# Online Supplement File 2:

# Look- up tables

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### Look up table: Head conventional x-ray

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Exam type** | **Body part** | **Decade** | **Age** | **Representative Score** | **Mean dose per exam #** | **Minimum dose per exam #** | **Maximum dose per exam #** | **Number of projection\*** | **Number of observation$** | **References** |
| Conventional | Skull | 1980-1989 | 0 | 3 | 2.43 | 1.50 | 3.36 | 4 | 6 | Ruiz 1991 |
| Conventional | Skull | 1980-1989 | 1 | 4 | 1.53 | 1.23 | 1.94 | 4 | 12 | Gallini 1992 |
| Conventional | Skull | 1980-1989 | 5 | 4 | 1.15 | 0.89 | 1.51 | 4 | 12 | Gallini 1992 |
| Conventional | Skull | 1980-1989 | 10 | 4 | 1.06 | 0.81 | 1.41 | 4 | 12 | Gallini 1992 |
| Conventional | Skull | 1980-1989 | 15 | 4 | 0.97 | 0.73 | 1.33 | 4 | 12 | Gallini 1992 |
| Conventional | Skull | 1980-1989 | Adult | 4 | 3.40 | 3.40 | 3.40 | 5 | 1 | Melo 2016 |
| Conventional | Skull | 1990-1999 | 0 | 3 | 0.43 | 0.41 | 0.46 | 4 | 6 | McDonald 1996 |
| Conventional | Skull | 1990-1999 | 1 | 3 | 0.93 | 0.52 | 1.37 | 4 | 12 | McDonald 1996, Martin 1994 |
| Conventional | Skull | 1990-1999 | 10 | 3 | 0.68 | 0.33 | 1.21 | 4 | 18 | McDonald 1996, Martin 1994 |
| Conventional | Skull | 1990-1999 | 15 | 3 | 0.74 | 0.25 | 1.27 | 4 | 12 | McDonald 1996, Martin 1994 |
| Conventional | Skull | 1990-1999 | 5 | 3 | 0.70 | 0.38 | 1.04 | 4 | 18 | McDonald 1996, Martin 1994 |
| Conventional | Skull | 1990-1999 | Adult | 4 | 1.50 | 1.50 | 1.50 | 3 | 1 | Melo 2016 |
| Conventional | Skull | 2000-2010 | 0 | 5 | 0.57 | 0.55 | 0.58 | 4 | 2 | Kiljunen 2009 |
| Conventional | Skull | 2000-2010 | 1 | 5 | 0.42 | 0.34 | 0.50 | 4 | 2 | Kiljunen 2009 |
| Conventional | Skull | 2000-2010 | 10 | 5 | 0.79 | 0.76 | 0.82 | 4 | 2 | Kiljunen 2009 |
| Conventional | Skull | 2000-2010 | 15 | 5 | 0.67 | 0.34 | 1.18 | 4 | 3 | Kiljunen 2009 |
| Conventional | Skull | 2000-2010 | 5 | 5 | 0.65 | 0.60 | 0.69 | 4 | 3 | Kiljunen 2009 |
| Conventional | Skull | 2000-2010 | Adult | 2 | 0.60 | 0.55 | 0.65 | 4 | 2 | Knight 2014 |
| Conventional | Skull | 2000-2010 | Adult | 4 | 1.50 | 1.50 | 1.50 | 4 | 1 | Melo 2016 |
| Conventional | Sinus | 1980-1989 | Adult | 4 | 0.63 | 0.63 | 0.63 | 5 | 1 | Melo 2016 |
| Conventional | Sinus | 1990-1999 | Adult | 4 | 0.48 | 0.48 | 0.48 | 3 | 1 | Melo 2016 |
| Conventional | Sinus | 2000-2010 | 10 | 5 | 0.21 | 0.21 | 0.21 | 2 | 1 | Kiljunen 2009 |
| Conventional | Sinus | 2000-2010 | 15 | 5 | 0.35 | 0.35 | 0.35 | 2 | 1 | Kiljunen 2009 |
| Conventional | Sinus | 2000-2010 | 5 | 5 | 0.15 | 0.15 | 0.15 | 2 | 1 | Kiljunen 2009 |
| Conventional | Sinus | 2000-2010 | Adult | 4 | 0.48 | 0.48 | 0.48 | 3 | 1 | Melo 2016 |
|  |  |  |  |  |  |  |  |  |  |  |
| (#) mean, minimum and maximum reflect the distribution across the different simulations that were performed for each procedure x age x time period frame. For the analysis we used the mean dose.(\*) To obtain the dose for a single projection, divide the mean dose per exam by the number of projection |
| ($) The mean, minimum and maximum reported is calculate across the number of values reported in this column |  |  |

