

The implementation of ICPC in EPR in Malta

Jean K Soler



History

- Attended first Wonca International Classification Committee meeting in 1998
- Collaboration between Henk Lamberts and Inge Okkes and the Malta College of Family Doctors started 1999
- A group of doctors (approximately 15, 8 or so still recording today) trained to use ICPC, during a one-day seminar
- First data analysis around 2003
- Formal publications on database covering 2001-2005
- Supported new project in Serbia, also a success

TransHiS

- Program first in MS-DOS, then in Windows database application
- Fully incorporates ICPC-2 and its principles
 - Reason for encounter, history-taking, intermediate process, diagnosis, resulting process, prescriptions, referrals
 - Episode of care
 - Double-coding with ICD-10 as necessary, but also free text
 - Specialist letters, test results and radiological images
- Coding accuracy assisted with Thesaurus

	Surname 1	First name 2	DOB	Gender	PatNr	FamNr	Address	City
1	Abdilla		11/07/1979	F	895	523		Attard BZN04
2	Abela		14/01/1983	M	570	349		Attard BZN04
3	Abela		02/04/1992	F	170	52		Attard BZN03
4	Abela		21/10/1956	F	485	296		Attard
5	Abela		01/01/1993	F	886	519		Attard
6	Abela		27/09/1990	M	484	296		Attard
7	Abela		29/10/1999	M	1156	661		Attard ATD1600
8	Abela		01/09/1984	F	151	104		Attard BZN04
9	Abela		13/05/1995	M	392	77		Attard
a	Abela		25/01/1973	F	369	77		Attard
b	Abela		25/05/1928	F	984	567		B'Kara
c	Abela		27/05/1928	M	982	567		B'Kara
d	Abela		31/01/1991	M	169	52		Attard BZN03
e	Abela		01/01/1998	M	1000	77		Attard
f	Abela		15/07/1982	M	479	119		Attard
g	Abela		27/10/1995	M	76	52		Attard BZN03
h	Abela		01/01/1955	F	896	519		Attard
i	Abela		01/12/1949	M	1255	59		Attard
j	Abela		01/02/1954	M	175	119		Attard
k	Abela		15/07/1984	F	130	93		Attard BZN13
l	Abela		30/10/1990	M	335	101		B'Kara BKR14
m	Abela		02/07/1959	F	152	104		Attard BZN04
n	Abela		15/12/1946	F	87	59		Attard
o	Abela		05/12/1955	M	147	101		B'Kara BKR14
p	Abela		20/04/1968	M	1155	661		Attard ATD1600
q	Abela		29/11/1998	M	108	77		Attard
r	Abela		11/06/1958	F	259	101		B'Kara BKR14
s	Abela		04/09/1968	F	77	52		Attard BZN03
t	Abela		26/08/1997	M	256	52		Attard BZN03
u	Agius		25/12/1998	F	653	396		Birkirkara BZN04
v	Agius		01/04/1930	M	774	467		Attard
w	Agius		02/06/1940	F	85	58		Attard
x	Agius		15/02/1961	F	295	195		Attard BZN03
y	Agius		08/01/1940	M	900	479		Attard BZN13
z	Agius		29/06/1946	M	137	99		Attard BZN02
	Agius		12/07/1961	M	97	68		Attard BZN12
	Agius		27/03/1972	M	463	282		Attard BZN03
	Agius		10/07/1988	F	782	473		Attard BZN13

Name	A
First name	D
Gender, DOB	F
Listed since	06
ID card	04
Telephone home	42
Job	Bank employee

Text: agius Search Listed Browse Problems Medication Investigations Letters New

	Surname	First name	DOB	Gender	PatNr	FamNr	Address	City
1	Agius							
2	Agius							
3	Agius							
4	Agius							
5	Agius							
6	Agius							
7	Agius							
8	Agius							
9	Agius							
a	Agius							
b	Agius							
c	Agius							
d	Agius							
e	Agius							
f	Agius							
g	Agius							
h	Agius							
i	Agius							
j	Agius							
k	Agius							
l	Agius							
m	Agius							
n	Agius							
o	Agius							

Enter new encounter of Mrs. A [redacted] (79)

Edit ICPC Investigation Medication Referral/consultation Other Lists

BFE RFE cp.2-6 Int. interv. Int. invest. Diagn. Reg. interv. Res. investigation Med.list Prescripitor Other med. Referral

+ Add subcounter

Date: 20/06/2011 Monday Encounter: [dropdown]

Subcounter 1

Type	Icpc	Label

Select code and label of RFE cp.1,7

Code: R05

Label: Cough

Ihesaurus [OK] [Cancel]

Browse Lists [OK] [Cancel]

Find next Find previous Highlight

Patient Family 1234 Numbers

	Number	Average per year
Registration from 02/03/2000 until 20/06/2011	11.30	
encounters	200	17.70
new episodes	75	6.64
old episodes	0	0.00
subencounters	493	43.63
referrals, consultation	26	2.30
medication	454	40.18

Surname	First name	DOB	Gender	PatNr	FamNr	Address	City
---------	------------	-----	--------	-------	-------	---------	------

p	Abela						
q	Abela						
r	Abela						
s	Abela						
t	Abela						
u	Agius						
v	Agius						
w	Agius						
x	Agius						
y	Agius						
z	Agius						

Enter new encounter of Mrs (86)

Edit ICPC Investigation Medication Referral/consultation Other Lists

RFE RFE cp.2-6 Int. interv. Int. invest. Diagn. Res. interv. Res. investigation Med.list Prescripтор Other med. Referral

Add subencounter

Date: 01/08/2018 Wednesday Encounter

Subencounter 1

Type	Icon	Label
------	------	-------

Select diagnosis

ICPC: R74 Upper respiratory infection acute

ICD10: ...

Label: Upper respiratory infection acute

NOX: Certain

IC	New Old/new	Label	First	Last
<input checked="" type="checkbox"/>	R74 Old	Upper respiratory infection acute	11/02/2011	11/02/2011
<input type="checkbox"/>	R74	Upper respiratory infection acute	22/11/2006	22/11/2006
<input type="checkbox"/>	R74	Upper respiratory infection acute	22/09/2004	22/09/2004

Problems Browse Thesaurus Ok Cancel

Browse Lists Ok Cancel

Patient Family 1234 Numbers

Name	
First name	
Gender, DOB	
Listed since	on
ID card	
Telephone home	
Job	

Episode list of Mrs. [redacted]

Text: a

File Edit List

Episode list

Join episodes Info

Browse Medication Investigations Letters Show all Rename Problem +/-

ICPC	ICD10	Label	N	First	Last
K93		Pulmonary embolism	1	01/11/2015	13/02/2016
K87	I11	Hypertensive heart disease	1	02/03/2000	13/01/2016
L91		OA of the shoulders, ankles, elbow	1	14/02/2001	13/01/2016
N87	G20	Parkinsonism	1	22/11/2008	13/01/2016
P06	F51	Sleep disturbance	1	02/03/2000	13/01/2016
P76	F41.2	Mixed anxiety and depressive disorder	1	14/02/2001	13/01/2016
T86		Hypothyroidism/myxoedema	1	02/03/2000	13/01/2016
T93		Lipid disorder, Cholesterol N, HDL high	1	30/03/2000	13/01/2016
A85	T88.7	Tremor due to tricyclic antidepressants	4	22/10/2001	11/01/2016
A88	T69.9	Effect of reduced temperature, unspecified	1	04/01/2012	11/01/2016
L84	M47.8	Spondylosis; lumbar	1	24/01/2005	11/01/2016
A91		Borderline high urea	1	08/08/2014	08/08/2014
A98		Health maintenance/preventive medicine	8	22/10/2001	08/08/2014
L87	M72.2	Plantar; fasciitis	1	16/07/2012	14/07/2014
R05	R05	Cough	1	12/03/2007	14/07/2014
L18		Muscle pain - shoulder and back pain	2	06/10/2006	31/01/2013
A97		Application for social service (telecare)	2	23/04/2007	26/09/2012
Z03	Z59.9	House problem - cold	1	04/01/2012	09/02/2012
L77	S93.4	Sprain/strain of ankle R	1	27/01/2012	27/01/2012
Z01		Poverty/financial problem	1	25/10/2011	25/10/2011
Z10		Health care system problem	1	25/10/2011	25/10/2011
L89	M16	Osteoarthritis of hip	1	10/05/2011	30/05/2011
L90		Osteoarthritis of knee	1	11/03/2011	30/05/2011
N17	R42	Vertigo/dizziness	2	29/10/2005	29/03/2011
R74		Upper respiratory infection acute	3	22/09/2004	11/02/2011
D83	K14.0	Glossitis	2	28/04/2000	11/08/2010
F03	H04.2	Lacrimation; abnormal	1	06/08/2009	11/08/2010
A13	Z71.1	Concern about/fear of medical treatment	1	26/07/2010	26/07/2010
L14	R25.2	Leg/thigh symptom/complaint	1	03/06/2009	28/05/2010
R80		Influenza	1	08/02/2010	12/02/2010
S03	B07	Warts - face	1	24/11/2009	24/11/2009
S06		Rash localized - face, butterfly	1	24/11/2009	24/11/2009
A92		Allergy/allergic reaction to peaches	1	27/08/2009	27/08/2009
H82	H81.1	Benign paroxysmal vertigo	3	16/04/2007	27/08/2009
L17	M77.4	Metatarsalgia	1	06/08/2009	06/08/2009
L99	M88.0	Paget; bone, skull	1	06/08/2009	06/08/2009
H70		Otitis externa	2	18/07/2007	12/03/2009
F70	H10.5	Conjunctivitis infectious	2	22/02/2002	11/02/2009
R23		Voice symptom/complaint	1	16/01/2004	11/02/2009
Z15		Loss/death of partner problem	1	18/05/2007	16/12/2008
L81		Injury left forefinger with kitchen shredder	1	22/09/2008	22/09/2008
F16		Eyelid symptom: itchy after rubbing	1	27/05/2008	27/05/2008
K89		Transient cerebral ischaemia	1	12/10/2007	12/10/2007
Z18		Illness problem with child	1	10/09/2007	10/09/2007
K88		Postural hypotension	1	17/04/2007	17/04/2007
Z14		Partner illness problem	1	22/11/2006	21/03/2007
M108	G25.0	Essential tremor	1	29/03/2005	29/09/2005
66			87		

