



EUROPEAN MEDICINES AGENCY  
SCIENCE MEDICINES HEALTH

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Data Analytics and Methods Taskforce

## Glucocorticoid induced osteoporosis (GIOP): prescription patterns of glucocorticoids in paediatric patients

Report

Procedure number: [REDACTED]



## 1. Roles and responsibilities

Role	Responsible
Lead analyst	Luis Pinheiro
Analyst	Valentijn de Jong, Karin Hedenmalm
Paediatric Co-ordinator	██████████

## 2. Milestones

Milestone	Date
Data analysis plan	11 November 2021
Draft results	11 November 2021
Internal report	03 December 2021
Peer-review	07 December 2021
Revision	07 December 2021
Submission	07 December 2021

## 3. Rationale and background

██████████ request a modification to the PIP for ██████████ with a view to remove the requirement for clinical studies in paediatric patients with Glucocorticoids Induced Osteoporosis (GIOP). ██████████ considers that conducting meaningful clinical studies with ██████████ in paediatric patients with GIOP is not achievable.

██████████ supports their proposal describing analyses presented by ██████████, related to a ██████████. This study aimed to evaluate the prevalence of GIOP in the paediatric population. Data from US MarketScan (claims database) and from UK CPRD and a German electronic health record database (primary care data) from 2013 to 2018 was used.

The results presented suggest that the prevalence of GIOP and the prevalence of osteoporotic fractures in paediatric patients taking glucocorticoids for > 90 days are low. In addition, the absolute number of children taking glucocorticoids chronically (> 90 days) seem small and with a trend towards reduction of chronic use in several EU MSs in the last decade, which ██████████ suggests make recruitment for the clinical trials difficult.

In the absence of linked data (primary, secondary and specialist), and accounting for the limitations of primary care data, an alternative approach of using proxies in primary care databases that may suggest long-term use of glucocorticoids, and whether prescription patterns changed over time, would provide an additional view on the results provided.

This data analysis protocol describes a proposed methodological approach to understand whether long-term exposure to glucocorticoids in paediatric patients is likely.

There are several benefits to conducting an analysis in-house, namely the increased transparency, the recency of the data in-house (up to 2020) as compared to the analyses presented (up to 2018), the possibility of using multiple proxies of long-term duration and conducting multiple sensitivity analyses, and, the experience gained from providing this analysis to the PDCO will help the Agency improve its analytical support to committees.

## 4. Research question

Can a sufficient number of paediatric patients exposed to long term prescription of glucocorticoid-containing products, and that develop fractures, be identified to suggest that recruitment for a clinical trial in GIOP is feasible?

## 5. Objectives

- Determine the yearly prevalence of use of glucocorticoid-containing products in paediatric patients, from 2015-2020.
- Describe paediatric patient characteristics, namely gender distribution and number and proportion of paediatric patients treated with glucocorticoid-containing products with a diagnostic code for likely indications for long-term use of glucocorticoid-containing products.
- Determine the number of prescriptions of glucocorticoid-containing products in paediatric patients by year.
- Determining the incidence of osteoporosis and fractures in patients likely to be on long-term use of glucocorticoid-containing products.

## 6. Methods

### 6.1. Data sources

IMS France (FR) and IMS Germany (DE) were used. IMS France only includes primary care data, whereas IMS Germany has primary care data and speciality data, including paediatrics.

### 6.2. Study design and statistical analysis

A retrospective descriptive cohort study was conducted. Patients with ages between 0 and 17 between 2015 and 2020 were included. All data from IMS FR and primary care data and paediatric speciality data from IMS DE were used.

Yearly prevalence was determined as the number of patients prescribed a glucocorticoid (see 6.3.1.) divided by the number of patients that were active during the period of interest (i.e. had at least one prescription or consultation during that year). Point estimates and 95% confidence intervals are reported. The list of disorders for the descriptive analysis was taken from the study conducted by the marketing authorisation holder and include rheumatoid arthritis, inflammatory bowel disease (Crohn's disease and ulcerative colitis), psoriasis, immune thrombocytopenic purpura, multiple sclerosis, nephrotic syndrome, systemic lupus erythematosus, muscular dystrophy, neuropathy and asthma. Proportion of paediatric patients with these disorders are presented.

Number of prescriptions of glucocorticoids was determined as the number of prescriptions of a glucocorticoid per patient per year (for the yearly trends). Mean, median, 75% percentile and maximums were reported per year.

As a proxy for long-term exposure, patients that had four or more prescriptions within 180 days were considered as having a long exposure.

For the calculation of the incidence of osteoporosis and/or fractures, eligible patients were defined as those that had four or more prescriptions of glucocorticoids within any 180-day period and no previous history of osteoporosis or fractures. At risk window started at the fourth prescription and ended 180 days later. For each time period of interest, from 2015 to 2020, a lookback period of 180 days was added to allow the fourth exposure to glucocorticoids to be counted from the start of the year.

Instant Health Data, R 4.0.4 and SAS Enterprise Guide 7.1 were used in the study.

### **6.3. Study variables**

#### **6.3.1. Drug Exposures**

Exposure to glucocorticoids is defined as a patient having any EphMRA ATC code for:

- A07E2 PROD INTEST CORTICOSTER
- H02A1 INJ CORTICOSTEROIDS PLAIN
- H02A2 ORAL CORTICOSTEROID PLAIN
- H02A3 OTH SYS CORTICOSTERO PLN
- H02B0 COMB CORTICOSTEROIDS
- R03D2 CORTICOID, SYSTEMIC
- R03F1 BETA-2-AGON.+CORT.INHAL.

#### **6.3.2. Disorders**

See Annex I for ICD 10 codes for disorders.

#### **6.3.3. Outcomes**

See Annex II for ICD 10 codes for fractures and osteoporosis.

### **6.4. Sensitivity analyses**

A different proxy for long-term exposure was used – six prescriptions within 180 days.

## **7. Results**

A total of 2,509,587 patients between the age of 0 and 17 were included in this study, 424,001 from the French database (IMS FR) and 2,085,586 from the German database (IMS DE).

Between six and nine percent of the paediatric population had at least one of the ten diseases likely to lead to long-term exposure to glucocorticoids. Asthma was the most frequently observed disorder, with between six to seven percent across the databases. All other disorders were observed at a frequency lower than one percent (Table 1).

Within the IMS DE data, more disorders seem to be treated within the Paediatric Speciality as compared to the GP practices, although the differences are generally under one percent, to the exception of Asthma (5.4% GP vs 7.0% Paediatric).

Table 1: Characteristics of paediatric patients in the IMS FR and IMS DE databases

Characteristics of paediatric patients in the IMS FR and IMS DE databases				
Characteristic <sup>1</sup>	IMS FR		IMS DE	
	GP N (%)	GP + Paediatric N (%)	GP N (%)	Paediatric N (%)
<b>Gender</b>				
Female	197779 (46.65)	1007058 (48.29)	299289 (48.93)	707769 (48.02)
Male	226217 (53.35)	1075960 (51.59)	310768 (50.8)	765192 (51.92)
<b>Underlying conditions</b>				
Any Disease	26757 (6.311)	169413 (8.123)	40278 (6.585)	129135 (8.761)
Asthma	25014 (5.9)	135768 (6.51)	32888 (5.377)	102880 (6.98)
Immune Thrombocytopenic Purpura	9 (0.002)	599 (0.029)	74 (0.012)	525 (0.036)
Inflammatory Bowel Disease	72 (0.017)	2973 (0.143)	973 (0.159)	2000 (0.136)
Multiple Sclerosis	7 (0.002)	305 (0.015)	135 (0.022)	170 (0.012)
Muscular Dystrophy	< 5 (not applicable)	841 (0.04)	144 (0.024)	697 (0.047)
Nephrotic Syndrome	29 (0.007)	530 (0.025)	92 (0.015)	438 (0.03)
Neuropathy	755 (0.178)	9278 (0.445)	3959 (0.647)	5319 (0.361)
Psoriasis	1117 (0.263)	7042 (0.338)	2257 (0.369)	4785 (0.325)
Rheumatoid Arthritis	24 (0.006)	4431 (0.212)	367 (0.06)	4064 (0.276)
Systemic Lupus	5 (0.001)	147 (0.007)	25 (0.004)	122 (0.008)

<sup>1</sup> For data protection reasons, exact numbers of incident cases are not show if below five and non-null.

