

# Hepatitis B and C epidemiology in selected population groups in the EU/EEA

## Appendices

### Appendix 1. PRISMA charts of identified citations

Figure A1. PRISMA flow diagram for the systematic review for research question 1

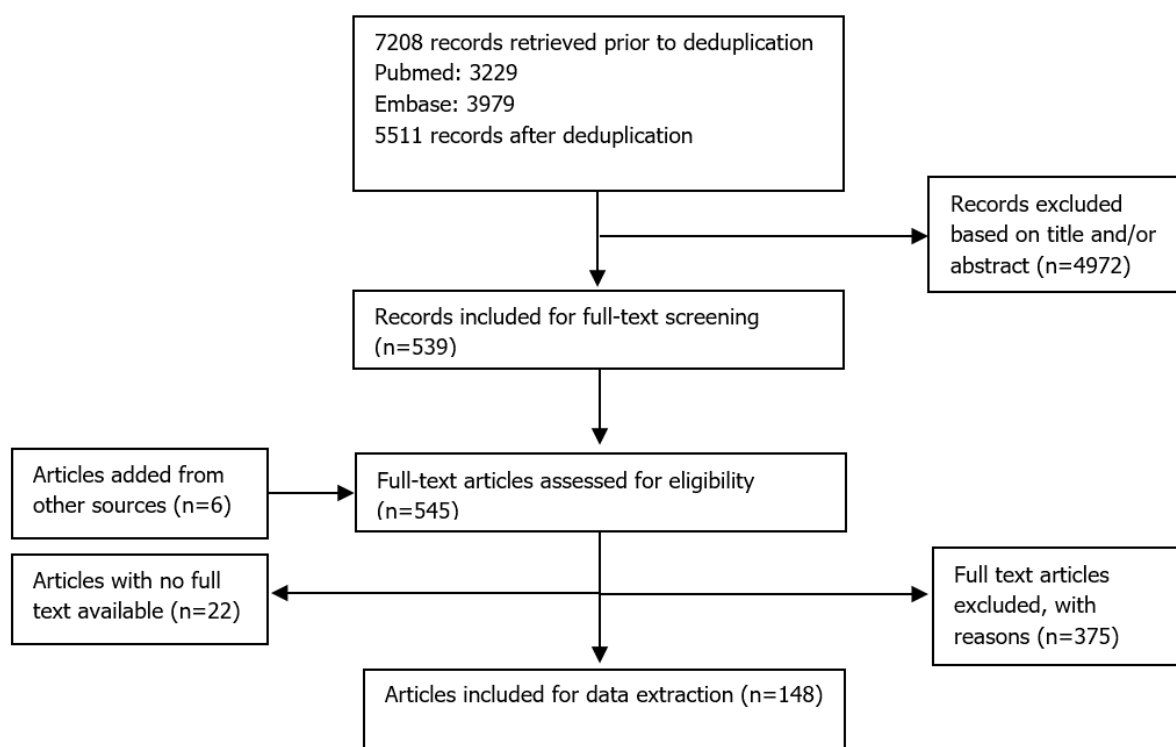
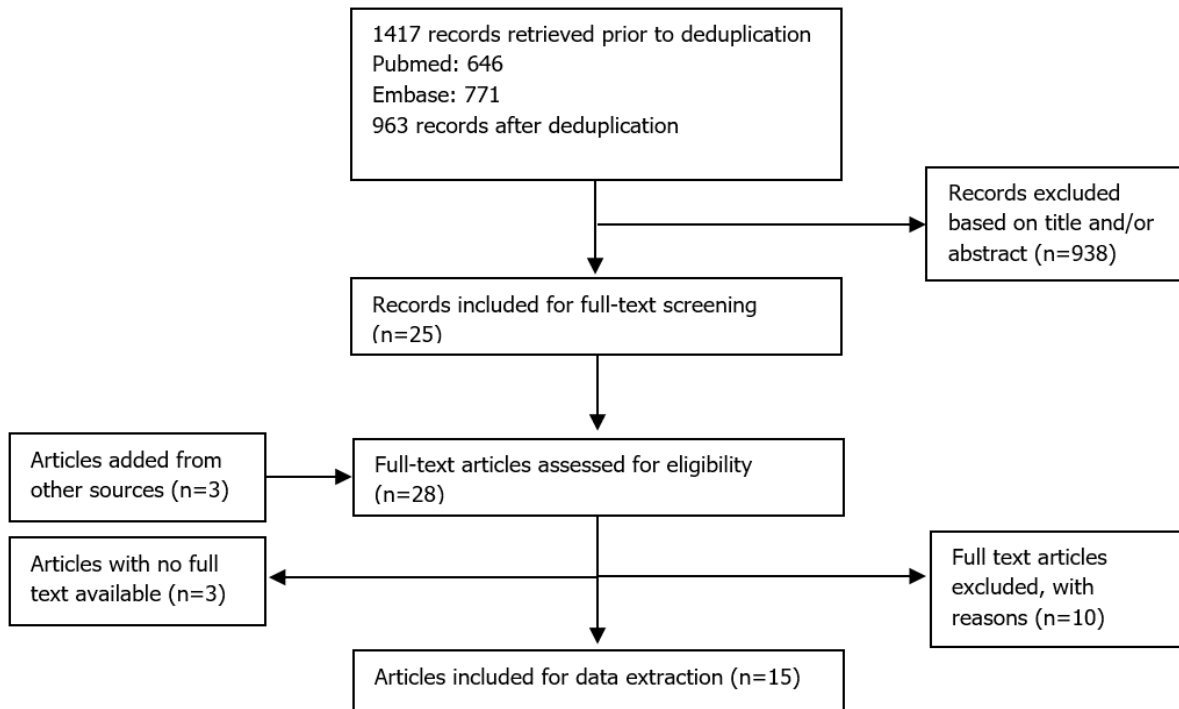


Table A1. Reasons for exclusion of publications for research question 1

Reasons for exclusion	
Non-pertinent publication types (e.g. reviews, letters to the editor, editorials, comments)	93
Non EU/EEA country	39
Population group outside of the scope or covered in previous systematic reviews [19]	78
Outcomes not related to the risk of acquiring HBV/HCV or burden of disease	66
Haemodialysis studies from single centres	5
Inappropriate or unspecified virological markers or self-reported infections	40
Populations with high HBV vaccination rate (for studies on HBV infection only)	2
Studies on PLHIV, if studies with more representative populations exist for that country	21
Populations in which the same outcomes have been reported in the same population in a more recent publication	8
Unclear methodology	4
Outbreak investigations	2
Migrants where data are not stratified per country of origin	17
<b>Total</b>	<b>375</b>

**Figure A2. PRISMA flow diagram for the systematic review for research question 2**



**Table A2. Reasons for exclusion of publications for research question 2**

Reasons for exclusion	
Non-pertinent publication types (e.g. reviews, letters to the editor, editorials, comments)	1
Non EU/EEA countries	2
Other outcomes not related to proportion of undiagnosed cases	5
Undiagnosed fraction reported is cited from previous publication	2
<b>Total</b>	<b>10</b>

## Appendix 2. Search strategy

The following search strings were composed based on the PICO questions to meet the review objectives.

- a. Hepatitis B and hepatitis C
- b. Occurrence
- c. Undiagnosed fraction
- d. Subgroups
- e. Europe

### PubMed search strings

#### *#a string for Hepatitis B and Hepatitis C virus*

(Hepatitis B[MeSH] OR Hepatitis B virus[Mesh] OR Hepatitis B Antigens[Mesh] OR Hepatitis B Antibodies[Mesh] OR hepatitis b[tiab] OR hbv[tiab] OR Hep B[tiab] OR hbsag[tiab] OR 'hbs ag'[tiab] OR Hepatitis C[MeSH] OR Hepacivirus[MeSH] OR Hepatitis C Antibodies[MeSH] OR Hepatitis C Antigens[Mesh] OR Hepatitis C[tiab] OR hepaciviru\*[tiab] OR hcv[tiab] OR hep c[tiab] OR blood borne virus\*[tiab] OR bbv[tiab])

#### *#b1 string for occurrence*

(Seroepidemiologic Studies[Mesh] OR Prevalence[Mesh] OR Incidence[Mesh] OR seroprevalen\*[tiab] OR prevalen\*[tiab] OR inciden\*[tiab] OR occurrence[tiab] OR positivity rate\*[tiab] OR odds ratio\*[tiab] OR relative risk\*[tiab] OR transmission rate\*[tiab] OR 'at risk'[tiab])

#### *#b2 string for incidence only*

(Incidence[Mesh] OR inciden\*[tiab] OR occurrence[tiab])

#### *#c string for undiagnosed fraction*

(undiagnosed[tiab] OR unaware\*[tiab] OR aware\*[tiab] OR 'previously diagnosed'[tiab] OR 'previous diagnosis'[tiab] OR 'diagnosed previously'[tiab] OR 'prior diagnosis'[tiab] OR 'diagnosed prior'[tiab] OR 'diagnosed priorly'[tiab] OR 'past diagnosis'[tiab] OR 'diagnosed in the past'[tiab] OR 'diagnosed beforehand'[tiab] OR 'diagnosed before'[tiab] OR 'not diagnosed'[tiab])

#### *#d1 string for risk groups not covered in previous reviews*

(health care staff[tiab] OR healthcare staff[tiab] OR health staff[tiab] OR health worker\*[tiab] OR health care worker\*[tiab] OR healthcare worker\*[tiab] OR health care provider\*[tiab] OR healthcare provider\*[tiab] OR medical staff[tiab] OR exposure prone procedure\*[tiab] OR fieldworker\*[tiab] OR safety worker\*[tiab] OR police\*[tiab] OR firefighter\*[tiab] OR firemen[tiab] OR fireman[tiab] OR paramedic\*[tiab] OR ambulance[tiab] OR corrections officer\*[tiab] OR correctional officer\*[tiab] OR prison guard\*[tiab] OR waste worker\*[tiab] OR waste dispos\*[tiab] OR waste collect\*[tiab] OR waste remov\*[tiab] OR sewage worker\*[tiab] OR rubbish men[tiab] OR rubbish man[tiab] OR rubbishm\*[tiab] OR rubbish dispos\*[tiab] OR rubbish collect\*[tiab] OR rubbish remov\*[tiab] OR bin man[tiab] OR bin men[tiab] OR dustbin man[tiab] OR dustbin men[tiab] OR garbage men[tiab] OR garbage man[tiab] OR garbagem\*[tiab] OR garbage dispos\*[tiab] OR garbage collect\*[tiab] OR garbage worker\*[tiab] OR garbage remov\*[tiab] OR trash men[tiab] OR trash man[tiab] OR trashm\*[tiab] OR trash dispos\*[tiab] OR trash collect\*[tiab] OR trash worker\*[tiab] OR trash remov\*[tiab] OR refuse dispos\*[tiab] OR refuse collect\*[tiab] OR refuse worker\*[tiab] OR refuse remov\*[tiab] OR HIV infected[tiab] OR HIV positive[tiab] OR HIV seropositive[tiab] OR HIV patient\*[tiab] OR infected with HIV[tiab] OR STI patient\*[tiab] OR STD patient\*[tiab] OR STI infected[tiab] OR STD infected[tiab] OR intranasal drug\*[tiab] OR snort drugs[tiab] OR inhale drugs[tiab] OR blood transfusion\*[tiab] OR transplant\*[tiab] OR dialys\*[tiab] OR hemodialys\*[tiab] OR haemodialys\*[tiab] OR medical intervention\*[tiab] OR dental[tiab] OR dentistry[tiab] OR surgery[tiab] OR medical procedure\*[tiab] OR tattoo\*[tiab] OR pierc\*[tiab] OR scarifi\*[tiab] OR body modification[tiab] OR acupunctur\*[tiab] OR mesotherapy[tiab] OR care home\*[tiab] OR institutional\*[tiab] OR residential care[tiab] OR mentally disabled[tiab] OR mental disabilit\*[tiab] OR intellectual disabilit\*[tiab] OR intellectually disabled[tiab] OR low intellect[tiab] OR learning disabilit\*[tiab] OR retard\*[tiab] OR cognitive disabilit\*[tiab] OR intellectual impairment[tiab] OR mental deficiency[tiab] OR homeless\*[tiab] OR vagrant\*[tiab] OR partner\*[tiab] OR couple\*[tiab] OR spouse\*[tiab] OR husband\*[tiab] OR wife[tiab] OR wives[tiab] OR household[tiab] OR contact\*[tiab] OR mother\*[tiab] OR birth cohort[tiab] OR travel\*[tiab] OR rape\*[tiab] OR assault\*[tiab] OR multiple sexual partners[tiab] OR multiple sex partners[tiab] OR multiple sexual contacts[tiab] OR sexually promiscuous[tiab] OR sexual promiscuity[tiab] OR diabet\*[tiab] OR auto-inject\*[tiab] OR transsexual\*[tiab] OR transgender\*[tiab] OR anabolic steroid\*[tiab] OR performance enhancing[tiab] OR beauty[tiab] OR salon\*[tiab] OR pedicur\*[tiab] OR manicur\*[tiab])

#### *#d2 string for groups covered in previous reviews*

(drug use\*[tiab] OR IDU\*[tiab] OR PWID[tiab] OR People who inject drugs[tiab] OR People who use drugs[tiab] OR prison\*[tiab] OR closed setting\*[tiab] OR inmate\*[tiab] OR incarcerat\*[tiab] OR penal[tiab] OR jail\*[tiab] OR reformatory\*[tiab] OR custodial[tiab] OR custody[tiab] OR gaol\*[tiab] OR penitentiary\*[tiab] OR detention[tiab] OR correctional[tiab] OR detainee\*[tiab] OR imprison\*[tiab] OR confinement[tiab] OR cellmate\*[tiab] OR convict\*[tiab] OR immigrant\*[tiab] OR migrant\*[tiab] OR emigrant\*[tiab] OR migrat\*[tiab] OR emigrat\*[tiab] OR displaced population\*[tiab] OR exile\*[tiab] OR refugee\*[tiab] OR asylum[tiab] OR men who have sex with men[tiab] OR MSM[tiab] OR men having sexual relations with men[tiab] OR MASM[tiab] OR homosexual\*[tiab] OR gay[tiab] OR pregnan\*[tiab] OR gravid\*[tiab])

#### *#e string for EU/EEA*

(((((Europe\*[ad] OR Europa\*[ad] OR EU[ad] OR EEA[ad] OR 'EU/EEA'[ad] OR ECSC[ad] OR Euratom[ad] OR Eurozone[ad] OR EEC[ad] OR ec[ad] OR (Schengen[ad] AND (area[ad] OR countr\*[ad] OR region\*[ad] OR state[ad] OR states[ad]))) OR Euroregion[ad] OR Euroregions[ad] OR Balkan[ad] OR Balkans[ad] OR Baltic[ad] OR (Mediterranean[ad] AND (area[ad] OR countr\*[ad] OR region\*[ad] OR state[ad] OR states[ad]))) OR Alpine[ad] AND (area[ad] OR countr\*[ad] OR region\*[ad] OR state[ad] OR states[ad]))) OR Scandinavia[ad] OR Scandinavian[ad] OR 'Nordic country'[ad] OR 'Nordic countries'[ad] OR 'Nordic state'[ad] OR 'Nordic states'[ad] OR Danubian[ad] OR 'Iberian peninsula'[ad] OR 'Peninsula iberica'[ad] OR 'Peninsula Iberique'[ad] OR 'Iberian Peninsula'[ad] OR Iberia[ad] OR Czechoslovakia[ad] OR 'Czecho Slovakia'[ad] OR Ceskoslovensko[ad] OR 'Cesko slovensko'[ad] OR Benelux[ad] OR Fennoscandia[ad] OR 'Fenno Scandinavia'[ad] OR Fennoskandi\*[ad] OR (Visegrad[ad] AND (Group[ad] OR Four[ad] OR Triangle[ad])) OR 'Visegradska ctyrka'[ad] OR 'Visegradska skupina'[ad] OR 'Visegradi Egyuttmukodes'[ad] OR 'Visegradi negyek'[ad] OR 'Grupa Wyszehradzka'[ad] OR 'Vysehradska skupina'[ad] OR 'Vysehradska stvorka'[ad])) OR ('Iceland'[Mesh] OR Iceland[ad] OR Icelandic\*[tw] OR islenska\*[tw] OR Icelander\*[tw] OR islendinga\*[tw] OR Islendingar[ad] OR Inslenska[ad] OR Reykjavik[ad] OR Reykjavikurborg[ad] OR Hofudborgarsvaedi[ad] OR Sudurnes[ad] OR Vesturland[ad] OR Vestfirir[ad] OR Westfjords[ad] OR Nordurland[ad] OR Austurland[ad] OR Sudurland[ad] OR Kopavogur[ad] OR Hafnarfjordur[ad] OR Akureyri[ad] OR Gardabaer[ad] OR Mosfellsbaer[ad] OR Keflavik[ad] OR Akranes[ad] OR Selfoss[ad] OR Seltjarnarnes[ad] OR ((Iceland[ad] OR Icelandic\*[ad] OR islenska\*[ad] OR Inslenska[ad] OR Icelander\*[ad] OR Islendingar[ad] OR Inslenska[ad] OR Reykjavikurborg[ad] OR Hofudborgarsvaedi[ad] OR Sudurnes[ad] OR Vesturland[ad] OR Vestfirir[ad] OR Westfjords[ad] OR Nordurland[ad] OR Austurland[ad] OR Sudurland[ad] OR Kopavogur[ad] OR Hafnarfjordur[ad] OR Akureyri[ad] OR Gardabaer[ad] OR Mosfellsbaer[ad] OR Keflavik[ad] OR Akranes[ad] OR Selfoss[ad] OR Seltjarnarnes[ad] OR (Norway[ad] OR Norwegian\*[ad] OR Norge[ad] OR Noreg[ad] OR Norgga[ad] OR Akershus[ad] OR 'Aust Agder'[ad] OR Buskerud[ad] OR Finnmark[ad] OR Hedmark[ad] OR Hordaland[ad] OR 'More og Romsdal'[ad] OR 'More and Romsdal'[ad] OR 'More Romsdal'[ad] OR Nordland[ad] OR Trondelag[ad] OR Oppland[ad] OR Oslo[ad] OR Ostfold[ad] OR Rogaland[ad] OR 'Sogn og fjordane'[ad] OR

'Sogn and fjordane[ad] OR 'sogn fjordane[ad] OR Telemark[ad] OR Troms[ad] OR Romsa[ad] OR Romssa[ad] OR 'Vest Agder[ad] OR Vestfold[ad] OR Bergen[ad] OR Stavanger[ad] OR Sandnes[ad] OR Trondheim[ad] OR Trondhjem[ad] OR Kaupangen[ad] OR Nidaros[ad] OR Drammen[ad] OR Fredrikstad[ad] OR Skien[ad] OR Tromso[ad] OR Sarpborg[ad] OR (Liechtenstein[ad] OR Lienchtensteiner\*[ad] OR Balzers[ad] OR Eschen[ad] OR Gamprin[ad] OR Mauren[ad] OR Planken[ad] OR Ruggell[ad] OR Schaan[ad] OR Schellenberg[ad] OR Triesen[ad] OR Triesenberg[ad] OR Vaduz[ad])) OR (Iceland[ad] OR Icelandic\*[ad] OR isenska\*[ad] OR Icelander\*[ad] OR islendinga\*[ad] OR Islendigar[ad] OR Isenska[ad] OR Reykjavik[ad] OR Reykjavikurborg[ad] OR Hofudborgarsvaedi[ad] OR Sudurnes[ad] OR Vesturland[ad] OR Westfirir[ad] OR Westfjords[ad] OR Nordurland[ad] OR Austurland[ad] OR Sudurland[ad] OR Kopavogur[ad] OR Hafnarfjordur[ad] OR Akureyri[ad] OR Gardabaer[ad] OR Mosfellsbaer[ad] OR Keflavik[ad] OR Akranes[ad] OR Selfoss[ad] OR Seltjarnarnes[ad] OR (((('Liechtenstein[Mesh] OR Liechtenstein[tw] OR Lienchtensteiner\*[tw] OR Balzers[tw] OR Eschen[tw] OR Gamprin[tw] OR Mauren[tw] OR Planken[tw] OR Ruggell[tw] OR Schaan[tw] OR Schellenberg[tw] OR Triesen[tw] OR Triesenberg[tw] OR Vaduz[tw])) OR ('Norway[Mesh] OR Norway[tw] OR Norwegian\*[tw] OR Norge[tw] OR Noreg[tw] OR Norgga[tw] OR Akershus[tw] OR 'Aust Agder[tw] OR Buskerud[tw] OR Finnmark[tw] OR Hedmark[tw] OR Hordaland[tw] OR 'More og Romsdal[tw] OR 'More and Romsdal[tw] OR 'More Romsdal[tw] OR Nordland[tw] OR Trondelag[tw] OR Oppland[tw] OR Oslo[tw] OR Ostfold[tw] OR Rogaland[tw] OR 'Sogn og fjordane[tw] OR 'Sogn and fjordane[tw] OR 'sogn fjordane[tw] OR Telemark[tw] OR Troms[tw] OR Romsa[tw] OR Romssa[tw] OR 'Vest Agder[tw] OR Vestfold[tw] OR Bergen[tw] OR Stavanger[tw] OR Sandnes[tw] OR Trondheim[tw] OR Trondhjem[tw] OR Kaupangen[tw] OR Nidaros[tw] OR Drammen[tw] OR Fredrikstad[tw] OR Skien[tw] OR Tromso[tw] OR Sarpborg[tw])) OR ('Iceland[Mesh] OR 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'Vukovarsko srijemska[tw] OR 'Vukovar[tw] OR Srijem[tw] OR Zadar[tw] OR Zadarska[tw] OR Rijeka[tw] OR 'Velika gorica[tw] OR 'Slavonski brod[tw] OR Pula[tw] OR ('Cyprus[Mesh] OR Cyprus[tw] OR Cypriot\*[tw] OR Kypros[tw] OR Kibris\*[tw] OR kypriaki[tw] OR Kyprioi[tw] OR Nicosia[tw] OR Lefkosa[tw] OR Lefkosia[tw] OR Famagusta[tw] OR Magusa[tw] OR Ammochostos[tw] OR Gazimagusa[tw] OR Kyrenia[tw] OR Girne[tw] OR Keryneia[tw] OR Larnaca[tw] OR Larnaka[tw] OR Iskele[tw] OR Limassol[tw] OR Lemesos[tw] OR Limasol[tw] OR Leymosun[tw] OR Pafos[tw] OR Pafos[tw] OR Baf[tw] OR Strovolos[tw] OR Lakatamia[tw] OR Lakadamyia[tw] OR 'Kato Polemidia[tw] OR 'Kato Polemidhia[tw] OR Aglandjia[tw] OR Eglence[tw] OR Aglantzia[tw] OR Aradhippou[tw] OR Aradippou[tw] OR Engomi[tw] OR ('Czech Republic[Mesh] OR Czech\*[tw] OR Cesky[tw] OR Ceska[tw] OR Cech[tw] OR Cestina[tw] OR Prague[tw] OR Praha[tw] OR Prag[tw] OR Stredoces\*[tw] OR Jihoces\*[tw] OR Bohemia[tw] OR Bohemian[tw] OR Pizen\*[tw] OR Pilsen[tw] OR Karlovars\*[tw] OR 'Karlovy Vary[tw] OR Usteck\*[tw] OR Usti[tw] OR Liberec\*[tw] OR 'Hradec Kralove[tw] OR Kralovehradec\*[tw] OR Pardubic\*[tw] OR Olomouc\*[tw] OR Olomoc[tw] OR Holomoc[tw] OR Moravskoslezs\*[tw] OR Jihomorav\*[tw] OR Moravia[tw] OR Moravian[tw] OR Morava[tw] OR Vysocina[tw] OR Zlin[tw] OR Zlinsk\*[tw] OR 'Ceske Budejovice[tw] OR Budweis[tw] OR Brno[tw] OR Ostrava[tw] OR ('Denmark[Mesh] OR Denmark[tw] OR Danish\*[tw] OR dane[tw] OR danes[tw] OR Danmark[tw] OR dansk\*[tw] OR Hovedstaden[tw] OR Midtjylland[tw] OR Nordjylland[tw] OR Sjælland[tw] OR Sealand[tw] OR 'Zealand region[tw] OR 'region Zealand[tw] OR Syddanmark[tw] OR Jutland[tw] OR Jylland[tw] OR Sonderjylland[tw] OR Copenhagen[tw] OR Kobenhavn[tw] OR Arhus[tw] OR Aarhus[tw] OR Bornholm[tw] OR Frederiksberg[tw] OR Frederiksberg[tw] OR Ringkjobing[tw] OR Viborg[tw] OR Vejle[tw] OR Roskilde[tw] OR Storstrom[tw] OR Vestsjaellands[tw] OR 'West Zealand[tw] OR Funen[tw] OR Ribe[tw] OR 'Kalaallit Nunaat[tw] OR Gronland[tw] OR Foroyar[tw] OR Faeroerne[tw] OR 'Faroe islands[tw] OR Aalborg[tw] OR Alborg[tw] OR Odense[tw] OR Esbjerg[tw] OR Gentofte[tw] OR Gladsaxe[tw] OR Randers[tw] OR Kolding[tw] OR ('Estonia[Mesh] OR Estonia\*[tw] OR Eesti[tw] OR Eestlased[tw] OR Eestlane[tw] OR Harju[tw] OR Harjuma[tw] OR Hiiumaa[tw] OR Hiiumaa[tw] OR 'Ida Viru[tw] OR 'Ida Virumaa[tw] OR Jarvamaa[tw] OR Jarva[tw] OR Jogeveamaa[tw] OR Jogevea[tw] OR Laanemaa[tw] OR Laane[tw] OR 'Laane Virumaa[tw] OR Parnu[tw] OR Parnumaa[tw] OR Polva[tw] OR Polvamaa[tw] OR Rapla[tw] OR Raplamaa[tw] OR Saare[tw] OR Saaremaa[tw] OR Tartu[tw] OR Tartumaa[tw] OR Valga[tw] OR Valgamaa[tw] OR Viljandimaa[tw] OR Viljandi[tw] OR Voru[tw] OR Vorumaa[tw] OR Tallinn[tw] OR Narva[tw] OR 'Kohtla Jarve[tw] OR Rakvere[tw] OR Maardu[tw] OR Sillamae[tw] OR Kuressaare[tw] OR ('Finland[Mesh] OR Finland[tw] OR Finnish\*[tw] OR Finn[tw] OR Finns[tw] OR Suomi[tw] AND Suomen[tw] OR Suomalaiset[tw] OR Aland[tw] OR Ahvenanmaa[tw] OR Uusimaa[tw] OR Nyland[tw] OR Karelia[tw] OR Karjala[tw] OR Karelén[tw] OR Ostrobothnia[tw] OR Pohjanmaa[tw] OR Osterbotten[tw] OR Savonia[tw] OR Savo[tw] OR Savolax[tw] OR Kainuu[tw] OR Kainuu[tw] OR Kajanaland\*[tw] OR 'Kanta Hame[tw] OR Tavastia[tw] OR Tavastland[tw] OR Kymenlaakso[tw] OR Kymmenedalen[tw] OR Lapland[tw] OR Lappi[tw] OR Lapland[tw] OR 'Paijat Hame[tw] OR Pirkanmaa[tw] OR Birkaland[tw] OR Satakunta[tw] OR Satakunda[tw] OR Helsinki[tw] OR Helsingfors[tw] OR Espoo[tw] OR Esbo[tw] OR Tampere[tw] OR Tammerfors[tw] OR Vantaa[tw] OR Vanda[tw] OR Oulu[tw] OR Uleaborg[tw] OR Turku[tw] OR Abo[tw] OR Jyväskylä[tw] OR Kuopio[tw] OR Lahti[tw] OR Lahtis[tw] OR Kouvolaa[tw] OR ('France[Mesh] OR France[tw] OR French\*[tw] OR Francais\*[tw] OR Alsace[tw] OR Elsass[tw] OR Aquitaine[tw] OR Aquitania[tw] OR Akitania[tw] OR Aguiene[tw] OR Auvergne[tw] OR Auvergne[tw] OR Auvergne[tw] OR Auvergne[tw] OR Normandie[tw] OR

Normandy[tw] OR Normandie[tw] OR Bourgogne[tw] OR Burgundy[tw] OR Bregogne[tw] OR Borgogne[tw] OR Brittany[tw] OR Breizh[tw] OR Bertayn[tw] OR Bretagne[tw] OR 'Champagne Ardenne[tw] OR Corse[tw] OR Corsica[tw] OR 'Franche Comte[tw] OR 'Franche Comte[tw] OR 'Franche Comtat[tw] OR Guadeloupe[tw] OR Guyane[tw] OR Guiana[tw] OR 'Languedoc Roussillon[tw] OR 'Lengadoc Rosselhon[tw] OR 'Llenguadoc-Rossello[tw] OR Limousin[tw] OR Lemosin[tw] OR Lorraine[tw] OR Lothringen[tw] OR Lottringe[tw] OR Martinique[tw] OR 'Midi Pyrenees[tw] OR 'Miegjorn Pireneus[tw] OR 'Mieidia Pireneus[tw] OR 'Mediodia Pirineos[tw] OR 'Pays de la Loire[tw] OR 'Brioual Liger[tw] OR Picardie[tw] OR Picardy[tw] OR 'Poitou Charentes[tw] OR 'Peitau Charantas[tw] OR 'Poitou-Cherentes[tw] OR Provence[tw] OR Provenca[tw] OR Prouvenco[tw] OR 'Cote d'Azur[tw] OR 'Cote d'Azur[tw] OR 'Costo d'Azur[tw] OR 'Costo d'Azur[tw] OR 'Costa d'Azur[tw] OR 'Costa d'Azur[tw] OR Reunion[tw] OR 'Rhone Alpes[tw] OR 'Rono Arpes[tw] OR 'Rose Aups[tw] OR Ain[tw] OR Aisne[tw] OR Allier[tw] OR 'Alpes de Haute Provence[tw] OR 'Haute Alpes[tw] OR 'Alpes Maritimes[tw] OR Ardeche[tw] OR Ardennes[tw] OR Ariège[tw] OR Aube[tw] OR Aude[tw] OR Aveyron[tw] OR 'Bas Rhin[tw] OR 'Bouches du Rhone[tw] OR Calvados[tw] OR Cantal[tw] OR Charente[tw] OR Cher[tw] OR Correze[tw] OR 'Corse du Sud[tw] OR 'Cote d'Or[tw] OR 'Cote d'Or[tw] OR 'Cotes d'Armor[tw] OR 'Cotes d'Armor[tw] OR Creuse[tw] OR 'Deux Sevres[tw] OR Dordogne[tw] OR Doubs[tw] OR Drome[tw] OR Essonne[tw] OR Eure[tw] OR Finistere[tw] OR Gard[tw] OR Gers[tw] OR Gironde[tw] OR 'Haute Corse[tw] OR 'Haute Garonne[tw] OR 'Haute Marne[tw] OR 'Hautes Alpes[tw] OR 'Haute Saone[tw] OR 'Haute Savoie[tw] OR 'Hautes Pyrenees[tw] OR 'Haute Vienne[tw] OR 'Haut Rhin[tw] OR 'Haut Rhin[tw] OR 'Hauts de Seine[tw] OR Herault[tw] OR 'Ile de France[tw] OR 'Ile et Vilaine[tw] OR Indre[tw] OR Isere[tw] OR Jura[tw] OR Landes[tw] OR Loire[tw] OR Loiret[tw] OR (Lot[tw] AND (departement[tw] OR departement[tw])) OR 'Lot et Garonne[tw] OR 'Loir et Cher[tw] OR Lozere[tw] OR Manche[tw] OR Marne[tw] OR Mayenne[tw] OR Mayotte[tw] OR 'Meurthe et Moselle[tw] OR Meuse[tw] OR Morbihan[tw] OR Moselle[tw] OR (Nord[tw] AND (departement[tw] OR departement[tw])) OR 'Nievre[tw] OR Oise[tw] OR Orne[tw] OR 'Pas de calais[tw] OR 'Noord-Nauw van Kales[tw] OR Paris[tw] OR 'Puy de dome[tw] OR 'Pyrenees Atlantiques[tw] OR 'Pyrenees Orientales[tw] OR Rhone[tw] OR Sarthe[tw] OR Savoie[tw] OR 'Seine et Marne[tw] OR 'Seine Maritime[tw] OR Somme[tw] OR Tarn[tw] OR 'Territoire de Belfort[tw] OR 'Val de Marne[tw] OR 'Val d'Oise[tw] OR Var[tw] OR Vaucluse[tw] OR Vendee[tw] OR Vienne[tw] OR Vosges[tw] OR Yonne[tw] OR Yvelines[tw] OR Marseille[tw] OR Lyon[tw] OR Nice[tw] OR Nantes[tw] OR Strasbourg[tw] OR Montpellier[tw] OR Bordeaux[tw] OR Lille[tw] OR Toulouse[tw] OR 'Outre Mer[tw] OR 'Seine Saint Denis[tw] OR ('Germany[Mesh] OR German\*[tw] OR Deutsch[tw] OR Bundesrepublik[tw] OR Westdeutschland[tw] OR Ostdeutschland[tw] OR Baden[tw] OR Wuerttemberg[tw] OR Wurttemberg[tw] OR Bayern[tw] OR Bavaria[tw] OR Berlin[tw] OR Brandenburg[tw] OR Bremen[tw] OR Oldenburg[tw] OR Mitteldeutschland[tw] OR Rhein[tw] OR Rhine[tw] OR Hannover[tw] OR Braunschweig[tw] OR Gottingen[tw] OR Goettingen[tw] OR Nurnberg[tw] OR Nuernberg[tw] OR Ruhr[tw] OR Koln[tw] OR koeln[tw] OR Bonn[tw] OR Hamburg[tw] OR Hessen[tw] OR Hesse[tw] OR Hestia[tw] OR Mecklenburg[tw] OR Vorpommern[tw] OR Pomerania[tw] OR Niedersachsen[tw] OR Neddersassen[tw] OR Saxony[tw] OR Niederbayern[tw] OR 'Northern Rhine[tw] OR 'North Rhine[tw] OR Westphalia[tw] OR Westfalen[tw] OR 'Rhineland Palatinate[tw] OR 'Rheinland Pfalz[tw] OR Saarland[tw] OR Sachsen[tw] OR 'Schleswig Holstein[tw] OR Thuringia[tw] OR Thuringen[tw] OR Thueringen[tw] OR Munchen[tw] OR Muenchen[tw] OR Munich[tw] OR Frankfurt[tw] OR Stuttgart[tw] OR Dusseldorf[tw] OR Duesseldorf[tw] OR Dortmund[tw] OR Essen[tw] OR ('Greece[Mesh] OR Greece[tw] OR 'Hellenic republic[tw] OR Greek\*[tw] OR Ellada[tw] OR Elladas[tw] OR 'Elliniki Dimokratia[tw] OR Hellas[tw] OR Hellenes[tw] OR Attica[tw] OR Attiki[tw] OR Makedonia\*[tw] OR Macedonia[tw] OR Thraki[tw] OR Thrace[tw] OR Crete[tw] OR Kriti[tw] OR 'Ionia Nisia[tw] OR 'Ionian neson[tw] OR 'Ionion nison[tw] OR 'Ionian islands[tw] OR 'Ionian island[tw] OR Epirus[tw] OR Ipeiros[tw] OR 'Perifereia Ipeirou[tw] OR 'North aegean[tw] OR 'Northern Aegean[tw] OR 'Aegean islands[tw] OR 'Aegean island[tw] OR 'Nisoi Aigaiou[tw] OR 'Notio Aigaiou[tw] OR Peloponnese[tw] OR Peloponniso\*[tw] OR Thessaly[tw] OR Thessalia[tw] OR Thessalian[tw] OR Petthalia[tw] OR 'Voreio Aigaiou[tw] OR 'Voreio Aigaiou[tw] OR 'South aegean[tw] OR 'Southern Aegean[tw] OR 'Mount athos[tw] OR 'Oros Athos[tw] OR Cyclades[tw] OR Cyclades[tw] OR Kiklades[tw] OR Dodecanese[tw] OR Dodekanisa[tw] OR Athens[tw] OR Athina[tw] OR Thessaloniki[tw] OR Thessalonica[tw] OR Patras[tw] OR Patra[tw] OR Pireas[tw] OR Piraeus[tw] OR Larissa[tw] OR Larisa[tw] OR Heraklion[tw] OR Heraclion[tw] OR Iraklion[tw] OR Irakleion[tw] OR Iraklio[tw] OR Volos[tw] OR Rhodes[tw] OR Rodos[tw] OR Ioannina[tw] OR Janina[tw] OR Yannena[tw] OR Chania[tw] OR Chalcis[tw] OR Chalkida[tw] OR ('Hungary[Mesh] OR Hungar\*[tw] OR Magyarorszag[tw] OR Magyar\*[tw] OR Dunantuli[tw] OR Transdanubia[tw] OR Dunantul[tw] OR 'Great Plain[tw] OR 'Eszak Alfold[tw] OR 'Del Alfold[tw] OR 'Alfold es eszak[tw] OR 'Northern Alfold[tw] OR 'North Alfold[tw] OR 'South Alfold[tw] OR 'Southern Alfold[tw] OR Bacs[tw] OR Kiskun[tw] OR Baranya[tw] OR Bekes[tw] OR Borsod[tw] OR Abauj[tw] OR Zemplen[tw] OR Budapest[tw] OR Csongrad[tw] OR Fejer[tw] OR gyor[tw] OR moson[tw] OR sopron[tw] OR hajdu[tw] OR bihar[tw] OR Heves[tw] OR 'jasz nagykun szolnok[tw] OR komarom[tw] OR esztergom[tw] OR Nograd[tw] OR (Pest[tw] AND (megye[tw] OR county[tw])) OR Somogy[tw] OR szabolcs[tw] OR szatmar[tw] OR bereg[tw] OR Tolna[tw] OR Vas[tw] OR Veszprem[tw] OR Zala[tw] OR Debrecen[tw] OR Miskolc[tw] OR Szeged[tw] OR Pecs[tw] OR Gyor[tw] OR Nyiregyhaza[tw] OR Kecskemet[tw] OR Szekesfehervar[tw] OR Szombathely[tw] OR ('Ireland[Mesh] OR Ireland[tw] OR Eire[tw] OR Irish\*[tw] OR Fingal[tw] OR 'Fine Gall[tw] OR Dublin[tw] OR 'Ath Cliath[tw] OR 'Dun Laoghaire[tw] OR Wicklow[tw] OR 'Cill Mhantain[tw] OR 'Chill Mhantain[tw] OR Wexford[tw] OR 'Loch Garman[tw] OR Carlow[tw] OR Ceatharlach[tw] OR Kildare[tw] OR 'Cill Dara[tw] OR 'Chill Dara[tw] OR Meath[tw] OR 'An Mhi[tw] OR 'Contae na Mi[tw] OR Louth[tw] OR 'Contae Lu[tw] OR Monaghan[tw] OR Muineachan[tw] OR Mhuineachan[tw] OR Cavan[tw] OR 'An Cabhan[tw] OR 'An Cabhair[tw] OR Lough[tw] OR 'An Longfort[tw] OR 'an Longfoirt[tw] OR Langford[tw] OR Westmeath[tw] OR 'An Iarmhi[tw] OR 'na Iarmhi[tw] OR Offaly[tw] OR 'Uibh Fhaili[tw] OR Laois[tw] OR Laoise[tw] OR Kilkenny[tw] OR 'Chill Chainnigh[tw] OR 'Cill Chainnigh[tw] OR Waterford[tw] OR 'Port Laige[tw] OR Watterford[tw] OR Cork[tw] OR Corcaigh[tw] OR Chorcaigh[tw] OR Kerry[tw] OR Ciarraigh[tw] OR Chiarraigh[tw] OR Limerick[tw] OR Luimneach[tw] OR Luimnigh[tw] OR Tipperary[tw] OR 'Tiobraid Arann[tw] OR 'Tiobraid Arann[tw] OR Clare[tw] OR 'An Clár[tw] OR 'an Chlair[tw] OR Galway[tw] OR Gaillimh[tw] OR 'na Gaillimhe[tw] OR Mayo[tw] OR 'Maigh Eo[tw] OR 'Mhaigh Eo[tw] OR Roscommon[tw] OR 'Ros comain[tw] OR Sligo[tw] OR Sligeach[tw] OR Shligigh[tw] OR Leitrim[tw] OR Liatroma[tw] OR Liatroma[tw] OR Donegal[tw] OR 'Dhun na nGall[tw] OR Dinnnygal[tw] OR Dunnyga[tw] OR Leinster[tw] OR Laighin[tw] OR 'Cuige Laighean[tw] OR Munster[tw] OR Mumhain[tw] OR 'Cuige Mumhan[tw] OR Connacht[tw] OR Connacht[tw] OR Drogheda[tw] OR 'Droichead Atha[tw] OR Dundalk[tw] OR 'Dun Dealgan[tw] OR Swords[tw] OR Sord[tw] OR Bray[tw] OR Bre[tw] OR Navan[tw] OR 'An Uaimh[tw] OR ('Italy[Mesh] OR Italy[tw] OR Italia\*[tw] OR Abruzzo[tw] OR Abruzzi[tw] OR Basilicata[tw] OR Lucania[tw] OR Calabria[tw] OR Campania[tw] OR 'Emilia Romagna[tw] OR 'friuli venezia giulia[tw] OR Lazio[tw] OR Latium[tw] OR Liguria\*[tw] OR Lombardy[tw] OR Lombardia[tw] OR Marche[tw] OR Marches[tw] OR Molisano[tw] OR Molise[tw] OR Piedmont\*[tw] OR Piemonte[tw] OR Bolzano[tw] OR Bozen[tw] OR Trentino[tw] OR Trento[tw] OR Puglia[tw] OR Apulia[tw] OR Sardinia[tw] OR Sardegna[tw] OR Sicily[tw] OR Sicilia[tw] OR Toscana[tw] OR Tuscany[tw] OR Umbria[tw] OR 'Valle d'Aosta[tw] OR 'Vallee d'Aoste[tw] OR 'Valle d'Aosta[tw] OR 'Vallee d'Aoste[tw] OR 'Aosta Valley[tw] OR Veneto[tw] OR Venetia[tw] OR Triveneto[tw] OR Rome[tw] OR Roma[tw] OR Milan[tw] OR Milano[tw] OR Naples[tw] OR Napoli[tw] OR Turin[tw] OR Torino[tw] OR Palermo[tw] OR Genoa[tw] OR Genova[tw] OR Bologna[tw] OR Florence[tw] OR Firenze[tw] OR Bari[tw] OR Catania[tw] OR ('Latvia[Mesh] OR Latvi\*[tw] OR Riga[tw] OR Courland[tw] OR Kurzeme[tw] OR Kurland[tw] OR Latgale[tw] OR Lettgallia[tw] OR Latgola[tw] OR Latgolia[tw] OR Vidzeme[tw] OR Vidumo[tw] OR Semigalia[tw] OR Semigalia[tw] OR Zemgale[tw] OR Pieriga[tw] OR Daugavpils[tw] OR Dinaburg[tw] OR Jekabpils[tw] OR Jakobstadt[tw] OR Jelgava[tw] OR Jurmala[tw] OR Liepaja[tw] OR Libau[tw] OR Rezekne[tw] OR Rezne[tw] OR Rositten[tw] OR Valmiera[tw] OR Volmar[tw] OR Ventspils[tw] OR Windau[tw] OR Ogre[tw] OR ('Lithuania[Mesh] OR Lithuania\*[tw] OR 'Lietuvos Respublika[tw] OR Lietuva[tw] OR lietuviai[tw] OR Alytus[tw] OR Alytaus[tw] OR Kaunas[tw] OR Kauno[tw] OR Klaipeda[tw] OR Klaipedos[tw] OR Marijampoles[tw] OR Marijampole[tw] OR Panevezys[tw] OR Panevezio[tw] OR Siauliai[tw] OR Siauliai[tw] OR Taurages[tw] OR Taurage[tw] OR Telsiu[tw] OR Telsiai[tw] OR Utenos[tw] OR Utena[tw] OR Vilnius[tw] OR Vilniaus[tw] OR Mazeikiai[tw] OR Jonava[tw] OR Mazeikiu[tw] OR Jonavos[tw] OR ('Luxembourg[Mesh] OR Luxembourg\*[tw] OR Luxembourg[tw] OR Letzebuerg[tw] OR Diekirch[tw] OR Grevenmacher[tw] OR 'Esch sur Alzette[tw] OR 'Esch Uelzecht[tw] OR 'Esch an der Alzette[tw] OR 'Esch an der Alzig[tw] OR Dudelange[tw] OR Diddeleng[tw] OR Dudelingen[tw] OR Dueldelingen[tw] OR Schifflange[tw] OR Scheffleng[tw] OR Schifflingen[tw] OR Bettembourg[tw] OR Beetebuerg[tw] OR Bettemburg[tw] OR Petange[tw] OR Peiteng[tw] OR Petingen[tw] OR Ettelbruck[tw] OR Ettelbrueck[tw] OR Diekirch[tw] OR Dikrech[tw] OR Strassen[tw] OR Stroossen[tw] OR Bertrange[tw] OR Bartreng[tw] OR Bartringen[tw] OR ('Malta[Mesh] OR Malta[tw] OR Maltese\*[tw] OR Maltin[tw] OR Gozo[tw] OR Ghawdex[tw] OR Valletta[tw] OR 'Ili Belt[tw] OR Birkirkara[tw] OR 'B Kara[tw] OR 'B'Kara[tw] OR Bircirkara[tw] OR Mosta[tw] OR Qormi[tw] OR 'St Paul s Bay[tw] OR 'St Paul's Bay[tw] OR 'Pawl il Bahar[tw] OR Zabbar[tw] OR Sliema[tw] OR Naxxara[tw] OR Gwann[tw] OR 'St John[tw] OR Zebbug[tw] OR 'Gitta rohan[tw] OR Fgura[tw] OR ('Netherlands[Mesh] OR Netherlands[tw] OR Nederland\*[tw] OR Dutch\*[tw] OR Drenthe[tw] OR Flevoland[tw] OR Friesland[tw] OR Fryslan[tw] OR Frisia[tw] OR Gelderland[tw] OR Guelders[tw] OR Groningen[tw] OR Limburg[tw] OR Brabant[tw] OR