Print Copy

TD1600

BKR14

ZN03

ZN03

ra BZN04

ZN03

ZN13

ZN02

ZN12

ZN03

ZN13

ZN04

ZN03

ZN04

ra BZN04

ra BZN04

ZN13

ZN04

ZN12

ZN03

ra BZN04

ZN12

ZN12

ZN02

ZN10

wl il-Bahar BZN03

wl il-Bahar BZN03

's Bay

TD1081

TD1081

Text: Agius Search Listed Browse Problems Medication Investigations Letters New

Surname	First name	DOB	Gender	PatNr	FamNr	Address	City
1	Agius						
2	Agius						
3	Agius						
4	Agius						
5	Agius						
6	Agius						
7	Agius						

Episode list of Mrs. Agius, [redacted]

Problem list Browse Medication Investigations Letters Show all Rename Pro

Join episodes Info

ICPC	ICD10	Label	N	First	Last
K87	I11	Hypertensive heart disease	1	02/03/2000	31/05/2011
T93		Lipid disorder	1	30/03/2000	31/05/2011
L84	M47.8	Spondylosis; lumbar	1	24/01/2005	30/05/2011
L89	M16	Osteoarthritis of hip	1	10/05/2011	30/05/2011
L90		Osteoarthritis of knee	1	11/03/2011	30/05/2011
P76	F41.2	Mixed anxiety and depressive disorder	1	14/02/2001	30/05/2011
P06	F51	Sleep disturbance	1	02/03/2000	09/05/2011
N17	R42	Vertigo/dizziness	1	05/11/2010	29/03/2011
N87	G20	Parkinsonism	1	22/11/2008	29/03/2011
T86		Hypothyroidism/myxoedema	1	02/03/2000	29/03/2011
R74		Upper respiratory infection acute	1	11/02/2011	11/02/2011
A85	T88.7	Cough secondary to Perindopril or Sinemet	4	22/10/2001	27/09/2011
A92		Allergy/allergic reaction to peaches	1	27/08/2009	27/08/2009
H82	H81.1	Benign paroxysmal vertigo	3	16/04/2007	27/08/2009
K89		Transient cerebral ischaemia	1	12/10/2007	12/10/2007
D87		Gastritis	1	21/11/2001	14/12/2007
L91		OA of the shoulders, ankles, elbow	1	02/03/2000	29/10/2007
T82		Obesity	1	02/03/2000	24/01/2007
S02		Scalp pruritus	1	02/03/2000	15/10/2006
A98		Breast examination	2	22/10/2001	22/09/2009
L98		Flat foot	1	06/01/2004	06/01/2004
S99		Pyogenic granuloma	1	06/01/2004	06/01/2004
K83	I08	Multiple valve diseases	1	31/05/2000	27/10/2007
K94		Phlebitis/thrombophlebitis	1	02/03/2000	02/03/2000
24			30		

Print Copy

Subcounters of Mrs. Agius, F [redacted] with episode K87

All Graph Delete Edit

Enc.date	Enc.type	Id	RFE cp.1,7	RFE cp.2-6	History	Intern.int.	Dia	ICD10	Diagn.label	Stat.
31/05/2011	R	J		K50				K87 I11	Hypertensive heart disease	0
30/05/2011	R	J		K31		K31		K87 I11	Hypertensive heart disease	0
10/05/2011	E	J		K31		K31		K87 I11	Hypertensive heart disease	0
29/03/2011	R	J		K50				K87 I11	Hypertensive heart disease	0
11/02/2011	E	J		K31		K31		K87 I11	Hypertensive heart disease	0
26/01/2011	R	J		K50				K87 I11	Hypertensive heart disease	0
27/11/2010	R	J		K50				K87 I11	Hypertensive heart disease	0
27/09/2010	R	J		K50,K64		K31		K87 I11	Hypertensive heart disease	0
06/09/2010	E	J		K64		K31		K87 I11	Hypertensive heart disease	0
11/08/2010	E	J		K45,K50		K31		K87 I11	Hypertensive heart disease	0
26/07/2010	R	J	A13,R02,R05	K50,K31		K31,K45		K87 I11	Hypertensive heart disease	0
28/05/2010	R	J		K50				K87 I11	Hypertensive heart disease	0
19/04/2010	R	J		K50				K87 I11	Hypertensive heart disease	0
05/04/2010	E	J		K50				K87 I11	Hypertensive heart disease	0
06/01/2010	T	J		K45,K50		K45		K87 I11	Hypertensive heart disease	0
05/01/2010	E	J		K50				K87 I11	Hypertensive heart disease	0
24/11/2009	R	J		K50				K87 I11	Hypertensive heart disease	0
06/08/2009	E	J		K50				K87 I11	Hypertensive heart disease	0
03/06/2009	E	J		K50,A30		A31,K31		K87 I11	Hypertensive heart disease	0
25/04/2009	R	J		K50				K87 I11	Hypertensive heart disease	0
12/03/2009	E	J		K31,K45		K31		K87 I11	Hypertensive heart disease	0
16/02/2009	E	J		K31,K50		K31,K45		K87 I11	Hypertensive heart disease	0

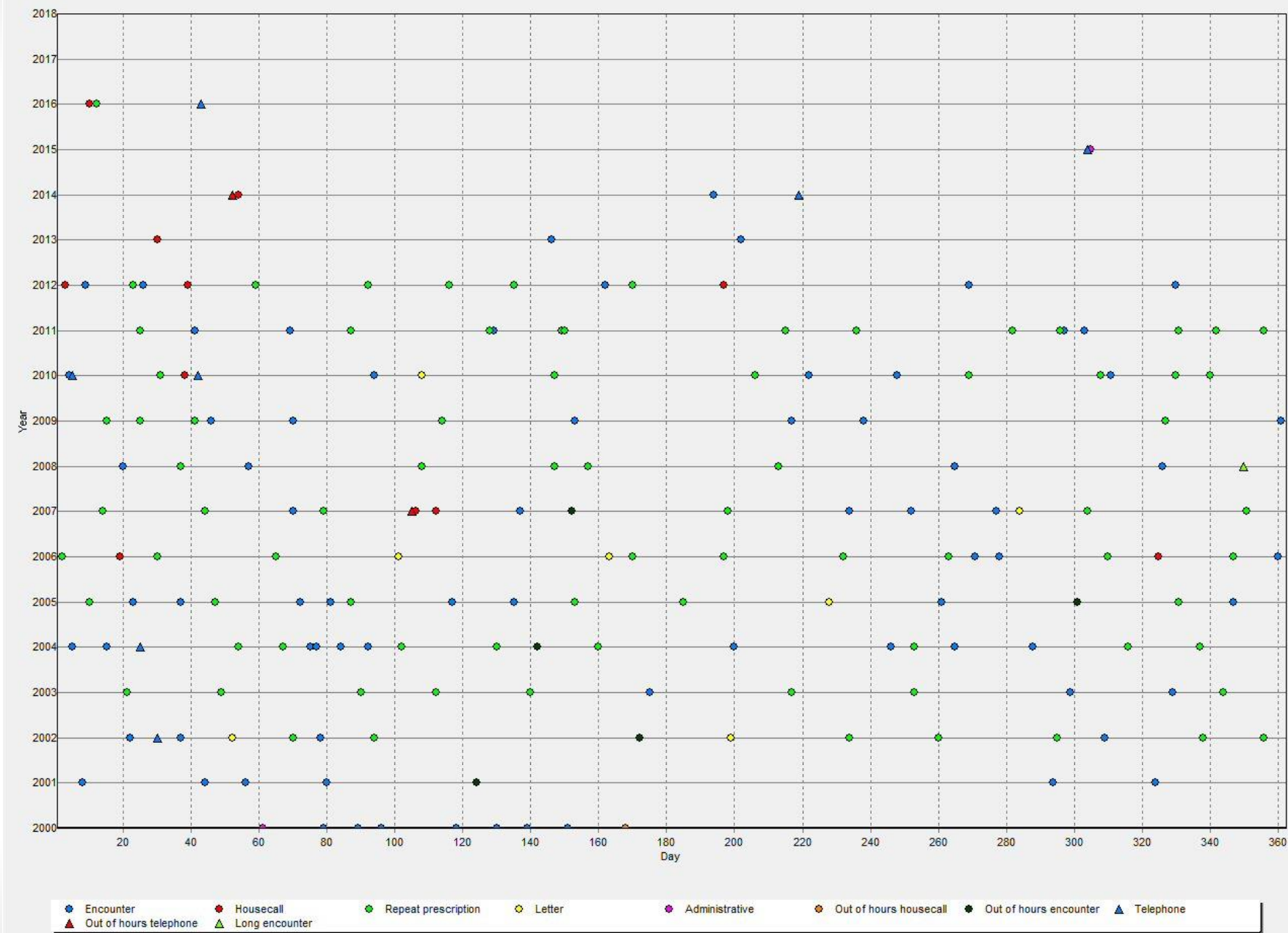
Codes and labels

Rfe cp.2-6	K31	Medical examination/health evaluation-partial
Intern.int.	K31	Medical examination/health evaluation-partial
Intern.investigations	Systolic blood pressure	130
	Diastolic blood pressure	75
Diagnosis	K87, Old	I11 Hypertensive heart disease