The prevalence of prescription of glucocorticoids to paediatric patients for the period from 2015 to 2020 has been relatively stationary for the IMS DE, in particular the GP speciality (2.6% in 2015 to 2.4% in 2016). The IMS FR GP data suggests a decrease from 2015 (15.4%) to 2020 (10.3%) (Table 2).

Table 2: Prevalence of prescription of glucocorticoids to paediatric patients (per 100 patients) in the IMS FR and IMS DE databases, from 2015 to 2020

Prevalence of prescription of glucocorticoids to paediatric patients in the IMS FR and IMS DE databases				
Year	IMS FR		IMS DE	
	GP Est. [95%CI]	GP + Paediatric Est. [95%CI]	GP Est. [95%CI]	Paediatric Est. [95%CI]
2015	15.34 [15.17-15.51]	4.57 [4.527-4.614]	2.567 [2.503-2.633]	5.282 [5.228-5.337]
2016	15.1 [14.93-15.26]	4.788 [4.745-4.83]	2.772 [2.709-2.836]	5.507 [5.454-5.56]
2017	14.91 [14.74-15.07]	4.892 [4.85-4.934]	2.862 [2.799-2.927]	5.597 [5.545-5.649]
2018	14.64 [14.48-14.8]	4.787 [4.745-4.829]	2.729 [2.665-2.794]	5.465 [5.414-5.517]
2019	14.52 [14.35-14.68]	5.046 [5.002-5.09]	2.847 [2.779-2.916]	5.731 [5.677-5.784]
2020	10.26 [10.1-10.42]	4.071 [4.028-4.113]	2.435 [2.367-2.504]	4.574 [4.523-4.626]

A decreasing trend in the prevalence of prescription of glucocorticoids to paediatric patients in the IMS FR database can be seen more clearly in Figure 1.

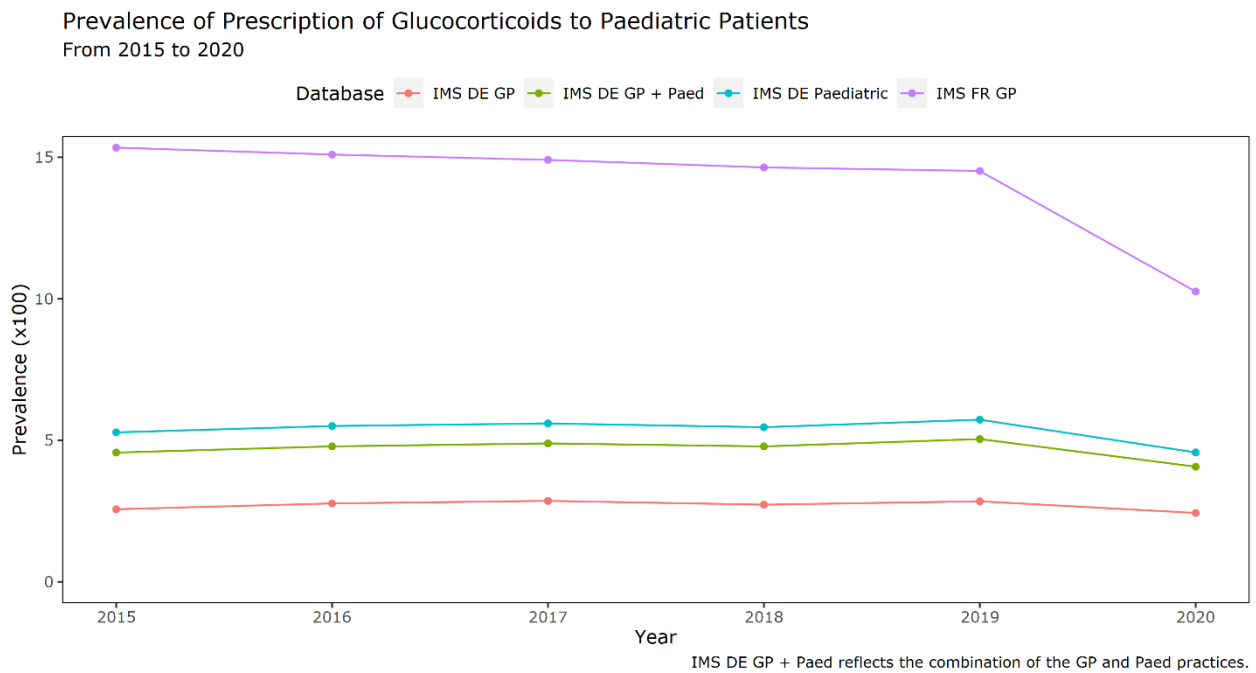


Figure 1: Prevalence of prescription of glucocorticoids to paediatric patients from 2015 to 2020

In terms of number of prescriptions of glucocorticoids per year, the mean number of prescriptions seems to be going down in the IMS FR database, from 1.4 in 2015 to 1.2 in 2020. The maximum number of prescriptions for IMS FR has dropped more sharply from 19 in 2015 to 10 in 2020 (Table 3). The trends of distribution of prescription of glucocorticoids for the IMS DE database are less clear, with a reasonably stationary mean, but with maximums that had a large drop only in 2020.

Table 3: Distribution of the number of prescriptions of glucocorticoids per year

Distribution of the number of prescriptions of glucocorticoids per year								
Year	IMS FR				IMS DE (GP+Paed)			
	Mean	Median	Q 75%	Maximum	Mean	Median	Q 75%	Maximum
2015	1.405374	1	1	19	1.677937	1	2	35
2016	1.385948	1	1	18	1.610890	1	2	34
2017	1.377745	1	1	11	1.634679	1	2	34
2018	1.384294	1	1	14	1.606601	1	2	27
2019	1.364624	1	1	13	1.579167	1	2	39
2020	1.248275	1	1	10	1.635746	1	2	19

The number of patients that were prescribed 4 to 6 glucocorticoids in a year has decreased across all databases and specialities. Furthermore, across the databases GP prescription of seven or more glucocorticoids per year is below 50 patients in 2020. The numbers are higher for the IMS DE Paediatric speciality, in the low hundreds (~300 patients) (Table 4).

Table 4: Prescription of glucocorticoids per year, in categories

Prescriptions of glucocorticoids per year, in categories						
Database and prescription intervals	2015	2016	2017	2018	2019	2020
<b>IMS FR</b>						
1 to 3	26014	27224	27052	26152	25048	14398
4 to 6	854	854	824	812	759	223
7 to 9	97	76	71	72	47	14
10 +	15	13	11	11	11	2
<b>IMS DE GP + Paed</b>						
1 to 3	36673	43264	45425	44230	45204	31258
4 to 6	2643	2729	3109	2859	2764	2213
7 to 9	503	485	529	511	418	311
10 +	167	154	154	120	113	90
<b>IMS DE GP</b>						
1 to 3	5521	6698	7000	6402	6175	4509
4 to 6	276	309	343	261	261	212
7 to 9	65	63	51	60	44	33
10 +	29	29	32	20	16	14
<b>IMS DE Paediatric</b>						
1 to 3	31152	36566	38425	37828	39029	26749
4 to 6	2367	2420	2766	2598	2503	2001
7 to 9	438	422	478	451	374	278
10 +	138	125	122	100	97	76

Patients with four and six prescriptions of glucocorticoids within 180 days were identified and used as proxy for long term exposure. IMS DE GP data and IMS FR GP data show a similar proportion of paediatric patients being prescribed four prescriptions over 180 days; furthermore, both data suggest a decreasing tendency. IMS DE Paediatric data suggests a higher proportion of this pattern of prescription between high 50s and 60 per 10000 patients, and consequently pulling up the combined GP and Paediatric trend line to mid-50; here also there seems to be a decreasing trend (Figure 1).



For six prescriptions in 180 days the numbers are even lower, around 10 per 10000 for IMS DE GP and IMS FR GP, but follow the same decreasing tendency over time.