Holland[tw] OR Overijssel[tw] OR Overijssel[tw] OR Utrecht[tw] OR Zeeland[tw] OR Amsterdam[tw] OR Rotterdam[tw] OR Hague[tw] OR 's-Gravenhage[tw] OR 'Den Haag[tw] OR Eindhoven[tw] OR Tilburg[tw] OR Almere[tw] OR Breda[tw] OR Nijmegen[tw] OR Nimeguen[tw] OR ('Poland'[Mesh] OR Poland[tw] OR Polska[tw] OR Polish[tw] OR Pole[tw] OR Poles[tw] OR Polski[tw] OR Polak[tw] OR Polka[tw] OR Polacy[tw] OR Dolnoslaskie[tw] OR Silesia\*[tw] OR Slask[tw] OR Slask[tw] OR Pomorskie[tw] OR Pomerania\*[tw] OR Kujawsko[tw] OR Kuyavian[tw] OR Lodzkie[tw] OR Lodz[tw] OR Lubelskie[tw] OR Lublin[tw] OR Lubuskie[tw] OR Lubusz[tw] OR Lubus[tw] OR Malopolskie[tw] OR Mazowieckie[tw] OR Mazowskie[tw] OR Masovia[tw] OR Masovian[tw] OR Opolskie[tw] OR Opole[tw] OR Podkarpackie[tw] OR Subcarpathian\*[tw] OR Podlaskie[tw] OR Podlachia[tw] OR Podlasie[tw] OR Slaskie[tw] OR Swietokrzyskie[tw] OR 'Warmia Mazuria[tw] OR 'Warmian Mazurian[tw] OR 'Warmia Masuria[tw] OR 'Warmian Masurian[tw] OR 'Warmia Mazury[tw] OR 'Warmiansko Mazurskie[tw] OR 'Warmian Masurian[tw] OR Wielkopolskie[tw] OR Zachodniopomorskie[tw] OR Warsaw[tw] OR Warszawa[tw] OR Krakow[tw] OR Cracow[tw] OR Wroclaw[tw] OR Poznan[tw] OR Gdansk[tw] OR Szczecin[tw] OR Bydgoszcz[tw] OR Katowice[tw] OR ('Portugal'[Mesh] OR Portugal[tw] OR Portugues\*[tw] OR Azores[tw] OR Acores[tw] OR Madeira[tw] OR Alentejo[tw] OR Algarve[tw] OR Lisboa[tw] OR Lisbon[tw] OR Alto Tras-os-Montes[tw] OR (Ave[tw] AND (community[tw] OR intermunicipal[tw] OR comunidade[tw])) OR Mondego[tw] OR Vouga[tw] OR Beira[tw] OR Cavado[tw] OR Lafoes[tw] OR Douro[tw] OR Porto[tw] OR Oporto[tw] OR Tejo[tw] OR Minho[tw] OR Setubal[tw] OR Pinhal[tw] OR 'Serra da Estrela[tw] OR Tamega[tw] OR Leira[tw] OR Santarem[tw] OR Beja[tw] OR Faro[tw] OR Evora[tw] OR Portalegre[tw] OR 'Castelo Branco[tw] OR Guarda[tw] OR Coimbra[tw] OR Aveiro[tw] OR Viseu[tw] OR Braganca[tw] OR Braganza[tw] OR Braga[tw] OR 'Vila real[tw] OR 'Viana do Castelo[tw] OR Gaia[tw] OR Amadora[tw] OR Funchal[tw] OR Coimbra[tw] OR Almada[tw] OR (Aguilva[tw] AND Cacem[tw])) OR ('Romania'[Mesh] OR Romania\*[tw] OR Rumania\*[tw] OR Roumania\*[tw] OR Romani[tw] OR Ruman[tw] OR Alba[tw] OR Arad[tw] OR Arges[tw] OR Bacau[tw] OR Bihor[tw] OR 'Bistrita Nasaud[tw] OR Botosani[tw] OR Braila[tw] OR Brasov[tw] OR Kronstadt[tw] OR Brassov[tw] OR Brassovia[tw] OR Coron[tw] OR Bucharest[tw] OR Bucuresti[tw] OR Buzau[tw] OR Calarasi[tw] OR 'Caras-Severin[tw] OR Cluj[tw] OR Klausenburg[tw] OR Kolozsvar[tw] OR Constanta[tw] OR Tomis[tw] OR Konstantia[tw] OR Kostence[tw] OR Covasna[tw] OR Dambovitza[tw] OR Dolj[tw] OR Galati[tw] OR Galatz[tw] OR Galac[tw] OR Kalas[tw] OR Giurgiu[tw] OR Gorj[tw] OR Harghita[tw] OR Hunedoara[tw] OR Ialomita[tw] OR Iasi[tw] OR Jassy[tw] OR Lassy[tw] OR Ilfov[tw] OR Maramures[tw] OR Mehedinti[tw] OR Mures[tw] OR Neamt[tw] OR (Olt[tw] AND (river[tw] OR county[tw] OR region[tw] OR judetul[tw] OR Raul[tw])) OR Prahova[tw] OR Salaj[tw] OR 'Satu Mare[tw] OR Sibiu[tw] OR Temeuva[tw] OR Teleorman[tw] OR Timis[tw] OR Tulcea[tw] OR Valcea[tw] OR Vilcea[tw] OR Vaslui[tw] OR Vrancea[tw] OR Timisoara[tw] OR Temesvar[tw] OR Temeschburg[tw] OR Temeschwar[tw] OR Temesvar[tw] OR Temisvar[tw] OR Temesva[tw] OR Craiova[tw] OR Ploiesti[tw] OR Ploesti[tw] OR Oradea[tw] OR Varad[tw] OR Varat[tw] OR ('Slovakia'[Mesh] OR Slovakia[tw] OR Slovensk\*[tw] OR Slovak\*[tw] OR Slovaci[tw] OR Slovenki[tw] OR Bratislav\*[tw] OR Presporok[tw] OR Pressburg[tw] OR Posonium[tw] OR Banskobystri\*[tw] OR 'Banska Bystrica[tw] OR Neusohl[tw] OR Besztercebanya[tw] OR Kosic\*[tw] OR Kaschau[tw] OR Kassa[tw] OR Nitrian\*[tw] OR Nitra[tw] OR Neutra[tw] OR Nyitra[tw] OR Nyitria[tw] OR Trnav\*[tw] OR Tyrnau[tw] OR Nagyszombat[tw] OR Tyrnavia[tw] OR Presov\*[tw] OR Trencian\*[tw] OR Trencin[tw] OR Trencschin[tw] OR Trencsen[tw] OR Zilina[tw] OR Sillein[tw] OR Zsolna[tw] OR Zylina[tw] OR (Martin[tw] AND (city[tw] OR Svaty[tw])) OR Turocszentmarton[tw] OR Poprad[tw] OR Deutschendorf[tw] OR Zvolen[tw] OR ('Slovenia'[Mesh] OR Slovenia\*[tw] OR Slovenija[tw] OR slovensk\*[tw] OR Slovenci[tw] OR Slovene\*[tw] OR Gorenjska[tw] OR Carniola[tw] OR Goriska[tw] OR Gorizia[tw] OR Jugovzhodna[tw] OR Koroska[tw] OR Carinthia[tw] OR 'Notranjsko kraska[tw] OR 'Obalno kraska[tw] OR 'Coastal karst[tw] OR Osrednjeslovenska[tw] OR Podravska[tw] OR Drava[tw] OR Pomurska[tw] OR Mura[tw] OR Savinjska[tw] OR Savinja[tw] OR Spodnjeposavska[tw] OR Zasavska[tw] OR 'Central Sava[tw] OR Posavska[tw] OR 'Lower Sava[tw] OR Ljubljana[tw] OR Laibach[tw] OR Lubiana[tw] OR Maribor[tw] OR 'Marburg an der Drau[tw] OR Kranj[tw] OR Carnium[tw] OR Creina[tw] OR Chreina[tw] OR Krainbur[tw] OR Koper[tw] OR Capodistria[tw] OR Kopar[tw] OR Celje[tw] OR 'Novo mesto[tw] OR Neustadt[tw] OR Domzale[tw] OR Velenje[tw] OR Wollan[tw] OR Woellan[tw] OR 'Nova Gorica[tw] OR Kamnik[tw] OR ('Spain'[Mesh] OR Spain[tw] OR Espana[tw] OR Spanish[tw] OR Espanol\*[tw] OR Spaniard\*[tw] OR Andalucia[tw] OR Andalusia[tw] OR Aragon[tw] OR Arago[tw] OR Cantabria[tw] OR Canarias[tw] OR 'Canary Islands[tw] OR (Canaries[tw] AND island\*[tw]) OR 'Castile and leon[tw] OR 'Castilla y Leon[tw] OR 'Castile La Mancha[tw] OR 'Castilla La Mancha[tw] OR Cataluna[tw] OR Catalonia[tw] OR Ceuta[tw] OR Madrid[tw] OR Melilla[tw] OR Navarra[tw] OR Navarre[tw] OR Valencia\*[tw] OR Extremadura[tw] OR Galicia[tw] OR Balears[tw] OR 'Balearic Islands[tw] OR 'Balear Islands[tw] OR Baleares[tw] OR 'La Rioja[tw] OR 'Pais Vasco[tw] OR 'Basque Country[tw] OR 'Baske region[tw] OR Euskadi[tw] OR Asturias[tw] OR Murcia[tw] OR Coruna[tw] OR Alava[tw] OR Araba[tw] OR Albacete[tw] OR Alicante[tw] OR Alacant[tw] OR Almeria[tw] OR Avila[tw] OR Badajoz[tw] OR Badajoz[tw] OR Barcelona[tw] OR Burgos[tw] OR Caceres[tw] OR Cadiz[tw] OR Castellon[tw] OR Castello[tw] OR 'Ciudad Real[tw] OR Cordoba[tw] OR Cuenca[tw] OR Eivissa[tw] OR Ibiza[tw] OR Formentera[tw] OR 'El Hierro[tw] OR Fuerteventura[tw] OR Galiza[tw] OR Girona[tw] OR Gerona[tw] OR 'Gran Canaria[tw] OR Granada[tw] OR Guadalajara[tw] OR Guipuzcoa[tw] OR Gipuzkoa[tw] OR Huelva[tw] OR Huesca[tw] OR Jaen[tw] OR 'La Gomera[tw] OR 'La Palma[tw] OR Lanzarote[tw] OR Leon[tw] OR Lleida[tw] OR Llerida[tw] OR Lugo[tw] OR Malaga[tw] OR Mallorca[tw] OR Majorca[tw] OR Menorca[tw] OR Minorca[tw] OR Murcia[tw] OR Ourense[tw] OR Orense[tw] OR Palencia[tw] OR Pontevedra[tw] OR Salamanca[tw] OR Segovia[tw] OR Sevilla[tw] OR Seville[tw] OR Soria[tw] OR Tarragona[tw] OR Tenerife[tw] OR Teruel[tw] OR Toledo[tw] OR Valladolid[tw] OR Vizcaya[tw] OR Biscay[tw] OR Zamora[tw] OR Zaragoza[tw] OR Saragosa[tw] OR 'Las Palmas[tw] OR Bilbao[tw] OR Bilbao[tw] OR ('Sweden'[Mesh] OR Sweden[tw] OR Sverige[tw] OR Swedish[tw] OR Svenska[tw] OR svenskar[tw] OR Swede[tw] OR Swedes[tw] OR Norrland[tw] OR Mellansverige[tw] OR Smaland[tw] OR Stockholm\*[tw] OR Sydsverige[tw] OR Vastsverige[tw] OR Blekinge[tw] OR Dalarna[tw] OR Gavleborg\*[tw] OR Gotland\*[tw] OR Halland\*[tw] OR Jamtland\*[tw] OR Jonkoping\*[tw] OR Kalmar[tw] OR Kronoberg\*[tw] OR Norrbotten\*[tw] OR Orebro[tw] OR Ostergotland\*[tw] OR Skane[tw] OR Sodermanlands[tw] OR Uppsala[tw] OR Varmland\*[tw] OR Vasterbotten\*[tw] OR Vasternorrland\*[tw] OR Vastmanland\*[tw] OR vastergotland\*[tw] OR Gotaland\*[tw] OR Gothenburg[tw] OR Goteborg[tw] OR Malmö[tw] OR Vasteras[tw] OR Linkoping[tw] OR Helsingborg[tw] OR Helsingborg[tw] OR Norrkoping[tw] OR ('Great Britain'[Mesh] OR GB[tw] OR 'United kingdom[tw] OR UK[tw] OR Britain[tw] OR British[tw] OR England[tw] OR English[tw] OR Scottish[tw] OR Scots[tw] OR Wales[tw] OR Cymru[tw] OR Welsh[tw] OR Irish[tw] OR Avon[tw] OR Bedfordshire[tw] OR Berkshire[tw] OR Bristol[tw] OR Buckinghamshire[tw] OR Cambridgeshire[tw] OR 'Isle of Ely[tw] OR Cheshire[tw] OR Cleveland[tw] OR Cornwall[tw] OR Cumberland[tw] OR Cumbria[tw] OR Derbyshire[tw] OR Devon[tw] OR Dorset[tw] OR Durham[tw] OR Essex[tw] OR Gloucestershire[tw] OR Hampshire[tw] OR Southampton[tw] OR (Hereford[tw] AND Worcester[tw]) OR Hertfordshire[tw] OR Herefordshire[tw] OR Humberside[tw] OR Huntingdon[tw] OR Huntingdonshire[tw] OR 'Isle of Wight[tw] OR Kent[tw] OR Lancashire[tw] OR Leicestershire[tw] OR Lincolnshire[tw] OR London[tw] OR Manchester[tw] OR Merseyside[tw] OR Middlesex[tw] OR Norfolk[tw] OR Northamptonshire[tw] OR Northumberland[tw] OR Nottinghamshire[tw] OR Oxfordshire[tw] OR Peterborough[tw] OR Rutland[tw] OR Shropshire[tw] OR Salop[tw] OR Somerset[tw] OR Yorkshire[tw] OR Staffordshire[tw] OR Suffolk[tw] OR Surrey[tw] OR Sussex[tw] OR (Tyne[tw] AND Wear[tw]) OR Warwickshire[tw] OR Midlands[tw] OR Westmorland[tw] OR Wiltshire[tw] OR Worcestershire[tw] OR 'Isle of Man[tw] OR Jersey[tw] OR Guernsey[tw] OR 'Channel Islands[tw] OR Aberdeen[tw] OR Aberdeenshire[tw] OR Angus[tw] OR Forfarshire[tw] OR Argyll[tw] OR Ayrshire[tw] OR Banffshire[tw] OR Berwickshire[tw] OR Bute[tw] OR Caithness[tw] OR Clackmannanshire[tw] OR Cromartyshire[tw] OR Dumfriesshire[tw] OR Dunbartonshire[tw] OR Dumbarton[tw] OR Dundee[tw] OR Lothian[tw] OR Haddingtonshire[tw] OR Edinburgh[tw] OR Fife[tw] OR Glasgow[tw] OR Inverness-shire[tw] OR Kincardineshire[tw] OR Kinross-shire[tw] OR Kirkcudbrightshire[tw] OR Lanarkshire[tw] OR Midlothian[tw] OR Moray[tw] OR Elginshire[tw] OR Nairnshire[tw] OR Orkney[tw] OR Peeblesshire[tw] OR Perthshire[tw] OR Renfrewshire[tw] OR (Ross[tw] AND Cromarty[tw]) OR Ross-shire[tw] OR Roxburghshire[tw] OR Selkirkshire[tw] OR Shetland[tw] OR Zetland[tw] OR Stirlingshire[tw] OR Sutherland[tw] OR Linlithgowshire[tw] OR Wigtownshire[tw] OR Anglesey[tw] OR Brecknockshire[tw] OR Caernarfonshire[tw] OR Carmarthenshire[tw] OR Cardiganshire[tw] OR Ceredigion[tw] OR Clwyd[tw] OR Denbighshire[tw] OR Dyfed[tw] OR Flintshire[tw] OR Flintshire[tw] OR Glamorgan[tw] OR Gwent[tw] OR Gwynedd[tw] OR Merionethshire[tw] OR Montgomeryshire[tw] OR Monmouthshire[tw] OR Pembrokeshire[tw] OR Powys[tw] OR Radnorshire[tw] OR Antrim[tw] OR Aontroim[tw] OR 'Contae Aontroma[tw] OR Antrim[tw] OR Antrim[tw] OR Entrim[tw] OR Armagh[tw] OR 'Ard Mhacha[tw] OR Airmagh[tw] OR Belfast[tw] OR (Down[tw] AND (district[tw] OR council[tw] OR County[tw])) OR 'An Dun[tw] OR 'an Duin[tw] OR Doon[tw] OR Doun[tw] OR Fermanagh[tw] OR 'Fear Manach[tw] OR 'Fhear Manach[tw] OR Fermanay[tw] OR Londonderry[tw] OR Doire[tw] OR Dhoire[tw] OR Lunnonderriel[tw] OR Derry[tw] OR Birmingham[tw] OR Leeds[tw] OR Sheffield[tw] OR Bradford[tw] OR Liverpool[tw])) OR ((GB[ad] OR 'United kingdom[ad] OR UK[ad] OR Britain[ad] OR British[ad] OR England[ad] OR English[ad] OR Scotland[ad] OR Scottish[ad] OR Scots[ad] OR Wales[ad] OR Cymru[ad] OR Welsh[ad] OR 'North Ireland[ad] OR 'Northern Ireland[ad] OR Irish[ad] OR Avon[ad] OR Bedfordshire[ad] OR Berkshire[ad] OR Bristol[ad] OR Buckinghamshire[ad] OR Cambridgeshire[ad] OR 'Isle of Ely[ad] OR Cheshire[ad] OR Cleveland[ad] OR

Cornwall[ad] OR Cumberland[ad] OR Cumbria[ad] OR Derbyshire[ad] OR Devon[ad] OR Dorset[ad] OR Durham[ad] OR Essex[ad] OR Gloucestershire[ad] OR Hampshire[ad] OR Southampton[ad] OR (Hereford[ad] AND Worcester[ad]) OR Hertfordshire[ad] OR Herefordshire[ad] OR Humberside[ad] OR Huntingdon[ad] OR Huntingdonshire[ad] OR 'Isle of Wight[ad] OR Kent[ad] OR Lancashire[ad] OR Leicestershire[ad] OR Lincolnshire[ad] OR London[ad] OR Manchester[ad] OR Merseyside[ad] OR Middlesex[ad] OR Norfolk[ad] OR Northamptonshire[ad] OR Northumberland[ad] OR Nottinghamshire[ad] OR Oxfordshire[ad] OR Peterborough[ad] OR Rutland[ad] OR Shropshire[ad] OR Salop[ad] OR Somerset[ad] OR Yorkshire[ad] OR Staffordshire[ad] OR Suffolk[ad] OR Surrey[ad] OR Sussex[ad] OR (Tyne[ad] AND Wear[ad]) OR Warwickshire[ad] OR midlands[ad] OR Westmorland[ad] OR Wiltshire[ad] OR Worcestershire[ad] OR 'Isle of Man[ad] OR Jersey[ad] OR Guernsey[ad] OR 'Channel Islands[ad] OR Aberdeen[ad] OR Aberdeenshire[ad] OR Angus[ad] OR Forfarshire[ad] OR Argyll[ad] OR Ayrshire[ad] OR Banffshire[ad] OR Berwickshire[ad] OR bute[ad] OR Caithness[ad] OR Clackmannanshire[ad] OR Cromartyshire[ad] OR Dumfriesshire[ad] OR Dunbartonshire[ad] OR Dumbarton[ad] OR Dundee[ad] OR Lothian[ad] OR Haddingtonshire[ad] OR Edinburgh[ad] OR Fife[ad] OR Glasgow[ad] OR Inverness-shire[ad] OR Kincardineshire[ad] OR Kinross-shire[ad] OR Kirkcubrightshire[ad] OR Lanarkshire[ad] OR Midlothian[ad] OR Moray[ad] OR Elginshire[ad] OR Nairnshire[ad] OR Orkney[ad] OR Peeblesshire[ad] OR Perthshire[ad] OR Renfrewshire[ad] OR (Ross[ad] AND Cromarty[ad]) OR Ross-shire[ad] OR Roxburghshire[ad] OR Selkirkshire[ad] OR Shetland[ad] OR Zetland[ad] OR Stirlingshire[ad] OR Sutherland[ad] OR Linlithgowshire[ad] OR Wigtownshire[ad] OR Anglesey[ad] OR Brecknockshire[ad] OR Caernarfonshire[ad] OR Carmarthenshire[ad] OR Cardiganshire[ad] OR Ceredigion[ad] OR Clwyd[ad] OR Denbighshire[ad] OR Dyfed[ad] OR Flintshire[ad] OR Glamorgan[ad] OR Gwent[ad] OR Gwynedd[ad] OR Merionethshire[ad] OR Montgomeryshire[ad] OR Monmouthshire[ad] OR Pembrokeshire[ad] OR Powys[ad] OR Radnorshire[ad] OR Antrim[ad] OR Aontroim[ad] OR 'Contae Aontroma[ad] OR Antrim[ad] OR Antrim[ad] OR Entrim[ad] OR Armagh[ad] OR 'Ard Mhacha[ad] OR Airmagh[ad] OR Belfast[ad] OR (Down[ad] AND (district[ad] OR council[ad] OR County[ad])) OR 'An Dun[ad] OR 'an Duin[ad] OR Doon[ad] OR Doun[ad] OR Fermanagh[ad] OR 'Fear Manach[ad] OR 'Fhear Manach[ad] OR Fermanay[ad] OR Londonderry[ad] OR Doire[ad] OR Dhoire[ad] OR Lunnonderrie[ad] OR Derry[ad] OR Birmingham[ad] OR Leeds[ad] OR Sheffield[ad] OR Bradford[ad] OR Liverpool[ad] OR (Sweden[ad] OR Sverige[ad] OR Swedish[ad] OR Svenska[ad] OR svenskar[ad] OR Swede[ad] OR Swedes[ad] OR Norrland[ad] OR Mellansverige[ad] OR Smaland[ad] OR Stockholm\*[ad] OR Sydsverige[ad] OR Vastsverige[ad] OR Blekinge[ad] OR Dalarna[ad] OR Gavleborg\*[ad] OR Gotland\*[ad] OR Halland\*[ad] OR Jamtland\*[ad] OR Jonkoping\*[ad] OR Kalmar[ad] OR Kronoberg\*[ad] OR Norrbotten\*[ad] OR Orebro\*[ad] OR Ostergotland\*[ad] OR Skane[ad] OR Sodermanlands[ad] OR Uppsala[ad] OR Varmland\*[ad] OR Vasterbotten\*[ad] OR Vasternorrland\*[ad] OR Vastmanland\*[ad] OR vastergotland\*[ad] OR Gotaland\*[ad] OR Gothenburg[ad] OR Goteborg[ad] OR Malmö[ad] OR Vasteras[ad] OR Linköping[ad] OR Helsingborg[ad] OR Helsingborg[ad] OR Norrköping[ad] OR (Spain[ad] OR Espana[ad] OR Spanish[ad] OR Espanol\*[ad] OR Spaniard\*[ad] OR Andalusia[ad] OR Andalusia[ad] OR Aragon[ad] OR Arago[ad] OR Cantabria[ad] OR Canarias[ad] OR 'Canary Islands[ad] OR (Canaries[ad] AND island\*[ad]) OR 'Castile and leon[ad] OR 'Castilla y Leon[ad] OR 'Castile La Mancha[ad] OR 'Castilla La Mancha[ad] OR Catalonia[ad] OR Catalonia[ad] OR Ceuta[ad] OR Madrid[ad] OR Melilla[ad] OR Navarra[ad] OR Navarre[ad] OR Valencia\*[ad] OR Extremadura[ad] OR Galicia[ad] OR Balears[ad] OR 'Balearic Islands[ad] OR 'Balear Islands[ad] OR Balears[ad] OR 'La Rioja[ad] OR 'Pais Vasco[ad] OR 'Basque Country[ad] OR 'Basque region[ad] OR Euskadi[ad] OR Asturias[ad] OR Murcia[ad] OR Coruna[ad] OR Alava[ad] OR Araba[ad] OR Alacete[ad] OR Alicante[ad] OR Alacant[ad] OR Almeria[ad] OR Avila[ad] OR Badajoz[ad] OR Badajoz[ad] OR Barcelona[ad] OR Burgos[ad] OR Caceres[ad] OR Cadiz[ad] OR Castellon[ad] OR Castello[ad] OR 'Ciudad Real[ad] OR Cordoba[ad] OR Cuenca[ad] OR Eivissa[ad] OR Ibiza[ad] OR Formentera[ad] OR 'El Hierro[ad] OR Fuerteventura[ad] OR Galiza[ad] OR Girona[ad] OR Gerona[ad] OR 'Gran Canaria[ad] OR Granada[ad] OR Guadalajara[ad] OR Guipuzcoa[ad] OR Gipuzkoa[ad] OR Huelva[ad] OR Huesca[ad] OR Jaen[ad] OR 'La Gomera[ad] OR 'La Palma[ad] OR Lanzarote[ad] OR Leon[ad] OR Lleida[ad] OR Lerida[ad] OR Lugo[ad] OR Malaga[ad] OR Mallorca[ad] OR Majorca[ad] OR Menorca[ad] OR Minorca[ad] OR Murcia[ad] OR Ourense[ad] OR Orense[ad] OR Palencia[ad] OR Pontevedra[ad] OR Salamanca[ad] OR Segovia[ad] OR Segovia[ad] OR Sevilla[ad] OR Seville[ad] OR Soria[ad] OR Tarragona[ad] OR Tenerife[ad] OR Teruel[ad] OR Toledo[ad] OR Valladolid[ad] OR Vizcaya[ad] OR Biscay[ad] OR Zamora[ad] OR Zaragoza[ad] OR Saragossa[ad] OR 'Las Palmas[ad] OR Bilbao[ad] OR Bilbo[ad] OR (Slovenia\*[ad] OR Slovenija[ad] OR slovensk\*[ad] OR Slovencija[ad] OR Slovene\*[ad] OR Gorenjska[ad] OR Carniola[ad] OR Goriska[ad] OR Gorizia[ad] OR Jugovzhodna[ad] OR Koroska[ad] OR Carinthia[ad] OR 'Notranjsko kraska[ad] OR 'Obalno kraska[ad] OR 'Coastal karst[ad] OR Osrednjeslovenska[ad] OR Podravska[ad] OR Drava[ad] OR Pomurska[ad] OR Mura[ad] OR Savinjska[ad] OR Savinja[ad] OR Spodnjeposavska[ad] OR Zasavska[ad] OR 'Central Sava[ad] OR Posavska[ad] OR 'Lower Sava[ad] OR Ljubljana[ad] OR Ljubljana[ad] OR Lubiana[ad] OR Maribor[ad] OR Marburg an der Drau[ad] OR Kranj[ad] OR Carnium[ad] OR Creina[ad] OR Chreina[ad] OR Krainbur[ad] OR Koper[ad] OR Capodistria[ad] OR Kopar[ad] OR Celje[ad] OR 'Novo mesto[ad] OR Neustadt[ad] OR Domžale[ad] OR Velenje[ad] OR Wollan[ad] OR Woellan[ad] OR 'Nova Gorica[ad] OR Kamnik[ad] OR (Slovakia[ad] OR Slovensk\*[ad] OR Slovak\*[ad] OR Slovaci[ad] OR Slovenki[ad] OR Bratislav\*[ad] OR Presporok[ad] OR Pressburg[ad] OR Pressburg[ad] OR Posonium[ad] OR Banskobystrici[ad] OR 'Banska Bystrica[ad] OR Neusohl[ad] OR Besztercebanya[ad] OR Kosic\*[ad] OR Kaschau[ad] OR Kassa[ad] OR Nitrian\*[ad] OR Nitra[ad] OR Neutra[ad] OR Nyitra[ad] OR Nyitria[ad] OR Trnav\*[ad] OR Tyrnau[ad] OR Nagyszombat[ad] OR Tyrnavia[ad] OR Presov\*[ad] OR Trencian\*[ad] OR Trencin[ad] OR Trencsintin[ad] OR Trencsen[ad] OR Zilina[ad] OR Sillein[ad] OR Zsolna[ad] OR Zylina[ad] OR (Martin[ad] AND (city[ad] OR Svaty[ad])) OR Turocszentmarton[ad] OR Poprad[ad] OR Deutschenord[ad] OR Zvolen[ad] OR (Romania\*[ad] OR Rumania\*[ad] OR Roumania\*[ad] OR Romani[ad] OR Rumanif[ad] OR Alba[ad] OR Arad[ad] OR Arges[ad] OR Bacau[ad] OR Bihor[ad] OR 'Bistrita Nasaud[ad] OR Botosani[ad] OR Braila[ad] OR Brasov[ad] OR Kronstadt[ad] OR Brasso[ad] OR Brassovia[ad] OR Coron[ad] OR Bucharest[ad] OR Bucuresti[ad] OR Buzau[ad] OR Calarasi[ad] OR 'Caras-Severin[ad] OR Cluj[ad] OR Klausenburg[ad] OR Kolozsvar[ad] OR Constanta[ad] OR Tomis[ad] OR Konstantia[ad] OR Kostence[ad] OR Covasna[ad] OR Dambovita[ad] OR Dolj[ad] OR Galati[ad] OR Galatz[ad] OR Galac[ad] OR Kalas[ad] OR Giurgiu[ad] OR Gorj[ad] OR Harghita[ad] OR Hunedoara[ad] OR Ialomita[ad] OR Iasi[ad] OR Jassy[ad] OR Lassy[ad] OR Ilfov[ad] OR Maramures[ad] OR Mehedinti[ad] OR Mures[ad] OR Neamt[ad] OR Olt[ad] AND (river[ad] OR county[ad] OR region[ad] OR judetul[ad] OR Raul[ad])) OR Prahova[ad] OR Salaj[ad] OR 'Satu Mare[ad] OR Sibiu[ad] OR Suceava[ad] OR Teleorman[ad] OR Timis[ad] OR Tulcea[ad] OR Valcea[ad] OR Vilcea[ad] OR Vaslui[ad] OR Vrancea[ad] OR Timisoara[ad] OR Temeswar[ad] OR Temeschburg[ad] OR Temeschwar[ad] OR Temesvar[ad] OR Temisvar[ad] OR Temisvar[ad] OR Temesva[ad] OR Craiova[ad] OR Ploiesti[ad] OR Ploesti[ad] OR Oradea[ad] OR Varad[ad] OR Varat[ad] OR (Portugal[ad] OR Portugues\*[ad] OR Azores[ad] OR Madeira[ad] OR Alentejo[ad] OR Algarve[ad] OR Lisboa[ad] OR Lisbon[ad] OR 'Alto Tras-os-Montes[ad] OR (Ave[ad] AND (community[ad] OR intermunicipal[ad] OR comunidade[ad])) OR Mondego[ad] OR Vouga[ad] OR Beira[ad] OR Cavado[ad] OR Lafoes[ad] OR Douro[ad] OR Porto[ad] OR Oporto[ad] OR Tejo[ad] OR Minho[ad] OR Setubal[ad] OR Pinhal[ad] OR 'Serra da Estrela[ad] OR Tamega[ad] OR Leira[ad] OR Santarem[ad] OR Beja[ad] OR Faro[ad] OR Evora[ad] OR Portalegre[ad] OR 'Castelo Branco[ad] OR Guarda[ad] OR Cimbra[ad] OR Aveiro[ad] OR Viseu[ad] OR Braganca[ad] OR Braganza[ad] OR Braga[ad] OR 'Vila real[ad] OR 'Viana do Castelo[ad] OR Gaia[ad] OR Amadora[ad] OR Funchal[ad] OR Coimbra[ad] OR Almada[ad] OR (Aguai[ad] AND Cacem[ad])) OR (Poland[ad] OR Polska[ad] OR Polish[ad] OR Pole[ad] OR Poles[ad] OR Polskif[ad] OR Polak[ad] OR Polka[ad] OR Polacy[ad] OR Dolnoslaskie[ad] OR Silesia\*[ad] OR Slask[ad] OR Pomorskie[ad] OR Pomerania\*[ad] OR Kujawsko[ad] OR Kuyavian[ad] OR Lodzkie[ad] OR Lodz[ad] OR Lubelskie[ad] OR Lublin[ad] OR Lubuskie[ad] OR Lubusz[ad] OR Lubus[ad] OR Malopolskie[ad] OR Mazowieckie[ad] OR Mazowske[ad] OR Masovia[ad] OR Masovian[ad] OR Opolskie[ad] OR Opole[ad] OR Podkarpackie[ad] OR Subcarpathian\*[ad] OR Podlaskie[ad] OR Podlachia[ad] OR Podlasie[ad] OR Slaskie[ad] OR Swietokrzyskie[ad] OR 'Warmia Mazuria[ad] OR 'Warmian Mazurian[ad] OR 'Warmia Masuria[ad] OR 'Warmian Masurian[ad] OR 'Warmia Mazury[ad] OR 'Warminsko Mazurskie[ad] OR 'Warmian Masurian[ad] OR Wielkopolskie[ad] OR Zachodniopomorskie[ad] OR Warsaw[ad] OR Warszawa[ad] OR Krakow[ad] OR Cracow[ad] OR Wroclaw[ad] OR Poznan[ad] OR Gdansk[ad] OR Szczecin[ad] OR Bydgoszcz[ad] OR Katowice[ad] OR (Netherlands[ad] OR Nederland\*[ad] OR Dutch\*[ad] OR Drenthe[ad] OR Flevoland[ad] OR Friesland[ad] OR Fryslan[ad] OR Frisia[ad] OR Gelderland[ad] OR Guelders[ad] OR Groningen[ad] OR Limburg[ad] OR Brabant[ad] OR Holland[ad] OR Overijssel[ad] OR Overijssel[ad] OR Utrecht[ad] OR Zeeland[ad] OR Amsterdam[ad] OR Rotterdam[ad] OR Hague[ad] OR 's-Gravenhage[ad] OR 'Den Haag[ad] OR Eindhoven[ad] OR Tilburg[ad] OR Almere[ad] OR Breda[ad] OR Nijmegen[ad] OR Nimeguen[ad] OR (Malta[ad] OR Maltese\*[ad] OR Malta[ad] OR Maltin[ad] OR Gozo[ad] OR Għawdex[ad] OR Valletta[ad] OR 'Il Belt[ad] OR Birkirkara[ad] OR 'B Kara[ad] OR 'B'Kara[ad] OR Birchirara[ad] OR Mosta[ad] OR Qormi[ad] OR 'St Paul s Bay[ad] OR 'St Paul's Bay[ad] OR 'Pawli il Bahar[ad] OR Zabbar[ad] OR Sliema[ad] OR Naxxar[ad] OR Gwann[ad] OR 'St John[ad] OR Zebbug[ad] OR 'Citta rohan[ad] OR Fgura[ad] OR Luxembourg\*[ad] OR Letzebuerg[ad] OR Letzebuerg[ad] OR Diekirch[ad] OR Grevenmacher[ad] OR 'Esch sur Alzette[ad] OR 'Esch Uelzecht[ad] OR 'Esch an der Alzette[ad] OR 'Esch an der Alzig[ad] OR Dudelange[ad] OR Diddeleng[ad] OR Dudelingen[ad] OR Duedelingen[ad] OR Schiffange[ad] OR Scheffleng[ad] OR Schiffingen[ad] OR Bettembourg[ad] OR Beetebuerg[ad] OR



Bettemburg[ad] OR Petange[ad] OR Peiteng[ad] OR Petingen[ad] OR Ettelbruck[ad] OR Ettelbreck[ad] OR Ettelbrueck[ad] OR Diekirch[ad] OR Dikrech[ad] OR Strassen[ad] OR Stroossen[ad] OR Bertrange[ad] OR Bartreng[ad] OR Bartringen[ad] OR (Lithuania\*[ad] OR Lietuvos Respublika[ad] OR Lietuva[ad] OR lietuviu[ad] OR Alytus[ad] OR Alytaus[ad] OR Kaunas[ad] OR Kauno[ad] OR Klaipeda[ad] OR Klaipėdos[ad] OR Marijampoles[ad] OR Marijampole[ad] OR Panevezys[ad] OR Panevezio[ad] OR Siauliai[ad] OR Siauliui[ad] OR Taurages[ad] OR Taurage[ad] OR Telsiu[ad] OR Telsiai[ad] OR Utenos[ad] OR Utena[ad] OR Vilnius[ad] OR Vilniaus[ad] OR Mazeikiai[ad] OR Jonava[ad] OR Mazeikiu[ad] OR Jonavos[ad] OR (Latvi\*[ad] OR Riga[ad] OR Courland[ad] OR Kurzeme[ad] OR Kurland[ad] OR Latgale[ad] OR Lettgallia[ad] OR Latgola[ad] OR Latgālija[ad] OR Vidzeme[ad] OR Vidumo[ad] OR Semigale[ad] OR Semigalia[ad] OR Zemgale[ad] OR Pieriga[ad] OR Daugavpils[ad] OR Dinaburg[ad] OR Jekabpils[ad] OR Jakobstadt[ad] OR Jelgava[ad] OR Jurmala[ad] OR Liepaja[ad] OR Libau[ad] OR Rezekne[ad] OR Rezne[ad] OR Rositten[ad] OR Valmiera[ad] OR Wolmar[ad] OR Ventspils[ad] OR Windau[ad] OR Ogre[ad] OR (Italy[ad] OR Italia\*[ad] OR Abruzzo[ad] OR Abruzzi[ad] OR Basilicata[ad] OR Lucania[ad] OR Calabria[ad] OR Campania[ad] OR 'Emilia Romagna[ad] OR 'friuli venezia giulia[ad] OR Lazio[ad] OR Latium[ad] OR Liguria\*[ad] OR Lombardy[ad] OR Lombardia[ad] OR Marche[ad] OR Marches[ad] OR Molisano[ad] OR Molise[ad] OR Piedmont\*[ad] OR Piemonte[ad] OR Bolzano[ad] OR Bozen[ad] OR Trentino[ad] OR Trento[ad] OR Puglia[ad] OR Apulia[ad] OR Sardinia[ad] OR Sardegna[ad] OR Sicily[ad] OR Sicilia[ad] OR Toscana[ad] OR Tuscany[ad] OR Umbria[ad] OR 'Valle d Aosta[ad] OR 'Vallee d Aoste[ad] OR 'Valle d'Aosta[ad] OR 'Aosta Valley[ad] OR Veneto[ad] OR Venetia[ad] OR Triveneto[ad] OR Rome[ad] OR Roma[ad] OR Milan[ad] OR Milano[ad] OR Naples[ad] OR Napoli[ad] OR Turin[ad] OR Torino[ad] OR Palermo[ad] OR Genoa[ad] OR Genova[ad] OR Bologna[ad] OR Florence[ad] OR Firenze[ad] OR Bari[ad] OR Catania[ad] OR (Ireland[ad] OR Eire[ad] OR Irish\*[ad] OR Fingal[ad] OR 'Fine Gall[ad] OR Dublin[ad] OR 'Ath Cliath[ad] OR 'Dun Laoghaire[ad] OR Wicklow[ad] OR 'Cill Mhantain[ad] OR 'Chill Mhantain[ad] OR Wexford[ad] OR 'Loch Garman[ad] OR Carlow[ad] OR Ceatharlach[ad] OR Kildare[ad] OR 'Cill Dara[ad] OR 'Chill Dara[ad] OR Meath[ad] OR 'An Mhi[ad] OR 'Contae na Mi[ad] OR Louth[ad] OR 'Contae Lu[ad] OR Monaghan[ad] OR Muineachan[ad] OR Mhuineachain[ad] OR Cavan[ad] OR 'An Cabhan[ad] OR 'An Cabhain[ad] OR Longford[ad] OR 'An Longfort[ad] OR 'an Longfoirt[ad] OR Langfurd[ad] OR Westmeath[ad] OR 'An Iarmhi[ad] OR 'na Iarmhi[ad] OR Offaly[ad] OR 'Uibh Fhaili[ad] OR Laois[ad] OR Laoise[ad] OR Kilkenny[ad] OR 'Chill Chainnigh[ad] OR 'Cill Chainnigh[ad] OR Waterford[ad] OR 'Port Lairge[ad] OR Watterford[ad] OR Cork[ad] OR Corcaigh[ad] OR Chorcaí[ad] OR Kerry[ad] OR Ciarraí[ad] OR Chiarráil[ad] OR Limerick[ad] OR Luimneach[ad] OR Luimnigh[ad] OR Tipperary[ad] OR 'Tiobraid Arann[ad] OR 'Thiobraid Arann[ad] OR Clare[ad] OR 'An Clair[ad] OR 'an Chlair[ad] OR Galway[ad] OR Gaillimh[ad] OR 'na Gaillimhe[ad] OR Mayo[ad] OR 'Maigh Eo[ad] OR 'Mhaigh Eo[ad] OR Roscommon[ad] OR 'Ros comain[ad] OR Sligo[ad] OR Sligeach[ad] OR Shligigh[ad] OR Leitrim[ad] OR Liatroim[ad] OR Liatroma[ad] OR Donegal[ad] OR 'Dhun na nGall[ad] OR Dinnygal[ad] OR Dunnyga[ad] OR Leinster[ad] OR Laighin[ad] OR 'Cuige Laignean[ad] OR Munster[ad] OR Mumhain[ad] OR 'Cuige Mumhan[ad] OR Connacht[ad] OR Connachta[ad] OR Drogheda[ad] OR 'Droichead Atha[ad] OR Dundalk[ad] OR 'Dun Dealgan[ad] OR Swords[ad] OR Sord[ad] OR Bray[ad] OR Navan[ad] OR Bre[ad] OR 'An Uaimh[ad] OR (Hungar\*[ad] OR Magyarország[ad] OR Magyar\*[ad] OR Dunantuli[ad] OR Transdanubia[ad] OR Dunantul[ad] OR 'Great Plain[ad] OR 'Eszak Alföld[ad] OR 'Del Alföld[ad] OR 'Alföld es eszak[ad] OR 'Northern Alföld[ad] OR 'North Alföld[ad] OR 'South Alföld[ad] OR 'Southern Alföld[ad] OR Bacs[ad] OR Kiskun[ad] OR Baranya[ad] OR Bekes[ad] OR Borsod[ad] OR Abauj[ad] OR Zemplen[ad] OR Budapest[ad] OR Csongrad[ad] OR Fejer[ad] OR győr[ad] OR moson[ad] OR sopron[ad] OR hajdu[ad] OR bihar[ad] OR Heves[ad] OR 'jasz nagykun szolnok[ad] OR komarom[ad] OR esztergom[ad] OR Nograd[ad] OR (Pest[ad] AND (megye[ad] OR county[ad])) OR Somogy[ad] OR szabolcs[ad] OR szatmar[ad] OR bereg[ad] OR Tolna[ad] OR Vas[ad] OR Veszprem[ad] OR Zala[ad] OR Debrecen[ad] OR Miskolc[ad] OR Szeged[ad] OR Pecs[ad] OR Győr[ad] OR Nyiregyhaza[ad] OR Kecskemet[ad] OR Szekesfehervar[ad] OR Szombathely[ad] OR (Greece[ad] OR 'Hellenic republic[ad] OR Greek\*[ad] OR Ellada[ad] OR Elladas[ad] OR 'Elliniki Dimokratia[ad] OR Hellas[ad] OR Hellenes[ad] OR Attica[ad] OR Attiki[ad] OR Makedonia\*[ad] OR Macedonia[ad] OR Thraki[ad] OR Thrace[ad] OR Crete[ad] OR Kriti[ad] OR 'Ionia Nisia[ad] OR 'Ionion neson[ad] OR 'Ionion nison[ad] OR 'Ionian islands[ad] OR 'Ionian island[ad] OR Epirus[ad] OR Ipeiros[ad] OR 'Periferia Ipeirou[ad] OR 'North aegean[ad] OR 'Northern Aegean[ad] OR 'Aegean islands[ad] OR 'Aegean island[ad] OR 'Nisoi Agaiou[ad] OR 'Notio Aigaiou[ad] OR Peloponnese[ad] OR Peloponniso\*[ad] OR Thessaly[ad] OR Thessalia[ad] OR Thessalian[ad] OR Petthalia[ad] OR 'Voreio Aigaiou[ad] OR 'Voreio Aigaiou[ad] OR 'South aegean[ad] OR 'Southern Aegean[ad] OR 'Mount athos[ad] OR 'Oros Athos[ad] OR Cyclades[ad] OR Cycklades[ad] OR Kiklades[ad] OR Dodecanese[ad] OR Dodekanisa[ad] OR Athens[ad] OR Athina[ad] OR Thessaloniki[ad] OR Thessalonica[ad] OR Patras[ad] OR Patra[ad] OR Pireas[ad] OR Piraeus[ad] OR Larissa[ad] OR Larisa[ad] OR Heraklion[ad] OR Heraklion[ad] OR Iraklion[ad] OR Irakleion[ad] OR Iraklio[ad] OR Volos[ad] OR Rhodes[ad] OR Rodos[ad] OR Ioannina[ad] OR Janina[ad] OR Yannena[ad] OR Chania[ad] OR Chalcis[ad] OR Chalkida[ad] OR (German\*[ad] OR Deutsch\*[ad] OR Bundesrepublik[ad] OR Westdeutschland[ad] OR Ostdeutschland[ad] OR Baden[ad] OR Wuerttemberg[ad] OR Wurttemberg[ad] OR Bayern[ad] OR Bavaria[ad] OR Berlin[ad] OR Brandenburg[ad] OR Bremen[ad] OR Oldenburg[ad] OR Mitteldeutschland[ad] OR Rhein[ad] OR Rhine[ad] OR Hannover[ad] OR Braunschweig[ad] OR Gottingen[ad] OR Goettingen[ad] OR Nurnberg[ad] OR Nuernberg[ad] OR Ruhr[ad] OR Koln[ad] OR koeln[ad] OR Bonn[ad] OR Hamburg[ad] OR Hessen[ad] OR Hesse[ad] OR Hestia[ad] OR Mecklenburg[ad] OR Vorpommern[ad] OR Pomerania[ad] OR Niedersachsen[ad] OR Neddersassen[ad] OR Saxony[ad] OR Niederbayern[ad] OR 'Northern Rhine[ad] OR 'North Rhine[ad] OR Westphalia[ad] OR Westfalen[ad] OR 'Rhineland Palatinate[ad] OR 'Rheinland Pfalz[ad] OR 'Saarland[ad] OR Sachsen[ad] OR 'Schleswig Holstein[ad] OR Thuringia[ad] OR Thuringen[ad] OR Thuringen[ad] OR Munchen[ad] OR Muenchen[ad] OR Munich[ad] OR Frankfurt[ad] OR Stuttgart[ad] OR Dusseldorf[ad] OR Duesseldorf[ad] OR Dortmund[ad] OR Essen[ad] OR (France[ad] OR French\*[ad] OR Francais\*[ad] OR Alsace[ad] OR Elsass[ad] OR Aquitaine[ad] OR Aquitania[ad] OR Akitania[ad] OR Aguiene[ad] OR Auvergne[ad] OR Auvergne[ad] OR Auverna[ad] OR Normandie[ad] OR Normandie[ad] OR Normandief[ad] OR Bourgogne[ad] OR Burgundy[ad] OR Bregogne[ad] OR Borgeogne[ad] OR Borgogne[ad] OR Brittany[ad] OR Breizh[ad] OR Bertaeyn[ad] OR Bretagne[ad] OR 'Champagne Ardenne[ad] OR Corse[ad] OR Corsica[ad] OR 'Franche Comte[ad] OR 'Frantche Comte[ad] OR 'Franche Comtat[ad] OR Guadeloupe[ad] OR Guyane[ad] OR Guiana[ad] OR 'Languedoc Roussillon[ad] OR 'Lengadoc Rosselhon[ad] OR 'Llenguadoc-Rossello[ad] OR Limousin[ad] OR Lemosin[ad] OR Lorraine[ad] OR Lothringen[ad] OR Lottringe[ad] OR Martinique[ad] OR 'Midi Pyrenees[ad] OR 'Miegjorn Pireneus[ad] OR 'Mieidia Pireneus[ad] OR 'Mediodia Pireneus[ad] OR 'Pays de la Loire[ad] OR 'Briou al Liger[ad] OR Picardie[ad] OR OR Picardy[ad] OR 'Poitou Charentes[ad] OR 'Peitau Charantas[ad] OR 'Poetou-Cherentes[ad] OR Provence[ad] OR Provenca[ad] OR Prouvenco[ad] OR 'Cote d Azur[ad] OR 'Cote d'Azur[ad] OR 'Costo d'Azur[ad] OR 'Costo d'Azur[ad] OR 'Costa d'Azur[ad] OR 'Costa d'Azur[ad] OR 'Costa d'Azur[ad] OR Reunion[ad] OR 'Rhône Alpes[ad] OR 'Rono Arpes[ad] OR 'Rose Aups[ad] OR Ain[ad] OR Aisne[ad] OR Allier[ad] OR 'Alpes de Haute Provence[ad] OR 'Haute Alpes[ad] OR 'Alpes Maritimes[ad] OR Ardeche[ad] OR Ardennes[ad] OR Ariege[ad] OR Aube[ad] OR Aude[ad] OR Aveyron[ad] OR 'Bas Rhin[ad] OR 'Bouches du Rhone[ad] OR Calvados[ad] OR Cantal[ad] OR Charente[ad] OR Cher[ad] OR Correze[ad] OR 'Corse du Sud[ad] OR 'Cote d Or[ad] OR 'Cote d'Or[ad] OR 'Cotes d'Armor[ad] OR 'Cotes d'Armor[ad] OR Creuse[ad] OR 'Deux Sevres[ad] OR Dordogne[ad] OR Doubs[ad] OR Drome[ad] OR Essonne[ad] OR Eure[ad] OR Finistere[ad] OR Gard[ad] OR Gers[ad] OR Gironde[ad] OR 'Haute Corse[ad] OR 'Haute Garonne[ad] OR 'Haute Marne[ad] OR 'Hautes Alpes[ad] OR 'Haute Saone[ad] OR 'Haute Savoie[ad] OR 'Hautes Pyrenees[ad] OR 'Haute Vienne[ad] OR 'Haut Rhin[ad] OR 'Hauts de Seine[ad] OR Herault[ad] OR 'Ile de France[ad] OR 'Ile et Vilaine[ad] OR Indre[ad] OR Isere[ad] OR Jura[ad] OR Landes[ad] OR Loire[ad] OR Loiret[ad] OR (Lot[ad] AND (departement[ad] OR department[ad])) OR 'Lot et Garonne[ad] OR 'Loir et Cher[ad] OR Lozere[ad] OR Manche[ad] OR Marne[ad] OR Mayenne[ad] OR Mayotte[ad] OR 'Meurthe et Moselle[ad] OR Meuse[ad] OR Morbihan[ad] OR Moselle[ad] OR (Nord[ad] AND (departement[ad] OR departement[ad])) OR 'Nievre[ad] OR Oise[ad] OR Orne[ad] OR 'Pas de calais[ad] OR 'Noord-Nauw van Kales[ad] OR Paris[ad] OR 'Puy de dome[ad] OR 'Pyrenees Atlantiques[ad] OR 'Pyrenees Orientales[ad] OR Rhone[ad] OR Sarthe[ad] OR Savoie[ad] OR 'Seine et Marne[ad] OR 'Seine Maritime[ad] OR Somme[ad] OR Tarn[ad] OR 'Territoire de Belfort[ad] OR 'Val de Marne[ad] OR 'Val d Oise[ad] OR Var[ad] OR Vaucluse[ad] OR Vendee[ad] OR Vienne[ad] OR Vosges[ad] OR Yonne[ad] OR Yvelines[ad] OR Marseille[ad] OR Lyon[ad] OR Nice[ad] OR Nantes[ad] OR Strasbourg[ad] OR Montpellier[ad] OR Bordeaux[ad] OR Lille[ad] OR Toulouse[ad] OR 'Outre Mer[ad] OR 'Seine Saint Denis[ad] OR (Finland[ad] OR Finnish\*[ad] OR Finn[ad] OR Finns[ad] OR Suomi[ad] AND Suomen[ad] OR Suomalaiset[ad] OR Aland[ad] OR Ahvenanmaa[ad] OR Uusimaa[ad] OR Nyland[ad] OR Karelia[ad] OR Karjala[ad] OR Karelän[ad] OR Ostrobothnia[ad] OR Pohjanmaa[ad] OR Ostrobothnia[ad] OR Savonia[ad] OR Savo[ad] OR Savolax[ad] OR Kainuu[ad] OR Kajanaland\*[ad] OR 'Kanta Hame[ad] OR Tavastia[ad] OR Tavastland[ad] OR Kymenlaakso[ad] OR Kymmenedalen[ad] OR Lapland[ad] OR Lappi[ad] OR Lapland[ad] OR 'Pajjat Hame[ad] OR Pirkkanmaa[ad] OR Birkaland[ad] OR Satakunta[ad] OR Satakunda[ad] OR Helsinkifors[ad] OR Helsingfors[ad] OR Espoo[ad] OR Esbo[ad] OR Tampere[ad] OR Tammerfors[ad] OR Vantaa[ad] OR Vanda[ad] OR Oulu[ad] OR Uleaborg[ad] OR Turku[ad] OR Abo[ad] OR Jyväskylä[ad] OR Kuopio[ad] OR Lahti[ad] OR Lahtis[ad] OR Kouvola[ad] OR (Estonia\*[ad] OR Eesti[ad] OR Eestlased[ad] OR Eestlane[ad] OR Harju[ad] OR Harjumaa[ad] OR Hiiumaa[ad] OR Hiiu[ad] OR Hiiumaa[ad] OR