### Look up table: Neck conventional x-ray

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Exam type** | **Body part** | **Decade** | **Age** | **Representative Score** | **Mean dose per exam #** | **Minimum dose per exam #** | **Maximum dose per exam #** | **Number of projection\*** | **Number of observation$** | **References** |
| Conventional | Neck soft | 1980-1989 | Adult | 4 | 0.02 | 0.02 | 0.02 | 2 | 1 | Melo 2017 |
| Conventional | Neck soft | 1990-1999 | Adult | 4 | 0.01 | 0.01 | 0.01 | 2 | 1 | Melo 2017 |
| Conventional | Neck soft | 2000-2010 | 0 | 2 | 0.01 | 0.00 | 0.02 | 2 | 2 | Knight 2013 |
| Conventional | Neck soft | 2000-2010 | 1 | 2 | 0.01 | 0.00 | 0.02 | 2 | 2 | Knight 2013 |
| Conventional | Neck soft | 2000-2010 | 10 | 2 | 0.01 | 0.00 | 0.02 | 2 | 2 | Knight 2013 |
| Conventional | Neck soft | 2000-2010 | 15 | 2 | 0.01 | 0.00 | 0.01 | 2 | 2 | Knight 2013 |
| Conventional | Neck soft | 2000-2010 | 5 | 2 | 0.00 | 0.00 | 0.01 | 2 | 2 | Knight 2013 |
| Conventional | Neck soft | 2000-2010 | Adult | 2 | 0.00 | 0.00 | 0.01 | 2 | 2 | Knight 2013 |
| Conventional | Neck soft | 2000-2010 | Adult | 4 | 0.01 | 0.01 | 0.01 | 2 | 1 | Melo 2017 |
| Conventional | Full spine | 1980-1989 | 10 | 3 | 0.27 | 0.05 | 0.53 | 3 | 6 | Ruiz 1990 |
| Conventional | Full spine | 1980-1989 | 15 | 3 | 0.22 | 0.08 | 0.33 | 3 | 4 | Ruiz 1990 |
| Conventional | Full spine | 1980-1989 | 5 | 3 | 0.10 | 0.04 | 0.16 | 3 | 2 | Ruiz 1990 |
| Conventional | Cervical spine | 1980-1989 | Adult | 4 | 0.04 | 0.04 | 0.04 | 4 | 1 | Melo 2017 |
| Conventional | Cervical spine | 1990-1999 | Adult | 4 | 0.03 | 0.03 | 0.03 | 5 | 1 | Melo 2017 |
| Conventional | Cervical spine | 2000-2010 | 0 | 2 | 0.02 | 0.00 | 0.03 | 2 | 4 | Knight 2013 |
| Conventional | Cervical spine | 2000-2010 | 1 | 2 | 0.01 | 0.00 | 0.03 | 2 | 4 | Knight 2013 |
| Conventional | Cervical spine | 2000-2010 | 10 | 2 | 0.02 | 0.00 | 0.04 | 3 | 4 | Knight 2013 |
| Conventional | Full spine | 2000-2010 | 10 | 3 | 0.00 | 0.00 | 0.00 | 3 | 10 | Gogos 2003 |
| Conventional | Cervical spine | 2000-2010 | 15 | 2 | 0.02 | 0.00 | 0.04 | 3 | 4 | Knight 2013 |
| Conventional | Full spine | 2000-2010 | 15 | 3 | 0.00 | 0.00 | 0.00 | 3 | 10 | Gogos 2003 |
| Conventional | Cervical spine | 2000-2010 | 5 | 2 | 0.01 | 0.00 | 0.01 | 2 | 4 | Knight 2013 |
| Conventional | Cervical spine | 2000-2010 | Adult | 2 | 0.03 | 0.00 | 0.06 | 5 | 4 | Knight 2013 |
| Conventional | Cervical spine | 2000-2010 | Adult | 4 | 0.03 | 0.03 | 0.03 | 5 | 1 | Melo 2017 |
| (#) mean, minimum and maximum reflect the distribution across the different simulations that were performed for each procedure x age x time period frame. For the analysis we used the mean dose.(\*) To obtain the dose for a single projection, divide the mean dose per exam by the number of projection |
| ($) The mean, minimum and maximum reported is calculate across the number of values reported in this column |  |  |  |