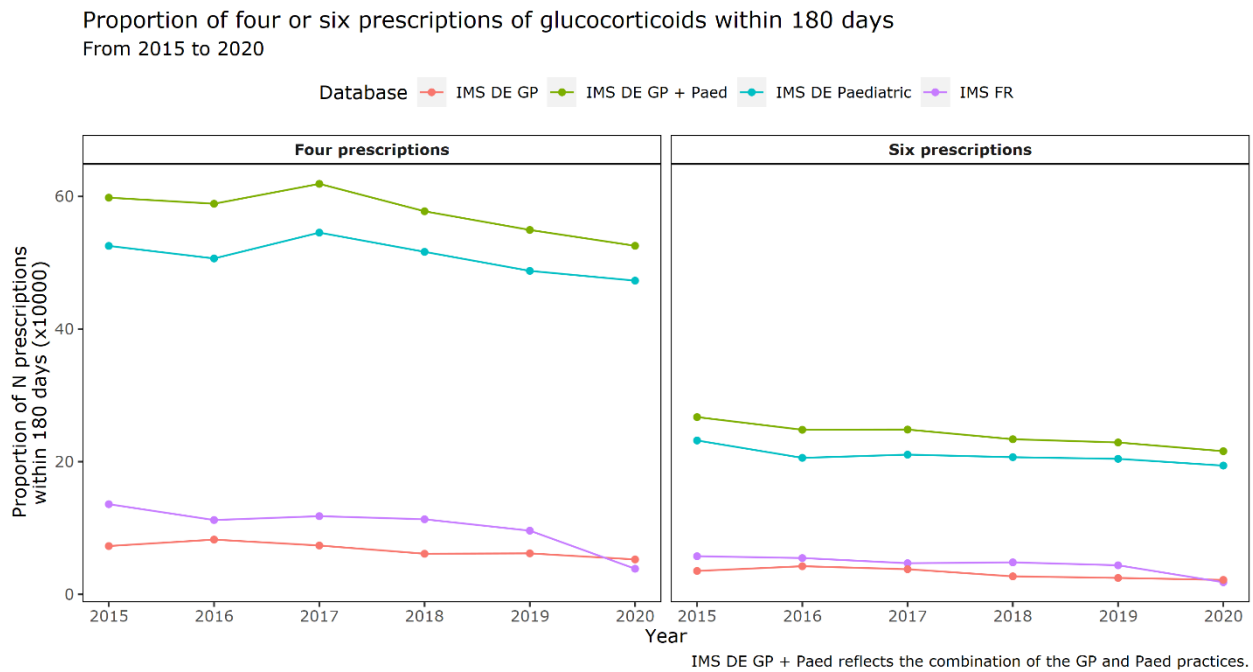


Figure 2: Proportion of four or six prescriptions of glucocorticoids within 180 days, from 2015 to 2020

Within paediatric patients with four or more prescriptions for glucocorticoids within a 180-day interval, the incidence rate of osteoporosis and/or fractures was generally under 1 per 100 person-years for IMS DE across the period from 2016 to 2020, with the exception of 2019 (3.48 per 100 person-years) whereas for IMS FR the incidence rate has been 0 per 100 person-years from 2017 to 2020.

Incidence rate of osteoporosis and/or fractures in paediatric patients with at least four prescriptions for glucocorticoids  
From 2015 to 2020

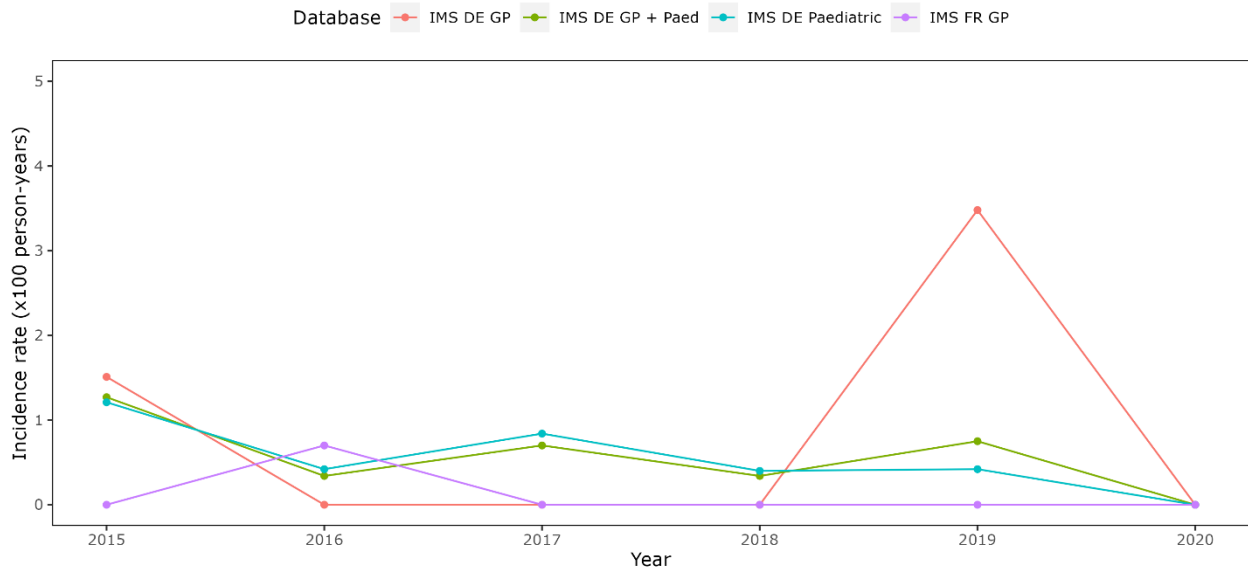


Figure 3: Incidence rate of osteoporosis and/or fractures in paediatric patients with at least four prescriptions for glucocorticoids

These incident rates reflect, either no incident cases or a small number of incident cases, always fewer than five.

Table 5: Number of incident cases of fractures or osteoporosis in patients taking long-term corticosteroids

Year	IMS FR		IMS DE	
	GP <sup>1</sup>	GP + Paed <sup>1</sup>	GP <sup>1</sup>	Paediatric <sup>1</sup>
2015	0	<5	<5	<5
2016	<5	<5	0	<5
2017	0	<5	0	<5
2018	0	<5	0	<5
2019	0	<5	<5	<5
2020	0	0	0	0

<sup>1</sup> For data protection reasons, exact numbers of incident cases are not show if below five and non-null.

## 8. Discussion

A total of 2,509,587 patients between the age of 0 and 17 were included in this study, 424,001 from a French database (IMS FR) and 2,085,586 from a German database (IMS DE).

Fewer than ten percent of the paediatric population in this study had one of the ten diseases likely to lead to long-term exposure to glucocorticoids. Of those, asthma was the most frequently observed disorder, accounting for 82% of the disorders in the population.

The prevalence of prescription of glucocorticoids ranges from around 2% to around 15%. Prevalence in the IMS FR is three-fold that of IMS DE (~15% vs 4-5%), but in 2020 there was a sharp drop to the prevalence of prescription in IMS FR (10%).

The distribution of prescriptions is highly skewed as shown by the 75% quantile (1 prescription in IMS FR and 2 prescriptions in IMS DE), but also showing a decrease over time for the maximum number of prescriptions per child. While data suggest that IMS FR has higher prevalence of prescription, IMS DE appears to have higher density of exposure (higher number of corticosteroids prescriptions per patient).

Long term exposure, measured using four or six prescriptions within 180 days, seems higher in the paediatric speciality context (50-60 per 10,000) than in a GP setting (<20 per 10,000), and seems to be decreasing over time. Moreover, across the databases, GP prescription of seven or more glucocorticoids per year is below 50 patients in 2020; in the Paediatric setting, the number is higher (~300) but decreasing over time.

Furthermore, the incidence rate of osteoporosis and/or fractures, determined only in paediatric patients that had long-term exposure of four or more prescriptions for glucocorticoids is typically below 1 per 100 person-years, and has not exceeded 4 per 100 person-years. This incident rate corresponded to fewer than five incident cases per year per database (IMS FR and IMS DE GP + Paediatrics).

Collectively, the data suggest that the number of paediatric patients exposed to long-term glucocorticoids is low and decreasing, a relatively small number (<60 in 10,000 paediatric patients) have a long term exposure and that the incidence of osteoporosis and/or fractures in those with long term exposure is frequently under 1 per 100 person-years, corresponding to fewer than five incident cases per year, per database.

