



Solution logicielle pour analyser une problématique de santé



Histoire d'une collaboration

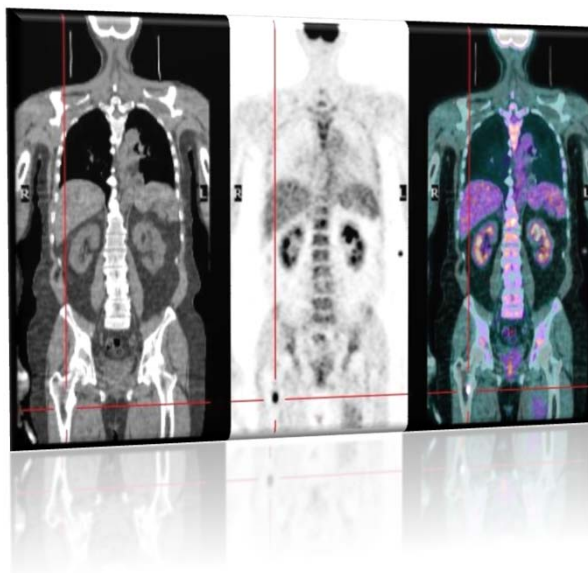
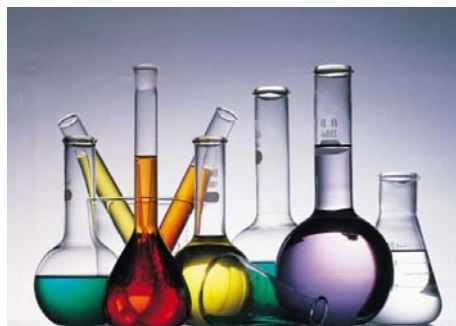


