Tc}$  1-day : **"bad"**
    - $^{201}\text{TlCl}_2$  single : **ok**
  - Thyroid :
    - $^{99m}\text{Tc}$  : **"bad"** (P75 = max. Belnuc)
    - $^{123}\text{I}$  : **ok** (but extremely large values to be investigated)
  - Lung perfusion :  $^{99m}\text{Tc}$  : **"bad"** (P75 = max. Belnuc)
- ➔ **corrective actions to be taken for most of procedures for at least 25% of departments (cf. personalized feed-back)**