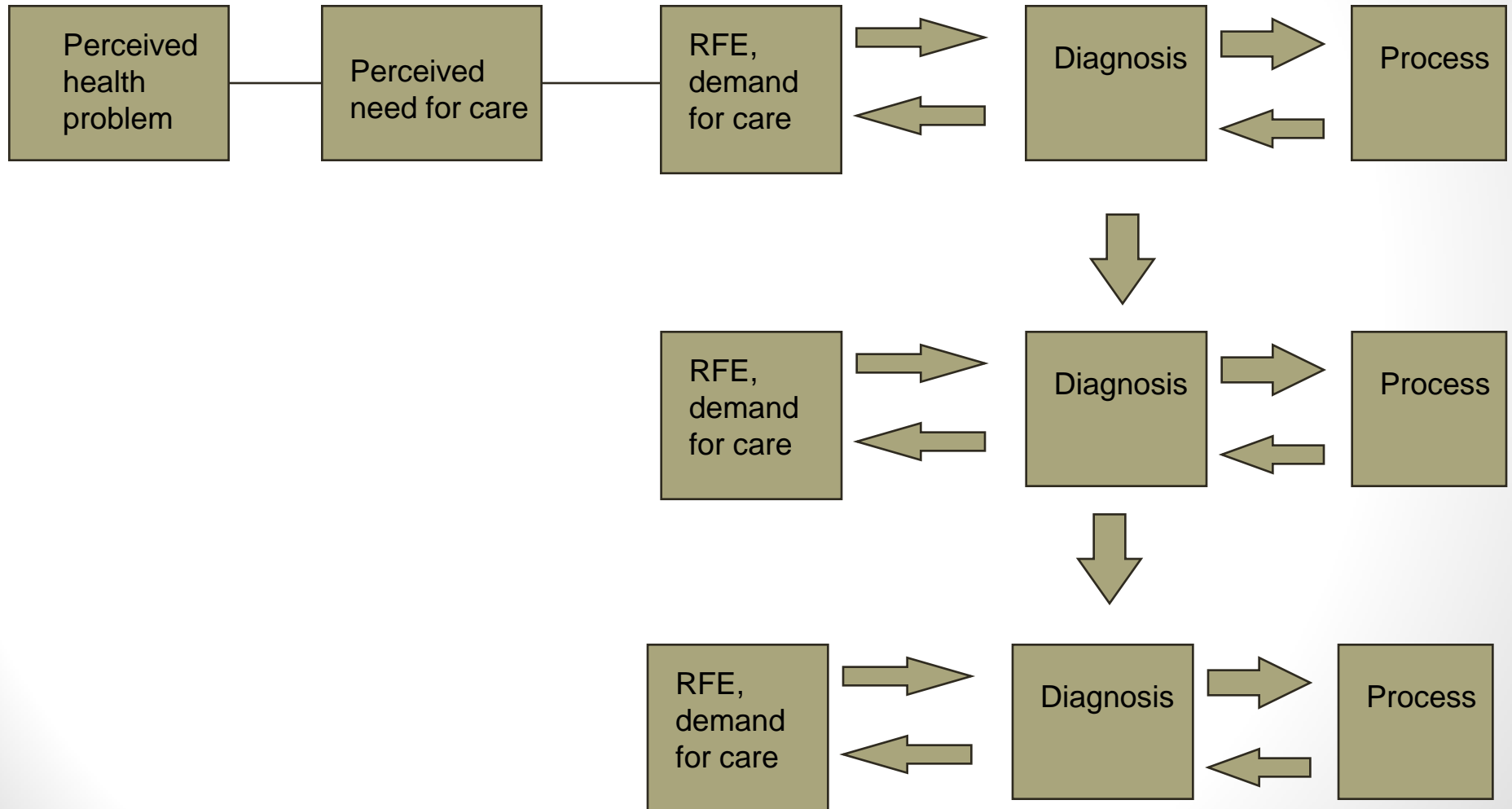
Find next Find previous Highlight

Patient Family 1234 Numbers

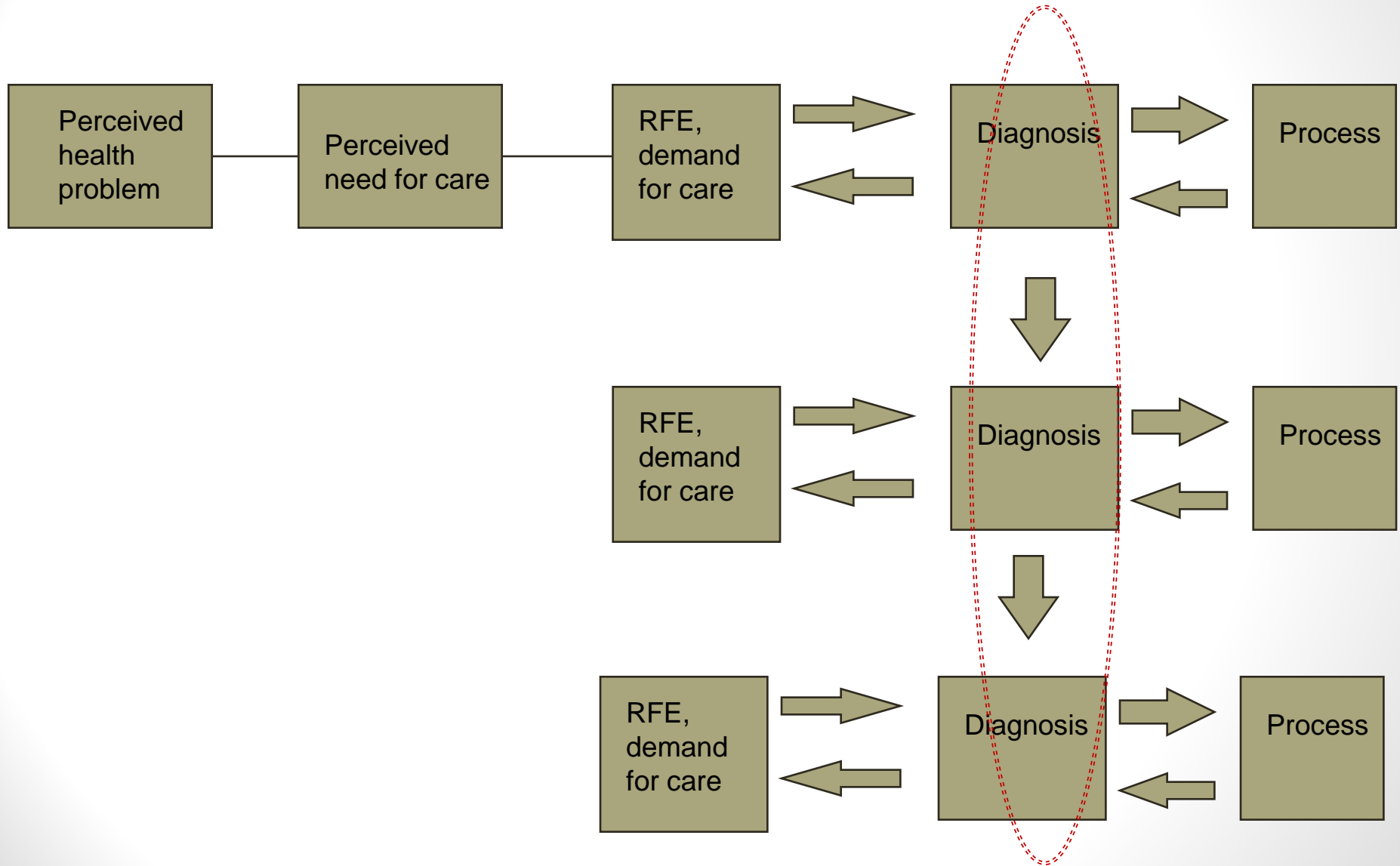
	Number
Registration from 02/03/2000 until 20/06/2011	11.30
encounters	200
new episodes	75
old episodes	0
subcounters	493
referrals, consultation	26
medication	454