Markus Jatton
Régis Le Coultre
Octobre 2015

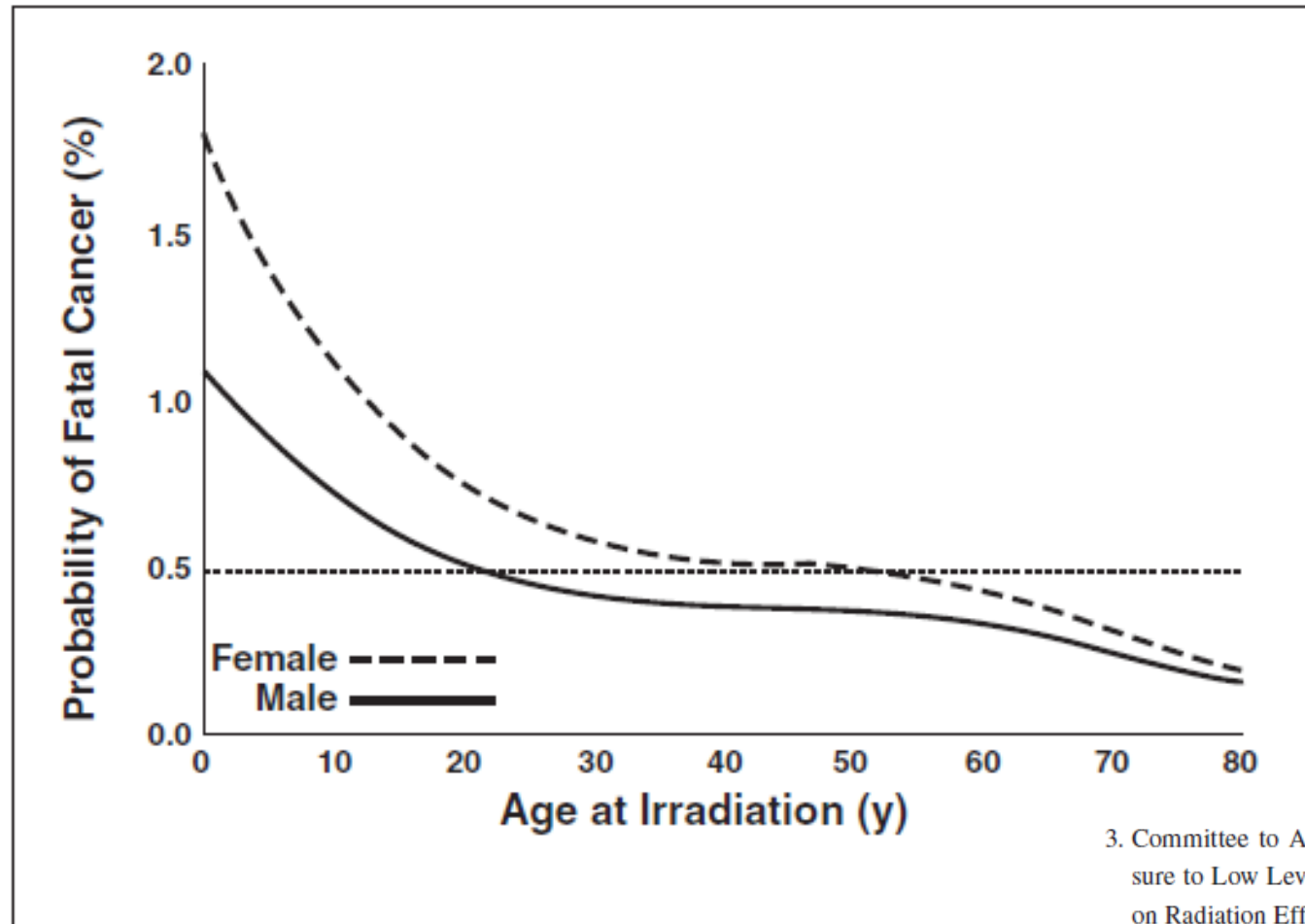


Quelle est
l'irradiation de la
population suisse
par la radiologie
médicale ?









AJR2011; 196:762–767

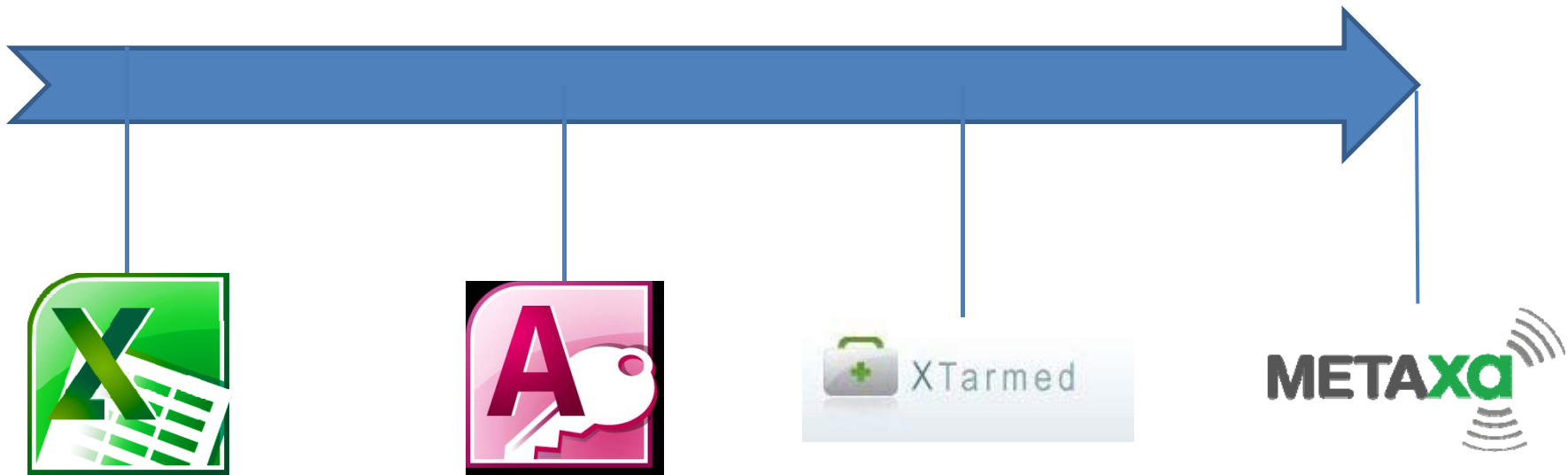
Fig. 2—Lifetime attributable risk as function of sex and age for hypothetical 100-mGy uniform whole-body exposure [3].