These elements do seem to suggest that recruitment for a clinical trial in GIOP is challenging.

This study provides a comprehensive overview of the prescription of glucocorticoids in paediatric patients and disorders that could lead to long-term prescription of glucocorticoids. In addition, it introduced a proxy to identify likely long-term exposure to glucocorticoids and explored the incidence of osteoporosis and/or fractures in paediatric patients that are likely to be in-long term exposure, which in turn could be considered a proxy for GIOP.

There are, however, several limitations to this study, in particular, the fact that dose and duration of medication is not fully recorded in the databases, which meant that proxies for long exposure had to be identified.

An assumption was made that four prescriptions in 180 days would suggest long term use, this might have been a generous assumption, but does not materially affect the interpretation of the result – the data already suggests that the exposure is small, stricter proxies would only even smaller exposure.

Other possible study approaches, such as conducting a retrospective study starting from a patient pathological fracture and looking back to the previous 365 days to measure exposure to glucocorticoid-containing products could also be conducted.

## Annex I – Codes for disorders

Disorder	Code	Description
Juvenile arthritis	M08	Juvenile arthritis
Juvenile arthritis	M08.0	Juvenile rheumatoid arthritis
Juvenile arthritis	M08.00	Juvenile rheumatoid arthritis, multiple sites
Juvenile arthritis	M08.01	Juvenile rheumatoid arthritis, shoulder region
Juvenile arthritis	M08.02	Juvenile rheumatoid arthritis, upper arm
Juvenile arthritis	M08.03	Juvenile rheumatoid arthritis, forearm
Juvenile arthritis	M08.04	Juvenile rheumatoid arthritis, hand
Juvenile arthritis	M08.05	Juvenile rheumatoid arthritis, pelvic region and thigh
Juvenile arthritis	M08.06	Juvenile rheumatoid arthritis, lower leg
Juvenile arthritis	M08.07	Juvenile rheumatoid arthritis, ankle and foot
Juvenile arthritis	M08.08	Juvenile rheumatoid arthritis, other
Juvenile arthritis	M08.09	Juvenile rheumatoid arthritis, site unspecified
Juvenile arthritis	M08.1	Juvenile ankylosing spondylitis
Juvenile arthritis	M08.10	Juvenile ankylosing spondylitis, multiple sites
Juvenile arthritis	M08.11	Juvenile ankylosing spondylitis, shoulder region
Juvenile arthritis	M08.12	Juvenile ankylosing spondylitis, upper arm
Juvenile arthritis	M08.13	Juvenile ankylosing spondylitis, forearm
Juvenile arthritis	M08.14	Juvenile ankylosing spondylitis, hand
Juvenile arthritis	M08.15	Juvenile ankylosing spondylitis, pelvic region and thigh
Juvenile arthritis	M08.16	Juvenile ankylosing spondylitis, lower leg
Juvenile arthritis	M08.17	Juvenile ankylosing spondylitis, ankle and foot
Juvenile arthritis	M08.18	Juvenile ankylosing spondylitis, other
Juvenile arthritis	M08.19	Juvenile ankylosing spondylitis, site unspecified
Juvenile arthritis	M08.2	Juvenile arthritis with systemic onset
Juvenile arthritis	M08.20	Juvenile arthritis with systemic onset, multiple sites
Juvenile arthritis	M08.21	Juvenile arthritis with systemic onset, shoulder region
Juvenile arthritis	M08.22	Juvenile arthritis with systemic onset, upper arm
Juvenile arthritis	M08.23	Juvenile arthritis with systemic onset, forearm
Juvenile arthritis	M08.24	Juvenile arthritis with systemic onset, hand
Juvenile arthritis	M08.25	Juvenile arthritis with systemic onset, pelvic region and thigh
Juvenile arthritis	M08.26	Juvenile arthritis with systemic onset, lower leg
Juvenile arthritis	M08.27	Juvenile arthritis with systemic onset, ankle and foot
Juvenile arthritis	M08.28	Juvenile arthritis with systemic onset, other
Juvenile arthritis	M08.29	Juvenile arthritis with systemic onset, site unspecified
Juvenile arthritis	M08.3	Juvenile polyarthritis (seronegative)
Juvenile arthritis	M08.30	Juvenile polyarthritis (seronegative), multiple sites
Juvenile arthritis	M08.31	Juvenile polyarthritis (seronegative), shoulder region
Juvenile arthritis	M08.32	Juvenile polyarthritis (seronegative), upper arm
Juvenile arthritis	M08.33	Juvenile polyarthritis (seronegative), forearm

Disorder	Code	Description
Juvenile arthritis	M08.34	Juvenile polyarthritis (seronegative), hand
Juvenile arthritis	M08.35	Juvenile polyarthritis (seronegative), pelvic region and thigh
Juvenile arthritis	M08.36	Juvenile polyarthritis (seronegative), lower leg
Juvenile arthritis	M08.37	Juvenile polyarthritis (seronegative), ankle and foot
Juvenile arthritis	M08.38	Juvenile polyarthritis (seronegative), other
Juvenile arthritis	M08.39	Juvenile polyarthritis (seronegative), site unspecified
Juvenile arthritis	M08.4	Pauciarticular juvenile arthritis
Juvenile arthritis	M08.40	Pauciarticular juvenile arthritis, multiple sites
Juvenile arthritis	M08.41	Pauciarticular juvenile arthritis, shoulder region
Juvenile arthritis	M08.42	Pauciarticular juvenile arthritis, upper arm
Juvenile arthritis	M08.43	Pauciarticular juvenile arthritis, forearm
Juvenile arthritis	M08.44	Pauciarticular juvenile arthritis, hand
Juvenile arthritis	M08.45	Pauciarticular juvenile arthritis, pelvic region and thigh
Juvenile arthritis	M08.46	Pauciarticular juvenile arthritis, lower leg
Juvenile arthritis	M08.47	Pauciarticular juvenile arthritis, ankle and foot
Juvenile arthritis	M08.48	Pauciarticular juvenile arthritis, other
Juvenile arthritis	M08.49	Pauciarticular juvenile arthritis, site unspecified
Juvenile arthritis	M08.8	Other juvenile arthritis
Juvenile arthritis	M08.80	Other juvenile arthritis, multiple sites
Juvenile arthritis	M08.81	Other juvenile arthritis, shoulder region
Juvenile arthritis	M08.82	Other juvenile arthritis, upper arm
Juvenile arthritis	M08.83	Other juvenile arthritis, forearm
Juvenile arthritis	M08.84	Other juvenile arthritis, hand
Juvenile arthritis	M08.85	Other juvenile arthritis, pelvic region and thigh
Juvenile arthritis	M08.86	Other juvenile arthritis, lower leg
Juvenile arthritis	M08.87	Other juvenile arthritis, ankle and foot
Juvenile arthritis	M08.88	Other juvenile arthritis, other
Juvenile arthritis	M08.89	Other juvenile arthritis, site unspecified
Juvenile arthritis	M08.9	Juvenile arthritis, unspecified
Juvenile arthritis	M08.90	Juvenile arthritis, unspecified, multiple sites
Juvenile arthritis	M08.91	Juvenile arthritis, unspecified, shoulder region
Juvenile arthritis	M08.92	Juvenile arthritis, unspecified, upper arm
Juvenile arthritis	M08.93	Juvenile arthritis, unspecified, forearm
Juvenile arthritis	M08.94	Juvenile arthritis, unspecified, hand
Juvenile arthritis	M08.95	Juvenile arthritis, unspecified, pelvic region and thigh
Juvenile arthritis	M08.96	Juvenile arthritis, unspecified, lower leg
Juvenile arthritis	M08.97	Juvenile arthritis, unspecified, ankle and foot
Juvenile arthritis	M08.98	Juvenile arthritis, unspecified, other
Juvenile arthritis	M08.99	Juvenile arthritis, unspecified, site unspecified
Multiple sclerosis	G35	Multiple sclerosis
Idiopathic thrombocytopenic purpura	D69.3	Idiopathic thrombocytopenic purpura
Asthma	J45	Asthma