'Ida Viru[ad] OR 'Ida Virumaa[ad] OR Jarvamaa[ad] OR Jarva[ad] OR Jogeamaa[ad] OR Jogeva[ad] OR Laanemaa[ad] OR Laane[ad] OR 'Laane Virumaa[ad] OR Parnu[ad] OR Parnumaa[ad] OR Polva[ad] OR Polvamaa[ad] OR Rapla[ad] OR Raplamaa[ad] OR Saare[ad] OR Saaremaa[ad] OR Tartu[ad] OR Tartumaa[ad] OR Valga[ad] OR Valgamaa[ad] OR Viljandimaa[ad] OR Viljandi[ad] OR Voru[ad] OR Vorumaa[ad] OR Tallinn[ad] OR Narva[ad] OR 'Kohla Jarve[ad] OR Rakvere[ad] OR Maardu[ad] OR Sillamae[ad] OR Kuressaare[ad] OR Denmark[ad] OR Danish\*[ad] OR dane[ad] OR danes[ad] OR Danmark[ad] OR dansk\*[ad] OR Hovedstaden[ad] OR Midtjylland[ad] OR Nordjylland[ad] OR Sjælland[ad] OR Sealand[ad] OR 'Zealand region[ad] OR 'region Zealand[ad] OR Syddanmark[ad] OR Jutland[ad] OR Jylland[ad] OR Sonderjyllands[ad] OR Copenhagen[ad] OR København[ad] OR ARhus[ad] OR Aarhus[ad] OR Bornholm[ad] OR Frederiksberg[ad] OR Frederiksborg[ad] OR Ringkjobing[ad] OR Viborg[ad] OR Vejle[ad] OR Roskilde[ad] OR Storstrom[ad] OR Vestsjaellands[ad] OR 'West Zealand[ad] OR Funen[ad] OR Ribe[ad] OR 'Kalaallit Nunaat[ad] OR Gronland[ad] OR Foroyar[ad] OR Faeroerne[ad] OR 'Faroe islands[ad] OR Aalborg[ad] OR Alborg[ad] OR Odense[ad] OR Esbjerg[ad] OR Gentofte[ad] OR Gladsaxe[ad] OR Randers[ad] OR Kolding[ad] OR (Czech\*[ad] OR Cesky[ad] OR Ceska[ad] OR Cech[ad] OR Cestina[ad] OR Prague[ad] OR Praha[ad] OR Stredoces\*[ad] OR Jihoces\*[ad] OR Bohemia[ad] OR Bohemian[ad] OR Plzen\*[ad] OR Pilsen[ad] OR Karlovars\*[ad] OR 'Karlovy Vary[ad] OR Usteck\*[ad] OR Usti[ad] OR Liberec\*[ad] OR 'Hradec Kralove[ad] OR Kralovehradec\*[ad] OR Pardubic\*[ad] OR Olomouc\*[ad] OR Olomoc[ad] OR Holomoc[ad] OR Moravskoslezs\*[ad] OR Jihomorav\*[ad] OR Moravia[ad] OR Moravian[ad] OR Morava[ad] OR Vysocina[ad] OR Zlin[ad] OR Zlinsk\*[ad] OR 'Ceske Budejovice[ad] OR Budweis[ad] OR Brno[ad] OR Ostrava[ad] OR (Cyprus[ad] OR Cypriot\*[ad] OR Kypros[ad] OR Kibris\*[ad] OR kypriaki[ad] OR Kyprioi[ad] OR Nicosia[ad] OR Lefkosa[ad] OR Lefkosia[ad] OR Famagusta[ad] OR Magusa[ad] OR Ammochostos[ad] OR Gazimagusa[ad] OR Kyrenia[ad] OR Girne[ad] OR Keryneia[ad] OR Larnaca[ad] OR Larnaka[ad] OR Iskele[ad] OR Limassol[ad] OR Lemesos[ad] OR Limasol[ad] OR Leymosun[ad] OR Paphos[ad] OR Pafos[ad] OR Baf[ad] OR Strovolos[ad] OR Lakatamia[ad] OR Lakadamyia[ad] OR 'Kato Polemidia[ad] OR 'Kato Polemidhia[ad] OR Aglandia[ad] OR Eglence[ad] OR Aglantzia[ad] OR Aradhippou[ad] OR Aradippou[ad] OR Engomi[ad] OR (Croat\*[ad] OR Hrvatsk\*[ad] OR hrvati[ad] OR Bjelovar[ad] OR 'Bjelovarsko bilogorska[ad] OR 'Brod Posavina[ad] OR 'Brodsko posavska[ad] OR 'Dubrovnik Neretva[ad] OR 'dubrovacko neretvanska[ad] OR Zagreb[ad] OR Zagrebacka[ad] OR Istria[ad] OR Istarska[ad] OR Karlovska[ad] OR Karlovac[ad] OR 'Koprivnicko krizevacka[ad] OR Koprivnica[ad] OR Krizevci[ad] OR 'Krapina Zagorje[ad] OR 'Krapinsko zagorska[ad] OR 'Lika Senj[ad] OR 'Licko senjska[ad] OR Medimurska[ad] OR Medimurje[ad] OR Osijek[ad] OR Baranja[ad] OR 'Osjecko baranjska[ad] OR 'Pozega Slavonia[ad] OR 'Pozesko slavonska[ad] OR 'Primorje Gorski Kotar[ad] OR 'Primorsko goranska[ad] OR 'Sibensko kninska[ad] OR 'Sibensko kninske[ad] OR Sibenik[ad] OR Knin[ad] OR Sisak[ad] OR 'Sisacko moslavacka[ad] OR Moslavina[ad] OR 'Splitsko dalmatinska[ad] OR Split[ad] OR Dalmatia[ad] OR Varazdin[ad] OR Varazdinska[ad] OR Viroviticko[ad] OR 'podravska[ad] OR Virovitica[ad] OR Podravina[ad] OR 'Vukovarsko srijemska[ad] OR Vukovar[ad] OR Srijem[ad] OR Zadar[ad] OR Zadarska[ad] OR Rijeka[ad] OR 'Velika gorica[ad] OR 'Slavonski brod[ad] OR Pula[ad] OR (Bulgaria\*[ad] OR Balgariya[ad] OR Balgarija[ad] OR Blagoevgrad\*[ad] OR 'Pirin Macedonia[ad] OR Burgas[ad] OR Dobrich[ad] OR Gabrovo[ad] OR Haskovo[ad] OR Kardzhali[ad] OR Kurdzhali[ad] OR Kjustendil[ad] OR Lovech[ad] OR Lovec[ad] OR Montana[ad] OR Pazardzhik[ad] OR Pernik[ad] OR Pleven\*[ad] OR Plovdiv[ad] OR Razgrad[ad] OR Rousse[ad] OR Ruse[ad] OR Rusenka[ad] OR Shumen[ad] OR Silistra[ad] OR Sliven[ad] OR Smolyan[ad] OR Sofia[ad] OR Sofyiska[ad] OR Sofijska[ad] OR 'Stara Zagora[ad] OR Targovishte[ad] OR Varna[ad] OR 'Veliko Tarnovo[ad] OR Vidin[ad] OR Vratsa[ad] OR Vratza[ad] OR Yambol[ad] OR (Belgi\*[ad] OR Belge\*[ad] OR Belg[ad] OR Brussel\*[ad] OR Bruxelles[ad] OR Bruxelloise[ad] OR Walloon\*[ad] OR Wallon[ad] OR Vlaams[ad] OR Flander\*[ad] OR Flandern[ad] OR Flandre[ad] OR Flemish[ad] OR Flamand[ad] OR Flemisch[ad] OR Flamisch\*[ad] OR Vlaanderen[ad] OR Flamande[ad] OR Waals[ad] OR Antwerp\*[ad] OR Anvers[ad] OR Henegouwen[ad] OR Hennegau[ad] OR Hainault[ad] OR Hainaut[ad] OR Liege[ad] OR Luik[ad] OR Luttich[ad] OR Limbourg[ad] OR Limburg[ad] OR Namur[ad] OR Namen[ad] OR Ostflandern[ad] OR Westflandern[ad] OR Ghent[ad] OR Gent[ad] OR Gand[ad] OR Charleroi[ad] OR Bruges[ad] OR Brugge\*[ad] OR Schaarbeek[ad] OR Schaarbeek[ad] OR Anderlecht[ad] OR Leuven[ad] OR Louvain[ad] OR (Austria\*[ad] OR Osterreich\*[ad] OR Oesterreich\*[ad] OR Ostosterreich[ad] OR Ostoesterreich[ad] OR Sudosterreich[ad] OR Sudosterreich[ad] OR Westosterreich[ad] OR Westoesterreich[ad] OR Burgenland[ad] OR Carinthia[ad] OR Karnten[ad] OR Kaernten[ad] OR Niederosterreich[ad] OR Niederosterreich[ad] OR Oberosterreich[ad] OR Oberosterreich[ad] OR Salzburg[ad] OR Saizburg[ad] OR Styria[ad] OR Steiermark[ad] OR Tyrol[ad] OR Tiro[ad] OR Vorarlberg[ad] OR Vienna[ad] OR Wien[ad] OR Graz[ad] OR Linz[ad] OR Innsbruck[ad] OR Klagenfurt[ad] OR Villach[ad] OR Wels[ad] OR 'St Polten[ad] OR 'St Poelten[ad] OR 'Sankt Polten[ad] OR 'Sankt Poelten[ad] OR Dornbirn[ad]))

## Embbase search strings

### **#a string for Hepatitis B and Hepatitis C virus**

('hepatitis B'/exp OR 'hepatitis B antibody'/exp OR 'hepatitis B antigen'/exp OR 'hepatitis b':ti,ab OR 'hbv':ti,ab OR 'hep b':ti,ab OR 'hbsag':ti,ab OR 'hbs ag':ti,ab OR 'hepatitis C'/exp OR 'Hepacivirus'/exp OR 'hepatitis C antibody'/exp OR 'hepatitis C antigen'/exp OR 'hepatitis c':ti,ab OR 'hepaciviru\*':ti,ab OR 'hcv':ti,ab OR 'hep c':ti,ab OR 'blood borne virus':ti,ab OR 'blood borne viruses':ti,ab OR 'bbv':ti,ab)

### **#b1 string for occurrence**

('prevalence'/exp OR 'incidence'/exp OR seroprevalen\*:ti,ab OR prevalen\*:ti,ab OR inciden\*:ti,ab OR distribution\*:ti,ab OR frequenc\*:ti,ab OR 'occurrence':ti,ab OR 'positivity rate':ti,ab OR 'positivity rates':ti,ab OR 'odds ratio':ti,ab OR 'odds ratios':ti,ab OR 'relative risk':ti,ab OR 'relative risks':ti,ab OR 'transmission rate':ti,ab OR 'transmission rates':ti,ab OR 'at risk':ti,ab)

### **#b2 string for incidence/occurrence only**

('incidence'/exp OR inciden\*:ti,ab OR 'occurrence':ti,ab)

### **#c string for undiagnosed fraction**

('undiagnosed':ti,ab OR (previous\* NEAR/3 diagnos\*):ti,ab OR ('prior' NEAR/3 diagnos\*):ti,ab OR (before\* NEAR/3 diagnos\*):ti,ab OR ('past' NEAR/3 diagnos\*):ti,ab OR 'not diagnosed':ti,ab OR unaware\*:ti,ab OR aware\*:ti,ab)

### **#d1 string for risk groups not covered in previous reviews**

('health care staff':ti,ab OR 'healthcare staff':ti,ab OR 'health staff':ti,ab OR 'health worker':ti,ab OR 'health workers':ti,ab OR 'health care worker':ti,ab OR 'health care workers':ti,ab OR 'healthcare worker':ti,ab OR 'healthcare workers':ti,ab OR 'health care provider':ti,ab OR 'healthcare provider':ti,ab OR 'health care providers':ti,ab OR 'healthcare providers':ti,ab OR 'medical staff':ti,ab OR 'exposure prone procedure':ti,ab OR 'exposure prone procedures':ti,ab OR 'safety worker':ti,ab OR 'safety workers':ti,ab OR 'police\*':ti,ab OR 'firefighter\*':ti,ab OR 'firemen':ti,ab OR 'fireman':ti,ab OR 'paramedic\*':ti,ab OR 'ambulance':ti,ab OR 'corrections officer':ti,ab OR 'corrections officers':ti,ab OR 'correctional officer':ti,ab OR 'correctional officers':ti,ab OR 'prison guard':ti,ab OR 'prison guards':ti,ab OR 'waste worker':ti,ab OR 'waste workers':ti,ab OR 'waste disposal':ti,ab OR 'waste disposer':ti,ab OR 'waste disposers':ti,ab OR 'waste collection':ti,ab OR 'waste collector':ti,ab OR 'waste collectors':ti,ab OR 'waste removal':ti,ab OR 'waste remover':ti,ab OR 'waste removers':ti,ab OR 'sewage worker':ti,ab OR 'sewage workers':ti,ab OR 'rubbish men':ti,ab OR 'rubbish man':ti,ab OR 'rubbishm\*':ti,ab OR 'rubbish disposal':ti,ab OR 'rubbish disposer':ti,ab OR 'rubbish disposers':ti,ab OR 'rubbish collection':ti,ab OR 'rubbish collector':ti,ab OR 'rubbish collectors':ti,ab OR 'rubbish removal':ti,ab OR 'rubbish remover':ti,ab OR 'rubbish removers':ti,ab OR 'bin man':ti,ab OR 'bin men':ti,ab OR 'dustbin man':ti,ab OR 'dustbin men':ti,ab OR 'garbage men':ti,ab OR 'garbage man':ti,ab OR 'garbagem\*':ti,ab OR 'garbage disposal':ti,ab OR 'garbage disposer':ti,ab OR 'garbage disposers':ti,ab OR 'garbage collection':ti,ab OR 'garbage collector':ti,ab OR 'garbage collectors':ti,ab OR 'garbage worker':ti,ab OR 'garbage workers':ti,ab OR 'garbage removal':ti,ab OR 'garbage remover':ti,ab OR 'garbage removers':ti,ab OR 'trash men':ti,ab OR 'trash man':ti,ab OR 'trashm\*':ti,ab OR 'trash disposal':ti,ab OR 'trash disposer':ti,ab OR 'trash disposers':ti,ab OR 'trash collection':ti,ab OR 'trash collector':ti,ab OR 'trash collectors':ti,ab OR 'trash worker':ti,ab OR 'trash workers':ti,ab OR 'trash removal':ti,ab OR 'trash removers':ti,ab OR 'trash removers':ti,ab OR 'refuse disposal':ti,ab OR 'refuse disposer':ti,ab OR 'refuse disposers':ti,ab OR 'refuse collection':ti,ab OR 'refuse collector':ti,ab OR 'refuse collectors':ti,ab OR 'refuse worker':ti,ab OR 'refuse workers':ti,ab OR 'refuse removal':ti,ab OR 'refuse remover':ti,ab OR 'refuse removers':ti,ab OR 'HIV infected':ti,ab OR 'HIV positive':ti,ab OR 'HIV seropositive':ti,ab OR 'HIV patient':ti,ab OR 'HIV patients':ti,ab OR 'infected with HIV':ti,ab OR 'STI patient':ti,ab OR 'STI patients':ti,ab OR 'STD patient':ti,ab OR 'STD patients':ti,ab OR 'STI infected':ti,ab OR 'STD infected':ti,ab OR

'intranasal drug':ti,ab OR 'intranasal drugs':ti,ab OR 'snort drugs':ti,ab OR 'inhale drugs':ti,ab OR 'blood transfusion'/exp OR 'blood transfusion':ti,ab OR 'blood transfusions':ti,ab OR 'graft recipient'/exp OR transplant\*:ti,ab OR 'hemodialysis'/exp OR dialys\*:ti,ab OR 'hemodialys':ti,ab OR 'haemodialys':ti,ab OR 'medical intervention':ti,ab OR 'medical interventions':ti,ab OR 'dental':ti,ab OR 'dentistry':ti,ab OR 'surgery':ti,ab OR 'medical procedure':ti,ab OR 'medical procedures':ti,ab OR 'body modification'/exp OR tattoo\*:ti,ab OR pierc\*:ti,ab OR scarifi\*:ti,ab OR 'body modification':ti,ab OR acupunctur\*:ti,ab OR 'mesotherapy':ti,ab OR 'care home':ti,ab OR 'care homes':ti,ab OR 'institutional':ti,ab OR 'residential care':ti,ab OR 'mentally disabled person'/exp OR 'mentally disabled':ti,ab OR 'mental disability':ti,ab OR 'mental disabilities':ti,ab OR 'intellectual disability':ti,ab OR 'intellectual disabilities':ti,ab OR 'intellectually disabled':ti,ab OR 'low intellect':ti,ab OR 'learning disability':ti,ab OR 'learning disabilities':ti,ab OR retard\*:ti,ab OR 'cognitive disability':ti,ab OR 'cognitive disabilities':ti,ab OR 'intellectual impairment':ti,ab OR 'mental deficiency':ti,ab OR homeless\*:ti,ab OR vagrant\*:ti,ab OR partner\*:ti,ab OR couple\*:ti,ab OR 'nuclear family'/exp OR 'spouse'/exp OR spouse\*:ti,ab OR husband\*:ti,ab OR 'wife':ti,ab OR 'wives':ti,ab OR 'household':ti,ab OR contact\*:ti,ab OR mother\*:ti,ab OR 'birth cohort':ti,ab OR 'travel'/exp OR travel\*:ti,ab OR 'rape'/exp OR rape\*:ti,ab OR assault\*:ti,ab OR 'multiple sexual partners':ti,ab OR 'multiple sex partners':ti,ab OR 'multiple sexual contacts':ti,ab OR 'sexually promiscuous':ti,ab OR 'sexual promiscuity':ti,ab OR diabet\*:ti,ab OR auto-inject\*:ti,ab OR transsexual\*:ti,ab OR transgender\*:ti,ab OR 'anabolic steroid':ti,ab OR 'anabolic steroids':ti,ab OR 'performance enhancing':ti,ab OR 'beauty':ti,ab OR salon\*:ti,ab OR pedicur\*:ti,ab OR manicur\*:ti,ab)

### **#d2 string for groups covered in previous reviews**

('drug use':ti,ab OR 'drug user':ti,ab OR 'drug users':ti,ab OR IDU\*:ti,ab OR 'PWID':ti,ab OR 'people who inject drugs':ti,ab OR 'people who use drugs':ti,ab OR 'prison':ti,ab OR 'closed setting':ti,ab OR 'closed settings':ti,ab OR inmate\*:ti,ab OR 'imprisoned':ti,ab OR 'incarcerat':ti,ab OR 'penal':ti,ab OR 'jail':ti,ab OR 'reformatory':ti,ab OR 'custodial':ti,ab OR 'custody':ti,ab OR 'gaol':ti,ab OR 'penitentiary':ti,ab OR 'detention':ti,ab OR 'correctional':ti,ab OR 'detainee':ti,ab OR 'imprison':ti,ab OR 'confinement':ti,ab OR 'cellmate':ti,ab OR 'convict':ti,ab OR 'immigrant':ti,ab OR 'migrant':ti,ab OR 'emigrant':ti,ab OR 'migrat':ti,ab OR 'emigrat':ti,ab OR 'displaced population':ti,ab OR 'displaced populations':ti,ab OR 'exile':ti,ab OR 'refugee':ti,ab OR 'asylum':ti,ab OR 'men who have sex with men':ti,ab OR 'MSM':ti,ab OR 'men having sexual relations with men':ti,ab OR 'MASM':ti,ab OR 'homosexual':ti,ab OR 'gay':ti,ab OR 'pregnan':ti,ab OR 'gravid':ti,ab)

### **#e string for EU/EEA**

'european union'/exp OR 'europe'/de OR europe\*:ab,ti OR europa\*:ab,ti OR eu:ab,ti OR eea:ab,ti OR eefta:ab,ti OR 'eu/eea':ab,ti OR 'eu/efta':ab,ti OR ecsc:ab,ti OR euratom:ab,ti OR eurozone:ab,ti OR eec:ab,ti OR ec:ab,ti OR 'schengen:ab,ti AND (area:ab,ti OR countr\*:ab,ti OR region\*:ab,ti OR state:ab,ti OR states:ab,ti)) OR euroregion:ab,ti OR euroregions:ab,ti OR 'eastern europe'/de OR 'western europe'/de OR 'balkan peninsula'/exp OR balkan:ab,ti OR balkans:ab,ti OR 'baltic states'/de OR baltic:ab,ti OR 'southern europe'/de OR (mediterranean:ab,ti AND (area:ab,ti OR countr\*:ab,ti OR region\*:ab,ti OR state:ab,ti OR states:ab,ti)) OR (alpine:ab,ti AND (area:ab,ti OR countr\*:ab,ti OR region\*:ab,ti OR state:ab,ti OR states:ab,ti)) OR 'scandinavia'/de OR scandinavia:ab,ti OR 'nordic NEXT/1 (countr\* OR state\*)':ab,ti OR danubian:ab,ti OR 'iberian peninsula':ab,ti OR 'peninsula iberica':ab,ti OR 'péninsule ibérique':ab,ti OR 'iberian penintsula':ab,ti OR iberia:ab,ti OR anatolia:ab,ti OR anadolu:ab,ti OR anatole:ab,ti OR anatolian:ab,ti OR 'yugoslavia (pre-1992)'/de OR 'yugoslavia'/exp OR yugoslavia:ab,ti OR 'czechoslovakia'/de OR 'czechoslovakia':ab,ti OR 'czech slovakia':ab,ti OR 'cesko slovensko':ab,ti OR 'benelux'/exp OR benelux:ab,ti OR fennoscandia:ab,ti OR 'fenna scandinavia':ab,ti OR fennoskandi\*:ab,ti OR (visegrád:ab,ti AND (group:ab,ti OR four:ab,ti OR triangle:ab,ti)) OR 'visehrádská čtyřka':ab,ti OR 'visehrádská skupina':ab,ti OR 'visehrádi együttműködés':ab,ti OR 'visehrádi négyek':ab,ti OR 'grupa wyszehradzka':ab,ti OR 'vyšehradská skupina':ab,ti OR 'vyšehradská štvorka':ab,ti OR 'European'/de OR 'EU citizen'/de OR 'Central European'/de OR 'Eastern European'/de OR 'Northern European'/de OR 'Western European'/de OR 'austrian'/exp OR 'austria'/exp OR austria\*:ab,ti OR osterreich\*:ab,ti OR oesterreich\*:ab,ti OR ostosterreich:ab,ti OR ostoessterreich:ab,ti OR sudosterreich:ab,ti OR sudoesterreich:ab,ti OR westosterreich:ab,ti OR westoesterreich:ab,ti OR burgenland:ab,ti OR carinthia:ab,ti OR karnten:ab,ti OR kaernten:ab,ti OR niederosterreich:ab,ti OR niederoesterreich:ab,ti OR oberosterreich:ab,ti OR oberoesterreich:ab,ti OR salzburg:ab,ti OR saizburg:ab,ti OR styria:ab,ti OR steiermark:ab,ti OR tyrol:ab,ti OR tirol:ab,ti OR vorarlberg:ab,ti OR vienna:ab,ti OR wien:ab,ti OR graz:ab,ti OR linz:ab,ti OR innsbruck:ab,ti OR klagenfurt:ab,ti OR villach:ab,ti OR wels:ab,ti OR 'st polten':ab,ti OR 'st poelten':ab,ti OR 'sankt polten':ab,ti OR 'sankt poelten':ab,ti OR 'dornbirn':ab,ti OR 'Belgium'/exp OR 'Belgian'/exp OR Belgi\*:ti,ab OR Belge\*:ti,ab OR Belg:ti,ab OR Brussel\*:ti,ab OR Bruxelles:ti,ab OR Bruxelloise:ti,ab OR Walloon\*:ti,ab OR Wallon\*:ti,ab OR Vlaams:ti,ab OR Flander\*:ti,ab OR Flandern:ti,ab OR Flandre:ti,ab OR Flemish:ti,ab OR Flamand:ti,ab OR Flemisch:ti,ab OR Flämisch:ti,ab OR Vlaanderen:ti,ab OR Flamande:ti,ab OR Waals:ti,ab OR Antwerp\*:ti,ab OR Anvers:ti,ab OR Henegouwen:ti,ab OR Hennegau:ti,ab OR Hainaut:ti,ab OR Hainaut:ti,ab OR Liege:ti,ab OR Luik:ti,ab OR Luttich:ti,ab OR Limbourg:ti,ab OR Limburg:ti,ab OR Namur:ti,ab OR Namen:ti,ab OR Ostflandern:ti,ab OR Westflandern:ti,ab OR Ghent:ti,ab OR Gent:ti,ab OR Gand:ti,ab OR Charleroi:ti,ab OR Bruges:ti,ab OR Brugge\*:ti,ab OR Schaarbeek:ti,ab OR Schaarbeek:ti,ab OR Anderlecht:ti,ab OR Leuven:ti,ab OR Louvain:ti,ab OR 'bulgaria'/exp OR 'bulgarian (citizen)'/exp OR 'Bulgarian (people)'/exp OR bulgari\*:ti,ab OR bulgariya:ab,ti OR balgariya:ab,ti OR blagoevgrad\*:ab,ti OR 'croatia'/exp OR 'croatian (citizen)'/exp OR 'Croat (people)'/exp OR croat\*:ab,ti OR hrvatsk\*:ab,ti OR hrvati:ab,ti OR bjelovar:ab,ti OR 'bjelovarsko bilogorska':ab,ti OR 'brod posavina':ab,ti OR 'brodsko posavska':ab,ti OR 'dubrovnik neretva':ab,ti OR 'dubrovacko neretvanska':ab,ti OR zagreb:ab,ti OR zagrebicka:ab,ti OR istria:ab,ti OR istarska:ab,ti OR karlovacka:ab,ti OR karlova:ab,ti OR 'koprivnicko krizevacka':ab,ti OR 'koprivnica':ab,ti OR 'krizevci':ab,ti OR 'krapina zagorje':ab,ti OR 'krapinsko zagorska':ab,ti OR 'lika senj':ab,ti OR 'licko senjska':ab,ti OR 'medimurska':ab,ti OR 'medimurje':ab,ti OR 'osijek':ab,ti OR 'baranja':ab,ti OR 'osječko baranjska':ab,ti OR 'pozeza slavonia':ab,ti OR 'pozesko slavonska':ab,ti OR 'primorje gorski kotar':ab,ti OR 'primorsko goranska':ab,ti OR 'sibensko kninska':ab,ti OR 'sibensko kninske':ab,ti OR 'sibenik':ab,ti OR 'knin':ab,ti OR 'sisak':ab,ti OR 'sisacko moslavacka':ab,ti OR 'moslavina':ab,ti OR 'splitsko dalmatinska':ab,ti OR 'split':ab,ti OR 'dalmatia':ab,ti OR 'varazdin':ab,ti OR 'varazdinska':ab,ti OR 'viroviticko':ab,ti OR 'podravska':ab,ti OR 'virovitica':ab,ti OR 'podravina':ab,ti OR 'vukovarsko srijemska':ab,ti OR 'vukovar':ab,ti OR 'srijem':ab,ti OR 'zadar':ab,ti OR 'zadarska':ab,ti OR 'rijeka':ab,ti OR 'velika gorica':ab,ti OR 'slavonski brod':ab,ti OR 'pula':ab,ti OR 'cyprus'/exp OR 'cyriot'/exp OR cyprus:ab,ti OR cyprriot\*:ab,ti OR kypros:ab,ti OR kibris\*:ab,ti OR 'kypraki':ab,ti OR 'kyprioi':ab,ti OR 'nicosia':ab,ti OR 'lefkosa':ab,ti OR 'lefkosia':ab,ti OR 'famagusta':ab,ti OR 'magusa':ab,ti OR 'amochostos':ab,ti OR 'gazimagusa':ab,ti OR 'kyrenia':ab,ti OR 'girne':ab,ti OR 'keryneia':ab,ti OR 'larnaca':ab,ti OR 'larnaka':ab,ti OR 'iskele':ab,ti OR 'limassol':ab,ti OR 'lemesos':ab,ti OR 'limasol':ab,ti OR 'leymosun':ab,ti OR 'paphos':ab,ti OR 'pafos':ab,ti OR 'baf':ab,ti OR 'strovolos':ab,ti OR 'lakatamia':ab,ti OR 'lakadamyia':ab,ti OR 'kato polemidia':ab,ti OR 'kato polemidhia':ab,ti OR 'aglandjia':ab,ti OR 'eglenca':ab,ti OR 'aglantzia':ab,ti OR 'aradhipou':ab,ti OR 'aradhipou':ab,ti OR 'engomi':ab,ti OR 'czech (citizen)'/exp OR 'czech republic'/exp OR 'Czech (people)'/exp OR czech\*:ab,ti OR cesky:ab,ti OR ceska:ab,ti OR cech:ab,ti OR cestina:ab,ti OR prague:ab,ti OR praha:ab,ti OR prag:ab,ti OR stredoces\*:ab,ti OR jihoces\*:ab,ti OR bohemia:ab,ti OR bohemian:ab,ti OR plzen\*:ab,ti OR pilsen:ab,ti OR karlovars\*:ab,ti OR 'karlovy vary':ab,ti OR uesteck\*:ab,ti OR usti:ab,ti OR liberec\*:ab,ti OR 'hradec kralove':ab,ti OR 'královéhradeck':ab,ti OR 'pardubic':ab,ti OR olomouc\*:ab,ti OR olomoc:ab,ti OR holomoc:ab,ti OR moravskoslezsk\*:ab,ti OR 'jihomorav':ab,ti OR moravia:ab,ti OR moravian:ab,ti OR morava:ab,ti OR vysocina:ab,ti OR zlin:ab,ti OR zlinsk\*:ab,ti OR 'ceske budejovice':ab,ti OR 'budweis':ab,ti OR brno:ab,ti OR ostrava:ab,ti OR 'Denmark'/exp OR 'Danish citizen'/exp OR 'Dane (people)'/exp OR Denmark:ti,ab OR Danish\*:ti,ab OR dane:ti,ab OR danes:ti,ab OR Danmark:ti,ab OR dansk\*:ti,ab OR Hovedstaden:ti,ab OR Midtjylland:ti,ab OR Nordjylland:ti,ab OR Sjaelland:ti,ab OR Sealand:ti,ab OR 'Zealand region':ti,ab OR 'region Zealand':ti,ab OR Syddanmark:ti,ab OR Jutland:ti,ab OR Jylland:ti,ab OR Sønderjylland:ti,ab OR Copenhagen:ti,ab OR København:ti,ab OR Århus:ti,ab OR Aarhus:ti,ab OR Bornholm:ti,ab OR Frederiksberg:ti,ab OR Frederiksborg:ti,ab OR Ringkjøbing:ti,ab OR Viborg:ti,ab OR Vejle:ti,ab OR Roskilde:ti,ab OR Storstrøm:ti,ab OR Vestsjælland:ti,ab OR 'Fest Zeeland':ti,ab OR 'Ribe':ti,ab OR 'Kalaallit Nunaat':ti,ab OR Gronland:ti,ab OR 'Føroyar':ti,ab OR 'Færøerne':ti,ab OR 'Faroe islands':ti,ab OR Aalborg:ti,ab OR Ålborg:ti,ab OR Odense:ti,ab OR Esbjerg:ti,ab OR Gentofte:ti,ab OR Gladsaxe:ti,ab OR Randers:ti,ab OR Kolding:ti,ab OR 'Estonia'/exp OR 'Estonian (citizen)'/exp OR 'Estonian (people)'/exp OR Estonia\*:ti,ab OR Eestii:ti,ab OR Eestlased:ti,ab OR Eestlane:ti,ab OR Harju:ti,ab OR Harjuma:ti,ab OR Hiium:ti,ab OR Hiiumaa:ti,ab OR 'Ida Viru':ti,ab OR 'Ida Virumaa':ti,ab OR Jarvama:ti,ab OR Jarva:ti,ab OR Jogeve:ti,ab OR Jogeve:ti,ab OR Laanemaa:ti,ab OR Laane:ti,ab OR 'Laane Virumaa':ti,ab OR Parnu:ti,ab OR Parnumaa:ti,ab OR 'Polva':ti,ab OR 'Polvamaa':ti,ab OR Rapla:ti,ab OR Raplamaa:ti,ab OR Saare:ti,ab OR Saaremaa:ti,ab OR Tartu:ti,ab OR Tartumaa:ti,ab OR Valga:ti,ab OR Valgamaa:ti,ab OR Viljandimaa:ti,ab OR Viljandi:ti,ab OR Voru:ti,ab OR Vorumaa:ti,ab OR Tallinn:ti,ab OR Narva:ti,ab OR 'Kohtla Jarve':ti,ab OR Rakvere:ti,ab OR Maardu:ti,ab OR Sillamae:ti,ab OR Kuressaare:ti,ab OR 'Finland'/exp OR 'Finn (citizen)'/exp OR 'Finn (people)'/exp OR Finland:ti,ab OR Finnish\*:ti,ab OR Finn:ti,ab OR Finns:ti,ab OR Suomi:ti,ab OR Suomen:ti,ab OR

Suomalaiset:ti,ab OR Aland:ti,ab OR Ahvenanmaa:ti,ab OR Uusimaa:ti,ab OR Nyland:ti,ab OR Karelia:ti,ab OR Karjala:ti,ab OR Karelén:ti,ab OR Ostrobothnia:ti,ab OR Pohjanmaa:ti,ab OR Osterbotten:ti,ab OR Savonia:ti,ab OR Savo:ti,ab OR Savolax:ti,ab OR Kainuu:ti,ab OR Kajanaland\*:ti,ab OR 'Kanta Hame':ti,ab OR Tavastia:ti,ab OR Tavastland:ti,ab OR Kymenlaakso:ti,ab OR Kymmenedalen:ti,ab OR Lapland:ti,ab OR Lappi:ti,ab OR OR Lappland:ti,ab OR 'Paijat Hame':ti,ab OR OR Pirkanmaa:ti,ab OR Birkaland:ti,ab OR Satakunta:ti,ab OR OR Satakunda:ti,ab OR Helsinki:ti,ab OR Helsingfors:ti,ab OR Espoo:ti,ab OR Esbo:ti,ab OR Tampere:ti,ab OR Tammerfors:ti,ab OR Vantaa:ti,ab OR Vanda:ti,ab OR Oulu:ti,ab OR Uleaborg:ti,ab OR Turku:ti,ab OR Abo:ti,ab OR OR Jyväskylä:ti,ab OR OR Kuopio:ti,ab OR Lahti:ti,ab OR Lahtis:ti,ab OR Kouvola:ti,ab OR 'France'/exp OR 'Frenchman'/exp OR France:ti,ab OR French\*:ti,ab OR Français\*:ti,ab OR Alsace:ti,ab OR Elsass:ti,ab OR Aquitaine:ti,ab OR Aquitania:ti,ab OR Akitania:ti,ab OR Aguiéne:ti,ab OR Auvergne:ti,ab OR Auvèrnhè:ti,ab OR Auvèrnhà:ti,ab OR Normandie:ti,ab OR Normandy:ti,ab OR Normandis:ti,ab OR Bourgogne:ti,ab OR Burgundy:ti,ab OR Bregogne:ti,ab OR Borgoégne:ti,ab OR Borgogne:ti,ab OR Brittany:ti,ab OR Breizh:ti,ab OR Bertaèyn:ti,ab OR Bretagne:ti,ab OR 'Champagne Ardenne':ti,ab OR Corse:ti,ab OR Corsica:ti,ab OR 'Franche Comte':ti,ab OR 'Franche Comte':ti,ab OR 'Franche Comtat':ti,ab OR Guadeloupe:ti,ab OR Guyane:ti,ab OR Guiana:ti,ab OR 'Languedoc Roussillon':ti,ab OR 'Lengadoc Rosselhon':ti,ab OR 'Llenguadoc-Rossello':ti,ab OR Limousin:ti,ab OR Lemosin:ti,ab OR Lorraine:ti,ab OR Lothringen:ti,ab OR Lotrringe:ti,ab OR Martinique:ti,ab OR 'Midi Pyrenees':ti,ab OR 'Miègjorn Pirenèus':ti,ab OR 'Meidia Pirenèus':ti,ab OR 'Mediodia Pirineos':ti,ab OR 'Pays de la Loire':ti,ab OR 'Broiòù al Liger':ti,ab OR Picardie:ti,ab OR Picardy:ti,ab OR 'Poitou Charentes':ti,ab OR 'Peitau Charantas':ti,ab OR 'Poitou-Cherentes':ti,ab OR Provence:ti,ab OR Provenca:ti,ab OR Prouvenco:ti,ab OR 'Cote d Azur':ti,ab OR 'Costo d Azur':ti,ab OR 'Costa d Azur':ti,ab OR Reunion:ti,ab OR 'Rhône Alpes':ti,ab OR 'Rono Arpes':ti,ab OR 'Rose Aups':ti,ab OR Ain:ti,ab OR Aisne:ti,ab OR OR Allier:ti,ab OR 'Alpes de Haute Provence':ti,ab OR 'Haute Alpes':ti,ab OR 'Alpes Maritimes':ti,ab OR OR Ardeche:ti,ab OR Ardennes:ti,ab OR Ariege:ti,ab OR Aube:ti,ab OR Aude:ti,ab OR Aveyron:ti,ab OR 'Bas Rhin':ti,ab OR 'Bouches du Rhône':ti,ab OR OR Calvados:ti,ab OR Cantal:ti,ab OR Charente:ti,ab OR Cher:ti,ab OR Correze:ti,ab OR 'Corse du Sud':ti,ab OR 'Cote d Or':ti,ab OR 'Cotes d Armor':ti,ab OR Creuse:ti,ab OR 'Deux Sevres':ti,ab OR Dordogne:ti,ab OR Doubs:ti,ab OR Drome:ti,ab OR Essonne:ti,ab OR Eure:ti,ab OR Finistere:ti,ab OR Gard:ti,ab OR Gers:ti,ab OR Gironde:ti,ab OR 'Haute Corse':ti,ab OR 'Haute Garonne':ti,ab OR 'Haute Marne':ti,ab OR 'Hautes Alpes':ti,ab OR 'Haute Saone':ti,ab OR 'Haute Savoie':ti,ab OR 'Hautes Pyrenees':ti,ab OR 'Haute Vienne':ti,ab OR 'Haut Rhin':ti,ab OR 'Hauts de Seine':ti,ab OR Herault:ti,ab OR 'Ile de France':ti,ab OR 'Ile et Vilaine':ti,ab OR Indre:ti,ab OR Isere:ti,ab OR Jura:ti,ab OR Landes:ti,ab OR Loire:ti,ab OR Loiret:ti,ab OR (Lot NEAR/3 (departement OR department)):ab,ti OR 'Lot et Garonne':ti,ab OR 'Loir et Cher':ti,ab OR Lozere:ti,ab OR Manche:ti,ab OR Marne:ti,ab OR Mayenne:ti,ab OR Mayotte:ti,ab OR 'Meurthe et Moselle':ti,ab OR Meuse:ti,ab OR Morbihan:ti,ab OR Moselle:ti,ab OR (Nord NEAR/3 (department OR departement)):ti,ab OR OR Nievre:ti,ab OR Oise:ti,ab OR Orne:ti,ab OR 'Pas de calais':ti,ab OR 'Noord-Nauw van Kales':ti,ab OR Paris:ti,ab OR 'Puy de dome':ti,ab OR 'Pyrenees Atlantiques':ti,ab OR 'Pyrenees Orientales':ti,ab OR OR Rhone:ti,ab OR Sarthe:ti,ab OR OR Savoie:ti,ab OR 'Seine et Marne':ti,ab OR 'Seine Maritime':ti,ab OR OR Somme:ti,ab OR OR Tarn:ti,ab OR OR 'Territoire de Belfort':ti,ab OR 'Val de Marne':ti,ab OR 'Val d Oise':ti,ab OR Var:ti,ab OR Vaucluse:ti,ab OR Vendee:ti,ab OR Vienne:ti,ab OR Vosges:ti,ab OR Yonne:ti,ab OR Yvelines:ti,ab OR Marseille:ti,ab OR Lyon:ti,ab OR Nice:ti,ab OR OR Nantes:ti,ab OR OR Strasbourg:ti,ab OR OR Montpellier:ti,ab OR OR Bordeaux:ti,ab OR Lille:ti,ab OR Toulouse:ti,ab OR 'Outre Mer':ti,ab OR 'Seine Saint Denis':ti,ab OR 'Germany'/de OR 'German (citizen)'/exp OR German\*:ti,ab OR Deutsch\*:ti,ab OR Bundesrepublik:ti,ab OR Westdeutschland:ti,ab OR Ostdeutschland:ti,ab OR Baden:ti,ab OR Wuerttemberg:ti,ab OR Wurttemberg:ti,ab OR Bayern:ti,ab OR Bavaria:ti,ab OR Berlin:ti,ab OR OR Brandenburg:ti,ab OR Bremen:ti,ab OR OR Oldenburg:ti,ab OR OR Mitteldeutschland:ti,ab OR Rhein:ti,ab OR OR Rhine:ti,ab OR OR Hannover:ti,ab OR OR Braunschweig:ti,ab OR OR Göttingen:ti,ab OR OR Goettingen:ti,ab OR OR Nurnberg:ti,ab OR OR Nurnberg:ti,ab OR OR Ruhr:ti,ab OR OR Koln:ti,ab OR OR koeln:ti,ab OR OR Bonn:ti,ab OR OR Hamburg:ti,ab OR OR Hessen:ti,ab OR OR Hesse:ti,ab OR OR Hestia:ti,ab OR OR Mecklenburg:ti,ab OR OR Vorpommern:ti,ab OR OR Pomerania:ti,ab OR OR Niedersachsen:ti,ab OR OR Neddersassen:ti,ab OR OR Saxony:ti,ab OR OR Niederbayern:ti,ab OR 'Northern Rhine':ti,ab OR 'North Rhine':ti,ab OR OR Westphalia:ti,ab OR OR Westfalen:ti,ab OR OR 'Rhineland Palatinate':ti,ab OR OR 'Rheinland Pfalz':ti,ab OR Saarland:ti,ab OR OR Sachsen:ti,ab OR 'Schleswig Holstein':ti,ab OR OR Thuringia:ti,ab OR OR Thuringen:ti,ab OR OR Thuringen:ti,ab OR OR Muenchen:ti,ab OR Muenchen:ti,ab OR Munich:ti,ab OR Frankfurt:ti,ab OR Stuttgart:ti,ab OR Dusseldorf:ti,ab OR Duesseldorf:ti,ab OR Dortmund:ti,ab OR Essen:ti,ab OR 'Greece'/exp OR 'Greek (citizen)'/exp OR 'Greek (people)'/exp OR Greece:ti,ab OR 'Hellenic republic':ti,ab OR OR Greek\*:ti,ab OR OR Ellada:ti,ab OR OR Elladas:ti,ab OR 'Elliniki Dimokratia':ti,ab OR OR Hellas:ti,ab OR OR Hellenes:ti,ab OR OR Attika:ti,ab OR OR Makedonia\*:ti,ab OR OR Macedonia:ti,ab OR OR Thraki:ti,ab OR OR Thrace:ti,ab OR OR Crete:ti,ab OR OR Kriti:ti,ab OR 'Ionia Nisia':ti,ab OR 'Ionion neson':ti,ab OR 'Ionion nIson':ti,ab OR 'Ionian islands':ti,ab OR 'Ionian island':ti,ab OR OR Epirus:ti,ab OR OR Ipeiros:ti,ab OR 'Perifèria Ipeirou':ti,ab OR 'North aegean':ti,ab OR 'Northern Aegean':ti,ab OR 'Aegean islands':ti,ab OR 'Aegean island':ti,ab OR 'Nisoi Agaïou':ti,ab OR 'Notio Aigaio':ti,ab OR OR Peloponnese:ti,ab OR OR Peloponniso\*:ti,ab OR OR Thessaly:ti,ab OR OR Thessalia:ti,ab OR OR Thessalian:ti,ab OR OR Petthalia:ti,ab OR 'Voreio Aigaio':ti,ab OR 'Voreio Aigaïou':ti,ab OR 'South aegean':ti,ab OR 'Southern Aegean':ti,ab OR 'Mount athos':ti,ab OR 'Oros Athos':ti,ab OR OR Cyclades:ti,ab OR OR Cycklades:ti,ab OR OR Kiklades:ti,ab OR OR Dodecanese:ti,ab OR OR Dodekanisa:ti,ab OR OR Athens:ti,ab OR OR Athina:ti,ab OR OR Thessaloniki:ti,ab OR OR Thessalonica:ti,ab OR OR Patras:ti,ab OR OR Ortra:ti,ab OR OR Piraeus:ti,ab OR OR Larissa:ti,ab OR OR Larisa:ti,ab OR OR Heraklion:ti,ab OR OR Heraklion:ti,ab OR OR Iraklion:ti,ab OR OR Irakleion:ti,ab OR OR Iraklio:ti,ab OR OR Volos:ti,ab OR OR 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Somogy:ti,ab OR OR szabolcs:ti,ab OR OR szatmar:ti,ab OR OR bereg:ti,ab OR OR Tolna:ti,ab OR OR Vas:ti,ab OR OR Veszprem:ti,ab OR OR Zala:ti,ab OR OR Debrecen:ti,ab OR OR Miskolc:ti,ab OR OR Szeged:ti,ab OR OR Pecs:ti,ab OR OR Gyor:ti,ab OR OR Nyiregyhaza:ti,ab OR OR Kecskemet:ti,ab OR OR Szekesfehervar:ti,ab OR OR Szombathely:ti,ab OR 'Ireland'/exp OR 'Irish (citizen)'/exp OR OR Ireland:ti,ab OR OR Eire:ti,ab OR OR Irish\*:ti,ab OR OR Fingal:ti,ab OR 'Fine Gall':ti,ab OR OR Dublin:ti,ab OR 'Ath Cliath':ti,ab OR 'Dun Laoghaire':ti,ab OR Wicklow:ti,ab OR 'Cill Mhantain':ti,ab OR 'Chill Mhantain':ti,ab OR Wexford:ti,ab OR 'Loch Garman':ti,ab OR OR Carlow:ti,ab OR OR Ceatharlach:ti,ab OR OR Kildare:ti,ab OR 'Cill Dara':ti,ab OR 'Chill Dara':ti,ab OR OR Meath:ti,ab OR 'An Mhi':ti,ab OR 'Contae na Mi':ti,ab OR OR Louth:ti,ab OR 'Contae Lu':ti,ab OR OR Monaghan:ti,ab OR OR Muineachán:ti,ab OR OR Mhuineacháin:ti,ab OR OR Cavan:ti,ab OR 'An Cabhan':ti,ab OR 'An Cabhain':ti,ab OR OR 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OR Dinnygal:ti,ab OR OR Dunnya:ti,ab OR OR Leinster:ti,ab OR OR Laighin:ti,ab OR 'Cúige Laighean':ti,ab OR OR Munster:ti,ab OR OR Mumhain:ti,ab OR 'Cúige Mumhan':ti,ab OR OR Connacht:ti,ab OR OR Connachta:ti,ab OR OR Drogheda:ti,ab OR 'Droichead Atha':ti,ab OR OR Dundalk:ti,ab OR 'Dún Dealgan':ti,ab OR OR Swords:ti,ab OR OR Sord:ti,ab OR OR Bray:ti,ab OR OR Bre:ti,ab OR OR Navan:ti,ab OR 'An Uaimh':ti,ab OR 'Italy'/exp OR 'Italian (citizen)'/exp OR 'Italic people'/exp OR OR Italia\*:ti,ab OR OR Abruzzo:ti,ab OR OR Abruzzi:ti,ab OR OR Basilicata:ti,ab OR OR Lucania:ti,ab OR OR Calabria:ti,ab OR OR Campania:ti,ab OR OR 'Emilia Romagna':ti,ab OR OR 'friuli venezia giulia':ti,ab OR OR Lazio:ti,ab OR OR Latium:ti,ab OR OR Liguria\*:ti,ab OR OR Lombardy:ti,ab OR OR Lombardia:ti,ab OR OR Marche:ti,ab OR OR Marches:ti,ab OR OR Molisano:ti,ab OR OR Molise:ti,ab OR OR Piedmont\*:ti,ab OR OR Piemonte:ti,ab OR OR Bolzano:ti,ab OR OR Bozen:ti,ab OR OR Trentino:ti,ab OR OR Trento:ti,ab OR OR Puglia:ti,ab OR OR Apulia:ti,ab OR OR Sardinia:ti,ab OR OR Sardegna:ti,ab OR OR Sicily:ti,ab OR OR Sicilia:ti,ab OR OR Toscana:ti,ab OR OR Tuscany:ti,ab OR OR Umbria:ti,ab OR 'Valle d Aosta':ti,ab OR 'Vallee d Aoste':ti,ab OR 'Aosta Valley':ti,ab OR OR Veneto:ti,ab OR OR Venetia:ti,ab OR OR Triveneto:ti,ab OR OR Rome:ti,ab OR OR Roma:ti,ab OR OR Milan:ti,ab OR OR Milano:ti,ab OR OR Naples:ti,ab OR OR Napoli:ti,ab OR OR Turin:ti,ab OR OR Torino:ti,ab OR OR Palermo:ti,ab OR OR Genoa:ti,ab OR OR Genova:ti,ab OR OR Bologna:ti,ab OR OR Florence:ti,ab OR OR Firenze:ti,ab OR OR Bari:ti,ab OR OR Catania:ti,ab OR 'Latvia'/exp OR 'Latvian (citizen)'/exp OR 'Lett (people)'/exp OR OR Latvi\*:ti,ab OR OR Riga:ti,ab OR OR Courland:ti,ab OR OR Kurzeme:ti,ab OR OR Kurland:ti,ab OR OR Latgale:ti,ab OR OR Lettgallia:ti,ab OR OR Latgola:ti,ab OR OR Latgalia:ti,ab OR OR Vidzeme:ti,ab OR OR Vidumo:ti,ab OR OR Semigallia:ti,ab OR OR Semigalia:ti,ab OR OR Zemgale:ti,ab OR OR Pieriga:ti,ab OR OR 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Kaunas:ti,ab OR Kauno:ti,ab OR Klaipeda:ti,ab OR Klaipedos:ti,ab OR Marijampoles:ti,ab OR Marijampole:ti,ab OR Panevezys:ti,ab OR Panevezio:ti,ab OR Siauliai:ti,ab OR Siauliu:ti,ab OR Taurages:ti,ab OR Taurage:ti,ab OR Telsiu:ti,ab OR Telsiai:ti,ab OR Utenos:ti,ab OR Utena:ti,ab OR Vilnius:ti,ab OR Vilniaus:ti,ab OR Mazeikiai:ti,ab OR Or Jonava:ti,ab OR Mazeikiu:ti,ab OR Jonavos:ti,ab OR 'Luxembourg/exp OR Luxembourg\*:ti,ab OR Luxemburg:ti,ab OR Letzebuerg:ti,ab OR Diekirch:ti,ab OR Grevenmacher:ti,ab OR 'Esch sur Alzette':ti,ab OR 'Esch Uelzecht':ti,ab OR 'Esch an der Alzette':ti,ab OR 'Esch an der Alzig':ti,ab OR Dudelange:ti,ab OR Diddeleng:ti,ab OR Dülélingen:ti,ab OR Duedelingen:ti,ab OR Schiffflange:ti,ab OR Scheffleng:ti,ab OR Schiffingen:ti,ab OR Or Bettembourg:ti,ab OR Beetebeuerg:ti,ab OR Or Bettemburg:ti,ab OR Or Petengen:ti,ab OR Or Peiting:ti,ab OR Or Petingen:ti,ab OR Or Ettelbruck:ti,ab OR Or Ettelbreck:ti,ab OR Or Diekirch:ti,ab OR Or Dikrech:ti,ab OR Or Strassen:ti,ab OR Or Stroossen:ti,ab OR Or Bertrange:ti,ab OR Or Bartreng:ti,ab OR Or Bartringen:ti,ab OR 'Malta'/exp OR 'Maltese (citizen)'/exp OR Malta:ti,ab OR 'Maltese\*':ti,ab OR Maltin:ti,ab OR Gozo:ti,ab OR Ghawdex:ti,ab OR Valletta:ti,ab OR 'Il Belt':ti,ab OR Birkirkara:ti,ab OR 'B Kara':ti,ab OR Or Bircchircara:ti,ab OR Or Mosta:ti,ab OR Or Qormi:ti,ab OR 'St Paul s Bay':ti,ab OR 'Pawl il Bahar':ti,ab OR Or Zabbar:ti,ab OR Or Sliema:ti,ab OR Or Naxxar:ti,ab OR Or Gwann:ti,ab OR 'St John':ti,ab OR Or Zebbug:ti,ab OR 'Citta rohan':ti,ab OR Or Fgura:ti,ab OR 'Netherlands'/exp OR 'Dutchman'/exp OR Netherlands:ti,ab OR Nederland\*:ti,ab OR Dutch\*:ti,ab OR Drenthe:ti,ab OR Flevoland:ti,ab OR Friesland:ti,ab OR Fryslan:ti,ab OR Frisia:ti,ab OR Gelderland:ti,ab OR Guelders:ti,ab OR Groningen:ti,ab OR Limburg:ti,ab OR Brabant:ti,ab OR Or Holland:ti,ab OR Or Overijssel:ti,ab OR Or Overissel:ti,ab OR Or Utrecht:ti,ab OR Or Zeeland:ti,ab OR Or Amsterdam:ti,ab OR Or Rotterdam:ti,ab OR Or Hague:ti,ab OR 's-Gravenhage':ti,ab OR 'Den Haag':ti,ab OR Or Eindhoven:ti,ab OR Or Tilburg:ti,ab OR Or Almere:ti,ab OR Or Breda:ti,ab OR Or Nijmegen:ti,ab OR Or Nimeguen:ti,ab OR Or 'Poland'/exp OR 'Polish citizen'/exp OR 'Pole (people)'/exp OR Poland:ti,ab OR Polska:ti,ab OR Polish:ti,ab OR Pole:ti,ab OR Or Poles:ti,ab OR Or Polski:ti,ab OR Or Polak:ti,ab OR Or Polka:ti,ab OR Or Polacy:ti,ab OR Or Dolnoslaskie:ti,ab OR Or Silesia\*:ti,ab OR Or Slask:ti,ab OR Or Pomorskie:ti,ab OR Or Pomerania\*:ti,ab OR Or Kujawsko:ti,ab OR Or Kuyavian:ti,ab OR Or Lodzkie:ti,ab OR Or Lodz:ti,ab OR Or Lubelskie:ti,ab OR Or Lublin:ti,ab OR Or Lubuskie:ti,ab OR Or Lubusz:ti,ab OR Or Lubus:ti,ab OR Or Malopolskie:ti,ab OR Or Mazowieckie:ti,ab OR Or Mazowske:ti,ab OR Or Masovia:ti,ab OR Or Masovian:ti,ab OR Or Opolskie:ti,ab OR Or Opole:ti,ab OR Or Podkarpackie:ti,ab OR Or Subcarpathian\*:ti,ab OR Or Podlaskie:ti,ab OR Or Podlachia:ti,ab OR Or Podlasie:ti,ab OR Or Slaskie:ti,ab OR Or Swietokrzyskie:ti,ab OR Or 'Warmia Mazuria':ti,ab OR Or 'Warmian Mazurian':ti,ab OR Or 'Warmian Masurian':ti,ab OR Or 'Warmia Mazury':ti,ab OR Or 'Warminsko Mazurskie':ti,ab OR Or 'Warmian Masurian':ti,ab OR Or Wielkopolskie:ti,ab OR Or Zachodniopomorskie:ti,ab OR Or Warsaw:ti,ab OR Or Warszawa:ti,ab OR Or Krakow:ti,ab OR Or Cracow:ti,ab OR Or Wroclaw:ti,ab OR Or Poznan:ti,ab OR Or Gdansk:ti,ab OR Or Szczecin:ti,ab OR Or Bydgoszcz:ti,ab OR Or Katowice:ti,ab OR Or 'Portugal'/exp OR 'Portuguese (citizen)'/exp OR Portugal:ti,ab OR Or Portugues\*:ti,ab OR Or Azores:ti,ab OR Or Acores:ti,ab OR Or Madeira:ti,ab OR Or Alentejo:ti,ab OR Or Algarve:ti,ab OR Or Lisboa:ti,ab OR Or Lisbon:ti,ab OR Or 'Alto Tras-os-Montes':ti,ab OR Or (Ave NEAR/3 (community OR intermunicipal OR comunidade)):ti,ab OR Or Mondego:ti,ab OR Or Vouga:ti,ab OR Or Beira:ti,ab OR Or Cavado:ti,ab OR Or Lafoes:ti,ab OR Or Douro:ti,ab OR Or Porto:ti,ab OR Or Oporto:ti,ab OR Or Tejo:ti,ab Or Or Minho:ti,ab Or Or Setubal:ti,ab Or Or Pinhal:ti,ab Or Or 'Serra da Estrela':ti,ab Or Or Tamega:ti,ab Or Or Leira:ti,ab Or Or Santarem:ti,ab Or Or Beja:ti,ab Or Or Faro:ti,ab Or Or Evora:ti,ab Or Or Portalegre:ti,ab Or Or 'Castelo Branco':ti,ab Or Or Guarda:ti,ab Or Or Coimbra:ti,ab Or Or Aveiro:ti,ab Or Or Viseu:ti,ab Or Or Braganca:ti,ab Or Or Braganza:ti,ab Or Or Braga:ti,ab Or Or 'Vila real':ti,ab Or Or 'Viana do Castelo':ti,ab Or Or Gaia:ti,ab Or Or Amadora:ti,ab Or Or Funchal:ti,ab Or Or Coimbra:ti,ab Or Or Almada:ti,ab Or Or (Aguilva:ti,ab AND Cacem:ti,ab) OR 'Romania'/exp OR 'Romanian (citizen)'/exp OR Romania\*:ti,ab OR Or Rumania\*:ti,ab OR Or Roumania\*:ti,ab OR Or Romani:ti,ab OR Or Rumanii:ti,ab OR Or Alba:ti,ab Or Or Arad:ti,ab Or Or Arges:ti,ab Or Or Bacau:ti,ab Or Or Bihor:ti,ab Or Or 'Bistrita Nasaud':ti,ab Or Or Botosani:ti,ab Or Or Braila:ti,ab Or Or Brasov:ti,ab Or Or Kronstadt:ti,ab Or Or Brassov:ti,ab Or Or Brassovia:ti,ab Or Or Coron:ti,ab Or Or Bucharest:ti,ab Or Or Bucuresti:ti,ab Or Or Buzau:ti,ab Or Or Calarasi:ti,ab Or Or 'Caras-Severin':ti,ab Or Or Cluj:ti,ab Or Or Klausenburg:ti,ab Or Or Kolozsvar:ti,ab Or Or Constanta:ti,ab Or Or Tomis:ti,ab Or Or Konstantia:ti,ab Or Or Kostence:ti,ab Or Or Covasna:ti,ab Or Or Dambovita:ti,ab Or Or Dolj:ti,ab Or Or Galati:ti,ab Or Or Galatz:ti,ab Or Or Galac:ti,ab Or Or Kalas:ti,ab Or Or Giurgiu:ti,ab Or Or Gorj:ti,ab Or Or Harghita:ti,ab Or Or Hunedoara:ti,ab Or Or Ialomita:ti,ab Or Or Iasi:ti,ab Or Or Jassy:ti,ab Or Or Lassy:ti,ab Or Or Ilfov:ti,ab Or Or Maramures:ti,ab Or Or Mehedinti:ti,ab Or Or Mures:ti,ab Or Or Neamt:ti,ab Or Or (Olt:ti,ab AND (river:ti,ab OR county:ti,ab OR region:ti,ab OR judetul:ti,ab OR Or Raul:ti,ab)) OR Or Prahova:ti,ab Or Or Salaj:ti,ab Or Or 'Satu Mare':ti,ab Or Or Sibiu:ti,ab Or Or Sibiu:ti,ab Or Or Suceava:ti,ab Or Or Teleorman:ti,ab Or Or Timis:ti,ab Or Or Tulcea:ti,ab Or Or Valcea:ti,ab Or Or Vilcea:ti,ab Or Or Vaslui:ti,ab Or Or Vrancea:ti,ab Or Or Timisoara:ti,ab Or Or Temeswar:ti,ab Or Or Temeschburg:ti,ab Or Or Temeschwar:ti,ab Or Or Temesvar:ti,ab Or Or Temisvar:ti,ab Or Or Timisvar:ti,ab Or Or Temesva:ti,ab Or Or Craiova:ti,ab Or Or Ploiesti:ti,ab Or Or Ploesti:ti,ab Or Or Oradea:ti,ab Or Or Varad:ti,ab Or Or Varat:ti,ab Or Or 'Slovakia'/exp OR 'Slovak (citizen)'/exp OR 'Slovak (people)'/exp OR Slovakia:ti,ab Or Or Slovensk\*:ti,ab Or Or Slovak\*:ti,ab Or Or Slovaci:ti,ab Or Or Slovenki:ti,ab Or Or Bratislav\*:ti,ab Or Or Presporok:ti,ab Or Or Pressburg:ti,ab Or Or Preßburg:ti,ab Or Or Posonium:ti,ab Or Or Banskobystr\*:ti,ab Or Or 'Banska Bystrica':ti,ab Or Or Or Neusohl:ti,ab Or Or Besztercebánya:ti,ab Or Or Kosic\*:ti,ab Or Or Kaschau:ti,ab Or Or Kassa:ti,ab Or Or Nitrian\*:ti,ab Or Or Nitra:ti,ab Or Or Nyitra:ti,ab Or Or Nyitra:ti,ab Or Or Nyitria:ti,ab Or Or Trnav\*:ti,ab Or Or Tyrnau:ti,ab Or Or Nagyszombat:ti,ab Or Or Tyrnavia:ti,ab Or Or Presov\*:ti,ab Or Or Trencian\*:ti,ab Or Or Trencin:ti,ab Or Or Trencschin:ti,ab Or Or Trencsén:ti,ab Or Or Zilina:ti,ab Or Or Sillein:ti,ab Or Or Zsolna:ti,ab Or Or Zylina:ti,ab Or Or (Martin:ti,ab AND (city:ti,ab OR Or Svaty:ti,ab)) OR Or Turócszentmárton:ti,ab Or Or Poprad:ti,ab Or Or Deutschendorf:ti,ab Or Or Zvolen:ti,ab Or Or 'Slovenia'/exp OR 'Slovenian (citizen)'/exp OR 'Slovene (people)'/exp OR Slovenia\*:ti,ab Or Or Slovenija:ti,ab Or Or slovensk\*:ti,ab Or Or Slovenci:ti,ab Or Or Slovene\*:ti,ab Or Or Gorenjska:ti,ab Or Or Carniola:ti,ab Or Or Goriska:ti,ab Or Or Gorizia:ti,ab Or Or Jugovzhodna:ti,ab Or Or Koroska:ti,ab Or Or Carinthia:ti,ab Or Or 'Notranjsko kraska':ti,ab Or Or 'Obalno kraska':ti,ab Or Or 'Coastal karst':ti,ab Or Or Osrednjeslovenska:ti,ab Or Or Podravska:ti,ab Or Or Drava:ti,ab Or Or Pomurska:ti,ab Or Or Mura:ti,ab Or Or Savinjska:ti,ab Or Or Savinja:ti,ab Or Or Spodnjeposavska:ti,ab Or Or Zavarota:ti,ab Or Or 'Central Sava':ti,ab Or Or Or Posavska:ti,ab Or Or 'Lower Sava':ti,ab Or Or Ljubljana:ti,ab Or Or Laibach:ti,ab Or Or Lubiana:ti,ab Or Or Maribor:ti,ab Or Or 'Marburg an der Drau':ti,ab Or Or Kranj:ti,ab Or Or Carnium:ti,ab Or Or Creina:ti,ab Or Or Chreina:ti,ab Or Or Krainbur:ti,ab Or Or Koper:ti,ab Or Or Capodistria:ti,ab Or Or Kopar:ti,ab Or Or Celje:ti,ab Or Or 'Novo mesto':ti,ab Or Or Or Neustadt:ti,ab Or Or Domzale:ti,ab Or Or Velenje:ti,ab Or Or Wollan:ti,ab Or Or Woellan:ti,ab Or Or 'Nova Gorica':ti,ab Or Or Or Kamnik:ti,ab Or Or 'Spain'/exp OR 'Spaniard'/exp OR 'Basque (people)'/exp OR Spain:ti,ab Or Or Espana:ti,ab Or Or Spanish:ti,ab Or Or Espanol\*:ti,ab Or Or Spaniard\*:ti,ab Or Or Andalusia:ti,ab Or Or Andalusia:ti,ab Or Or Aragon:ti,ab Or Or Arago:ti,ab Or Or Cantabria:ti,ab Or Or Canarias:ti,ab Or Or 'Canary Islands':ti,ab Or Or (Canaries:ti,ab AND island\*:ti,ab) OR Or 'Castile and leon':ti,ab Or Or 'Castilla y Leon':ti,ab Or Or 'Castile La Mancha':ti,ab Or Or 'Castilla La Mancha':ti,ab Or Or Catalonia:ti,ab Or Or Catalonia:ti,ab Or Or Ceuta:ti,ab Or Or Madrid:ti,ab Or Or Melilla:ti,ab Or Or Navarra:ti,ab Or Or Or Navarra:ti,ab Or Or Valencia\*:ti,ab Or Or Or Extremadura:ti,ab Or Or Galicia:ti,ab Or Or Balears:ti,ab Or Or 'Balearic Islands':ti,ab Or Or 'Balear Islands':ti,ab Or Or Baleares:ti,ab Or Or 'La Rioja':ti,ab Or Or 'Pais Vasco':ti,ab Or Or 'Basque Country':ti,ab Or Or 'Basque region':ti,ab Or Or Euskadi:ti,ab Or Or Asturias:ti,ab Or Or Murcia:ti,ab Or Or Or Coruna:ti,ab Or Or Or Alava:ti,ab Or Or Or Araba:ti,ab Or Or Albacete:ti,ab Or Or Alicante:ti,ab Or Or Alacant:ti,ab Or Or Almeria:ti,ab Or Or Or Avila:ti,ab Or Or Or Badajoz:ti,ab Or Or Or Badajoz:ti,ab Or Or Barcelona:ti,ab Or Or Burgos:ti,ab Or Or Burgos:ti,ab Or Or Cadiz:ti,ab Or Or Castellon:ti,ab Or Or Or Castello:ti,ab Or Or 'Ciudad Real':ti,ab Or Or Or Cordoba:ti,ab Or Or Or Cuenca:ti,ab Or Or Or Eivissa:ti,ab Or Or Or Ibiza:ti,ab Or Or Or Formentera:ti,ab Or Or Or 'El Hierro':ti,ab Or Or Or Fuerteventura:ti,ab Or Or Or Galiza:ti,ab Or Or Or Girona:ti,ab Or Or Or Girona:ti,ab Or Or Or 'Gran Canaria':ti,ab Or Or Or Granada:ti,ab Or Or Or Guadalajara:ti,ab Or Or Or Guipuzcoa:ti,ab Or Or Or Gipuzkoa:ti,ab Or Or Or Huelva:ti,ab Or Or Or Huesca:ti,ab Or Or Or Jaen:ti,ab Or Or Or 'La Gomera':ti,ab Or Or Or 'La Palma':ti,ab Or Or Or Lanzarote:ti,ab Or Or Or Leon:ti,ab Or Or Or Or Lleida:ti,ab Or Or Or Or Lerida:ti,ab Or Or Or Or Lugo:ti,ab Or Or Or Or Malaga:ti,ab Or Or Or Mallorca:ti,ab Or Or Or Majorca:ti,ab Or Or Or Menorca:ti,ab Or Or Or Minorca:ti,ab Or Or Or Murcia:ti,ab Or Or Or Ourense:ti,ab Or Or Or Orense:ti,ab Or Or Or Palencia:ti,ab Or Or Or Pontevedra:ti,ab Or Or Or Salamanca:ti,ab Or Or Or Segovia:ti,ab Or Or Or Sevilla:ti,ab Or Or Or Seville:ti,ab Or Or Or Or Soria:ti,ab Or Or Or Tarragona:ti,ab Or Or Or Tenerife:ti,ab Or Or Or Or Teruel:ti,ab Or Or Or Toledo:ti,ab Or Or Or Valladolid:ti,ab Or Or Or Vizcaya:ti,ab Or Or Or Biscay:ti,ab Or Or Or Zamora:ti,ab Or Or Or Zaragoza:ti,ab Or Or Or Or Saragossa:ti,ab Or Or Or 'Las Palmas':ti,ab Or Or Or Bilbao:ti,ab Or Or Or Or 'Sweden'/exp OR 'Swedish citizen'/exp OR 'Swede (people)'/exp OR Sweden:ti,ab Or Or Sverige:ti,ab Or Or Swedish:ti,ab Or Or Or Svenska:ti,ab Or Or Or svenskar:ti,ab Or Or Or Or Swede:ti,ab Or Or Or Or Swedes:ti,ab Or Or Or Norrland:ti,ab Or Or Or Mellansverige:ti,ab Or Or Or Smaland:ti,ab Or Or Or Stockholm\*:ti,ab Or Or Or Sydsvverige:ti,ab Or Or Or Vastsvverige:ti,ab Or Or Or Blekinge:ti,ab Or Or Or Dalarna:ti,ab Or Or Or Gavleborg\*:ti,ab Or Or Or Gotland\*:ti,ab Or Or Or Halland\*:ti,ab Or Or Or Jamtland\*:ti,ab Or Or Or Jonkoping\*:ti,ab Or Or Or Kalmar:ti,ab Or Or Or Kronoberg\*:ti,ab Or Or Or Norrbotten\*:ti,ab Or Or Or Orebro:ti,ab Or Or Or Ostergotland\*:ti,ab Or Or Or Skane:ti,ab Or Or Or Sodermanlands:ti,ab Or Or Or Uppsala:ti,ab Or Or Or Varmland\*:ti,ab Or Or Or Vasterbotten\*:ti,ab Or Or Or Vasternorrland\*:ti,ab Or Or Or Vastmanland\*:ti,ab Or Or Or vastergotland\*:ti,ab Or Or Or Or Gotaland\*:ti,ab Or Or Or Gothenburg:ti,ab Or Or Or Goteborg:ti,ab Or Or Or Malmö:ti,ab Or Or Or Vasteras:ti,ab Or Or Or Or Linköping:ti,ab Or Or Or Or Helsingborg:ti,ab Or Or Or Or Helsingborg:ti,ab Or Or Or Norrköping:ti,ab Or Or 'United Kingdom'/exp OR 'British citizen'/exp OR 'GB':ti,ab Or Or 'United kingdom':ti,ab Or Or 'UK':ti,ab Or Or Or Britain:ti,ab Or Or Or British:ti,ab Or Or Or England:ti,ab Or Or Or English:ti,ab Or Or Or Scotland:ti,ab Or Or Or Scottish:ti,ab Or Or Or Scots:ti,ab Or Or Or Wales:ti,ab Or Or Or Cymru:ti,ab Or Or Or Welsh:ti,ab Or Or Or 'North Ireland':ti,ab Or Or Or 'Northern Ireland':ti,ab Or Or Or Or Irish:ti,ab Or Or Or Or Avon:ti,ab Or Or Or Or Bedfordshire:ti,ab Or Or Or Or Berkshire:ti,ab Or Or Or Or Bristol:ti,ab Or Or Or Or Dorset:ti,ab Or Or Or Or Buckinghamshire:ti,ab Or Or Or Or Cambridgeshire:ti,ab Or Or Or Or 'Isle of Ely':ti,ab Or Or Or Or Cheshire:ti,ab Or Or Or Or Cleveland:ti,ab Or Or Or Or Cornwall:ti,ab Or Or Or Or Cumberland:ti,ab Or Or Or Or Cumbria:ti,ab Or Or Or Or Derbyshire:ti,ab Or Or Or Or Devon:ti,ab Or Or Or Or Dorset:ti,ab Or Or Or Or Durham:ti,ab Or Or Or Or Or Or Essex:ti,ab Or Or Or Or Gloucestershire:ti,ab Or Or Or Or Hampshire:ti,ab Or Or Or Or Southampton:ti,ab Or Or Or Or Hereford:ti,ab AND Or Or Or Herefordshire:ti,ab Or Or Or Herefordshire:ti,ab Or Or Or Or Humber:ti,ab Or Or Or Or Or Or Huntingdon:ti,ab Or Or Or Or Huntingdonshire:ti,ab Or Or Or Or 'Isle of Wight':ti,ab Or Or Or Or Kent:ti,ab Or Or Or Or Lancashire:ti,ab Or Or Or Or Leicestershire:ti,ab Or Or Or Or Lincolnshire:ti,ab Or Or Or Or London:ti,ab Or Or Or Or Manchester:ti,ab Or Or Or Or Merseyside:ti,ab Or Or Or Or Middlesex:ti,ab Or Or Or Or Norfolk:ti,ab Or Or Or Or Northamptonshire:ti,ab Or Or Or Or Northumberland:ti,ab Or Or Or Or Nottinghamshire:ti,ab Or