Episodes of care over time

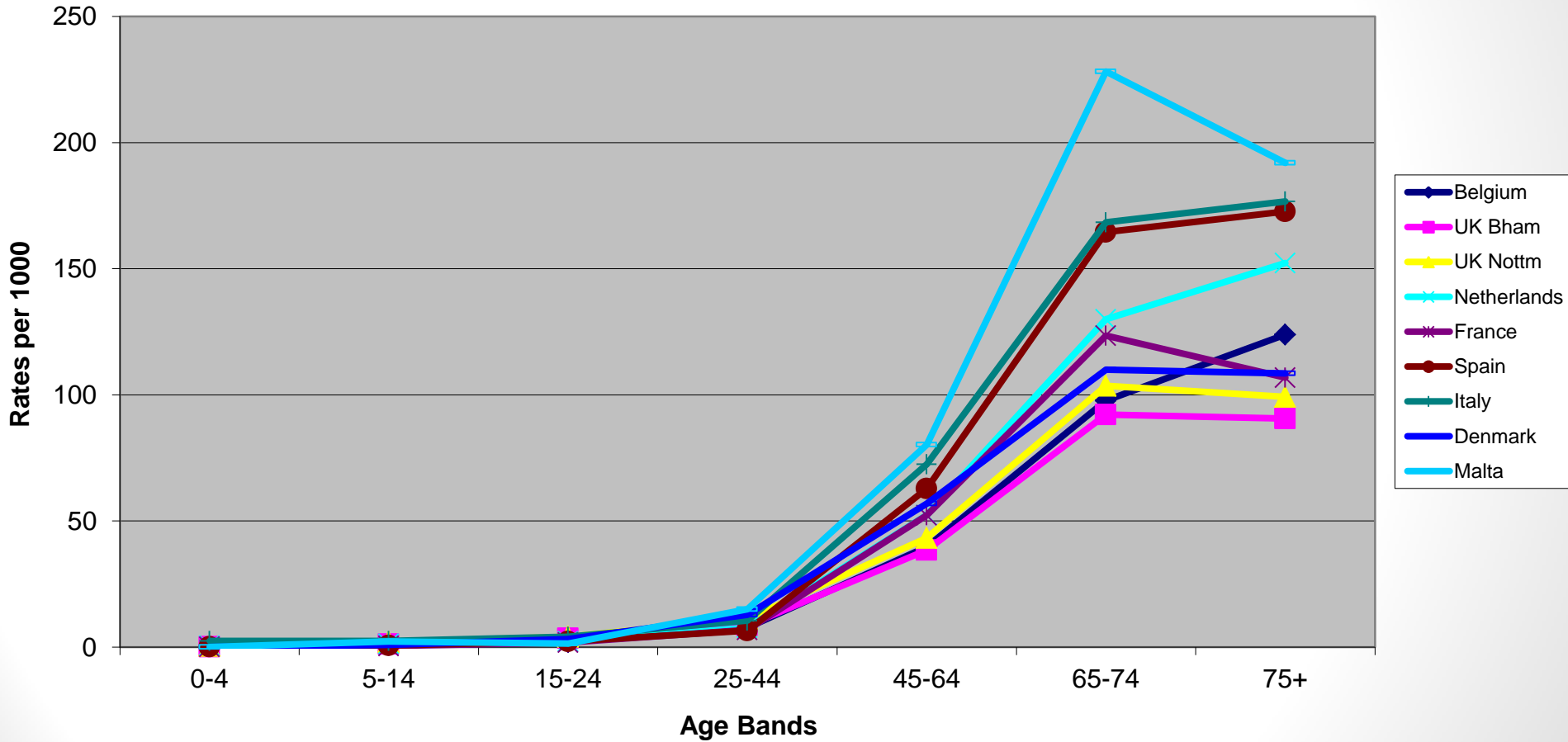


Episodes of care over time



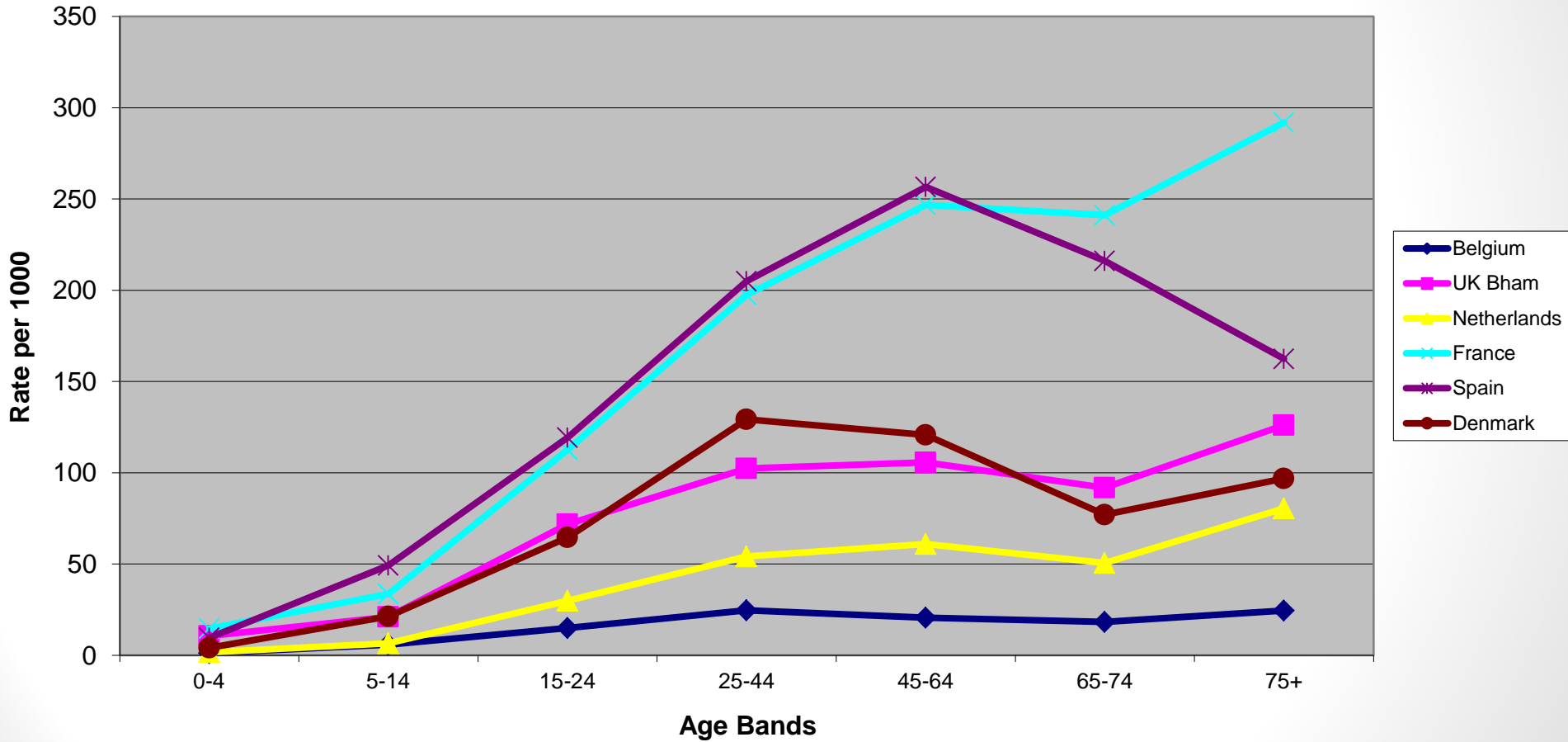
Diabetes Prevalence All

non standardised data



All Dr Assessed Mental Illness Prevalence

non standardised data



Comparing incidence and prevalence of episode titles

	The Netherlands				Malta				Serbia			
	Incidence		Prevalence		Incidence		Prevalence		Incidence		Prevalence	
	Rate	Standardised	Rate	Standardised	Rate	Standardised	Rate	Standardised	Rate	Standardised	Rate	Standardised
Diagnosis												
All chapter P component 7	21.0	21.3	69.6	70.7	12.2	13.5	42.5	51.5	23.3	18.3	81.0	61.5
All chapter P	80.5	81.4	206.4	210.5	31.0	34.0	95.6	110.6	38.7	32.2	113.3	88.0

70.7 p 1000 py (NI) 51.5 p 1000 py (Mt) 61.5 p 1000 py (Sb)

Distribution of prevalences

per 1000 patients per year

Prevalence	Number of diagnoses
> 5	150
1-5	250
0.1-1	1500
0.01-0.1	2000
< 0.01	4000

SYMPTOMS

DIAGNOSES

200

400

**ICPC:
> 1 PER 1000
PPY**

600

10.000

**ICD:
<1 PER 1000
PPY**

Granularity of ICPC

TABLE 1 Ranking of the prevalences (described as rates per 1000 patient years) of ICPC classes for diagnoses presenting in family practice, with the width of the 95% CI for the observation within 1 practice (1356 patient years), 10 practices (13 560 patient years) and 100 practices (135 600 patient years)