Disorder	Code	Description
Asthma	J45.0	Predominantly allergic asthma
Asthma	J45.1	Nonallergic asthma
Asthma	J45.8	Mixed asthma
Asthma	J45.9	Asthma, unspecified
Asthma	J46	Status asthmaticus
Systemic lupus	M32	Systemic lupus erythematosus
Systemic lupus	M32.0	Drug-induced systemic lupus erythematosus
Systemic lupus	M32.1	Systemic lupus erythematosus with organ or system involvement
Systemic lupus	M32.8	Other forms of systemic lupus erythematosus
Systemic lupus	M32.9	Systemic lupus erythematosus, unspecified
Muscular dystrophy	G71.0	Muscular dystrophy
Nephrotic syndrome	N04	Nephrotic syndrome
Nephrotic syndrome	N04.0	Nephrotic syndrome, minor glomerular abnormality
Nephrotic syndrome	N04.1	Nephrotic syndrome, focal and segmental glomerular lesions
Nephrotic syndrome	N04.2	Nephrotic syndrome, diffuse membranous glomerulonephritis
Nephrotic syndrome	N04.3	Nephrotic syndrome, diffuse mesangial proliferative glomerulonephritis
Nephrotic syndrome	N04.4	Nephrotic syndrome, diffuse endocapillary proliferative glomerulonephritis
Nephrotic syndrome	N04.5	Nephrotic syndrome, diffuse mesangiocapillary glomerulonephritis
Nephrotic syndrome	N04.6	Nephrotic syndrome, dense deposit disease
Nephrotic syndrome	N04.7	Nephrotic syndrome, diffuse crescentic glomerulonephritis
Nephrotic syndrome	N04.8	Nephrotic syndrome, other
Nephrotic syndrome	N04.9	Nephrotic syndrome, unspecified
Neuropathy	G56	Mononeuropathies of upper limb
Neuropathy	G56.0	Carpal tunnel syndrome
Neuropathy	G56.1	Other lesions of median nerve
Neuropathy	G56.2	Lesion of ulnar nerve
Neuropathy	G56.3	Lesion of radial nerve
Neuropathy	G56.8	Other mononeuropathies of upper limb
Neuropathy	G56.9	Mononeuropathy of upper limb, unspecified
Neuropathy	G57	Mononeuropathies of lower limb
Neuropathy	G57.0	Lesion of sciatic nerve
Neuropathy	G57.1	Meralgia paraesthetica
Neuropathy	G57.2	Lesion of femoral nerve
Neuropathy	G57.3	Lesion of lateral popliteal nerve
Neuropathy	G57.4	Lesion of medial popliteal nerve
Neuropathy	G57.5	Tarsal tunnel syndrome
Neuropathy	G57.6	Lesion of plantar nerve
Neuropathy	G57.8	Other mononeuropathies of lower limb

Disorder	Code	Description
Neuropathy	G57.9	Mononeuropathy of lower limb, unspecified
Neuropathy	G58	Other mononeuropathies
Neuropathy	G58.0	Intercostal neuropathy
Neuropathy	G58.7	Mononeuritis multiplex
Neuropathy	G58.8	Other specified mononeuropathies
Neuropathy	G58.9	Mononeuropathy, unspecified
Neuropathy	G59	Mononeuropathy in diseases classified elsewhere
Neuropathy	G59.0	Diabetic mononeuropathy
Neuropathy	G59.8	Other mononeuropathies in diseases classified elsewhere
Neuropathy	G60	Hereditary and idiopathic neuropathy
Neuropathy	G60.0	Hereditary motor and sensory neuropathy
Neuropathy	G60.1	Refsum disease
Neuropathy	G60.2	Neuropathy in association with hereditary ataxia
Neuropathy	G60.3	Idiopathic progressive neuropathy
Neuropathy	G60.8	Other hereditary and idiopathic neuropathies
Neuropathy	G60.9	Hereditary and idiopathic neuropathy, unspecified
Neuropathy	G61	Inflammatory polyneuropathy
Neuropathy	G61.0	Guillain-Barré syndrome
Neuropathy	G61.1	Serum neuropathy
Neuropathy	G61.8	Other inflammatory polyneuropathies
Neuropathy	G61.9	Inflammatory polyneuropathy, unspecified
Neuropathy	G62	Other polyneuropathies
Neuropathy	G62.0	Drug-induced polyneuropathy
Neuropathy	G62.1	Alcoholic polyneuropathy
Neuropathy	G62.2	Polyneuropathy due to other toxic agents
Neuropathy	G62.8	Other specified polyneuropathies
Neuropathy	G62.9	Polyneuropathy, unspecified
Neuropathy	G63	Polyneuropathy in diseases classified elsewhere
Neuropathy	G63.0	Polyneuropathy in infectious and parasitic diseases classified elsewhere
Neuropathy	G63.1	Polyneuropathy in neoplastic disease
Neuropathy	G63.2	Diabetic polyneuropathy
Neuropathy	G63.3	Polyneuropathy in other endocrine and metabolic diseases
Neuropathy	G63.4	Polyneuropathy in nutritional deficiency
Neuropathy	G63.5	Polyneuropathy in systemic connective tissue disorders
Neuropathy	G63.6	Polyneuropathy in other musculoskeletal disorders
Neuropathy	G63.8	Polyneuropathy in other diseases classified elsewhere
Inflammatory Bowel Disease	K50	Crohn disease [regional enteritis]
Inflammatory Bowel Disease	K50.0	Crohn disease of small intestine
Inflammatory Bowel Disease	K50.1	Crohn disease of large intestine
Inflammatory Bowel Disease	K50.8	Other Crohn disease
Inflammatory Bowel Disease	K50.9	Crohn disease, unspecified
Inflammatory Bowel Disease	K51	Ulcerative colitis
Inflammatory Bowel Disease	K51.0	Ulcerative (chronic) pancolitis

<b>Disorder</b>	<b>Code</b>	<b>Description</b>
Inflammatory Bowel Disease	K51.2	Ulcerative (chronic) proctitis
Inflammatory Bowel Disease	K51.3	Ulcerative (chronic) rectosigmoiditis
Inflammatory Bowel Disease	K51.4	Inflammatory polyps
Inflammatory Bowel Disease	K51.5	Left sided colitis
Inflammatory Bowel Disease	K51.8	Other ulcerative colitis
Inflammatory Bowel Disease	K51.9	Ulcerative colitis, unspecified



## Annex II – Codes for Fractures and Osteoporosis

code	description
M48.4	Fatigue fracture of vertebra
M48.40	Fatigue fracture of vertebra, multiple sites in spine
M48.41	Fatigue fracture of vertebra, occipito-atlanto-axial region
M48.42	Fatigue fracture of vertebra, cervical region
M48.43	Fatigue fracture of vertebra, cervicothoracic region
M48.44	Fatigue fracture of vertebra, thoracic region
M48.45	Fatigue fracture of vertebra, thoracolumbar region
M48.46	Fatigue fracture of vertebra, lumbar region
M48.47	Fatigue fracture of vertebra, lumbosacral region
M48.48	Fatigue fracture of vertebra, sacral and sacrococcygeal region
M48.49	Fatigue fracture of vertebra, site unspecified
M48.5	Collapsed vertebra, not elsewhere classified
M48.50	Collapsed vertebra, not elsewhere classified, multiple sites in spine
M48.51	Collapsed vertebra, not elsewhere classified, occipito-atlanto-axial region
M48.52	Collapsed vertebra, not elsewhere classified, cervical region
M48.53	Collapsed vertebra, not elsewhere classified, cervicothoracic region
M48.54	Collapsed vertebra, not elsewhere classified, thoracic region
M48.55	Collapsed vertebra, not elsewhere classified, thoracolumbar region
M48.56	Collapsed vertebra, not elsewhere classified, lumbar region
M48.57	Collapsed vertebra, not elsewhere classified, lumbosacral region
M48.58	Collapsed vertebra, not elsewhere classified, sacral and sacrococcygeal region
M48.59	Collapsed vertebra, not elsewhere classified, site unspecified
M49.5	Collapsed vertebra in diseases classified elsewhere
M49.50	Collapsed vertebra in diseases classified elsewhere, multiple sites in spine
M49.51	Collapsed vertebra in diseases classified elsewhere, occipito-atlanto-axial region
M49.52	Collapsed vertebra in diseases classified elsewhere, cervical region
M49.53	Collapsed vertebra in diseases classified elsewhere, cervicothoracic region
M49.54	Collapsed vertebra in diseases classified elsewhere, thoracic region
M49.55	Collapsed vertebra in diseases classified elsewhere, thoracolumbar region
M49.56	Collapsed vertebra in diseases classified elsewhere, lumbar region
M49.57	Collapsed vertebra in diseases classified elsewhere, lumbosacral region
M49.58	Collapsed vertebra in diseases classified elsewhere, sacral and sacrococcygeal region
M49.59	Collapsed vertebra in diseases classified elsewhere, site unspecified
M80	Osteoporosis with pathological fracture
M80.1	Postoophorectomy osteoporosis with pathological fracture
M80.10	Postoophorectomy osteoporosis with pathological fracture, multiple sites
M80.11	Postoophorectomy osteoporosis with pathological fracture, shoulder region
M80.12	Postoophorectomy osteoporosis with pathological fracture, upper arm
M80.13	Postoophorectomy osteoporosis with pathological fracture, forearm
M80.14	Postoophorectomy osteoporosis with pathological fracture, hand