Oxfordshire:ti,ab OR Peterborough:ti,ab OR Rutland:ti,ab OR Shropshire:ti,ab OR Salop:ti,ab OR Somerset:ti,ab OR Yorkshire:ti,ab OR Staffordshire:ti,ab OR Suffolk:ti,ab OR Surrey:ti,ab OR Sussex:ti,ab OR (Tyne:ti,ab AND Wear:ti,ab) OR Warwickshire:ti,ab OR Midlands:ti,ab OR Westmorland:ti,ab OR Wiltshire:ti,ab OR Worcestershire:ti,ab OR 'Isle of Man':ti,ab OR Jersey:ti,ab OR Guernsey:ti,ab OR 'Channel Islands':ti,ab OR Aberdeen:ti,ab OR Aberdeenshire:ti,ab OR Angus:ti,ab OR Forfarshire:ti,ab OR Argyll:ti,ab OR Ayrshire:ti,ab OR Banffshire:ti,ab OR Berwickshire:ti,ab OR Bute:ti,ab OR Caithness:ti,ab OR Clackmannanshire:ti,ab OR Cromartyshire:ti,ab OR Dumfriesshire:ti,ab OR Dunbartonshire:ti,ab OR Dumbarton:ti,ab OR Dundee:ti,ab OR Lothian:ti,ab OR Haddingtonshire:ti,ab OR Edinburgh:ti,ab OR Fife:ti,ab OR Glasgow:ti,ab OR Inverness-shire:ti,ab OR Kincardineshire:ti,ab OR Kinross-shire:ti,ab OR Kirkcudbrightshire:ti,ab OR Lanarkshire:ti,ab OR Midlothian:ti,ab OR Moray:ti,ab OR Elginshire:ti,ab OR Nairnshire:ti,ab OR Orkney:ti,ab OR Peeblesshire:ti,ab OR Perthshire:ti,ab OR Renfrewshire:ti,ab OR (Ross:ti,ab AND Cromarty:ti,ab) OR Ross-shire:ti,ab OR Roxburghshire:ti,ab OR Selkirkshire:ti,ab OR Shetland:ti,ab OR Zetland:ti,ab OR Stirlingshire:ti,ab OR Or Sutherland:ti,ab OR Linlithgowshire:ti,ab OR Wigtownshire:ti,ab OR Anglesey:ti,ab OR Brecknockshire:ti,ab OR Caernarfonshire:ti,ab OR Carmarthenshire:ti,ab OR Cardiganshire:ti,ab OR Ceredigion:ti,ab OR Clwyd:ti,ab OR Denbighshire:ti,ab OR Dyfed:ti,ab OR Flintshire:ti,ab OR Glamorgan:ti,ab OR Gwent:ti,ab OR Gwynedd:ti,ab OR Merionethshire:ti,ab OR Montgomeryshire:ti,ab OR Monmouthshire:ti,ab OR Pembrokeshire:ti,ab OR Powys:ti,ab OR Radnorshire:ti,ab OR Antrim:ti,ab OR Aontrom:ti,ab OR 'Contae Aontroma':ti,ab OR Antrim:ti,ab OR Antrim:ti,ab OR Entrim:ti,ab OR Armagh:ti,ab OR 'Ard Mhacha':ti,ab OR Airmagh:ti,ab OR Belfast:ti,ab OR (Down:ti,ab AND (district:ti,ab OR council:ti,ab OR County:ti,ab)) OR 'An Dún':ti,ab OR 'an Dúin':ti,ab OR Doon:ti,ab OR Doun:ti,ab OR Fermanagh:ti,ab OR 'Fear Manach':ti,ab OR 'Fhear Manach':ti,ab OR Fermanagh:ti,ab OR Londonderry:ti,ab OR Doire:ti,ab OR Dhoire:ti,ab OR Lunnonderrrie:ti,ab OR Derry:ti,ab OR Birmingham:ti,ab OR Leeds:ti,ab OR Sheffield:ti,ab OR Bradford:ti,ab OR Liverpool:ti,ab OR 'Iceland'/exp OR 'Iceland'/exp OR Iceland:ti,ab OR Icelandic\*:ti,ab OR islenska\*:ti,ab OR Icelander\*:ti,ab OR islendinga\*:ti,ab OR Islendigar:ti,ab OR Inslenska:ti,ab OR Reykjavík:ti,ab OR Reykjavíkurborg:ti,ab OR Hofudborgarsvaedi:ti,ab OR Sudurnes:ti,ab OR Vesturland:ti,ab OR Vestfirðir:ti,ab OR Westfjords:ti,ab OR Nordurland:ti,ab OR Austurland:ti,ab OR Sudurland:ti,ab OR Kopavogur:ti,ab OR Hafnarfjörður:ti,ab OR Akureyri:ti,ab OR Gardabaer:ti,ab OR Mosfellsbaer:ti,ab OR Keflavik:ti,ab OR Akranes:ti,ab OR Selfoss:ti,ab OR Seltjarnarnes:ti,ab OR 'Bosnia and Herzegovina'/exp OR 'Bosnian (citizen)'/exp OR 'Bosniak (people)'/exp OR Bosnia\*:ti,ab OR Herzegov\*:ti,ab OR Herzegovine:ti,ab OR Bosna:ti,ab OR Bosne:ti,ab OR Bosanski:ti,ab OR Bosanac:ti,ab OR Bosanci:ti,ab OR Srpska:ti,ab OR Brcko:ti,ab OR Posavski:ti,ab OR Posavina:ti,ab OR posavska:ti,ab OR Tuzlanski:ti,ab OR Tuzla:ti,ab OR Tuzlanska:ti,ab OR 'Zenicko dobojski':ti,ab OR 'Zenicko dobojska':ti,ab OR Zenica:ti,ab OR 'Bosansko Podrinjski':ti,ab OR 'Bosansko Podrinjska':ti,ab OR Srednjobosanski:ti,ab OR hercegovacko:ti,ab OR Zapadnohercegovacki:ti,ab OR Zapadnohercegovacka:ti,ab OR Sarajevo:ti,ab OR Sarajevska:ti,ab OR 'Kanton 10':ti,ab OR '10 kanton':ti,ab OR Hercegovosanska:ti,ab OR 'Unsko sanski':ti,ab OR 'Una Sana':ti,ab OR 'Banja Luka':ti,ab OR bijeljina:ti,ab OR OR Mostar:ti,ab OR Prijedor:ti,ab OR Cazin:ti,ab OR Dobo:ti,ab OR Zupanja:ti,ab OR 'Kosovo'/exp OR 'Kosovar'/exp OR Kosov\*:ti,ab OR Ferizaj\*:ti,ab OR Urosevac\*:ti,ab OR Gjakov\*:ti,ab OR Dakovic\*:ti,ab OR Gjukan\*:ti,ab OR Gnjilan\*:ti,ab OR Mitrovic\*:ti,ab OR Pejes:ti,ab OR Peja:ti,ab OR Peje:ti,ab OR Pecki:ti,ab OR Pec:ti,ab OR Pristin\*:ti,ab OR Prishtin\*:ti,ab OR Pristinski:ti,ab OR Prizrenit:ti,ab OR Prizrenski:ti,ab OR Prizen:ti,ab OR Prizeni:ti,ab OR Prizreni:ti,ab OR Produjev\*:ti,ab OR Vucitr:ti,ab OR Vushtrri\*:ti,ab OR 'Suva reka':ti,ab OR Suhareka:ti,ab OR Besiana:ti,ab OR Metohija:ti,ab OR Dukagjini:ti,ab OR Liechtenstein'/exp OR Liechtenstein:ti,ab OR Liechtensteiner\*:ti,ab OR Balzers:ti,ab OR Eschen:ti,ab OR Gamprin:ti,ab OR Mauren:ti,ab OR Planken:ti,ab OR Ruggell:ti,ab OR Schaan:ti,ab OR Schellenberg:ti,ab OR Triesen:ti,ab OR Triesenberg:ti,ab OR Vaduz:ti,ab OR 'Norway'/exp OR 'Norwegian (citizen)'/exp OR 'Norwegian (people)'/exp OR Norway:ti,ab OR Norwegian\*:ti,ab OR Norge:ti,ab OR Noreg:ti,ab OR Norrga:ti,ab OR Akershus:ti,ab OR 'Aust Agder':ti,ab OR Buskerud:ti,ab OR Finnmark:ti,ab OR Hedmark:ti,ab OR Hordaland:ti,ab OR 'More og Romsdal':ti,ab OR 'More and Romsdal':ti,ab OR 'More Romsdal':ti,ab OR Nordland:ti,ab OR Trondelag:ti,ab OR Oppland:ti,ab OR Oslo:ti,ab OR Ostfold:ti,ab OR Rogaland:ti,ab OR 'Sogn og fjordane':ti,ab OR 'Sogn and fjordane':ti,ab OR 'sogn fjordane':ti,ab OR Telemark:ti,ab OR Troms:ti,ab OR Romsa:ti,ab OR Romsa:ti,ab OR 'Vest Agder':ti,ab OR 'Vest Agder':ti,ab OR Vestfold:ti,ab OR Bergen:ti,ab OR Stavanger:ti,ab OR Sandnes:ti,ab OR Trondheim:ti,ab OR Trondhjem:ti,ab OR Kaupangen:ti,ab OR Nidaros:ti,ab OR Drammen:ti,ab OR Fredrikstad:ti,ab OR Skien:ti,ab OR Tromsø:ti,ab OR Sarpsborg:ti,ab OR europe\*:ad OR europa\*:ad OR eu:ad OR eea:ad OR eefta:ad OR 'eu/eea':ad OR 'eu/efta':ad OR eesc:ad OR euratom:ad OR eurozone:ad OR eec:ad OR ec:ad OR (schengen:ad AND (area:ad OR countr\*:ad OR region\*:ad OR state:ad)) OR euroregion:ad OR euroregions:ad OR balkan:ad OR balkans:ad OR baltic:ad OR (mediterranean:ad AND (area:ad OR countr\*:ad OR region\*:ad OR state:ad OR states:ad)) OR (alpine:ad AND (area:ad OR countr\*:ad OR region\*:ad OR state:ad OR states:ad)) OR scandinavia:ad OR scandinavian:ad OR (nordic NEXT/1 (countr\* OR state\*)):ad OR danubian:ad OR 'iberian peninsula':ad OR 'peninsula iberica':ad OR 'péninsule ibérique':ad OR 'iberian penintsula':ad OR iberia:ad OR anatolia:ad OR anadolu:ad OR anatole:ad OR anatolian:ad OR yugoslavia:ad OR czechoslovakia:ad OR 'czechoslovakia':ad OR ceskoslovensko:ad OR 'cesko slovensko':ad OR benelux:ad OR fennoscandia:ad OR 'feno scandinavia':ad OR fennoskandi\*:ad OR (visegrád:ad AND (group:ad OR four:ad OR triangle:ad)) OR 'visegrádska čtyřka':ad OR 'visegrádska skupina':ad OR 'visegrádi együtműködés':ad OR 'visegrádi négyek':ad OR 'grupa wyszehradzka':ad OR 'vyšehradská skupina':ad OR 'vyšehradská štvorka':ad OR austria\*:ad OR osterreich\*:ad OR oesterreich\*:ad OR ostosterreich:ad OR ostoesterreich:ad OR sudosterreich:ad OR sudoesterreich:ad OR westosterreich:ad OR westoesterreich:ad OR burgenland:ad OR carinthia:ad OR karnten:ad OR kaernten:ad OR niederosterreich:ad OR niederoesterreich:ad OR oberosterreich:ad OR oberoesterreich:ad OR salzburg:ad OR saizburg:ad OR styria:ad OR steiermark:ad OR tyrol:ad OR tirol:ad OR vorarlberg:ad OR vienna:ad OR wien:ad OR graz:ad OR linz:ad OR innsbruck:ad OR klagenfurt:ad OR villach:ad OR wels:ad OR 'st polten':ad OR 'st poelten':ad OR 'sankt polten':ad OR 'sankt poelten':ad OR dornbirn:ad OR Belgi\*:ad OR Belge\*:ad OR Belg:ad OR Brussel\*:ad OR Bruxelles:ad OR Bruxelles:ad OR Walloon\*:ad OR Wallon\*:ad OR Vlaams:ad OR Vlaanderen:ad OR Flandern:ad OR Flandre:ad OR Flemish:ad OR Flamand:ad OR Flemisch:ad OR Flämisch:ad OR Vlaanderen:ad OR Flamande:ad OR Waals:ad OR Antwerp\*:ad OR Anvers:ad OR Henegouwen:ad OR Hennegau:ad OR Hainault:ad OR Hainaut:ad OR Liege:ad OR Luik:ad OR Luttich:ad OR Limbourg:ad OR Limburg:ad OR Namur:ad OR Namen:ad OR Ostflandern:ad OR Westflandern:ad OR Ghent:ad OR Gent:ad OR Gand:ad OR Charleroi:ad OR Bruges:ad OR Brugge\*:ad OR Schaarbeek:ad OR Schaerbeek:ad OR Anderlecht:ad OR Leuven:ad OR Louvain:ad OR Bulgaria:ad OR balgariya:ad OR bulgariya:ad OR blagoevgrad\*:ad OR 'pirin macedonia':ad OR burgas:ad OR dobrich:ad OR gabrovo:ad OR haskovo:ad OR kardzhali:ad OR kurzhdzhal:ad OR kyustendil:ad OR lovech:ad OR lovec:ad OR montana:ad OR pazardzhik:ad OR pernik:ad OR pleven\*:ad OR plovdiv:ad OR razgrad:ad OR russe:ad OR ruse:ad OR rusenka:ad OR shumen:ad OR silistra:ad OR sliven:ad OR smolyan:ad OR sofia:ad OR sofijiska:ad OR sofiiska:ad OR 'stara zagora':ad OR targovishte:ad OR varna:ad OR 'veliko tarnovo':ad OR vidin:ad OR vratsa:ad OR vratza:ad OR yambol:ad OR croat\*:ad OR hrvatsk\*:ad OR hrvati:ad OR bjelovar:ad OR 'bjelovarsko bilogorska':ad OR 'brod posavina':ad OR 'brodska posavska':ad OR 'dubrovnik neretva':ad OR 'dubrovacko neretvanska':ad OR zagreb:ad OR zagrebicka:ad OR istria:ad OR istarska:ad OR karlovska:ad OR karlovack:ad OR 'koprivnicko krizevacka':ad OR koprivnica:ad OR krizevci:ad OR 'krapina zagorje':ad OR 'krapinsko zagorska':ad OR 'lika senj':ad OR 'licko senjska':ad OR medimurska:ad OR medimurje:ad OR osijek:ad OR baranja:ad OR 'osjecko baranjska':ad OR 'pozega slavonia':ad OR 'pozesko slavonska':ad OR 'primorje gorski kotar':ad OR 'primorsko goranska':ad OR 'sibensko kninska':ad OR 'sibensko kninske':ad OR sibenik:ad OR knin:ad OR sisak:ad OR 'sisacko moslavacka':ad OR moslavina:ad OR 'splitska dalmatinska':ad OR split:ad OR dalmatia:ad OR varazdin:ad OR varazdinska:ad OR viroviticko:ad OR podravska:ad OR virovitica:ad OR podravina:ad OR 'vukovarsko srijemska':ad OR vukovar:ad OR srijem:ad OR zadar:ad OR zadarska:ad OR rijeka:ad OR 'velika gorica':ad OR 'slavonski brod':ad OR pula:ad OR cyprus:ad OR cyprriot\*:ad OR kypros:ad OR kibris\*:ad OR kypraki:ad OR kyprioi:ad OR nicosia:ad OR lefkosa:ad OR lefkosia:ad OR famagusta:ad OR ammoghostos:ad OR gazimagusa:ad OR kyrenia:ad OR girne:ad OR keryneia:ad OR larnaca:ad OR larnaka:ad OR iskele:ad OR limassol:ad OR lemesos:ad OR limasol:ad OR leymosun:ad OR paphos:ad OR pafos:ad OR baf:ad OR strouvolos:ad OR lakatamia:ad OR lakadamyia:ad OR 'kato polemidia':ad OR 'kato polemidhia':ad OR aglandjia:ad OR englene:ad OR aglantzia:ad OR aradhippou:ad OR aradippou:ad OR engomi:ad OR czech\*:ad OR cesky:ad OR ceska:ad OR cech:ad OR cestina:ad OR praha:ad OR praha:ad OR prag:ad OR stredoces\*:ad OR jihoces\*:ad OR bohemia:ad OR bohemian:ad OR plzen\*:ad OR pilsen:ad OR karlovska\*:ad OR 'karlovy vary':ad OR uesteck\*:ad OR usti:ad OR liberec\*:ad OR 'hradec kralove':ad OR 'kralovehradec':ad OR pardubic\*:ad OR olomouc\*:ad OR olomoc:ad OR holomoc:ad OR moravskoslezs\*:ad OR jihomorav\*:ad OR moravia:ad OR moravian:ad OR morava:ad OR vysocina:ad OR zlin:ad OR zlin:ad OR zlin:ad OR 'ceske budejovice':ad OR brno:ad OR ostrava:ad OR Denmark:ad OR Danish\*:ad OR dane:ad OR danes:ad OR Danmark:ad OR dansk\*:ad OR Hovedstaden:ad OR Midtjylland:ad OR Nordjylland:ad OR Sjælland:ad OR Sealand:ad OR 'Zealand region':ad OR 'region Zealand':ad OR Syddanmark:ad OR Jutland:ad OR Jylland:ad OR Sønderjylland:ad OR Copenhagen:ad OR København:ad OR Århus:ad OR Aarhus:ad OR Bornholm:ad OR Frederiksberg:ad OR Frederiksborg:ad OR Ringkjøbing:ad OR Viborg:ad OR Vejle:ad OR Roskilde:ad OR Storstrøm:ad OR Vestsjællands:ad OR 'West Zealand':ad OR Funen:ad OR Ribe:ad OR 'Kalaallit Nunaat':ad OR Gronland:ad OR Foroyar:ad OR Faeroerne:ad OR 'Faroe islands':ad OR Aalborg:ad OR Alborg:ad OR

Odense:ad OR Esbjerg:ad OR Gentofte:ad OR Gladsaxe:ad OR Randers:ad OR Kolding:ad OR Estonia\*:ad OR Eesti:ad OR Eestlased:ad OR Eestlane:ad OR Harju:ad OR Harjumaa:ad OR Hiiumaa:ad OR Hiiu:ad OR Hiiumaa:ad OR 'Ida Viru':ad OR 'Ida Virumaa':ad OR Jarvamaa:ad OR Jarva:ad OR Jogeveamaa:ad OR Jogevea:ad OR Laanemaa:ad OR Laane:ad OR 'Laane Virumaa':ad OR Parnu:ad OR Parnumaa:ad OR Polva:ad OR Polvamaa:ad OR OR Rapla:ad OR Raplamaa:ad OR Saare:ad OR Saaremaa:ad OR Tartu:ad OR Tartumaa:ad OR Tartu:ad OR Jyväskylä:ad OR Valga:ad OR Valgamaa:ad OR Viljandimaa:ad OR Viljandi:ad OR Voru:ad OR Vorumaa:ad OR Tallinn:ad OR Narva:ad OR 'Kohtla Jarve':ad OR Rakvere:ad OR Maardu:ad OR Sillamae:ad OR Kuressaare:ad OR Finland:ad OR Finnish\*:ad OR Finn:ad OR Finns:ad OR Suomi:ad Suomen:ad OR Suomalaiset:ad OR OR Aland:ad OR Ahvenanmaa:ad OR Uusimaa:ad OR Nyland:ad OR Karelia:ad OR Karjala:ad OR Karelän:ad OR Ostrobothnia:ad OR Pohjanmaa:ad OR Osterbotten:ad OR Savonia:ad OR Savo:ad OR Savolax:ad OR Kainuu:ad OR Kajanaland\*:ad OR 'Kanta Hame':ad OR Tavastia:ad OR Tavastland:ad OR Kymenlaakso:ad OR Kymmenedalen:ad OR Lapland:ad OR Lappi:ad OR Lapland:ad OR 'Pajjat Hame':ad OR Pirkanmaa:ad OR Birkaland:ad OR Satakunta:ad OR Satakunda:ad OR Helsinki:ad OR Helsingfors:ad OR Espoo:ad OR Esbo:ad OR Tampere:ad OR Tammerfors:ad OR OR Vantaa:ad OR Vanda:ad OR OR Oulu:ad OR Uleaborg:ad OR OR Turku:ad OR Abo:ad OR OR Jyväskylä:ad OR Kuopio:ad OR Lahti:ad OR Lahtis:ad OR OR Kouvola:ad OR France:ad OR French\*:ad OR Français\*:ad OR Alsace:ad OR Elsass:ad OR Aquitaine:ad OR Aquitania:ad OR Akitania:ad OR Aguiéne:ad OR Auvergne:ad OR Auvergne:ad OR Auvèrnhne:ad OR Auvèrnhna:ad OR Normandie:ad OR Normandy:ad OR Normandie:ad OR Bourgogne:ad OR Burgundy:ad OR Bregogne:ad OR Bregogne:ad OR Borgogne:ad OR Brittany:ad OR Breizh:ad OR Bertaëyn:ad OR Bretagne:ad OR 'Champagne Ardenne':ad OR Corse:ad OR Corsica:ad OR 'Franche Comte':ad OR 'Frantche Comte':ad OR 'Franche Comtat':ad OR Guadeloupe:ad OR Guyane:ad OR Guiana:ad OR 'Languedoc Roussillon':ad OR 'Lengadoc Rosselhon':ad OR 'Llenguadoc-Rossello':ad OR Limousin:ad OR Lemosin:ad OR OR Lorraine:ad OR OR Lothringen:ad OR Lottringe:ad OR Martinique:ad OR 'Midi Pyrenees':ad OR 'Miègjorn Pirenèus':ad OR 'Miedia Pirenèus':ad OR 'Mediodia Pirineos':ad OR 'Pays de la Loire':ad OR 'Broïoù al Liger':ad OR Picardie:ad OR Picardy:ad OR 'Poitou Charentes':ad OR 'Peitau Charantas':ad OR 'Poitou-Cherentes':ad OR Provence:ad OR Provenca:ad OR Prouvenco:ad OR 'Cote d Azur':ad OR 'Costo d Azur':ad OR 'Costa d Azur':ad OR Reunion:ad OR 'Rhone Alpes':ad OR 'Rono Arpes':ad OR 'Rose Aups':ad OR Ain:ad OR Aisne:ad OR Allier:ad OR 'Alpes de Haute Provence':ad OR 'Haute Alpes':ad OR 'Alpes Maritimes':ad OR Ardeche:ad OR Ardennes:ad OR Ariege:ad OR Aube:ad OR Aude:ad OR Aveyron:ad OR 'Bas Rhin':ad OR 'Bouches du Rhone':ad OR Calvados:ad OR Cantal:ad OR Charente:ad OR Cher:ad OR Correze:ad OR 'Corse du Sud':ad OR 'Cote d Or':ad OR 'Cotes d Armor':ad OR Creuse:ad OR 'Deux Sevres':ad OR Dordogne:ad OR Dous:ad OR Drome:ad OR Essonne:ad OR Eure:ad OR OR Finistere:ad OR OR Gard:ad OR Gers:ad OR OR Gironde:ad OR 'Haute Corse':ad OR 'Haute Garonne':ad OR 'Hautes Alpes':ad OR 'Haute Saone':ad OR 'Haute Savoie':ad OR 'Hautes Pyrenees':ad OR 'Haute Vienne':ad OR 'Haut Rhin':ad OR 'Hauts de Seine':ad OR OR Herault:ad OR 'Ile de France':ad OR 'Ile et Vilaine':ad OR Indre:ad OR Isere:ad OR Jura:ad OR Landes:ad OR Loire:ad OR Loiret:ad OR (Lot NEAR/3 (departement OR department)):ad OR 'Lot et Garonne':ad OR 'Loir et Cher':ad OR Lozere:ad OR Manche:ad OR Orne:ad OR Mayenne:ad OR OR Mayotte:ad OR 'Meurthe et Moselle':ad OR OR Meuse:ad OR OR Morbihan:ad OR Moselle:ad OR (Nord NEAR/3 (departement OR departement)):ad OR Nievre:ad OR Oise:ad OR Orne:ad OR 'Pas de calais':ad OR 'Noord-Nauw van Kales':ad OR Paris:ad OR 'Puy de dome':ad OR 'Pyrenees Atlantiques':ad OR 'Pyrenees Orientales':ad OR OR Rhone:ad OR OR Sarthe:ad OR Savoie:ad OR 'Seine et Marne':ad OR 'Seine Maritime':ad OR OR Somme:ad OR OR Tarn:ad OR 'Territoire de Belfort':ad OR 'Val de Marne':ad OR 'Val d Oise':ad OR OR Var:ad OR Vaucluse:ad OR Vendee:ad OR Vienne:ad OR Vosges:ad OR Yonne:ad OR Yvelines:ad OR Marseille:ad OR Lyon:ad OR Nice:ad OR Nantes:ad OR Strasbourg:ad OR OR Montpellier:ad OR OR Bordeaux:ad OR Lille:ad OR OR Toulouse:ad OR 'Outre Mer':ad OR 'Seine Saint Denis':ad OR OR German\*:ad OR OR Deutsch\*:ad OR Bundesrepublik:ad OR Westdeutschland:ad OR OR Ostdeutschland:ad OR OR Baden:ad OR OR Wuerttemberg:ad OR OR Bayern:ad OR OR Bavaria:ad OR OR Berlin:ad OR OR Brandenburg:ad OR OR Bremen:ad OR OR Oldenburg:ad OR OR Mitteldeutschland:ad OR OR Rhein:ad OR OR Rhine:ad OR OR Hannover:ad OR OR Braunschweig:ad OR OR Göttingen:ad OR OR Goettingen:ad OR OR Nurnberg:ad OR OR Nuernberg:ad OR OR Ruhr:ad OR OR Koln:ad OR OR koeln:ad OR OR Bonn:ad OR OR Hamburg:ad OR OR Hessen:ad OR OR Hesse:ad OR OR Hessa:ad OR OR Mecklenburg:ad OR OR Vorpommern:ad OR OR Pomerania:ad OR OR Niedersachsen:ad OR OR Neddersassen:ad OR OR Saxony:ad OR OR Niederbayern:ad OR OR 'Northern Rhine':ad OR OR 'North Rhine':ad OR OR Westfalen:ad OR OR 'Rhineland Palatinat':ad OR OR 'Rheinland Pfalz':ad OR OR Saarland:ad OR OR Sachsen:ad OR OR 'Schleswig Holstein':ad OR OR Thuringia:ad OR OR Thuringen:ad OR OR Thueringen:ad OR OR Munchen:ad OR OR Muenchen:ad OR OR Munich:ad OR OR Frankfurt:ad OR OR Stuttgart:ad OR OR Dusseldorf:ad OR OR Duesseldorf:ad OR OR Dortmund:ad OR OR Essen:ad OR OR Greece:ad OR OR 'Hellenic republic':ad OR OR Ellada:ad OR OR Elladas:ad OR OR 'Elliniki Dimokratia':ad OR OR Hellas:ad OR OR Hellenes:ad OR OR Attica:ad OR OR Attiki:ad OR OR Makedonia\*:ad OR OR Macedonia:ad OR OR Thraki:ad OR OR Thrace:ad OR OR Crete:ad OR OR Kriki:ad OR OR 'Ionia Nisia':ad OR OR 'Ionion neson':ad OR OR 'Ionion nison':ad OR OR 'Ionian islands':ad OR OR 'Ionian island':ad OR OR Epirus:ad OR OR Ipeiros:ad OR OR 'Perifèria Ipeïrou':ad OR OR 'North aegean':ad OR OR 'Northern Aegean':ad OR OR 'Aegean islands':ad OR OR 'Nisoi Agaïou':ad OR OR 'Notio Aigaïo':ad OR OR Peloponnese:ad OR OR Peloponniso\*:ad OR OR Thessaly:ad OR OR Thessalia:ad OR OR Thessalian:ad OR OR Petthalia:ad OR OR 'Voreio Aigaïo':ad OR OR 'Voreio Aigaïou':ad OR OR 'South aegean':ad OR OR 'Southern Aegean':ad OR OR 'Mount athos':ad OR OR 'Oros Athos':ad OR OR Cyclades:ad OR OR Cycklades:ad OR OR Kiklades:ad OR OR Dodecanese:ad OR OR Dodekanisa:ad OR OR Athens:ad OR OR Athina:ad OR OR Thessaloniki:ad OR OR Thessalonica:ad OR OR Patras:ad OR OR Patra:ad OR OR Pireas:ad OR OR Piraeus:ad OR OR Larissa:ad OR OR Larisa:ad OR OR Heraklion:ad OR OR Heraklion:ad OR OR Iraklion:ad OR OR Irakleion:ad OR OR Iraklio:ad OR OR Volos:ad OR OR Rhodes:ad OR OR Rodos:ad OR OR Ioannina:ad OR OR Janina:ad OR OR Yannena:ad OR OR Chania:ad OR OR Chalcis:ad OR OR Chalkida:ad OR OR Hungary\*:ad OR OR Magyarország:ad OR OR Magyar\*:ad OR OR Dunantuli:ad OR OR Transdanubia:ad OR OR Dunantul:ad OR OR 'Great Plain':ad OR OR 'Eszak Alföld':ad OR OR 'Del Alföld':ad OR OR 'Alfold es eszak':ad OR OR 'Northern Alföld':ad OR OR 'North Alföld':ad OR OR 'South Alföld':ad OR OR 'Southern Alföld':ad OR OR Bacs:ad OR OR Kiskun:ad OR OR Baranya:ad OR OR Bekes:ad OR OR Borsod:ad OR OR Abauj:ad OR OR Zemplen:ad OR OR Budapest:ad OR OR Csongrad:ad OR OR Fejer:ad OR OR gyor:ad OR OR moson:ad OR OR sopron:ad OR OR hajdu:ad OR OR bihar:ad OR OR Heves:ad OR OR 'jasz nagykun szolnok':ad OR OR komarom:ad OR OR esztergom:ad OR OR Nograd:ad OR OR (Pest NEXT/3 (megye OR county)):ad OR OR Somogy:ad OR OR szabolcs:ad OR OR szatmar:ad OR OR bereg:ad OR OR Tolna:ad OR OR Vas:ad OR OR Veszprem:ad OR OR Zala:ad OR OR Debrecen:ad OR OR Miskolc:ad OR OR Szeged:ad OR OR Pecs:ad OR OR Gyor:ad OR OR Nyiregyhaza:ad OR OR Kecskemet:ad OR OR Szekesfehervar:ad OR OR Szombathely:ad OR OR Ireland:ad OR OR Eire:ad OR OR Irish\*:ad OR OR Fingal:ad OR OR 'Fine Gall':ad OR OR Dublin:ad OR OR 'Ath Cliath':ad OR OR 'Dun Laoghaire':ad OR OR Wicklow:ad OR OR 'Cill Mhantain':ad OR OR 'Chill Mhantain':ad OR OR Wexford:ad OR OR 'Loch Garman':ad OR OR Carlow:ad OR OR Ceatharlach:ad OR OR Kildare:ad OR OR 'Cill Dara':ad OR OR 'Chill Dara':ad OR OR Meath:ad OR OR 'An Mhi':ad OR OR 'Contae na Mi':ad OR OR Louth:ad OR OR 'Contae Lu':ad OR OR Monaghan:ad OR OR Muineachán:ad OR OR Mhuineacháin:ad OR OR Cavan:ad OR OR 'An Cabhan':ad OR OR 'An Cabhain':ad OR OR Longford:ad OR OR 'An Longfort':ad OR OR 'an Longfoirt':ad OR OR Langford:ad OR OR Westmeath:ad OR OR 'An Iarmhí':ad OR OR 'na Iarmhí':ad OR OR Offaly:ad OR OR 'Uíbh Fhailí':ad OR OR Laois:ad OR OR Laoise:ad OR OR Kilkenny:ad OR OR 'Chill Chainnigh':ad OR OR 'Cill Chainnigh':ad OR OR Waterford:ad OR OR 'Port Lairge':ad OR OR Watterford:ad OR OR Cork:ad OR OR Corcaigh:ad OR OR Chorcaí:ad OR OR Kerry:ad OR OR Ciarraí:ad OR OR Chiarraí:ad OR OR Limerick:ad OR OR Luimneach:ad OR OR Luimnigh:ad OR OR Tipperary:ad OR OR 'Tiobraid Arann':ad OR OR 'Thiobraid Arann':ad OR OR Clare:ad OR OR 'An Clár':ad OR OR 'an Chlair':ad OR OR Galway:ad OR OR Gaillimh:ad OR OR 'na Gaillimhe':ad OR OR Mayo:ad OR OR 'Maigh Eo':ad OR OR 'Mhaigh Eo':ad OR OR Roscommon:ad OR OR 'Ros comain':ad OR OR Sligo:ad OR OR Sligeach:ad OR OR Shligigh:ad OR OR Leitrim:ad OR OR Liatroim:ad OR OR Liatroma:ad OR OR Donegal:ad OR OR 'Dhún na nGall':ad OR OR Dinnnygal:ad OR OR Dunnyga:ad OR OR Leinster:ad OR OR Laignin:ad OR OR 'Cúige Laighean':ad OR OR Munster:ad OR OR Mumhain:ad OR OR 'Cúige Mumhan':ad OR OR Connacht:ad OR OR Connachta:ad OR OR Drogheda:ad OR OR 'Droichead Atha':ad OR OR Dundalk:ad OR OR 'Dún Dealgan':ad OR OR OR Swords:ad OR OR Sord:ad OR OR Bray:ad OR OR Bre:ad OR OR Navan:ad OR OR 'An Uaimh':ad OR OR Italy:ad OR OR Italia\*:ad OR OR Abruzzo:ad OR OR Abruzzi:ad OR OR Basilicata:ad OR OR Lucania:ad OR OR Calabria:ad OR OR Campania:ad OR OR 'Emilia Romagna':ad OR OR 'friuli venezia giulia':ad OR OR Lazio:ad OR OR Latium:ad OR OR Liguria\*:ad OR OR Lombardy:ad OR OR Lombardia:ad OR OR Marche:ad OR OR Marches:ad OR OR Molisano:ad OR OR Molise:ad OR OR Piedmont\*:ad OR OR Piemonte:ad OR OR Bolzano:ad OR OR Bozen:ad OR OR Trentino:ad OR OR Trento:ad OR OR Puglia:ad OR OR Apulia:ad OR OR Sardinia:ad OR OR Sardegna:ad OR OR Sicily:ad OR OR Sicilia:ad OR OR Toscana:ad OR OR Tuscany:ad OR OR Umbria:ad OR OR 'Valle d Aosta':ad OR OR 'Vallee d Aoste':ad OR OR 'Aosta Valley':ad OR OR Veneto:ad OR OR Venetia:ad OR OR Triveneto:ad OR OR Rome:ad OR OR Roma:ad OR OR Milan:ad OR OR Milano:ad OR OR Naples:ad OR OR Napoli:ad OR OR Turin:ad OR OR Torino:ad OR OR Palermo:ad OR OR Genoa:ad OR OR Genova:ad OR OR Bologna:ad OR OR Florence:ad OR OR Firenze:ad OR OR Bari:ad OR OR Catania:ad OR OR Latvi\*:ad OR OR Riga:ad OR OR Courland:ad OR OR Kurzeme:ad OR OR Kurland:ad OR OR Latgale:ad OR OR Lettgallia:ad OR OR Latgola:ad OR OR Latgallia:ad OR OR Vidzeme:ad OR OR Vidumo:ad OR OR Semigalia:ad OR OR Semigalia:ad OR OR Zemgale:ad OR OR Pieriga:ad OR OR Daugavpils:ad OR OR Dinaburg:ad OR OR Jekabpils:ad OR OR Jakobstadt:ad OR OR Jelgava:ad OR OR Jurmala:ad OR OR Liepaja:ad OR OR Libau:ad OR OR Rezekne:ad OR OR Rezne:ad OR OR Rositten:ad OR OR Valmiera:ad OR OR Wolmar:ad OR OR Ventspils:ad OR OR Windau:ad OR OR Ogre:ad OR OR Lithuania\*:ad OR OR 'Lietuvos Respublika':ad OR OR Lietuva:ad OR OR lietuviai:ad OR OR Alytus:ad OR OR Alytaus:ad OR OR Kaunas:ad OR OR Kauno:ad OR OR Kauno:ad OR OR Klaipeda:ad OR OR Klaipėdos:ad OR OR Marijampoles:ad OR OR Marijampole:ad OR OR Panevezys:ad OR OR Panevezio:ad OR OR Siauliai:ad OR OR Siauliu:ad OR OR Taurages:ad OR OR Taurage:ad OR OR Telsiu:ad OR OR Telsiai:ad OR OR Utenos:ad OR OR Utena:ad OR OR Vilnius:ad OR OR Vilniaus:ad OR OR Mazeikiai:ad OR OR Jonava:ad OR OR Mazeikiu:ad OR OR Jonavos:ad OR OR Luxembourg\*:ad OR OR Luxemburg:ad OR OR Letzebuerg:ad OR OR Diekirch:ad OR OR Grevenmacher:ad OR OR 'Esch sur Alzette':ad OR OR 'Esch Uelzecht':ad OR OR 'Esch an der Alzette':ad OR OR 'Esch an der Alzig':ad OR OR Dudelange:ad OR OR Diddeleng:ad OR OR Dūdelingen:ad OR OR Duedelingen:ad OR OR Schifflange:ad OR OR Scheffleng:ad OR OR Schifflingen:ad OR OR Bettembourg:ad OR OR Beetebuerg:ad OR OR Bettemburg:ad OR OR Petange:ad OR OR Peiteng:ad OR OR Petingen:ad OR OR Ettelbruck:ad OR