ICPC class	Rank in prevalence	Prevalence per 1000 patient years	95% CI width for 1356 patient years	95% CI width for 13 560 patient years	95% CI width for 135 600 patient years
K86/87 (hypertension)	3	80	31	9	3
R74 (URTI)	8	54	25	5	2
N89 (migraine)	51	15	14	4	1
B80 (iron deficiency anaemia)	75	11	12	4	1
B81 (pernicious anaemia)	241	3	6	2	0.6
A20 (euthanasia discussion/request)	316	2	6	2	0.4
P77 (suicide attempt)	397	1	4	1	0.3
N86 (multiple sclerosis)	434	1	3	1	0.3
D76 (pancreatic malignancy)	587	0.2	2	0.5	0.2
A73/(malaria)	609	0.1	1	0.5	0.1

Source: EFP-extended.¹⁷

ICPC2-ICD10 THESAURUS

**A diagnostic Terminology for Semi-automatic Double Coding
in Electronic Patient Records**

Henk Becker, SibO Oskam, Inge Okkes, Kees van Boven, Henk Lamberts
Academic Medical Center/University of Amsterdam
Department of Family Medicine



University of Amsterdam

Amsterdam, 2005



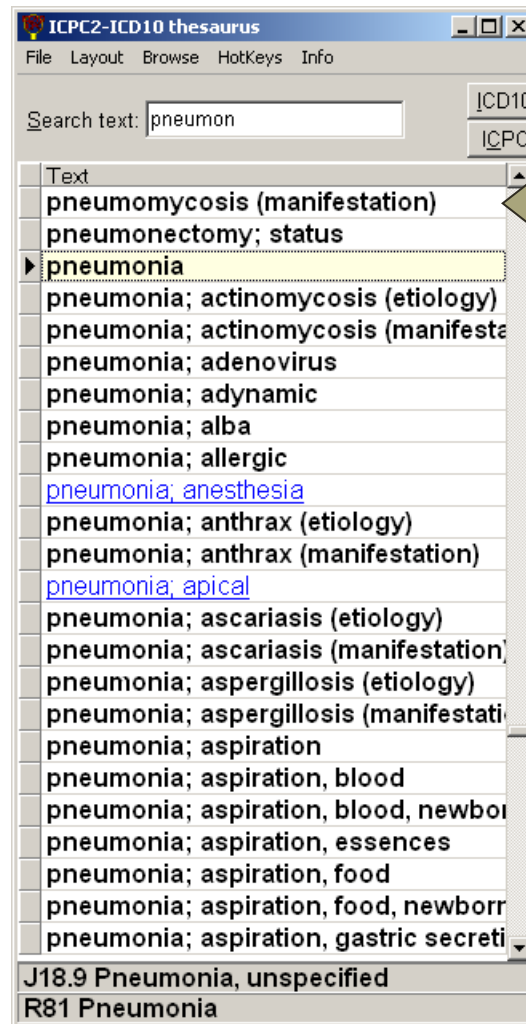
Example:

In the Search text box, you type 'pneumonia',

Search text:

Text
pneumohydrothorax
pneumohydrothorax
pneumomediastinum
pneumomediastinum; congenital or perinatal
pneumomycosis (etiology)
pneumomycosis (manifestation)
pneumonectomy; status
▶ pneumonia
pneumonia; actinomycosis (etiology)
pneumonia; actinomycosis (manifestation)
pneumonia; adenovirus
pneumonia; adynamic
pneumonia; alba
pneumonia; allergic
pneumonia; anesthesia
pneumonia; anthrax (etiology)

there are many types of pneumonia in ICD-10,



Say we want to select 'pneumonia; Haemophilus influenzae' (typing 'pneum;h' will do)..

ICD2-ICD10 thesaurus

File Layout Browse HotKeys Info

Search text:

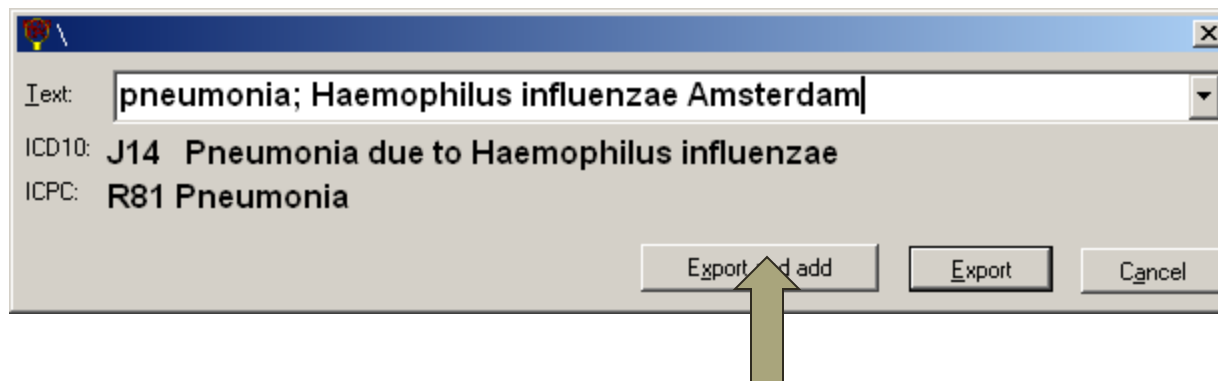
ICD10
ICPC

Text
pneumonia; Enterobacter
pneumonia; eosinophilic
pneumonia; Escherichia coli
pneumonia; fibroid
pneumonia; fibroid
pneumonia; Friedländer's bacil
pneumonia; fumes and vapors
pneumonia; fungus
pneumonia; gangrenous
pneumonia; giant cell (etiology)
pneumonia; giant cell (manifestation)
pneumonia; gonococcal (etiology)
pneumonia; gonococcal (manifestation)
pneumonia; gonorrhoea (etiology)
pneumonia; gonorrhoea (manifestation)
pneumonia; grippal
▶ pneumonia; Haemophilus influenzae

J14 Pneumonia due to Haemophilus influenzae
R81 Pneumonia

..double click, and the export box shows.

Suppose you want to add a new type (e.g., 'Amsterdam'). You can add that term, and also you may add this new type to your Thesaurus.. just click 'Export and add'...



Search text: ICD10
ICPC

- Text
- synovium; hypertrophy
- synovium; rupture
- synovium; syphilitic (etiology)
- synovium; syphilitic (manifestation)
- synovium; syphilitic, congenital (early) (etiology)
- synovium; syphilitic, congenital (early) (manifestation)
- syphiliid
- syphiliid; congenital
- syphiliid; newborn
- syphiliid; tubercular (etiology)
- syphiliid; tubercular (manifestation)
- syphiliid; tubercular, congenital
- ▶ syphilis
 - syphilis; , vitreous, hemorrhage (manifestation)
 - syphilis; abdomen
 - syphilis; adenopathy
 - syphilis; adrenal (etiology)
 - syphilis; adrenal (manifestation)
 - [syphilis; age under 2 years](#)
 - syphilis; age under 2 years
 - syphilis; age under 2 years, acquired
 - syphilis; alopecia (etiology)
 - syphilis; alopecia (manifestation)
 - syphilis; anemia (etiology)
 - syphilis; anemia (manifestation)

Select ICPC code:

Code	Label
▶ X70	Syphilis female
Y70	Syphilis male

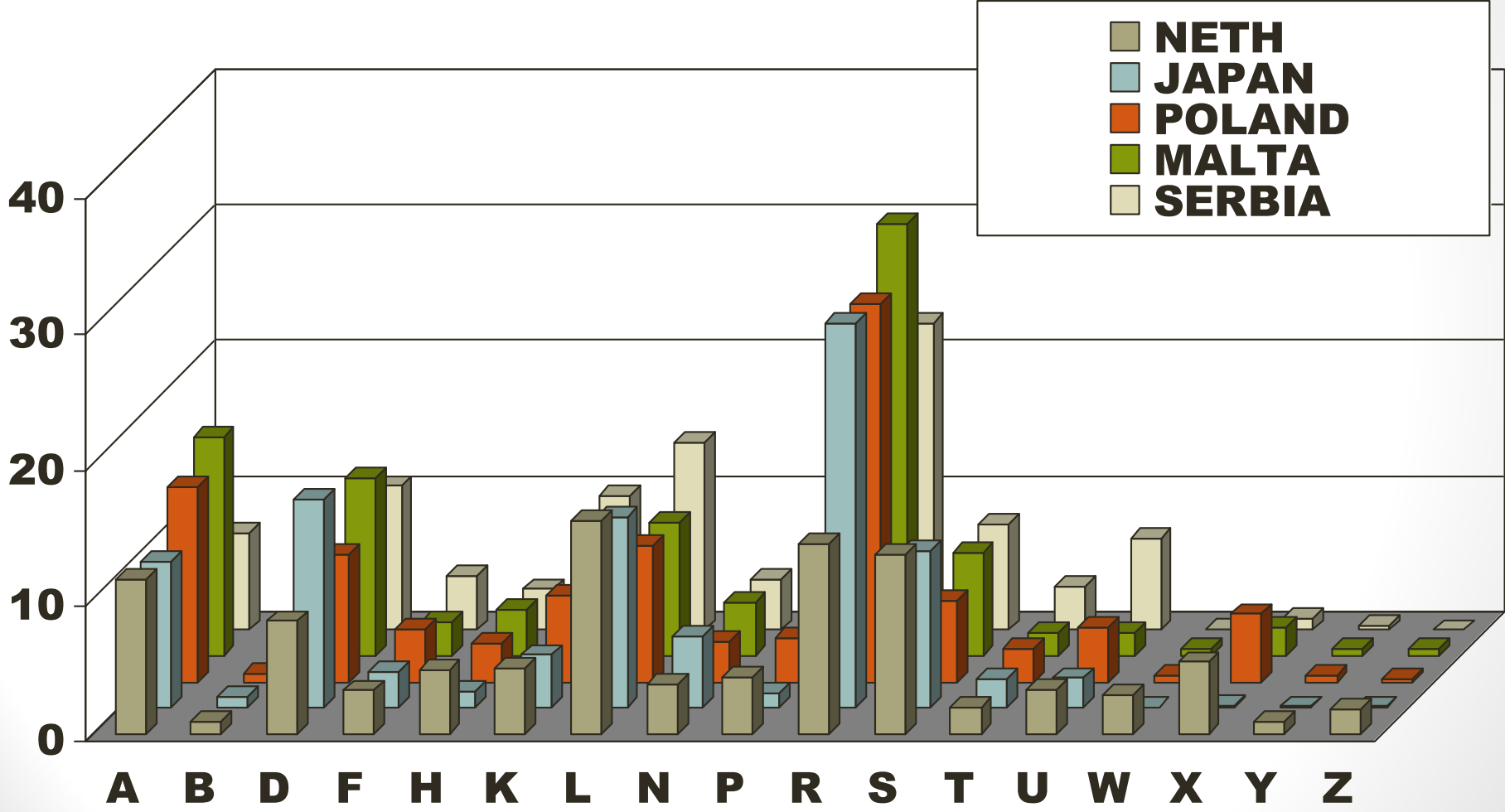
OK Cancel

Mapping to ICD9:

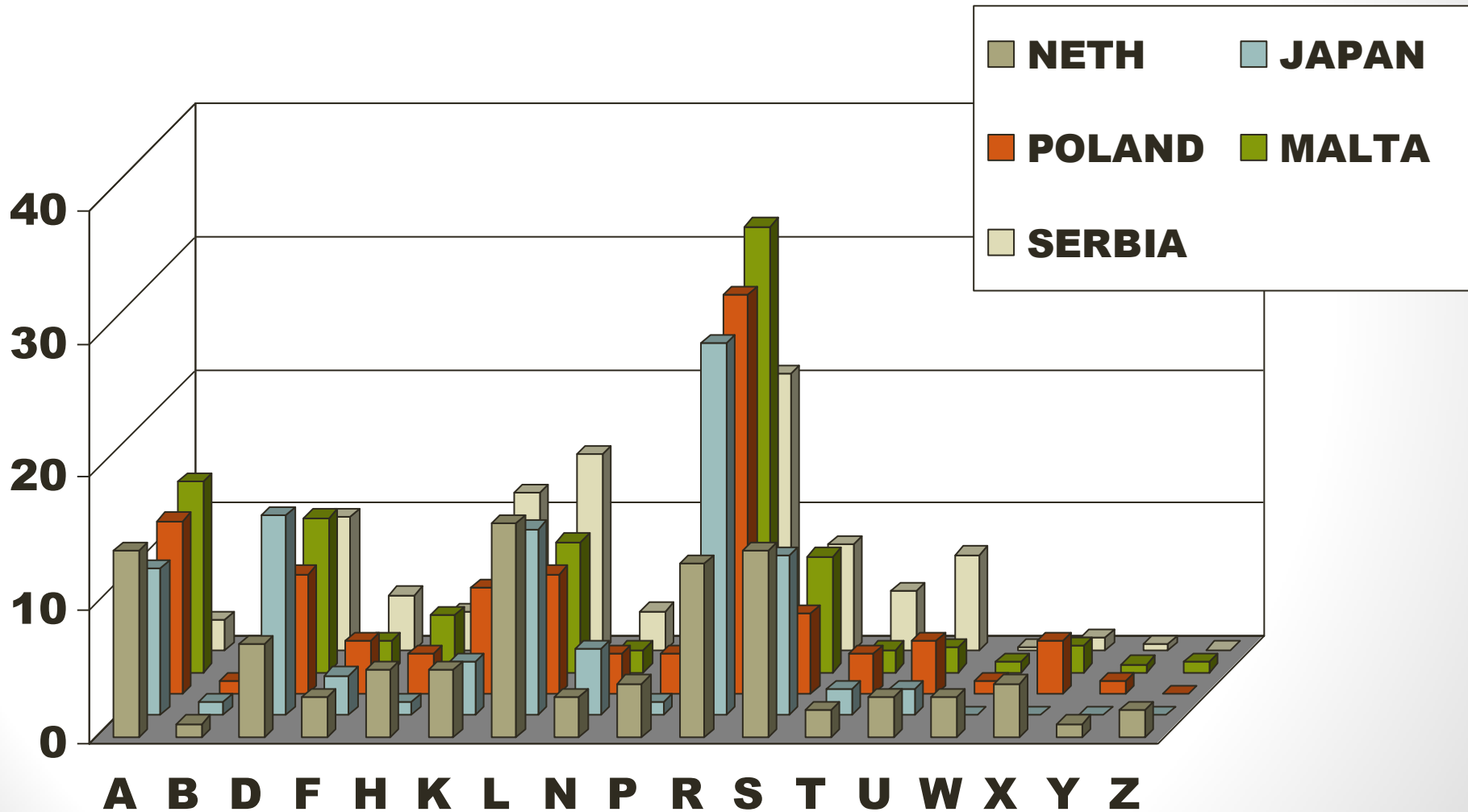
▶ 097.9 Syphilis nos

ICPC allows high quality data
reduction and output

REASONS FOR ENCOUNTER AT START OF EPISODE BY ICPC-CHAPTER (%)



NEW EPISODES OF CARE BY ICPC-CHAPTER (%)