3. Committee to Assess Health Risks From Exposure to Low Levels of Ionizing Radiation, Board on Radiation Effects Research, Division of Earth and Life Studies, National Research Council of the National Academies. *Health risks from exposure to low levels of ionizing radiation: BEIR VII Phase 2*. Washington, DC: National Academies Press, 2006

Empfangsschein / Récépissé / Ricvuta	Einzahlung Giro	Versament Virement	Versamento Girato
BANQUE CANTONALE DE GENEVE 1211 GENEVE 2 Supplément pour le service de la Poste # OCP - SEC Case postale 2652 1213 Ornex N° Compte: Z 3285.51.32	BANQUE CANTONALE DE GENEVE 1211 GENEVE 2 Supplément pour le service de la Poste # OCP - SEC Case postale 2652 1213 Ornex N° Compte: Z 3285.51.32	Mario BERNASCONI 17.12.1962 Changement d'employeur	
Posto/Compte/Conto: 12-1-2 CHF 65,00	Posto/Compte/Conto: 12-1-2 CHF 65,00	Titulaire et bénéficiaire par l'intermédiaire de Au Bon coiffeur SA Rue du Lac 12 1200 Genève	

**Utilisation de données de facturation
Tarmed pour en déduire des informations
sur l'irradiation de la population suisse.**

L'histoire: essais 1, 2, 3 ...