code	description
M80.15	Postoophorectomy osteoporosis with pathological fracture, pelvic region and thigh
M80.16	Postoophorectomy osteoporosis with pathological fracture, lower leg
M80.17	Postoophorectomy osteoporosis with pathological fracture, ankle and foot
M80.18	Postoophorectomy osteoporosis with pathological fracture, other
M80.19	Postoophorectomy osteoporosis with pathological fracture, site unspecified
M80.2	Osteoporosis of disuse with pathological fracture
M80.20	Osteoporosis of disuse with pathological fracture, multiple sites
M80.21	Osteoporosis of disuse with pathological fracture, shoulder region
M80.22	Osteoporosis of disuse with pathological fracture, upper arm
M80.23	Osteoporosis of disuse with pathological fracture, forearm
M80.24	Osteoporosis of disuse with pathological fracture, hand
M80.25	Osteoporosis of disuse with pathological fracture, pelvic region and thigh
M80.26	Osteoporosis of disuse with pathological fracture, lower leg
M80.27	Osteoporosis of disuse with pathological fracture, ankle and foot
M80.28	Osteoporosis of disuse with pathological fracture, other
M80.29	Osteoporosis of disuse with pathological fracture, site unspecified
M80.3	Postsurgical malabsorption osteoporosis with pathological fracture
M80.30	Postsurgical malabsorption osteoporosis with pathological fracture, multiple sites
M80.31	Postsurgical malabsorption osteoporosis with pathological fracture, shoulder region
M80.32	Postsurgical malabsorption osteoporosis with pathological fracture, upper arm
M80.33	Postsurgical malabsorption osteoporosis with pathological fracture, forearm
M80.34	Postsurgical malabsorption osteoporosis with pathological fracture, hand
M80.35	Postsurgical malabsorption osteoporosis with pathological fracture, pelvic region and thigh
M80.36	Postsurgical malabsorption osteoporosis with pathological fracture, lower leg
M80.37	Postsurgical malabsorption osteoporosis with pathological fracture, ankle and foot
M80.38	Postsurgical malabsorption osteoporosis with pathological fracture, other
M80.39	Postsurgical malabsorption osteoporosis with pathological fracture, site unspecified
M80.4	Drug-induced osteoporosis with pathological fracture
M80.40	Drug-induced osteoporosis with pathological fracture, multiple sites
M80.41	Drug-induced osteoporosis with pathological fracture, shoulder region
M80.42	Drug-induced osteoporosis with pathological fracture, upper arm
M80.43	Drug-induced osteoporosis with pathological fracture, forearm
M80.44	Drug-induced osteoporosis with pathological fracture, hand
M80.45	Drug-induced osteoporosis with pathological fracture, pelvic region and thigh
M80.46	Drug-induced osteoporosis with pathological fracture, lower leg
M80.47	Drug-induced osteoporosis with pathological fracture, ankle and foot
M80.48	Drug-induced osteoporosis with pathological fracture, other
M80.49	Drug-induced osteoporosis with pathological fracture, site unspecified
M80.5	Idiopathic osteoporosis with pathological fracture
M80.50	Idiopathic osteoporosis with pathological fracture, multiple sites
M80.51	Idiopathic osteoporosis with pathological fracture, shoulder region
M80.52	Idiopathic osteoporosis with pathological fracture, upper arm

code	description
M80.53	Idiopathic osteoporosis with pathological fracture, forearm
M80.54	Idiopathic osteoporosis with pathological fracture, hand
M80.55	Idiopathic osteoporosis with pathological fracture, pelvic region and thigh
M80.56	Idiopathic osteoporosis with pathological fracture, lower leg
M80.57	Idiopathic osteoporosis with pathological fracture, ankle and foot
M80.58	Idiopathic osteoporosis with pathological fracture, other
M80.59	Idiopathic osteoporosis with pathological fracture, site unspecified
M80.8	Other osteoporosis with pathological fracture
M80.80	Other osteoporosis with pathological fracture, multiple sites
M80.81	Other osteoporosis with pathological fracture, shoulder region
M80.82	Other osteoporosis with pathological fracture, upper arm
M80.83	Other osteoporosis with pathological fracture, forearm
M80.84	Other osteoporosis with pathological fracture, hand
M80.85	Other osteoporosis with pathological fracture, pelvic region and thigh
M80.86	Other osteoporosis with pathological fracture, lower leg
M80.87	Other osteoporosis with pathological fracture, ankle and foot
M80.88	Other osteoporosis with pathological fracture, other
M80.89	Other osteoporosis with pathological fracture, site unspecified
M80.9	Unspecified osteoporosis with pathological fracture
M80.90	Unspecified osteoporosis with pathological fracture, multiple sites
M80.91	Unspecified osteoporosis with pathological fracture, shoulder region
M80.92	Unspecified osteoporosis with pathological fracture, upper arm
M80.93	Unspecified osteoporosis with pathological fracture, forearm
M80.94	Unspecified osteoporosis with pathological fracture, hand
M80.95	Unspecified osteoporosis with pathological fracture, pelvic region and thigh
M80.96	Unspecified osteoporosis with pathological fracture, lower leg
M80.97	Unspecified osteoporosis with pathological fracture, ankle and foot
M80.98	Unspecified osteoporosis with pathological fracture, other
M80.99	Unspecified osteoporosis with pathological fracture, site unspecified
M84	Disorders of continuity of bone
M84.0	Malunion of fracture
M84.00	Malunion of fracture, multiple sites
M84.01	Malunion of fracture, shoulder region
M84.02	Malunion of fracture, upper arm
M84.03	Malunion of fracture, forearm
M84.04	Malunion of fracture, hand
M84.05	Malunion of fracture, pelvic region and thigh
M84.06	Malunion of fracture, lower leg
M84.07	Malunion of fracture, ankle and foot
M84.08	Malunion of fracture, other
M84.09	Malunion of fracture, site unspecified
M84.1	Nonunion of fracture [pseudarthrosis]
M84.10	Nonunion of fracture [pseudarthrosis], multiple sites