### Look up table: Head CT scan

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Exam type** | **Body part** | **Decade** | **Age exam** | **Representative score** | **Mean exam** | **references** |
| Scan | Head | 1980-1989 | 0 to 14 | 5 | Table 4, Brain dose from head CT (Mean value) before 1990; in Lee 2016 | Lee 2016 |
| Scan | Head | 1990-1999 | 0 to 19 | 5 | Table 4, Brain dose from head CT (Mean value) 1990-1999; in Lee 2016 | Lee 2016 |
| Scan | Head | 2000-2010 | 0 to 4 | 5 | Table 4, Brain dose from head CT (Mean value); in Lee 2016 | Lee 2016 |
| Scan | Head | 2000-2010 | 5 to 9 | 5 | Table 4, Brain dose from head CT (Mean value); in Lee 2016 | Lee 2016 |
| Scan | Head | 2000-2010 | 10 to 14 | 5 | Table 4, Brain dose from head CT (Mean value); in Lee 2016 | Lee 2016 |
| Scan | Head | 2000-2010 | 15 to 19 | 5 | Table 4, Brain dose from head CT (Mean value); in Lee 2016 | Lee 2016 |

### Look up table: dental x-ray

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Exam type** | **Decade** | **Age** | **Mean dose per exam** | **References** |
| Intraoral x-ray | 1980-1989 | Adult | Table 5, Mean value 1980-1989; in Fontana 2019 | Fontana 2019 |
| Intraoral x-ray | 1990-1999 | Adult | Table 5, Mean value 1990-1999; in Fontana 2019 | Fontana 2019 |
| Intraoral x-ray | 2000-2009 | Adult | Table 5, Mean value 2000-2009; in Fontana 2019 | Fontana 2019 |
| Full Mouth x-ray | 1980-1989 | Adult | We took the correspondent value for the Intraoral x-ray and multiplied it for 20, as the number of intraoral x-ray required to cover the full mouth | Fontana 2019 |
| Full Mouth x-ray | 1990-1999 | Adult | We took the correspondent value for the Intraoral x-ray and multiplied it for 20, as the number of intraoral x-ray required to cover the full mouth | Fontana 2019 |
| Full Mouth x-ray | 2000-2009 | Adult | We took the correspondent value for the Intraoral x-ray and multiplied it for 20, as the number of intraoral x-ray required to cover the full mouth | Fontana 2019 |
| Panoramic x-ray | 1980-1989 | Adult | 0.049 | Gibbs 1988 (Mean across 3 measurement) |
| Panoramic x-ray | 2000-2010 | Adult | 0.008 | Lecomber 2000, Hayakawa 2001 (mean a cross 9 measurement) |

### Look up table: fetal dose from common x-ray examinations

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Exam type** | **Body part** | **Representative score** | **Mean dose per exam\*** | **Minimum dose per exam\*** | **Maximum dose per exam\*** | **Number of observation$** | **references** |
| Conventional | Dental | 2 | 0.00 | 0.00 | 0.00 | 3 | Fenig 2001, Toppenberg 1999, Wagner 1997 |
| Conventional | Extremities | 2 | 0.01 | 0.01 | 0.18 | 3 | Fenig 2001, Toppenberg 1999, Wagner 1997 |
| Conventional | Thorax | 5 | 0.05 | Not found | 0.01 | 3 | Chahed 2000, Sharp 1998, Tung and Tsai 1999 |
| Scan | Thorax | 5 | 0.06 | Not found | 0.96 | 1 | Sharp 1998 |
| Conventional | Mammography | 5 | 0.16 | Not found | Not found | 1 | Chahed 2000 |
| Conventional | Abdomen | 5 | 1.40 | Not found | 4.20 | 2 | Sharp 1998, Tung and Tsai 1999 |
| Conventional | Barium enema | 5 | 6.80 | Not found | 24.00 | 1 | Sharp 1998 |
| Scan | Abdomen | 5 | 8.00 | Not found | 49.00 | 1 | Sharp 1998 |
| Conventional | Pelvimetry | 2 | 12.70 | Not found | Not found | 2 | Fenig 2001, Fergurson 1996 |
| Conventional | Skull | 5 | Not found | Not found | 0.01 | 1 | Sharp 1998 |
| Scan | Head | 5 | Not found | Not found | 0.01 | 1 | Sharp 1998 |
| (\*) Mean, minimum and maximum reflect the distribution across the different simulations that were performed for each procedure x age x time period frame. For the analysis we used the mean dose. The values reported here are values of mean (minimum or maximum) of fetal dose. Time period was not taken into account for this table because of the paucity of data |
| ($) The mean, minimum and maximum reported is calculate across the number of values reported in this column |