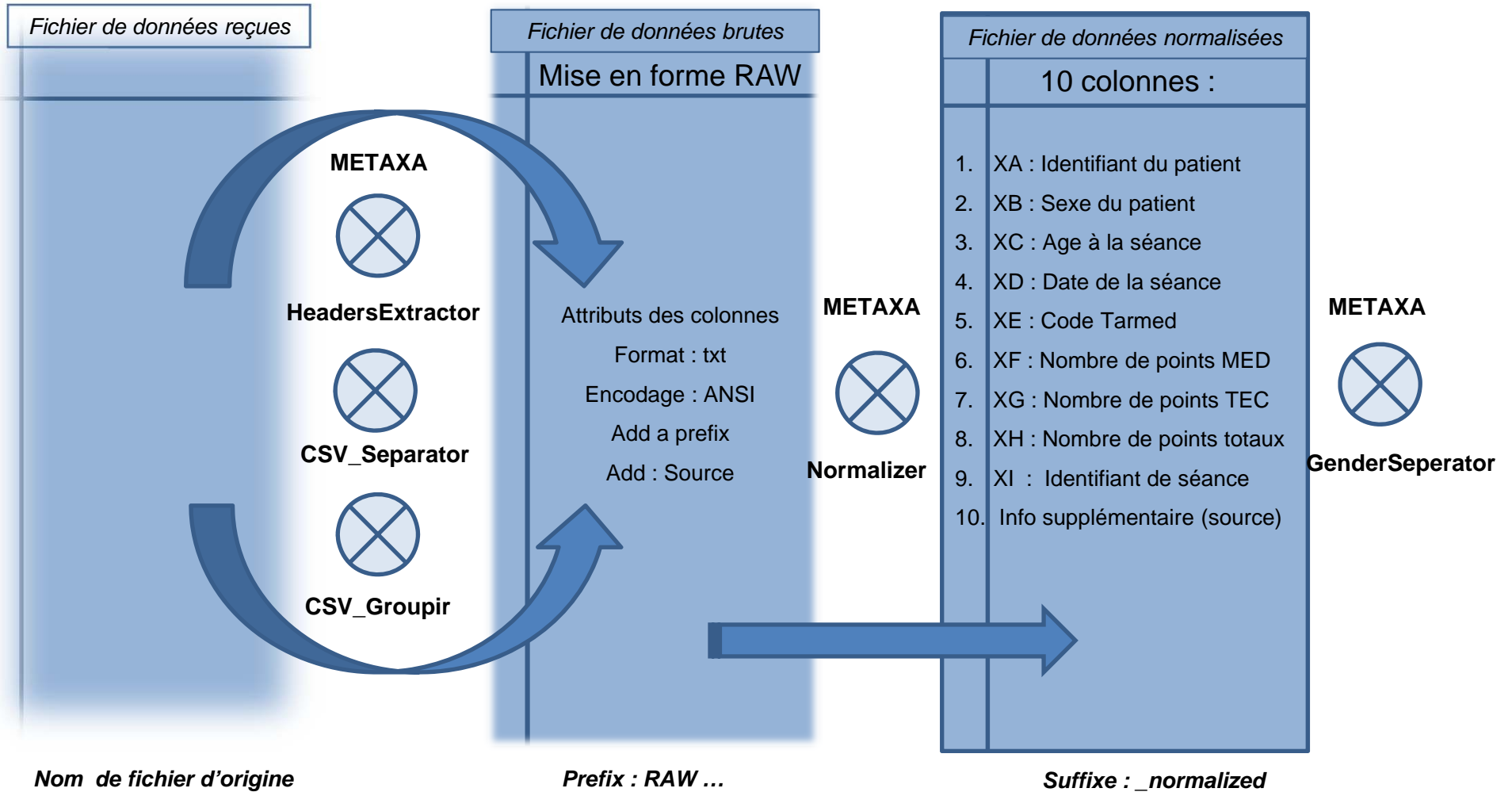


La solution ...



- Saisie unique des données
- Redondance minimale
- Architecture SAAS
- Anonymisation
- Efficacité du procédé
- Précision des résultats

Préparation des données



Mise en forme RAW

The image shows a Notepad++ window with a raw data file open. A table in the center details the mapping between raw data fields and their corresponding codes. A large blue arrow points from the table to the transformed data below.

Field	Raw Value	Code
Prestataire	009 - 2RAD	XA
IPP	8D0E82F5039E889D7461C73B4836143E	XD[dd.MM.yyyy hh:mm]
Exam-DATE	01.01.2013 00:00	XE[CT##.####]
Code-Tarmed	CT39.0140	XH
libelé		XF
NB-PT_total	36.25	XG
PTS_MED	12.35	XI
PTS_TEC	23.9	XB[M F]
identifiant-exa	A - 6969516	XCp[yyyy]
sex	M	
Année-naissance	1994	

The transformed data in the bottom window is as follows:

```

1 Prestataire XA XE[CT##.####] XH XF XG XI XB[M|F] XCp[yyyy] CRUF
2 009 - 2RAD 8D0E82F5039E889D7461C73B4836143E 01.01.2013 00:00 CT39.0140 36.25 12.35 23.9 A - 6969516 M 1994 CRUF
3 009 - 2RAD 8D0E82F5039E889D7461C73B4836143E 01.01.2013 00:00 CT39.0145 18.13 6.18 11.95 A - 6969516 M 1994 CRUF
4 009 - 2RAD 8D0E82F5039E889D7461C73B4836143E 01.01.2013 00:00 CT39.2000 14.94 0 14.94 A - 6969516 M 1994 CRUF
5 009 - 2RAD 8D0E82F5039E889D7461C73B4836143E 01.01.2013 00:00 CT39.0016 62.89 5.74 57.15 A - 6969516 M 1994 CRUF
6 009 - 2RAD 91C023D1D3F7199EC27F7E604DB24997 01.01.2013 00:00 CT39.0190 32.34 14.41 17.93 H - 6969618 F 1917 CRUF
7 009 - 2RAD 91C023D1D3F7199EC27F7E604DB24997 01.01.2013 00:00 CT39.0220 36.25 12.35 23.9 H - 6969618 F 1917 CRUF
    
```


Fichier de données normalisées

XA : Identifiant du patient
 XB : Sexe du patient
 XC : Age à la séance
 XD : Date de la séance
 XE : Code Tarmed

XF : Nombre de points MED
 XG : Nombre de points TEC
 XH : Nombre de points totaux
 XI : Identifiant de séance
 Info supplémentaire (source)

The screenshot shows a Notepad++ window with the file 'RAW_T_0657_2013_normalized.txt'. The text contains a list of data rows, each starting with a patient ID (e.g., 0657_8D0E82F5039E889D7461C73B4836143E) followed by various fields separated by arrows. Two dialog boxes are overlaid on the text:

- Dialog 1:** 'You can add a prefix to patient and seance lds'. It has a checked checkbox 'Add a prefix' and a text input field containing '0657'. A red arrow points from the '0657' in the text to this input field.
- Dialog 2:** 'Select the contents of the additional column'. It has a dropdown menu showing 'A fixed text' and a 'Select desired fixed value:' field containing 'HOP'. A blue arrow points from the 'HOP' in the text to this field.