code	description
M84.11	Nonunion of fracture [pseudarthrosis], shoulder region
M84.12	Nonunion of fracture [pseudarthrosis], upper arm
M84.13	Nonunion of fracture [pseudarthrosis], forearm
M84.14	Nonunion of fracture [pseudarthrosis], hand
M84.15	Nonunion of fracture [pseudarthrosis], pelvic region and thigh
M84.16	Nonunion of fracture [pseudarthrosis], lower leg
M84.17	Nonunion of fracture [pseudarthrosis], ankle and foot
M84.18	Nonunion of fracture [pseudarthrosis], other
M84.19	Nonunion of fracture [pseudarthrosis], site unspecified
M84.2	Delayed union of fracture
M84.20	Delayed union of fracture, multiple sites
M84.21	Delayed union of fracture, shoulder region
M84.22	Delayed union of fracture, upper arm
M84.23	Delayed union of fracture, forearm
M84.24	Delayed union of fracture, hand
M84.25	Delayed union of fracture, pelvic region and thigh
M84.26	Delayed union of fracture, lower leg
M84.27	Delayed union of fracture, ankle and foot
M84.28	Delayed union of fracture, other
M84.29	Delayed union of fracture, site unspecified
M84.3	Stress fracture, not elsewhere classified
M84.30	Stress fracture, not elsewhere classified, multiple sites
M84.31	Stress fracture, not elsewhere classified, shoulder region
M84.32	Stress fracture, not elsewhere classified, upper arm
M84.33	Stress fracture, not elsewhere classified, forearm
M84.34	Stress fracture, not elsewhere classified, hand
M84.35	Stress fracture, not elsewhere classified, pelvic region and thigh
M84.36	Stress fracture, not elsewhere classified, lower leg
M84.37	Stress fracture, not elsewhere classified, ankle and foot
M84.38	Stress fracture, not elsewhere classified, other
M84.39	Stress fracture, not elsewhere classified, site unspecified
M84.4	Pathological fracture, not elsewhere classified
M84.40	Pathological fracture, not elsewhere classified, multiple sites
M84.41	Pathological fracture, not elsewhere classified, shoulder region
M84.42	Pathological fracture, not elsewhere classified, upper arm
M84.43	Pathological fracture, not elsewhere classified, forearm
M84.44	Pathological fracture, not elsewhere classified, hand
M84.45	Pathological fracture, not elsewhere classified, pelvic region and thigh
M84.46	Pathological fracture, not elsewhere classified, lower leg
M84.47	Pathological fracture, not elsewhere classified, ankle and foot
M84.48	Pathological fracture, not elsewhere classified, other
M84.49	Pathological fracture, not elsewhere classified, site unspecified
M84.8	Other disorders of continuity of bone

code	description
M84.80	Other disorders of continuity of bone, multiple sites
M84.81	Other disorders of continuity of bone, shoulder region
M84.82	Other disorders of continuity of bone, upper arm
M84.83	Other disorders of continuity of bone, forearm
M84.84	Other disorders of continuity of bone, hand
M84.85	Other disorders of continuity of bone, pelvic region and thigh
M84.86	Other disorders of continuity of bone, lower leg
M84.87	Other disorders of continuity of bone, ankle and foot
M84.88	Other disorders of continuity of bone, other
M84.89	Other disorders of continuity of bone, site unspecified
M84.9	Disorder of continuity of bone, unspecified
M84.90	Disorder of continuity of bone, unspecified, multiple sites
M84.91	Disorder of continuity of bone, unspecified, shoulder region
M84.92	Disorder of continuity of bone, unspecified, upper arm
M84.93	Disorder of continuity of bone, unspecified, forearm
M84.94	Disorder of continuity of bone, unspecified, hand
M84.95	Disorder of continuity of bone, unspecified, pelvic region and thigh
M84.96	Disorder of continuity of bone, unspecified, lower leg
M84.97	Disorder of continuity of bone, unspecified, ankle and foot
M84.98	Disorder of continuity of bone, unspecified, other
M84.99	Disorder of continuity of bone, unspecified, site unspecified
S02	Fracture of skull and facial bones
S02.0	Fracture of vault of skull
S02.1	Fracture of base of skull
S02.10	Fracture of base of skull, closed
S02.11	Fracture of base of skull, open
S02.2	Fracture of nasal bones
S02.20	Fracture of nasal bones, closed
S02.21	Fracture of nasal bones, open
S02.3	Fracture of orbital floor
S02.30	Fracture of orbital floor, closed
S02.31	Fracture of orbital floor, open
S02.4	Fracture of malar and maxillary bones
S02.40	Fracture of malar and maxillary bones, closed
S02.41	Fracture of malar and maxillary bones, open
S02.5	Fracture of tooth
S02.6	Fracture of mandible
S02.60	Fracture of mandible, closed
S02.61	Fracture of mandible, open
S02.7	Multiple fractures involving skull and facial bones
S02.70	Multiple fractures involving skull and facial bones, closed
S02.71	Multiple fractures involving skull and facial bones, open
S02.8	Fractures of other skull and facial bones

code	description
S02.80	Fractures of other skull and facial bones, closed
S02.81	Fractures of other skull and facial bones, open
S02.9	Fracture of skull and facial bones, part unspecified
S02.90	Fracture of skull and facial bones, part unspecified, closed
S02.91	Fracture of skull and facial bones, part unspecified, open
S12	Fracture of neck
S12.0	Fracture of first cervical vertebra
S12.1	Fracture of second cervical vertebra
S12.10	Fracture of second cervical vertebra, closed
S12.11	Fracture of second cervical vertebra, open
S12.2	Fracture of other specified cervical vertebra
S12.20	Fracture of other specified cervical vertebra, closed
S12.21	Fracture of other specified cervical vertebra, open
S12.7	Multiple fractures of cervical spine
S12.70	Multiple fractures of cervical spine, closed
S12.71	Multiple fractures of cervical spine, open
S12.8	Fracture of other parts of neck
S12.80	Fracture of other parts of neck, closed
S12.81	Fracture of other parts of neck, open
S12.9	Fracture of neck, part unspecified
S12.90	Fracture of neck, part unspecified, closed
S12.91	Fracture of neck, part unspecified, open
S22	Fracture of rib(s), sternum and thoracic spine
S22.0	Fracture of thoracic vertebra
S22.00	Fracture of thoracic vertebra, closed
S22.01	Fracture of thoracic vertebra, open
S22.1	Multiple fractures of thoracic spine
S22.10	Multiple fractures of thoracic spine, closed
S22.11	Multiple fractures of thoracic spine, open
S22.2	Fracture of sternum
S22.20	Fracture of sternum, closed
S22.21	Fracture of sternum, open
S22.3	Fracture of rib
S22.30	Fracture of rib, closed
S22.31	Fracture of rib, open
S22.4	Multiple fractures of ribs
S22.40	Multiple fractures of ribs, closed
S22.41	Multiple fractures of ribs, open
S22.5	Flail chest
S22.50	Flail chest, closed
S22.51	Flail chest, open
S22.8	Fracture of other parts of bony thorax
S22.80	Fracture of other parts of bony thorax, closed

code	description
S22.81	Fracture of other parts of bony thorax, open
S22.9	Fracture of bony thorax, part unspecified
S22.90	Fracture of bony thorax, part unspecified, closed
S22.91	Fracture of bony thorax, part unspecified, open
S32	Fracture of lumbar spine and pelvis
S32.0	Fracture of lumbar vertebra
S32.00	Fracture of lumbar vertebra, closed
S32.01	Fracture of lumbar vertebra, open
S32.1	Fracture of sacrum
S32.10	Fracture of sacrum, closed
S32.11	Fracture of sacrum, open
S32.2	Fracture of coccyx
S32.20	Fracture of coccyx, closed
S32.21	Fracture of coccyx, open
S32.3	Fracture of ilium
S32.30	Fracture of ilium, closed
S32.31	Fracture of ilium, open
S32.4	Fracture of acetabulum
S32.40	Fracture of acetabulum, closed
S32.41	Fracture of acetabulum, open
S32.5	Fracture of pubis
S32.50	Fracture of pubis, closed
S32.51	Fracture of pubis, open
S32.7	Multiple fractures of lumbar spine and pelvis
S32.70	Multiple fractures of lumbar spine and pelvis, closed
S32.71	Multiple fractures of lumbar spine and pelvis, open
S32.8	Fracture of other and unspecified parts of lumbar spine and pelvis
S32.80	Fracture of other and unspecified parts of lumbar spine and pelvis, closed
S32.81	Fracture of other and unspecified parts of lumbar spine and pelvis, open
S42	Fracture of shoulder and upper arm
S42.0	Fracture of clavicle
S42.1	Fracture of scapula
S42.10	Fracture of scapula, closed
S42.11	Fracture of scapula, open
S42.2	Fracture of upper end of humerus
S42.20	Fracture of upper end of humerus, closed
S42.21	Fracture of upper end of humerus, open
S42.3	Fracture of shaft of humerus
S42.30	Fracture of shaft of humerus, closed
S42.31	Fracture of shaft of humerus, open
S42.4	Fracture of lower end of humerus
S42.40	Fracture of lower end of humerus, closed
S42.41	Fracture of lower end of humerus, open