### Look up table: newborn dose from common x-ray examination

| **Exam type** | **Body part** | **Decade\*** | **Mean dose #** | **Minimum dose #** | **Maximum dose #** | **References** |
| --- | --- | --- | --- | --- | --- | --- |
| Conventional | abdomen | 1980-1989 | Mean between minimum and maximum  | 0.00 | 0.00 | Kettunen 2004 (babygram) |
| Conventional | abdomen | 1990-1999 | Mean between minimum and maximum  | 0.00 | 0.00 | Kettunen 2004 (babygram) |
| Conventional | abdomen | 2000-2010 | Mean between minimum and maximum  | 0.00 | 0.00 | Kettunen 2004 (babygram) |
| Conventional | extremities | 1980-1989 | 0.00 | 0.00 | 0.00 | Kettunen 2004 (babygram). For the mean dose (the one that we will use in the main analysis), we will use the minimum of the babygram) as the dose will be actually virtually 0.  |
| Conventional | extremities | 1990-1999 | 0.00 | 0.00 | 0.00 | Kettunen 2004 (babygram) |
| Conventional | extremities | 2000-2010 | 0.00 | 0.00 | 0.00 | Kettunen 2004 (babygram) |
| Conventional | head | 1980-1989 | 2.43 | 1.50 | 3.36 | Ruiz 1991 |
| Conventional | head | 1990-1999 | 0.43 | 0.41 | 0.46 | Mcdonald 1996, Martin 1994 |
| Conventional | head | 2000-2010 | 0.57 | 0.55 | 0.58 | Kilujenen 2009 |
| Conventional | sinus | 1980-1989 | 2.43 | 1.50 | 3.36 | We do not have sinus in in 1980-89. We used the dose for skull in the same time period |
| Conventional | skull | 1990-1999 | 0.43 | 0.41 | 0.46 | Mcdonald 1996, Martin 1994 |
| Conventional | skull | 2000-2010 | 0.57 | 0.55 | 0.58 | Kiljunen 2009 |
| Conventional | thorax | 1980-1989 | Mean between minimum and maximum  | 0.00 | 0.00 | Kettunen 2004 (chest proyection) |
| Conventional | thorax | 1990-1999 | Mean between minimum and maximum  | 0.00 | 0.00 | Kettunen 2004 (chest proyection) |
| Conventional | thorax | 1990-1999 | Mean between minimum and maximum  | 0.00 | 0.00 | Kettunen 2004 (babygram) |
| Conventional | thorax | 2000-2010 | Mean between minimum and maximum  | 0.00 | 0.00 | Kettunen 2004 (chest proyection) |
| Conventional | whole body | 1990-1999 | Mean between minimum and maximum  | 0.00 | 0.00 | Kettunen 2004 (babygram) |
| Conventional | whole body | 2000-2010 | Mean between minimum and maximum  | 0.00 | 0.00 | Kettunen 2004 (babygram) |
| Nuclear | abdomen | 1990-1999 | 0.00 | 0.00 | 0.00 | Treves 2010 said that the dose from nuclear medicine procedure is comparable with common imaging procedure. Thus we will just imputing the dose from common x-ray procedures of the same body part |
| Nuclear | abdomen | 2000-2010 | 0.00 | 0.00 | 0.00 | Treves 2010 said that the dose from nuclear medicine procedure is comparable with common imaging procedure. Thus we will just imputing the dose from common x-ray procedures of the same body part |
| Nuclear | head | 1990-1999 | 0.43 | 0.41 | 0.46 | Treves 2010 said that the dose from nuclear medicine procedure is comparable with common imaging procedure. Thus we will just imputing the dose from common x-ray procedures of the same body part |
| Nuclear | head | 2000-2010 | 0.57 | 0.55 | 0.58 | Treves 2010 said that the dose from nuclear medicine procedure is comparable with common imaging procedure. Thus we will just imputing the dose from common x-ray procedures of the same body part |
| Nuclear | thorax | 1980-1989 | 0.00 | 0.00 | 0.00 | Treves 2010 said that the dose from nuclear medicine procedure is comparable with common imaging procedure. Thus we will just imputing the dose from common x-ray procedures of the same body part |
| Nuclear | thorax | 1990-1999 | 0.00 | 0.00 | 0.00 | Treves 2010 said that the dose from nuclear medicine procedure is comparable with common imaging procedure. Thus we will just imputing the dose from common x-ray procedures of the same body part |
| Nuclear | thorax | 2000-2010 | 0.00 | 0.00 | 0.00 | Treves 2010 said that the dose from nuclear medicine procedure is comparable with common imaging procedure. Thus we will just imputing the dose from common x-ray procedures of the same body part |
| Nuclear | whole body | 1990-1999 | 0.00 | 0.00 | 0.00 | Treves 2010 said that the dose from nuclear medicine procedure is comparable with common imaging procedure. Thus we will just imputing the dose from common x-ray procedures of the same body part |
| Scan | abdomen | 1990-1999 | 0.54 | 0.08 | 1.05 | Thierry-Chef 2019 (1990-95) |
| Scan | abdomen | 2000-2010 | 0.36 | 0.02 | 2.33 | Thierry-Chef 2019 (2000-05) |
| Scan | extremities | 2000-2010 | 0.06 | 0.00 | 0.26 | Thierry-Chef 2019 (limb, 2000-05) |
| Scan | head | 1990-1999 | Table 4, Brain dose from head CT (Mean value) 1990-1999 for age range 0 to 14; in Lee 2016 | see same table | see same table | Lee 2016 |
| Scan | head | 2000-2010 | Table 4, Brain dose from head CT (Mean value) 2000-2010 for age range 0 to 14; in Lee 2016 | see same table | see same table | Lee 2016 |
| Scan | thorax | 1990-1999 | 3.03 | 1.61 | 4.73 | Thierry-Chef 2019 (chest, 1990-95) |
| Scan | thorax | 2000-2010 | 1.51 | 0.31 | 12.58 | Thierry-Chef 2019 (chest, 1990-95) |
| Scan | whole body | 1990-1999 | 23.87 | 5.58 | 40.46 | Thierry-Chef 2019  |
| Scan | whole body | 2000-2010 | 27.42 | 4.49 | 38.64 | Thierry-Chef 2019 |
| (#) Mean, minimum and maximum reflect the distribution across the different simulations that were performed for each procedure x age x time period frame. For the analysis we used the mean dose.(\*) Age is not reported here as in this table we reported values for newborns (that is children age 0 to 1 year) |