The data rows in the background are as follows:

1	0657_8D0E82F5039E889D7461C73B4836143E	→H	→19	→01.01.2013	→TM390140	→12.35	→23.90	→36.25	→0657_A	-	6969516	→HOP	CRLE
2	0657_8D0E82F5039E889D7461C73B4836143E	→H	→19	→01.01.2013	→TM390145	→6.18	→11.95	→18.13	→0657_A	-	6969516	→HOP	CRLE
3	0657_8D0E82F5039E889D7461C73B4836143E	→H	→19	→01.01.2013	→TM392000	→0.00	→14.94	→14.94	→0657_A	-	6969516	→HOP	CRLE
4	0657_8D0E82F5039E889D7461C73B4836143E	→H	→19	→01.01.2013	→TM390016	→5.74	→57.15	→62.89	→0657_A	-	6969516	→HOP	CRLE
5	0657_91C023D1D3F7199EC27F7	Choose prefix			0190	→14.41	→17.88	→32.34	→0657_H	-	6969618	→HOP	CRLE
6	0657_91C023D1D3F7199EC27F7				0220	→12.35	→23.90	→36.25	→0657_H	-	6969618	→HOP	CRLE
7	0657_91C023D1D3F7199EC27F7				0225	→11.12	→11.95	→16.07	→0657_H	-	6969618	→HOP	CRLE
8	0657_91C023D1D3F7199EC27F7				0240	→12.35	→29.88	→42.23	→0657_H	-	6969618	→HOP	CRLE
9	0657_91C023D1D3F7199EC27F7				0245	→4.12	→11.95	→16.07	→0657_H	-	6969618	→HOP	CRLE
10	0657_91C023D1D3F7199EC27F7				0210	→0			→0657_H	-	6969618	→HOP	CRLE
11	0657_91C023D1D3F7199EC27F7				0015	→5			→0657_H	-	6969618	→HOP	CRLE
12	0657_A8D49464E089CBFB23EFF3				0190	→1			→0657_H	-	6970094	→HOP	CRLE
13	0657_A8D49464E089CBFB23EFF3FC70518A29	→F	→80	→01.01.2013	→TM392010	→0			→0657_H	-	6970094	→HOP	CRLE
14	0657_A8D49464E089CBFB23EFF3FC70518A29	→F	→80	→01.01.2013	→TM394080	→9			→0657_H	-	6970094	→HOP	CRLE
15	0657_A8D49464E089CBFB23EFF3FC70518A29	→F	→80	→01.01.2013	→TM394170	→4			→0657_H	-	6970094	→HOP	CRLE
16	0657_A8D49464E089CBFB23EFF3FC70518A29	→F	→80	→01.01.2013	→TM394310	→0			→0657_H	-	6970094	→HOP	CRLE
17	0657_A8D49464E089CBFB23EFF3FC70518A29	→F	→80	→01.01.2013	→TM390015	→5			→0657_H	-	6970094	→HOP	CRLE
18	0657_A8D49464E089CBFB23EFF3FC70518A29	→F	→80	→01.01.2013	→TM390015	→5			→0657_H	-	6970094	→HOP	CRLE
19	0657_A9A8C613B3105E82FD0D359A91CF0E76	→F	→83	→01.01.2013	→TM390190	→14.41	→17.93	→32.34	→0657_H	-	6970094	→HOP	CRLE
20	0657_A9A8C613B3105E82FD0D359A91CF0E76	→F	→83	→01.01.2013	→TM392010	→0.00	→29.88	→29.88	→0657_H	-	6970094	→HOP	CRLE
21	0657_A9A8C613B3105E82FD0D359A91CF0E76	→F	→83	→01.01.2013	→TM390015	→5.74	→57.15	→62.89	→0657_H	-	6970094	→HOP	CRLE
22	0657_B6B5C1B97081174D21AB62BBDEBE642E	→F	→76	→01.01.2013	→TM390310	→12.35	→20.91	→33.26	→0657_A	-	6969738	→HOP	CRLE
23	0657_B6B5C1B97081174D21AB62BBDEBE642E	→F	→76	→01.01.2013	→TM390315	→12.36	→23.90	→36.26	→0657_A	-	6969738	→HOP	CRLE