Ettelbreck:ad OR Ettelbrueck:ad OR Diekirch:ad OR Dikrech:ad OR Strassen:ad OR Stroossen:ad OR Bertrange:ad OR Bartreng:ad OR Bartringen:ad OR Malta:ad OR Maltese\*:ad OR Maltn:ad OR Gozo:ad OR Għawdex:ad OR Valletta:ad OR 'Il Belt':ad OR Birkirkara:ad OR 'B Kara':ad OR Bircircara:ad OR Mosta:ad OR Qormi:ad OR 'St Paul s Bay':ad OR 'Pawl il Bahar':ad OR Zabbar:ad OR Sliema:ad OR Naxxar:ad OR Gwann:ad OR 'St John':ad OR Zebbug:ad OR 'Citta rohan':ad OR Fgura:ad OR Netherlands:ad OR Nederland\*:ad OR Dutch\*:ad OR Drenthe:ad OR Flevoland:ad OR Friesland:ad OR Fryslan:ad OR Frisia:ad OR Gelderland:ad OR Guelders:ad OR Groningen:ad OR Limburg:ad OR Brabant:ad OR Holland:ad OR Overijssel:ad OR Overissel:ad OR Utrecht:ad OR Zeeland:ad OR Amsterdam:ad OR Rotterdam:ad OR Hague:ad OR 's-Gravenhage':ad OR 'Den Haag':ad OR Eindhoven:ad OR Tilburg:ad OR Almere:ad OR Breda:ad OR Nijmegen:ad OR Nimegue:ad OR Poland:ad OR Polska:ad OR Polish:ad OR Pole:ad OR Poles:ad OR Polski:ad OR Polak:ad OR Polka:ad OR Polacy:ad OR Dolnoslaskie:ad OR Silesia\*:ad OR Slask:ad OR Pomorskie:ad OR Pomerania\*:ad OR Kujawsko:ad OR Kuyavian:ad OR Lodzkie:ad OR Lodz:ad OR Lubelskie:ad OR Lublin:ad OR Lubuskie:ad OR Lubusz:ad OR Lubus:ad OR Malopolskie:ad OR Mazowieckie:ad OR Mazowskie:ad OR Masovia:ad OR Masovian:ad OR Opolskie:ad OR Opole:ad OR Podkarpackie:ad OR Subcarpathian\*:ad OR Podlaskie:ad OR Podlachia:ad OR Podlasie:ad OR Slaskie:ad OR Swietokrzyskie:ad OR 'Warmia Mazuria':ad OR 'Warmian Mazurian':ad OR 'Warmia Masuria':ad OR 'Warmian Masurian':ad OR 'Warmia Mazury':ad OR 'Warminko Mazurskie':ad OR 'Warmian Masurian':ad OR Wielkopolskie:ad OR Zachodniopomorskie:ad OR Warsaw:ad OR Warszawa:ad OR Krakow:ad OR Cracow:ad OR Wroclaw:ad OR Poznan:ad OR Gdansk:ad OR Szczecin:ad OR Bydgoszcz:ad OR Katowice:ad OR Portugal:ad OR Portugues\*:ad OR Azores:ad OR Acores:ad OR Madeira:ad OR Alentejo:ad OR Algarve:ad OR Lisboa:ad OR Lisbon:ad OR 'Alto Tras-os-Montes':ad OR (Ave NEAR/3 (community OR intermunicipal OR comunidade)):ad OR Mondego:ad OR Vouga:ad OR Beira:ad OR Cavado:ad OR Lafoes:ad OR Douro:ad OR Porto:ad OR Oporto:ad OR Tejo:ad OR Minho:ad OR OR Setubal:ad OR Pinhal:ad OR 'Serra da Estrela':ad OR OR Tamega:ad OR OR Leira:ad OR Santarem:ad OR Beja:ad OR Faro:ad OR Evora:ad OR Portalegre:ad OR 'Castelo Branco':ad OR Guarda:ad OR Coimbra:ad OR Aveiro:ad OR Viseu:ad OR Braganca:ad OR Braganza:ad OR Braga:ad OR 'Vila real':ad OR 'Viana do Castelo':ad OR Gaia:ad OR Amadora:ad OR Funchal:ad OR Coimbra:ad OR Almada:ad OR (Aguvalva:ad AND Cacem:ad) OR Romania\*:ad OR Rumania\*:ad OR Roumania\*:ad OR Romani:ad OR Rumanian:ad OR Alba:ad OR Arad:ad OR Arges:ad OR Bacau:ad OR Bihor:ad OR 'Bistrita Nasaud':ad OR Botosani:ad OR Braila:ad OR Brasov:ad OR Kronstadt:ad OR Brasso:ad OR Brassovia:ad OR Coron:ad OR Bucharest:ad OR Bucuresti:ad OR Buzau:ad OR Calarasi:ad OR 'Caras-Severin':ad OR Cluj:ad OR Klausenburg:ad OR Kolozsvar:ad OR Constanta:ad OR Tomis:ad OR Konstantia:ad OR Kostence:ad OR Covasna:ad OR Dambovita:ad OR Dolj:ad OR Galati:ad OR Galatz:ad OR Galac:ad OR Kalas:ad OR Giurgiu:ad OR Gorj:ad OR Harghita:ad OR Hunedoara:ad OR Ialomita:ad OR Iasi:ad OR Jassy:ad OR Lassy:ad OR Ilfov:ad OR Maramures:ad OR Mehedinti:ad OR Mures:ad OR Neamt:ad OR (Olt:ad AND (river:ad OR county:ad OR region:ad OR judetul:ad OR Raul:ad)) OR Prahova:ad OR Salaj:ad OR 'Satu Mare':ad OR Sibiu:ad OR Suceava:ad OR Teleorman:ad OR Timis:ad OR Tulcea:ad OR Valcea:ad OR Vilcea:ad OR Vaslui:ad OR Vrancea:ad OR Timisoara:ad OR Temeswar:ad OR Temeschburg:ad OR Temeschwar:ad OR Temesvar:ad OR Timisvar:ad OR Timisvar:ad OR Temesva:ad OR Craiova:ad OR Ploiesti:ad OR Ploesti:ad OR Oradea:ad OR Varad:ad OR Varat:ad OR Slovakia:ad OR Slovensk\*:ad OR Slovak\*:ad OR Slovaci:ad OR Slovenki:ad OR Bratislav\*:ad OR Presporok:ad OR Pressburg:ad OR Preßburg:ad OR Posenium:ad OR Banskobystrica:ad OR 'Banska Bystrica':ad OR Neusohl:ad OR Besztercebánya:ad OR OR Koscic\*:ad OR OR Kaschau:ad OR OR Kassa:ad OR OR Nitrian\*:ad OR OR Nitra:ad OR OR Neutra:ad OR OR Nyitra:ad OR OR Trnav\*:ad OR OR Tyrnau:ad OR Nagyszombat:ad OR OR Tyrnavia:ad OR OR Presov\*:ad OR OR Trencian\*:ad OR OR Trencin:ad OR Trentschin:ad OR Trencsén:ad OR OR Zilina:ad OR OR Sillein:ad OR OR Zsolna:ad OR OR Zylina:ad OR (Martin:ad AND (city:ad OR Svaty:ad)) OR Turócszentmárton:ad OR OR Poprad:ad OR Deutschendorf:ad OR Zvolen:ad OR Slovenia\*:ad OR Slovenija:ad OR slovensk\*:ad OR Slovenci:ad OR Slovene\*:ad OR Gorenjska:ad OR Carniola:ad OR Goriska:ad OR Gorizia:ad OR Jugovzhodna:ad OR Koroska:ad OR Carinthia:ad OR 'Notranjsko kraska':ad OR 'Obalno kraska':ad OR 'Coastal karst':ad OR Osrednjeslovenska:ad OR Podravska:ad OR OR Drava:ad OR Pomurska:ad OR Mura:ad OR Savinjska:ad OR Savinja:ad OR Spodnjeponavska:ad OR OR Zasavska:ad OR 'Central Sava':ad OR OR Posavska:ad OR 'Lower Sava':ad OR Ljubljana:ad OR OR Laibach:ad OR OR Lubiana:ad OR OR Maribor:ad OR 'Marburg an der Drau':ad OR OR Kranj:ad OR OR Carnium:ad OR OR Creina:ad OR Chreina:ad OR OR Krainbur:ad OR OR Koper:ad OR Capodistria:ad OR OR Kopar:ad OR OR Celje:ad OR 'Novo mesto':ad OR OR Neustadt:ad OR OR Domzale:ad OR OR Velenje:ad OR OR Wollan:ad OR OR Woellan:ad OR 'Nova Gorica':ad OR OR Kamnik:ad OR OR Spain:ad OR OR Espana:ad OR OR Spanish:ad OR OR Espanol\*:ad OR OR Spaniard\*:ad OR OR Andalusia:ad OR OR Andalusia:ad OR OR Aragon:ad OR OR Arago:ad OR OR Cantabria:ad OR OR Canarias:ad OR OR Canary Islands:ad OR (Canaries:ad AND island\*:ad) OR 'Castile and leon':ad OR 'Castilla y Leon':ad OR 'Castile La Mancha':ad OR 'Castilla La Mancha':ad OR OR Catalonia:ad OR OR Ceuta:ad OR OR Madrid:ad OR OR Melilla:ad OR OR Navarra:ad OR OR Navarre:ad OR OR Valencia:ad OR OR Extremadura:ad OR OR Galicia:ad OR OR Balears:ad OR 'Balearic Islands':ad OR OR 'Balear Islands':ad OR OR Balears:ad OR OR 'La Rioja':ad OR OR 'Pais Vasco':ad OR 'Basque Country':ad OR OR 'Baske region':ad OR OR Euskadi:ad OR OR Asturias:ad OR OR Murcia:ad OR OR Coruna:ad OR OR Alava:ad OR OR Araba:ad OR OR Albacete:ad OR OR Alicante:ad OR OR Alacant:ad OR OR Almeria:ad OR OR Avila:ad OR OR Badajoz:ad OR OR Badajoz:ad OR OR Barcelona:ad OR OR Burgos:ad OR OR Caceres:ad OR OR Cadiz:ad OR OR Castellon:ad OR OR Castello:ad OR 'Ciudad Real':ad OR OR Cordoba:ad OR OR Cuenca:ad OR OR Eivissa:ad OR OR Ibiza:ad OR OR Formentera:ad OR OR 'El Hierro':ad OR OR Fuerteventura:ad OR OR Galiza:ad OR OR Girona:ad OR OR Gerona:ad OR 'Gran Canaria':ad OR OR Granada:ad OR OR Guadalupe:ad OR OR Guipuzcoa:ad OR OR Gipuzkoa:ad OR OR Huelva:ad OR OR Huesca:ad OR OR Jaen:ad OR 'La Gomera':ad OR 'La Palma':ad OR OR Lanzarote:ad OR OR Leon:ad OR OR Lleida:ad OR OR Lerida:ad OR OR Lugo:ad OR OR Malaga:ad OR OR Mallorca:ad OR OR Majorca:ad OR OR Menorca:ad OR OR Minorca:ad OR OR Murcia:ad OR OR Ourense:ad OR OR Orense:ad OR OR Palencia:ad OR OR Pontevedra:ad OR OR Salamanca:ad OR OR Segovia:ad OR OR Sevilla:ad OR OR Seville:ad OR OR Soria:ad OR OR Tarragona:ad OR OR Tenerife:ad OR OR Teruel:ad OR OR Toledo:ad OR OR Valladolid:ad OR OR Vizcaya:ad OR Biscay:ad OR OR Zamora:ad OR OR Zaragoza:ad OR OR Saragossa:ad OR 'Las Palmas':ad OR OR Bilbao:ad OR OR Sweden:ad OR OR Sverige:ad OR Swedish:ad OR OR Svenska:ad OR OR svenskar:ad OR OR Swede:ad OR OR Swedes:ad OR OR Norrland:ad OR OR Mellansverige:ad OR OR Smaland:ad OR Stockholm\*:ad OR OR Sydsvetige:ad OR OR Vastsvetige:ad OR OR Blekinge:ad OR OR Dalarna:ad OR OR Gavleborg\*:ad OR OR Gotland\*:ad OR OR Halland\*:ad OR OR Jamtland\*:ad OR OR Jonkoping\*:ad OR OR Kalmar:ad OR OR Kronoberg\*:ad OR OR Norrbotten\*:ad OR OR Orebro:ad OR OR Ostergotland\*:ad OR OR Skane:ad OR OR Sodermanlands:ad OR OR Uppsala:ad OR OR Varmland\*:ad OR OR Vasterbotten\*:ad OR OR Vasternorrland\*:ad OR OR Vastmanland\*:ad OR OR vastergotland\*:ad OR OR Gotaland\*:ad OR OR Gothenburg:ad OR OR Goteborg:ad OR OR Malmo:ad OR OR Vasteras:ad OR OR Linkoping:ad OR OR Helsingborg:ad OR OR Helsingborg:ad OR OR Norrkoping:ad OR OR 'GB':ad OR 'United Kingdom':ad OR 'UK':ad OR OR Britain:ad OR OR British:ad OR OR England:ad OR OR English:ad OR OR Scotland:ad OR OR Scottish:ad OR OR Scots:ad OR OR Wales:ad OR OR Cymru:ad OR OR Welsh:ad OR 'North Ireland':ad OR 'Northern Ireland':ad OR OR Irish:ad OR OR Avon:ad OR OR Bedfordshire:ad OR OR Berkshire:ad OR OR Bristol:ad OR OR Buckinghamshire:ad OR OR Cambridgeshire:ad OR 'Isle of Ely':ad OR OR Cheshire:ad OR OR Cleveland:ad OR OR Cornwall:ad OR OR Cumberland:ad OR OR Cumbria:ad OR OR Derbyshire:ad OR OR Devon:ad OR OR Dorset:ad OR OR Durham:ad OR OR Essex:ad OR OR Gloucestershire:ad OR OR Hampshire:ad OR OR Southampton:ad OR (Hereford:ad AND Worcester:ad) OR OR Hertfordshire:ad OR OR Herefordshire:ad OR OR Humberside:ad OR OR Huntingdon:ad OR OR Huntingdonshire:ad OR 'Isle of Wight':ad OR OR Kent:ad OR OR Lancashire:ad OR OR Leicestershire:ad OR OR Lincolnshire:ad OR OR London:ad OR OR Manchester:ad OR OR Merseyside:ad OR OR Middlesex:ad OR OR Norfolk:ad OR OR Northamptonshire:ad OR OR Northumberland:ad OR OR Nottinghamshire:ad OR OR Oxfordshire:ad OR OR Peterborough:ad OR OR Rutland:ad OR OR Shropshire:ad OR OR Salop:ad OR OR Somerset:ad OR OR Yorkshire:ad OR OR Staffordshire:ad OR OR Suffolk:ad OR OR Surrey:ad OR OR Sussex:ad OR (Tyne:ad AND Wear:ad) OR OR Warwickshire:ad OR OR Midlands:ad OR OR Westmorland:ad OR OR Wiltshire:ad OR OR Worcestershire:ad OR 'Isle of Man':ad OR OR Jersey:ad OR OR Guernsey:ad OR OR 'Channel Islands':ad OR OR Aberdeen:ad OR OR Aberdeenshire:ad OR OR Angus:ad OR OR Forfarshire:ad OR OR Argyll:ad OR OR Ayrshire:ad OR OR Banffshire:ad OR OR Berwickshire:ad OR OR Bute:ad OR OR Caithness:ad OR OR Clackmannanshire:ad OR OR Cromartyshire:ad OR OR Dumfriesshire:ad OR OR Dunbartonshire:ad OR OR Dumbarton:ad OR OR Dundee:ad OR OR Lothian:ad OR OR Haddingtonshire:ad OR OR Edinburgh:ad OR OR Fife:ad OR OR Glasgow:ad OR OR Inverness-shire:ad OR OR Kincardineshire:ad OR OR Kinross-shire:ad OR OR Kirkcudbrightshire:ad OR OR Lanarkshire:ad OR OR Midlothian:ad OR OR Moray:ad OR OR Elginshire:ad OR OR Nairnshire:ad OR OR Orkney:ad OR OR Peeblesshire:ad OR OR Perthshire:ad OR OR Renfrewshire:ad OR (Ross:ad AND Cromarty:ad) OR OR Ross-shire:ad OR OR Roxburghshire:ad OR OR Selkirkshire:ad OR OR Shetland:ad OR OR Zetland:ad OR OR Stirlingshire:ad OR OR Sutherland:ad OR OR Linlithgowshire:ad OR OR Wigtonshire:ad OR OR Anglesey:ad OR OR Brecknockshire:ad OR OR Caernarfonshire:ad OR OR Carmarthenshire:ad OR OR Cardiganshire:ad OR OR Ceredigion:ad OR OR Clwyd:ad OR OR Denbighshire:ad OR OR Dyfed:ad OR OR Flintshire:ad OR OR Glamorgan:ad OR OR Gwent:ad OR OR Gwynedd:ad OR OR Merionethshire:ad OR OR Montgomeryshire:ad OR OR Monmouthshire:ad OR OR Pembrokeshire:ad OR OR Powys:ad OR OR Radnorshire:ad OR OR Antrim:ad OR OR Antrim:ad OR 'Contae Aontroma':ad OR OR Antrim:ad OR OR Antrim:ad OR OR Armagh:ad OR 'Ard Mhacha':ad OR OR Airmagh:ad OR OR Belfast:ad OR (Down:ad AND (district:ad OR OR council:ad OR OR County:ad)) OR 'An Dún':ad OR 'an Dúin':ad OR OR Down:ad OR OR Down:ad OR OR Fermanagh:ad OR OR 'Fear Manach':ad OR 'Fhear Manach':ad OR OR Fermanagh:ad OR OR Londonderry:ad OR OR Doire:ad OR OR Dhoire:ad OR OR Lunnonderrie:ad OR OR Derry:ad OR OR Birmingham:ad OR OR Leeds:ad OR OR Sheffield:ad OR OR Bradford:ad OR OR Liverpool:ad OR OR Makedon\*:ad OR OR Macedon\*:ad OR OR Fyrom:ad OR OR Istocen:ad OR OR Severoistocen:ad OR OR Jugoistocen:ad OR OR Jugozapaden:ad OR OR Pelagonia:ad OR OR Poloski:ad OR OR Polog:ad OR OR Skopski:ad OR OR Skopje:ad OR OR Skopje:ad OR OR Kconje:ad OR OR Vardar\*:ad OR OR Bitola:ad OR OR Kumanovo:ad OR OR Prilep:ad OR OR Tetovo:ad OR OR Tetova:ad OR OR Tetove:ad OR OR Veles:ad OR OR Stip:ad OR OR Shtip:ad OR OR Ohrid:ad OR OR Gostivar:ad OR OR Gostivari:ad OR OR Strumica:ad OR OR Iceland:ad OR OR Icelandic\*:ad OR OR islenska\*:ad OR OR Icelander\*:ad OR



islendinga\*:ad OR Islendigar:ad OR Inslenska:ad OR Reykjavik:ad OR Reykjavikurborg:ad OR Hofudborgarsvaedi:ad OR Sudurnes:ad OR Vesturland:ad OR Vestfirðir:ad OR Westfjords:ad OR Nordurland:ad OR Austurland:ad OR Sudurland:ad OR Kopavogur:ad OR Hafnarfjordur:ad OR Akureyri:ad OR Gardabaer:ad OR Mosfellsbaer:ad OR Keflavik:ad OR Akranes:ad OR Selfoss:ad OR Seltjarnarnes:ad OR Bosnia\*:ad OR Herzegov\*:ad OR Herzegonine:ad OR Bosna:ad OR Bosne:ad OR Bosanski:ad OR Bosanac:ad OR Bosanci:ad OR Srpska:ad OR Brcko:ad OR Posavski:ad OR Posavina:ad OR posavska:ad OR Tuzlanski:ad OR Tuzla:ad OR Tuzlanska:ad OR 'Zenickho dobojski':ad OR 'Zenicko dobojska':ad OR OR Zenica:ad OR 'Bosansko Podrinjski':ad OR 'Bosansko Podrinjska':ad OR Srednjobosanski:ad OR hercegovacko:ad OR Zapadnohercegovacki:ad OR Zapadnohercegovacka:ad OR Sarajevo:ad OR Sarajevska:ad OR 'Kanton 10':ad OR '10 kanton':ad OR Hercegbosanska:ad OR 'Unsko sanski':ad OR 'Una Sana':ad OR 'Banja Luka':ad OR bijeljina:ad OR Mostar:ad OR Prijedor:ad OR Cazin:ad OR Doboj:ad OR Zupanja:ad OR Kosov\*:ad OR Ferizaj\*:ad OR Urosevac\*:ad OR Gjakov\*:ad OR Dakovic\*:ad OR Gjilan\*:ad OR Gnjilan\*:ad OR Mitrovic\*:ad OR Pejes:ad OR Peja:ad OR Peje:ad OR Pecki:ad OR Pec:ad OR Pristin\*:ad OR Prishtin\*:ad OR Pristinski:ad OR Prizrenit:ad OR Prizrenski:ad OR Prizen:ad OR Prizren:ad OR Prizeni:ad OR Produjev\*:ad OR Vucitrn:ad OR Vushtrri\*:ad OR 'Suva reka':ad OR Suhareka:ad OR Besiana:ad OR Metohija:ad OR Dukagjini:ad OR Dukagjinit:ad OR Liechtenstein:ad OR Lienchtensteiner\*:ad OR Balzers:ad OR Eschen:ad OR Gamprin:ad OR Mauren:ad OR Planken:ad OR Ruggell:ad OR Schaan:ad OR Schellenberg:ad OR Triesen:ad OR Triesenberg:ad OR Vaduz:ad OR Norway:ad OR Norwegian\*:ad OR OR Norge:ad OR Noreg:ad OR Norgga:ad OR Akershus:ad OR 'Aust Agder':ad OR Buskerud:ad OR Finnmark:ad OR Hedmark:ad OR Hordaland:ad OR 'More og Romsdal':ad OR 'More and Romsdal':ad OR 'More Romsdal':ad OR Nordland:ad OR Trondelag:ad OR Oppland:ad OR Oslo:ad OR Ostfold:ad OR Rogaland:ad OR 'Sogn og fjordane':ad OR 'Sogn and fjordane':ad OR 'sogn fjordane':ad OR Telemark:ad OR Troms:ad OR OR Romsa:ad OR Romssa:ad OR 'Vest Agder':ad OR Vestfold:ad OR Bergen:ad OR Stavanger:ad OR Sandnes:ad OR Trondheim:ad OR Trondhjem:ad OR Kaupangen:ad OR Nidaros:ad OR Drammen:ad OR Fredrikstad:ad OR Skien:ad OR Tromso:ad OR Sarpsborg:ad OR Gibraltar:ti,ab OR Gibraltar:ad OR Hebrid\*:ti,ab OR Hebrid\*:ad OR Svalbard\*:ti,ab OR Svalbard\*:ad

## Limits

- Time limits: For research question 1 parts 1 and 2, and for research question 2: literature published from 2005 onwards. For research question 1 part 3, literature published from 2015 onwards.
- No language limits.
- Specifically for EMBASE: publication type: review, article and article in press

## Running the literature search

Three separate searches were performed for research question 1:

- Search 1 searched for articles with data on risk groups not covered in previous reviews, from 2005 onwards (search strings #a AND #b1 AND #d1 AND #f).
- Searches 2 and 3 updated existing data on HBV/HCV prevalence in groups covered by previous reviews [19] – search 2 searched for articles with incidence data in these groups from 2005 onwards (search strings #a AND #b2 AND #d2 AND #f)
- Search 3 searched for all data in these groups from 2015 onwards (search strings #a AND #b1 AND #d2 AND #f).

The retrieved articles were pooled. The table below shows an overview of the different search strings used per research question.

**Table A3. Search strings per topic and subquestion**

#	String description	Topic 1 Who to test			Topic 2 Undiagnosed fraction
		sub1-1	sub1-2	sub1-3*	
a	Hepatitis B and Hepatitis C virus	X	X	X	X
b1	Occurrence	X		X	
b2	incidence only		X		
c	undiagnosed fraction				X
d1	Risk groups not covered in previous reviews	X			
d2	Groups covered in previous reviews		X	X	
e	EU/EEA	X	X	X	X

\* Update only for literature published between 2015-2017

The table below provides the number of hits retrieved on February 14<sup>th</sup> 2017.

**Table A4. Search results PubMed per topic and sub-question**

Topic	Search strings	Time limits	Pubmed hits	Embase hits
Topic 1 part 1	#a AND #b1 AND #d1 AND #f	2005-2017	3229	3979
Topic 1 part 2	#a AND #b2 AND #d2 AND #f	2005-2017	584	536
Topic 1 part 3	#a AND #b1 AND #d2 AND #f	2015-2017	403	345
Topic 2	#a AND #c AND #f	2005-2017	646	771

## Appendix 3. Data extraction

**Table A5. Variables: data extraction**

Variable	Description	Values
<b>Reference</b>		
Author	Surname of first author of the article	Surname
Year	Year of publication of the article	Year: yyyy
Journal	Journal of publication	Journal name
<b>Study characteristics</b>		
Virus	Virus for which prevalence/incidence data are reported	HCV HBV both
Country	Country for which the study report prevalence estimates	Country name
Study design	Design of reported study	Randomised controlled trial Surveillance study Non-randomised, prospective comparative study Prospective observational study Retrospective observational study Cross-sectional study Meta-analysis/Systematic review Mathematical modelling study Other
Period of sampling	Month/s and year/s during which study sampling was conducted	Month/s and year/s
Setting	Narrative field for relevant details of setting	
Sampling approach	Description of sampling approach	Exhaustive (screening) Random sampling Convenience sampling Respondent-driven Mixed Other Not reported Not applicable
HBV: specimen	Specimen type	Serum Saliva Dry blood spot Saliva/dry blood spot Not reported Not applicable Other*
HBV: testing method	Method of testing	EIA HBsAg CLIA HBsAg ECLIA HBsAg RIA HBsAg RDT HBsAg HBsAg, not specified NAT EIA + NAT CLIA + NAT RDT + NAT not specified HBsAg + NAT Not reported Other*
HBV: confirmation	Whether a confirmation test was performed and what type of test	Yes/No; test
HBV: acute or chronic	Authors specification of disease type that reported prevalence/incidence applies to	Acute Chronic Both Not specified Not applicable
HCV: specimen	Specimen type	Serum Saliva Dry blood spot Saliva/dry blood spot Not reported Not applicable Other*
HCV: testing method	Method of testing	EIA anti-HCV CLIA anti-HCV ECLIA anti-HCV RDT anti-HCV Particle agglutination anti-HCV anti-HCV, not specified NAT anti-HCV, not specified or NAT EIA anti-HCV or NAT Various anti-HCV Not reported Other*

Variable	Description	Values
HCV: confirmation test	Whether a confirmation test (anti-HCV) was performed and what type of test	No anti-HCV, not specified RIBA EIA anti-HCV LIA EIA + RIBA Various anti-HCV Other*
HCV-RNA	Whether NAT was performed	Yes/no
HCV: acute or chronic	Authors specification of disease type that reported prevalence/incidence applies to	Acute Chronic Both Not specified Not applicable
<b>Research question 2 only:</b>		
Methodology undiagnosed cases	Approach used to determine undiagnosed fraction	Modelling Screening
<b>Study population</b>		
Group of interest	Population subgroup sampled in the study	General population PWID Migrants MSM People in prison Pregnant women Health care workers Public safety workers Waste workers Sex workers PLHIV HBV/HCV+ STI infected People having an STI test People engaging in high risk sexual behaviour Sexual assault victims Intranasal drug users Sexual partners of PWID Recipients of SOHO (Haemo)dialysis recipients Recipients of medical/dental interventions Diabetes patients Transgender Anabolic steroid users Tattoo/piercing artists Recipients of tattoo/piercings Recipients of acupuncture, mesotherapy or beauty therapies People in care homes/institutionalised people Intellectually disabled people Homeless Household/family/sexual partners Birth cohort Travellers Other*
Study population description	Narrative field for any further relevant information on the study population for which the prevalence/incidence is reported	
Study population N	Size of the study population	Numerical
Sample description	Narrative field to describe the sample of all included participants who provided specimens for testing	
Sample N	Size of the sample	Numerical
Inclusion criteria	Narrative field to list any additional criteria for inclusion not covered in sample description	
Exclusion criteria	Narrative field to list any additional criteria for exclusion not covered in sample description	
Gender: % male	Percentage of the sample that were male	%
Age, mean	Mean age of the sample $\pm$ standard deviation (if reported)	Numerical
Age, median	Median age of the sample with interquartile range (if reported)	Numerical
Age, range	Minimum and maximum age of study population	Numerical
<b>Results HBV research question 1</b>		
Prevalence HBV %	% HBsAg positive	%
Prevalence HBV 95% CI	95% CI of the HBV prevalence	Numerical
Incidence value HBV	Value reported for incidence of HBV	Numerical
Incidence unit HBV	Unit reported for incidence of HBV	cases per 100 person-years % per year 12 year cumulative incidence (%) % per 10 years % per 75 days Other*
Incidence HBV 95% CI	95% CI of incidence	Numerical

Variable	Description	Values
OR HBV in group compared to general population	OR of HBV in study population compared to the general population	Numerical
OR HBV 95% CI	95% CI of OR	Numerical
RR HBV in group compared to general population	RR of HBV in study population compared to the general population	Numerical
RR HBV 95% CI	95% CI of RR	Numerical
Other outcome HBV	Narrative field for other relevant reported outcomes	
Comments HBV	Narrative field for comments	
<b>Results HCV research question 1</b>		
Prevalence anti-HCV %	% anti-HCV positive (unconfirmed)	%
Prevalence anti-HCV 95% CI	95% CI of the anti-HCV prevalence (unconfirmed)	Numerical
Prevalence confirmed anti-HCV %	% anti-HCV positive (confirmed)	%
Prevalence confirmed anti-HCV 95% CI	95% CI of the anti-HCV prevalence (unconfirmed)	Numerical
Prevalence HCV-RNA %	% HCV-RNA positive	%
Prevalence HCV-RNA 95% CI	95% CI of the HCV-RNA prevalence	Numerical
Incidence value HCV	Value reported for incidence of HCV	Numerical
Incidence unit HCV	Unit reported for incidence of HCV	cases per 100 person-years % per year 12 year cumulative incidence (%) % per 10 years % per 75 days Other*
Incidence HCV 95% CI	95% CI of incidence	Numerical
OR HCV in group compared to general population	OR of HCV in study population compared to the general population	Numerical
OR HCV 95% CI	95% CI of OR	Numerical
RR HCV in group compared to general population	RR of HBV in study population compared to the general population	Numerical
RR HCV 95% CI	95% CI of RR	Numerical
Other outcome HCV	Narrative field for other relevant reported outcomes	
Comments HCV	Narrative field for comments	
<b>Results HBV research question 2</b>		
Proportion undiagnosed cases HBV	Percentage of positive cases that were unaware of infection/undiagnosed	%
Other outcomes HBV	Narrative field for other relevant reported outcomes	
Comments HBV	Narrative field for comments	
<b>Results HCV research question 2</b>		
Proportion undiagnosed cases HCV	Percentage of positive cases that were unaware of infection/undiagnosed	%
Other outcomes HCV	Narrative field for other relevant reported outcomes	
Comments HCV	Narrative field for comments	
<b>General</b>		
Critical appraisal	Narrative field for aspects of quality assessment, as described in section 2.5	Aspects in which the study diverged from the checklist in section 2.5
General comments	Narrative field for relevant comments on the study or further interpretation of the data extraction and critical appraisal	

## Appendix 4. Excluded references

**Table A6. Excluded references, systematic literature search for research question 1**

Author	Year	Journal
Agher, et al.	2005	Medecine et Maladies Infectieuses
Alanko Blomé, et al.	2014	PLoS ONE
Almroth, et al.	2010	Journal of Medical Virology
Alonso Lopez, et al.	2016	Gastroenterol Hepatol
Alter	2006	J Hepatol
Andersson, et al.	2012	Epidemiology and Infection
Aniszewska, et al.	2010	Przegląd Lekarski
Anna Gyarmathy, et al.	2009	European Journal of Public Health
Antonucci, et al.	2009	G Ital Nefrol
Antonucci, et al.	2008	Scand J Infect Dis
Anžej Doma, et al.	2013	Zdravniški Vestnik
Arbune, et al.	2013	Balkan Med J
Arends, et al.	2005	Neth J Med
Arias-Moliz, et al.	2015	Medicina Oral, Patologia Oral y Cirugia Bucal
Aroldi, et al.	2005	Transplantation
Arribas, et al.	2005	AIDS
Assadian, et al.	2008	Vasa
Aznar, et al.	2009	Haemophilia
Backmund, et al.	2005	Eur Addict Res
Backmund, et al.	2006	Drug Alcohol Depend
Backmund	2007	Bundesgesundheitsblatt - Gesundheitsforschung - Gesundheitsschutz
Bal, et al.	2016	Open Forum Infect Dis
Balogun, et al.	2009	Epidemiology and Infection
Barril, et al.	2014	J Clin Microbiol
Barros, et al.	2008	Cent Eur J Public Health
Basnet, et al.	2015	Scand J Public Health
Batisse, et al.	2016	Therapie
Beijer, et al.	2012	The Lancet Infectious Diseases
Belhassen-García, et al.	2015	Clinical Microbiology and Infection
Benet, et al.	2007	J Viral Hepat
Benova, et al.	2014	Clin Infect Dis
Berenguer, et al.	2012	AIDS
Beynon, et al.	2009	BMC Geriatrics
Bhattacharya, et al.	2009	J Clin Virol
Biłski	2011	Hepatitis Monthly
Biot, et al.	2017	Archives de Pédiatrie
Bjerke, et al.	2010	
Boguradzka, et al.	2012	Family Medicine and Primary Care Review
Borgna-Pignatti, et al.	2005	Ann N Y Acad Sci
Borgna-Pignatti, et al.	2014	Br J Haematol
Bottero, et al.	2015	Open Forum Infect Dis
Boura, et al.	2014	J Int AIDS Soc
Bowser, et al.	2006	Fetal and Pediatric Pathology
Braczkowska, et al.	2006	Przegl Lek
Bradshaw, et al.	2015	Journal of Infectious Diseases
Bradshaw, et al.	2013	Curr Opin Infect Dis
Brambilla, et al.	2005	Ann Ig
Brant, et al.	2008	Journal of Viral Hepatitis
Brindicci, et al.	2015	J Immigr Minor Health
Brook, et al.	2013	HIV Medicine
Bruggmann, et al.	2014	J Viral Hepat
Buja, et al.	2015	Ann Ist Super Sanita
Buturovic-Ponikvar	2005	Ther Apher Dial
Buturovic-Ponikvar	2009	Ther Apher Dial
Cachafeiro, et al.	2009	Clinical Infectious Diseases
Cacoub, et al.	2015	Liver Int
Calleja-Panero, et al.	2013	Revista Espanola de Enfermedades Digestivas
Canaro, et al.	2015	European journal of haematology
Carvalho, et al.	2016	European Journal of Gastroenterology and Hepatology

Author	Year	Journal
Casanova, et al.	2015	J Acquir Immune Defic Syndr
Cassone	2012	Pathog Glob Health
Castellares, et al.	2008	Journal of Viral Hepatitis
Cavlek, et al.	2011	Cent Eur J Public Health
Chan, et al.	2011	Infection
Chan, et al.	2016	International Journal of Infectious Diseases
Chen, et al.	2011	Hepatobiliary Pancreat Dis Int
Cheung, et al.	2013	Best Practice and Research: Clinical Gastroenterology
Chevaux, et al.	2009	Gastroenterol Clin Biol
Chibber, et al.	2011	Journal of Maternal-Fetal and Neonatal Medicine
Cholongitas, et al.	2010	Journal of Hepatology
Christoforidis, et al.	2008	Archives of Medical Science
Cicolini, et al.	2008	Prof Inferm
Cifuentes, et al.	2012	Enfermedades Infecciosas y Microbiología Clínica
Cifuentes, et al.	2015	Enfermedades Infecciosas y Microbiología Clínica Monografías
Cingolani, et al.	2014	J Int AIDS Soc
Cobo, et al.	2016	J Immigr Minor Health
Coppola, et al.	2015	Eurosurveillance
Coppola, et al.	2015	World J Hepatol
Comberg, et al.	2011	Liver Int
Corrao, et al.	2013	ScientificWorldJournal
Cousien, et al.	2016	Hepatology
Coyne, et al.	2009	International Journal of STD and AIDS
Croucher, et al.	2013	Sexually Transmitted Infections
Cruciani, et al.	2015	BMC Infect Dis
Cuenca-Gómez, et al.	2016	Revista Clínica Española
Curcio, et al.	2011	J Addict Med
Dapena, et al.	2013	Pediatr Infect Dis J
Daskalopoulou, et al.	2014	J Int AIDS Soc
D'Avino, et al.	2014	J Int AIDS Soc
de la Fuente, et al.	2006	Revista española de salud pública
De La Hoya, et al.	2011	European Journal of Clinical Microbiology and Infectious Diseases
De Schrijver	2005	Euro Surveill
de Vos, et al.	2013	Addiction (Abingdon, England)
De Vos, et al.	2006	EDTNA-ERCA Journal
De Waure, et al.	2010	Journal of Epidemiology and Community Health
Degenhardt, et al.	2016	The Lancet Infectious Diseases
Degenhardt, et al.	2012	The Lancet
Del Corno, et al.	2006	Annali di igiene : medicina preventiva e di comunità
Del Olmo, et al.	2006	Journal of Gastroenterology and Hepatology (Australia)
Delcor, et al.	2016	American Journal of Tropical Medicine and Hygiene
Delotte, et al.	2014	Journal of Maternal-Fetal and Neonatal Medicine
Di Domenico, et al.	2006	Igiene e sanità pubblica
Di Napoli, et al.	2015	G Ital Nefrol
Dobosz	2007	Przegl Epidemiol
Dolan, et al.	2005	Addiction
Dolan, et al.	2016	The Lancet
D'Oliveira Jr, et al.	2005	Journal of Viral Hepatitis
Dougan, et al.	2007	Sexually Transmitted Diseases
Duberg, et al.	2013	Lakartidningen
Dunleavy, et al.	2010	Occupational Medicine
Dwyre, et al.	2011	Vox Sanguinis
Dyson, et al.	2014	Frontline Gastroenterology
Edgren, et al.	2016	Ann Intern Med
Elder, et al.	2006	Occup Med (Lond)
Elkabbany, et al.	2017	J Diabetes Complications
Elseviers, et al.	2014	J Ren Care
Ena, et al.	2011	Eur J Intern Med
Enache, et al.	2012	Int Urol Nephrol
Eriksen, et al.	2009	J Forensic Sci
Escudero-Castano, et al.	2008	Open Dent J
Eskandarani, et al.	2014	Dan Med J
Esmaili, et al.	2017	Journal of Viral Hepatitis

Author	Year	Journal
Esteban, et al.	2008	Journal of Hepatology
Esteve, et al.	2011	World Journal of Gastroenterology
Evlampidou, et al.	2016	British Journal of General Practice
Fabrizi, et al.	2005	Alimentary Pharmacology and Therapeutics
Fabrizi, et al.	2008	Semin Dial
Falagas, et al.	2007	PLoS ONE
Falconer, et al.	2009	Scandinavian Journal of Infectious Diseases
Faustini, et al.	2009	BMC Infectious Diseases
Fernandez-Lopez, et al.	2016	AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV
Fishman, et al.	2014	Nature Reviews Nephrology
Flexor, et al.	2013	Presse Med
Fonquernie, et al.	2006	Medecine et Maladies Infectieuses
Fornieri, et al.	2011	Giornale italiano di nefrologia : organo ufficiale della Società italiana di nefrologia
Forns, et al.	2005	Hepatology
Franceschini, et al.	2006	Journal of Acquired Immune Deficiency Syndromes
Francisci, et al.	2006	Haematologica
Fransen Van De Putte, et al.	2012	Thrombosis Research
Frijstein, et al.	2011	Netherlands Journal of Medicine
Fuster, et al.	2017	J Addict Med
Gaeta, et al.	2006	J Hepatol
Gamage, et al.	2011	BMC Infectious Diseases
Ganczak, et al.	2006	Chir Narzadow Ruchu Ortop Pol
Garcia Agudo, et al.	2016	Nefrologia
Garcia Gonzalo, et al.	2016	Aten Primaria
García-Agudo, et al.	2013	Nefrologia
Garcia-Alonso, et al.	2016	Dig Liver Dis
Genet, et al.	2014	J Int AIDS Soc
Germinario, et al.	2015	Epidemiol Prev
Gershon, et al.	2007	Infection Control and Hospital Epidemiology
Gessouli-Voltiraki, et al.	2007	Review of Clinical Pharmacology and Pharmacokinetics, International Edition
Ghosn, et al.	2005	Presse Med
Goel, et al.	2011	Eur J Pediatr
Gojak, et al.	2012	Medicinski arhiv
Goniewicz, et al.	2012	Ann Agric Environ Med
Gonzalez Cerrajero, et al.	2006	An Med Interna
González-Tomé, et al.	2008	HIV Medicine
Grady, et al.	2013	Hepatology
Greca, et al.	2012	Braz J Med Biol Res
Greenaway, et al.	2015	PLoS ONE
Greenup, et al.	2014	J Hepatol
Grzegorzewska, et al.	2011	Nephrology Dialysis Transplantation
Grzegorzewska, et al.	2010	Nephron - Clinical Practice
Guitton, et al.	2006	European Journal of Clinical Pharmacology
Gyarmathy, et al.	2015	Lancet Infect Dis
Hagemann, et al.	2014	Sexually Transmitted Infections
Hahné, et al.	2012	Vaccine
Hahné, et al.	2012	Epidemiology and Infection
Hampel, et al.	2016	Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz
Handanagic, et al.	2016	Int J Drug Policy
Harder, et al.	2011	Vaccine
Hedrich, et al.	2012	Addiction (Abingdon, England)
Hegazi, et al.	2016	Int J STD AIDS
Henard, et al.	2010	Medecine et Maladies Infectieuses
Hentzien, et al.	2016	J Nutr Health Aging
Hesse, et al.	2007	Am J Addict
Hewett, et al.	2011	British Journal of General Practice
Hickman, et al.	2007	Journal of Viral Hepatitis
Himmelreich, et al.	2013	Deutsches Arzteblatt International
Hinsenkamp, et al.	2012	Int Orthop
Hirzel, et al.	2015	BMC Infect Dis
Hontelez, et al.	2010	Journal of Epidemiology and Community Health
Hope, et al.	2013	BMJ Open
Howard, et al.	2010	Journal of Acquired Immune Deficiency Syndromes



Author	Year	Journal
Hughes, et al.	2012	Infect Drug Resist
Huntington, et al.	2015	AIDS
Indofi, et al.	2007	Journal of Medical Virology
Indofi, et al.	2008	Journal of Medical Virology
Ingliz, et al.	2014	HIV Medicine
Ip, et al.	2016	AIDS Care
Isnard Bagnis, et al.	2017	Liver Int
Jablonka, et al.	2016	Notfall und Rettungsmedizin
Jablonowska, et al.	2006	HIV and AIDS Review
Jackson, et al.	2016	Infect Dis Poverty
Jafari, et al.	2012	Canadian Journal of Public Health
Jhaveri, et al.	2014	Journal of the Pediatric Infectious Diseases Society
Jin, et al.	2016	Sex Health
Jogeda, et al.	2016	Infect Genet Evol
Joven, et al.	2013	HIV Medicine
Judd, et al.	2005	British Medical Journal
Juganariu, et al.	2014	Rev Med Chir Soc Med Nat lasi
Just, et al.	2012	Transfusion
Kallas, et al.	2015	Infect Genet Evol
Kamar, et al.	2008	Nephrol Ther
Karageorgopoulos, et al.	2015	World J Hepatol
Keeble, et al.	2015	Human Vaccines and Immunotherapeutics
Kim, et al.	2016	AIDS Behav
Koedijk, et al.	2010	Nederlands Tijdschrift voor Geneeskunde
Koumbi, et al.	2010	Clinical and Vaccine Immunology
Kozul, et al.	2010	Coll Antropol
Lagana, et al.	2015	Int J Gynaecol Obstet
Laheij, et al.	2012	Journal of Oral Microbiology
Landes, et al.	2008	HIV Medicine
Larance, et al.	2008	Drug and Alcohol Review
Larney, et al.	2013	Hepatology
Leao, et al.	2010	Arq Gastroenterol
Lee, et al.	2006	British Medical Journal
Leon, et al.	2016	Epidemiology and Infection
Leroy, et al.	2008	European Journal of Clinical Microbiology and Infectious Diseases
Levorato, et al.	2017	Ann Ig
Li Cavoli, et al.	2012	Hepatitis Research and Treatment
Libertone, et al.	2014	J Int AIDS Soc
Limina, et al.	2015	J Immigr Minor Health
López-Caleya, et al.	2006	Enfermedades Infecciosas y Microbiología Clínica
Lorenc, et al.	2014	London Journal of Primary Care
Loverro, et al.	2016	Sexually Transmitted Infections
Lucidarme, et al.	2011	Epidemiology and Infection
Lucidarme, et al.	2012	Hepato-Gastro and Oncologie Digestive
Lugoboni, et al.	2015	International Journal of Environmental Research and Public Health
Lumbreras, et al.	2006	AIDS
Machaira, et al.	2015	Journal of Antimicrobial Chemotherapy
Mahboobi, et al.	2013	Journal of Gastrointestinal and Liver Diseases
Makinson, et al.	2015	European Respiratory Journal
Mancebo, et al.	2017	J Infect
Mancuso, et al.	2006	Hemoglobin
Mangia, et al.	2008	International Journal of Artificial Organs
Marque-Juillet, et al.	2010	Pathologie Biologie
Martín Ibáñez, et al.	2006	Anales de Pediatría
Martín Sánchez, et al.	2009	Revista española de salud pública
Martin, et al.	2015	Journal of Viral Hepatitis
May, et al.	2015	Journal of Acquired Immune Deficiency Syndromes
Mazuecos, et al.	2012	Transplant Proc
Mc Grath-Lone, et al.	2014	Sex Transm Infect
McGettrick, et al.	2016	International Journal of STD and AIDS
Mijakoski, et al.	2011	Macedonian Journal of Medical Sciences
Mikolajczyk, et al.	2014	Drug and Alcohol Dependence
Minguez Gallego, et al.	2011	Revista Clinica Espanola