### Look up table: How we treated missing values in the previous look-up tables

|  |
| --- |
| After having matched the previous look up tables with the data from MOBI-kids we had some of the reported examination remaining without an assigned dose, because the dose was not reported in the look up table. Here we summarized what we assumed for each specific case in assigning the dose |
| **Exam type** | **Body part** | **Decade** | **Age** | **n observations in the dataset** | **Assumed dose (mean)** | **Reference** | **Rational for assumption** |
| Conventional | sinus | 1980-1989 | 0 | 1 | 0.15 | Sinus, 5 years of age, 2000-2010 (Kiljunen 2009) | Closest age and closest period |
| Conventional | sinus | 1990-1999 | 1 | 3 | 0.15 | Sinus, 5 years of age, 2000-2010 (Kiljunen 2009) | Closest age and closest period |
| Conventional | sinus | 1990-1999 | 5 | 7 | 0.15 | Sinus, 5 years of age, 2000-2010 (Kiljunen 2009) | Closest age and closest period |
| Conventional | sinus | 1990-1999 | 10 | 1 | 0.21 | Sinus, 10 years of age, 2000-2010 (Kiljunen 2009) | Closest age and closest period |
| Conventional | sinus | 2000-2010 | 1 | 1 | 0.15 | Sinus, 5 years of age, 2000-2010 (Kiljunen 2009) | Closest age and closest period |
| Conventional | neck | 1990-1999 | 0 | 1 | 0.1 | Full spine, 5 years of age, 1980-89 (Ruiz 1991) | Full spine does include the neck and likely the dose to the brain in mainly deriving from the scatter radiation when examining the cervical spine |
| Conventional | neck | 1990-1999 | 1 | 2 | 0.1 | Full spine, 5 years of age, 1980-89 (Ruiz 1991) | Full spine does include the neck and likely the dose to the brain in mainly deriving from the scatter radiation when examining the cervical spine |
| Conventional | neck | 1990-1999 | 5 | 3 | 0.1 | Full spine, 5 years of age, 1980-89 (Ruiz 1991) | Full spine does include the neck and likely the dose to the brain in mainly deriving from the scatter radiation when examining the cervical spine |
| Conventional | neck | 1990-1999 | 10 | 2 | 0.27 | Full spine, 10 years of age, 1980-89 (Ruiz 1991) | Full spine does include the neck and likely the dose to the brain in mainly deriving from the scatter radiation when examining the cervical spine |
| Conventional | neck | 1990-1999 | 15 | 1 | 0.22 | Full spine, 15 years of age, 1980-89 (Ruiz 1991) | Full spine does include the neck and likely the dose to the brain in mainly deriving from the scatter radiation when examining the cervical spine |
| Conventional | breast |  | fetal | 1 | 0.16 | Mammography (Chaled 2000) | Similar type of examination |
| Conventional | lumbar spine |  | fetal | 2 | 12.7 | Pelvimetry (Sharp 1998) | Very similar examinations in term of fetal exposure |
| Conventional | whole body |  | fetal | 1 | 12.7 | Pelvimetry (Sharp 1998) | Image of the whole body, does include the pelvis |