Incidence and prevalence

			NI Incidence				NI Prevalence				Mt		Mt Incidence				Mt Prevalence				Sb		Sb Incidence				Sb Prevalence			
Rank	Code	Label	p1000py EU 2005		p1000py EU2005		Rank	p1000py EU 2005		p1000py EU2005		Rank	p1000py EU 2005		p1000py EU2005		Rank	p1000py EU 2005		p1000py EU 2005		Rank	p1000py EU 2005		p1000py EU 2005		p1000py EU 2005		p1000py EU 2005	
1	R05	Cough	121.8	119.7	164.8	162.2	1	188.9	167.8	243.5	219.5	1	33.7	32.0	164.9	147.4														
2	A03	Fever	58.2	55.2	71.5	68.0	4	114.8	92.9	130.6	106.3	12	5.1	5.4	16.4	15.7														
3	S06	Local redness/erythema/rash	56.7	56.2	70.6	70.2	10	31.7	30.6	38.2	37.4	39	1.9	1.7	3.7	3.0														
4	R21	Sympt/complnt throat	50.6	50.8	61.2	61.5	2	168.0	150.3	184.2	165.0	2	18.6	20.1	55.8	58.4														
5	A04	General weakness/tiredness	49.5	49.8	76.4	77.1	14	23.8	26.2	34.0	40.2	17	4.0	3.3	45.5	32.3														
6	S04	Local swelling/papul/lump/mass	47.9	48.2	54.9	55.3	20	15.0	15.3	17.7	18.4	33	2.4	2.2	4.7	4.1														
7	L03	Low back complt excl radiation	46.0	46.9	75.6	77.1	34	8.6	9.4	13.3	15.2	14	4.9	3.9	56.7	41.9														
8	D06	Other localized abdominal pain	37.9	38.2	60.9	61.6	7	37.9	37.7	50.0	51.9	27	2.7	2.3	8.2	6.4														
9	H01	Ear pain/earache	36.1	34.5	43.3	41.4	8	37.8	32.4	42.4	36.5	16	4.2	3.9	11.7	10.4														
10	N01	Headache (excl N02 N89 R09)	35.8	36.0	53.2	53.5	9	32.4	30.7	45.0	44.3	6	7.2	6.4	51.4	39.3														
11	R02	Shortness of breath dyspnea	33.0	33.1	71.3	72.0	27	10.3	11.7	21.8	26.4	33	2.4	2.1	20.6	15.5														
12	L08	Shoulder symptoms/complaints	31.7	32.4	49.8	50.9	28	9.9	11.5	13.6	16.5	46	1.6	1.4	9.7	7.6														
13	L17	Foot & toe symptoms/complaints	31.1	31.5	41.4	42.0	21	14.7	16.8	19.4	23.1	59	1.0	0.9	3.9	3.0														
14	L15	Knee symptoms/complaints	30.5	31.1	48.6	49.8	24	12.5	13.9	17.7	20.8	28	2.7	2.3	16.5	12.6														
15	S02	Pruritus	29.2	29.3	41.7	42.0	19	16.0	15.2	20.3	19.7	11	5.7	5.1	14.7	11.4														
16	R74	URI (head cold)	28.8	28.4	34.4	33.9	40	5.9	5.8	8.0	7.7	111	0.3	0.4	0.6	0.6														
17	L01	Neck sympt/complnt excl headache	28.5	28.8	43.6	44.2	18	16.6	16.5	21.5	22.2	4	8.6	6.9	97.8	68.7														
18	L14	Leg/thigh symptoms/complaints	27.8	28.6	45.1	46.5	22	13.4	16.3	20.1	26.1	35	2.2	1.9	15.4	11.5														
19	H02	Hearing complaints (excl H84)	27.6	27.8	36.4	36.6	51	4.7	5.2	6.1	6.9	36	2.2	1.8	3.6	2.8														
20	L04	Chest symptoms/complaints	25.1	25.7	35.4	36.2	16	21.1	24.0	28.1	32.7	26	2.8	2.7	16.2	12.3														
21	N17	Vertigo/dizziness	24.1	24.8	38.0	39.0	15	23.8	26.4	34.2	39.3	21	3.4	2.4	14.9	10.2														
22	D11	Diarrhoea	22.2	21.9	29.8	29.5	6	41.1	37.7	47.2	44.2	13	5.0	5.1	12.5	12.3														
26	U02	Urinary frequency/urgency	17.5	17.8	22.4	22.9	36	7.4	8.3	9.4	10.9	15	4.8	4.0	20.1	14.6														
27	U01	Dysuria/painful urination	17.3	17.6	21.5	21.9	25	11.4	11.5	13.6	14.2	9	6.0	4.8	27.0	21.1														
28	D09	Nausea	17.1	17.4	24.6	25.0	13	27.0	25.8	33.0	32.4	25	2.9	2.7	9.8	8.3														
29	L02	Back symptom/complaint	16.9	17.3	24.8	25.2	12	27.6	29.9	37.1	41.7	5	8.0	7.1	58.0	43.6														
34	D10	Vomiting	15.0	14.5	20.0	19.4	5	41.7	35.1	47.2	40.5	42	1.7	1.9	4.6	4.3														
35	D01	Abdominal pain/cramps general	14.9	14.7	24.5	24.3	11	29.1	26.7	36.0	34.2	7	6.7	6.2	40.5	33.2														
36	P01	Feeling anxious/nervous/tense	14.7	14.9	30.8	31.4	29	9.8	10.8	25.8	29.4	8	6.2	5.0	80.5	58.9														
39	F02	Red eye	13.3	13.3	15.3	15.3	26	10.6	9.8	12.3	11.4	18	3.8	3.4	8.2	6.9														
41	D02	Abdominal pain epigastric	12.3	12.5	20.6	21.0	58	3.7	4.0	5.6	6.5	10	5.8	4.9	32.1	25.9														
53	R07	Sneezing/nasal congestion	9.2	9.2	12.7	12.7	3	135.1	113.8	157.7	133.7	52	1.2	1.2	3.3	3.6														
75	S07	Rash generalized	6.0	5.7	7.2	6.9	17	17.0	13.9	20.7	17.0	100	0.3	0.4	0.6	0.6														
78	K02	Pressure/tightness of heart	5.5	5.7	10.8	11.2	122	1.1	1.6	2.1	3.2	19	3.5	2.9	69.7	51.7														
123	A05	Feeling ill	3.5	3.6	8.6	8.7	154	0.7	0.8	0.9	1.2	20	3.4	2.9	10.4	7.9														
129	R01	Pain respiratory system	3.2	3.3	4.5	4.5	82	2.2	2.3	2.9	3.0	3	12.8	11.3	94.4	80.9														
36 ranks	Total Rfe 2-6 (p1000py)		2048.1		3295.3		1549.6		2043.8		281.8		1767.5																	
Proportion Rfe 2-6 of Top 20 distribution (N)			Rfe 2-6	T20 Rfe	38%		Rfe 2-6	T20 Rfe	20%		Rfe 2-6	T20 Rfe	57%																	
			65356	170939			10745	52616			13061	22815																		

Incidence and prevalence

			NI Prevalence		NI Incidence			NI Prevalence		NI Incidence			Sb Prevalence		Sb Incidence	
Rank	Code	Label	p1000py	EU2005	p1000py	EU2005	Rank	p1000py	EU2005	p1000py	EU2005	Rank	p1000py	EU2005	p1000py	EU2005
1	A98	Prevention	171.4	175.6	97.9	99.0	2	111.6	131.8	90.4	107.7	50	5.3	4.6	4.5	3.9
2	W11	Family plan/oral contraceptive	93.0	93.7	12.6	13.1	127	2.3	-	1.5	-	-	0.0	-	0.0	-
3	K86	Uncomplicated hypertension	75.7	79.2	5.3	5.5	7	41.1	59.9	4.6	6.2	1	114.1	79.8	19.3	14.4
4	S88	Contact dermatitis/other eczema	59.9	60.3	32.1	32.2	39	7.8	7.0	6.9	6.2	44	6.2	5.1	4.4	3.8
5	P06	Disturbances of sleep/insomnia	57.9	59.8	17.2	17.5	81	3.8	5.9	1.1	1.5	51	5.2	3.5	2.1	1.5
6	U71	Cystitis/other urin infect NOS	57.5	59.0	48.9	50.2	21	17.1	17.6	15.2	15.5	6	49.5	36.5	25.9	19.6
7	L03	Low back complt excl radiation	55.7	56.9	41.0	41.7	90	3.5	3.7	2.6	2.8	43	6.4	4.7	2.5	2.0
8	R74	URI (head cold)	53.7	52.4	50.5	49.2	1	205.7	177.3	202.0	174.1	2	99.5	92.5	47.2	44.6
9	R05	Cough	50.6	50.1	42.3	41.8	10	27.6	24.3	23.0	20.3	96	2.3	2.4	1.4	1.6
10	R78	Acute bronchitis/bronchiolitis	48.6	48.2	41.8	41.3	6	43.4	41.7	42.0	40.0	5	50.7	44.9	25.5	23.0
11	A97	No disease	48.3	48.6	43.2	43.4	5	44.3	47.3	42.3	44.9	173	0.9	1.0	0.6	0.7
12	S74	Dermatophytosis	47.2	47.9	32.9	33.2	34	9.5	10.0	7.8	8.0	72	3.2	2.9	2.2	2.1
13	H81	Excessive ear wax	43.6	44.7	39.2	40.2	31	11.1	12.3	9.4	10.3	101	2.1	1.8	1.8	1.5
14	R96	Asthma	40.9	40.4	6.7	6.5	8	39.3	35.7	12.1	10.7	62	4.0	3.5	0.7	0.7
15	T93	Lipid metabolism disorder	39.4	41.4	7.5	7.9	14	21.6	28.8	9.1	11.4	17	19.6	14.9	11.1	8.6
16	R97	Hayfever/allergic rhinitis	38.7	39.0	8.8	8.8	11	25.4	23.2	10.0	9.0	209	0.7	0.7	0.4	0.4
17	A04	General weakness/tiredness	37.5	38.0	30.6	30.9	65	4.8	5.4	4.2	4.5	123	1.5	1.2	0.9	0.8
18	P76	Depressive disorder	36.1	36.9	10.1	10.2	15	21.4	25.8	6.7	7.5	31	9.7	7.1	2.4	1.8
19	R75	Sinusitis acute/chron	35.9	35.9	30.8	30.8	16	20.8	18.8	18.3	16.3	27	10.9	9.9	5.0	4.5
20	A85	A/dv effect med agent proper dose	35.8	36.9	30.7	31.6	17	20.8	24.0	14.5	17.5	361	0.2	0.2	0.1	0.1
24	T90	Diabetes non-insulin dependent	31.9	33.3	4.1	4.3	19	17.8	28.8	3.1	4.5	11	28.4	19.9	4.6	3.3
25	P01	Feeling anxious/nervous/tense	29.8	30.9	12.7	13.1	26	12.8	14.2	7.5	8.2	20	14.1	10.7	4.4	3.7
27	L86	Back syndrome with radiating pain	24.3	24.9	12.8	13.1	28	12.1	14.7	7.1	8.5	7	43.1	32.0	12.4	9.6
41	D87	Stomach function disorder	18.8	19.4	7.6	7.8	32	10.9	11.3	8.0	7.6	14	21.0	16.9	10.2	8.4
46	K85	Elevated blood pressure	16.4	17.0	8.0	8.2	38	8.1	9.9	5.7	7.2	9	42.3	30.1	8.7	6.8
48	D73	Gastroenteritis presumed infection	15.9	15.5	15.3	14.9	3	80.6	70.7	79.6	69.9	30	10.0	8.7	5.7	5.4
49	R76	Tonsillitis acute	15.5	15.3	14.7	14.5	9	34.4	26.9	32.4	25.4	12	25.6	29.0	13.8	15.5
54	K74	Ischaemic heart dis with angina	15.2	16.0	2.7	2.8	71	4.5	7.9	1.3	1.9	16	19.7	14.0	3.6	2.6
55	R77	Laryngitis/tracheitis acute	15.0	15.1	13.9	14.0	20	17.8	15.6	16.8	14.8	37	7.7	6.2	4.3	3.6
59	K77	Heart failure	14.4	14.9	3.5	3.6	62	5.1	10.4	2.0	3.9	19	14.3	10.2	2.7	2.0
77	L18	Muscle pain	11.1	11.4	7.3	7.4	4	45.0	48.1	40.5	43.2	270	0.4	0.3	0.2	0.2
83	K87	Hypertension complicated	10.3	10.9	0.5	0.5	98	3.3	6.2	0.2	0.3	13	23.2	15.3	4.2	2.7
88	R80	Influenza	9.6	9.6	9.4	9.4	12	25.2	22.8	24.8	22.3	97	2.2	2.0	1.3	1.2
118	P17	Tobacco abuse	7.6	7.7	4.4	4.5	18	19.9	21.3	1.5	1.5	39	7.2	7.3	6.4	6.5
102	P74	Anxiety disorder/anxiety state	8.8	8.9	2.0	2.0	24	14.7	18.3	3.8	4.2	3	60.5	44.3	19.1	14.7
128	L83	Neck syndrome	6.9	7.1	2.4	2.5	74	4.3	4.4	3.4	3.4	8	42.5	30.8	11.8	9.1
162	L84	Back syndrome without radiat pain	5.2	5.4	1.2	1.3	141	2.0	2.8	1.0	1.3	4	52.9	39.7	14.2	11.8
226	D85	Duodenal ulcer	3.4	3.5	0.6	0.6	415	0.2	0.3	0.0	-	10	35.1	26.2	11.2	8.6
267	K80	Cardiac arrhythmia NOS	2.6	2.7	1.0	1.0	479	0.1	0.2	0.0	-	15	20.3	14.6	4.7	3.7
282	R79	Chronic bronchitis	2.4	2.5	0.5	0.5	188	1.3	2.0	0.5	0.7	18	19.3	14.5	4.7	3.5
441	R29	Respiratory symptom/complaint other	0.7	0.7	0.6	0.6	13	24.4	22.2	23.6	21.3	240	0.5	0.5	0.2	0.3
41 ranks		Total Episodes of care (p1000py)	3503.2		2130.1			1731.4		1281.0			1419.1		566.5	
		Proportion Top 20 EoC of whole distribution	32%					51%					56%			