code	description
S42.7	Multiple fractures of clavicle, scapula and humerus
S42.70	Multiple fractures of clavicle, scapula and humerus, closed
S42.71	Multiple fractures of clavicle, scapula and humerus, open
S42.8	Fracture of other parts of shoulder and upper arm
S42.80	Fracture of other parts of shoulder and upper arm, closed
S42.81	Fracture of other parts of shoulder and upper arm, open
S42.9	Fracture of shoulder girdle, part unspecified
S42.90	Fracture of shoulder girdle, part unspecified, closed
S42.91	Fracture of shoulder girdle, part unspecified, open
S52	Fracture of forearm
S52.0	Fracture of upper end of ulna
S52.00	Fracture of upper end of ulna, closed
S52.01	Fracture of upper end of ulna, open
S52.1	Fracture of upper end of radius
S52.10	Fracture of upper end of radius, closed
S52.11	Fracture of upper end of radius, open
S52.2	Fracture of shaft of ulna
S52.20	Fracture of shaft of ulna, closed
S52.21	Fracture of shaft of ulna, open
S52.3	Fracture of shaft of radius
S52.30	Fracture of shaft of radius, closed
S52.31	Fracture of shaft of radius, open
S52.4	Fracture of shafts of both ulna and radius
S52.40	Fracture of shafts of both ulna and radius, closed
S52.41	Fracture of shafts of both ulna and radius, open
S52.5	Fracture of lower end of radius
S52.50	Fracture of lower end of radius, closed
S52.51	Fracture of lower end of radius, open
S52.6	Fracture of lower end of both ulna and radius
S52.60	Fracture of lower end of both ulna and radius, closed
S52.61	Fracture of lower end of both ulna and radius, open
S52.7	Multiple fractures of forearm
S52.70	Multiple fractures of forearm, closed
S52.71	Multiple fractures of forearm, open
S52.8	Fracture of other parts of forearm
S52.80	Fracture of other parts of forearm, closed
S52.81	Fracture of other parts of forearm, open
S52.9	Fracture of forearm, part unspecified
S52.90	Fracture of forearm, part unspecified, closed
S52.91	Fracture of forearm, part unspecified, open
S62.00	Fracture of navicular [scaphoid] bone of hand, closed
S62.01	Fracture of navicular [scaphoid] bone of hand, open
S62.10	Fracture of other carpal bone(s), closed



code	description
S62.11	Fracture of other carpal bone(s), open
S62.20	Fracture of first metacarpal bone, closed
S62.21	Fracture of first metacarpal bone, open
S62.30	Fracture of other metacarpal bone, closed
S62.31	Fracture of other metacarpal bone, open
S62.40	Multiple fractures of metacarpal bones, closed
S62.41	Multiple fractures of metacarpal bones, open
S62.50	Fracture of thumb, closed
S62.51	Fracture of thumb, open
S62.60	Fracture of other finger, closed
S62.61	Fracture of other finger, open
S62.70	Multiple fractures of fingers, closed
S62.71	Multiple fractures of fingers, open
S62.80	Fracture of other and unspecified parts of wrist and hand, closed
S62.81	Fracture of other and unspecified parts of wrist and hand, open
S72	Fracture of femur
S72.0	Fracture of neck of femur
S72.1	Pertrochanteric fracture
S72.10	Pertrochanteric fracture, closed
S72.11	Pertrochanteric fracture, open
S72.2	Subtrochanteric fracture
S72.20	Subtrochanteric fracture, closed
S72.21	Subtrochanteric fracture, open
S72.3	Fracture of shaft of femur
S72.30	Fracture of shaft of femur, closed
S72.31	Fracture of shaft of femur, open
S72.4	Fracture of lower end of femur
S72.40	Fracture of lower end of femur, closed
S72.41	Fracture of lower end of femur, open
S72.7	Multiple fractures of femur
S72.70	Multiple fractures of femur, closed
S72.71	Multiple fractures of femur, open
S72.8	Fractures of other parts of femur
S72.80	Fractures of other parts of femur, closed
S72.81	Fractures of other parts of femur, open
S72.9	Fracture of femur, part unspecified
S72.90	Fracture of femur, part unspecified, closed
S72.91	Fracture of femur, part unspecified, open
S82.00	Fracture of patella, closed
S82.01	Fracture of patella, open
S82.10	Fracture of upper end of tibia, closed
S82.11	Fracture of upper end of tibia, open
S82.20	Fracture of shaft of tibia, closed

code	description
S82.21	Fracture of shaft of tibia, open
S82.30	Fracture of lower end of tibia, closed
S82.31	Fracture of lower end of tibia, open
S82.40	Fracture of fibula alone, closed
S82.41	Fracture of fibula alone, open
S82.50	Fracture of medial malleolus, closed
S82.51	Fracture of medial malleolus, open
S82.60	Fracture of lateral malleolus, closed
S82.61	Fracture of lateral malleolus, open
S82.70	Multiple fractures of lower leg, closed
S82.71	Multiple fractures of lower leg, open
S82.80	Fractures of other parts of lower leg, closed
S82.81	Fractures of other parts of lower leg, open
S82.90	Fracture of lower leg, part unspecified, closed
S82.91	Fracture of lower leg, part unspecified, open
S92	Fracture of foot, except ankle
S92.0	Fracture of calcaneus
S92.00	Fracture of calcaneus, closed
S92.01	Fracture of calcaneus, open
S92.1	Fracture of talus
S92.10	Fracture of talus, closed
S92.11	Fracture of talus, open
S92.2	Fracture of other tarsal bone(s)
S92.20	Fracture of other tarsal bone(s), closed
S92.21	Fracture of other tarsal bone(s), open
S92.3	Fracture of metatarsal bone
S92.30	Fracture of metatarsal bone, closed
S92.31	Fracture of metatarsal bone, open
S92.4	Fracture of great toe
S92.40	Fracture of great toe, closed
S92.41	Fracture of great toe, open
S92.5	Fracture of other toe
S92.50	Fracture of other toe, closed
S92.51	Fracture of other toe, open
S92.7	Multiple fractures of foot
S92.70	Multiple fractures of foot, closed
S92.71	Multiple fractures of foot, open
S92.9	Fracture of foot, unspecified
S92.90	Fracture of foot, unspecified, closed
S92.91	Fracture of foot, unspecified, open
T02.10	Fractures involving thorax with lower back and pelvis, closed
T02.11	Fractures involving thorax with lower back and pelvis, open
T02.20	Fractures involving multiple regions of one upper limb, closed

code	description
T02.21	Fractures involving multiple regions of one upper limb, open
T02.30	Fractures involving multiple regions of one lower limb, closed
T02.31	Fractures involving multiple regions of one lower limb, open
T02.40	Fractures involving multiple regions of both upper limbs, closed
T02.41	Fractures involving multiple regions of both upper limbs, open
T02.50	Fractures involving multiple regions of both lower limbs, closed
T02.51	Fractures involving multiple regions of both lower limbs, open
T02.60	Fractures involving multiple regions of upper limb(s) with lower limb(s), closed
T02.61	Fractures involving multiple regions of upper limb(s) with lower limb(s), open
T02.70	Fractures involving thorax with lower back and pelvis with limb(s), closed
T02.71	Fractures involving thorax with lower back and pelvis with limb(s), open
T02.80	Fractures involving other combinations of body regions, closed
T02.81	Fractures involving other combinations of body regions, open
T02.90	Multiple fractures, unspecified, closed
T02.91	Multiple fractures, unspecified, open
T08.0	Fracture of spine, level unspecified, closed
T08.1	Fracture of spine, level unspecified, open
T10	Fracture of upper limb, level unspecified
T10.0	Fracture of upper limb, level unspecified, closed
T10.1	Fracture of upper limb, level unspecified, open
T12.0	Fracture of lower limb, level unspecified, closed
T12.1	Fracture of lower limb, level unspecified, open
T14.20	Fracture of unspecified body region, closed
T14.21	Fracture of unspecified body region, open
Z87.3	Personal history of diseases of the musculoskeletal system and connective tissue