| Conventional | lumbar spine |  | fetal |  | 8.41 | Linet 2009 (sum of AP and lat projection) |  |
| Scan | head |  | fetal |  | 0.5 | Toppenberg 1999 |  |
| conventional | head |  | fetal |  | 0.01 | Kettunen 2004 |  |
| Scan | dental |  | fetal | 2 | 0.001 | Fenig 2001, Toppenberg 1999, Wagner 1997 | Max of dental conventional as in Fenig 2001, Toppenberg 1999 and Wagner 1995 (head scan max is 0.005) |
| Scan | abdomen | 2000-2010 | 5 to 9 | 1 | 0.14 | Thierry-Chef 2019 |  |
| Scan | abdomen | 2000-2010 | 10 to 14 | 8 | 0.09 | Thierry-Chef 2019 |  |
| Scan | abdomen | 2000-2010 | 15 to 19 | 11 | 0.05 | Thierry-Chef 2019 |  |
| Scan | abdomen | 2000-2010 | >19 | 10 | 0.03 | Thierry-Chef 2019 |  |
| Scan | head | 2000-2010 | >19 | 146 | 33 | Lee 2016 | Closest age (15 to 19 age) for the same decade |
| Scan | neck | 1990-1999 | 0 to 4 | 1 | 18.95 | Thierry-Chef 2019 |  |
| Scan | neck | 2000-2010 | 5 to 9 | 1 | 16.74 | Thierry-Chef 2019 |  |
| Scan | neck | 2000-2010 | 10 to 14 | 11 | 16.41 | Thierry-Chef 2019 |  |
| Scan | neck | 2000-2010 | 15 to 19 | 9 | 10.20 | Thierry-Chef 2019 |  |
| Scan | neck | 2000-2010 | >19 | 1 | 13.72 | Thierry-Chef 2019 |  |
| Scan | spine | 2000-2010 | 10 to 14 | 1 | 16.41 | Thierry-Chef 2019 |  |
| Scan | whole body | 1990-1999 | 0 to 4 | 4 | 27.56 | Thierry-Chef 2019 |  |
| Scan | whole body | 1990-1999 | 5 to 9 | 2 | 22.07 | Thierry-Chef 2019 |  |
| Scan | whole body | 2000-2010 | 0 to 4 | 2 | 24.29 | Thierry-Chef 2019 |  |
| Scan | whole body | 2000-2010 | 5 to 9 | 11 | 26.61 | Thierry-Chef 2019 |  |
| Scan | whole body | 2000-2010 | 10 to 14 | 41 | 24.49 | Thierry-Chef 2019 |  |
| Scan | whole body | 2000-2010 | 15 to 19 | 35 | 19.93 | Thierry-Chef 2019 |  |
| Scan | whole body | 2000-2010 | >19 | 24 | 19.93 | Thierry-Chef 2019 |  |
| Scan | Dental | 2000-2010 | 10 to 14 | 27 | 7.48 | Thierry-Chef 2019 |  |
| Scan | Dental | 2000-2010 | 15 to 19 | 11 | 5.05 | Thierry-Chef 2019 |  |
| Scan | Dental | 2000-2010 | 20 to 24 | 13 | 8.69 | Thierry-Chef 2019 |  |
| Scan | Dental | 2000-2010 | Before 10 | 8 | 15.97 | Thierry-Chef 2019 |  |
| Nuclear | abdomen | 1990-1999 | fetal |  | 0.00 | Treves 2011 | In Treves 2011 it is reported that the dose from a nuclear x-ray examination, thus we imputed the dose from the equivalent conventional examination |
| Nuclear | abdomen | 2000-2010 | fetal |  | 0.00 | Treves 2011 |
| Nuclear | head | 1990-1999 | fetal |  | 0.43 | Treves 2011 |
| Nuclear | head | 2000-2010 | fetal |  | 0.57 | Treves 2011 |
| Nuclear | thorax | 1980-1989 | fetal |  | 0.00 | Treves 2011 |
| Nuclear | thorax | 1990-1999 | fetal |  | 0.00 | Treves 2011 |
| Nuclear | thorax | 2000-2010 | fetal |  | 0.00 | Treves 2011 |
| Nuclear | whole body | 1990-1999 | fetal |   | 0.00 | Treves 2011 |