Bayes theorem

<i>Crosstab of diagnosis against RfE at the start of a new EoC</i>			
	With bronchitis (R78)	With any other EoC	Total
With cough (R05)	4717 (24.4%)	14578 (75.6%)	19295
With any other RfE	1899 (0.6%)	316154 (99.4%)	318053
Total	6616 (2.0%)	330732 (98.0%)	337348
LR+: 16.2	LR-: 0.3	Odds: 53.9	
C. Int.: 15.8 - 16.5	C. Int: 0.3 - 0.3	C. Int.: 51.0 - 57.0	
Sens: 0.71	PV+: 0.24	Pretest 0.02	
Spec: 0.96	PV-: 0.99	Posttest: 0.32	

Okkes IM, Oskam SK, Lamberts H. The probability of specific diagnoses for patients presenting with common symptoms to Dutch family physicians. J Fam Pract. 2002 Jan; 51(1):31-6.

Okkes IM, Oskam SK, Van Boven K, Lamberts H. EFP. (2005). Episodes of Care in Family Practice. Epidemiological data based on the routine use of the International Classification of Primary Care (ICPC) in the Transition Project of the Academic Medical Center/University of Amsterdam. (1985–2003). In: Okkes IM, Oskam SK, Lamberts H (eds). (2005). ICPC in the Amsterdam Transition Project. CD-Rom. Amsterdam, the Netherlands: Department of Family Medicine, Academic Medical Center, University of Amsterdam

RfE and episode titles

A03	Fever	R74(5.9[5.6-6.4];2.8[2.6-3.0];5.3[4.2-6.6]), R78(7.6[7.1-8.2];3.1[2.8-3.5];5.5[4.3-7.1])
		A97(0.1[0.1-0.1];-;-), A85(0.1[0.1-0.2];-;-), D73(4.3[3.8-4.9];-;-)
		R76(12.9[11.7-14.2];13.2[11.8-14.7];6.2[4.6-8.5]), R77(2.7[2.3-3.2];-;-)
		R80(33.3[30.0-36.9];6.9[6.1-7.8];-), R29(-;6.8[6.0-7.7];-)

A03 is fever

R74 is upper respiratory tract infection

R78 is acute bronchitis

R76 is tonsillitis

RfE and episode titles

Netherlands = 5.9

A03	Fever	R74(5.9[5.6-6.4];2.8[2.6-3.0];5.3[4.2-6.6]), R78(7.6[7.1-8.2];3.1[2.8-3.5];5.5[4.3-7.1])
		A97(0.1[0.1-0.1];-;-), A85(0.1[0.1-0.2];-;-), D73(4.3[3.8-4.9];-;-)
		R76(12.9[11.7-14.2];13.2[11.8-14.7];6.2[4.6-8.5]), R77(2.7[2.3-3.2];-;-)
		R80(33.3[30.0-36.9];6.9[6.1-7.8];-), R29(-;6.8[6.0-7.7];-)

A03 is fever

R74 is upper respiratory tract infection

R78 is acute bronchitis

R76 is tonsillitis

RfE and episode titles

Malta = 2.8

A03	Fever	R74(5.9[5.6-6.4];2.8[2.6-3.0];5.3[4.2-6.6]), R78(7.6[7.1-8.2];3.1[2.8-3.5];5.5[4.3-7.1])
		A97(0.1[0.1-0.1];-;-), A85(0.1[0.1-0.2];-;-), D73(4.3[3.8-4.9];-;-)
		R76(12.9[11.7-14.2];13.2[11.8-14.7];6.2[4.6-8.5]), R77(2.7[2.3-3.2];-;-)
		R80(33.3[30.0-36.9];6.9[6.1-7.8];-), R29(-;6.8[6.0-7.7];-)

A03 is fever

R74 is upper respiratory tract infection

R78 is acute bronchitis

R76 is tonsillitis

RfE and episode titles

Serbia = 5.3

A03	Fever	R74(5.9[5.6-6.4];2.8[2.6-3.0];5.3[4.2-6.6]), R78(7.6[7.1-8.2];3.1[2.8-3.5];5.5[4.3-7.1])
		A97(0.1[0.1-0.1];-;-), A85(0.1[0.1-0.2];-;-), D73(4.3[3.8-4.9];-;-)
		R76(12.9[11.7-14.2];13.2[11.8-14.7];6.2[4.6-8.5]), R77(2.7[2.3-3.2];-;-)
		R80(33.3[30.0-36.9];6.9[6.1-7.8];-), R29(-;6.8[6.0-7.7];-)

A03 is fever

R74 is upper respiratory tract infection

R78 is acute bronchitis

R76 is tonsillitis

RfE and episode titles

A03	Fever	R74(5.9[5.6-6.4];2.8[2.6-3.0];5.3[4.2-6.6]), R78(7.6[7.1-8.2];3.1[2.8-3.5];5.5[4.3-7.1])
		A97(0.1[0.1-0.1]; ;), A85(0.1[0.1-0.2];-;-), D73(4.3[3.8-4.9];-;-)
		R76(12.9[11.7-14.2];13.2[11.8-14.7];6.2[4.6-8.5]), R77(2.7[2.3-3.2];-;-)
		R80(33.3[30.0-36.9];6.9[6.1-7.8];-), R29(-;6.8[6.0-7.7];-)

A03 is fever

R74 is upper respiratory tract infection

R78 is acute bronchitis

R76 is tonsillitis

RfE and episode titles

A03	Fever	R74(5.9[5.6-6.4];2.8[2.6-3.0];5.3[4.2-6.6]) R78(7.6[7.1-8.2];3.1[2.8-3.5];5.5[4.3-7.1])
		A97(0.1[0.1-0.1]; ;), A85(0.1[0.1-0.2];-;-), D73(4.3[3.8-4.9]; ;)
		R76(12.9[11.7-14.2];13.2[11.8-14.7];6.2[4.6-8.5]), R77(2.7[2.3-3.2];-;-)
		R80(33.3[30.0-36.9];6.9[6.1-7.8];-), R29(-;6.8[6.0-7.7];-)

A03 is fever

R74 is upper respiratory tract infection

R78 is acute bronchitis

R76 is tonsillitis

RfE and episode titles

A03	Fever	R74(5.9[5.6-6.4];2.8[2.6-3.0];5.3[4.2-6.6]), R78(7.6[7.1-8.2];3.1[2.8-3.5];5.5[4.3-7.1])
		A97(0.1[0.1-0.1]; ;), A85(0.1[0.1-0.2]; ; -), D73(4.3[3.8-4.9]; ;)
		R76(12.9[11.7-14.2];13.2[11.8-14.7];6.2[4.6-8.5]), R77(2.7[2.3-3.2];-;-)
		R80(33.3[30.0-36.9];6.9[6.1-7.8];), R29(-;6.8[6.0-7.7];-)

A03 is fever

R74 is upper respiratory tract infection

R78 is acute bronchitis

R76 is tonsillitis

Diagnostic odds ratios for RfE “fever” and common infections