logout

METAXA METADATA EXTRACTION AND ANALYSIS

- Import
- Export
- Rules
- XTARMED
- TARMED
- Users



Import

Raw data file: Aucun fichier choisi

Final DB

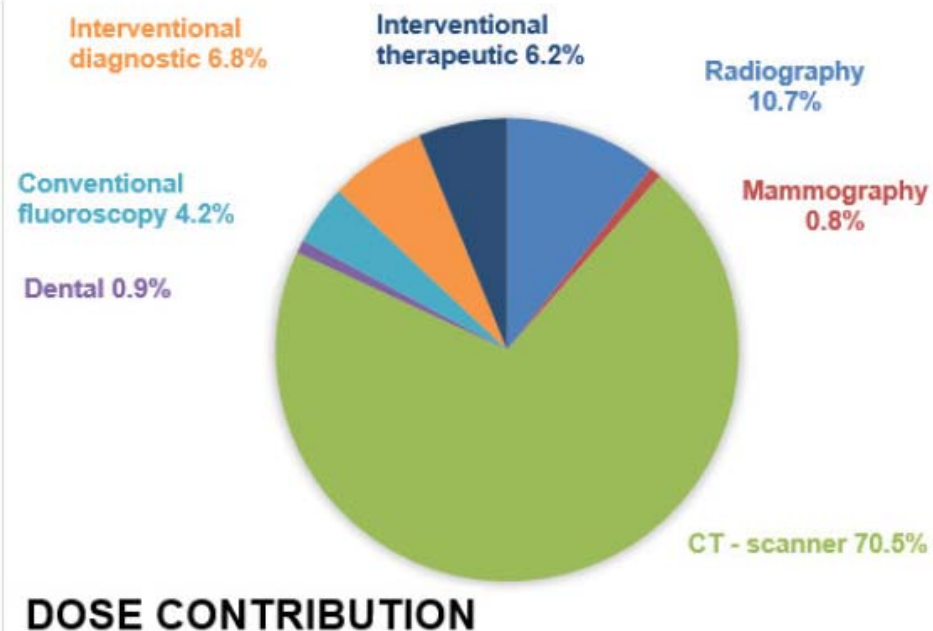
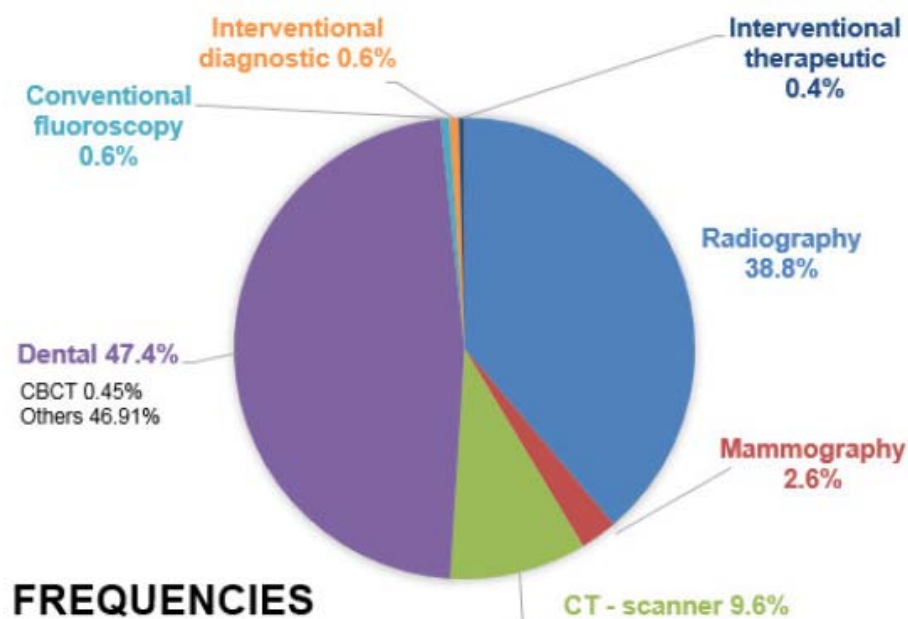
Final data: 0