Author	Year	Journal
Mohsen, et al.	2005	HIV Medicine
Molton, et al.	2010	Journal of Infection
Monge-Maillo, et al.	2015	American Journal of Tropical Medicine and Hygiene
Monpierre, et al.	2016	Bull Soc Pathol Exot
Montella, et al.	2005	Infection
Moriondo, et al.	2007	Journal of Viral Hepatitis
Mravcik, et al.	2016	Epidemiol Mikrobiol Imunol
Mullaert, et al.	2015	Vaccine
Mullish, et al.	2014	Alimentary Pharmacology and Therapeutics
Munoz-Gamez, et al.	2016	Med Clin (Barc)
Neukam, et al.	2016	BMC Infect Dis
Niculescu, et al.	2015	AIDS Research and Human Retroviruses
Nogueras, et al.	2014	Microbiology and Immunology
Nothdurft, et al.	2007	Journal of Travel Medicine
Nowicki, et al.	2005	J Infect Dis
O'Carroll, et al.	2008	European Journal of Public Health
Onyeka, et al.	2013	BMC Public Health
op de Coul, et al.	2010	Ned Tijdschr Geneeskd
Origer, et al.	2012	Journal of Epidemiology and Community Health
Orio, et al.	2007	Medicina Clinica
Orsagova, et al.	2014	Epidemiol Mikrobiol Imunol
Orsetti, et al.	2013	Infection
Oviedo, et al.	2012	BMC public health
Padovese, et al.	2014	Journal of public health (Oxford, England)
Page, et al.	2016	Clin Med (Lond)
Palacios, et al.	2009	Journal of the International Association of Physicians in AIDS Care (Chicago, Ill. : 2002)
Pallawela, et al.	2014	Journal of Medical Virology
Palmateer, et al.	2013	International Journal of Drug Policy
Palmateer, et al.	2014	PLoS ONE
Pande, et al.	2013	Journal of Viral Hepatitis
Partanen, et al.	2009	European Journal of Vascular and Endovascular Surgery
Payne-James, et al.	2005	Journal of Clinical Forensic Medicine
Petrova, et al.	2010	World J Gastroenterol
Platt, et al.	2016	The Lancet Infectious Diseases
Pneumaticos, et al.	2012	European Journal of Orthopaedic Surgery and Traumatology
Polilli, et al.	2016	Infection
Pontali, et al.	2016	Int J Prison Health
Prevost, et al.	2015	Addiction
Proietti, et al.	2005	Minerva Gastroenterologica e Dietologica
Puglia, et al.	2016	Braz J Infect Dis
Ransy, et al.	2007	Med Sci (Paris)
Raven, et al.	2016	Infection Control and Hospital Epidemiology
Removille, et al.	2011	BMC public health
Reyes-Uruena, et al.	2015	BMC Public Health
Rice, et al.	2015	Occup Med (Lond)
Richens	2006	Travel Medicine and Infectious Disease
Rigopoulou, et al.	2005	Journal of Clinical Virology
Rivanera, et al.	2009	Pathol Biol (Paris)
Romero, et al.	2008	Transplantation Proceedings
Rosińska, et al.	2015	BMC Infectious Diseases
Roux, et al.	2014	BMJ Open
Roy, et al.	2005	J Hosp Infect
Roy, et al.	2007	Epidemiology and Infection
Rubio Caballero, et al.	2005	Med Clin (Barc)
Ruiz-Sancho, et al.	2007	HIV Clinical Trials
Russo, et al.	2016	J Public Health (Oxf)
Salazar-Vizcaya, et al.	2016	Hepatology
Sanchez Recio, et al.	2016	Gac Sanit
Sánchez, et al.	2013	Liver International
Saracino, et al.	2014	AIDS Research and Human Retroviruses
Sarmiento, et al.	2016	Transpl Infect Dis
Sattari, et al.	2013	Pharmaceutical Sciences
Scatigna, et al.	2017	Human Vaccines and Immunotherapeutics

Author	Year	Journal
Scheidell, et al.	2015	Addict Behav
Schlagenhauf, et al.	2015	Lancet Infect Dis
Schulpis, et al.	2008	Clinical Biochemistry
Scognamiglio, et al.	2009	BMC Infectious Diseases
Seme, et al.	2009	Acta Dermatovenerologica Alpina, Pannonica et Adriatica
Shi, et al.	2010	Int J Infect Dis
Silva, et al.	2017	Eur J Gastroenterol Hepatol
Smith, et al.	2015	Clinical Infectious Diseases
Snijdwind, et al.	2015	Journal of Clinical Virology
Sonder, et al.	2009	Journal of Travel Medicine
Sonder, et al.	2013	J Travel Med
Sowole, et al.	2015	BMC Nephrology
Spada, et al.	2013	Journal of Medical Virology
Spagnuolo, et al.	2014	J Int AIDS Soc
Spauwen, et al.	2015	Sex Transm Infect
Stanečková, et al.	2006	Central European Journal of Public Health
Steinsvåg, et al.	2013	Transfusion and Apheresis Science
Stern, et al.	2008	BMC Med Res Methodol
Strada, et al.	2015	BMC Infect Dis
Styczynski, et al.	2016	Clin Microbiol Infect
Su, et al.	2010	Liver Transpl
Suen, et al.	2010	Journal of Viral Hepatitis
Sulowicz, et al.	2007	Hemodialysis International
Tafari, et al.	2009	BMC Infectious Diseases
Tang, et al.	2005	Hemodial Int
Tarjan, et al.	2016	Int J Drug Policy
Tarján, et al.	2017	International Journal of Drug Policy
Terasaki, et al.	2016	J Immigr Minor Health
Thompson, et al.	2009	Transplant Infectious Disease
Thorburn, et al.	2006	Liver Transplantation
Tomkins, et al.	2012	Journal of Viral Hepatitis
Tomkins, et al.	2015	Journal of Hospital Infection
Topka, et al.	2012	Journal of Renal Care
Tosti, et al.	2007	Infection Control and Hospital Epidemiology
Tovo, et al.	2006	Arquivos de Gastroenterologia
Tovo, et al.	2016	World J Gastroenterol
Tran, et al.	2015	PLoS ONE
Tsui, et al.	2007	Clinical Infectious Diseases
Turci, et al.	2006	Journal of Acquired Immune Deficiency Syndromes
Turner, et al.	2011	Addiction (Abingdon, England)
Uuskula, et al.	2012	AIDS Care
Vallejo, et al.	2008	European Addiction Research
Van Der Helm, et al.	2011	AIDS
Van Houdt, et al.	2009	Journal of Medical Virology
Van Houdt, et al.	2010	Journal of Viral Hepatitis
Van Rijckevorsel, et al.	2013	Journal of Hepatology
Van Schalkwyk, et al.	2014	Canadian Journal of Gastroenterology and Hepatology
van Wijk, et al.	2008	American Journal of Infection Control
Van Wijk, et al.	2012	Community Dentistry and Oral Epidemiology
Vanhommerig, et al.	2014	J Acquir Immune Defic Syndr
Vanhommerig, et al.	2015	J Virol Methods
Vanya, et al.	2016	Reviews in Medical Microbiology
Vassallo, et al.	2013	Journal of NeuroVirology
Vassallo, et al.	2015	HIV Medicine
Vedio, et al.	2017	J Viral Hepat
Vendramin, et al.	2017	Transfusion
Vennarecci, et al.	2007	Transplant Proc
Verdalles, et al.	2011	Blood Purification
Vermehren, et al.	2012	PLoS ONE
Verscheijden, et al.	2015	Emerging Themes in Epidemiology
Vescio, et al.	2008	Journal of Epidemiology and Community Health
Vila-Rodriguez, et al.	2013	Am J Psychiatry
Vilbic-Cavlek, et al.	2015	World J Gastroenterol

Author	Year	Journal
Villano, et al.	2015	BMC Infectious Diseases
Volf, et al.	2008	Eur J Public Health
Waruingi, et al.	2016	Journal of Neonatal-Perinatal Medicine
Weill-Barillet, et al.	2016	Revue d'Epidemiologie et de Sante Publique
Weis, et al.	2006	Clin Infect Dis
Weiss, et al.	2007	Am J Surg
Wendland, et al.	2016	BMC Public Health
Wenz, et al.	2016	BMC Public Health
Wenzel, et al.	2013	Dermatology
Westermann, et al.	2015	Occupational and Environmental Medicine
Wicker, et al.	2008	Annals of Occupational Hygiene
Wicker, et al.	2016	Unfallchirurg
Wiessing, et al.	2011	Eurosurveillance
Wilczyńska, et al.	2010	Medycyna Pracy
Winnock, et al.	2011	Vaccine
Wolfram, et al.	2015	Journal of Hepatology
Xiridou, et al.	2013	Sexually Transmitted Infections
Yao, et al.	2013	Clinical and Vaccine Immunology
Yaphe, et al.	2012	Sex Transm Infect
Zambon, et al.	2012	Revista da Associacao Medica Brasileira
Zampieron, et al.	2006	EDTNA-ERCA Journal
Zampino, et al.	2015	World J Hepatol
Zwolińska, et al.	2013	AIDS Research and Human Retroviruses

**Table A7. Excluded references, systematic literature search for research question 2**

Author	Year	Journal
Brouard, et al.	2015	PLoS One
Chappuis, et al.	2015	Medecine et Maladies Infectieuses
Corona-Lau, et al.	2015	Rev Invest Clin
Flisiak, et al.	2015	European Journal of Gastroenterology and Hepatology
Harris, et al.	2016	Journal of Viral Hepatitis
Hutchinson, et al.	2006	Scottish Medical Journal
Mohsen, et al.	2005	HIV Medicine
Parda, et al.	2014	Przegł Epidemiol
Rosinska, et al.	2016	Przegł Epidemiol
Schmidt, et al.	2014	BMC Public Health

## Appendix 5. Summary tables for HBV prevalence

### Proxy populations and other groups of interest

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>Pregnant women</i>									
Tsankova 2016	Bulgaria 2009-2013	Cross-sectional study	Exhaustive (screening)	Pregnant women	Pregnant women attending antenatal care in Varna	2700	2.26	- Sample may not be representative of all pregnant women in Bulgaria	Pregnant women who chose to test HBV were included only. The region of Varna is the most urbanized in Bulgaria.
Ruffini 2016	Italy May 2011-April 2012	Cross-sectional study	Exhaustive (screening)	Pregnant women	Pregnant women in 13 birth centers of central Italy, who were screened for HBV	10,093	0.79	- No major comments	Around 25% of women were of immigrant origin
Orkin 2016	UK 2013	Cross-sectional study	Exhaustive (screening)	Pregnant women	Pregnant women who visited antenatal clinics at two London hospitals	1000	1	- Sample likely not representative of source population	Both hospitals serve areas falling within the highest deprivation quintiles in the country. The inclusion criteria may have introduced bias due to the requirement of specific information which is less likely to be complete for ethnic minority populations.

### Needle-based and iatrogenic transmission

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>People who inject drugs</i>									
Alexiev 2016	Bulgaria 2010-2014	Cross-sectional study	Not reported	PWID living with HIV	HIV-1 positive PWIDs nationwide, diagnosed between 2010-2014	150	20.6	- little detail in methods section - selection study population not clear - not clear whether study population is representative	
Larsen 2008	France 2004	Cross-sectional study	Mixed	PWID living with HIV	HIV infected Intravenous drug users from 167 randomly selected wards throughout France	348	7.5	- Methods serology not reported - The sample population may not be representative of the source population	Participation rate of wards was not as high as expected (60.3%) which may present a bias
Treso 2011	Hungary June 2007-June 2009	Cross-sectional study	Exhaustive (screening)	PWID in prison	PWID Prisoners in 20 Hungarian prisons	209	1.4	- No major comments	
Cachafeiro 2011	Spain 2004-2008	Prospective observational study	Not reported	PWID living with HIV	HIV+ MSM from the CoRIS cohort who are HAART naive	1852	5.8	- The methods are not clearly described	The sampling methods of CoRIS were not reported. Prevalence of HBV is based on results at first testing

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>(Haemo)dialysis recipients</i>									
Mina 2010	Greece May-August 2001	Cross-sectional study	Exhaustive (screening)	Haemodialysis recipients	End-stage renal failure patients from 5 units in central Greece	366	5.5	- No major comments	
Fabrizi 2005	Italy NR	Cross-sectional study	Not reported	Haemodialysis recipients	Patients on maintenance dialysis at five units in Italy	585	1.88	- Selection study population not clear	
Kuzminskis 2005	Lithuania 2002	Prospective observational study	Other	Haemodialysis recipients	All haemodialysis patients in Lithuania	701	11.7	- methods serology not described - no details on study population provided	The article covers 1996-2002. Here, data reported for 2002 was extracted only.
Voiculescu 2006	Romania 2008-2009	Cross-sectional study	Exhaustive (screening)	(Haemo)dialysis recipients	Hemodialysis patients from 6 dialysis centers	174	7.91	- No major comments	
Schiller 2015	Romania 2010	Prospective observational study	Not reported	Haemodialysis recipients	End-stage kidney disease patients treated with haemodialysis at 56 units	600	9.5	- Selection of patients not described	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
Saracho 2015	Spain 2004-2011	Prospective observational study	Exhaustive (screening)	Haemodialysis recipients living with HIV	Patients on renal replacement therapy from 11 autonomous communities, infected with HIV	480	7.8	- Few methodological details were provided.	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>Healthcare workers</i>									
Rybacki 2013	Poland 2009	Cross-sectional study	Random sampling	HCW	Health care employees of 5 health care departments in Lodz	520	1.2	- Limited description of study population	Participation rate was incomplete (as reported by authors, 86.7% agreed to take part in study)
Slusarczyk 2012	Poland Dec 2008-Jan 2009	Retrospective observational study	Exhaustive (screening)	HCW	Hospital personnel including administrative personnel employed in two major clinical hospitals at the Medical University of Warsaw	961	0.6	- Sample may not be representative of HCW in Poland	Hospital administrative personnel unlikely to have exposure to hepatitis also included in sample.
Ganczak 2006	Poland 2009	Cross-sectional study	Not reported	HCW	Surgeons and nurses from surgical and gynaecological wards of 16 hospitals of Western Pomerania	427	0.7	- The sample population may not be representative of the source population, the study population may be considered a subgroup at higher risk	
Voiculescu 2006	Romania 2008-2009	Cross-sectional study	Exhaustive (screening)	HCW	Doctors and nurses with occupational exposure to hepatitis in 17 districts of Romania	93	2.15	- No major comments	HBV vaccination is reported as compulsory for health care workers, but rates of vaccination were not reported here

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>Diabetes Mellitus patients</i>									
Cadranel 2008	France Jan 1996-March 1997	Cross-sectional study	Exhaustive (screening)	DM type 1 or 2	Hospitalised patients with type 1 or type 2 diabetes from 11 centres in France	1561	0.7	- study population not completely representative for total population	Hospitalised diabetes patients may have been more frequently exposed to invasive procedures (and thus hepatitis) than non-hospitalised patients
Soverini 2011	Italy 2007-2008	Cross-sectional study	Random sampling	DM type 2	Outpatients with type 2 diabetes at 3 diabetes units in Turin, Bologna and Naples	859	1.63	- Sample may not be representative of all type 2 diabetes patients in Italy	Type 2 DM patients living in the Naples area had a prevalence of HBV infection nearly double that observed in Turin and in Bologna.
Esparza-Martin 2013	Spain 2007-2011	Retrospective observational study	Exhaustive (screening)	DM patients	Diabetes patients referred for the initial consultation for diabetic nephropathy to nephrological centers in Grand Canary island	500	0.4	- selection study population not clear - methods serology hardly described - unclear whether study population is representative	95% of the patients had type 2 Diabetes Mellitus

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>Recipients of SOHO</i>									
Larsen 2008	France 2004	Cross-sectional	Mixed	Transfusion recipients / haemophiliacs living with HIV	HIV+ transfusion recipients / haemophiliacs from 167 randomly selected wards throughout France	50	5.9	- Methods serology not reported - The sample population may not be representative of the source population	Participation rate of wards was not as high as expected (60.3%) which may present a bias
Zervou 2006	Greece Jan 1999- Dec 2000	Cross-sectional study	Exhaustive (screening)	Cardiac surgery patients who received blood units	Patients who had undergone cardiac surgery at a hospital in Ioannina, and had received more than three blood units perioperatively	204	2	- No major comments	41.7% of the patients had been operated before 1991. 78.4% of the patients had undergone open-heart surgery in Greece and the remaining (21.6%) abroad.
Tagliaferri 2008	Italy Jan 2003- June 2006	Surveillance study	Exhaustive (screening)	Patients with inherited bleeding disorders treated before 1986	Patients with inherited bleeding disorders in 8 haemophilia centres in the Emilia-Romagna region, treated before 1986	NR	4	- Methods serology not reported	The focus of the study is quite broad, therefore few methodological details about HBV are given. Most but not all patients with congenital bleeding disorders from the region are captured.
Kucharska 2016	Poland NR	Cross-sectional study	Random sampling	HCV+ Haemophilia patients	HCV+ Haemophilic patients of several centers in Poland	71	9.8	- unclear whether study population is representative	Around 37% of the patients had been vaccinated against HBV during their lifetime, but none of them had been vaccinated as newborns. The study presents part of analyses of a wider study HemC, focused on the anti-HCV positive hemophilic patients, particularly those born prior to 1991. All patients were exposed to non-virus inactivated blood products.

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>Waste workers</i>									
Rachiotis 2012	Greece 2007-2008	Cross-sectional study	Exhaustive (screening)	Municipal waste workers	Municipal waste collectors from a municipality in central Greece, responsible for the collection of household waste and waste from private dentist & medical practices	100	4	- Unclear if population is representative of the source population	
Tsovili 2014	Greece Jan-Aug 2008	Cross-sectional study	Exhaustive (screening)	Municipal waste workers	Municipal waste workers in a municipality of Attica	50	2	- Small sample size - Sample is not representative of all waste workers in Greece	



Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
Dounias 2005	Greece Sept 1999-Dec 2001	Cross-sectional study	Convenience sampling	Municipal waste workers	Municipal waste workers in Keratsini, attending an annual medical check-up	71	11.3	- selection of study population not clear - major confounders not included in analysis - not generalisable to total population	The evaluation of exposure to waste was crude and non-detailed
Squeri 2006	Italy March-May 2005	Cross-sectional study	Not reported	Municipal waste workers	Municipal waste workers in the province of Messina responsible for sweeping as well as collection and disposal of household waste	327	3.98	- Selection of participants not reported	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>Recipients of tattoos/piercings</i>									
Urbanus 2011	Netherlands 2007-2010	Cross-sectional study	Mixed	People with multiple tattoos and/or piercings	People with multiple tattoos and/or piercings (except regular ear piercings) recruited at tattoo conventions, shops and an STI clinic in Amsterdam	434	0.7	- Sample may not be representative of all persons with tattoos/piercings in the Netherlands	

## Sexual transmission

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>Men who have sex with men</i>									
Alexiev 2016	Bulgaria 2010-2014	Cross-sectional study	Not reported	MSM living with HIV	HIV-1 positive MSM nationwide, diagnosed between 2010-2014	287	8.4	- little detail in methods section - selection study population not clear - not clear whether study population is representative	
Nielsen 2015	Denmark Nov 2010-Feb 2012	Retrospective observational study	Exhaustive (screening)	MSM	MSM having an STI screen/test in a clinic in Denmark	141	1.4	- The study population may not be representative of the source population	Study was carried out at a single venereal disease clinic in Denmark and results are thus not generalizable to the general MSM population. The reliance on self-reported risk group status might lead to misclassification. 14% of MSM were vaccinated against HBV.
Larsen 2008	France 2004	Cross-sectional study	Mixed	MSM living with HIV	HIV infected MSM from 167 randomly selected wards throughout France	558	9.2	- Methods serology not reported - The sample population may not be representative of the source population	Participation rate of wards was not as high as expected (60.3%) which may present a bias
Jansen 2015	Germany 1996-2012	Prospective observational study	Not reported	MSM living with HIV	HIV-1 positive MSM from multiple centres nationwide	1838	1.7	- Selection of study population not clear	Almost half of the population was vaccinated against HBV

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
Elefsiniotis 2006	Greece NR	Retrospective observational study	Not reported	MSM living with HIV	HIV-infected homosexual men followed up at the department of Infectious diseases at Athens University hospital since 1995	453	17.2	- The selection of the study population is not described - The methods are not clearly described - The study population is unlikely to be representative of the population of HIV+ patients in Greece	The time period in which the study was performed and when/how often markers were measured is not reported
Cachafeiro 2011	Spain 2004-2008	Prospective observational study	Not reported	MSM living with HIV	HIV+ patients who use Intravenous drugs from the CoRIS cohort who are HAART naive	721	7.8	- The methods are not clearly described	The sampling methods of CoRIS were not reported. Prevalence of HBV is based on results at first testing

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>Sex workers</i>									
Nielsen 2015	Denmark Nov 2010-Feb 2012	Retrospective observational study	Exhaustive (screening)	Sex workers	Sex workers having an STI screen/test in a clinic in Denmark	13	0	- The study population may not be representative of the source population	Study was carried out at a single venereal disease clinic in Denmark and results are thus not generalizable to the general sex worker population. The reliance on self-reported risk group status might lead to misclassification.
Nigro 2006	Italy 2001-2002	Cross-sectional study	Exhaustive (screening)	Female sex workers from Colombia and Dominican Republic	Female sex workers from Colombia and the Dominican Republic, attending a STI consultancy center in Catania (Eastern Sicily)	118	2.5	- The study population likely not representative of the source population - Brief methodology section	Female sex workers enrolled in this study were attending a consultation on STIs/HIV, safer sex practices and the use of condoms. This might make the sample less representative. Dominican and Colombian sex workers are not representative of all sex workers. There was inconsistency in the prevalence of HBV reported in the text (1.6%) and the prevalence reported on the table of results (2.5%). Here, the prevalence as reported in the table is provided

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>Persons engaging in high risk sexual behaviour</i>									
Treso 2011	Hungary June 2007-June 2009	Cross-sectional study	Exhaustive (screening)	People in prison who have had unprotected sex	Prisoners who have had unprotected sex in 20 Hungarian prisons	927	1.4	- No major comments	

**Intranasal transmission**

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>Intranasal drug users</i>									
Brouard 2017	France 2011-2013	Cross-sectional study	Random sampling	Intranasal drug users	People who have ever used drugs intranasally, attending harm reduction centres across France, participating in ANRS-Coquelicot	1661	1.4	- methods serology not described	Intranasal drug users were recruited from/ specialised centres, drug users not attending these centres will have been missed. The study was implemented in non-randomly chosen geographical areas, chosen to reflect the diversity of drug use in France. Sample N was calculated from the percentage of all drug users with a history of intranasal drug use.

**Vulnerable populations and mixed transmission groups**

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>People living with HIV</i>									
Alexiev 2016	Bulgaria 2010-2014	Cross-sectional study	Not reported	PLHIV	HIV-1 positive patients nationwide, diagnosed between 2010-2014	794	10.4	- little detail in methods section - selection study population not clear - not clear whether study population is representative	
Alexiev 2016	Bulgaria 2010-2014	Cross-sectional study	Not reported	MSM living with HIV	HIV-1 positive MSM nationwide, diagnosed between 2010-2014	287	8.4	- little detail in methods section - selection study population not clear - not clear whether study population is representative	
Alexiev 2016	Bulgaria 2010-2014	Cross-sectional study	Not reported	PLHIV in prison	HIV-1 positive prisoners nationwide, diagnosed between 2010-2014	59	16.9	- little detail in methods section - selection study population not clear - not clear whether study population is representative	
Alexiev 2016	Bulgaria 2010-2014	Cross-sectional study	Not reported	PWID living with HIV	HIV-1 positive PWIDs nationwide, diagnosed between 2010-2014	150	20.6	- little detail in methods section - selection study population not clear - not clear whether study population is representative	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
Andersen 2014	Denmark Jan 2011- Jan 2013	Prospective observational study	Exhaustive (screening)	PLHIV	HIV+ patients actively followed at the outpatient clinic of Aarhus University Hospital	574	3	- Not clear how representative the study population is for all HIV patients in Denmark	A low HBV vaccination rate exists in this population, however, no seroconversions were observed during the study period
Larsen 2008	France 2004	Cross-sectional study	Mixed	PLHIV	HIV infected patients from 167 randomly selected wards throughout France	1849	7	- Methods serology not reported - The sample population may not be representative of the source population	Participation rate of wards was not as high as expected (60.3%) which may present a bias
Larsen 2008	France 2004	Cross-sectional study	Mixed	MSM living with HIV	HIV infected MSM from 167 randomly selected wards throughout France	558	9.2	- Methods serology not reported - The sample population may not be representative of the source population	Participation rate of wards was not as high as expected (60.3%) which may present a bias
Larsen 2008	France 2004	Cross-sectional study	Mixed	PWID living with HIV	HIV infected Intravenous drug users from 167 randomly selected wards throughout France	348	7.5	- Methods serology not reported - The sample population may not be representative of the source population	Participation rate of wards was not as high as expected (60.3%) which may present a bias
Larsen 2008	France 2004	Cross-sectional study	Mixed	Transfusion recipients/haemophiliacs living with HIV	HIV infected transfusion recipients/haemophiliacs from 167 randomly selected wards throughout France	50	5.9	- Methods serology not reported - The sample population may not be representative of the source population	Participation rate of wards was not as high as expected (60.3%) which may present a bias
Jansen 2015	Germany 1996-2012	Prospective observational study	Not reported	MSM living with HIV	HIV-1 positive MSM from multiple centres nationwide	1838	1.7	- Selection of study population not clear	Almost half of the population was vaccinated against HBV
Elefsiniotis 2006	Greece NR	Retrospective observational study	Not reported	PLHIV	HIV-infected patients followed up at the department of infectious diseases at Athens University hospital since 1995	737	12.1	- The selection of the study population is not described - The methods are not clearly described - The study population is unlikely to be representative of the population of HIV+ patients in Greece	The time period in which the study was performed and when/how often markers were measured is not reported

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
Elefsiniotis 2006	Greece NR	Retrospective observational study	Not reported	MSM living with HIV	HIV-infected homosexual men followed up at the department of Infectious diseases at Athens University hospital since 1995	453	17.2	<ul style="list-style-type: none"> <li>- The selection of the study population is not described</li> <li>- The methods are not clearly described</li> <li>- The study population is unlikely to be representative of the population of HIV+ patients in Greece</li> </ul>	The time period in which the study was performed and when/how often markers were measured is not reported
Cicconi 2007	Italy 1997	Prospective observational study	Not reported	PLHIV	HIV-1 positive persons naive to antiretroviral drugs, in the ICONA study in 69 treatment centres across Italy	5272	3.7	<ul style="list-style-type: none"> <li>- Methods serology not reported</li> <li>- The methods are not clearly described</li> </ul>	Methods of the ICONA study (time period, sampling) were not described in detail.
Sanarico 2016	Italy Jan- Dec 2013	Cross-sectional study	Not reported	PLHIV in prison	HIV+ Prisoners in detention centres of 7 Italian towns	69	8.8	<ul style="list-style-type: none"> <li>- Data collection is not adequately described</li> <li>- It is not clear whether the study population is representative of the source population</li> </ul>	Prisoners previously diagnosed with HIV with sample left over are included in the study, however the original sampling approach is not described
Monarca 2015	Italy July 2013	Cross-sectional study	Exhaustive (screening)	PLHIV in prison	HIV+ prisoners at 25 correctional institutions across Italy	338	6.8	<ul style="list-style-type: none"> <li>- Methods serology not reported</li> <li>- Limited information on selection of study population</li> <li>- Representative of study population unclear</li> <li>- Limited information on study population</li> </ul>	The survey was conducted in almost a quarter of all Italian prisoners. The study was focused on HIV prevalence.
Zhang 2006	Netherlands 1998-2012	Prospective observational study	Not reported	PLHIV	HIV-1 patients in the ATHENA cohort	12800	5	<ul style="list-style-type: none"> <li>- Methods serology not reported</li> <li>- The methods are not clearly described</li> </ul>	Methods of the ATHENA study (sampling, number and location of centres) were not described in detail
Ruta 2005	Romania NR	Prospective observational study	Not reported	PLHIV	HIV-infected adolescents living in Constanta county	161	43.4	<ul style="list-style-type: none"> <li>- The methods are not clearly described</li> <li>- The study population is not representative of all HIV+ patients in Romania</li> </ul>	The study population (adolescents) are not representative for all HIV+ patients. Little detail is given on sampling and no study period is reported
Cachafeiro 2011	Spain 2004-2008	Prospective observational study	Not reported	PLHIV	HIV+ patients from the CoRIS cohort who are HAART naive	4419	5.8	<ul style="list-style-type: none"> <li>- The methods are not clearly described</li> </ul>	The sampling methods of CoRIS were not reported. Prevalence of HBV is based on results at first testing

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
González-García 2005	Spain May-Sept 2002	Cross-sectional study	Other	PLHIV	HIV+ patients attending 39 HIV centres throughout Spain	1260	4.9	- Methods serology not reported - Study population may not be representative of HIV+ patients in Spain	Selection of participants was by attendance during the study period. Therefore, patients with more frequent visits could be overrepresented
Llenas-García 2012	Spain 1992-2009	Retrospective observational study	Exhaustive (screening)	Migrants living with HIV	HIV+ migrants attending a clinic in Madrid	371	5.4	- Methods serology not reported - It is not clear whether the population is representative for HIV+ migrants in the whole of Spain	As the prevalence of HBV in migrants is largely dependent on their country of origin, this could differ widely per region, depending on the origin of migrants there
Cachafeiro 2011	Spain 2004-2008	Prospective observational study	Not reported	MSM living with HIV	HIV+ patients who use intravenous drugs from the CoRIS cohort who are HAART naive	721	7.8	- The methods are not clearly described	The sampling methods of CoRIS were not reported. Prevalence of HBV is based on results at first testing
Cachafeiro 2011	Spain 2004-2008	Prospective observational study	Not reported	MSM living with HIV	HIV+ MSM from the CoRIS cohort who are HAART naive	1852	5.8	- The methods are not clearly described	The sampling methods of CoRIS were not reported. Prevalence of HBV is based on results at first testing
Price 2012	UK 1996-2009	Prospective observational study	Not reported	PLHIV	HIV+ patients attending treatment centres participating in UK CHIC	25973	5.1	- Methods serology not reported - Limited description of study population - No clear if study population is representative of the source population	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>People in prison</i>									
Alexiev 2016	Bulgaria 2010-2014	Cross-sectional study	Not reported	PLHIV in prison	HIV-1 positive prisoners nationwide, diagnosed between 2010-2014	59	16.9	- little detail in methods section - selection study population not clear - not clear whether study population is representative	
Jacomet 2015	France June 2010-Dec 2013	Prospective observational study	Exhaustive (screening)	People in prison	Prisoners of the Clermont-Ferrand and Riom prisons	357	0.6	- unclear whether study population is representative	participation rate was a little over 50%
Treso 2011	Hungary June 2007-June 2009	Cross-sectional study	Exhaustive (screening)	People in prison who got a tattoo in prison	Prisoners who got a tattoo in prison in 20 Hungarian prisons	222	2.3	- No major comments	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
Treso 2011	Hungary June 2007-June 2009	Cross-sectional study	Exhaustive (screening)	People in prison who have had unprotected sex	Prisoners who have had unprotected sex in 20 Hungarian prisons	927	1.4	- No major comments	
Treso 2011	Hungary June 2007-June 2009	Cross-sectional study	Exhaustive (screening)	People in prison with a tattoo	Prisoners with a tattoo 20 Hungarian prisons	993	1.4	- No major comments	
Treso 2011	Hungary June 2007-June 2009	Cross-sectional study	Exhaustive (screening)	PWID in prison	PWID Prisoners in 20 Hungarian prisons	209	1.4	- No major comments	
Sanarico 2016	Italy Jan- Dec 2013	Cross-sectional study	Not reported	PLHIV in prison	HIV+ Prisoners in detention centres of 7 Italian towns	69	8.8	- Data collection is not adequately described - It is not clear whether the study population is representative of the source population	Prisoners previously diagnosed with HIV with sample left over are included in the study, however the original sampling approach is not described
Monarca 2015	Italy July 2013	Cross-sectional study	Exhaustive (screening)	PLHIV in prison	HIV+ prisoners at 25 correctional institutions across Italy	338	6.8	- Methods serology not reported - Limited information on selection of study population - Representative of study population unclear - Limited information on study population	The survey was conducted in almost a quarter of all Italian prisoners. The study was focused on HIV prevalence.

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>Migrants</i>									
Mockenhaupt 2016	Germany Oct 2013-Nov 2015	Cross-sectional study	Exhaustive (screening)	Syrian migrant children	Syrian migrants in Germany	488	0	- Methods serology not reported	Migrants were evaluated within 42 days of arrival in Germany
El-Hamad 2015	Italy Jan 2006-April 2010	Prospective observational study	Exhaustive (screening)	Brazilian migrants	Migrants from Brazil, who accessed the Service of International Medicine in Brescia	91	3.3	- no major comments	
El-Hamad 2015	Italy Jan 2006-April 2010	Prospective observational study	Exhaustive (screening)	Chinese migrants	Migrants from China, who accessed the Service of International Medicine in Brescia	246	11.4	- no major comments	
El-Hamad 2015	Italy Jan 2006-April 2010	Prospective observational study	Exhaustive (screening)	Egyptian migrants	Migrants from Egypt, who accessed the Service of International Medicine in Brescia	234	2.1	- no major comments	
El-Hamad 2015	Italy Jan 2006-April 2010	Prospective observational study	Exhaustive (screening)	Moldovan migrants	Migrants from Moldova, who accessed the Service of International Medicine in Brescia	821	10.7	- no major comments	



Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
El-Hamad 2015	Italy Jan 2006-April 2010	Prospective observational study	Exhaustive (screening)	Moroccan migrants	Migrants from Morocco, who accessed the Service of International Medicine in Brescia	159	1.9	- no major comments	
El-Hamad 2015	Italy Jan 2006-April 2010	Prospective observational study	Exhaustive (screening)	Nigerian migrants	Migrants from Nigeria, who accessed the Service of International Medicine in Brescia	301	1.7	- no major comments	
El-Hamad 2015	Italy Jan 2006-April 2010	Prospective observational study	Exhaustive (screening)	Pakistani migrants	Migrants from Pakistan, who accessed the Service of International Medicine in Brescia	241	2.1	- no major comments	
Ruffini 2016	Italy May 2011-April 2012	Cross-sectional study	Exhaustive (screening)	Pregnant Albanian migrants	Albanian pregnant women in 13 birth centers of central Italy, who were screened for HBV	337	7.71	- No major comments	
Ruffini 2016	Italy May 2011-April 2012	Cross-sectional study	Exhaustive (screening)	Pregnant Chinese migrants	Chinese pregnant women in 13 birth centers of central Italy, who were screened for HBV	171	8.19	- No major comments	
Ruffini 2016	Italy May 2011-April 2012	Cross-sectional study	Exhaustive (screening)	Pregnant Macedonian migrants	Macedonian pregnant women in 13 birth centers of central Italy, who were screened for HBV	190	2.11	- No major comments	
Ruffini 2016	Italy May 2011-April 2012	Cross-sectional study	Exhaustive (screening)	Pregnant Romanian migrants	Romanian pregnant women in 13 birth centers of central Italy, who were screened for HBV	258	1.94	- No major comments	
Ruffini 2016	Italy May 2011-April 2012	Cross-sectional study	Exhaustive (screening)	Pregnant Senegalese migrants	Senegalese pregnant women in 13 birth centers of central Italy, who were screened for HBV	49	6.12	- No major comments	
Ruffini 2016	Italy May 2011-April 2012	Cross-sectional study	Exhaustive (screening)	Pregnant Ukrainian migrants	Ukrainian pregnant women in 13 birth centers of central Italy, who were screened for HBV	69	7.25	- No major comments	
El-Hamad 2015	Italy Jan 2006-April 2010	Prospective observational study	Exhaustive (screening)	Romanian migrants	Migrants from Romania, who accessed the Service of International Medicine in Brescia	161	3.7	- no major comments	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
El-Hamad 2015	Italy Jan 2006-April 2010	Prospective observational study	Exhaustive (screening)	Senegalese migrants	Migrants from Senegal, who accessed the Service of International Medicine in Brescia	308	13	- no major comments	
El-Hamad 2015	Italy Jan 2006-April 2010	Prospective observational study	Exhaustive (screening)	Ukrainian migrants	Migrants from Ukraine, who accessed the Service of International Medicine in Brescia	460	1.1	- no major comments	
Coenen 2016	Netherlands 2009-2013	Cross-sectional study	Other	Chinese migrants	First generation Chinese migrants in six Dutch cities	4423	6	-unclear whether study population is representative	Response rate is relatively low (15%). Study includes five independent screening programmes resulting in heterogeneous groups.
Cochrane 2015	UK 2006-2014	Retrospective observational study	Exhaustive (screening)	Pregnant Indian migrants	Migrant women born in countries with high or intermediate HBV prevalence (>2%), resident in Bristol, who gave birth between 01/04/2006 and 01/04/2014 for whom testing data were available	433	0.5	- methods serology not described - unclear whether study population is representative for all UK pregnant migrants	data were collected from a single city and therefore the prevalence estimates may not generalise to other migrant populations in the UK
Cochrane 2015	UK 2006-2014	Retrospective observational study	Exhaustive (screening)	Pregnant Pakistani migrants	Migrant women born in countries with high or intermediate HBV prevalence (>2%), resident in Bristol, who gave birth between 01/04/2006 and 01/04/2014 for whom testing data were available	481	0.8	- methods serology not described - unclear whether study population is representative	data were collected from a single city and therefore the prevalence estimates may not generalise to other migrant populations in the UK
Cochrane 2015	UK 2006-2014	Retrospective observational study	Exhaustive (screening)	Pregnant Polish migrants	Migrant women born in countries with high or intermediate HBV prevalence (>2%), resident in Bristol, who gave birth between 01/04/2006 and 01/04/2014 for whom testing data were available	919	0.7	- methods serology not described - unclear whether study population is representative	data were collected from a single city and therefore the prevalence estimates may not generalise to other migrant populations in the UK
Cochrane 2015	UK 2006-2014	Retrospective observational study	Exhaustive (screening)	Pregnant Somali migrants	Migrant women born in countries with high or intermediate HBV prevalence (>2%), resident in Bristol, who gave birth between 01/04/2006 and 01/04/2014 for whom testing data were available	1001	2.9	- methods serology not described - unclear whether study population is representative	data were collected from a single city and therefore the prevalence estimates may not generalise to other migrant populations in the UK

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>Family/household/sexual partners of HBsAg+ persons</i>									
Pazdiora 2012	Czech Republic 1997-2005	Cross-sectional study	Exhaustive (screening)	Family members and sexual partners of HBsAg+ persons	Family members and sexual partners of persons with positive HBsAg test results from laboratories in Pilsen	964	5.7	- Methods serology not reported	Family/sexual partners tested included husband/wife, parents, siblings, children, grandchildren, partner and others. Prevalence rates were highest among parents and siblings
Zervou 2006	Greece 1991-1999	Prospective observational study	Exhaustive (screening)	Family members of HBsAg+ persons	Family members of HBsAg positive blood donors at a bloodbank in Ioannina	387	15.8	- The study population may not be representative for the source population in Greece	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>Travellers</i>									
Gergely 2014	France 2008-2012	Retrospective observational study	Mixed	Travellers	Travellers and humanitarians visiting the vaccination center of the Institut Pasteur	1093	5.86	- methods serology not described - no representative study population	- HBV serology is proposed to unvaccinated individuals and to those whose vaccination status is unknown, if they travel to countries of high or intermediate prevalence of HBV, for long or frequent trips. - More than half of travellers were of sub-Saharan African origin (as yellow fever vaccination is required to travel in most sub-Saharan African countries). This is a recruitment bias and targeted screening. Serology data were only available for less than a third of individuals for whom it was prescribed, which could represent a participation bias. The prevalence may be an underestimation as pre-vaccination screening is not systematically performed, and risk behaviours are not asked during the pre-travel consultation

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence HBV (%)	Critical appraisal	General comments
<i>Transgender persons</i>									
Luzzati 2016	Italy 2000-2014	Retrospective observational study	Exhaustive (screening)	Transgender persons who underwent sex reassignment surgery	Transgender persons referred to a hospital in Trieste to be evaluated for sex reassignment surgery	243	4.5	- study population probably not representative	25 subjects were Female to Male and 218 were Male to Female. Prevalence data were calculated from absolute numbers reported per gender group. According to the authors, the relative small number of subjects in this single center might not be generalizable

## Appendix 6. Summary tables for HCV prevalence

### Proxy populations and other groups of interest

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Pregnant women</i>										
Walewska-Zielecka 2006	Poland 2010-2014	Cross-sectional study	Exhaustive (screening)	Pregnant women	Pregnant women attending outpatient clinics across Poland	16120	0.76		- Methods serology not reported	
Kopilović 2015	Slovenia 2013	Cross-sectional study	Exhaustive (screening)	Pregnant women	Pregnant women tested at laboratories throughout Slovenia	9574	0.11	0.08	- study population not clearly described	Prevalence rates are also reported for 1999, 2003 and 2009 in the article
Cortina-Borja 2016	UK 2012	Cross-sectional study	Exhaustive (screening)	Pregnant women	Pregnant women delivering live-born infants, screened at a laboratory for North Thames region	31467	0.095		-unclear whether population is representative	- the analysis concerned the North Thames region, it is not clear whether these data are representative for whole UK - in around 0.05% of cases, linkage with birth registration data were not possible, resulting in some missing data. The approach was limited to women delivering live-born babies. For 7% of the neonates sampled, the mother was resident outside of the region.
Orkin 2016	UK 2013	Cross-sectional study	Exhaustive (screening)	Pregnant women	Pregnant women who visited antenatal clinics at two London hospitals	1000	0.5	0.1	- Sample likely not representative of source population	Both hospitals serve areas falling within the highest deprivation quintiles in the country. The inclusion criteria may have introduced bias due to the requirement of specific information which is less likely to be complete for ethnic minority populations.
Selvaplatt 2015	UK 2003-2013	Cross-sectional study	Exhaustive (screening)	Pregnant women	Pregnant women attending antenatal care at a hospital in London	35355	0.38	0.17	- Sample may not be representative of all pregnant women in the UK	The study centre is in London and may have an overrepresented migrant population

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Birth cohorts</i>										
Chlibek 2006	Czech Republic Feb 2015- Sept 2015	Prospective observational study	Convenience sampling	Aged 18-29	Adult population, aged 18-29 years, in the Czech Republic	554	1.99	1.26	- The sample population may not be representative of the source population	The study sample was recruited using an advertising campaign in the media. A higher proportion of HCWs in the sample and enrolment of PWID (unknown whether this was a representative proportion) may have influenced results
Chlibek 2006	Czech Republic Feb 2015- Sept 2015	Prospective observational study	Convenience sampling	Aged 30-44	Adult population, aged 30-44 years, in the Czech Republic	866	3.58	2.08	- The sample population may not be representative of the source population	The study sample was recruited using an advertising campaign in the media. A higher proportion of HCWs in the sample and enrolment of PWID (unknown whether this was a representative proportion) may have influenced results
Chlibek 2006	Czech Republic Feb 2015- Sept 2015	Prospective observational study	Convenience sampling	Aged 45-59	Adult population, aged 45-59 years, in the Czech Republic	702	0.85	0.43	- The sample population may not be representative of the source population	The study sample was recruited using an advertising campaign in the media. A higher proportion of HCWs in the sample and enrolment of PWID (unknown whether this was a representative proportion) may have influenced results
Chlibek 2006	Czech Republic Feb 2015- Sept 2015	Prospective observational study	Convenience sampling	Aged 60+	Adult population, aged 60+ years, in the Czech Republic	878	0.23	0	- The sample population may not be representative of the source population	The study sample was recruited using an advertising campaign in the media. A higher proportion of HCWs in the sample and enrolment of PWID (unknown whether this was a representative proportion) may have influenced results
Walewska-Zielecka 2006	Poland Feb 2015	Cross-sectional study	Convenience sampling	Aged 15-24	Persons aged 15-24, in Poland	3411	1.5		- The sample population is not representative of the source population	Only people living in big cities and their suburbs were included, who might not be representative of the general working population in Poland. In addition, the reported prevalence is an overestimation as the sample was composed of people tested for medical reasons

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Walewska-Zielecka 2006	Poland Feb 2015	Cross-sectional study	Convenience sampling	Aged 15-49	Persons aged 15-49, in Poland	56921	1.4		- The sample population is not representative of the source population	Only people living in big cities and their suburbs were included, who might not be representative of the general working population in Poland. In addition, the reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Walewska-Zielecka 2006	Poland Feb 2015	Cross-sectional study	Convenience sampling	Aged 25-34	Persons aged 25-34, in Poland	35047	1.2		- The sample population is not representative of the source population	Only people living in big cities and their suburbs were included, who might not be representative of the general working population in Poland. In addition, the reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Walewska-Zielecka 2006	Poland Feb 2015	Cross-sectional study	Convenience sampling	Aged 35-44	Persons aged 35-44, in Poland	15614	1.6		- The sample population is not representative of the source population	Only people living in big cities and their suburbs were included, who might not be representative of the general working population in Poland. In addition, the reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Walewska-Zielecka 2006	Poland Feb 2015	Cross-sectional study	Convenience sampling	Aged 45-54	Persons aged 45-54, in Poland	5107	2.9		- The sample population is not representative of the source population	Only people living in big cities and their suburbs were included, who might not be representative of the general working population in Poland. In addition, the reported prevalence is an overestimation as the sample was composed of people tested for medical reasons

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Walewska-Zielecka 2006	Poland Feb 2015	Cross-sectional study	Convenience sampling	Aged 50-64	Persons aged 50-64, in Poland	4884	2.7		- The sample population is not representative of the source population	Only people living in big cities and their suburbs were included, who might not be representative of the general working population in Poland. In addition, the reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Walewska-Zielecka 2006	Poland Feb 2015	Cross-sectional study	Convenience sampling	Aged 55-64	Persons aged 55-64, in Poland	2626	2.6		- The sample population is not representative of the source population	Only people living in big cities and their suburbs were included, who might not be representative of the general working population in Poland. In addition, the reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Mena 2006	Spain 2008-2012	Cross-sectional study	Convenience sampling	Born after 1990	People born after 1990, living in A coruna university hospital medical care area	4910	0.9		- The sample population is not representative of the source population	The reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Mena 2006	Spain 2008-2012	Cross-sectional study	Convenience sampling	Born before 1930	People born before 1930, living in A coruna university hospital medical care area	4131	8.1		- The sample population is not representative of the source population	The reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Mena 2006	Spain 2008-2012	Cross-sectional study	Convenience sampling	Born between 1931-35	People born between 1931-1935, living in A coruna university hospital medical care area	4306	9		- The sample population is not representative of the source population	The reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Mena 2006	Spain 2008-2012	Cross-sectional study	Convenience sampling	Born between 1936-1940	People born between 1936-1940, living in A coruna university hospital medical care area	4294	8.6		- The sample population is not representative of the source population	The reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Mena 2006	Spain 2008-2012	Cross-sectional study	Convenience sampling	Born between 1941-1945	People born between 1941-1945, living in A coruna university hospital medical care area	5498	6.6		- The sample population is not representative of the source population	The reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Mena 2006	Spain 2008-2012	Cross-sectional study	Convenience sampling	Born between 1946-1950	People born between 1946-1950, living in A coruna university hospital medical care area	7839	8		- The sample population is not representative of the source population	The reported prevalence is an overestimation as the sample was composed of people tested for medical reasons



Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Mena 2006	Spain 2008-2012	Cross-sectional study	Convenience sampling	Born between 1951-1955	People born between 1951-1955, living in A coruna university hospital medical care area	6652	6.2		- The sample population is not representative of the source population	The reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Mena 2006	Spain 2008-2012	Cross-sectional study	Convenience sampling	Born between 1956-1960	People born between 1956-1960, living in A coruna university hospital medical care area	8361	9.5		- The sample population is not representative of the source population	The reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Mena 2006	Spain 2008-2012	Cross-sectional study	Convenience sampling	Born between 1961-1965	People born between 1961-1965, living in A coruna university hospital medical care area	8881	14.5		- The sample population is not representative of the source population	The reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Mena 2006	Spain 2008-2012	Cross-sectional study	Convenience sampling	Born between 1966-1970	People born between 1966-1970, living in A coruna university hospital medical care area	11167	13.5		- The sample population is not representative of the source population	The reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Mena 2006	Spain 2008-2012	Cross-sectional study	Convenience sampling	Born between 1971-1975	People born between 1971-1975, living in A coruna university hospital medical care area	13113	9.4		- The sample population is not representative of the source population	The reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Mena 2006	Spain 2008-2012	Cross-sectional study	Convenience sampling	Born between 1976-1980	People born between 1976-1980, living in A coruna university hospital medical care area	13315	5.2		- The sample population is not representative of the source population	The reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Mena 2006	Spain 2008-2012	Cross-sectional study	Convenience sampling	Born between 1981-1985	People born between 1981-1985, living in A coruna university hospital medical care area	9968	2.5		- The sample population is not representative of the source population	The reported prevalence is an overestimation as the sample was composed of people tested for medical reasons
Mena 2006	Spain 2008-2012	Cross-sectional study	Convenience sampling	Born between 1986-1990	People born between 1986-1990, living in A coruna university hospital medical care area	5724	1.2		- The sample population is not representative of the source population	The reported prevalence is an overestimation as the sample was composed of people tested for medical reasons

### Needle-based and iatrogenic transmission

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>People who inject drugs</i>										
Alexiev 2016	Bulgaria 2010-2014	Cross-sectional study	Not reported	PWID living with HIV	HIV-1 positive PWIDs nationwide, diagnosed between 2010-2014	150	87.4	71.6	- little detail in methods section - selection study population not clear - not clear whether study population is representative	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Larsen 2008	France 2004	Cross-sectional study	Mixed	PWID living with HIV	HIV infected Intravenous drug users from 167 randomly selected wards throughout France	348	92.8		- Methods serology not reported - The sample population may not be representative of the source population	Participation rate of wards was not as high as expected (60.3%) which may present a bias
Treso 2011	Hungary June 2007- June 2009	Cross-sectional study	Exhaustive (screening)	PWID in prison	PWID Prisoners in 20 Hungarian prisons	209	22.5		- No major comments	
Babudieri 2005	Italy Nov 2011-Feb 2002	Cross-sectional study	Convenience sampling	PWID in prison	Prisoners who inject drugs in 8 prisons in different areas of Italy	296	74.7		- The study population may not be representative of all prisoners in Italy	
Dalgard 2009	Norway 2002	Cross-sectional study	Respondent-driven	PWID in prison	All users of a needle syringe programme in Oslo for PWID with a history of incarceration	239	86		- The sample population may not be representative of the source population	
Grzeszczuk 2015	Poland 2008-2013	Cross-sectional study	Not reported	PWID living with HIV	Adult HIV-1 infected patients treated at a clinic in Bialystok who use Intravenous drugs	264	97.7		- The methods are not clearly described - Selection of study population not clear - The study population is not representative of all HIV+ patients in Poland	
Berenguer 2016	Spain June-July 2015	Cross-sectional study	Random sampling	PWID living with HIV	HIV-infected patients in active follow-up in 41 centres throughout Spain, using Intravenous drugs	573	91.4	53.8	- Methods serology not reported	
Cachafeiro 2011	Spain 2004-2008	Prospective observational study	Not reported	PWID living with HIV	HIV+ MSM from the CoRIS cohort who are HAART naive	1852	3.5		- The methods are not clearly described	The sampling methods of CoRIS were not reported. Prevalence of HCV is based on results at first testing
Vallejo 2015	Spain 2001-2006	Prospective observational study	Mixed	Homeless PWID	Homeless heroin injectors recruited from the streets of Barcelona, Madrid and Seville, participating in the Itinere cohort	166	69.9		- Sample may not be representative of all recent heroin injectors	Small sample size and low follow-up rate. Participants may not be representative of all recent heroin injectors. 2/3 were HCV positive for HCV at baseline and around half of them were lost to follow-up.