### Look up table: decision that we took when we had a missing values in the MOBI-kids dataset

|  |
| --- |
| We also had missing in the information collected. Here we have a summary of the type of information that were missing and the decision we took in each specific case |
| **Exam type** | **Body part** | **Decade** | **Age** | **n observations in the dataset** | **Comments** |
| Conventional | skull | **NA** | **NA** | 24 | Not included in the main analysis. In a sensitivity analysis they were included as done before the two year window period |
| Conventional | **NA** |  | fetal | 1 | Not included |
| **NA** | **NA** |  | fetal | 1 | Not included |
| Scan | **NA** | 1990-1999 | 0 to 4 | 2 | We assumed it was a head procedure. Head procedure is the most common in the dataset and in general is the most common procedures in children |
| Scan | **NA** | 2000-2010 | 5 to 9 | 8 | We assumed it was a head procedure. Head procedure is the most common in the dataset and in general is the most common procedures in children |
| Scan | **NA** | 2000-2010 | 10 to 14 | 10 | We assumed it was a head procedure. Head procedure is the most common in the dataset and in general is the most common procedures in children |
| Scan | **NA** | 2000-2010 | 15 to 19 | 12 | We assumed it was a head procedure. Head procedure is the most common in the dataset and in general is the most common procedures in children |
| Scan | **NA** | 2000-2010 | >19 | 11 | We assumed it was a head procedure. Head procedure is the most common in the dataset and in general is the most common procedures in children |
| Scan | head | **NA** | **NA** | 9 | Not included in the main analysis. In a sensitivity analysis they were included as done before the two year window period |
| Nuclear | **NA** | 1980-1989 | Newborn | 1 | Mean across all the nuclear medicine procedures |
| Scan | **NA** | 1980-1989 | Newborn | 1 | We assumed it was a head procedure. Head procedure is the most common in the dataset and in general is the most common procedures in children |
| NA= Missing |  |  |  |  |  |
|  |  |  |  |  |  |

### Bibliography for Supplementary File 2

Reference lists for the look up tables

|  |  |
| --- | --- |
| **Table** | **Reference** |
| Head conventional table | (1–6) |
| Neck conventional table | (1,3,7,8) |
| Head CT | (9) |
| Dental | (10–13) |
| Fetal | (14–21) |
| Newborn | (1,4–6,9,14) |
| Missing values | (1,6,9,22–24) |

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