Temporary DB

Tmp data: 0

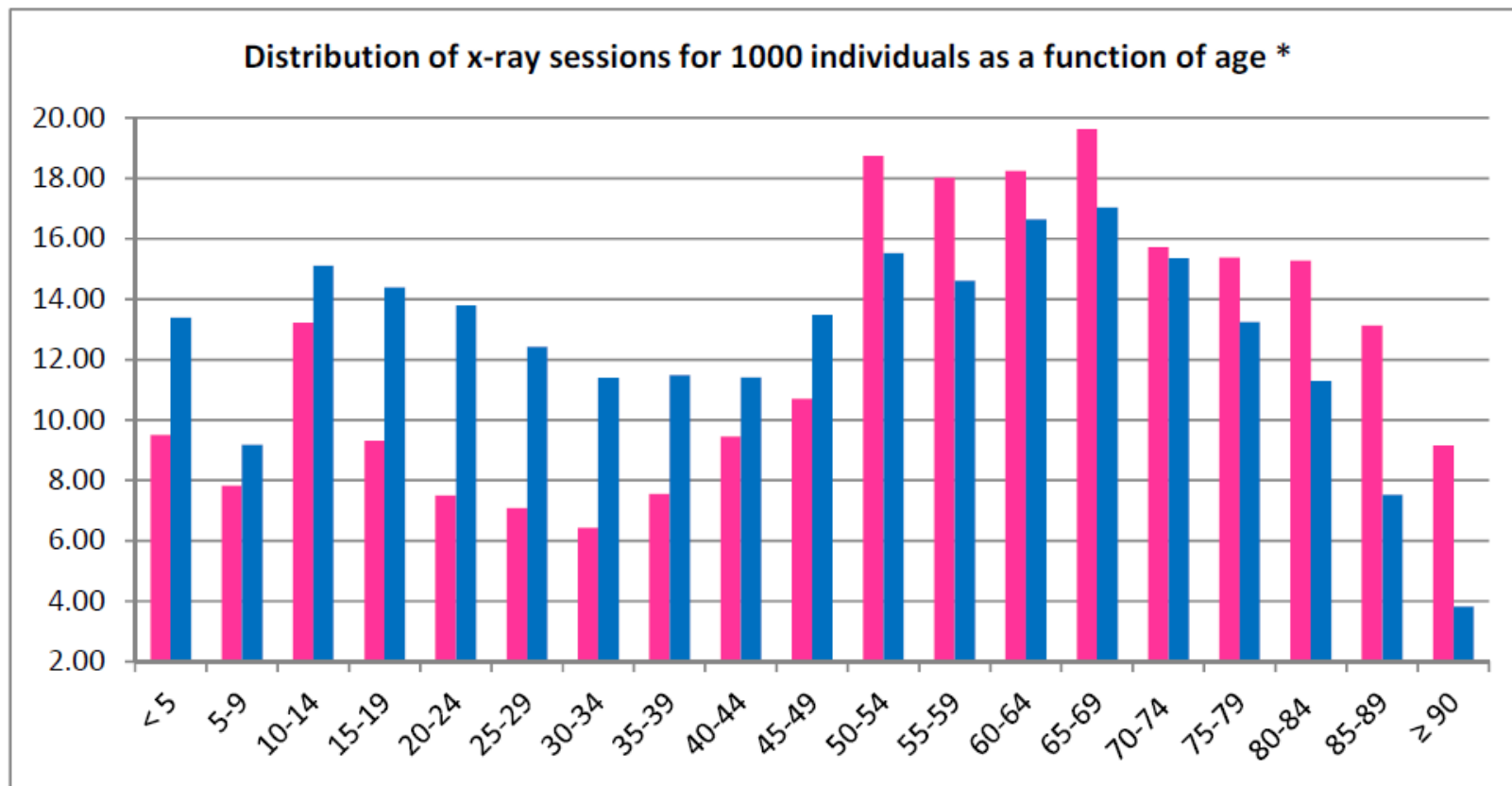
Résultats :

Summary of the distribution of frequencies and doses:



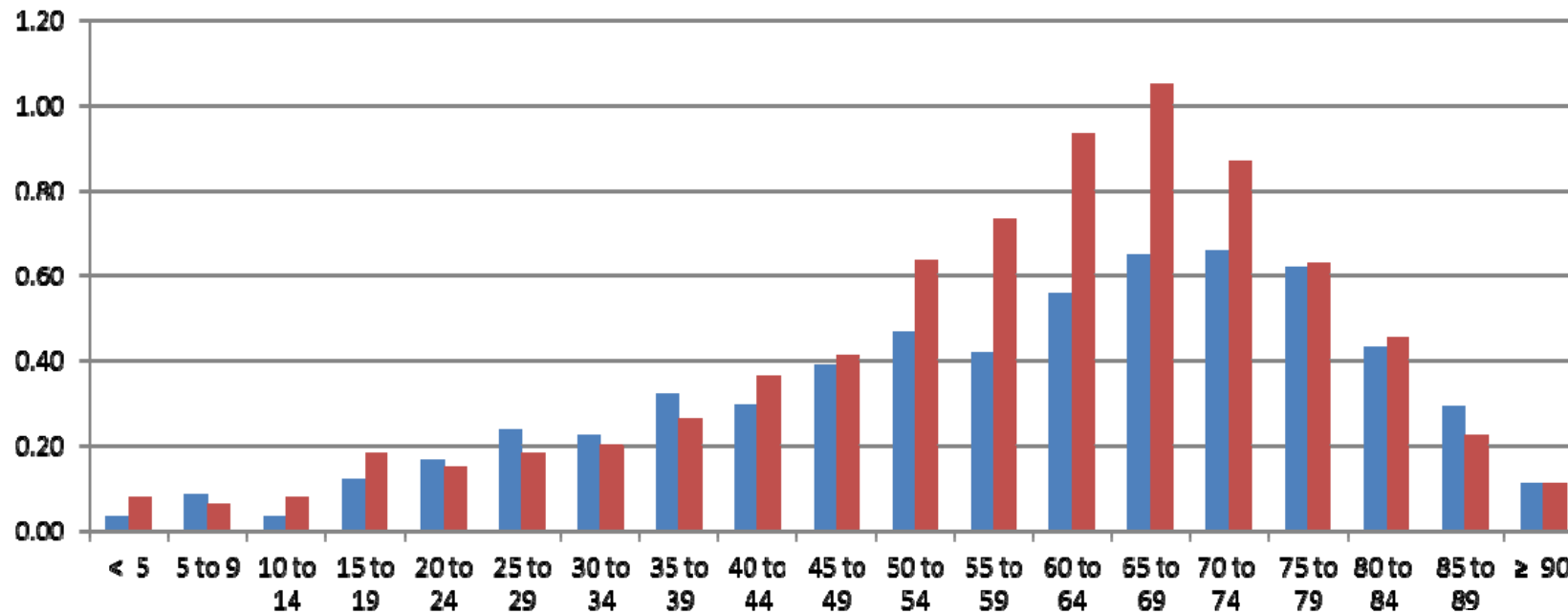
Exposure of the Swiss population by medical X-rays: 2013

Use of TARMED data - radiography



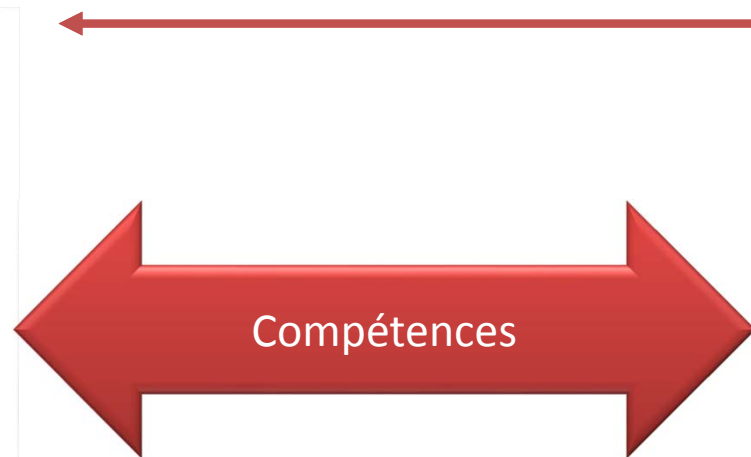
Age distribution (men in blue)

Use of TARMED data – CT scan



Age distribution of chest CT examinations (men in red)

Problématiques multiples et fort diverses
Aspects «Life-critical»
Procédures (time-frame) liées à la santé
Normes à respecter, composer avec l'existant



Considérations de sécurité
Veille technologique
Opportunités d'optimisation du cadre de travail
Une solution logicielle vue comme un service global



...de votre attention !

Questions ?