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Vallejo 2015	Spain 2001-2006	Prospective observational study	Mixed	PWID in prison	Heroin injectors who have been imprisoned, recruited from the streets of Barcelona, Madrid and Seville, participating in the Itinere cohort	251	84.9		- Sample may not be representative of all recent heroin injectors	Small sample size and low follow-up rate. Participants may not be representative of all recent heroin injectors. 2/3 were HCV positive for HCV at baseline and around half of them were lost to follow-up.
Vallejo 2015	Spain 2001-2006	Prospective observational study	Mixed	PWID Sex workers	Heroin injectors recruited from the streets of Barcelona, Madrid and Seville, participating in the Itinere cohort, who exchange sex for money or drugs	64	84.4		- Sample may not be representative of all recent heroin injectors	Small sample size and low follow-up rate. Participants may not be representative of all recent heroin injectors. 2/3 were HCV positive for HCV at baseline and around half of them were lost to follow-up.
Stenkvist 2014	Sweden Sept 2010	Cross-sectional study	Exhaustive (screening)	PWID living with HIV	HIV+ Intravenous drug users living in Sweden	410	98		- Methods serology not reported	The nearly universal (90%) anti-HCV testing minimizes the risk of selection bias. However, since female sex and HIV transmission routes other than PWID and MSM were overrepresented among untested patients, the prevalence found might be an overestimation.
Turner 2010	UK 1996-2007	Prospective observational study	Not reported	PWID living with HIV	HIV+ Intravenous drug users attending treatment centres participating in UK CHIC	622	83.7		- Methods serology not reported - The methods are not clearly described	The methods of the UK CHIC study (sampling, location centres) were not described in detail
Balogun 2009	UK 1998, 1999, 2000, 2001	Cross-sectional study	Not reported	PWID living with HIV	HIV+ (ex)PWID who attended GUM clinics in England, Northern Ireland and Wales	201	38.3		- selection study population not clear - study population not clearly described - population not completely representative of source population (also ex-PWID included)	RNA positivity rates of anti-HCV positive samples are low for one of the study years, indicating a problem with storage. A sampling bias exists by use of the GUM clinic setting. The authors suggest that only around 20% of (ex)PWIDs attending drug clinics are current injectors

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Cullen 2015	UK 2011	Cross-sectional study	Exhaustive (screening)	Homeless PWID	Participants of UAM survey, recruiting at PWID services across England, Wales and Northern Ireland, who reported injecting during the preceding year and who have been homeless in the past 12 months	566	34.7		- unclear whether population is representative	
Hope 2011	UK 2006	Cross-sectional study	Respondent-driven	Homeless PWID	PWIDs living in the urban area of Bristol, who have been homeless in the past year	174	67		- Methods serology not reported - The sample population may not be representative of the source population.	The sampling method (recruiting people who know each other) might compromise the external validity of the study.
Balogun 2009	UK 1998, 1999, 2000, 2001	Cross-sectional study	Not reported	PWID MSM	Homosexual male (ex)PWID who attended 15 GUM clinics in England, Northern Ireland and Wales	612	22.1		- selection study population not clear - study population not clearly described - population not completely representative of source population (also ex-PWID included)	RNA positivity rates of anti-HCV positive samples are low for one of the study years, indicating a problem with storage. A sampling bias exists by use of the GUM clinic setting. The authors suggest that only around 20% of (ex)PWIDs attending drug clinics are current injectors. The group is defined as male homosexual, which may not be fully representative of MSM
Cullen 2015	UK 2011	Cross-sectional study	Exhaustive (screening)	PWID in prison	Participants of UAM survey, recruiting at PWID services across England, Wales and Northern Ireland, who reported injecting during the preceding year and who have ever been to prison	1204	49.3		- unclear whether population is representative	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>(Haemo)dialysis recipients</i>										
Goodkin 2017	EU/EEA wide 1996-2015	Prospective observational study	Random sampling	Haemodialysis recipients	Haemodialysis patients aged ≥ 18 years, enrolled in the DOPPS study	27372	6.74		- Methods serology not reported	Data reported for Europe (Belgium, Italy, France, Germany, Spain, Sweden and UK) was extracted.
Saune 2011	France NR	Cross-sectional study	Exhaustive (screening)	Haemodialysis recipients	Patients receiving chronic hemodialysis in 56 hemodialysis units or self-care satellite units	4718	7.7	4.5	- Methods serology not reported	
Ayzac 2009	France Jan-Dec 2005	Surveillance study	Exhaustive (screening)	Haemodialysis recipients	Chronic haemodialysis patients treated in 6 units	664		5.3	- Methods serology not reported	
Izopet 2005	France 1997-2000	Prospective observational study	Not reported	Haemodialysis recipients	Chronic haemodialysis patients treated in 25 units	1323	16.3		- Selection of study population not clear - Unclear whether study population is representative	study population seems to be representative, but participation rate is not reported
Baid-Agrawal 2014	Germany Aug 2009-May 2010	Cross-sectional study	Exhaustive (screening)	Haemodialysis recipients	Patients undergoing chronic hemodialysis at 6 centres in Berlin	417	3.6	2.4	- no major comments	
Ross 2008	Germany 2002-2003	Prospective observational study	Not reported	Haemodialysis recipients	maintenance haemodialysis patients treated in North Rhine Westphalen	2909	5.2	4	- No major comments	HCV infections were not evenly distributed among the participating facilities with prevalence rates ranging from 0 to 17.4%
Mina 2010	Greece May-August 2001	Cross-sectional study	Exhaustive (screening)	Haemodialysis recipients	End-stage renal failure patients from 5 units in central Greece	366	24		- No major comments	
Sypsa 2005	Greece Feb 1993-May 1995	Prospective observational study	Exhaustive (screening)	Haemodialysis recipients	Patients receiving haemodialysis at 5 units in Athens	562	29	19.6	- No major comments	
Di Napoli 2006	Italy 1995-2003	Surveillance study	Exhaustive (screening)	Haemodialysis recipients	Patients undergoing dialysis in the Lazio Region	6412	15.1		- Unclear whether population is representative	
Fabrizi 2005	Italy NR	Cross-sectional study	Not reported	Haemodialysis recipients	Patients on maintenance dialysis at five units in Italy	585	18.8		- Selection study population not clear	
Kuzminskis 2005	Lithuania 2002	Prospective observational study	Other	Haemodialysis recipients	All haemodialysis patients in Lithuania	682	12.5		- methods serology not described - no details on study population provided	The article covers 1996-2002. Here, data reported for 2002 was extracted only.
Schiller 2015	Romania 2010	Prospective observational study	Not reported	Haemodialysis recipients	End-stage kidney disease patients treated with haemodialysis at 56 units	600	27.3		- Selection of patients not described	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Voiculescu 2006	Romania 2008-2009	Cross-sectional study	Exhaustive (screening)	Haemodialysis recipients	Hemodialysis patients from 6 dialysis centers	174	39.26	20.69	- No major comments	Anti-HCV serology is associated with problems of specificity and sensitivity in patients on renal replacement therapies.
Gallego 2006	Spain 2003	Prospective observational study	Exhaustive (screening)	Haemodialysis recipients	All hemodialysis patients in the province of Albacete	161	6.2		- no major comments	Prevalence was reported annually between 1993-2003. In this table, data for 2003 is extracted only.
Saracho 2015	Spain 2004-2011	Prospective observational study	Exhaustive (screening)	HIV+ Haemodialysis	Patients on renal replacement therapy from 11 autonomous communities, infected with HIV	480	53.1		- Few methodological details were provided.	
Gallego 2006	Spain 2003	Prospective observational study	Exhaustive (screening)	Peritoneal dialysis recipients	All peritoneal dialysis patients in the province of Albacete	35	5.7		- no major comments	Prevalence was reported annually between 1993-2003. In this table, data for 2003 is extracted only.
Ghafur 2007	UK NR	Cross-sectional study	Exhaustive (screening)	Haemodialysis recipients	End-stage renal dialysis patients receiving haemodialysis and undergoing routine surveillance for HCV from 7 units in London	360	3.3	1.9	- selection of study population is unclear - unclear whether study population is representative	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Healthcare workers</i>										
Montella 2005	Italy 2000-2002	Cross-sectional study	Not reported	HCW	Employees of the National Cancer Institute of Naples	781	6.4		- Information on study population selection is limited and therefore the representativeness is unclear - No information on data collection approach	Study conducted in Naples (a part of Italy endemic for HCV) which might lead to overestimation of the prevalence.
Marconi 2010	Italy 1999-2009	Prospective observational study	Not reported	HCW	Health care workers at high risk of exposure in a hospital in Italy	403	3		- Selection of the study population is not clearly described	The sample is simply described as 'HCWs at higher risk of exposure to blood-borne pathogens'
Zaaijer 2006	Netherlands 2000-2009	Cross-sectional study	Exhaustive (screening)	HCW	Exposure prone procedures-performing personnel (EPPs) at a hospital in Amsterdam	729	1.4	0.14	- No major comments	
Rybacki 2013	Poland 2009	Cross-sectional study	Random sampling	HCW	Health care employees of 5 health care departments in Lodz	520	0.8		- Limited description of study population	
Flisiak 2011	Poland Oct 2009-Feb 2010	Cross-sectional study	Exhaustive (screening)	HCW	Health care workers from different health settings in Poland	9029	1.42	0.39	- No major comments	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Zagozdzon 2006	Poland 2005	Cross-sectional study	Exhaustive (screening)	HCW	All HCW in the region of Pomerania	4248	1.3		- No major comments	
Slusarczyk 2012	Poland Dec 2008-Jan 2009	Retrospective observational study	Exhaustive (screening)	HCW	Hospital personnel including administrative personnel employed in two major clinical hospitals at the Medical University of Warsaw	961	1.7	0.3	- Sample may not be representative of HCW in Poland	Hospital administrative personnel unlikely to have exposure to hepatitis also included in sample.
Ganczak 2012	Poland Jan-June 2009	Cross-sectional study	Other	HCW	Nurses and midwives from surgical and gynaecological wards of 16 hospitals in Western Pomerania	414	1.1		-unclear whether study population is representative	16 hospitals were randomly selected from the region of Western Pomerania, Poland. It is not clear whether this region is representative for Poland
Ganczak 2012	Poland Jan-June 2009	Cross-sectional study	Other	HCW	Doctors from surgical and gynaecological wards of 16 hospitals in Western Pomerania	89	1.4		-unclear whether study population is representative	16 hospitals were randomly selected from the region of Western Pomerania, Poland. It is not clear whether this region is representative for Poland
Ganczak 2006	Poland 2009	Cross-sectional study	Not reported	HCW	surgeons and nurses from surgical and gynaecological wards of 16 hospitals of Western Pomerania	427	1.4		- The sample population may not be representative of the source population, the study population may be considered a subgroup at higher risk	
Voiculescu 2006	Romania 2008-2009	Cross-sectional study	Exhaustive (screening)	HCW	Doctors and nurses with occupational exposure to hepatitis in 17 districts of Romania	93	1.07	0	- No major comments	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Diabetes Mellitus patients</i>										
Cadranel 2008	France Jan 1996-March 1997	Cross-sectional study	Exhaustive (screening)	DM type 1 or 2	Hospitalised patients with type 1 or type 2 diabetes from 11 centres in France	1561	2.11	1.47	- study population not completely representative for total population	Hospitalised diabetes patients may have been more frequently exposed to invasive procedures (and thus hepatitis) than non-hospitalised patients

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Cadranel 2008	France Jan 1996-March 1997	Cross-sectional study	Exhaustive (screening)	DM type 1 or 2 blood transfusion recipients	Hospitalised patients with type 1 or type 2 diabetes from 11 centres in France, who had a blood transfusion before 1991	122	8.2		- study population not completely representative for total population	Hospitalised diabetes patients may have been more frequently exposed to invasive procedures (and thus hepatitis) than non-hospitalised patients
Cadranel 2008	France Jan 1996-March 1997	Cross-sectional study	Exhaustive (screening)	DM type 1 or 2 medical procedure recipients	Hospitalised patients with type 1 or type 2 diabetes from 11 centres in France, who had a medical procedure (surgery, endoscopy or other invasive procedure)	1607	9.15		- study population not completely representative for total population	Hospitalised diabetes patients may have been more frequently exposed to invasive procedures (and thus hepatitis) than non-hospitalised patients
Soverini 2011	Italy 2007-2008	Cross-sectional study	Random sampling	DM type 2	Outpatients with type 2 diabetes at 3 diabetes units in Turin, Bologna and Naples	859	5.94	4.04	- Sample may not be representative of all type 2 diabetes patients in Italy	DM type 2 patients living in the Naples area had a prevalence of HCV infection nearly double of that observed in Turin and in Bologna.
Sporea 2009	Romania NR	Cross-sectional study	Random sampling	DM patients	Diabetic patients treated and followed up at the county hospital Timisoara	559	4.5		- Date of sampling not reported - Sample unlikely to be representative of all diabetic patients in Romania	12% of the patients had type 1 DM and 88% had type 2 DM.
Sporea 2009	Romania July-Dec 2006	Retrospective observational study	Exhaustive (screening)	DM patients	Diabetic patients from the County Hospital Petrosani	625	7.7		- Sample unlikely to be representative of all diabetic patients in Romania	8% of the patients had type 1 DM and 92% type 2 DM.
Esparza-Martín 2013	Spain 2007-2011	Retrospective observational study	Exhaustive (screening)	DM patients	Diabetes patients referred for the initial consultation for diabetic nephropathy to nephrological centers in Grand Canary island	500	2.4		- selection study population not clear - methods serology hardly described - unclear whether study population is representative	95% of the patients had type 2 Diabetes Mellitus
Sjöberg 2008	Sweden 1998	Cross-sectional study	Exhaustive (screening)	DM patients	Diabetes patients living in Malmo	874	0.69	0.57	- Study population may not be representative of the diabetic population of Sweden	



Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Recipients of SOHO</i>										
Cadranel 2008	France Jan 1996- March 1997	Cross-sectional study	Exhaustive (screening)	DM type 1 or 2 blood transfusion recipients	Hospitalised patients with type 1 or type 2 diabetes from 11 centres in France, who had a blood transfusion before 1991	122	8.2		- study population not completely representative for total population	Hospitalised diabetes patients may have been more frequently exposed to invasive procedures (and thus hepatitis) than non-hospitalised patients
Larsen 2008	France 2004	Cross-sectional study	Mixed	Transfusion recipients / haemophiliacs living with HIV	HIV+ transfusion recipients or haemophiliacs from 167 randomly selected wards throughout France	50	47.1		- Methods serology not reported - The sample population may not be representative of the source population	Participation rate of wards was not as high as expected (60.3%) which may present a bias
Christofidou 2008	Greece 2001- 2004	Cross-sectional study	Exhaustive (screening)	Beta-thalassemia major patients	Beta-thalassemia major patients at a hospital in Southwestern Greece	214	54.2	46.7	- It is unlikely that the study population is representative for all Beta-thalassemic patients in Greece	Single centre study
Zervou 2006	Greece Jan 1999- Dec 2000	Cross-sectional study	Exhaustive (screening)	Cardiac surgery patients who received blood units	Patients who had undergone cardiac surgery at a hospital in Ioannina, and had received more than three blood units perioperatively	204	2		- No major comments	41.7% of the patients had been operated before 1991. 78.4% of the patients had undergone open-heart surgery in Greece and the remaining (21.6%) abroad.
Federici 2006	Italy 1998- 2004	Prospective observational study	Exhaustive (screening)	Haemophilia patients	Patients with Haemophilia registered at a single centre	327	82	62	unclear whether study population is representative	patients from a single centre were enrolled
Tagliaferri 2008	Italy Jan 2003- June 2006	Surveillance study	Exhaustive (screening)	Patients with inherited bleeding disorders	Patients with inherited bleeding disorders in 8 haemophilia centres in the Emilia-Romagna region	512	35.5		- Methods serology not reported	The focus of the study is quite broad, therefore few methodological details about HCV are given. Most but not all patients with congenital bleeding disorders from the region are captured.
Tagliaferri 2008	Italy Jan 2003- June 2006	Surveillance study	Exhaustive (screening)	Patients with inherited bleeding disorders treated before 1986	Patients with inherited bleeding disorders in 8 haemophilia centres in the Emilia-Romagna region, treated before 1986	NR	95.4		- Methods serology not reported	The focus of the study is quite broad, therefore few methodological details about HCV are given. Most but not all patients with congenital bleeding disorders from the region are captured.

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Federici 2006	Italy 1998-2004	Prospective observational study	Exhaustive (screening)	von Willebrand's Disease patients	Patients with von Willebrand's Disease registered in a single centre	142	39	12.6	-unclear whether study population is representative	patients from a single centre were enrolled

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Recipients of medical/dental procedures</i>										
Cadranel 2008	France Jan 1996-March 1997	Cross-sectional study	Exhaustive (screening)	DM type 1 or 2 medical procedure recipients	Hospitalised patients with type 1 or type 2 diabetes from 11 centres in France, who had a medical procedure (surgery, endoscopy or other invasive procedure)	1607	9.15		- study population not completely representative for total population	Hospitalised diabetes patients may have been more frequently exposed to invasive procedures (and thus hepatitis) than non-hospitalised patients
La Torre 2006	Italy 1995-2001	Cross-sectional study	Exhaustive (screening)	Family members of HCV+ persons who have had dental procedures	Household contacts of HCV infected patients of hospitals in central Italy, who have had dental procedures	169	8.9		- unclear whether the study population is representative	the sample of HCV patients seems to be representative, but it is not described what the response rate of the relatives participating in this study was
Vogt 2006	Germany NR	Retrospective observational study	Not reported	Cardiac surgery patients	Patients who underwent cardiac surgery as infants in Munich before 1991	414	11.3	6	- Methods serology not reported - Sampling approach not reported	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Waste workers</i>										
Tsovili 2014	Greece Jan-Aug 2008	Cross-sectional study	Exhaustive (screening)	Municipal waste workers	Municipal waste workers in a municipality of Attica	50	2		- Small sample size - Sample is not representative of all waste workers in Greece	
Squeri 2006	Italy March-May 2005	Cross-sectional study	Not reported	Municipal waste workers	Municipal waste workers in the province of Messina responsible for sweeping as well as collection and disposal of household waste	327	2.4		- Selection of participants not reported	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Anabolic steroid users</i>										
Hope 2016	UK 2012-2013	Cross-sectional study	Other	Anabolic steroid users	Image and performance enhancing drug injectors participating in the UAM survey or subsurveys	73	2		- unclear whether study population is representative - methods serology not reported	Impossible to measure the representativeness of those recruited because of the marginalization, rarity and illicit nature of Anabolic steroid injection.

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Recipients of tattoos/piercings</i>										
Urbanus 2011	Netherlands 2007-2010	Cross-sectional study	Mixed	People with multiple tattoos and/or piercings	People with multiple tattoos and/or piercings (except regular ear piercings) recruited at tattoo conventions, shops and an STI clinic in Amsterdam	434	0.2	0.2	- Sample may not be representative of all persons with tattoos/piercings in the Netherlands	

## Sexual transmission

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Men who have sex with men</i>										
Alexiev 2016	Bulgaria 2010-2014	Cross-sectional study	Not reported	MSM living with HIV	HIV-1 positive MSM nationwide, diagnosed between 2010-2014	287	3	1.5	- little detail in methods section - selection study population not clear - not clear whether study population is representative	
Andersen 2014	Denmark Jan 2011-Jan 2013	Prospective observational study	Exhaustive (screening)	MSM living with HIV	HIV+ MSM actively followed in the HIV outpatient clinic at Aarhus University Hospital	207	4		- Not clear how representative the study population is for all HIV patients in Denmark	
Larsen 2008	France 2004	Cross-sectional study	Mixed	MSM living with HIV	HIV infected MSM from 167 randomly selected wards throughout France	558	3.1		- Methods serology not reported - The sample population may not be representative of the source population	Participation rate of wards was not as high as expected (60.3%) which may present a bias
Jansen 2015	Germany 1996-2012	Prospective observational study	Not reported	MSM living with HIV	HIV-1 positive MSM from multiple centres nationwide	1838	8.2	4	- Selection of study population not clear	HCV prevalence may be underestimated because of delayed antibody response to acute infection, but may be overestimated as positive samples were not confirmed with immunoblot.
Elefsiniotis 2006	Greece NR	Retrospective observational study	Not reported	MSM living with HIV	HIV-infected homosexual men followed up at the department of Infectious diseases at Athens University hospital since 1995	453	8.6	8.6	- The selection of the study population is not described - The methods are not clearly described - The study population is unlikely to be representative of the population of HIV+ patients in Greece	The time period in which the study was performed and when/how often markers were measured is not reported
van Rooijen 2016	Netherlands 2007-2011	Prospective observational study	Exhaustive (screening)	MSM living with HIV	All eligible HIV+ MSM who visited the STI clinic of Amsterdam	869	6.4		- It is unlikely that the study population is representative of the source population	48.6% of HIV+ MSM who opted-out of anti-HCV testing reported being HCV-positive.
Urbanus 2014	Netherlands 2010	Cross-sectional study	Exhaustive (screening)	MSM living with HIV	HIV+ MSM visiting the STI clinic of Amsterdam	146	10.3	6.2	- Sample may not be representative of all HIV+ MSM in the Netherlands	Due to the anonymous nature of STI clinic visits, no correction was possible for multiple measurements per person in the analysis. In the article, the prevalence is reported for different years between 1995-2010. For this evidence table, the latest data were extracted only.
Heiligenberg 2012	Netherlands Oct 2007-June 2008	Retrospective observational study	Other	MSM living with HIV	HIV infected MSM attending outpatient clinics of two hospitals in Amsterdam and Rotterdam	649		4.7	- The population is not representative of the source population	Not all the patients visiting the outpatient clinic were invited to participate in the study due to logistic restrictions. Patients who spontaneously reported STI symptoms were excluded and referred to the STI clinic because the aim was to include those patients who at present would not have been screened for STI.

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
van Rooijen 2016	Netherlands 2007-2011	Prospective observational study	Exhaustive (screening)	MSM sex workers living with HIV	All eligible HIV+ MSM who visited the STI clinic of Amsterdam, who engaged in commercial sex work in the last 6 months	23	13		- It is unlikely that the study population is representative of the source population	48.6% of HIV+ MSM who opted-out of anti-HCV testing reported being HCV-positive.
Urbanus 2014	Netherlands 2010	Cross-sectional study	Exhaustive (screening)	MSM with chlamydia living with HIV	HIV+ MSM visiting the STI clinic of Amsterdam, who tested positive for chlamydia	92	25		- Sample may not be representative of all HIV+ MSM in the Netherlands	Due to the anonymous nature of STI clinic visits, no correction was possible for multiple measurements per person in the analysis. In the article, the prevalence is reported for different years between 1995-2010; here, the latest data were extracted only.
Berenguer 2016	Spain June-July 2015	Cross-sectional study	Random sampling	MSM living with HIV	HIV-infected MSM in active follow-up in 41 centres throughout Spain	655	4.3	1.6	- Methods serology not reported	
Cachafeiro 2011	Spain 2004-2008	Prospective observational study	Not reported	MSM living with HIV	HIV+ patients who use intravenous drugs from the CoRIS cohort who are HAART naive	721	89.5		- The methods are not clearly described	The sampling methods of CoRIS were not reported. Prevalence of HCV is based on results at first testing
Stenkvist 2014	Sweden Sept 2010	Cross-sectional study	Exhaustive (screening)	MSM living with HIV	HIV+ MSM living in Sweden	1620	3.7		- Methods serology not reported	The nearly universal (90%) anti-HCV testing minimizes the risk of selection bias. However, since female sex and HIV transmission routes other than injecting drug use and MSM were overrepresented among untested patients, the prevalence found might be an overestimation.
Scott 2010	UK Jan - June 2007	Cross-sectional study	Exhaustive (screening)	MSM living with HIV	HIV+ MSM attending one of three sexual health clinics in England	339	0.88	0.88	- Methods serology not reported - Study population is unlikely to be representative of all HIV+ MSM in UK	Here the prevalence of undiagnosed HCV was reported. This is lower than the true prevalence of HCV infection in MSM since individuals known to have HCV were excluded
Turner 2010	UK 1996-2007	Prospective observational study	Not reported	MSM living with HIV	HIV+ MSM attending treatment centres participating in UK CHIC	12059	7.2		- Methods serology not reported - The methods are not clearly described	The methods of the UK CHIC study (sampling, location centres) were not described in detail
Dougan 2007	UK Jan 2002-Dec 2003	Cross-sectional study	Convenience sampling	MSM living with HIV	HIV+ MSM in England and Wales	242	4.5		- Methods serology not reported - Methods not clearly described - The study population may not be representative of all HIV+ MSM in UK	Individuals may be incorrectly matched or individuals may not be matched if the information has not been recorded correctly or was missing, which might lead to underestimation of the results. It was not clear why testing was performed in individuals (as part of routine screening or on the basis of clinical symptoms), therefore sampling method was not clear and it is not clear whether the sample is representative. The exclusion of individuals with other potential exposure sources may also reduce representativeness.
Balogun 2009	UK 1998, 1999, 2000, 2001	Cross-sectional study	Not reported	PWID MSM	Homosexual male (ex)PWID who attended 15 GUM clinics in England, Northern Ireland and Wales	612	22.1		- selection study population not clear - study population not clearly described - population not completely representative of source population (also ex-PWID included)	RNA positivity rates of anti-HCV positive samples are low for one of the study years, indicating a problem with storage. A sampling bias exists by use of the GUM clinic setting. The authors suggest that only around 20% of (ex)PWIDs attending drug clinics are current injectors. The group is defined as male homosexual, which may not be fully representative of MSM

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Sex workers</i>										
Uuskula 2008	Estonia Oct 2005-May 2006	Cross-sectional study	Mixed	Female sex workers	Female sex workers in Tallinn	227	7.9		- Sample may not be representative of all sex workers in Estonia	A multistage approach using time-location, community and respondent driven sampling was used.
Nigro 2006	Italy 2001-2002	Cross-sectional study	Exhaustive (screening)	Female sex workers from Colombia and Dominican Republic	Female sex workers from Colombia and the Dominican Republic, attending a STI consultancy center in Catania (Eastern Sicily)	118	0		- The study population likely not representative of the source population - Brief methodology section	Female sex workers enrolled in this study were attending a consultation on STIs/HIV, safer sex practices and the use of condoms. This might make them less representative of Female sex workers Dominican and Colombian sex workers are not representative of all Female sex workers.
van Rooijen 2016	Netherlands 2007-2011	Prospective observational study	Exhaustive (screening)	MSM sex workers living with HIV	All eligible HIV+ MSM who visited the STI clinic of Amsterdam, who engaged in commercial sex work in the last 6 months	23	13		- It is unlikely that the study population is representative of the source population	48.6% of HIV+ MSM who opted-out of anti-HCV testing reported being HCV-positive.

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Persons engaging in high risk sexual behaviour</i>										
Cavlek 2009	Croatia 2003-2006	Cross-sectional study	Not reported	Commercial sex workers and their clients	Commercial sex workers and their clients from 7 Croatian cities	272	4		- selection study population not described - not clear whether study population is representative	Little information on the setting and sampling methods is provided
Cavlek 2009	Croatia 2003-2006	Cross-sectional study	Not reported	Persons with multiple sexual partners	Persons with multiple sexual partners from 7 Croatian cities	378	6.3		- selection study population not described - not clear whether study population is representative	Little information on the setting and sampling methods is provided
Treso 2011	Hungary June 2007-June 2009	Cross-sectional study	Exhaustive (screening)	People in prison who have had unprotected sex	Prisoners who have had unprotected sex in 20 Hungarian prisons	927	4.2		- No major comments	
Babudieri 2005	Italy Nov 2011-Feb 2002	Cross-sectional study	Convenience sampling	People in prison who have had unprotected sex	Prisoners who have had unprotected sex from 8 prisons in different areas of Italy	227	43.2		- The study population may not be representative of all prisoners in Italy	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>STI infected persons</i>										
Cavlek 2009	Croatia 2003-2006	Cross-sectional study	Not reported	Persons with a history of STI	Persons with a history of STI from 7 Croatian cities	199	8.5		- selection study population not described - not clear whether study population is representative	Little information on the setting and sampling methods is provided
Urbanus 2014	Netherlands 2010	Cross-sectional study	Exhaustive (screening)	MSM with chlamydia living with HIV	HIV+ MSM visiting the STI clinic of Amsterdam, who tested positive for chlamydia	92	25		- Sample may not be representative of all HIV+ MSM in the Netherlands	Due to the anonymous nature of STI clinic visits, no correction was possible for multiple measurements per person in the analysis. In the article, the prevalence is reported for different years between 1995-2010; here, the latest data were extracted only.

### Intranasal transmission

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Intranasal drug users</i>										
Grammatico-Guillon 2015	France 2008-2014	Cross-sectional study	Exhaustive (screening)	Intranasal drug users	Drug users visiting an addiction centre in Tours who reported exclusively intranasal drug use	65	5		- Methods serology not reported - It is unlikely that the study population is representative for intranasal drug users in France	Drug use type was determined by answers given to a questionnaire

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Brugal 2009	Spain Jan 2004– Nov 2006	Cross-sectional study	Mixed	Intranasal drug users	Cocaine users who have never injected heroin, recruited in the Itinere project in Madrid, Barcelona and Seville	586	0.9		- selection of study population insufficient	Nonprobabilistic sampling. The more sporadic and 'normalized' users are probably underrepresented. Cocaine use was intranasal, 0.9% had ever injected cocaine (but presumably also used it intranasally)
Macias 2008	Spain Sept 2003–Dec 2004	Cross-sectional study	Exhaustive (screening)	Intranasal drug users	Intranasal cocaine users who attended an addiction centre in Seville	154		10.4	- study population might not be representative	Participants were recruited from a drug treatment facility which could have resulted in a selection bias towards drug users less likely to engage in high-risk habits. Prevalence data were calculated from absolute numbers

### Vulnerable populations and mixed transmission groups

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>People living with HIV</i>										
Alexiev 2016	Bulgaria 2010-2014	Cross-sectional study	Not reported	PLHIV	HIV-1 positive patients nationwide, diagnosed between 2010-2014	794	25.6	20	- little detail in methods section - selection study population not clear - not clear whether study population is representative	
Alexiev 2016	Bulgaria 2010-2014	Cross-sectional study	Not reported	MSM living with HIV	HIV-1 positive MSM nationwide, diagnosed between 2010-2014	287	3	1.5	- little detail in methods section - selection study population not clear - not clear whether study population is representative	
Alexiev 2016	Bulgaria 2010-2014	Cross-sectional study	Not reported	PLHIV in prison	HIV-1 positive prisoners nationwide, diagnosed between 2010-2014	59	82	60.1	- little detail in methods section - selection study population not clear - not clear whether study population is representative	
Alexiev 2016	Bulgaria 2010-2014	Cross-sectional study	Not reported	PWID living with HIV	HIV-1 positive PWIDs nationwide, diagnosed between 2010-2014	150	87.4	71.6	- little detail in methods section - selection study population not clear - not clear whether study population is representative	
Andersen 2014	Denmark Jan 2011– Jan 2013	Prospective observational study	Exhaustive (screening)	PLHIV	HIV+ patients actively followed at the outpatient clinic of Aarhus University Hospital	574	7	4	- Not clear how representative the study population is for all HIV patients in Denmark	
Andersen 2014	Denmark Jan 2011– Jan 2013	Prospective observational study	Exhaustive (screening)	MSM living with HIV	HIV+ MSM actively followed in the HIV outpatient clinic at Aarhus University Hospital	207	4		- Not clear how representative the study population is for all HIV patients in Denmark	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Ghosn 2006	France 1996-2005	Prospective observational study	Exhaustive (screening)	PLHIV	HIV patients from the multicentre prospective ANRS PRIMO cohort	402	5.7	2.5	- Original selection criteria study population not described - unclear whether study population is representative	Less than 1% of this population are injecting drug users; most of them became HIV+ through the sexual route.
Larsen 2008	France 2004	Cross-sectional study	Mixed	PLHIV	HIV infected patients from 167 randomly selected wards throughout France	1849	24.3		- Methods serology not reported - The sample population may not be representative of the source population	Participation rate of wards was not as high as expected (60.3%) which may present a bias
Larsen 2008	France 2004	Cross-sectional study	Mixed	MSM living with HIV	HIV infected MSM from 167 randomly selected wards throughout France	558	3.1		- Methods serology not reported - The sample population may not be representative of the source population	Participation rate of wards was not as high as expected (60.3%) which may present a bias
Larsen 2008	France 2004	Cross-sectional study	Mixed	PWID living with HIV	HIV infected Intravenous drug users from 167 randomly selected wards throughout France	348	92.8		- Methods serology not reported - The sample population may not be representative of the source population	Participation rate of wards was not as high as expected (60.3%) which may present a bias
Larsen 2008	France 2004	Cross-sectional study	Mixed	Transfusion recipients/haemophiliacs living with HIV	HIV infected transfusion recipients/haemophiliacs from 167 randomly selected wards throughout France	50	47.1		- Methods serology not reported - The sample population may not be representative of the source population	Participation rate of wards was not as high as expected (60.3%) which may present a bias
Jansen 2015	Germany 1996-2012	Prospective observational study	Not reported	MSM living with HIV	HIV-1 positive MSM from multiple centres nationwide	1838	8.2	4	- Selection of study population not clear	HCV prevalence may be underestimated because of delayed antibody response to acute infection, but may be overestimated as positive samples were not confirmed with immunoblot.
Elefsiniotis 2006	Greece NR	Retrospective observational study	Not reported	PLHIV	HIV-infected patients followed up at the department of infectious diseases at Athens University hospital since 1995	737	8.2	8.2	- The selection of the study population is not described - The methods are not clearly described - The study population is unlikely to be representative of the population of HIV+ patients in Greece	The time period in which the study was performed and when/how often markers were measured is not reported
Elefsiniotis 2006	Greece NR	Retrospective observational study	Not reported	MSM living with HIV	HIV-infected homosexual men followed up at the department of Infectious diseases at Athens University hospital since 1995	453	8.6	8.6	- The selection of the study population is not described - The methods are not clearly described - The study population is unlikely to be representative of the population of HIV+ patients in Greece	The time period in which the study was performed and when/how often markers were measured is not reported

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Surah 2013	Ireland Feb-Mar 2011	Cross-sectional study	Exhaustive (screening)	PLHIV	Adult HIV+ patients attending specialist clinics in Dublin	111	26		- Methods serology not reported -Data are not analysed in depth - The study population is unlikely to be representative of the population of HIV+ patients in Ireland	HCV prevalence is not the focus of this study, therefore the methods and analysis of these data are not well described
Cicconi 2007	Italy 1997	Prospective observational study	Not reported	PLHIV	HIV-1 positive persons naive to antiretroviral drugs, in the ICONA study in 69 treatment centres across Italy	5272	40.7		- Methods serology not reported - The methods are not clearly described	Methods of the ICONA study (time period, sampling) were not described in detail. It was reported that HCV RNA was also measured in a sample of anti-HCV positive patients and only a small proportion were HCV-RNA negative
Sanarico 2016	Italy Jan-Dec 2013	Cross-sectional study	Not reported	PLHIV in prison	HIV+ Prisoners in detention centres of 7 Italian towns	69	78.3	65.2	- Data collection is not adequately described - It is not clear whether the study population is representative of the source population	- Prisoners previously diagnosed with HIV with sample left over are included in the study, however the original sampling approach is not described
Monarca 2015	Italy July 2013	Cross-sectional study	Exhaustive (screening)	PLHIV in prison	HIV+ prisoners at 25 correctional institutions across Italy	338	55.9		- Methods serology not reported - Limited information on selection of study population - Representative of study population unclear - Limited information on study population	The survey was conducted in almost a quarter of all Italian prisoners. The study was focused on HIV prevalence.
Zhang 2006	Netherlands 1998-2012	Prospective observational study	Not reported	PLHIV	HIV-1 patients in the ATHENA cohort	12800	3.7		- Methods serology not reported - The methods are not clearly described	Methods of the ATHENA study (sampling, number and location of centres) were not described in detail
van Rooijen 2016	Netherlands 2007-2011	Prospective observational study	Exhaustive (screening)	MSM living with HIV	All eligible HIV+ MSM who visited the STI clinic of Amsterdam	869	6.4		- It is unlikely that the study population is representative of the source population	48.6% of HIV+ MSM who opted-out of anti-HCV testing reported being HCV-positive.
Urbanus 2014	Netherlands 2010	Cross-sectional study	Exhaustive (screening)	MSM living with HIV	HIV+ MSM visiting the STI clinic of Amsterdam	146	10.3	6.2	- Sample may not be representative of all HIV+ MSM in the Netherlands	Due to the anonymous nature of STI clinic visits, no correction was possible for multiple measurements per person in the analysis. In the article, the prevalence is reported for different years between 1995-2010; here, the latest data were extracted only.



Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Heiligenberg 2012	Netherlands Oct 2007- June 2008	Retrospective observational study	Other	MSM living with HIV	HIV infected MSM attending outpatient clinics of two hospitals in Amsterdam and Rotterdam	649		4.7	- The population is not representative of the source population	Not all the patients visiting the outpatient clinic were invited to participate in the study due to logistic restrictions. Patients who spontaneously reported STI symptoms were excluded and referred to the STI clinic because the aim was to include those patients who at present would not have been screened for STI.
van Rooijen 2016	Netherlands 2007-2011	Prospective observational study	Exhaustive (screening)	MSM sex workers living with HIV	All eligible HIV+ MSM who visited the STI clinic of Amsterdam, who engaged in commercial sex work in the last 6 months	23	13		- It is unlikely that the study population is representative of the source population	48.6% of HIV+ MSM who opted-out of anti-HCV testing reported being HCV-positive.
Urbanus 2014	Netherlands 2010	Cross-sectional study	Exhaustive (screening)	MSM with chlamydia living with HIV	HIV+ MSM visiting the STI clinic of Amsterdam, who tested positive for chlamydia	92	25		- Sample may not be representative of all HIV+ MSM in the Netherlands	Due to the anonymous nature of STI clinic visits, no correction was possible for multiple measurements per person in the analysis. In the article, the prevalence is reported for different years between 1995-2010; here, the latest data were extracted only.
Grzeszczuk 2015	Poland 2008-2013	Cross-sectional study	Not reported	PLHIV	Adult HIV-1 infected patients treated at a clinic in Bialystok	457	71.1		- The methods are not clearly described - The study population is not representative of all HIV+ patients in Poland	
Grzeszczuk 2015	Poland 2008-2013	Cross-sectional study	Not reported	PLHIV in prison	Adult HIV-1 infected patients treated at a clinic in Bialystok, who have been imprisoned	107	93.5		- The methods are not clearly described - Selection of study population not clear - The study population is not representative of all HIV+ patients in Poland	
Grzeszczuk 2015	Poland 2008-2013	Cross-sectional study	Not reported	PWID living with HIV	Adult HIV-1 infected patients treated at a clinic in Bialystok who use Intravenous drugs	264	97.7		- The methods are not clearly described - Selection of study population not clear - The study population is not representative of all HIV+ patients in Poland	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Ruta 2005	Romania NR	Prospective observational study	Not reported	PLHIV	HIV-infected adolescents living in Constanta county	161	1.8		- The methods are not clearly described - The study population is not representative of all HIV+ patients in Romania	The study population (adolescents) are not representative for all HIV+ patients. Little detail is given on sampling and no study period is reported
Skamperle 2014	Slovenia 2013	Cross-sectional study	Exhaustive (screening)	PLHIV	All Individuals confirmed as HIV+ in Slovenia by the end of 2013	579	7.6	5.7	- Description of methodology, background and interpretation of results are limited	MSM accounted for the majority of HIV+ individuals in the study (63%). The article is an update of a previous publication, therefore few methodological details are given, and the theoretical background and interpretation of results are limited
Berenguer 2016	Spain June-July 2015	Cross-sectional study	Random sampling	PLHIV	HIV-infected patients in active follow-up in 41 centres throughout Spain	1867	37.7	22.1	- Methods serology not reported	
Rivero-Juarez 2015	Spain June and Dec 2014	Cross-sectional study	Exhaustive (screening)	PLHIV	HIV infected patients in 17 hospitals in Andalusia	13.506	20.5		- No major comments	
Cachafeiro 2011	Spain 2004-2008	Prospective observational study	Not reported	PLHIV	HIV+ patients from the CoRIS cohort who are HAART naive	4419	21.8		- The methods are not clearly described	The sampling methods of CoRIS were not reported. Prevalence of HCV is based on results at first testing
González-García 2005	Spain May-Sept 2002	Cross-sectional study	Other	PLHIV	HIV+ patients attending 39 HIV centres throughout Spain	1260	61	54.2	- Methods serology not reported - Study population may not be representative of HIV+ patients in Spain	Selection of serology participants was by attendance during the study period. Therefore, patients with more frequent visits could be overrepresented
Llenas-García 2012	Spain 1992-2009	Retrospective observational study	Exhaustive (screening)	Migrants living with HIV	HIV+ migrants attending a clinic in Madrid	371	7.7		- Methods serology not reported - It is not clear whether the population is representative for HIV+ migrants in the whole of Spain	As the prevalence of HCV in migrants is largely dependent on their country of origin, this could differ widely per region, depending on the origin of migrants there
Berenguer 2016	Spain June-July 2015	Cross-sectional study	Random sampling	MSM living with HIV	HIV-infected MSM in active follow-up in 41 centres throughout Spain	655	4.3	1.6	- Methods serology not reported	
Cachafeiro 2011	Spain 2004-2008	Prospective observational study	Not reported	MSM living with HIV	HIV+ patients who use Intravenous drugs from the CoRIS cohort who are HAART naive	721	89.5		- The methods are not clearly described	The sampling methods of CoRIS were not reported. Prevalence of HCV is based on results at first testing
Berenguer 2016	Spain June-July 2015	Cross-sectional study	Random sampling	PWID living with HIV	HIV-infected patients in active follow-up in 41 centres throughout Spain, using Intravenous drugs	573	91.4	53.8	- Methods serology not reported	
Cachafeiro 2011	Spain 2004-2008	Prospective observational study	Not reported	MSM living with HIV	HIV+ MSM from the CoRIS cohort who are HAART naive	1852	3.5		- The methods are not clearly described	The sampling methods of CoRIS were not reported. Prevalence of HCV is based on results at first testing

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Stenkvist 2014	Sweden Sept 2010	Cross-sectional study	Exhaustive (screening)	PLHIV	HIV+ adults living in Sweden	4765	14	11	- Methods serology not reported	The nearly universal (90%) anti-HCV testing minimizes the risk of selection bias. However, since female sex and HIV transmission routes other than PWID and MSM were overrepresented among untested patients, the prevalence found might be an overestimation.
Stenkvist 2014	Sweden Sept 2010	Cross-sectional study	Exhaustive (screening)	MSM living with HIV	HIV+ MSM living in Sweden	1620	3.7		- Methods serology not reported	The nearly universal (90%) anti-HCV testing minimizes the risk of selection bias. However, since female sex and HIV transmission routes other than PWID and MSM were overrepresented among untested patients, the prevalence found might be an overestimation.
Stenkvist 2014	Sweden Sept 2010	Cross-sectional study	Exhaustive (screening)	PWID living with HIV	HIV+ Intravenous drug users living in Sweden	410	98		- Methods serology not reported	The nearly universal (90%) anti-HCV testing minimizes the risk of selection bias. However, since female sex and HIV transmission routes other than PWID and MSM were overrepresented among untested patients, the prevalence found might be an overestimation.
Turner 2010	UK 1996-2007	Prospective observational study	Not reported	PLHIV	HIV+ adults attending treatment centres participating in UK CHIC	20365	8.9		- Methods serology not reported - The methods are not clearly described	The methods of the UK CHIC study (sampling, location centres) were not described in detail
Scott 2010	UK Jan - June 2007	Cross-sectional study	Exhaustive (screening)	MSM living with HIV	HIV+ MSM attending one of three sexual health clinics in England	339	0.88	0.88	- Methods serology not reported - Study population is unlikely to be representative of all HIV+ MSM in UK	Here the prevalence of undiagnosed HCV was reported. This is lower than the true prevalence of HCV infection in MSM since individuals known to have HCV were excluded
Turner 2010	UK 1996-2007	Prospective observational study	Not reported	MSM living with HIV	HIV+ MSM attending treatment centres participating in UK CHIC	12059	7.2		- Methods serology not reported - The methods are not clearly described	The methods of the UK CHIC study (sampling, location centres) were not described in detail

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Dougan 2007	UK Jan 2002- Dec 2003	Cross-sectional study	Convenience sampling	MSM living with HIV	HIV+ MSM in England and Wales	242	4.5		- Methods serology not reported - Methods not clearly described - The study population may not be representative of all HIV+ MSM in UK	Individuals may be incorrectly matched or individuals may not be matched if the information has not been recorded correctly or was missing, which might lead to underestimation of the results. It was not clear why testing was performed in individuals (as part of routine screening or on the basis of clinical symptoms), therefore sampling method was not clear and it is not clear whether the sample is representative. The exclusion of individuals with other potential exposure sources may also reduce representativeness.
Turner 2010	UK 1996-2007	Prospective observational study	Not reported	PWID living with HIV	HIV+ Intravenous drug users attending treatment centres participating in UK CHIC	622	83.7		- Methods serology not reported - The methods are not clearly described	The methods of the UK CHIC study (sampling, location centres) were not described in detail
Balogun 2009	UK 1998, 1999, 2000, 2001	Cross-sectional study	Not reported	PWID living with HIV	HIV+ (ex)PWID who attended GUM clinics in England, Northern Ireland and Wales	201	38.3		- selection study population not clear - study population not clearly described - population not completely representative of source population (also ex-PWID included)	RNA positivity rates of anti-HCV positive samples are low for one of the study years, indicating a problem with storage. A sampling bias exists by use of the GUM clinic setting. The authors suggest that only around 20% of (ex)PWIDs attending drug clinics are current injectors

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>People in prison</i>										
Alexiev 2016	Bulgaria 2010- 2014	Cross-sectional study	Not reported	PLHIV in prison	HIV-1 positive prisoners nationwide, diagnosed between 2010-2014	59	82	60.1	- little detail in methods section - selection study population not clear - not clear whether study population is representative	
Jacomet 2015	France June 2010- Dec 2013	Prospective observational study	Exhaustive (screening)	People in prison	Prisoners of the Clermont-Ferrand and Riom prisons	357	4.7	1.5	- unclear whether study population is representative	participation rate was a little over 50%
Treso 2011	Hungary June 2007- June 2009	Cross-sectional study	Exhaustive (screening)	People in prison who got a tattoo in prison	Prisoners who got a tattoo in prison in 20 Hungarian prisons	222	4.5		- No major comments	
Treso 2011	Hungary June 2007- June 2009	Cross-sectional study	Exhaustive (screening)	People in prison who have had unprotected sex	Prisoners who have had unprotected sex in 20 Hungarian prisons	927	4.2		- No major comments	
Treso 2011	Hungary June 2007- June 2009	Cross-sectional study	Exhaustive (screening)	People in prison with a tattoo	Prisoners with a tattoo in 20 Hungarian prisons	993	4.6		- No major comments	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Treso 2011	Hungary June 2007-June 2009	Cross-sectional study	Exhaustive (screening)	PWID in prison	PWID Prisoners in 20 Hungarian prisons	209	22.5		- No major comments	
Sanarico 2016	Italy Jan-Dec 2013	Cross-sectional study	Not reported	PLHIV in prison	HIV+ Prisoners in detention centres of 7 Italian towns	69	78.3	65.2	- Data collection is not adequately described - It is not clear whether the study population is representative of the source population	- Prisoners previously diagnosed with HIV with sample left over are included in the study, however the original sampling approach is not described
Monarca 2015	Italy July 2013	Cross-sectional study	Exhaustive (screening)	PLHIV in prison	HIV+ prisoners at 25 correctional institutions across Italy	338	55.9		- Methods serology not reported - Limited information on selection of study population - Representative of study population unclear - Limited information on study population	The survey was conducted in almost a quarter of all Italian prisoners. The study was focused on HIV prevalence.
Babudieri 2005	Italy Nov 2011-Feb 2002	Cross-sectional study	Convenience sampling	People in prison who have had blood transfusions	Prisoners who have had blood transfusions from 8 prisons in different areas of Italy	76	48.7		- The study population may not be representative of all prisoners in Italy	
Babudieri 2005	Italy Nov 2011-Feb 2002	Cross-sectional study	Convenience sampling	People in prison who have had unprotected sex	Prisoners who have had unprotected sex from 8 prisons in different areas of Italy	227	43.2		- The study population may not be representative of all prisoners in Italy	
Babudieri 2005	Italy Nov 2011-Feb 2002	Cross-sectional study	Convenience sampling	People in prison with tattoos	Prisoners with tattoos from 8 prisons in different areas of Italy	463	51.2		- The study population may not be representative of all prisoners in Italy	
Babudieri 2005	Italy Nov 2011-Feb 2002	Cross-sectional study	Convenience sampling	PWID in prison	Prisoners who inject drugs in 8 prisons in different areas of Italy	296	74.7		- The study population may not be representative of all prisoners in Italy	
Dalgard 2009	Norway 2002	Cross-sectional study	Respondent-driven	PWID in prison	All users of a Needle syringe programme in Oslo for PWID with a history of incarceration	239	86		- The sample population may not be representative of the source population	
Grzeszczuk 2015	Poland 2008-2013	Cross-sectional study	Not reported	PLHIV in prison	Adult HIV-1 infected patients treated at a clinic in Bialystok, who have been imprisoned	107	93.5		- The methods are not clearly described - Selection of study population not clear - The study population is not representative of all HIV+ patients in Poland	
Vallejo 2015	Spain 2001-2006	Prospective observational study	Mixed	PWID in prison	Heroin injectors who have been imprisoned, recruited from the streets of Barcelona, Madrid and Seville, participating in the Itinere cohort	251	84.9		- Sample may not be representative of all recent heroin injectors	Small sample size and low follow-up rate. Participants may not be representative of all recent heroin injectors. 2/3 were HCV positive for HCV at baseline and around half of them were lost to follow-up.
Cullen 2015	UK 2011	Cross-sectional study	Exhaustive (screening)	PWID in prison	Participants of UAM survey, recruiting at PWID services across England, Wales and Northern Ireland, who reported injecting during the preceding year and who have ever been to prison	1204	49.3		- unclear whether population is representative	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Family/household/sexual partners</i>										
Amoroso 2005	EU/EEA wide 1998-2004	Prospective observational study	Exhaustive (screening)	Infants of HCV+ mothers	Children of HCV infected mothers from 33 paediatric HCV network centres across Europe	1758	6.2		-selection study population not clear	There may be small center-associated differences in vertical transmission risk. Study centres were in Italy, Spain, Germany, Ireland, UK, Norway and Sweden
Amoroso 2005	EU/EEA wide 1998-2004	Prospective observational study	Exhaustive (screening)	Infants of HCV+/HIV+ mothers	Children of HCV infected HIV+ mothers from 33 paediatric HCV network centres across Europe	208	8.7		-selection study population not clear	There may be small center-associated differences in vertical transmission risk. Study centres were in Italy, Spain, Germany, Ireland, UK, Norway and Sweden
Amoroso 2005	EU/EEA wide 1998-2004	Prospective observational study	Exhaustive (screening)	Infants of HCV+/PWID mothers	Children of HCV infected mothers with a history of injecting drugs, from 33 paediatric HCV network centres across Europe	448	6.3		-selection study population not clear	There may be small center-associated differences in vertical transmission risk. Study centres were in Italy, Spain, Germany, Ireland, UK, Norway and Sweden
Mariné-Barjoan 2007	France 1998-2002	Prospective observational study	Exhaustive (screening)	Infants of HCV+ mothers	Infants of HCV infected mothers at 6 maternity hospitals in Southern France	214	5.6		- methods serology not reported - unclear whether study population is representative	About one third was lost to follow-up
Mariné-Barjoan 2007	France 1998-2002	Prospective observational study	Exhaustive (screening)	Infants of HCV+/HIV+ mothers	Infants of HIV/HCV infected mothers at 6 maternity hospitals in southern France	55	10.9		- unclear whether study population is representative - selection study population not clear	
Mariné-Barjoan 2007	France 1998-2002	Prospective observational study	Exhaustive (screening)	Infants of HCV+/PWID mothers	Infants of HCV infected mothers with a history of Intravenous drug use at 6 maternity hospitals in southern France	118	5.9		- unclear whether study population is representative - selection study population not clear	
McMenamin 2008	Ireland 2001-2005	Retrospective observational study	Exhaustive (screening)	Infants of HCV+ mothers	Infants of HCV infected mothers at 2 maternity units in Dublin	441	4.1		- No major comments	Although antibody status testing is described in the methods, this is not mentioned in the results. 21% of infants were lost to follow up, which reflects difficulties in the management of this group of patients
La Torre 2006	Italy 1995-2001	Cross-sectional study	Exhaustive (screening)	Family members of HCV+ persons	Household contacts of HCV infected patients of hospitals in central Italy	251	6		- unclear whether the study population is representative	the sample of HCV patients seems to be representative, but it is not described what the response rate of the relatives participating in this study was
La Torre 2006	Italy 1995-2001	Cross-sectional study	Exhaustive (screening)	Family members of HCV+ persons who have had dental procedures	Household contacts of HCV infected patients of hospitals in central Italy, who have had dental procedures	169	8.9		- unclear whether the study population is representative	the sample of HCV patients seems to be representative, but it is not described what the response rate of the relatives participating in this study was
La Torre 2006	Italy 1995-2001	Cross-sectional study	Exhaustive (screening)	Family members of HCV+ persons who have journeyed abroad	Household contacts of HCV infected patients of hospitals in central Italy, who have journeyed abroad	82	9.8		- unclear whether the study population is representative	the sample of HCV patients seems to be representative, but it is not described what the response rate of the relatives participating in this study was
Veronesi 2006	Italy 1996-2001	Prospective observational study	Exhaustive (screening)	Infants of HCV+ mothers	Newborns of HCV infected mothers at a hospital in Parma	110	2.7		- Methods for calculating prevalence may be inappropriate	Prevalence of anti-HCV was not given after 18 months of follow-up, only at time 0. Although a definition of infection is given, it is unclear how many children were infected according to this definition in this study, as it is only reported how many children were viremic at the end of the follow up period. It is not clear whether this number is in agreement with the number of infected children
Minola 2006	Italy 1975-2003	Prospective observational study	Exhaustive (screening)	Offspring of HCV+ persons	Offspring of HCV-positive index cases in Bergamo hospital	4982	2.3		- No major comments	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
Minola 2006	Italy 1975-2003	Prospective observational study	Exhaustive (screening)	Parents and siblings of HCV+ persons	Parents and siblings of HCV-positive index cases in Bergamo hospital	5796	2.1		- No major comments	
Minola 2006	Italy 1975-2003	Prospective observational study	Exhaustive (screening)	Sexual partners of HCV+ persons	Sexual partners of HCV-positive index cases in Bergamo hospital	2662	13.8		- No major comments	
Bacalhau 2006	Portugal 2002-2004	Retrospective observational study	Exhaustive (screening)	Infants of HCV+ mothers	Newborns of HCV infected mothers at a hospital in Leiria	37	2.7		- The sample population may not be representative of the source population	54% of the mothers were PWIDs; only pregnant women with risk factor were tested for HCV during pregnancy
Garcia Tejedor 2015	Spain 1986-2011	Retrospective observational study	Exhaustive (screening)	Infants of HCV+ mothers	Children of HCV infected mothers who gave birth at hospital La Fe	711	2.4		-unclear whether study population is representative	patients from one single centre in Valencia were included, it is not clear whether this is representative of whole Spain
Claret 2007	Spain 1999-2005	Prospective observational study	Exhaustive (screening)	Infants of HCV+ mothers	Newborns of HCV infected mothers at a hospital in Barcelona	144	2.8		- hardly any description on theoretical background - not clear whether study population is representative	not described whether these data from Barcelona are representative for Spain
Garcia Tejedor 2015	Spain 1986-2011	Retrospective observational study	Exhaustive (screening)	Infants of HCV+/HIV+ mothers	Children of HIV/HCV infected mothers who gave birth at hospital La Fe	216	3.2		-unclear whether study population is representative	patients from one single centre in Valencia were included, it is not clear whether this is representative of whole Spain

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Prevalence anti-HCV (%)	Prevalence HCV-RNA (%)	Critical appraisal	General comments
<i>Public safety workers</i>										
Burek 2010	Croatia 2005-2007	Cross-sectional study	Not reported	Female prison staff	Female correctional staff working in 20 prisons throughout Croatia	58	0		- selection study population not clear	
Burek 2010	Croatia 2005-2007	Cross-sectional study	Not reported	Male prison staff	Male correctional staff working in 20 prisons throughout Croatia	201	0		- selection study population not clear	
Treso 2011	Hungary June 2007-June 2009	Cross-sectional study	Exhaustive (screening)	Prison staff	Prison staff working in 20 Hungarian prisons	1066	0.5		- No major comments	

## Appendix 7. Summary tables for HBV incidence

### Needle-based and iatrogenic transmission

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HBV	Critical appraisal	General comments
<i>People who inject drugs</i>									
Blome 2011	Sweden 1997-2005	Prospective observational study	Exhaustive (screening)	PWID	PWID registered in the Malmo needle exchange programme	831	3.36 cases per 100 person-years	- No major comments	Only participants who were fully identified could be followed. However, demographic data reported by identifiable and nonidentifiable subjects were similar.

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HBV	Critical appraisal	General comments
<i>(Haemo)dialysis recipients</i>									
Corbett 2006	UK April 2009-Sept 2009	Prospective observational study	Exhaustive (screening)	Haemodialysis recipients who travelled	Maintenance haemodialysis patients from 9 units who travelled, with associated haemodialysis at another centre during a 6 month period	172	0 %	- The methods used may not be appropriate for the purpose of the research	No seroconversions were observed in the study period. However, the study period and follow up time was very short, and relatively few trips were to endemic countries

### Sexual transmission

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HBV	Critical appraisal	General comments
<i>Men who have sex with men</i>									
Cicconi 2008	Italy 1997	Prospective observational study	Not reported	MSM living with HIV	HIV-1 positive MSM naive to antiretroviral drugs, participating in the ICONA study in 69 treatment centres across Italy	273	1.73 cases per 100 person-years	- Methods serology not reported - The methods are not clearly described	
Jansen 2015	Germany 1996-2012	Prospective observational study	Not reported	MSM living with HIV	HIV-1 positive MSM from multiple centres nationwide	1838	2.51 cases per 100 person-years	- Selection of study population not clear	
Heuft 2014	Netherlands 1983-2012	Retrospective observational study	Not reported	MSM living with HIV	HIV+ MSM in the OLVG hospital cohort of Amsterdam	381	1.1 cases per 100 person-years	- Methods serology not reported - Selection of study population not clear	
Van Rijkevorsel 2008	Netherlands 1992-2006	Surveillance study	Other	MSM	MSM attending the STI clinic in Amsterdam	26000	0.047 % per year	- Unclear whether population is representative for the Netherlands	The incidence rate is based on the average number of new cases (12) reported per year. It is reported as incidence rate per 1000 MSM in the article; here, the rate was calculated as % per year. The incidence is based only on MSM who were tested, therefore it is likely to be an underestimation

### Vulnerable populations and mixed transmission groups

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HBV	Critical appraisal	General comments
<i>People living with HIV</i>									
Andersen 2014	Denmark Jan 2011-Jan 2013	Prospective observational study	Exhaustive (screening)	PLHIV	HIV+ patients actively followed at the outpatient clinic of Aarhus University Hospital	574	0.01 cases per 100 person-years	- Not clear how representative the study population is for all HIV patients in Denmark	
Jansen 2015	Germany 1996-2012	Prospective observational study	Not reported	MSM living with HIV	HIV-1 positive MSM from multiple centres nationwide	1838	2.51 cases per 100 person-years	- Selection of study population not clear	
Cicconi 2008	Italy 1997	Prospective observational study	Not reported	PLHIV	HIV-1 positive persons naive to antiretroviral drugs, participating in the ICONA study in 69 treatment centres across Italy	1037	1.22 cases per 100 person-years	- Methods serology not reported - The methods are not clearly described	
Cicconi 2008	Italy 1997	Prospective observational study	Not reported	MSM living with HIV	HIV-1 positive MSM naive to antiretroviral drugs, participating in the ICONA study in 69 treatment centres across Italy	273	1.73 cases per 100 person-years	- Methods serology not reported - The methods are not clearly described	
Cicconi 2008	Italy 1997	Prospective observational study	Not reported	STI-infected PLHIV	HIV-1 positive persons naive to antiretroviral drugs, participating in the ICONA study in 69 treatment centres across Italy, with STIs at enrolment	112	1.25 cases per 100 person-years	- Methods serology not reported - The methods are not clearly described	
Heuft 2014	Netherlands 1983-2012	Retrospective observational study	Not reported	MSM living with HIV	HIV+ MSM in the OLVG hospital cohort of Amsterdam	381	1.1 cases per 100 person-years	- Methods serology not reported - Selection of study population not clear	



Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HBV	Critical appraisal	General comments
Ruta 2005	Romania NR	Prospective observational study	Not reported	PLHIV	HIV-infected adolescents living in Constanta county	161	2.49 cases per 100 person-years	- The methods are not clearly described - The study population is not representative of all HIV+ patients in Romania	
Price 2012	UK 1996-2009	Prospective observational study	Not reported	PLHIV	HIV+ patients attending treatment centres participating in UK CHIC	25973	1.7 cases per 100 person-years	- Methods serology not reported - Limited description of study population - No clear if study population is representative of the source population	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HBV	Critical appraisal	General comments
<i>Migrants</i>									
Whelan 2006	Netherlands 1992-2009	Surveillance study	Exhaustive (screening)	Ghanaian migrants	First generation migrants born in Ghana resident in Amsterdam	100975	0.004 % per year	- Methods serology not reported	Incidence was based on the number of notified cases. 50–67% of older children and young adults with acute infection are asymptomatic and are probably unreported. Annual incidence was reported as cases per 100000 and computed in % per year here. Annual population estimates were used to approximate persons-at-risk per year
Whelan 2006	Netherlands 1992-2009	Surveillance study	Exhaustive (screening)	Moroccan migrants	First generation Moroccan migrants resident in Amsterdam	539342	0.0046 % per year	- Methods serology not reported	Incidence was based on the number of notified cases. 50–67% of older children and young adults with acute infection are asymptomatic and are probably unreported. Annual incidence was reported as cases per 100000 and computed in % per year here. Annual population estimates were used to approximate persons-at-risk per year
Whelan 2006	Netherlands 1992-2009	Surveillance study	Exhaustive (screening)	Turkish migrants	First generation Turkish migrants resident in Amsterdam	358043	0.0047 % per year	- Methods serology not reported	Incidence was based on the number of notified cases. 50–67% of older children and young adults with acute infection are asymptomatic and are probably unreported. Annual incidence was reported as cases per 100000 and computed in % per year here. Annual population estimates were used to approximate persons-at-risk per year

## Appendix 8. Summary tables for HCV incidence

### Needle-based and iatrogenic transmission

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HCV	Critical appraisal	General comments
<i>People who inject drugs</i>									
Grogan 2005	Ireland Dec 2001-Jan 2002	Cross-sectional study	Random sampling	PWID	Current or former heroin users attending 21 specialist addiction treatment centres in the south west	27	24.5 cases per 100 person-years	- the study population is not representative of the source population	the sample population (n=120) is not representative of the source population (n=1,459) and the response rate to follow up is low (patients with follow-up data n=27)
Puoti 2016	Italy 1997-2016	Prospective observational study	Not reported	PWID living with HIV	PWID living with HIV enrolled in the ICONA study	NR	7.2 cases per 100 person-years	- Serological methods are not adequately described - The methods are not clearly described - Unclear if the study population is representative of the source population - Theoretical background is limited - The study population is not described	
Van Den Berg 2007	Netherlands Dec 1985-Nov 2005	Retrospective observational study	Exhaustive (screening)	PWID	Ever-injecting drug users participating in the Amsterdam cohort studies	169	2 cases per 100 person-years	- Sample may not be representative of all PWID in Netherlands	
Folch 2016	Spain 2010-2011	Cross-sectional study	Convenience sampling	PWID	PWIDs attending harm reduction centres in Catalonia	161	25.06 cases per 100 person-years	- The methods are not appropriate for incidence calculation - The study population is not representative of all PWIDs	Sample of PWIDs visiting harm reduction clinics who began injecting in the past 5 years is unlikely to be representative of all PWIDs. More than half (59.0%) of new injectors were migrants. The cross-sectional design and reliance on assumptions to estimate incidence likely hinder how accurate this is.
Vallejo 2015	Spain 2001-2006	Prospective observational study	Mixed	PWID	Heroin injectors recruited from the streets of Barcelona, Madrid and Seville, participating in the Itinere cohort	57	52.9 cases per 100 person-years	- Sample may not be representative of all recent heroin injectors	Small sample size and low follow-up rate. Participants may not be representative of all recent heroin injectors. 2/3 were HCV positive for HCV at baseline and around half of them were lost to follow-up.
Marco 2014	Spain 1992-2012	Retrospective observational study	Exhaustive (screening)	PWID in prison	Inmates of a prison in a province of Barcelona with a history of intravenous drug use	168	6.66 cases per 100 person-years	- No clear description of serological testing	Only 24,8 % (29/117) of the infected population stayed within the prison during the follow-up period, the rest had permission for release, so it can not be determined if HCV occurred within or outside the prison.
Blome 2011	Sweden 1997-2005	Prospective observational study	Exhaustive (screening)	PWID	PWID registered in the Malmo needle exchange programme	831	38.3 cases per 100 person-years	- No major comments	Only participants who were fully identified could be followed. However, demographic data reported by identifiable and nonidentifiable subjects were similar.
Cullen 2015	UK 2011	Cross-sectional study	Exhaustive (screening)	PWID	Participants of UAM survey, recruiting at PWID services across England, Wales and Northern Ireland, who reported injecting during the preceding year	980	4 to 12 cases per 100 person-years	- Methods used may not be appropriate for accurate measurement of incidence - Unclear whether population is representative	The length of the window period for anti-HCV avidity was poorly understood, which might influence the precision of the incidence estimate. The broad incidence estimation is based on 161 person/years to 483 person/ years of exposure; derived from the lower and upper limits of the window period.
Allen 2012	UK 2008-2009	Cross-sectional study	Exhaustive (screening)	PWID	PWID attending needle exchange services across mainland Scotland	2555	10.8-21.9 cases per 100 person-years	- study population not entirely representative - Methods may not be appropriate to accurately measure incidence	Recruitment at needle exchange sites may bias the sample away from high risk injectors who are not in contact with services. The proportion of non-current injectors was confined to 25%. PWID included 25% non-current injectors (not injected in past 6 months). PCR was done in the anti-HCV negatives, and led to 2% positives of anti-HCV negative tests
Hope 2011	UK 2006	Cross-sectional study	Respondent-driven	PWID	PWIDs living in the urban area of Bristol	299	38-47 cases per 100 person-years	- Methods serology not reported - Methods may not be appropriate for accurate measurement of incidence - The sample population may not be representative of the source population.	The sampling method (recruiting people who know each other) might compromise the external validity of the study.

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HCV	Critical appraisal	General comments
Balogun 2009	UK 1998, 1999, 2000, 2001	Cross-sectional study	Not reported	PWID	(ex)PWID who attended 15 GUM clinics in England, Northern Ireland and Wales	1329	3.01 % per year	- selection study population not clear - study population not clearly described - population not completely representative of source population (also ex-PWID included) - Methods may not be appropriate to accurately measure incidence	RNA positivity rates of anti-HCV positive samples are low for one of the study years, indicating a problem with storage. The incidence may therefore be an underestimation. A sampling bias exists by use of the GUM clinic setting. The authors suggest that only around 20% of (ex)PWIDs attending drug clinics are current injectors
Craine 2009	UK 2004-2006	Prospective observational study	Mixed	PWID	People who inject drugs (PWIDs), recruited in various settings in South Wales	286	5.9 cases per 100 person-years	- Source population not representative - methods serology not described - definition of study population not complete - misclassification of infection	Sampling bias toward drug users in contact with treatment agencies and publically visible injectors. Low follow up rate and bias in follow up towards older individuals, those in treatment, more frequent injectors and those exposed to HCV before the study. Individuals recently infected at baseline and still seronegative at initial testing will be misclassified
Brant 2008	UK Feb 2002- Nov 2003	Retrospective observational study	Convenience sampling	PWID	PWID tested for HCV at one of 4 laboratories in England	390	12.9 cases per 100 person-years	- Methods may be inappropriate for accurate measurement of incidence - not clear of available samples (population) are representative of the source population	without systematic collection of follow-up samples, it was not possible to prove definitively that sera with the anti-HCV negative, HCV RNA positive pattern were from patients with acute infection rather than antibody negative chronic infection or false positive RNA results
Judd 2005	UK 2001-2003	Prospective observational study	Not reported	PWID	Injecting drug users recruited from community settings mainly in London	428	41.8 cases per 100 person-years	- No clear description of the methodology	
Taylor 2013	UK June 2010- March 2011	Cross-sectional study	Exhaustive (screening)	PWID in prison	Prisoners who inject drugs in all closed prisons in Scotland	479	2.0-2.9 %	- The methods may not be appropriate to accurately measure incidence	The incidence was estimated based on RNA positive/anti-HCV negative samples. New infections in people who had previously cleared the virus could not be identified. Prisoners incarcerated less than 75 days were excluded as the recent infection could be attributed to outside factors.

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HCV	Critical appraisal	General comments
<i>(Haemo)dialysis recipients</i>									
Ayzac 2009	France Jan-Dec 2005	Surveillance study	Exhaustive (screening)	Haemodialysis recipients	Chronic haemodialysis patients treated in 6 units	664	0 % per year	- Methods serology not reported	
Izopet 2005	France 1997-2000	Prospective observational study	Not reported	Haemodialysis recipients	Chronic haemodialysis patients treated in 25 units	1323	0.4 % per year	- Selection of study population not clear - Unclear whether study population is representative	study population seems to be representative, but participation rate is not reported
Ross 2008	Germany 2002-2003	Prospective observational study	Not reported	Haemodialysis recipients	maintenance haemodialysis patients treated in North Rhine Westphalen	2909	0 % per year	- No major comments	
Sypsa 2005	Greece Feb 1993- May 1995	Prospective observational study	Exhaustive (screening)	Haemodialysis recipients	Patients receiving haemodialysis at 5 units in Athens	562	6.2 cases per 100 person-years	- No major comments	
Di Napoli 2006	Italy 1995-2003	Surveillance study	Exhaustive (screening)	Haemodialysis recipients	Patients undergoing dialysis in the Lazio Region	6412	2.5 cases per 100 person-years	- Unclear whether population is representative	Seroconversion data (used to calculate incidence) was updated once a year. Individuals not receiving dialysis at the end of a year are therefore excluded from this analysis.
Ghafur 2007	UK NR	Cross-sectional study	Exhaustive (screening)	Haemodialysis recipients who recently travelled	End-stage renal dialysis patients receiving haemodialysis who had recently travelled, from 7 units in London	131	2.6 %	- Selection of study population is unclear - unclear whether study population is representative	Patients who travelled underwent weekly HCV RNA testing for the first 8 weeks after return

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HCV	Critical appraisal	General comments
Corbett 2006	UK April 2009-Sept 2009	Prospective observational study	Exhaustive (screening)	Haemodialysis recipients who travelled	Maintenance haemodialysis patients from 9 units who travelled, with associated haemodialysis at another centre during a 6 month period	172	0 %	- The methods used may not be appropriate for the purpose of the research	No seroconversions were observed in the study period. However, the study period and follow up time was very short, and relatively few trips were to endemic countries

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HCV	Critical appraisal	General comments
<b>Healthcare workers</b>									
Marconi 2010	Italy 1999-2009	Prospective observational study	Not reported	HCW	Health care workers at high risk of exposure in a hospital in Italy	403	0 per 10 years	- Selection of the study population is not clearly described	The sample is simply described as 'HCWs at higher risk of exposure to blood-borne pathogens'

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HCV	Critical appraisal	General comments
<b>Recipients of medical/dental interventions</b>									
Ciancio 2005	Italy 1999-2002	Prospective observational study	Exhaustive (screening)	Endoscopy patients	Outpatients referred for endoscopy in 3 units in Northwestern Italy	8260	0 cases per 100 person-years	- No major comments	8.3% of patients were lost to follow up, which may have been caused in part by an independent knowledge of recent HCV acquisition. However, age, sex, and risk factors did not differ between the adherent group and persons lost to follow-up.

**Sexual transmission**

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HCV	Critical appraisal	General comments
<b>Men who have sex with men</b>									
Apers 2013	Belgium 2001-2011	Retrospective observational study	Exhaustive (screening)	MSM living with HIV	HIV+ MSM attending the STI clinic of the Institute of Tropical Medicine, Antwerp	1105	1.36 cases per 100 person-years	- The sample population may not be representative of HIV+ MSM in Belgium	
Bottieau 2010	Belgium 2009	Retrospective observational study	Other	MSM living with HIV	HIV+ MSM attending the HIV/STI clinic of the Institute of Tropical Medicine, Antwerp	922	2.3-2.9 % per year	- Data collection may be inadequate - The study population may not be representative of HIV+ MSM in Belgium	Data for 2001-2009 is presented in the article, but reported here for 2009 only. Periodic HCV screening was not systematically performed. HIV+ MSM attending the clinic were tested for HCV after each STI episode or after sexual contact with an HCV-infected partner. Those considered by the treating physician as being at high risk for HCV infection (for example, those with multiple sexual partners, GHB users and frequent visitors to known high-risk discotheques or saunas) were tested at least once a year for HCV.
Barfod 2011	Denmark 2006-2009	Retrospective observational study	Not reported	MSM living with HIV	HIV infected MSM under treatment at a hospital department in Copenhagen	871	0.37 % per year	- Methods serology not reported - Selection of study population not clear - The denominator is incorrect	The denominator counts patients up until mid-2008, and since the nominator includes patients to the end of 2009, the incidence rate may be artificially high. The estimated yearly increase in patients fulfilling the denominator criteria is very unlikely to be more than 50, so the real incidence rate can be estimated to be no lower than 0.34% per y
Larsen 2011	France 2007	Surveillance study	Other	MSM living with HIV	HIV+ MSM attending HIV clinics throughout France participating in HEPAIG study	NR	0.36 % per year	- Methods serology not described - The denominator is not reported	Incidence was based on the number of notified cases. Annual incidence was reported as cases per 10000 and computed in % per year here. Results for 2006 were also reported in the article. Study might have missed out the HIV-infected MSM patients who did not seek follow-up medical care
Jansen 2015	Germany 1996-2012	Prospective observational study	Not reported	MSM living with HIV	HIV-1 positive MSM from multiple centres nationwide	1838	1.54 cases per 100 person-years	- Selection of study population not clear	HCV incidence may be underestimated because of delayed antibody response to acute infection, but may be overestimated as positive samples were not confirmed with immunoblot

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HCV	Critical appraisal	General comments
Puoti 2016	Italy 1997-2016	Prospective observational study	Not reported	MSM living with HIV	MSM living with HIV enrolled in the ICONA study	NR	0.7 cases per 100 person-years	- Serological methods are not adequately described - The methods are not clearly described - Unclear if the study population is representative of the source population - Theoretical background is limited - The study population is not described	
Hullegie 2016	Netherlands Jan 2014-Jan 2015	Surveillance study	Exhaustive (screening)	MSM living with HIV	HIV+ MSM participating in the Dutch Acute HCV HIV study	8849	1.1 cases per 100 person-years	- little description relevance of the study - study population not clearly described - methods serology not described	The population included represents 86% of all HIV+ MSM in the Netherlands
van Rooijen 2016	Netherlands 2007-2011	Prospective observational study	Exhaustive (screening)	MSM living with HIV	All eligible HIV+ MSM who visited the STI clinic of Amsterdam	869	2.35 cases per 100 person-years	- It is unlikely that the study population is representative of the source population	Unable to detect acute infections which might count as incidence.
Van De Laar 2007	Netherlands 1984-2003	Retrospective observational study	Mixed	MSM	MSM participating in the Amsterdam cohort study	1836	0.07 cases per 100 person-years	- Sample may not be representative of all MSM in Netherlands	A mix of convenience sampling (advertisements) and chain referral sampling was employed. After 1995, mainly HIV- MSM were recruited.
Vanhommerig 2006	Netherlands 1984-2012	Prospective observational study	Exhaustive (screening)	MSM	MSM in Amsterdam participating in the Amsterdam cohort study	2080	0.17 cases per 100 person-years	- The methods used were not clearly described	All HCV incident cases were HIV positive. Median follow-up time was reported to be 7.4 years
Sobrinho-Vegas 2014	Spain 2004-2011	Prospective observational study	Not reported	MSM living with HIV	HIV+ MSM from the CoRIS cohort	1421	0.75 cases per 100 person-years	- The methods are not clearly described	Sampling methods of CoRIS were not reported. HCV testing was performed according to clinical criteria, rather than following a pre-specified screening scheme, so it is possible that those with available follow-up serologies are those in which a higher probability of HCV infection was suspected; thus rates of HCV diagnoses may be overestimated
Martin 2016	UK 2004-2011	Prospective observational study	Exhaustive (screening)	MSM living with HIV	HIV+ MSM attending treatment clinics participating in UK CHIC	16533	1.07 cases per 100 person-years	-Methods serology not reported -limited information on selection of study population ('Individuals were included in the analysis if they had ever attended one of the 11 centers since 2004') -limited information on data collection -study population is not described	Focus of the article is on the modelling section
Giraudon 2008	UK Jan 2002-June 2006	Cross-sectional study	Other	MSM living with HIV	HIV+ MSM attending clinics in London and East Sussex	42985	0.9 cases per 100 person-years	- Methods serology not reported - Study population not representative for all HIV+ MSM in the UK	Response bias may have led to an overestimation of incidence as non-responding clinics may be more likely to have fewer cases Clinics were more likely to carry out routine screening of all HIV+ MSM over time
Turner 2006	UK 1999-2005	Cross-sectional study	Exhaustive (screening)	MSM living with HIV	HIV positive MSM attending a HIV-outpatient clinic in London	308	0.9 cases per 100 person-years	- Methods serology not described - Results are not clearly described - It is not clear if the population is representative for the UK	

**Intranasal transmission**

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HCV	Critical appraisal	General comments
<i>Intranasal drug users</i>									
Bravo 2012	Spain 2001-2003	Prospective observational study	Mixed	Intranasal drug users	Non-injecting heroin users who snort cocaine from street drug scenes and non-treatment settings in Madrid, Seville and Barcelona	36	3 cases per 100 person-years	- Methods used could lead to recall bias	Underreporting of injection during follow-up could have resulted in overestimation of HCV incidence among never-injectors. The potential misclassification was probably not influenced by recruitment procedures, as none of the admission criteria was related with the administration route, and no differential benefits could be obtained from being self-classified as an injector or non-injector. The use of long recall periods may have interfered with the recall process

**Vulnerable populations and mixed transmission route groups**

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HCV	Critical appraisal	General comments
<i>People living with HIV</i>									
Apers 2013	Belgium 2001-2011	Retrospective observational study	Exhaustive (screening)	MSM living with HIV	HIV+ MSM attending the STI clinic of the Institute of Tropical Medicine, Antwerp	1105	1.36 cases per 100 person-years	- The sample population may not be representative of HIV+ MSM in Belgium	
Bottiau 2010	Belgium 2009	Retrospective observational study	Other	MSM living with HIV	HIV+ MSM attending the HIV/STI clinic of the Institute of Tropical Medicine, Antwerp	922	2.3-2.9 % per year	- Data collection may be inadequate - The study population may not be representative of HIV+ MSM in Belgium	Data for 2001-2009 is presented in the article, but reported here for 2009 only. Periodic HCV screening was not systematically performed. HIV+ MSM attending the clinic were tested for HCV after each STI episode or after sexual contact with an HCV-infected partner. Those considered by the treating physician as being at high risk for HCV infection (for example, those with multiple sexual partners, GHB users and frequent visitors to known high-risk discotheques or saunas) were tested at least once a year for HCV.
Andersen 2014	Denmark Jan 2011-Jan 2013	Prospective observational study	Exhaustive (screening)	PLHIV	HIV+ patients actively followed at the outpatient clinic of Aarhus University Hospital	574	0.27 cases per 100 person-years	- Not clear how representative the study population is for all HIV patients in Denmark	
Barfod 2011	Denmark 2006-2009	Retrospective observational study	Not reported	MSM living with HIV	HIV infected MSM under treatment at a hospital department in Copenhagen	871	0.37 % per year	- Methods serology not reported - Selection of study population not clear - The denominator is incorrect	The denominator counts patients up until mid-2008, and since the nominator includes patients to the end of 2009, the incidence rate may be artificially high. The estimated yearly increase in patients fulfilling the denominator criteria is very unlikely to be more than 50, so the real incidence rate can be estimated to be no lower than 0.34% per year
Boesecke 2015	EU/EEA wide 2002-2013	Prospective observational study	Exhaustive (screening)	PLHIV	HIV patients from northern European centres participating in EuroSIDA	1578	4.4 12 year cumulative incidence (%)	- Methods serology not described	Only results for Northern Europe are shown here as this is the only region which contains solely EU/EEA countries (Denmark, Finland, Iceland, Ireland, Netherlands, Norway, Sweden, UK)
Ghosn 2006	France 1996-2005	Prospective observational study	Exhaustive (screening)	PLHIV	HIV patients from the multicentre prospective ANRS PRIMO cohort	402	0.43 cases per 100 person-years	- Original selection criteria study population not described - unclear whether study population is representative	Less than 1% of this population of Primary HIV infection are injecting drug users; most of them became HIV+ through the sexual route.

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HCV	Critical appraisal	General comments
Larsen 2011	France 2007	Surveillance study	Other	MSM living with HIV	HIV+ MSM attending HIV clinics throughout France participating in HEPAIG study	NR	0.36 % per year	- Methods serology not described - The denominator is not reported	Incidence was based on the number of notified cases. Annual incidence was reported as cases per 10000 and computed in % per year here. Results for 2006 were also reported in the article. Study might have missed out the HIV-infected MSM patients who did not seek follow-up medical care
Jansen 2015	Germany 1996-2012	Prospective observational study	Not reported	MSM living with HIV	HIV-1 positive MSM from multiple centres nationwide	1838	1.54 cases per 100 person-years	- Selection of study population not clear	HCV incidence may be underestimated because of delayed antibody response to acute infection, but may be overestimated as positive samples were not confirmed with immunoblot
Puoti 2016	Italy 1997-2016	Prospective observational study	Not reported	PLHIV	Persons living with HIV enrolled in the ICONA study	4059	0.6 cases per 100 person-years	- Serological methods are not adequately described - The methods are not clearly described - Unclear if the study population is representative of the source population - Theoretical background is limited - The study population is not described	
Puoti 2016	Italy 1997-2016	Prospective observational study	Not reported	MSM living with HIV	MSM living with HIV enrolled in the ICONA study	NR	0.7 cases per 100 person-years	- Serological methods are not adequately described - The methods are not clearly described - Unclear if the study population is representative of the source population - Theoretical background is limited - The study population is not described	
Puoti 2016	Italy 1997-2016	Prospective observational study	Not reported	PWID living with HIV	PWID living with HIV enrolled in the ICONA study	NR	7.2 cases per 100 person-years	- Serological methods are not adequately described - The methods are not clearly described - Unclear if the study population is representative of the source population - Theoretical background is limited - The study population is not described	
Hullege 2016	Netherlands Jan 2014-Jan 2015	Surveillance study	Exhaustive (screening)	MSM living with HIV	HIV+ MSM participating in the Dutch Acute HCV HIV study	8849	1.1 cases per 100 person-years	- little description relevance of the study - study population not clearly described - methods serology not described	The population included represents 86% of all HIV+ MSM in the Netherlands
van Rooijen 2016	Netherlands 2007-2011	Prospective observational study	Exhaustive (screening)	MSM living with HIV	All eligible HIV+ MSM who visited the STI clinic of Amsterdam	869	2.35 cases per 100 person-years	- It is unlikely that the study population is representative of the source population	Unable to detect acute infections which might count as incidence.
Sobrinho-Vegas 2014	Spain 2004-2011	Prospective observational study	Not reported	PLHIV	HIV+ patients from the CoRIS cohort	2122	0.93 cases per 100 person-years	- The methods are not clearly described	Sampling methods of CoRIS were not reported. HCV testing was performed according to clinical criteria, rather than following a pre-specified screening scheme, so it is possible that those with available follow-up serologies are those in which a higher probability of HCV infection was suspected; thus rates of HCV diagnoses may be overestimated
Sobrinho-Vegas 2014	Spain 2004-2011	Prospective observational study	Not reported	MSM living with HIV	HIV+ MSM from the CoRIS cohort	1421	0.75 cases per 100 person-years	- The methods are not clearly described	Sampling methods of CoRIS were not reported. HCV testing was performed according to clinical criteria, rather than following a pre-specified screening scheme, so it is possible that those with available follow-up serologies are those in which a higher probability of HCV infection was suspected; thus rates of HCV diagnoses may be overestimated
Martin 2016	UK 2004-2011	Prospective observational study	Exhaustive (screening)	MSM living with HIV	HIV+ MSM attending treatment clinics participating in UK CHIC	16533	1.07 cases per 100 person-years	-Methods serology not reported -limited information on selection of study population (Individuals were included in the analysis if they had ever attended one of the 11 centers since 2004) -limited information on data collection -study population is not described	Focus of the article is on the modelling section

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HCV	Critical appraisal	General comments
Giraudon 2008	UK Jan 2002- June 2006	Cross-sectional study	Other	MSM living with HIV	HIV+ MSM attending clinics in London and East Sussex	42985	0.9 cases per 100 person-years	- Methods serology not reported - Study population not representative for all HIV+ MSM in the UK	Response bias may have led to an overestimation of incidence as non-responding clinics may be more likely to have fewer cases Clinics were more likely to carry out routine screening of all HIV+ MSM over time
Turner 2006	UK 1999-2005	Cross-sectional study	Exhaustive (screening)	MSM living with HIV	HIV positive MSM attending a HIV-outpatient clinic in London	308	0.9 cases per 100 person-years	- Methods serology not described - Results are not clearly described - It is not clear if the population is representative for the UK	

Reference	Country and study period	Study design	Sampling approach	Subgroup	Study population	Sample N	Incidence HCV	Critical appraisal	General comments
<i>People in prison</i>									
Marco 2014	Spain 1992-2012	Retrospective observational study	Exhaustive (screening)	People in prison	Inmates of a prison in a province of Barcelona	2377	1.17 cases per 100 person-years	- No clear description of serological testing	Only 24.8 % (29/117) of the infected population stayed within the prison during the follow-up period, the rest had permission for release, so we can not determine if HCV occurred within or outside the prison.
Marco 2014	Spain 1992-2012	Retrospective observational study	Exhaustive (screening)	PWID in prison	Inmates of a prison in a province of Barcelona with a history of intravenous drug use	168	6.66 cases per 100 person-years	- No clear description of serological testing	Only 24.8 % (29/117) of the infected population stayed within the prison during the follow-up period, the rest had permission for release, so it can not be determined if HCV occurred within or outside the prison.
Taylor 2013	UK June 2010- March 2011	Cross-sectional study	Exhaustive (screening)	People in prison	Prisoners in all closed prisons in Scotland	4904	1 cases per 100 person-years	- The methods may not be appropriate to accurately measure incidence	The incidence was estimated based on RNA positive/anti-HCV negative samples. New infections in people who had previously cleared the virus could not be identified. Prisoners incarcerated less than 75 days were excluded as the recent infection could be attributed to outside factors.
Taylor 2013	UK June 2010- March 2011	Cross-sectional study	Exhaustive (screening)	PWID in prison	Prisoners who inject drugs in all closed prisons in Scotland	479	2.0-2.9 %	- The methods may not be appropriate to accurately measure incidence	The incidence was estimated based on RNA positive/anti-HCV negative samples. New infections in people who had previously cleared the virus could not be identified. Prisoners incarcerated less than 75 days were excluded as the recent infection could be attributed to outside factors.



## Appendix 9. Summary tables for the undiagnosed fraction of HBV cases

Reference	Country, Sampling period	Methodological approach	Sampling approach	Population group	Study population description	Sample N	Undiagnosed fraction HBV	Critical appraisal	General comments
Hansen, 2013	Denmark 2005-2007	Modelling	Not applicable	General population	General population from four national HBV source registers	NR	66.6		Proportion undiagnosed is based on 140,376 pregnant women tested for HBsAg in Denmark in the years 2005 to 2007, adjusted for 37% diagnosed but not present in the source registers
Meffre, 2010	France 2004	Screening	Mixed	General population	People invited for a health survey for a medical check-up at medical centres across France	14416	55.2	-study population might not be representative of the general population	
Wolfram, 2015	Germany 2012-2013	Screening	Exhaustive (screening)	General population	People aged 35+ in Germany participating in a check-up programme in 51 primary care private practices in North Rhine Westphalia	21008	85	-study population might not be representative of the general population	Only private practice patients receiving a 'check-up 35+' were included who do not represent the general population aged 35+. In addition patients younger than 35 were also included.
Pneumatics, 2012	Greece 2005-2006	Screening	Exhaustive (screening)	General population	Adult consecutive patients who underwent an orthopedic intervention at a Greek University Hospital	1694	83.3	- no major comments	
Papathodoridis, 2015	Greece 2012	Modelling	Other	General population	People aged 18-70 years in Greece who participated in a phone survey	9974	49.7	- Methodology unclear	Phone survey on awareness of HBV/HCV with quota sampling. 27.1% refused to participate or did not complete the questionnaire. Overall prevalence was based on age-adjusted (projected) prevalence estimates in the Greece adult general population, obtained from the National Health and Nutrition Examination Survey.
Ippolito, 2011	Italy 2008-2009	Screening	Exhaustive (screening)	General population	Consecutive patients admitted to clinical wards of a south Italian hospital	25000	40.3	- no description of total study population provided	Proportion unaware is from HBV-DNA positive
Hahne, 2011	Netherlands 1996-2007	Screening	Random sampling	General population	General population selected from 8 municipal registers in five regions of the Netherlands (Pienter studies)	13495	80	-study population might not be representative of the general population	Oversampling of migrants in 2007
Sagnelli, 2016	Italy 2012-2013	Screening	Exhaustive (screening)	Migrants	Pregnant migrants from countries with intermediate/high HBV endemicity, observed during pregnancy or at the time of delivery at eight hospitals across Italy	1970	56.7	- no major comments	
McPherson, 2013	UK NR	Screening	Convenience sampling	Migrants	British-Chinese subjects living in the North-East of England, attending 4 community centres and churches	606	81.1	- no description of total study population provided - unclear whether study population is representative	- Sample was composed of people responding to offer for testing, therefore it is likely that the undiagnosed fraction is an overestimation as people aware of their infection are less likely to be captured.
McPherson, 2013	UK NR	Screening	Convenience sampling	Migrants	British-South Asian subjects living in the North-East of England, attending 4 community centres and churches	520	100	- no description of total study population provided - unclear whether study population is representative	- Sample was composed of people responding to offer for testing, therefore it is likely that the undiagnosed fraction is an overestimation as people aware of their infection are less likely to be captured.
Vedio, 2013	UK NR	Screening	Convenience sampling	Migrants	Chinese residents in Sheffield attending a community centre	229	70	- study population might not be representative - methods for serology testing not reported	- The sample was a self-selected sample, as it was composed entirely of people requesting or volunteering for testing following prior or on the spot advertisement. This is likely to produce an overestimation of undiagnosed fraction as people aware of their infection are less likely to be captured.

## Appendix 10. Summary tables for the undiagnosed fraction of HCV cases

Reference	Country, Sampling period	Methodological approach	Sampling approach	Population group	Study population description	Sample N	Undiagnosed fraction	Critical appraisal	General comments
Christensen, 2012	Denmark NR	Modelling	Not applicable	General population	General population from four national HCV source registers	NR	46		The capture-recapture method only estimated the number of patients diagnosed with HCV and not the population that had never been tested for HCV. A direct estimate would require a general population survey which had not been performed in Denmark. The authors estimated the test coverage within the population of HCV infected in the drug treatment register and applied this to calculate the total population with chronic hepatitis C in Denmark
Meffre, 2010	France 2004	Screening	Mixed	General population	People invited for a health survey for a medical check-up at medical centres across France	14416	42,6	-study population might not be representative of the general population	
Vermeulen, 2012	Germany 2008-2010	Screening	Exhaustive (screening)	General population	Consecutive patients visiting the emergency department of two German hospitals and who had a blood sample taken as part of their routine diagnostic work up	28809	22,2	- no major comments	% aware of diagnosis differed between text and table. Numbers from table were kept.
Wolfram, 2015	Germany 2012-2013	Screening	Exhaustive (screening)	General population	People in Germany participating in a check-up programme in 51 primary care private practices in North Rhine Westphalia	21008	65	-study population might not be representative of the general population	Only private practice patients receiving a 'check-up 35+' were included who do not represent the general population aged 35+. In addition patients younger than 35 were also included.
Pneumatics, 2012	Greece 2005-2006	Screening	Exhaustive (screening)	General population	Adult consecutive patients who underwent an orthopedic intervention at a Greek University Hospital	1694	91,2	- no major comments	
Papathodoridis, 2015	Greece 2012	Modelling	Other	General population	People aged 18-70 years in Greece who participated in a phone survey	9974	80,8	- Methodology unclear	Phone survey on awareness of HBV/HCV with quota sampling. 27.1% refused to participate or did not complete the questionnaire. Overall prevalence was based on age-adjusted (projected) prevalence estimates in the Greece adult general population, obtained from the National Health and Nutrition Examination Survey.
Sakem, 2016	Poland NR	Modelling	Not applicable	General population	General population of Poland, from published literature, surveillance data and grey literature	NR	89,3	- not described whether children are included	
Prevost, 2015	UK 2009	Modelling	Not applicable	PWID	Recently (having injecting in the last year) and non-recently injecting PWIDs from across Scotland, from a drugs misuse database, a HCV diagnosis database, a capture-recapture study and survey from a needle exchange initiative	82536	59	- no major comments	
Vedio, 2013	UK NR	Screening	Convenience sampling	Migrants	Chinese residents in Sheffield attending a community centre	229	NA	- study population might not be representative - methods for serology testing not reported	- The sample was a self-selected sample, as it was composed entirely of people requesting or volunteering for testing following prior or on the spot advertisement. This is likely to produce an overestimation of undiagnosed fraction as people aware of their infection are less likely to be captured. - no positive samples for HCV were found

## Appendix 11. Comparative guideline analysis

### Introduction

In order to determine the populations for which hepatitis B/C testing should be a priority in different EU/EEA countries, it is important to identify which groups are at risk and/or have a high burden of disease. For this objective, research question 1 was formulated:

Research question 1: Which population subgroups have a high risk of acquiring HBV or HCV, and/or have a high burden of disease?

This research question was partly addressed using a comparative analysis of guidelines, in order to identify which groups have already been identified as being at risk for hepatitis B/C and the level of evidence that this was based on.

### Methods

#### *Guideline inventory*

Guidelines, guidance documents and other relevant policy documents (referred to hereafter collectively as 'guidelines') covering testing for hepatitis B and/or C were searched for and collected using the following methods:

- The search for guidelines was started at the internet site of the US National Guideline Clearinghouse. This site contains guidelines developed by e.g. NICE and SIGN.
- The following international and national institutes were searched for guidelines:
  - ECDC
  - WHO
  - EASL
  - NICE
  - SIGN
  - CDC
  - RIVM
  - U.S. preventative services task force
  - ASHM
  - Gov.uk
  - HSE Ireland
- In addition, recently developed, unpublished guidelines were sent by ECDC (recent IUSTI & WHO guidelines)
- Guidelines collected through the ongoing ECDC project 'Hepatitis B, C and E in the EU/EEA: assessment of monitoring and testing activities';
- A Google search of terms 'hepatitis' and 'guideline' was performed and the first 10 pages of search results screened for relevant items.

If more than one version of a guideline was available, the most comprehensive version was included. The entire text of each guideline was screened extensively for recommendations/information relevant to the research question.

#### *Level of evidence of guidelines*

Recommendations presented in the guidelines were based on a systematic review, references, or expert opinion, or a combination of these. The definitions of each are:

- **Systematic review:** Methodology is available and describes how the data was gathered systematically
- **References:** Data is evidence based, but no methodology is provided which shows that it has been gathered systematically
- **Expert opinion:** No methodology or references provided

The level of evidence was recorded per recommendation/guideline

#### *Quality assessment of guidelines*

The AGREE tool was used for the quality assessment of the guidelines. Assessment was based on a stepwise approach. In a first step, guidelines were included or excluded primarily based on three main criteria from the AGREE tool, i.e.:

- The overall objective(s) of the guideline is (are) specifically described.
- Systematic methods were used to search for evidence.
- The recommendations are specific and unambiguous.

In cases of doubt on the quality of a guideline, the guideline was assessed on a further six criteria from the AGREE tool:

- The criteria for selecting the evidence are clearly described.
- The strengths and limitations of the body of evidence are clearly described.
- The methods for formulating the recommendations are clearly described.
- The health benefits, side effects, and risks have been considered in formulating the recommendations.
- There is an explicit link between the recommendations and the supporting evidence.
- The guideline has been externally reviewed by experts prior to its publication.

Furthermore, a final grade was given to each guideline and a judgement was made on whether the guideline passed the assessment and whether its use is recommended.

## Results

A total of 17/25 guidelines provided information on population subgroups at risk of hepatitis B [186-202] and 24/27 guidelines provided information on population subgroups at risk of hepatitis C [2,11,186-189,191-193,195,197-210]

None of the guidelines which named population subgroups as being at risk based this information on evidence gathered in a systematic review. Although a number of guidelines (e.g. WHO, NICE) were evidence-based, the section on risk groups was based on references only, or expert opinion; presumably based on HBV/HCV prevalence in certain groups or known transmission patterns. In total, 10 of the 17 hepatitis B guidelines provided information based on references [187,191,193-195,197-199,201,202], four were based on expert opinion [189,190,192,196] and for three, it was unclear what they were based on [186,188,200]. For Hepatitis C guidelines, this was fourteen [2,187,191,193,195,197-199,201,202,205-207,210], seven [11,189,192,203,204,208,209] and three guidelines [186,188,200], respectively.

An overview of the different risk groups named and the frequency and proportion of guidelines which named each risk group is shown in table A7.

**Table A7. Number and proportion of guidelines identifying various population subgroups as being at risk for hepatitis B or C**

Population subgroup	Number (%) of guidelines which mention subgroup as being at risk	
	HBV	HCV
(Ex-)PWID	12 (71)	20 (83)
(Ex-)Intranasal drug users	2 (12)	5 (21)
(Ex-)Drug users	2 (12)	1 (4)
Migrants from (medium or) high prevalence areas	11 (65)	12 (50)
(Ex-)People in prison	6 (35)	13 (54)
Other (potentially) institutionalised persons*	3 (18)	1 (4)
MSM	10 (59)	3 (13)
MSM living with HIV	0 (0)	6 (25)
Sex workers	4 (24)	4 (17)
Persons with multiple sex partners	5 (29)	0 (0)
Family/household/close/sexual partners of HBV/HCV positive persons	8 (47)	4 (33)
Children of HBV/HCV positive mothers	3 (18)	14 (58)
PLHIV	5 (29)	10 (42)
Health care workers	2 (12)	7 (29)
Persons receiving haemodialysis	5 (29)	9 (38)
Recipients of unscreened blood and blood products or organs or tissues	1 (6)	13 (54)
Persons who have had tattoos or piercings	1 (6)	9 (38)**
Persons who have had medical/dental interventions	0 (0)	5 (21)
Travellers to intermediate/high prevalence areas	3 (18)	0 (0)

\* Including: children that receive care, adults in psychiatric institutions, intellectually disabled

\*\* Including four guidelines which specified unregulated/substandard settings

## Discussion

For HBV the most commonly named risk groups (named by more than half of the guidelines) were (ex-)PWID, migrants from medium or high prevalence areas and MSM. Other risk groups named in 20% or more guidelines include family/household/close/sexual partners of HBV-positive persons, (ex-)people in prison, persons with multiple sex partners, HIV-positive persons, persons receiving haemodialysis and sex workers.

For HCV the most commonly named risk groups (named by more than half of the guidelines) were (ex-)PWID, children of HCV-positive mothers, people in prison, recipients of unscreened blood and blood products or organs or tissues and migrants. Other risk groups named in 20% or more of the guidelines include HIV-positive persons, persons receiving haemodialysis, persons who have tattoos or piercings, family/household/close/sexual partners of HCV-positive persons, health care workers, HIV-positive MSM, persons who have had medical/dental interventions and (ex-)intranasal drug users.

Although there was overlap between HBV and HCV, differences in the type of risk groups identified for the two diseases were that sexual behaviour was often a factor shared by risk groups identified for HBV, but less often for HCV, and exposure through blood/medical/invasive procedures was more often a factor shared by risk groups identified for HCV than HBV.

Risk groups mentioned by just one guideline include: sexual assault victims, tattooists, baby boomers, various indigenous groups, all migrants (prevalence in country of origin not specified) and homeless persons.